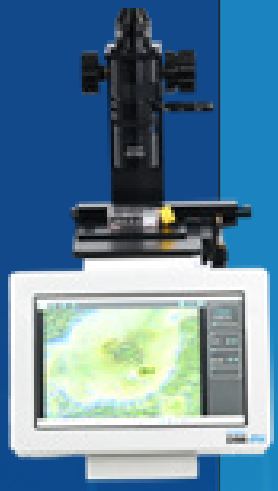
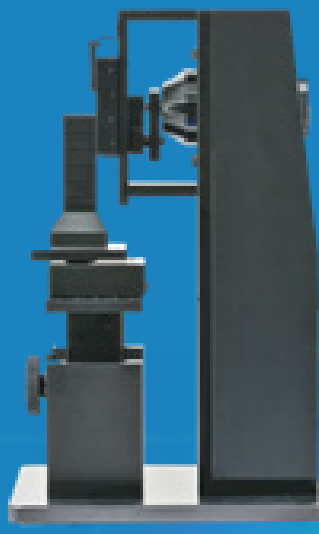
HOLMARC

HOLMARC
OPTO MECHATRONICS LTD









Scientific Lab Solutions

RESEARCH TOOLS

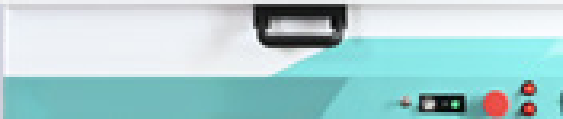
A COMPREHENSIVE GUIDE TO OUR 5000+ PRODUCTS

www.holmarc.com | sales@holmarc.com





ISO 9001:2015



HOLMARC OPTO-MECHATRONICS LTD

Technical Support

Get in touch with our technical experts and discuss your application needs and unique requirements You can be sure that you will receive rapid response and service

International sales and Service

Worldwide Distributors

Volume pricing / OEM Solutions

HOLMARC OPTO MECHATRONICS LIMITED

ISO 9001:2015
Made in INDIA



Online Informations
www.holmarc.com

Easy to use search features
Browse through our website & discover more about range of products and services

New product updations
Available before catalogue, We introduce more than 100 new products every year. Check them out before they hit the catalogue

Video Resources
There's nothing better than seeing a product in action
Watch our product demo to learn more about the products These video provides a high level overview of the main functionality of the products

Downloads
Documents, Software & Manuals can be download from www.holmarc.com/downloads

Contact Information

Registered Office
B.7., H.M.T. Industrial Estate
H.M.T. P.O, Kalamassery, Kochi
Kerala, India, Pin - 683 503

Corporate Office
Door No. 37/386, Manath Tower
Opp. Kalamassery Police Station
Changampuzha Nagar P.O, Kochi
Kerala, India, Pin - 682033
CIN : U33125KL1993PLC006984
GST No: 32AAACH9492C1ZQ
MSME : UDYAM-KL-02-0043524

Business Hours
Monday to Saturday 9:00am 5:00pm

E-mail Contacts
sales@holmarc.com

Website
www.holmarc.com

Sales Contacts:

Director - Sales & Marketing
Mob : +91 938-863-2098
Email : sales@holmarc.com

Engineer - Services (after sales)
Mob : +91 903-756-4846
Email : service@holmarc.com

Engineer - Sales & Service
+91 920-719-7771
+91 920-719-7772
+91 920-719-7776
Email : sales@holmarc.com

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How to Read QR Code

To fully utilize QR Code, a mobile phone/tab will need to have:
Camera CR Code-reading software and Web access

Connect with us on

Holmarc Welcomes You

It is with great pride that we announce the celebration of our 30th anniversary With the support and co-operation of our valued customers, Holmarc has evolved into a provider of integrated engineering tools for scientific research, be it in photonics. life science, nano technology or atmospheric science. We express our profound gratitude to at all our customers from scientific community for giving us opportunities to develop new products and expand our capabilities.



Physics lab Instruments described in this brochure is the result of years of experience in manufacturing various optical instruments for research and industrial applications for our clients. We have made a deliberate attempt in the design of these apparatus to keep all components and modules open as far as possible. This approach helps students to gain deep understanding and in most cases provide them hands on experience in setting up the experiments.

All components and modules used in our educational products are of highest quality comparable to the best in the world. The design of experiments is in tune with the state of the art trends in the field. Our expertise in the integration of optics, mechanics and electronics are fully made use of in all these apparatus. There are varieties of instruments to teach diffraction, interferometry, lasers & opto-electronics, optics, spectroscopy, polarization, holography, fiber optics, etc. for graduate and post graduate level courses, student research and projects. These products are used for industry training as well.

In case, if any of the products described in this brochure do not meet your specifications, please feel free to discuss with our engineers. We can suitably modify or alter the product to suit your application. We continue to develop many new products integrating various engineering disciplines for research applications whenever your research demands a new engineering approach, you are welcome to discuss your needs with our engineers

With best wishes.

Staff and Management.
Holmarc Opto-Mechatronics Ltd

WE AWAIT FOR AN EARLY OPPORTUNITY TO WORK WITH YOU TO MEET YOUR ENGINEERING NEEDS



Our Protfolio

Established in 1993 and located in Kochi, India, Holmarc Opto-Mechatronics Ltd manufactures variety of scientific and engineering instruments for research, industry and education. Our products in the fields of spectroscopy, microscopy holography and thin films reflect capabilities we have in multitudes of disciplines, be it optics, mechanics photonics, electronics or computer science.

Why Holmarc

ISO CERTIFIED COMPANY

ISO 9001:2015 Certified Company

To meet the challenges of global competition, we started an organized quality improvement program We have successfully implemented quality management system as per industry standard. The goal of the company is to design, manufacture and service quality products that consistently meet our customer's requirement and needs.

R&D DEPARTMENT

Our R&D department constantly interacts with leading research institutes in India for development and up gradation of our products.

GLORIOUS PAST AND COMMITTED SINCE 1993

Holmarc, from its very beginning in 1993 has maintained cordial and professional relationship with all major research institutes in India, Be it Atomic energy institution, Space research center, DRDO. IIT's, IISc's. NIT's, DST institutes, CSIR Centers and University Centers

HOLMARC IS UNIQUE IN ITS ABILITY TO DESIGN PROTOTYPE AND MANUFACTURE UNDER ONE ROOF



MULTI-DISCIPLINARY CAPABILITIES

Over the years, we have built expertise and capabilities in multitudes of engineering and scientific metrology disciplines right from conceptualization to manufacturing Our capabilities range from mechanics, optics and embedded systems to thin film meteorology, spectroscopy and microscopy both in design and manufacturing. For many of our products, in addition to design and development, we carry out manufacturing process development as well. When holmarc products are ordered, our customers can be sure of receiving products with our combined experience and expertise.

COST EFFECTIVE SOLUTIONS

Though we strive to be the best in the world in the respective product domain, we maintain lean manufacturing operations to keep our costs minimum as possible. We make sure that our products are most cost effective compared to our competitors with comparable performance.

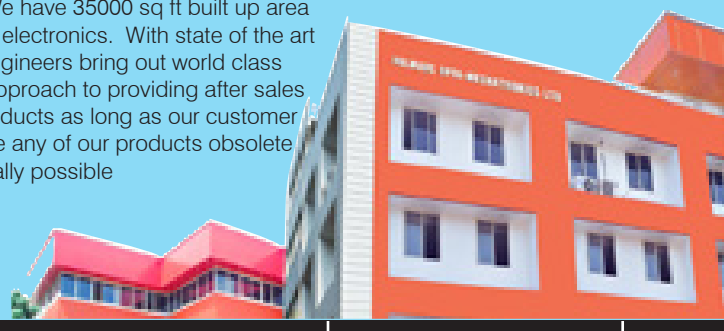
AFTER SALES SERVICE

We make sure that all our products are in working condition to the satisfaction of our customers throughout its life cycle irrespective of warranty period. It is our principle not to make any of our products obsolete as long as customer would like to use.

PRODUCT CUSTOMIZATION

Leveraging our multi-disciplinary capabilities, we routinely customize our products for specific applications. Our engineers are more than willing to work with users throughout the product development and manufacturing process.

Our strength is 330 people as of March 2024 and is still growing. All our departments, be it optics design, optics manufacturing, mechanics design, electronics R&D or soft-ware development are all manned by experienced professionals in the respective disciplines. We have 35000 sq ft built up area for housing our manufacturing infrastructure in optics mechanics and electronics. With state of the art machines, equipments and instruments. Holmarc technicians and engineers bring out world class products, each distinct and best in its kind. Holmarc is unique in its approach to providing after sales service. We give maintenance and modification support for all our products as long as our customer needs it irrespective of warranty or year of purchase. We do not make any of our products obsolete rather encourage our users to modify and use as long as it is technically possible



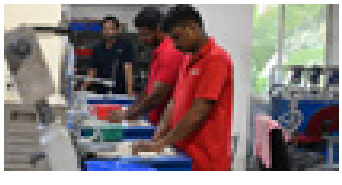
Optics

Optics Manufacturing and OEM Capability

HOLMARC offers custom and OEM ordering for optics and optical assemblies to bring a wide range of options and features to you. OEM orders are components or assemblies that will be used towards finished goods, manufacturing tools or pieces of testing equipment. For OEM enquires, please contact sales@holmarc.com or phone at 91 920-719-7771

Our optics facilities are staffed by well-trained, experienced technicians and engineers. Together they, combine years of experience with advanced machinery and tightly toleranced metrology to transform raw materials into finished optics. Lens production processes incorporate manual, automated machines and skilled craftsmen, providing a standard optics and the flexibility to create specialized optics tailored to a customer's needs. We can create optics from Calcite N-BK7, Fused Silica F2, NSF1, Sf66 NSK-14 Sf11 at from Schott and Quartz crystal, H-K9L F4, H-ZF3 etc CDGM Other materials are available on request. Optics up to 360mm diameter or 360mm square can be created in a diverse range of shapes and sizes. Our experienced technicians are able to regularly achieve a wavefront error of less than $\lambda/10$ and surface roughness between 3 to 5A on all optical flats







Thin Film Coating Lab

The Thin Film Coating Lab at Holmarc uses Vacuum coating chambers, Thin film reflectometer, Spectroscopic ellipsometer and spectrophotometers that aid in the creation of thin film optical coatings. A team of experienced engineers and technicians design, deposit, and measure thin film coatings ranging from our standard anti-reflective coatings to metallic mirror coatings.

Deposition techniques include resistive heat evaporation, electron beam evaporation with ion-assisted deposition, and ion beam sputtering. Alter deposition, coated optics go through another round of hand inspections and samples are optically profiled with Holmarc theta two theta advanced spectrophotometers: Transmission and reflectance data can be captured between 200 nm to 2.5 μm. The measurements taken at this step is to ensure optical performance meets specifications.





Key Capabilities
Skilled Technicians and Engineers
Vacuum Chambers Employing Multiple Deposition Techniques
Custom Built Chambers for Dedicated Use with Metals
Individual Hand Inspection of Optics
Optical Characterization by Spectrophotometer

Prototyping
Our design services cover all aspects of development optical. mechanical electronic and software for many industries including medical device, scientific. and industrial. we build complex instrumenta tion in very small form factors.

Design & Fabrication

Mechanical Design and Fabrication Workshop

This Division provides mechanical engineering support to all on-going project activities in terms of mechanical design, fabrication quality control, integration / assembly and installation of various electronic components/systems. The division has qualified and experienced manpower and a mix of conventional and CNC machines tools for mechanical fabrication and CAD facilities. The division also has chemical and electro plating facility

DESIGNING

Our product design team has extensive experience in the requirement planning process and we work closely with the customer to ensure we meet or exceed their targets and goals

Coordination is crucial to a successful product design and a smooth transition into production. With our dedicated team to define and execute a design and assembly plan, customers have come to think of us as an extension of their own engineering organizations

Our facility offers full product engineering, design, and manufacturing quick-turn capabilities, with specialized expertise in opto-mechanics and photonics systems Our staff of highly qualified engineers has countless years of experience with demanding commercial product delivery, as well as custom designed and OEM solutions





Custom Engineering

Custom Engineering design and manufacturing separates us from the competition. Bring us your most challenging requirements and let our engineers help to solve the issues that are impacting your performance. When your project requires products not available off the shelf, HOLMARC is your key to the perfectly developed solution. Many of the products that we offer today are designs that were developed to solve specific customer issues. We will customize our existing product to develop a modified standard or work with your team to develop a solution geared toward your specific needs. HOLMARC has an experienced engineering staff, with over 25 years of experience, and is dedicated to solve your problems, no matter the size or complexity





Key Capabilities

- Circuit Board Design, Manufacturing and Programing
- Data Acquisition and Control
- Electronic Test and Instrumentation
- Software Design and Engineering
- Graphic Display Programming and User Interface Design and Applications

CRITICAL ASSEMBLIES PRECISION ASSEMBLY OF PRODUCTS CONTAINING OPTICS. MECHANICS AND ELECTRONICS. HOLMARC CAN SUPPLY THE COMPONENTS TO YOUR SPECIFICATIONS

Electronics Design

Electronic Design and Software Services

Motion Control Manufacturing

Many modern electromechanical systems require custom control, power and signal- conditioning electronics that cannot be purchased off-the-shelf Holmarc provides custom electronic design services. With a wide range of scientific and technical knowledge, we have experience working on a diverse range of projects including anything from small electronic control systems to large systems. We work with you to help you figure out what you need by helping you develop and refine your requirements, and helping you evaluate solution paths before starting on a prototype. We can manufacture your electronic or electromechanical products from start to finish, quickly and with total flexibility.

Our staff is ready to assist you in every step of the process From program management to quality manufacturing & testing Please let us know more about your specific needs for a custom control system and our engineers will be glad to help you reaching your goals. For more information about our services in electrical and mechanical assembly or to learn about our additional services in contract manufacturing, please send an RFI/RFQ today.

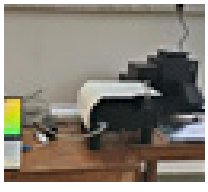
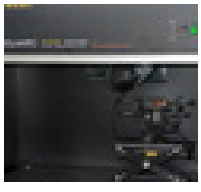
Customize Products

Modify the standard or request a part from scratch. Our design and manufacturing department will find the best solution for your applications

Product customization has been a core service of HOLMARC throughout our 31 years history Infrastructure and capabilities in mechanics and optics enable us to provide complete in-house services. We can modify a standard product or engineer a complete solution to meet any specific application requirements. HOLMARC has the unique capability to customize standard products for OEM and scientific applications. In addition to new product development, we actively pursue continuous improvement of our existing products.

Our experienced engineering, manufacturing and inspection teams are dedicated to produce quality components. We can assist in design and development of components as well as complete assemblies We are dedicated to meet our customer needs by leveraging our years of experience in optics, mechanics and control electronics.

HOLMARC IS THE IDEAL CANDIDATE FOR LOW TO MEDIUM VOLUME OPTICAL ELECTRO MECHANICAL MANUFACTURING




World Wide Distributer

Holmarc has presence throughout the world for all our product verticals, We ship directly to our customers where our exclusive distributers are not present. Where ever commercially viable, our engineers visit customer site for installation and training, When personal visits by our engineers are not economically suggestive, we encourage video conference for technical discussions as well as for training and service.

BELGIUM

ES France
127 Rue de BUZENVAL - BP 26
92380 GARCHES
Tel : +33 (0)147959901
+33 (0)609671207
E-mail : daniel.guez@es-france.com
Web : www.es-france.com

CHINA

Glord (Beijing) Tech Co. Ltd
Room 3071, Building 5
Tianyuan Road No.3,
Panggezhuang Town
Daxing District,
Beijing, China
Tel : 010-60347060,
17330024660
Email : info@bio-glord.com
Web : www.bio-glord.com

CHINA

Bio Excellence International Tech. Co. Ltd RM2-906, No.87# Jiancaicheng Road,
Changping Disctrict
Beijing, China
Ph : +86-13750923103
Email : sales@bio-goods.com
Web : www.bio-goods.com

EGYPT

Engineering Co., For Electronics
& Trade "ECET"
Office : 50 Kasr El Nile St., 11518, Cairo, Egypt
Factory : Sadat City 4th Industrial Region, Egypt
Tel : 201226961485, Fax : 00 20 48 2658074
Email : jackleen@eg-ecet.com
support@eg-ecet.com
Web : www.eg-ecet.com

FRANCE

ES France
127 Rue de BUZENVAL - BP 26
92380 GARCHES
Tel : +33 (0)147959901
+33 (0)609671207
E-mail : daniel.guez@es-france.com
Web : www.es-france.com

INDONESIA

PT KGC Saintifik
Kompleks Ruko CBD, Blok A2-07,
Cengkareng Timur, Cengkareng
Jakarta Barat, Indonesia - 10750
Tel : +6221-2252-2110, +6221-2252-2114
Email : sales@kgcscientific.com
Web : www.kgcscientific.com

IRAQ

Al-Nabaa Engineering Services Co. Ltd
Karrada, Baghdad - Iraq
St.# 27, District # 905,
Building # 6
PO. Box: 55045
Postal Code: 100069
Email : info@iraqndt.com
Web : www.nabaa.iq

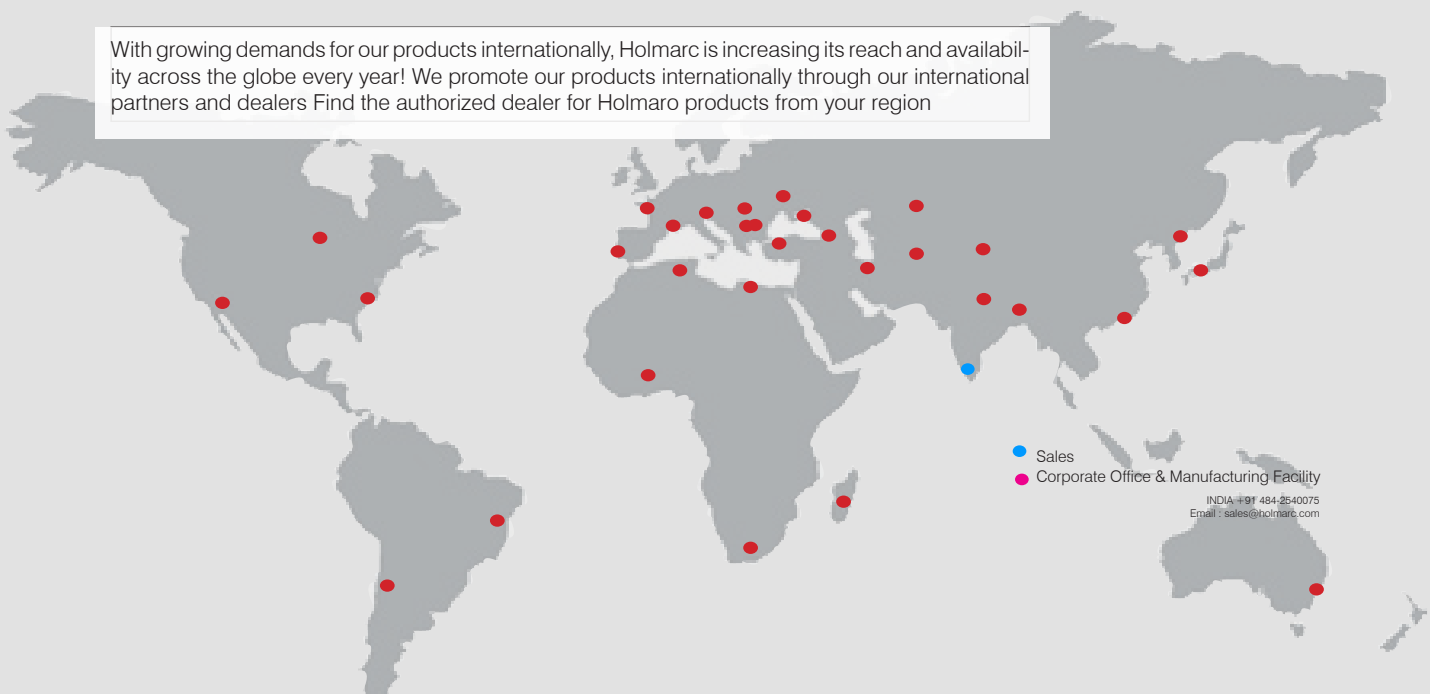
ISRAEL

Astech Optics
4 Nevatim St., Kiryat Matalonm
Petach-Tikva 49561, Israel
Deliverables & Mails : P.O.B. 21814
Tel-Aviv 61217
E-mail : sales@astechoptics.com
Web : www.astechoptics.com

KOREA

Korea Scientifics, Inc.
Room 1110, The LIV Gold BLD,
400-12, Yangcheon-ro, Gangseo-gu,
Seoul, Korea, 07573
Email : info@koreasci.com
Web : koreasci.com

With growing demands for our products internationally, Holmarc is increasing its reach and availability across the globe every year! We promote our products internationally through our international partners and dealers Find the authorized dealer for Holmaro products from your region



LUXEMB-OURG

ES France
127 Rue de BUZENVAL - BP 26
92380 GARCHES
Tel : +33 (0)147959901
+33 (0)609671207
E-mail : daniel.guez@es-france.com
Web : www.es-france.com

MALAYSIA

KGC RESOURCES SDN BHD
2-2-3, Jalan Setia Prima E U13/E. Seksyen U13
Setia Alam, 40170 Shah Alam
Selangor, Malaysia
Tel : +603-3341-2880, +603-3342-1680
E-mail : sales@kgcscientific.com
Web : www.kgcscientific.com

MEXICO

Antoeli S.A. de C.V.
Tulipán 102,
Col. Ciudad Jardín
C.P. 04370, Coyoacán
CDMX
Mexico D.F.
Tel : (55) 3095 7225, (55) 3095 7226
E-mail : fierco@antoeli.com.mx
Web : www.antoeli.com.mx

Morocco

Minael SARL
352, Sahl Wahrane,
Hay Oudaya, Temara,
12000, Morocco
Tel : +212 661 139 811
E-mail : contact@minael.ma
support@minael.ma
Web : minael.ma

NEPAL

Adwell International Pvt ltd
House No Kha-2-412
Lakhe Chaur Marg Thapa Gaon., Baneshwor-10,
Kathmandu- 44600
Mob : +977-01-4500958, 9851017958
E-mail : info@adwell.com.np
Web : www.adwell.com.np

ROMANIA

APEL LASER S.R.L.
25, vanatorilor Street,
077135, Mogosoaia, ILFov,
Romania.
Tel. +40743163434
Email : sales@apellaser.ro
Web : www.apellaser.ro

RUSSIA

LLC Scientific Devices & System, Novosibirsk, Akademgorodok
Nikolaeva street 11/5, 4th floor, Krasny Prospekt 1, Office 214, Russia
Tel. 8 (800) 707-44-73
Email : sales@spegroup.ru
Web : www.spegroup.ru

SWITZERLAND

France
127 Rue de BUZENVAL - BP 26, 92380 GARCHES
Tel : +33 (0)147959901
+33 (0)609671207
E-mail : daniel.guez@es-france.com
Web : www.es-france.com

Taiwan

Tien Shiang Trade & Engineering Co. Ltd.
Room 807, 50 Lin Seng N.Rd., Taipei, Taiwan,
R.O.CPost Code : 10441
Tel. +886-2-25637871 / 2
Fax. +886-2-25115760
E-mail : tinshing@ms16.hinet.net
Web : www.tienshiang.com

TUNISIA

NeuroTech Africa Scientific supplier & representative of NeuroTech Analytical Instruments in Tunisia, Centre Millenium, Block B 2nd floor, Office N"19, sidiDaoud La Marsa, 2046, Tunis Tel. (+216) 27237203 / (+216) 95570224
Email: youssef.e@neurotechinc.com

TURKEY

Global Analytical Laboratory Equipments Ltd.
Ümit Mahallesi 2547 Sokak No : 18 06810
Ümitköy, Ankara, Turkey
Tel: +90 312 236 07 02
E-mail : info@globalanalitik.com
Web : www.globalanalitik.com.tr

United Kingdom

CN Technical Services Limited, Unit 7, Foster Business Park
Boleness Road, Wisbech
Cambridgeshire
PE13 2XQ ENGLAND
Tel: +44 (0)1354 669899
Email: info@cntech.co.uk
Web : www.cntech.co.uk

International Sales & Services

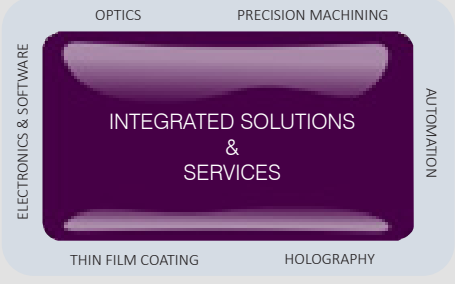
All of Holmarc's products described in this brochure are designed and manufactured for world market with state of the art design and contemporary features Though products are specified in metric units, we manufacture in British units as well. Similarly, our devices which require external power are manufactured for 220VAC and 110 VAC

SECURE PAYMENTS BY PayPal



Just one more easy way to pay!

If our capabilities are of interest then please tell us more about your required specifications and application process. You can contact us via phone, email or make plans to visit us



Volume pricing and OEM Solutions

For over 30 years. Homarc has been associating and building partnerships with original equipment manufacturers from diverse industrial disciplines with benefits to all parties involved

Significant portion of Holmarc's business comes from OEM customers in bio-medical diagnostics, analytical and pharmaceutical industries. Our vast experience in optics, mechanics and instrumentation electronics helps us to come out with the right custom product in the most cost effective manner for OEM applications.

We are proud to have enough staff strength and in house infrastructure to meet demanding delivery schedules from our OEM customers We associate with OEMs by providing parts/ components sub-assemblies or fully assembled products as per custom design by utilizing our production facilities, know how and experience in diverse engineering and scientific disciplines

Apart from standard products described in this brochure, holmarc manufactures custom products/parts/modules for OEMs. We are happy to acknowledge that a significant portion of our business is from our OEM clients. We offer our standard products as well to OEMs with / without custom modifications either for integrating with their final products or shipping it as it is. We welcome associations from OEMs around the world

Our quality assurance personals understand the importance of maintaining predictable functionality in all the products that we ship and havoc any deviations in product specifications can make in the assembly lines of our OEM customers Our QA department is fully equipped with experienced staff and state of the art instrumentation for assuring quality standards in all shipments we make

At Holmarc, vw are happy to pass the cost benefits of volume manufacturing to our esteemed customers, OEM as well as end users Special prices are available for any of our standard products with order quantity above 10 units All are welcome to discuss the details with our sales team

www.holmarc.com

contact us at
Email: sales@holmarc.com
Ph:+91 920-719-7771 +91 920-719-7772

B.7., HMT INDUSTRIAL ESTATE
KALAMASSERY
KOCHI- 683503, INDIA
CIN : U33125KL1993PLC006984
GST No: 32AAACH9492C1ZQ
MSME : UDYAM-KL-02-0043524

CUSTOMIZE ANY PRODUCT

WE HAVE WELL-DEVELOPED OPTIC AND MECHANICAL FABRICATION FACILITIES AND THIN FILM COATING UNIT CONTACT US FOR ASSISTANCE WITH YOUR MANUFACTURING NEEDS.

Service and Support



We have full fledged service department for ensuring prompt and timely service for all our products. As a policy, we make sure that all service queries and requests are answered within 48 hours or within 2 working day. Whether the product is standard or custom, whether it is in warranty or out of warranty, holmarc customers can remain assured of service at any point of time.

Our service team can be directly contacted at service@holmarc.com

WE ARE ALWAYS READY TO HELP YOU

Warranty and Terms

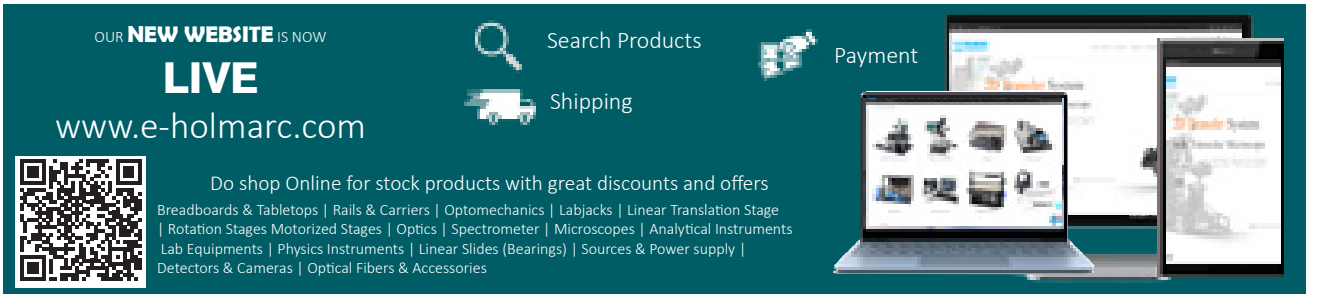
Every Holmarc Instruments and its accessories are warranted by HOLMARC OPTO-MECHATRONICS LTD for a period of ONE YEAR from the date of original purchase Holmarc will repair or replace a product, or part thereof, found by Holmarc to be defective, provided the defective part is returned to Holmarc, with proof of purchase This warranty applies to the original purchaser and our distributors and is non-transferable. Each returned part or product must include a written statement detailing the nature of the claimed defect, as well as the end user's name, address, and phone number

This warranty is not valid in cases where the product has been abused or mishandled, where unauthonzed repairs have been attempted or performed, or where depreciation of the product is due to normal wear-and-tear

Holmarc specifically disclaims special, indirect, or consequential damages or lost profit which may result from a breach of this warranty. Any implied which cannot be disclaimed are hereby limited to a term of one year from the date of original retail purchase. Holmarc reserves the right to change product specifications or to discontinue products without notice. Please refer our commercial invoice for warranty claim



We appreciate your feedback If you have any comments regarding our products, please let us know. HOLMARC appreciates any customer feedback Your inputs will help us evaluate and improve our product



Delivery and Shipping Policy

All purchases made from India is free deliverable to the location address entered by the user via Courier agencies like DHL, Bluedart or FedEx. If the destination address is unreachable to Courier, we will send the package via India Speed Post. Any Customs Duty, entry taxes or such will have to be paid by the Customer. We strive to ship the packages within one day from the date of purchase. Certain components can only be shipped by wooden packing. In that case, there will be a delay for fumigation and other paper works. However, dispatch is guaranteed within one week. Exworks-Kochi : Apply coupon 'Exworks-Kochi' in the 'Checkout page' or in the 'Cart page' in case you want to use your carrier for shipping and delivery.

Refund & Cancellation

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HOLOGRAPHIC LAB
FOR PRODUCTION OF GRATINGS

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4000+ Products for scientific research

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For research, we have a vast line of products virtually for all scientific disciplines. Our optics and opto-mechanics find wide applications in photonics related scientific research. We have introduced instruments like microscopes, spectroscopes, spectrophotometers, etc which find applications in every research labs. As you will find out from this brochure, we have products for holography and thin films as wellOur mission in the market is to provide quality reliable products by expanding our capabilities and product offerings. We have continued to expand our product line of spectroscopy and microscopy including optical characterization and measurement equipments. Our product range is rapidly expanding and we have many items available that are not shown in this catalogue.

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CONTENTS

22 **MICROSCOPES**
24 Digital Holography Microscope
24 Digital Holography
24 Microscope (DHM)
26 Motorized Digital Holography Microscope (DHM)
28 Digital Holography Microscope (DHM)
30 Digital Holography Microscope - Inverted
32 Motorized Microscope
32 Motorized Microscope TM01 - Trinocular
34 Fluorescence Microscope
34 Fluorescence Imaging Microscope
38 Inverted microscope – Fluorescence (Brightfield, Phase contrast, Epi-fluorescence)
40 Inspection Microscope
40 Inverted microscope – Phase contrast
42 Digital Inverted Microscope
44 Automated Inspection Microscope
46 Automicroscope
50 Slide Scanner
52 Laboratory Microscope
54 Trinocular Microscope
58 Trinocular microscope with Digital display and Trinocular Microscope with fiber optics cable

60 I**MAGING INSTRUMENTS**
62 Digital Inline Holography Microscope
64 Digital Inline
64 Holography Microscope
66 Fluorescence Microscope
66 Confocal Fluorescence Correlation Spectrometer
68 Confocal Fluorescence
68 Cross Correlation Spectrometer
72 Inspection Microscope
72 Thermal Lens Microscope - Confocal
74 Laser Microscope
78 Trinocular Inspection Microscope
78 with Boom Stand
80 Laser Ablation Inspection Microscope
82 Work Station with Inspection
82 Microscope & LCD display
84 Digital Inspection Microscope
86 Probe Station Microscope
86 Quadrupole Magnetic Probe Station
88 HV-IV Probe System
90 Piezoelectric Probe Station
92 Probe Station System T01 EC
94 Probe Station System T01L
96 Probe Station System
100 RF Probe Station System
102 Probe Station Platform & Accessories
106 Horizontal Microscope
108 Microscope Translation Stage
112 2D Transfer System
112 2D Transfer System with Digital Microscope 1 and 2
116 2D Transfer System with Trinocular Microscope
120 Telemicroscope
122 Telemicroscope
124 Interferometer
124 Fizeau Interferometer
126 Fizeau Interferometer with Encoder Rail System
128 Others
128 Illumination System
128 with Motorized Polarizer Rotator

130 **SPECTROPHOTOMETER**
132 Spectrophotometer
132 CCD Spectrophotometer / Fluorometer
134 SPE 3000 Series Spectrophotometer
138 SPE 6000 Series
138 Spectrophotometer
142 Theta 2 Theta Advanced
142 Spectrophotometer
144 Theta 2 Theta Advanced scanning Spectrophotometer SPA216 Series
146 Diffuse Reflectance Spectrophotometer





148 Diffused Reflectance Spectrophotometer
150 Modular Spectrophotometer

152 SPECTROSCOPY

154 Spectrometer Goniometer
154 Spectrometer Goniometer 1
156 Spectrometer Goniometer 2
158 Scattering Photometer Single Channel Light Detection
160 Spectrometer
160 CT216 Series
162 CG216 Series
164 CD 214 Series
166 UV-VIS-NIR Scanning Spectrometer
168 Spectra CT UV-VIS-NIR CCD Based
168 Stitched Scanning Spectrometer
170 Spectra CT UV-VIS-NIR CCD Based
170 Multi Channel Scanning Spectrometer
172 Spectra UV-VIS-NIR Standard Monochromator
174 Mini Monochromator
176 Spectra UV-VIS-NIR Quasar Series
176 Scientific Monochromators
180 Spectra UV-VIS-NIR High Throughput
180 DUAL Grating f/3.5 Monochromator
182 Laser Raman Spectrometer
184 532nm Research Grade Upright
184 Raman / PL Microscope
186 Confocal Laser Raman Spectrometer
188 Confocal Raman Spectroscopy
190 Upright 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer
196 Inverted 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer
202 Upright 532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer
208 Upright INSI Raman
216 532nm RESEARCH GRADE
216 Automated Micro Raman
216 Spectrometer
220 Fluorescence Spectrometer
222 Light Sources, Detectors & Accessories
226 Light Sources
228 Broadband Light Sources
230 Faraday Modulator
232 Optical Chopper
234 Lens Assembly Spectral Measurement System

236 CONTACT ANGLE METER
238 Contact Angle Meter
238 Contact Angle Meter - Base Model
242 Contact Angle Meter with Dispenser to camera positioning unit, Motorized Substrate Holder,Automated Dispenser & Temperature Control
244 Contact Angle Meter
246 Contact Angle Instrument for Under -Liquid Low Energy Surfaces

248 METROLOGY INSTRUMENTS

250 Measuring Microscope
250 Auto Measuring Microscope (Dual Camera)
252 Measuring Microscope (Dual Camera)
254 Measuring Microscope
256 Metallurgy Microscope
256 Auto Metallurgy Microscope
260 Tool Maker's
260 Microscope
262 Digital Microscope
262 Telecentric Digital Inspection /
262 Measuring Microscope
264 Auto Digital Microscope
266 Traveling Microscope
268 Digital Traveling Microscope
270 Autocollimator
272 Digital Autocollimator

274 ANALYTICAL INSTRUMENTS

276 Ellipsometer
276 Variable Angle Laser Ellipsometer
278 Variable Angle Spectroscopic Ellipsometer
280 Magneto Optic Ellipsometry
282 MOKE
282 High Sensitivity Laser Based Magneto-Optical Kerr Effect Station
284 Spectroscopic Magneto - Optic Rotation
284 Measurement System
286 Magneto Optic Spectrometer
286 Spectroscopic Kerr / Faraday / Ellipsometry





288 Polarimeter
288 Digital Polarimeter
290 Refractometer
290 Automatic Refractometer
292 Reflectometer
292 Near Normal Spectroscopic Reflectometer
294 Quantum Efficiency
294 Quantum Efficiency & IV Measurement System
298 Quantum Efficiency & Spectral Response Measurement System
300 Quantum Efficiency
300 Measurement System - VIS IR
304 Spectral Quantum Efficiency & IV
304 Measurement Unit
308 Solar Simulator
308 Solar Simulator 1
310 Solar Simulator 2
312 Solar Simulator with IV Measurement System
313 Xenon Light Source
314 Solar Simulator & IV Measurement
314 System with Keithley SMU
316 Spectral Response Measurement Apparatus
318 Photodetector Characterization Setup
320 Schlieren Imaging System
320 Standard Models with different Mirror sizes
322 Schlieren Imaging System
324 Laser Ablation
324 Confocal Micro Laser Ablation with integrated galvano scanning unit
328 Automated Multi-wavelength Laser Scribing/ablation/ Cutting station with Micro Inspection Camera
332 Laser Induced Current Measurement
332 Confocal Real-time Laser Beam Induced Current and Photoluminescence Measurement Unit
334 Light Beam Induced Current (LBIC) Measurement
336 Impedance Tube
338 Custom Impedance Tube
340 Lees Disc Apparatus
342 Conductivity Cell Measurement Setup
344 Z - Scan Characterization Kit
344 Characterization of Transparent Optical Materials
346 Electronic Speckle
346 Pattern Interferometer (ESPI)
348 Cyclical Force Generator

350 LAB EQUIPMENTS

352 Laminar Flow Hood
352 Laminar Flow Work Table
354 Glove Box
356 Nano Fiber Electrospinning Unit
356 Nano Fiber Electrospinning Unit
360 Nano Fiber Electrospinning Unit with Support
364 Dual Pump Nano Fiber Electrospinning Unit
368 Dual Pump Nano Fiber Electrospinning Unit
372 Nano Fiber Electrospinning Unit
376 Nano Fiber Double Spinning & Yarning System
380 Industrial Electrospinning
380 Industrial Scale Needle-less Electrospinning Unit
382 Spray Pyrolysis Equipment Unit
382 Flame Assisted
382 Spray Pyrolysis Equipment
384 Spray Pyrolysis Equipment (Table Top)
386 Spray Pyrolysis Equipment
388 Vacuum Spray Pyrolysis
388 Automated Equipment
390 Programmable Multi-Nozzle
390 Spraying System
392 UV Ozone Cleaner
392 UV Ozone Cleaner 150
394 UV Ozone Cleaner 350 400
396 Silar Coating System
396 Silar Coating System
398 Silar Coating System
400 SILAR Coating System
400 with Overhead Stirrer
402 SILAR Coating System
402 with Magnetic Stirrer
404 SILAR Coating System with Magnetic Stirrer & Ultrasonic Bath
406 SILAR Coating System for Large Substrate
408 SILAR Coating System without heater and Stirrer
410 Dip Coating Unit
410 Dip Coating Unit
412 Dip Coating Unit
414 Dip Coating Unit
416 Angle Dependent Dip Coating Unit
418 Dip Coating Unit
420 Dip Coating Unit
422 Dip Coating Unit
424 Spin Coating Unit



236
CONTACT ANGLE METER



248
METROLOGY INSTRUMENTS



274 ANALYTICAL INSTRUMENTS



350 LAB EQUIPMENTS

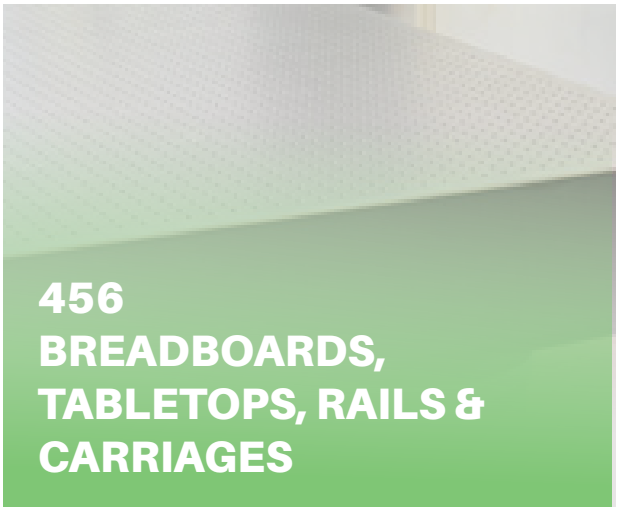
432 Bench Top Rubbing Machine
434 Other Equipments
436 Thermocycler
438 Vacuum Oven and Ion Exchanger
440 Electrochemical Discharge
440 Machining System
442 Syringe Pump
446 Peristaltic Pump
448 4 Tesla Electromagnet - Magnet Lab
450 PC based water cooled electromagnet
452 Magnetic Stirrer and Hot Plates

456 BREADBOARDS, TABLETOPS, RAILS & CARRIAGES

458 Solid Breadboards
458 Mini Breadboards
460 Standard Solid Breadboards
463 Heavy Duty Breadboards
464 Extra Large Breadboards
465 Solid Breadboards with aperture
465 Custom Breadboards & Support
466 Mounting Accessories
468 Honeycomb Breadboards
469 Honeycomb Breadboards Extreme Light Weight
470 Honeycomb Breadboards Light Weight
471 Honeycomb Breadboards
471 Standard
472 Honeycomb Tabletops
474 Tabletop Support
474 Passive Support (Automated Pressure & Level Controlled)
476 Passive Vibration Isolation System
478 Rigid Tabletop Support
478 with Height Adjustment
480 Desktop Vibration Isolation Support
482 Overhead Shelves
486 Overhead Shelf with Curtain
488 Wooden Drawer Shelf
490 Enclosures
492 Metallic Enclosures
494 Small Size Transparent Enclosures & Black Enclosures
495 Black Enclosures
496 Enclosure Construction System
498 Acoustic Enclosure
499 Vertical Laminar Flow with
499 Optical Table and Side Curtains
500 Optic Rails
500 Dovetail Triangular
500 Optical Rail & Carrier
502 HC - 2 Rail & Carriers
503 HC - 3 Rail & Carriers

504 OPTO MECHANICS

506 Platforms
506 Precision Tilting Platform
508 Kinematic Mirror Mounts
517 Adapters & Accessories
523 Gimbal Mirror Mounts
526 Cube / Prism mounts
528 Beam Steering Device
530 Lens Tube Assembly System
534 Rod Assembly
537 Lens Mounts
543 Filter Mounts
548 Polarizer Mounts
549 Laser Mounts
551 Apertures
554 Fiber Chuck and Holders
558 Optical Chopper
559 Motorised Shutter
560 Post Mounting Systems
560 8 mm Post System
561 PH Series Post Holders
562 12mm Post System
562 P Series Post
564 P-LE Series Post
565 PH Series Post
566 Pedestal Adapter
566 Pedestal Post Holder
566 PF Series Pedestal Fork
567 Post Collar
567 Translating Post Holder
568 Translating Pedestal Post Holder
568 12.7mm Post System
568 P Series Post
570 PH Series Post Holders
571 Pedestal Post Holder



456 BREADBOARDS, TABLETOPS, RAILS & CARRIAGES

572 Translating Post Holder
572 Ø12.7 mm
573 Translating Pedestal Post Holder
573 Ø12.7 mm
573 16 mm Post System
573 P16D Series Posts
574 P16D-LE Series Posts
574 PH-16D Series Post Holder
575 Pedestal Adapter
575 PPH Series Pedestal Post Holder
575 PF Series Pedestal Fork
576 PF Series Pedestal Fork
576 Translating Post Holder
576 Translating Pedestal Post Holder
577 Post Bases
579 Post Clamps
580 Slotted Plates
581 Opto Mechanical Kit
581 Heavy Duty Post System
581 Damped Heavy Duty Post
582 Post Spacer
582 Heavy Duty Post Base
582 Mounting Clamp
583 Large Mounting Clamp
583 Compact Post Clamp
583 Dual Rod System
584 C & V type clamps
584 C - Type Clamps
584 V - Type Clamps
584 Table Clamps
585 Tools & Accessories
585 Metric - English Thread Adapters
586 Set Screws
586 Nylon tipped set-screws
587 Copper tipped set-screws
587 Thumb Screws
587 Nylon tipped thumb screws
588 SHC Screws
588 Metric Socket Cap Screws
588 Metric Set Screws
589 Metric Allen Key, Washers & Nut
589 All in One Screw kit
590 Lab Jacks
590 Manual Labjack
591 Motorized Labjack



504 OPTO MECHANICS

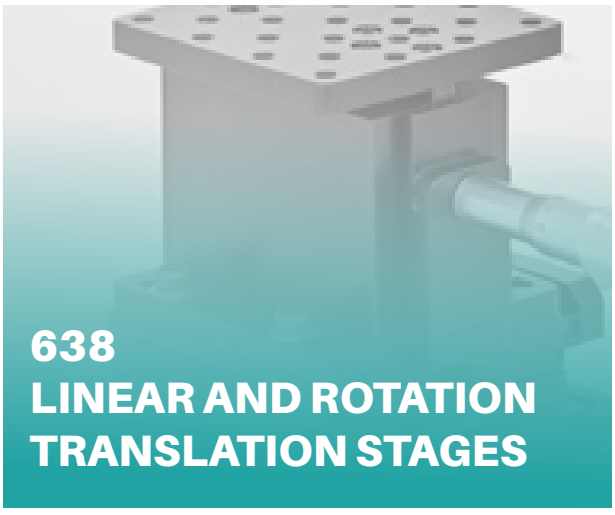
592 Heavy Duty Labjack
593 Motorized Heavy Duty Labjack
594 Controller for Motorized Lab jack
596 Motorized Vertical Translation Stages

598 OPTICS

600 Lenses
600 Spherical Singlets
600 Plano - Convex Lenses
601 Bi - Convex Lenses
602 Plano - Concave Lenses
603 Bi - Concave Lenses
604 Meniscus Lenses
605 Cylindrical Lenses
605 Plano Convex and Plano
605 Concave Cylindrical Lenses
606 Cylindrical Achromatic Lenses
606 Achromatic Lenses
606 Positive and Negative Achromatic Lenses
607 Cylindrical Achromatic Lenses
608 Axicons
610 Prisms
610 Prisms
610 Right Angle Prisms
611 Dove Prisms
612 Penta Prisms
612 Equilateral Prisms
612 Schmidt Prisms
612 Material - BK7
612 Bevel : 0.2mm x 45degree
613 Wedge Prisms
614 Pellin Broca Prisms
614 Littrow Prisms
614 Coated prism divert the incident beam by 60°
614 Uncoated prism ideal for dispersion of white light into spectrum
614 Rhomboid Prisms
615 Amici Roof Prisms
615 Schmidt Prisms
616 Windows
616 Rectangular and Square Windows
617 Circular Windows
618 Beamsplitters
618 Plate Beamsplitters



598 OPTICS

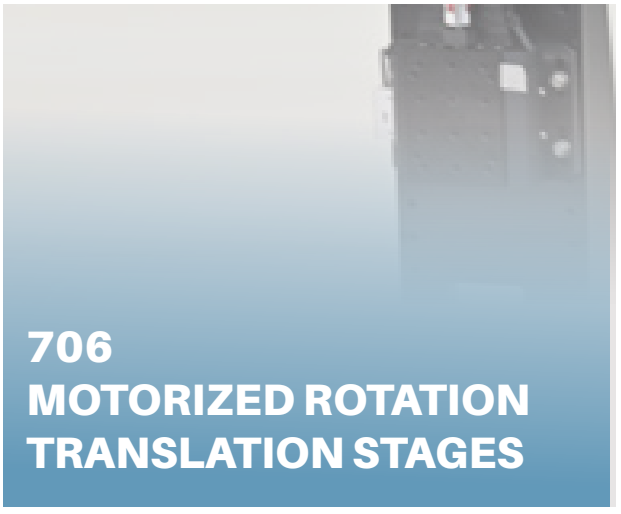


638 LINEAR AND ROTATION TRANSLATION STAGES

619 Metallic Cube Beamsplitters
620 Variable Beamsplitters (Mounted)
621 Beamsplitters
622 Mirrors
622 Plano Aluminium Mirrors
623 Plano Silver Mirror
623 Concave Mirror
624 Broadband Metallic Mirror
624 Cone Mirror
625 45° Rod Mirrors
625 Parabolic Concave Mirrors
626 Diffusers & Polarizing Optics
626 Diffusers
627 Polarizing Optics
627 Polarizers
627 Linear Film Polarizers
627 Lyot Depolarizer
628 Wave Plates / Retarders
628 Multiple-Order Wave Plates
629 Zero - Order Wave Plates
630 Fresnel Rhomb Retarders
631 Soleil - Babinet Compensator Fresnel Rhomb Retarders
632 Optical systems
632 10X Eye Loupe
632 Tube Lens - Infinity corrected
633 Beam Expanders
634 Variable Beam Expanders
634 Cylindrical Beam Expander Tube
635 Condensers
635 Fiber Collimator / Focusers
636 Microscope Objectives

638 LINEAR AND ROTATION TRANSLATION STAGES

640 Linear Translation Stage
640 TS-35 Translation Stage
642 TS-50 Translation Stage
644 TS-65 Translation Stage
646 TS-90 Translation Stage
648 TSQ-90 Translation Stage
650 TS 120 Translation Stage
652 TSQ 120 Translation Stage
654 Precision Translation Stage
654 TSV - 35 Translation Stage
656 LTSV-35 Translation Stage :
656 Side Drive
658 TSV-50 Translation Stage
660 LTSV-50 Translation Stage : Side Drive
662 TSV-65 Translation Stage
664 LTSV-65 Translation Stage :
664 Side Drive
666 TSV-90 Translation Stage
668 LTSV-90 Translation Stage
668 Side Drive
670 Vertical Translation Stage
671 VTS Series
672 Multi Axis Translation Stages
672 Manual XY Theta Stage
672 XYZ Compact Translation Stage
673 XYZ Compact Translation Stage
673 XYZ Compact Translation Stage
673 XYZ Compact Translation Stage
674 XYZ Compact Translation Stage
674 XYZ Compact Translation Stage
675 XYZ Compact Translation Stage
675 XYZ Positioner
676 4 Axis Stages
676 Five Axis Positioner
677 XYZ Heavy Duty Translation Stages
678 Heavy Duty Stage
678 Heavy Duty XZ Stage
678 XZTS 300-300
679 Heavy Duty TS
679 XYZTS Series
680 XY Moving Platform
680 XYTSM Series
681 XYTSWM Series XY Moving Platform
682 Heavy Duty XY Moving Platform
683 XYTSWM Series XY Heavy Duty Moving Platform
684 XYTS Series XY Moving Platform
685 XYTSW Series XY moving Stage
686 Long Travel Translation Stage
687 Translation Stage with Vernier readout
688 MLS Series Translation Stages
689 LTTS 50 Series
690 LTTS 75 Series
691 LTTS 125 Series
692 LTTS 150 Series
694 LTTS 200 Series



706
MOTORIZED ROTATION TRANSLATION STAGES



776
PHYSICS LAB INSTRUMENTS

695 LTTS 250 Series
696 Cryostat Positioner
696 Cryostat Positioner
697 Cryostat Positioner
697 Cryostat Positioner
698 Goniometer- Worm Gear Drive
698 GSM Series Goniometer
698 Single Axis
700 Heavy Duty Goniometer
702 Rotation Stage
702 Heavy Duty Goniometers
702 Single & Dual Axis
704 Rotation Stages -
704 Continuous Rotation - 360°
705 WRSC series Rotation Stages
705 WRS series Rotation Stages

706 MOTORIZED ROTATION TRANSLATION STAGES

708 Stepper Motors
708 Nema 23 High Vacuum
708 Compatible Stepper Motor
710 Control Electronics & Software
712 Custom Micro Motion Controls
714 Motorized Actuators
715 HO-MA Series
715 Heavy Duty
715 HO-HMA-Series
716 Motorized Linear Stage
717 Motorized Translation Stages MTS-M35 series
718 Motorized Translation Stages MTS-M series
720 Motorized Translation Stages MTS series
722 Motorized Translation Stages LMS series
724 Motorized Precision
724 Long Travel Translation stages MLTS series (Linear and XY)
725 Belt Driven High Speed Translation Stage (Linear)
726 Belt Driven High Speed Translation Stage (XY)
727 Motorized Translation Stages RCMTS-35 Series
728 RCMTS Series Motorized Stages
729 Motorized Translation Stages
729 RCMTS-50 Series
731 Motorized Translation Stages
731 RCMTS-125 Series
732 Motorized Translation Stages
732 RCMTS-150 Series
734 Motorized Translation Stages
734 RCMTS-200 Series
736 Motorized Translation Stages
736 RCMTS-250 Series
738 Motorized XY Moving Platform
738 XY Moving Platform
738 MXYTS Series
740 Motorized Vertical Translation Stages
742 Motorized Two Axes Gimbal Stage
744 Motorized Goniometer
746 Motorized Rotation Stage
746 Sine Drive Angular Stage
746 Sin216R Series
748 Motorized Rotation Stage
748 MRSC Series
750 Motorized Heavy Duty
750 Rotation Stages MRSH Series
752 Rotation stage with IP65 rating
754 Motorized Multi Axis Stage
756 XY Theta Stage
758 XYZ Stage
760 5 axis Stage
762 Vacuum Compatible
762 Motorized 5 Axis Stage
764 Design Stage
766 Gantry Design Stage GTNDT Series
768 Radiography Multi Axis Manipulator
770 Positioner
770 Pitch & Yaw Positioning Mechanism for Subsonic Wind Tunnel
772 Antenna Positioner
774 Dual Axis Antenna Positioner with Azimuth and Elevation Control

776 PHYSICS LAB INSTRUMENTS

778 Spectroscopy
778 Spectrometer-Goniometer
779 Spectrometer - Goniometer
780 CCD Based Constant Deviation Spectrometer
781 Flame Spectrometer
783 Hydrogen Spectra - Balmer Series Apparatus
784 Photoluminescence Measurement Apparatus
785 Zeeman Effect Apparatus



908 LABORATORY AUTOMATION

928 INDEX

786 Zeeman Effect Apparatus (Transverse & Longitudinal configuration)
788 Laser Raman Spectrometer (PMT Based)
789 Laser Raman Spectrometer (CCD Based)
790 Confocal Laser Raman Spectrometer
791 Educational spectrophotometer
792 Interferometry
794 Cornus Interference Apparatus
796 Michelson Interferometer (Standard Model)
798 Michelson Interferometer (Compact Model)
800 Magnetostriction with Michelson Interferometer
802 Michelson Interferometer (Sodium D'Lines)
804 Michelson Interferometer (Piezo Electric Effect)
806 Mach Zehnder Interferometer
808 Fabry - Perot Etalon
809 Fabry - Perot Interferometer (Projection Based)
810 Fabry - Perot Interferometer (CCD Based)
812 Fizeau Interferometer
814 Electronic Speckle Pattern Interferometer (ESPI)
816 Polarization
816 Brewster's Angle Apparatus
817 Malus Law Apparatus
818 Faraday Effect Apparatus
820 Faraday Effect Apparatus (Liquid Sample)
822 Faraday Effect Apparatus (Multi Wavelength)
824 Kerr Effect Apparatus
826 Pockel Effect Apparatus
828 Apparatus for the Study of Polarisation by Waveplates
829 Babinet Compensator
832 Fiber Optics
836 Laser & Opto Electronics
836 Apparatus for Characteristic study of Diode Laser
841 Z-Scan system
843 Spectral characteristics of LED
844 Second Harmonic Generation
848 Led, Laser Diode & Photodiode Characterization Apparatus
850 Diffraction
850 Screen Based Apparatus for Diffraction Experiments
851 Detector Based Apparatus for Diffraction Experiments
852 Single Slit Diffraction and Heisenberg's uncertainty principle
853 Goniometer Based Apparatus for Diffraction
854 Apparatus for Studying Diffraction from Reflection Grating
855 Apparatus for Determination of Particle Size
856 Fresnel's Biprism Diffraction Apparatus
858 Optics
858 Liquid Lens Apparatus
859 Geometrical Optics Experiment Apparatus
861 Refractometer
862 Mechanics
862 Contact Angle Meter
865 Lee's Disc Apparatus
866 Electricity and Magnetism
866 Millikan's Oil Drop Apparatus
868 Apparatus for the Study of Photo Electric Effect (Plank's Constant)
869 e/m Experiment Apparatus (Thomson's method)
871 Apparatus for the study of Biot-Savart's Law
872 B-H Curve / Magnetic Hysteresis Curve Experiment
873 Hall effect Apparatus
874 Hall Effect Sample Holder for Electromagnet
875 Magnetic Susceptibility - Quincke's Method
876 Magnetic Susceptibility - Gouy's method
878 Acoustics
880 Screen Based Apparatus for Ultrasonic Diffraction
881 Kundt's Tube Apparatus
882 Ultrasonic Diffraction using Goniometer
884 Holography
884 Holographic Lab
886 Thin Film Characterization
886 Spectrophotometer
887 Variable Angle Laser Ellipsometer
888 Variable Angle Spectroscopic Ellipsometer
889 Thin film Spectroscopic Reflectometer
890 Theta 2 theta advanced Spectrophotometer
892 Solar Cell
892 Solar Cell Characterization Apparatus
894 Spectral Response Measurement Apparatus
895 Conductivity Cell Measurement Setup
896 Astro Physics
896 Solar Characteristics Measurement Set Up
899 Astronomy and Astrophysics Experiment Set up
900 Temperature determination of an artificial star by photometry

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902 Sources and Detectors
902 Diode Laser
903 DPSS Laser

908 LABORATORY AUTOMATION
909 Reel to Reel Printing Machine
910 Stages and Laboratory Automation
910 Linear Slides
910 MS Series
912 Linear Slides
912 MS Series
914 Linear Roller Slides
914 ARS Series
916 Single Channel Dispensing Station
916 MICRO Plate 8 Channel Precision Dispensing Station
917 Multi-channel Precision Line Dispenser
918 Flowline F100
920 Automated Filling & Sealing station TDU9000S
922 Automated Filling & Sealing station TDU7000S
923 Automated Dispensing System
924 Glass Cutting and Slicing Machine
926 Multi Axis Manipulator
926 Automated Microscopy Positioning
927 Vial Dispensing Station
927 Large XY Scanning Machine

01

MICROSCOPES

Holmarc manufactures microscopes in standard and custom designs. There are products like telemicroscopes which are unique and proprietary. Our travelling microscopes are a way apart from the conventional instruments that the stages are precise and micrometer driven. As in many other holmarc products, our strength in microscopy is our ability to customize these instruments cost effectively. In many cases, we offer custom microscopes at the price of standard instruments. We make this possible by manufacturing optics, mechanics and electronics required for microscopes in house.

22 MICROSCOPES
24 Digital Holography Microscope
24 Digital Holography
24 Microscope (DHM)
26 Motorized Digital Holography Microscope (DHM)
28 Digital Holography Microscope (DHM)
30 Digital Holography Microscope - Inverted
32 Motorized Microscope
32 Motorized Microscope TM01 - Trinocular
34 Fluorescence Microscope
34 Fluorescence Imaging Microscope
38 Inverted microscope – Fluorescence (Brightfield, Phase contrast, Epi-fluorescence)
40 Inspection Microscope
40 Inverted microscope – Phase contrast
42 Digital Inverted Microscope
44 Automated Inspection Microscope
46 Automicroscope
50 Slide Scanner
52 Laboratory Microscope
54 Trinocular Microscope
58 Trinocular microscope with Digital display and Trinocular Microscope with fiber optics cable



Digital Holography Microscope



Digital Holography Microscope (DHM)

Model : HO-DHM-UT01-FA

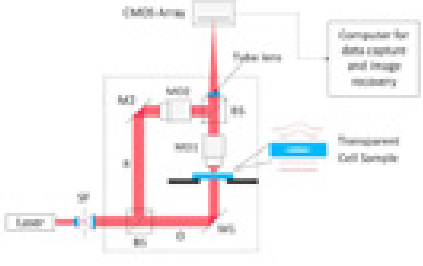
Digital holographic microscopy is an emerging modality that offers capability of quantitative phase imaging (QPI) of transparent unstained cells in their most natura state. While phasesensitive imaging methodologies such as dark-field, phase contrast and differential interference contrast are known for several decades, they cannot provide quantitative phase information. DHM can achieve this by use of interferometric imaging concept.

A manually operated shutter with source selector switch is provided near the eyepiece for the safety of eyes by blocking the laser light to the eyepiece.

Once the desired area for phase imaging is selected in brighfield mode, the user can close the manual shutter and the system will be ready for QPI.

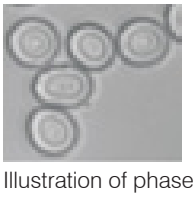
A complete user friendly software (Digital HM_V01) with laptop is provided with system for the recording and reconstruction of the images. The software uses patented unique single shot high resolution method for the phase image reconstruction.

Digital holographic microscope with user specified high end microscope objectives (Plan apochromatic, Plan fluorite, Extra-long WD etc.) may also be made available upon special requests.



Schematic of a balanced DHM system that works on the interferometric imaging principle. The phase image is obtained by digital processing of the interference signal recorded using an array sensor.

SF : Spatial filter,
BS : Beamsplitter,
O : Object beam,
R : Reference beam,
MO1 / MO2 : Microscope Objectives



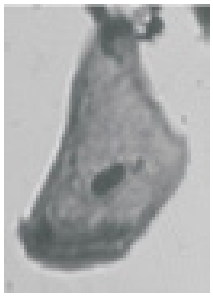


Illustration of phase images of red blood cells and patient cervical cells using Digital Holographic Microscopy system



When a collimated laser beam passes through a transparent cell sample, typically very little light is absorbed. The laser wavefront however gets distorted due to the phase delay seen by the beam at each (x, y) location (see Fig. 2). The phase Φ (x, y) of the beam after passing through the sample may be described as:

$$\Phi\ (x,y)\ =\ (\ 2\pi\ /\ \lambda\ )\ \int dz\ \ n\ (x,\ y,\ z)$$

Here λ is the wavelength of laser used and n (x, y, z) stands for the relative refractive index of the cell at location (x, y, z) relative to the surrounding medium. Clearly a strong phase signal is detected if there is large index difference between the cell and the surrounding medium. If the index of the cell is uniform over a region, the phase function can be approximately associated with the height map profile of the cell, thus giving a 3D perspective of the cell. Instead of employing external contrast agents, the DHM thus uses the natural refractive index contrast of the cells for imaging purpose. Refractive index is a property related to chemical composition and therefore a sensitive phase imaging system can have several applications in basic Bio-sciences and diagnostics.

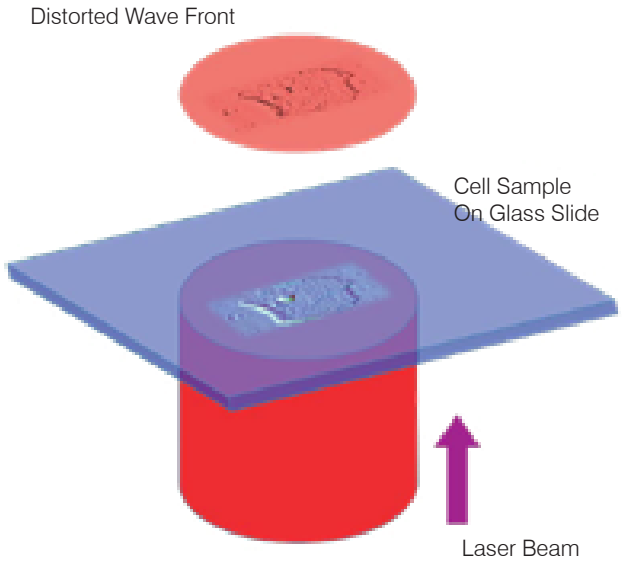


Illustration of phase delay of a collimated laser beam wavefront as it passes through a transparent cell sample. The phase delay is due to differential optical path difference through different parts of the cell sample.

FOURIER TRANSFORM METHOD

The Fourier Transform Method is a popular choice for processing of single shot interferometric imaging data. However this method is known to have poor spatial resolution which is well below the diffraction-limited resolution that the microscopic system can achieve. The IIT Delhi technology used in this product uses a novel constrained optimization approach to recovery of full-resolution phase images as illustrated in where bright-field and phase images of a cervical Fig. 3 cell are shown.

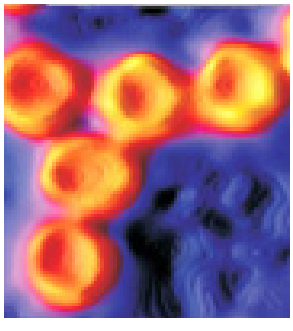
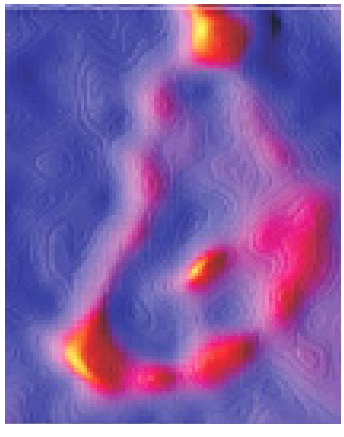
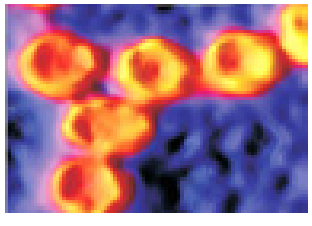


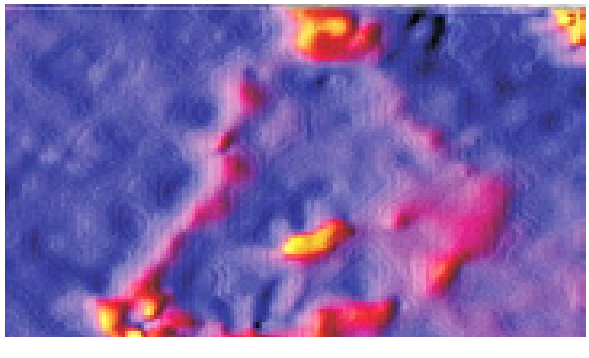
Illustration of phase images of red blood cells and patient cervical cells using Digital Holographic Microscopy system



The color coding indicates the phase map (approximately height map) of the cell.



high resolution phase images obtained using novel single shot phase imaging technology developed at IIT Delhi.



Motorized Digital Holography Microscope (DHM)

Model : HO-DHM-UT01-FA

Motorized - Single-Shot - Full Resolution

Holmarc's holography microscopes, such as the Digital Holography Microscope (HO-DHM-UT01), are advanced imaging devices designed for precise and innovative applications. These microscopes utilize a balanced afocal configuration with infinity-corrected plan achromatic objectives, enabling high-resolution imaging with minimal aberrations. They are equipped with features like a 650nm diode laser for illumination, a CMOS sensor for holographic image recording, and user-friendly software for image reconstruction1. Holmarc's holography microscopes are widely used in fields like materials science for 3D characterization, life sciences for non-invasive cell imaging, and industrial research for analyzing technical samples. Their ability to provide quantitative phase imaging makes them invaluable for studying dynamic processes and living cells

Specifications

DHM type	Transmission, Upright / Inverted Dual mode operation
Interferometer configuration	Balanced, afocal interferometer
Optical components	Optical components used in interferometer (mirrors, beamsplitters)
Measurement mode	Single wavelength, single-shot off-axis operation (without Phase Shifting)
Source	Diode laser
Source wavelength	650 nm
Object beam microscope objectives	Plan 40X, NA = 0.75 and 20X, NA = 0.50
Reference beam microscope objectives	Plan 40X, NA = 0.75 and 20X, NA = 0.50
Axial depth profiling accuracy	= 100 nm Lateral resolution : = 1 μm (Full diffraction limited resolution)
Field of view	0.180 x 0.120 mm 2 or more
LED - Laser selection	Motorized shutter for switching between bright-field and phase modes
Phase reconstruction	Through software

Applications

- Quantitative study of cellular dynamics
- Imaging of various cell types, including SKOV-3 ovarian cancer cells, fibroblast cells, testate amoeba, diatom
- skeletons, and red blood cells.
- 3D imaging and statistics of RBCs in multiple deformation states.
- Evolution of Physiological parameters of different cells.
- Non-destructive analysis of Living cells without any contrast agent: Cell number, confluence, proliferation,
- cell death, migration and viability
- Visualization of drug induced morphology changes.
- Visualization of stained or unstained / unprocessed cells
- Resolve neuronal network activity and identify cellular biomarkers of psychiatric disorders
- Screening and diagnostics material science.

Motorized stage

Motorized Z stage with autofocusing
Motorized XY stage with Joy stick as well as pc controller with specimen holder
75mm x 50 mm or more XY travel
230V 50Hz Power Input

Optical system

Quadruple, motorized rotating turret Intensity adjustable Nosepiece
Siedentopf Trinocular head, 30° inclination, 48 - 75mm adjustment Viewing head
10X wide field (FN20), diopter adjustable, High eye relief Eyepiece

Bright Field Observation

Infinity corrected (200mm or appropriate tube lens) Optical system

Software for easy operation and reliable results



Camera Specifications

Sensor type	:	CMOS Color
Shutter	:	Global shutter
Resolution	:	3 Mpix or more
Pixel size	:	3.5 μm or smaller
Frame rate	:	120 fps or better
ADC	:	12 bit
Colour depth	:	12 bit
Optical sensor class	:	1 / 1.8"
Interface connector	:	USB 3.0
Subsampling factor	:	2, 4, 8
Mount	:	C-mount
Minimum exposure time	:	0.05 ms or less
Software	:	Software interface for image capture and standard image processing tasks. Will be integrated with phase reconstruction software

Microscope Objectives

1. Plan 4X, NA = 0.13
2. Plan 10X, NA = 0.30
3. Plan 20X, NA = 0.50
4. Plan 40X, NA = 0.75

Illumination

Transmission type Illumination
High bright white LED Illumination system

Digital Holography Microscope (DHM)

Model : HO-DHM-UT01

HO-DHM-UT01 is a transmission type upright digital holography microscopes with balanced afocal configuration that uses infinity corrected plan achromatic objectives in both reference and object beams. A common tube lens is provided for achieving afocal imaging configuration with minimal aberrations. Sony make CMOS sensor is used for the recording of holographic images. A linearly polarized 650nm diode laser is used for illumination in the DHM system. A high bright LED illuminated brightfield observation with binocular viewing is also integrated in the system. Since users may not be familiar with phase images, the LED illumination can be used first to focus the cell sample as desired, followed by recording of the phase image using laser illumination.

In addition to the object beam objective, two low power objectives are also provided for larger FOV in brightfield observations. The nosepiece has a triple turret mechanism for holding three microscope objectives. The user can easily switch the objectives manually. As the low power objectives have large FOV, the user can use them first to locate the desired area of sample. A manually operated XY sample stage is provided for scanning the sample area. Once the sample area is located, the user can change the low power objective to high power objective for the magnified image of selected area.

A manually operated shutter with source selector switch is provided near the eyepiece for the safety of eyes by blocking the laser light to the eyepiece.

Once the desired area for phase imaging is selected in brighfield mode, the user can close the manual shutter and the system will be ready for QPI.

A complete user friendly software (Digital HM_V01) with laptop is provided with system for the recording and reconstruction of the images. The software uses patented unique single shot high resolution method for the phase image reconstruction.

- Unique single shot high resolution and accurate quantitative imaging capability (patented technology).
- No phase shifting required thus removing the need for piezo stages.
- Quantitative phase imaging without staining of cells.
- Full diffraction limited resolution performance.
- Digital holography as well as transmitted LED bright field observation.

Specifications

DHM type	Transmission, Upright
DHM configuration	Balanced, afocal
Measurement mode	Single wavelength
Source	Diode laser
Source wavelength	650 nm
Source power	5 mW
Object beam microscope objective	Plan Achromatic (40X, 0.65 NA)
Reference beam microscope objective	Plan Achromatic (40X, 0.65NA)
Axial depth profiling accuracy	≤ 50 nm
Lateral resolution	≤ 1 μm
Camera Field of view	0.185 x 0.124 mm2

Bright Field Observation

- Infinity corrected (200mm or appropriate tube lens) Optical system
- Brightfiled Observation method

Microscope Objectives

1. Plan Achromatic 10X, NA 0.25, 2mm FOV
2. Plan Achromatic 20X, NA 0.40, 1mm FOV
3. Plan Achromatic 40X, NA 0.65, 0.5mm FOV

Manual Stage

- Rectangular stage with specimen holder, XY travel - 78 x 54mm Sample Stage.
- Manual, coaxial drop down knob Sample Stage drive
- 230V 50Hz Power

Optical system

- Triple, Rotating turret Nosepiece
- Sidentopf Binocular head, 30o inclination, 48 -75mm IP adjustment Viewing head
- 10X wide field (FN20), diopter adjustable, High eye relief Eyepiece
- Coaxial coarse / fine focusing, fine 0.2mm / rotation Focusing

DHM Configuration

Transmission, Upright Balanced, afocal with 650nm singke wavelength diode laser



Camera Specifications

Sensor type	:	CMOS Color
Shutter	:	Rolling shutter
Pixel class	:	6 MP
Resolution	:	3088 x 2076 Pixels
Aspect ratio	:	3 : 2
Pixel size	:	2.4 μm
ADC	:	12 bit
Optical size	:	7.41 mm x 4.98mm
Manufacturer	:	Sony
Gain (master / RGB)	:	14.5x / 5x
Pixel clock range	:	20 MHz - 474 MHz
Frame rate free run mode	:	58.0 fps
Frame rate trigger (continuous)	:	29.0 fps
Frame rate trigger (maximum)	:	29.0 fps
Exposure time (min – max)	:	0.013 ms – 999 ms
Long exposure (maximum)	:	120000 ms
Interface connector	:	USB 3.0
Software	:	Digital HM_V01
Phase image reconstruction	:	Patented single shot high resolution method

Illumination

- Transmission Illumination
- High bright white LED, Intensity adjustable Illumination system

Digital Holography Microscope - Inverted

Model : HO-DHM-IT01

HO-DHM-IT01 is an Inverted type Digital Holography Microscope which can be used for the quantitative phase imaging for live cells. It is a transmission type inverted digital holography microscope with balanced afocal configuration that uses infinity corrected Plan achromatic objectives in both reference and object beams. A common tube lens is provided for achieving afocal imaging configuration with minimal aberrations. A single shot high resolution method patented by IIT Delhi is used for the phase image reconstruction. A 650nm diode laser is used for the construction of holographic image. A high bright white LED illuminated brightfield observation with binocular viewing is also integrated in the system. Since users may not be familiar with phase images, the brightfield observation can be used first to focus the cell sample as desired, followed by recording the phase image using laser illumination. The nosepiece in both object beam and reference beam is equipped with a sliding mechanism for holding two microscope objectives at a time. The user can easily switch the objectives manually in both object beam and reference beam simultaneously by rotating a knob.

A manually operated mechanical stage with 126 * 78 mm travel is equipped with different types of holders for holding different types of sample slides / dishes. A manually operated shutter with source selector switch is provided near the eyepiece for the safety of eyes by blocking the laser light to the eyepiece. Another automatic shutter is positioned in front of the laser to block the laser beam when the system is used for brightfield observation. Once the desired area for phase imaging is selected in brightfield mode the user can close the manual shutter and the system will be ready for QPI. A complete user-friendly software (Digital HM_V02) with laptop is provided with the system for the recording and reconstruction of the images. Digital holographic microscope with user specified high end microscope objectives (Plan apochromatic, Plan fluorite, Extra-long WD etc.) may also be made available upon special requests.

Specifications

DHM type	Transmission, Upright
DHM configuration	Balanced, afocal
Measurement mode	Single wavelength
Source	Diode laser
Source wavelength	650 nm
Source power	5 mW
Object beam microscope objective	Plan Achromatic (40X, 0.65 NA), Plan Achromatic (20X, 0.40 NA)
Reference beam microscope objective	Plan Achromatic (40X, 0.65NA), Plan Achromatic (20X, 0.40 NA)
Axial depth profiling accuracy	≤ 50 nm
Lateral resolution	≤ 1 μm
Camera Field of view	0.177 x 0.133 mm2

- Unique single shot high resolution and accurate quantitative imaging capability (patented technology).
- No phase shifting required thus removing the need for piezo stages.
- Quantitative phase imaging without staining of cells.
- Full diffraction limited resolution performance.
- Digital holography as well as transmitted LED bright field observation

Bright Field Observation

- Infinity corrected (200 mm tube lens) Optical system
- Brightfiled Observation method
- Inverted Brightfield configuration.

Microscope Objectives

1. Plan Achromatic 20X, NA 0.40, 1mm FOV

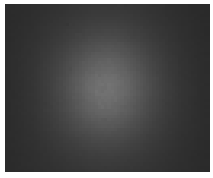
2. Plan Achromatic 40X, NA 0.65, 0.5mm FOV

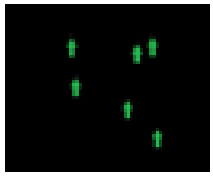
Mechanical stage

- 126mm x 78mm, co-axial dropdown knob Stage
- Petridish holder 35mm, Petridish holder 100mm, Glass slide holder, Universal holder for terasaki plate holder, glass slide, dia.35-65 dish and hemocytometer Stage Holders
- 230V 50Hz Power

Optical system

- Sliding mechanism for Two Objectives Nosepiece.
- Sidentopf Binocular head, 45° inclination, 48 - 75mm IP adjustment Viewing head
- 10X wide field (FN20), diopter adjustable, High eye relief Eyepiece
- Coaxial coarse / fine focusing, fine 0.2mm / rotation Focusing





DHM Configuration

Transmission, Upright Balanced, afocal with 650nm singke wavelength diode laser



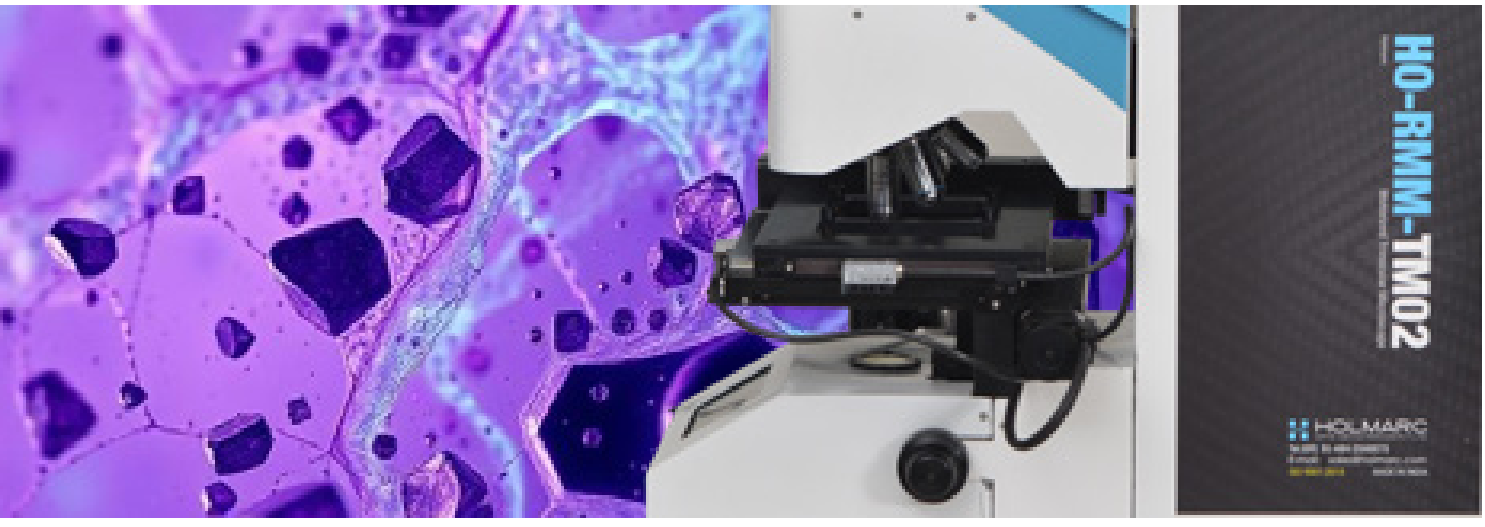
Camera Specifications

Sensor type	CMOS Color
Shutter	Global shutter
Pixel class	3.17 Mpix
Resolution	2056 x 1542 Pixels
Aspect ratio	4 : 3
Pixel size	3.45 μm
ADC	12 bit
Optical size	7.093 mm x 5.320 mm (8.87 mm diagonal)
Optical class	1 / 1.8”
Manufacturer	Sony
Gain (master / RGB)	24x / 4x
Frame rate free run mode	123 fps
Frame rate trigger (continuous)	123 fps
Frame rate trigger (maximum)	134 fps
Exposure time (min – max)	0.018 ms - 999 ms
Long exposure (maximum)	30000 ms
Interface connector	USB 3.0 micro-B
Software	Digital HM_ V02
Phase image reconstruction	Patented single shot high resolution method

Illumination

- Transmitted Illumination
- High bright white LED, Intensity adjustable Illumination system

Motorized Microscope



Motorized Microscope TM01 - Trinocular

Model : HO-RMM-TM01

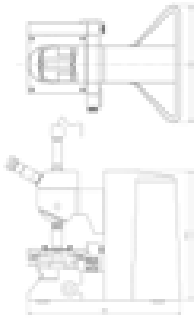
HO-RMM-TM01 is an upright motorized brightfield observation trinocular microscope which is developed for general purpose as well as research applications. This system is equipped with four infinity corrected Long working distance Plan Apochromatic objectives for high resolution imaging. A high-quality ball bearing mounted quadruple rotating turret helps the smooth changing of the objectives. High bright white LED illuminated transmitted Kohler illumination as well as epi-scopic illumination are provided for different type of samples. Motorized XY sample stage and motorized Z focusing stage with autofocusing technology are provided for the automatic scanning of the samples. A 1/2.5" USB3.0 CMOS 5Mp colour C-mount camera with an image grabbing software is also supplied with the system. The scanning, autofocusing, and stitching operations can be operated from image grabbing software. A hand held unit with a joystick control for XY sample stage and two push buttons for Z focusing stage is also equipped for manual operations of the stages. 0.37X camera reduction lens is supplied with the system to reduce the image magnification towards camera. A removable filter holder fitted at the base of the instrument so that the user can easily change the filter as per their application. All the materials used in the microscope are corrosion resistant to make sure of maintenance free operation and the body is aesthetically finished to suit the ambience of any modern laboratory.

- Motorized stages
- Automatic scanning
- Autofocusing
- Image stitching
- Particle counting and measurement software

SPECIFICATIONS

Microscope type	Upright, Infinity corrected Optical System
Observation method	Brightfield
Total Magnification	100x - 600X
Illumination	Transmitted and Reflected light
Illumination system	High bright white LED, Intensity adjustable
Nosepiece	Quadruple, Manual rotating turret
Viewing head	Sidentopf Trinocular head, 30° inclination, 48 - 75mm IP adjustment
Eyepiece	10X wide field (FN20), diopter adjustable, High eye relief
Camera adapter	C-mount adapter with 0.37 X reduction lens
Microscope Objectives	1. Super Long WD Plan Apo 10X, NA =0.30, WD = 40mm
	2. Super Long WD Plan Apo 20X, NA =0.35, WD = 17mm
	3. Super Long WD Plan Apo 40X, NA =0.50, WD = 8mm
	4. Plan Achromatic60X, NA =0.75, WD = 1.22mm
Z Focusing	Motorized with Autofocusing
Sample Stage	Precision Motorized stage, Travel = 75mm x 75mm
Image grabbing software	RMM V_01, Image Analyzer V_01 for Particle measuring





- Microfluidic
- Particle analysing
- Measurement
- Inspection
- Cell counting
- Pathology
- Haematology
- Biomedical

Camera Specifications

Sensor	:	1/2.5” CMOS Color camera
Sensor size	:	5.7mm x 4.28mm
Resolution	:	2592 x 1944 (5MP)
FPS	:	10fps @ 2592 x 1944 resolution
Pixel size	:	2.2um x 2.2um
Scan type	:	Progressive scan
Shutter type	:	Electronic rolling shutter
Exposure time	:	109us ~ 3000ms
Data format	:	8 bit RAW, 12 bit BMP
Sensitivity	:	1.76 V / lux - sec
Spectral range	:	380 - 650 nm
SNR	:	38.5 dB
Wide dynamic range	:	67.7 dB
Interface	:	USB 3.0
Lens mount	:	C-mount
Size	:	~ 44 x 44 x 39 mm

100x - 600X

Total Magnification

Optical system

Upright, Infinity corrected, Brightfield with Quadruple, Manual rotating turret Nosepiece

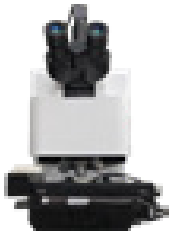


Illumination

Transmitted and Reflected light
High bright white LED, Intensity adjustable

Model : HO-RMM-TM02

TM02 Model with 5” LCD touch screen
Objective selection, Illumination intensity controls





Fluorescence Microscope



Fluorescence Imaging Microscope

Model : FIM5000S
HO-AMS-FL5000
HO-AMS-FL5000CX

A fluorescence microscope is an optical microscope that uses fluorescence instead of, or in addition to, scattering, reflection, and attenuation or absorption, to study the properties of organic or inorganic substances.“Fluorescence microscope” refers to any microscope that uses fluorescence to generate an image, whether it is a simple set up like an epifluorescence microscope or a more complicated design such as a confocal microscope, which uses optical sectioning to get better resolution of the fluorescence image.

Model : FIM5000S



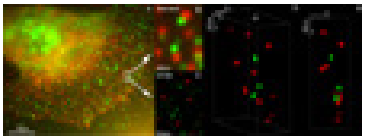


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Inverted Fluorescence Microscope

Model : HO-AMS-HO-AMS-FL5000

- HEATING STAGE for the glass slide (Microscope)
- RT - 100°C Temperature range
- Thermocouple Temperature readout
- +/- 1°C Temperature control Accuracy
- Temperature control electronics include PID controller and power supply
- Holder will be able to hold normal microscope slides, rectangular Reviewed



- Laser Scanning
- Fluorescence
- Microscopy
- Multichannel Fluorescence

Inverted Fluorescence Microscope 2

Model : HO-AMS-FL5000CX

- HEATING STAGE for the glass slide (Microscope)
- RT - 100°C Temperature range
- Thermocouple Temperature readout
- +/- 1°C Temperature control Accuracy
- Temperature control electronics include PID controller and power supply
- Holder will be able to hold normal microscope slides, rectangular Reviewed

HO-AMS-FL5000



HO-AMS-FL5000CX



SPECIFICATIONS

Model No	**FIM5000S**
	
Microscope type	Infinity corrected Confocal inverted Microscope
Eyepiece	10X achromatic wide field
Objectives	Plan apo-infinity long WD objectives (5X,10X, 20X, 45X, 60X)
Nosepiece	It shall accommodate at least 5 objectives and shall have slots for filters
Condenser	Shall be universal type with large Numerical aperture 1.25 - 100X iris and at least two filter holders
Stages	Motorised stage with minimum travel range of 10 x 5 cm2, and 1 micron resolution
Focus	50mm stage stroke with fine adjustment
Light sources	Fluorescence 405nm low noise laser of 100mW or better optical power. Possibility for co-axial pumping of external light source

CAMERA SPECIFICATIONS

Camera	4K imaging, 12bit resolution, cooled camera, suitable Cmount, licensed imaging software

	Inverted Fluorescence Microscope Research Grade	Inverted Fluorescence Microscope Research Grade
	HO-AMS-FL5000	**HO-AMS-FL5000CX**
		
Equipment Type	Inverted	Inverted
Eyepiece		
Optical System	Colour Corrected Infinity Optical System	Colour Corrected Infinity Optical System
Observation	Siedentopf Widefield Binocular 45° [F.N. 22]	Large LCD touch display
Eyepieces	10X / 22 extra wide field eyepieces	
Viewing Height	423 mm	
Sample Stage	Stepper motor controlled 120 x 120 mm with provision to hold well plate, Ø35 mm, Ø54 mm, and Ø65 mm petri dish, 4 glass slide etc.	Stepper motor controlled 120 x 120 mm with provision to hold well plate, Ø35 mm, Ø54 mm, and Ø65 mm petri dish, 4 glass slide etc.
Objectives	4 Nos. (5x, 10x, 20x and 50x)	4 Nos. 5x, 10x, 20x, , 50x , 100x oil immersion
Turret	Motorized positioning and 4 slots for keeping	Motorized positioning and 4 slots for keeping
Fluorescence filter wheel unit	2 deck (8 Slot each)	2 deck (8 Slot each)
Condenser	Abbe condenser	Abbe condenser
Focus	Motorized Stepper motor controlled	Motorized Stepper motor controlled
Illumination	50 W Quartz halogen (150W Xe Arc Lamp Optional)	50 W Quartz halogen (150W Xe Arc Lamp Optional
CAMERA SPECIFICATIONS		
Sensor type	Cooled 20MP CMOS for Imaging	Cooled 20MP CMOS for Imaging
Sensor model	Sony	Sony
Quantum efficiency	84% @ 535 nm	84% @ 535 nm
Resolution	5472(H) x 3648(V)	5472(H) x 3648(V
Pixel size	2.40μm x 2.40μm	2.40 μm x 2.40 μm
Sensor size	15.86 mm; 1inch	15.86 mm; 1inch
Shutter mode	Rolling	Rolling
Read noise	< 1e-	< 1e-
Cooling	Forced air (Ambient a+25°C)-15°C	Forced air (Ambient at +25°C) : -15°C
Frame rate	14fps @ 5472 x 3648, 53fps @ 2736 x 1824, 67fps @ 1824 x 1216	14fps @ 5472 x 3648, 53fps @ 2736 x 1824, 67fps @ 1824 x 121
Binning	2 x 2, 3 x 3, 4 x 4	2 x 2, 3 x 3, 4 x 4
Exposure settings	Auto / Manual	Auto / Manual
Exposure time	18us - 1hour	18us - 1hour
Picture format	JPG / PNG / TIFF / DICOM	JPG / PNG / TIFF / DICOM
Data interface	USB 3.0	USB 3.0
Bit depth	16bit / 8bit	16bit / 8bit
Camera size	85 mm x 85 mm x 109mm	85 mm x 85 mm x 109 mm
Power supply	12V	12 V
Controller	Joy stick type	Joy stick type
Ports	Two standard ports are available for camera and fiber coupling / galvano attachment	Two standard ports are available for camera and fiber coupling / galvano attachment

Inverted microscope – Fluorescence (Brightfield, Phase contrast, Epi-fluorescence)

Model : IM-PH-EPI

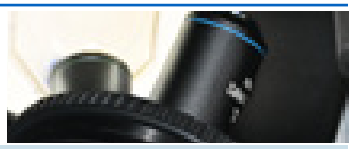
IM-PH-EPI is an inverted fluorescence microscope suitable for Brightfield and Phase contrast observations as well. The fluorescence illuminator is equipped with a manually rotatable 4 position fluorescence filter mount and a high bright white LED with adjustable intensity. Fluorescence filter sets are sold separately. Custom LED illumination wavelength can also be provided on special requests. Provisions for mounting different well plates and flasks are provided with the system for observing living cells or organisms.

This model is available in Binocular configuration with a 20MP CMOS camera on the side port. The binocular head is inclined at 45 degrees and both the eyepieces are dioptre adjustable. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. A mechanical stage with co-axial drop down knob is provided as the sample stage. A tension adjustable coaxial coarse and fine mechanism is used for the sample focusing. A Koehler LED transmitted illumination with plan achromatic phase contrast objectives are provided for routine inspection applications. A set of fluorescence objectives are also provided with the system. A user friendly software provides live measurement features and the measured data can be exported as pdf.

- Cell and tissue culture studies in life science and forensics
- Living cell imaging
- Neuroscience
- Microbiology
- Flow cytometry
- Material and earth science
- Crystallography
- Mineralogy
- Polymer morphology
- Lithographic patterns in fossils
- Sub-cellular imaging



Specifications



Model : IM-PH-EPI	
Configuration	Inverted
Optical system	Infinity corrected
Observation method	Brightfield, Phase Contrast, Epi-fluorescence
Observation Head	Sidentopf Binocular head, 45o, 55-75mm IP
Eyepieces	WF10X, FN20, Dioptric adjustment – both eyepieces
Nosepiece	Quadruple revolving, positive precision click stops, Manual. RMS thread

Objectives	
1. Plan Achro Phase Contrast 5X/0.10	WD = 9mm, CG=1.2mm
2. Plan Achro Phase Contrast 10X/0.25	WD = 4.3mm, CG=1.2mm
3. Plan Achro Phase Contrast 2X/0.40	WD = 8mm, CG=1.2mm
4. Plan Achro Phase Contrast 40X/0.60	WD = 3.5mm, CG=1.2mm
5. Plan Achromatic 20X/0.40	WD = 8.8mm
6. Plan Achromatic 40X/0.60	WD = 3.98mm
7. Plan Achromatic 100X/0.85 dry	WD = 0.40mm

Sample stage	Double layer Mechanical stage
Travel	126mm x 78mm
Sample holders	T-flask, 96 well plate, 6 well plate, Glass slide, 54mm Petridish
Focusing	Coaxial coarse and fine focusing mechanism
Condenser	Long working distance, NA = 0.30, WD = 70mm
Condenser accessories	Pre-centered Phase slider, Manual
Camera Port	Side

Transmitted Illumination	3W white LED, Adjustable intensity

Camera	20MP CMOS Color, USB3.0
Sensor type	CMOS Color
Sensor model	Sony IMX183
Resolution	5472 x 3648 pixels (20MP)
Sensor size	1”
Pixel size	2.4 um x 2.4um
Frame rate	10 fps @ full resolution
Exposure time	18us – 15S
Data interface	USB 3.0
Shutter	Rolling Shutter
Bit depth	16/8bit
Picture format	JPEG/PNG/TIFF
Mount	C-mount
PC requirements	i5 or above

Epi-fluorescence attachment
White LED illumination, intensity adjustable
4 position fluorescence filter cube mount
Manually rotatable
(Filter sets are sold separately)
(Custom wavelength LED is available as optional)

Software	Micro Analyser (Image grabbing, Live measurements, Reports etc)

Inspection Microscope



Inverted microscope – Phase contrast

(Brightfield, Phase Contrast, Transmitted Illumination)

HO-MG-IMR is an inverted microscope suitable for Brightfield and Phase contrast observations. Provisions for mounting different well plates and flasks are provided with the system for imaging living cells or organisms. This model is available in Binocular configuration with a 5MP CMOS camera on the side port. The eyepieces are inclined at 45 degrees and are dioptre adjustable. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. A mechanical stage with co-axial drop down knob is provided as the sample stage. A tension adjustable coaxial coarse and fine mechanism is used for the sample focusing. Powerful Koehler LED illumination with infinity corrected plan achromatic phase contrast objectives are provided for routine inspection applications. A user friendly software provides live measurement features and the measured data can be exported as pdf.

Model : HO-MG-IMR	
Configuration	Inverted
Optical system	Infinity corrected
Observation method	Brightfield, Phase Contrast
Observation Head	Sidentopf Binocular head, 45o, 55-75mm
Eyepieces	WF10X, FN20, Dioptric adjustment – both eyepieces
Nosepiece	Quadruple revolving, positive precision click stops, Manual. RMS thread
Objectives	
1. Plan Achro Phase Contrast 5X/0.10,	WD 1
2 Plan Achro Phase Contrast 10X/0.25	WD = 4.3mm, CG=1.2mm
3. Plan Achro Phase Contrast 20X/0.40	WD = 8mm, CG=1.2mm
4. Plan Achro Phase Contrast 40X/0.60	WD = 3.5mm, CG=1.2mm
Sample stage	Double layer Mechanical stage, Travel = 126mm x 78mm
Double layer Mechanical stage	Travel = 126mm x 78mm = T-flask, 96 well plate, 6 well plate, Glass slide, 54mm Petridish
Focusing	Coaxial coarse and fine focusing mechanism.
Condenser	Long working distance, NA = 0.30, WD = 70mm
Condenser accessories	Pre-centered Phase slider, Manual
Camera Port	Side
Transmitted Illumination	3W white LED, Adjustable intensity

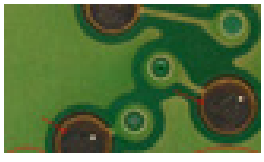
Inverted Objectives



Software



Sample Images





Camera

Optical format	1/2.5” CMOS
1/2.5” CMOS	5.70mm x 4.28mm
Active pixels	2592 x 1944 (5MP)
Pixel size	2.2 x 2.2 um
Shutter type	Full resolution – 7 fps
Frame rate	380-650nm
Spectral response	
Exposure time	0.072ms – 3000ms
Image format	RAW, BMP, JPG, PNG
Operating temperature	-30oC to +70oC
Sensitivity	1.76V/lux-sec(550nm)
Interface	USB2.0
USB2.0	C-mount
Software	Micro Analyser (Image grabbing, Live measurements, Reports etc)

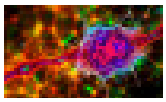
Microbiology



Cell and tissue culture



Sub-cellular imaging



Flow cytometry



Material and earth science



Crystallography



Mineralogy



Living cell imaging



Neuroscience



studies in life science and forensics



5x,10x,20x,40x





Illumination

3W white LED, Adjustable intensity



Stage

Double layer Mechanical stage, Travel = 126mm x 78mm



Digital Inverted Microscope

Model : DIM-PH

DIM-PH model is a digital inverted microscope designed for cell culture, live cell imaging, research, and laboratory applications. A 12.1" high resolution LCD display with built-in PC and software produces high quality images of the sample. Automatic measuring provision is included in the software for cell confluency measurements in live cell imaging. Since there is no eyepiece, this is an ideal tool for continuous monitoring of sample for an extended period of time. DIM-PH model is suitable for Brightfield and phase contrast observations. An epi-fluorescence illuminator is also included in the system and the user can easily update the system for fluorescence imaging by adding fluorescence filters cubes.

Specifications

Imaging methods	Brightfield, Phase Contrast (Ei-fluorescence upgradable)
Configuration	Inverted
Optical system	Infinity corrected; RMS threaded objectives with 45mm parfocal distance
Illumination	Transmitted light (for Brightfield and Phase contrast), Epi-fluorescence(Upgradable)
Nosepiece	Quadruple revolving, positive precision click stops
Objectives	1. Plan Achro Phase Contrast 5X/0.10, WD = 9mm, CG=1.2mm
	2. Plan Achro Phase Contrast 10X/0.25, WD = 4.3mm, CG=1.2mm
	2. Plan Achro Phase Contrast 20X/0.40, WD = 8mm, CG=1.2mm
	3. Plan Achro Phase Contrast 40X/0.60, WD = 3.5mm, CG=1.2mm
Sample stage	Attachable Double layer Mechanical manual stage
	Travel = 126mm x 78mm
	Drop down knob
Sample holders	Microscopic slides
	Hemocytometers
	T-25, T-75, T-175 flasks
	6 -, 12-, 24-, 48- , 96 well plates
	35, 50, 60, 100mm Petri dishes
Focusing	Manual, Coaxial coarse and fine focusing mechanism.
Condenser	Long working distance, NA = 0.30, WD = 70mm
Condenser accessories	Pre-centered Phase slider, Manual.
Condenser height	Adjustable for Brightfield observation
Transmitted Illumination	3W white LED, Adjustable intensity
Camera	1/2.5" CMOS Color
Resolution	5MP
Mount	C-mount
Camera Interface	USB2.0
Image format	BMP, JPG, PNG
Driver compatibility	Windows10 or higher
LCD Display & Image acquisition system	12.1" LCD touch screen , high resolution LCD touch screen(1280x800px) Display interface = HDMI
Epi-fluorescence attachment	White LED illumination, intensity adjustable 4 position fluorescence filter cube mount Manually rotatable (Filter sets are sold separately) (Custom wavelength LED is available as optional)

Epi-fluorescence attachment

White LED illumination, Intensity adjustable

Built-in Mini PC

(i3, 8GB RAM, 256 SSD

Features
live/capture image,
Confluence measurement.

password protection (21 CFR Part 11)

System can be connected to an external PC for capturing/ live viewing the images

Sample Holders

- Microscopic slides
- Hemocytometers
- T-25, T-75, T-175 flasks
- 6 -, 12-, 24-, 48- , 96 well plates
- 35, 50, 60, 100mm Petri dishes

Sample Stage

- Attachable Double layer Mechanical manual stage
- Travel = 126 mm x 78 mm
- Drop down knob

Sample Holders

Flasks, wellplates, Petri dishes, Slides



Automated Inspection Microscope

Model : HO-FA-TM01

Suppliers and manufacturers need to inspect parts and components to ensure and optimize performance and lifetime. But inspection must also be carried out in an efficient and cost-effective way. The goal is to optimize workflow efficiency for quality control including inspection and rework, failure analysis, and research and development (R&D). Many different challenges can occur when performing inspection with a microscope. Some of the most critical relate to workflow optimization, efficient reporting of results, training of users, and user comfort.

Specifications

Microscope type	Upright
Optical System	Infinity corrected
Observation method	Bright field, Simple polarising
Total Magnification	100x - 600x
Illumination	Transmitted and Reflected light
Illumination system	High bright white LED, Intensity adjustable
Nosepiece	Quadruple, Motorized rotating turret
Viewing head	Sidentopf Trinocular head, 30° inclination, 48 - 75mm IP adjustment
Eyepiece	10X wide field (FN20), diopter adjustable, High eye relief
Mounting adapter	C-mount adapter with 0.37 X reduction lens
Microscope Objectives	1. Super Long WD Plan Apo 10X, NA = 0.30, WD = 34mm
	2. Super Long WD Plan Apo 20X, NA = 0.35, WD = 29mm
	3. Super Long WD Plan Apo 50X, NA = 0.50, WD = 17mm
	4. Plan Achromatic 60X, NA = 0.75, WD = 1.22mm
Z Focusing	Motorized with Auto focusing, Z travel : 100mm
Sample Stage	Precision Motorized stage, Travel = 75mm x 75mm
Software	1. RMM V_01 = Image grabbing,scanning, autofocusing, stitching operation, Illumination Intensity controls
	2. Image Analyzer V_01 = Particle counting, Scratch-dig measurement, image analysis and measurement software
Provision for manual operation Using hand held unit with a joystick control for XY sample stage and two push buttons for Z focusing stage	
5" LCD touch screen Objective selection, Illumination intensity controls	
Power Input	230V, 50Hz

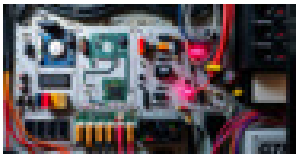
Inspection for the Automotive Industry



Inspection for Medical Device



Inspection for Electronics



Features

- Motorized XY stage for automatic scanning
- Motorized Z focusing stage with autofocusing
- Long working distance objectives
- Transmitted as well as episcopic (reflected) illumination
- Image stitching
- Particle counting
- Scratch-dig measurement (on polished optical surface)
- Image analysis and measurement software

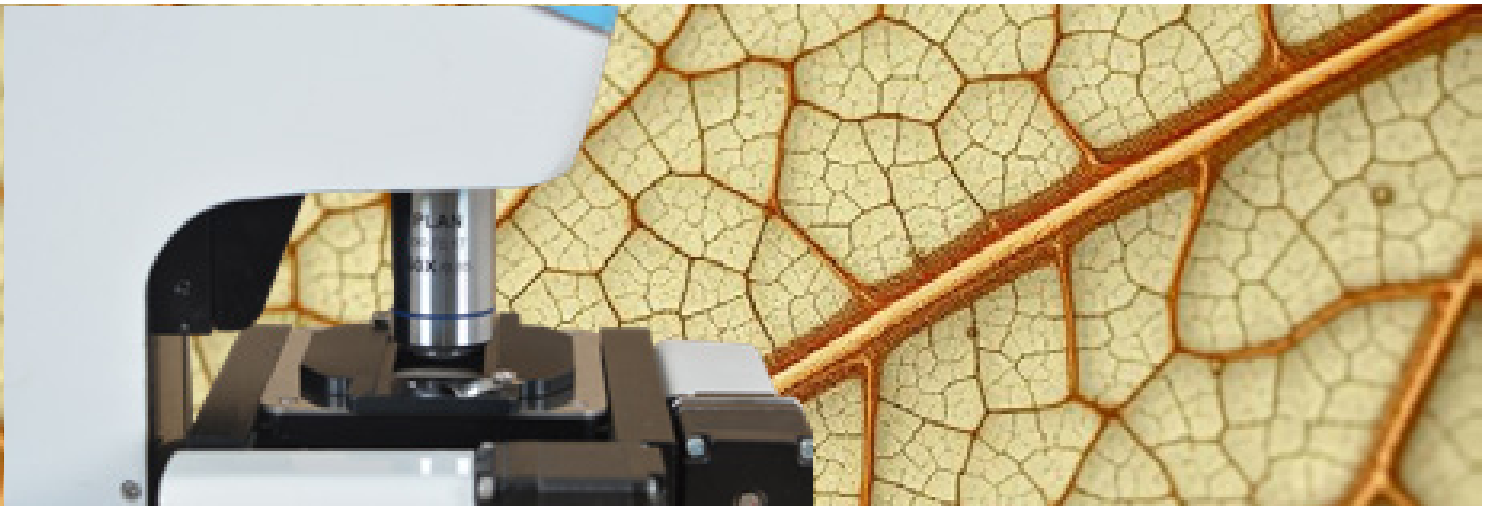
Camera Specifications

Sensor	1/2.5" CMOS Color sensor
Sensor size	5.7mm x 4.28mm
Resolution	2592 x 1944 (5MP)
Resolution	5472(H) x 3648(V)
FPS	10fps @ 2592 x 1944 resolution
Pixel size	2.2μm x 2.2μm
Scan type	Progressive scan
Shutter type	Electronic rolling shutter
Exposure time	109μs ~ 3000ms
Data format	8 bit RAW, 12 bit BMP
Sensitivity	1.76 V / lux - sec
Spectral range	380 - 650 nm
SNR	38.5 dB
Wide dynamic range	67.7 dB
Interface	USB 3.0
Lens mount	C - mount
Data acquisition and display system Normal configuration	
Laptop	



Explore in a flexible way
Seamlessly investigate various samples
Find the objective that best your needs

Automicroscope



Auto Microscope 1 (Single Slide Scanner) (Brightfield, Automatic scanning, Autofocusing, Transmitted Illumination)

HO-BM-AM01

Auto-microscope model: HO-BM-AM01 is a fully automated digital microscopy system developed for the acquisition of high resolution Brightfield images. The motorized XY sample stage helps to scan a particular sample area automatically and the autofocusing algorithm will find the best focused image in each frame before saving it to the pc for further analysis. The system is equipped with 5MP CMOS camera and a 60X Plan objective with 0.85 NA for the acquisition of high quality images. A diffused transmitted illumination with adjustable intensity provides uniform illumination over the entire field of view. The microscope objective is manually replaceable and user specified magnification can also be provided. A complete user friendly image acquisition software is provided along with the system for the automatic scanning of the sample.

Optical system	Infinity corrected
Observation method	Digital Brightfield
Nosepiece	Single objective holder, RMS thread
Microscope Objective	Plan Achro 60X/0.85
Illumination	Transmitted, White LED, Intensity adjustable via software
Focusing	Motorized with autofocusing algorithm
Image acquisition	
Software	AM_V01
Sample stage	Motorized XY stage
travel	18mmx18mm

XY sample stage - Motorized

Travel	18mm x 18mm
Drive	Stepper Motor
Resolution	5 micron
Accuracy	5 micron

Camera

Optical format	1/2.5” CMOS
Active imager size	5.70mm x 4.28mm
Active pixels	2592 x 1944 (5MP)
Pixel size	2.2 x 2.2 um
Shutter type	Electronic rolling shutter(ERS)
Frame rate	Full resolution – 7 fps
Spectral response	380-650nm
SNR	
Dynamic range	
Exposure time	0.072ms – 3000ms
Image format	RAW, BMP, JPG, PNG
Operating temperature	-30oC to +70oC
Sensitivity	1.76V/ lux-sec(550nm)
Interface	USB2.0
Lens mount	C-mount
Software interface	
Operating mode	
Data format	

Auto Microscope 2
HO-BM-AM02

Microscope type	Upright
Observation method	Brightfield
Illuminations	Transmitted Illumination
Illumination system	3W White LED, Intensity adjustable
Nosepiece Single	(objectives are manually replaceable)
	Z Focusing Motorized with autofocusing

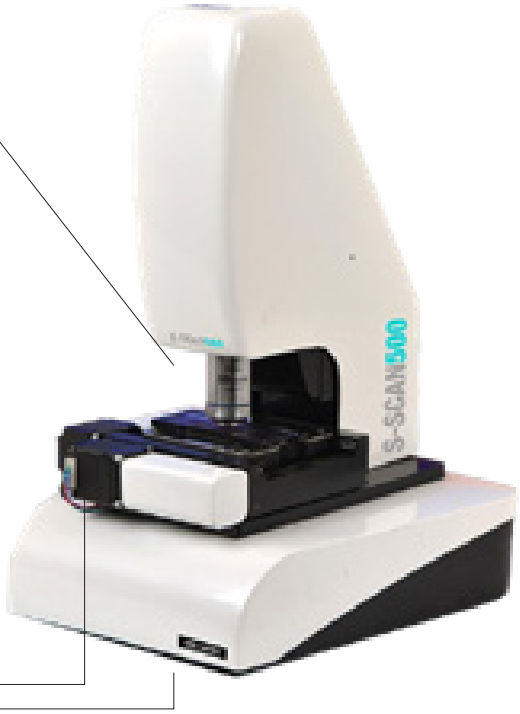
Sample XY Stage Precision Motorized XY Stage

Carriage size	325mm x 295mm
Travel	200mm x 170mm
Straight line accuracy	0.010mm
Repeatability	0.002mm
Stepper motor driven	
Condenser Substage condenser	
Microscope Objectives	
Plan Achromatic 20X	NA = 0.4, Working distance = 8.8mm, Optical resolution = 0.68 um Resolution = 0.16um / pixel
Plan Achromatic 40X	NA = 0.65, Working distance = 0.66 mm, Optical resolution = 0.41 um
Software AM_V01	Scanning, Stitching, Autofocusing

Camera

Camera Sensor	3MP CMOS, Color
Optical format	1/2”
Sensor size	6.55 mm x 4.92 mm
Active pixels	2048 H x 1536 V
Pixel size	3.2μm x 3.2μm
Frame rate	10 fps @ full resolution
Sensitivity	>1.0V / Lux - sec
Exposure time	0.047 ~ 3000 ms
Spectral range	380 - 650 nm
SNR	43 dB
Dynamic range	61 dB
Shutter	Electronic rolling shutter
Data interface	USB2.0
Image format	RAW / BMP / JPG / PNG
Data format	8 Bit / 12 Bit RAW

BM-AM01



HO-BM-AM02

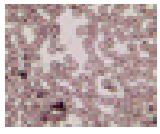
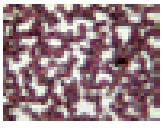


Auto Microscope 3

(3 Slide Scanner, Brightfield, Automatic scanning, Autofocusing, Transmitted Illumination, Reflected(Epi-scopic) Illumination)

BM-AM03 is an upright Trinocular microscope designed for the automatic scanning of samples. It is a cost effective motorized microscope for general purpose laboratory applications including biomedical and pathology.

A precision motorized XY stage is provided for automated sample scanning and a motorized Z focusing stage with an autofocusing algorithm helps to capture the best focused image of each frame. The sample stage is suitable for mounting up to 3 slides at time. A co-axial white LED illumination is provided for the observation of opaque samples and a white LED transmitted illumination is provided for transparent and semi-transparent samples.
A user-friendly software is included with the system for the automated scanning, stitching, and live measurement of the sample.



HO-BM-AM03



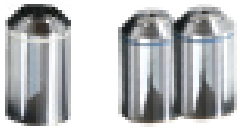
Motorized XY stage



Model :	HO-BM-AM03
Configuration	Upright
Optical system	Infinity corrected
Observation method	Brightfield, Brightfield-EPI
Observation Head	Trinocular (fixed- 50/50), 30o, 55-75mm IP adjustment
Eyepieces	WF10X, FN20, Dioptric adjustment – both eyepieces
Nosepiece	Quadruple revolving, positive precision click stops, Manual. RMS thread
Objectives	
1. Plan Achromatic 10X/0.25	WD = 20.2mm
2. Plan Achromatic 20X/0.40	WD = 8.8mm
3. Plan Achromatic 40X/0.60,	WD = 3.98mm
4. Plan Achromatic 100X/0.85 dry,	WD = 0.40mm
Sample stage	Motorized XY stage
Travel	75mm x 75mm
Focusing	Motorized with Autofocusing
Condenser	Abbe condenser, Iris Diaphragm
Illuminations	
1. Transmitted Illumination	3W white LED, Adjustable intensity
2. Epi-scopic Illumination	3W white LED, Adjustable intensity
Camera	
Optical format	1/2.5" CMOS
Active imager size	5.70mm x 4.28mm
Active pixels	2592 x 1944 (5MP)
Pixel size	2.2 x 2.2 um
Shutter type	Electronic rolling shutter(ERS)
Frame rate	Full resolution – 7 fps
Spectral response	380-650nm
Exposure time	0.072ms – 3000ms
Image format	RAW, BMP, JPG, PNG
Operating temperature	-30oC to +70oC
Sensitivity	1.76V/lux-sec(550nm)
Interface	USB2.0
Lens mount	C-mount
Software	Micro Analyser (scanning, Autofocusing, Live measurements, Reports etc)

Objectives

Plan Achromatic 10x,20x40x



Slide Scanner

Model : HO-SSC-01

HO-SSC-01 is an automated slide scanning microscope designed for single slide applications. It is a cost effective motorized microscope for general purpose laboratory applications including biomedical and pathology. A 7" touch screen display with built-in pc and software is provided with the system for data acquisition. A precision motorized XY stage is provided for automated sample scanning and a motorized Z focusing stage with an autofocusing algorithm helps to capture the best focused image of each frame. A white LED with intensity adjustable is provided for the transmitted illumination. A built-in software is included with the system for automated operation.

Specifications

Configuration	Upright
Optical system	Infinity corrected
Observation method	Brightfield
Nosepiece	Single, Manually replaceable objective
Sample stage	Motorized XY stage, Travel = 75mm x 50mm
Focusing	Motorized with Autofocusing
Condenser	Inbuilt condenser with diffuser
Transmitted Illumination	3W white LED, Adjustable intensity from display

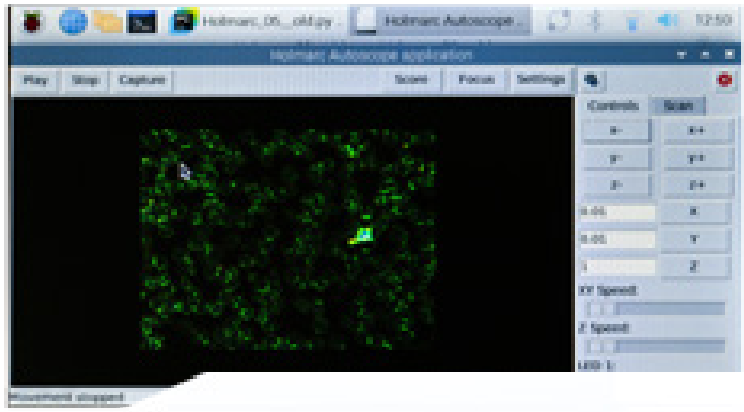
Objectives	
1. Plan Achromatic 20X / 0.40	WD = 8.8 mm, resolution = 0.11 um / pixel
2. Plan Achromatic 40X / 0.60	WD = 3.98 mm, resolution = 0.055 um / pixel
Display	7" Touchscreen, Raspberry
Built-in PC	Raspberry Pi 5, 8GB RAM, 128 GB microSD
Connectivity	WiFi, USB Port
Software	Micro Analyser (Image grabbing, Scanning, Autofocusing, documentation)

Features

- Single Slide Scanner
- Brightfield
- 7" touch screen
- Automatic scanning
- Autofocusing
- Transmitted Illumination

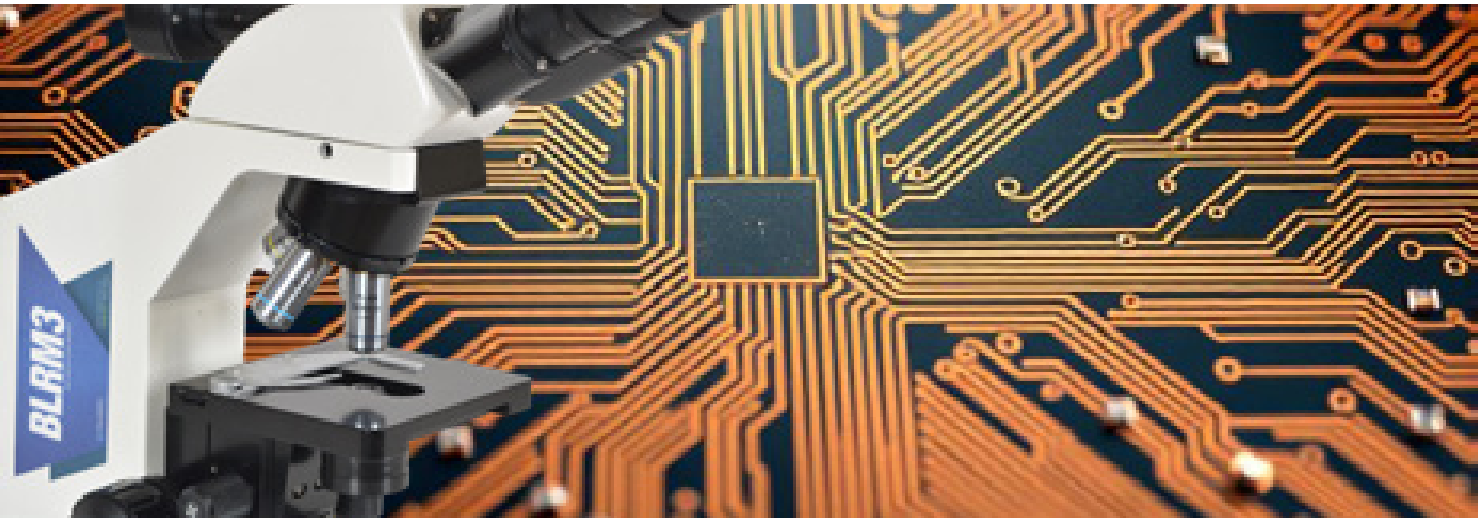
Camera

Camera Sensor	3MP CMOS, Color
Active pixels	2592 x 1944 (5MP)
Active imager size	5.70 mm x 4.28 mm
Pixel size	2.2 x 2.2 um
Shutter type	Electronic rolling shutter (ERS)
Frame rate	Full resolution – 7 fps
Spectral response	380 - 650 nm
Exposure time	0.072 ms – 3000 ms
Image format	RAW, BMP, JPG, PNG
Operating temperature	-30°C to +70°C
Sensitivity	1.76V / lux - sec (550nm)
Interface	USB 2.0
Lens mount	C-mount





Laboratory Microscope



MV215 and MV 224 series microscopes from Holmarc are cost effective yet state of the art products for general purpose laboratory applications including biomedical and pathology. This microscope is available in two models with binocular and trinocular heads. Portability and ease of use have been taken care of in the design along with stability and robustness. All materials used in the microscope are corrosion resistant to make sure of maintenance free operation. The body is esthetically finished to suit the ambience of any modern laboratory. Extreme fine focusing movements are assured by the use of precision machined and lapped mechanics.

Our microscopes have carefully designed and constructed body for rigidity, robustness and portability. Sub-micron sensitivity is achieved by precision linear motion stages with minimum possible friction and stick-slip. Our optics have been widely acknowledged for visual clarity and precision of results. Optics are made in house from the highest quality raw materials. All components included are inspected for quality at every manufacturing point before putting in to assembly. We customize and supply scientific microscopes to research laboratories.

SPECIFICATIONS

Model :	HO-MV215-BLRM	HO-MV224 Series
Head	Binocular Head, 30° Inclined.	Binocular Head, 30° Inclined.
Eyepiece	WF10X / 20 mm	WF10X / 20 mm
Objective	Infinity Achromatic 5x, 10x, 20x, 40x and 100x (s, oil)	Infinity Achromatic 5x, 10x, 20x, 40x and 100x (s, oil)
Nosepiece	Quadruple Revolving Nosepiece	Quadruple Revolving Nosepiece
Focusing	Coaxial coarse and fine focusing mechanism	Coaxial coarse and fine focusing mechanism
Stage	Double Layer Mechanical Stage	Double Layer Mechanical Stage
Travel Range	75 x 50 mm	75 x 75 mm
Illumination		
Light source	HB LED variable light intensity control using a knob	HB LED variable light intensity control using a knob
LED power	3W, comparable to an halogen bulb 30-35W.	3W, comparable to an halogen bulb 30-35W.
Color temp.	6300 K	6300 K
Condenser	Abbe N.A.=1.25 with Iris Diaphragm & Filter	Abbe N.A.=1.25 with Iris Diaphragm & Filter

HOLMARC Microscope Interactive System Controller

Holmarc Microscope Interactive System Controller brings a new level of user control for automated microscopes. The familiar joystick style control is enhanced for fine and coarse stage positioning. System include most functional keys and are arranged intelligently for intuitive application

Microscopes For Scientific measurement & Inspection Applications

Holmarc manufactures microscopes of varying sophistications for a variety of applications. Entire optics and mechanics for these microscopes are manufactured in house by our experienced technicians for assuring quality of the end product. Our objective is to provide our customers with superior products comparable to the best in the world at the most competitive prices. Each and every optics that become parts of these microscopes are hand polished to the highest quality and inspected for manufacturing defects before putting in to assembly.

MV215 Series

MV215 series microscopes are fitted with precision mechanics including fine focusing mechanism integrated with coarse focusing. Model HOMV215-BLRM3 has binocular head. Each head has standard eyetubes inclined at 30 degrees with the left eyetube having graduated diopter settings. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. Powerful Koehler illumination provides enhanced image quality and brightness for the observation of specimens. Advanced research microscopes with custom specifications are also manufactured at Holmarc. Please contact our sales team with your requirements.

Focusing	Shutter
Objective Lens Selection	Chopper
XY Sample Stage	Filter Wheels
Rotation Sample Holder	
Illumination	

Model : HO-MV215-BLRM3



MV224 series

MV224 series microscopes are fitted with precision mechanics including fine focusing mechanism integrated with coarse focusing. Model HO-MV224-BLRM2 has binocular head and Model HO-MV224-BLRM3 has trinocular head for camera integration. Each head has standard eyetubes inclined at 30 degrees with the left eyetube having graduated diopter settings. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. Powerful Koehler illumination provides enhanced image quality and brightness for the observation of specimens. Advanced research microscopes with custom specifications are also manufactured at Holmarc. Please contact our sales team with your requirements.

MV224 Series



Build Quality

The microscope body is designed ergonomically and esthetically. Each and every mechanical part is manufactured with care for lifelong operation without maintenance. Smooth focusing movements are achieved by rolling contact bearings wherever spatially possible or by fine lapped mating surfaces. There are four different models of standard microscopes available from Holmarc meant for differing scientific disciplines and applications. We manufacture custom designed microscopes as well, whether the customization is in optics or in mechanics.

Trinocular Microscope

Portability and ease of use have been taken care of in the design along with stability and robustness. All materials used in the microscope are corrosion resistant to make sure of maintenance free operation. The body is esthetically finished to suit the ambience of any modern laboratory. Extreme fine focusing movements are assured by the use of precision machined and lapped mechanics.

The binocular is inclined at 30 degrees and both eyepieces are dioptre adjustable. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. A co-axial drop down knob is provided for the operation the sample XY stage. Powerful Koehler LED illumination with infinity corrected plan achromatic objectives provide enhanced image quality and brightness for the observation of specimens. A user friendly software provides live measurement features and the measured data can be exported as pdf.

Trinocular microscope (Custom) (Brightfield, Transmitted Illumination)
BLRM3-TS

BLRM3-TS is a cost effective upright Brightfield microscope for general purpose laboratory applications including biomedical and pathology. This model is available in Trinocular configuration with a 5MP CMOS camera and a dedicated image analysis software with live measurement features.



HO-BLRM3-DL940



BLRM3-TS

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Trinocular microscope - Episcopic (Brightfield, Transmitted Illumination, Episcopic(Reflected) Illumination)

BLRM3-EPI

BLRM3-TS is a cost effective upright Brightfield microscope for general purpose laboratory applications including biomedical and pathology. This model is available in Trinocular configuration with a 5MP CMOS camera and a dedicated image analysis software with live measurement features.

Trinocular microscope - Fluorescence (Brightfield, Epi-Fluorescence)

BLRM3-FL

BLRM3-FL is an upright microscope suitable for both Epi-fluorescence and transmitted Brightfield application. The fluorescence illuminator is equipped with a white LED illumination with provision for mounting one set of fluorescence filter cube. Fluorescence filter sets are sold separately. Custom LED illumination can also be provided on special requests.
This model is available in Trinocular configuration with a 20MP CMOS camera and an image analysis software with live measurement features.
The eyepieces are inclined at 30 degrees and are dioptre adjustable. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. A co-axial drop down knob is provided for the operation the sample XY stage. A tension adjustable coaxial coarse and fine mechanism is used for the sample focusing. Powerful Koehler LED illumination with infinity corrected plan achromatic objectives provide enhanced image quality and brightness for the observation of specimens. A user friendly software provides live measurement features and the measured data can be exported as pdf.



BLRM3-EPI



BLRM3-FL

Fluorescence
Model

HOLMARC OPTO-MECHATRONICS LTD

Model :	HO-BLRM3-DL940	BLRM3-TS
		
Configuration	Upright	Upright
Optical system	Infinity corrected	Infinity corrected
Observation method	Brightfield	Brightfield
Observation Head	SidentopfTrinocular head, 30° inclination, 48 - 75mm IP adjustment	Trinocular (fixed- 50/50), 30o, 55-75mm IP adjustment
Eyepieces	10X wide field (FN20), Diopter adjustable, High eye relief	WF10X, FN20, Dioptric adjustment – both eyepieces
Nosepiece	Quadruple, Manually rotatable	Quadruple revolving, positive precision click stops, Manual. RMS thread
Objectives		
	1. Plan Achromatic 5X, NA = 0.12, WD = 26.1 mm	1. Plan Achromatic4X/0.10,WD 21mm
	2. Plan Achromatic 10X, NA = 0.25, WD = 20.2 mm	2. Plan Achromatic 10X/0.25, WD 5mm
	3. Plan Achromatic 20X, NA = 0.40, WD = 8.8 mm	3. Plan Achromatic 40X/0.65, WD 0.66mm
	4. Plan Achromatic 40X, NA = 0.60, WD = 3.98 mm	Plan Achromatic 100X/1.25 Oil, WD 0.36mm
	5. Plan Achromatic 100X, NA = 0.85, WD = 0.40 mm	
Sample stage	Double layer mechanical stage, Manual Travel = 75 x 50 mm	Double layer Mechanical stage, Travel 75mm x 50mm
Focusing	Coaxial coarse and fine focusing mechanism, Manual Drop down knob	Coaxial coarse and fine focusing mechanism
Condenser	Substage Abbe condenser, with Iris diaphragm & Filter Condenser focusing provision	Abbe NA 1.25, IRIS Diaphragm
Illumination	3W White LED Illumination - intensity adjustable 940nm LED illumination - Intensity adjustable	3W white LED illumination, Adjustable intensity
Bottom Illumination	3W White LED co-axial illumination - intensity adjustable	
Power Input	230V, 50Hz	
Camera		
Optical format	1 / 2.5" 5MP CMOS, Color	1/2.5" CMOS
Active imager siz	5.7 mm x 4.28 mm (7.13 mm diagonal)	5.70mm x 4.28mm
Active pixels	2592 H x 1944 V	2592 x 1944 (5MP)
Pixel size	2.2 μm x 2.2 μm	2.2 x 2.2 um
Shutter type	Electronic rolling shutter	Electronic rolling shutter(ERS)
Frame rate	6 - 8 fps @ full resolution	Full resolution – 7 fps,
Spectral response		380-650nm
Exposure time	0.058 ~ 3000 ms	0.072ms – 3000ms
Image format		RAW, BMP, JPG, PNG
Operating temperature		-30oC to +70oC
Sensitivity	1.4V / Lux - sec	1.76V/lux-sec(550nm)
SNR	38.1 dB	
Dynamic range	70.1 dB	
Interface	USB 2.0	USB2.0
Lens mount		C-mount
Software		Micro Analyser (Image grabbing, Live measurements, Reports etc)
Data Format	8 Bit / 12 Bit RAW	

	BLRM3-EPI	BLRM3-FL
		
Configuration	Upright	Upright
Optical system	Infinity corrected	Infinity corrected
Observation method		Brightfield, Brightfield-EPI
Observation Head	Trinocular (fixed- 50/50), 30o, 55-75mm IP adjustment	Trinocular (fixed- 50/50), 30o, 55-75mm IP adjustment
Eyepieces	WF10X, FN20, Dioptric adjustment – both eyepieces	WF10X, FN20, Dioptric adjustment – both eyepieces
Nosepiece	Quadruple revolving, positive precision click stops, Manual. RMS thread	Quadruple revolving, positive precision click stops, Manual. RMS thread
Objectives		
	1. Plan Achromatic 10X/0.25, WD 20.2mm	1. Plan Achromatic 10X/0.25, WD 20.2mm
	2. Plan Achromatic 20X/0.40, WD 8.8mm	2. Plan Achromatic 20X/0.40, WD 8.8mm
	3. Plan Achromatic 40X/0.60, WD 3.98mm	3. Plan Achromatic 40X/0.60, WD 3.98mm
	4. Plan Achromatic 100X/0.85 dry 0.40mm	4. Plan Achromatic 100X/0.85 dry WD 0.40mm
Sample stage	Double layer Mechanical stage, Travel = 75mm x 50mm	Double layer Mechanical stage, Travel = 75mm x 50mm
Focusing	Coaxial coarse and fine focusing mechanism	Coaxial coarse and fine focusing mechanism.
Condenser	Abbe NA 1.25, IRIS Diaphragm	Abbe NA 1.25, IRIS Diaphragm
Illumination	1. Transmitted Illumination 2. Epi-scopic Illumination	3W white LED, Adjustable intensity
	3W white LED, Adjustable intensity	
Camera		20MP CMOS Color, USB3.0
Optical format	1/2.5" CMOS	CMOS Color Sony IMX183
Active imager siz	5.70mm x 4.28mm	
Active pixels	2592 x 1944 (5MP)	5472 x 3648 pixels (20MP)
Pixel size	2.2 x 2.2 um	2.4 um x 2.4um
Shutter type	Electronic rolling shutter(ERS)	Rolling Shutter
Frame rate	Full resolution – 7 fps	10 fps @ full resolution
Spectral response	380-650nm	
Exposure time	0.072ms – 3000ms	18us – 15S
Image format	RAW, BMP, JPG, PNG	JPEG/PNG/TIFF
Operating temperature	-30oC to +70oC	
Sensitivity	1.76V/lux-sec(550nm)	
Interface	USB2.0	
Lens mount	C-mount	C-mount
Software	Micro Analyser (Image grabbing, Live measurements, Reports etc)	Micro Analyser (Image grabbing, Live measurements, Reports etc)
		Epi-fluorescence attachment, Provision for one Filter cube

Trinocular microscope with Digital display and Trinocular Microscope with fiber optics cable

Digital Display Model : BLRM3-TS-D
Fiber Optics Model : HO-BLRM-LWD-F

BLRM3-TS-D is an upright Trinocular + Digital Brightfield microscope for general purpose laboratory applications. The 7" touchscreen display with built-in PC and software produces high quality Brightfield images. This system is easily updatable to epi-fluorescence observation.
The binocular is inclined at 30 degrees and both eyepieces are dioptre adjustable. The smooth-operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. A co-axial drop down knob is provided for the operation the sample XY stage. Powerful Koehler LED illumination with infinity corrected plan achromatic objectives provide enhanced image quality and brightness

Built in PC

7" Touchscreen, Raspberry Built in PC with Raspberry Pi5, 8GB RAM, 128 GB microSD,

WiFi, USB Port Connectivity

Fiber attachment HO-BLRM-LWD-F

Provision to collect the image through a fiber





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	BLRM3-TS-D	HO-BLRM-LWD-F
	Digital display	Fiber attachment
Microscope type	Upright	Upright
Optical system	Infinity corrected	Infinity corrected
Observation method	Brightfield	Brightfield
Bottom Illumination (Transmitted)		3W White LED Illumination - intensity adjustable
Top illumination (Epi-scopic)		3W White LED co-axial illumination - intensity adjustable
Illumination	3W white LED illumination, Adjustable intensity	
Nosepiece	Quadruple revolving, positive precision click stops, Manual. RMS thread	Quadruple, Manually rotatable
Viewing head	Trinocular (fixed- 50/50), 30o, 55-75mm IP adjustment	SidentopfTrinocular head, 30° inclination, 48 - 75mm IP adjustmen
Eyepiece	WF10X, FN20, Dioptric adjustment – both eyepieces	10X wide field (FN20), diopter adjustable, High eye relief
		Type = Long working distance Plan Apochromatic
Microscope Objectives	1. Plan Achromatic 4X/0.10, WD = 21mm	Magnification = 10 X
	2. Plan Achromatic 10X/0.25, WD = 5mm	NA = 0.30
	3. Plan Achromatic 40X/0.65, WD = 0.66mm	Working Distance = 34 mm
	4.Plan Achromatic 100X/1.25 Oil, WD= 0.36mm	FOV eyepiece = 2 mm
		FOV camera = 0.57 mm x 0.428 mm
		Provision to collect the image through a fiber
		Fiber connector = SMA
Fiber attachment	-	Fiber NA = 0.22
		Fiber Core diameter = 1000 um
		Fiber patch code length = 2 meter
		Provision to select 50/50 or 100/0 to the fiber (manual selection)
Z Focusing	Coaxial coarse and fine focusing mechanism.	Manual Coaxial coarse and fine focusing mechanism
		Double layer mechanical stage
Sample XY Stage	Double layer Mechanical stage, Travel = 75mm x 50mm	Travel = 75 x 50 mm
		Drop down knob
Condenser	Abbe NA 1.25, IRIS Diaphragm	Substage Abbe condenser, with Iris diaphragm condenser focusing provision
Power Input		230V, 50Hz
Software		Micro Analyser (Image grabbing, measurements)
Camera		
Optical format	1/2.5" CMOS	1 / 2.5" 5MP CMOS, Color
Active imager siz	5.70mm x 4.28mm	5.7 mm x 4.28 mm (7.13 mm diagonal)
Active pixels	2592 x 1944 (5MP)	2592 H x 1944 V
Pixel size	2.2 x 2.2 um	2.2 μm x 2.2 μm
Shutter type	Electronic rolling shutter(ERS)	Electronic rolling shutter
Frame rate	7 fps	6 - 8 fps @ full resolution
Spectral response	380-650nm	
Exposure time	0.072ms – 3000ms	0.058 ~ 3000 ms
Image format	RAW, BMP, JPG, PNG	
Operating temperature	30oC to +70oC	
Sensitivity	1.76V/lux-sec(550nm)	1.4V / Lux - sec
SNR	USB2.0	38.1 dB
Dynamic range	C-mount	70.1 dB
Interface		USB 2.0
Lens mount		
Software	Micro Analyser (Image grabbing, Live measurements, Reports etc)	
Data Format		8 Bit / 12 Bit RAW
Display	7" Touchscreen, Raspberry	

02

IMAGING INSTRUMENTS

Holmarc manufactures precise imaging instruments designed for scientific and industrial use. Our product range includes digital microscopes, fluorescence systems, and interferometers, known for high-resolution imaging and custom design capabilities

60 IMAGING
60 INSTRUMENTS
62 Digital Inline Holography Microscope
64 Digital Inline
64 Holography Microscope
66 Fluorescence Microscope
66 Confocal Fluorescence Correlation Spectrometer
68 Confocal Fluorescence
68 Cross Correlation Spectrometer
72 Inspection Microscope
72 Thermal Lens Microscope - Confocal
74 Laser Microscope
78 Trinocular Inspection Microscope
78 with Boom Stand
80 Laser Ablation Inspection Microscope
82 Work Station with Inspection
82 Microscope & LCD display
84 Digital Inspection Microscope
86 Probe Station Microscope
86 Quadrupole Magnetic Probe Station
88 HV-IV Probe System
90 Piezoelectric Probe Station
92 Probe Station System T01 EC
94 Probe Station System T01L
96 Probe Station System
100 RF Probe Station System
102 Probe Station Platform & Accessories
106 Horizontal Microscope
108 Microscope Translation Stage
112 2D Transfer System
112 2D Transfer System with Digital Microscope 1 and 2
116 2D Transfer System with Trinocular Microscope
120 Telemicroscope
122 Telemicroscope
124 Interferometer
124 Fizeau Interferometer
126 Fizeau Interferometer with Encoder Rail System
128 Others
128 Illumination System
128 with Motorized Polarizer Rotator





Digital Inline Holography Microscope



Model : HO-DIHM-HT01

Holmarc's Digital In-line Holography microscope, model HO-DIHM-HT01, is a powerful imaging device that allows for the digital reconstruction of complex objects (amplitude and phase) from a single intensity image captured by passing coherent light through it.

Holmarc's DIHM is equipped with a transmission type in-line geometry. A coherent point light source illuminates the sample, and a CMOS camera records the 2D interference pattern created by the scattered light (object beam) with non-scattered light (reference beam). The software then computes the field backward to different planes to numerically recreate the samples' 3D structure from the recorded 2D interference pattern. For 3D reconstruction, the software employs a single shot phase unwrapping algorithm. The DIHM's broad depth of field allows it to image large volumes with equivalent resolution and to image particles at different depths simultaneously without the use of mechanical scanning.

The HO-DIHM-HT01 can be used both in-situ and ex-situ to image particles ranging in size from sub-microns to several millimetres. It records the interference pattern using a 405nm diode laser with pinhole assembly as a point light source and Sony's 1/1.8" 3.17Mpix CMOS IMX174 sensor. The 134 fps USB3.0 sensor delivers great image quality and low noise performance. The distance between the sample to pinhole and sample to camera is adjustable from the software. A motorized ND filter wheel is provided in front of the laser to adjust the laser power for different sample conditions. DIHM_V01 is an easy-to-use programme that allows you to save, rebuild, and analyse each hologram frame.

- Fratures
-
- Unique single shot high resolution and accurate quantitative imaging capability (patented technology).
- No phase shifting required thus removing the need for piezo stages.
- Quantitative phase imaging without staining of cells.
- Full diffraction limited resolution performance.
- Digital holography as well as transmitted LED bright field observation.

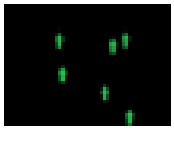
SPECIFICATIONS

DIHM configuration	Horizontal Laser
Light source	405nm diode laser (50mW)
Sample illumination beam profile	Plane wave front (Collimated beam)
Intensity control	Motorized variable ND filter, via software
Spatial filter assembly	Microscope objective based
Collimating optics	Multi-element design, Spherical aberration corrected
Source to sample distance	Fixed
Sample to Camera distance	Adjustable up to 200 mm, motorized movement, adjustable via software
YZ Sample stage	Manual, Provision to hold optical chamber of 8cm x 4cm x 1cm or higher

Samples

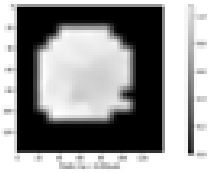


Hologram - Single frame

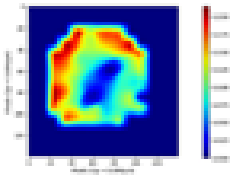


Binary particle map

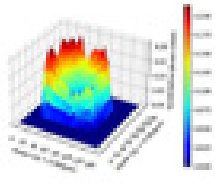
PARTICLE SAMPLES



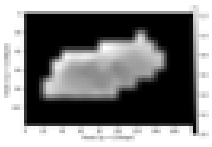
Particle 1 - Amplitude



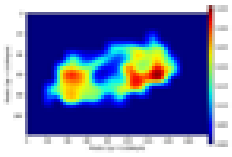
Particle 1 - Phase



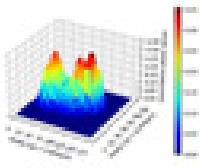
Particle 1 - 3D Phase



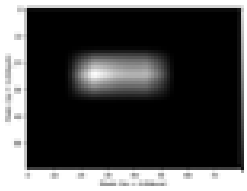
Particle 2 - Amplitude



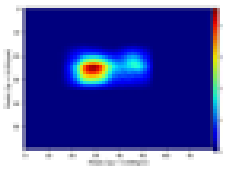
Particle 2 - Phase



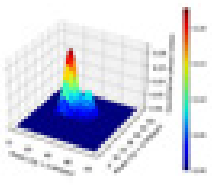
Particle 2 - 3D Phase



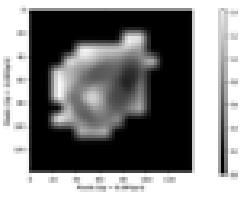
Particle 3 - Amplitude



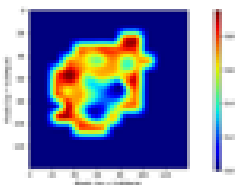
Particle 3 - Phase



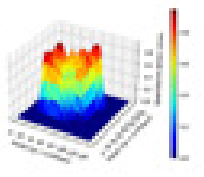
Particle 3 - 3D Phase



Particle 4 - Amplitude



Particle 4 - Phase



Particle 4 - 3D Phase

XY Sample Stage

Manual 8cm x 4cm x 1cm or higher with
Provision to hold optical chamber







Camera specifications

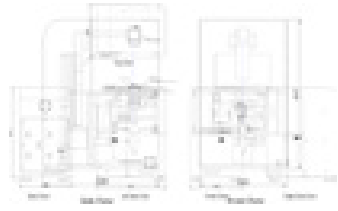
Sensor type	CMOS Mono
Sensor size	14.158 mm x 7.500 mm (16.02 mm diagonal)
Pixel size	3.45 um Full resolution = 4104 x 2174 Pixels (8.92 Mpix
Shutter	Global shutter
Sensor characteristic	Linear Readout mode = Progressive scan
Sensor model	Sony IMX267
ADC	12 bit
Gain (Master / RGB)	24X / 4X
Pixel clock range	99 MHz - 395 MHz
Frame rate freerun mode	33
Frame rate trigger (Continuous)	33
Frame rate trigger (maximum)	33
Exposure time (Min - Max)	0.027 ms - 1000 ms
Long exposure (Maximum)	30000 ms
Power consumption	1.6 W - 3.9 W
Image memory	128 MB
Interface connector	USB Type-C, Screwable
Power supply	USB cable
Lens mount	C - Mount
Dimensions	34 mm x 44 mm x 47 mm
Software	DIHM_V02
Software features	Image grabbing, Continuous mode recording, Frame by frame processing, Movie mode processing, image measurements, motorized stage controls

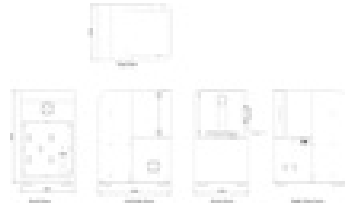


- Particle size analysis
- Particle tracking in 3D
- Cell biology, 3D dynamic analysis of cells
- Study of ice crystal habits in could chamber
- Microfluidics
- Marine biology
- Deformation analysis
- Refractive index characterization
- Ferroelectric metrology
- Electro-chemistry

Digital Inline Holography Microscope

Model : HO-DIHM-T01





Holmarc's Digital In-line Holography microscope, model HO-DIHM-T01, is a powerful imaging device that allows for the digital reconstruction of complex objects (amplitude and phase) from a single intensity image captured by passing coherent light through it.

Holmarc's DIHM is equipped with a transmission type in-line geometry. A coherent point light source illuminates the sample, and a CMOS camera records the 2D interference pattern created by the scattered light (object beam) with non-scattered light (reference beam). The software then computes the field backward to different planes to numerically recreate the samples' 3D structure from the recorded 2D interference pattern. For 3D reconstruction, the software employs a single shot phase unwrapping algorithm. The DIHM's broad depth of field allows it to image large volumes with equivalent resolution and to image particles at different depths simultaneously without the use of mechanical scanning.

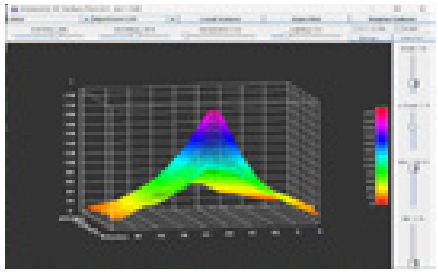
Specifications

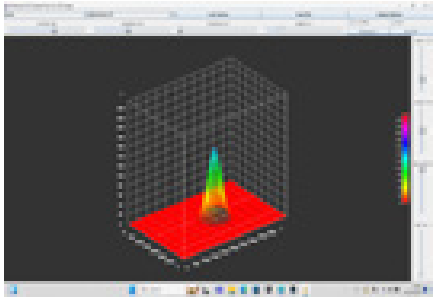
DIHM Type	Transmission, Upright Geometry
Light source	405nm diode laser, 50 mW
Point source assembly	Microscope objective + pinhole assembly
Software	DIHM_V01
Phase unwrapping	Single shot algorithm
Camera	1/1.8", 3.17MP, CMOS, Mono USB3.0, SONY, Global Shutter
Pinhole - sample distance	Adjustable, motorized, controls via software
Sample - Camera distance	Adjustable, motorized, controls via software
Laser power	Adjustable via motorized ND filter

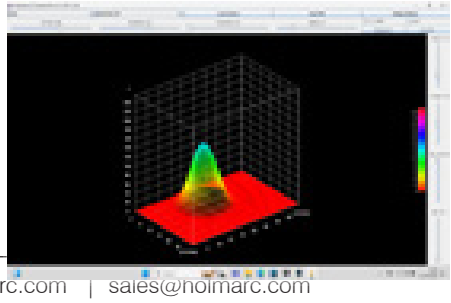
Particle size analysis
Particle tracking in 3D
Cell biology, 3D dynamic analysis of cells
Study of ice crystal habits in could chamber.
Microfluidics
Marine biology
Deformation analysis
Refractive index characterization
Ferroelectric metrology
Electro-chemistr

Software

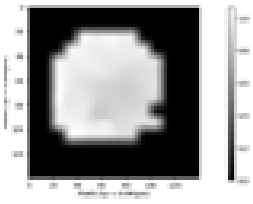
DIHM_V01 with Single shot algorithm



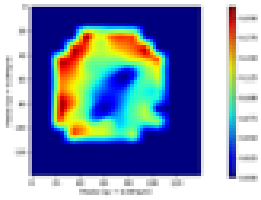




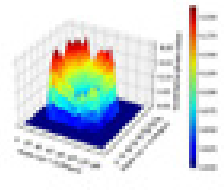
PARTICLE SAMPLES



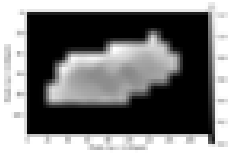
Particle 1 - Amplitude



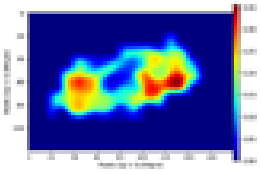
Particle 1 - Phase



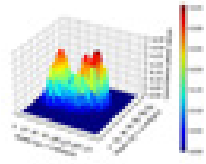
Particle 1 - 3D Phase



Particle 2 - Amplitude



Particle 2 - Phase

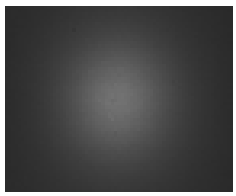


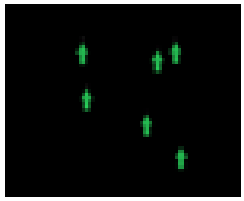
Particle 2 - 3D Phase

Model : HO-DIHM-T01

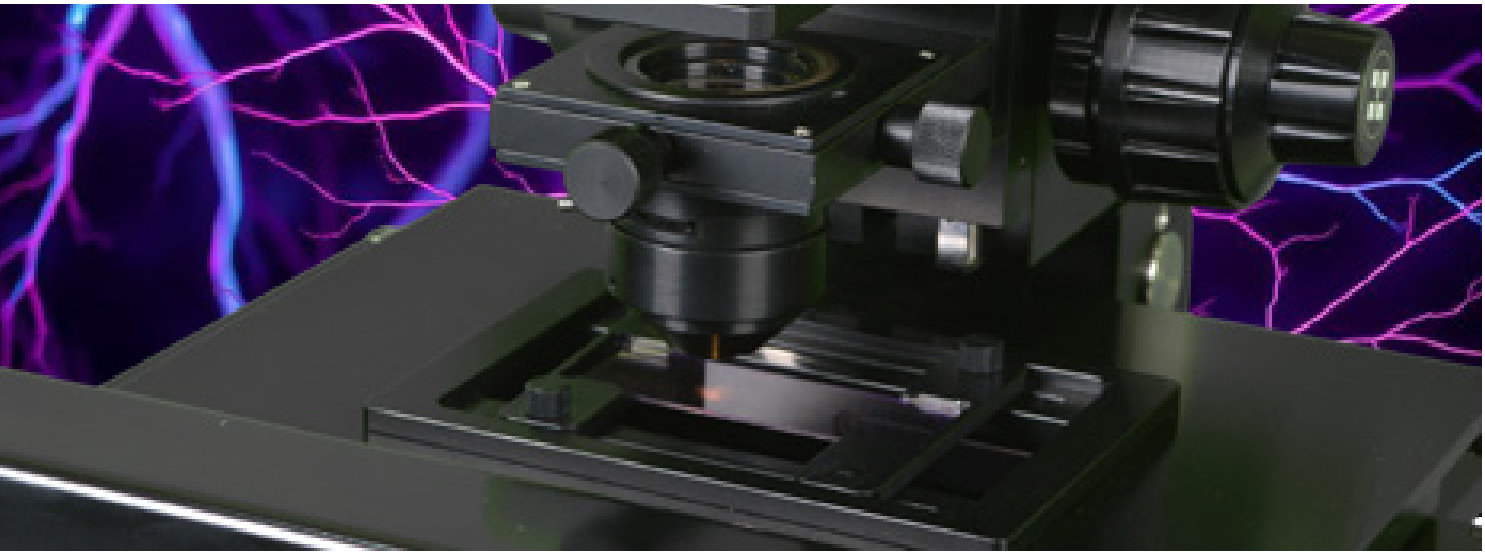


Samples

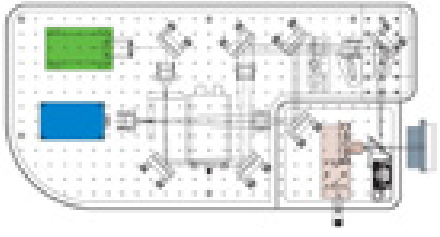




Fluorescence Microscope

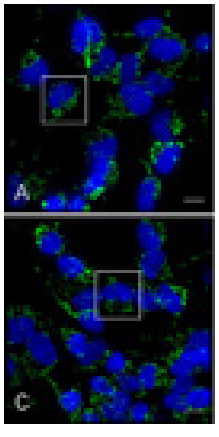


Confocal Fluorescence Correlation Spectrometer



Model : HO-SP-MFCS2C

Holmarc Confocal Flourescence Correlation Sectrometer is a microscope with fluorescence correlation spectroscopy (FCS) attachment for capturing molecular dynamics processes in cells, solutions and nano structures. This innovative product is developed with technology from Tata Institute of Fundamental Research (TIFR), Mumbai, a laboratory world-renowned for innovation in the area of FCS. The instrument is also available without the imaging microscope option for solutions study. The instrument is designed for maximum sensitivity through a careful design of the optical path and attentive selection of the optical components and light detectors. We have used two DPSS lasers in the instrument which are 532nm & 405nm with variable power output. Single laser configuration is also available.



The laser line clean up filters used in the instrument assures noise level in the laser output to bare minimum. The Optical paths are carefully designed so that the lasers can be used independently without changing any Opto-mechanical or Optics component in the path. Lenses, Mirrors etc are carefully chosen to minimize any aberration or any losses. Dichroic filters, band pass filters, emission filters etc are sourced from best suppliers in the world for matching the laser output and sample data acquisition requirements. High NA (1.20), water immersion Microscope Objective is used for microscopy. These super apochromat objectives, fully compensate for both spherical and chromatic aberrations from the UV to the near infrared region. Their sensitivity to fluorescence emission ensures the acquisition of sharp, clear images, without color shift, even in bright field and Nomarski DIC observations. We have used the Single Photon Counting APD for detection of fluorescence. It detects single photons of light over 400 nm to 1060 nm wavelength range - a range and sensitivity that far outperforms a photomultiplier tube. The fiber-coupled Single Photon Counting APD used has a peak photon detection efficiency of more than 65% at 650 nm over 180 μm diameter. The photodiode is both thermoelectrically cooled and temperature controlled, ensuring stabilized performance despite ambient temperature changes..

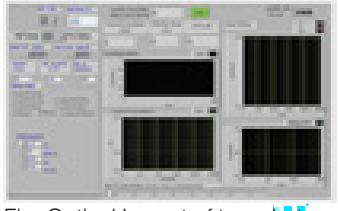
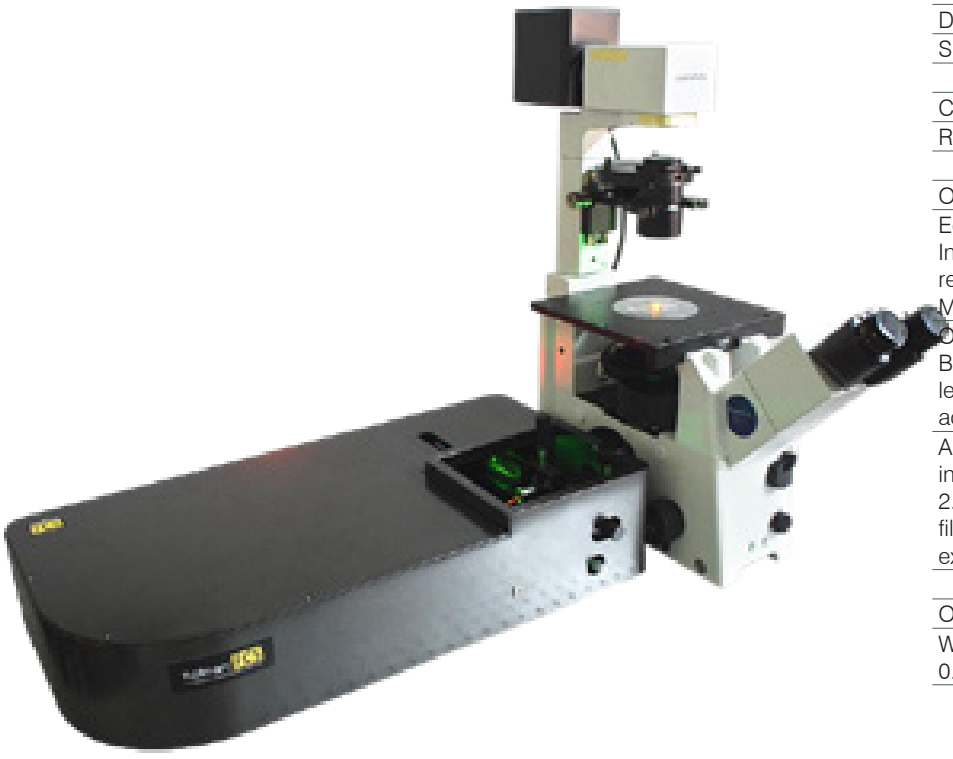


Fig. Optical Layout of two photon excitation laser scanning fluorescence correlation spectrometer

Digital Correlator card

The digital Correlator card used in the instrument requires no external power supply and can be used for both auto and cross correlation. The instrument is placed in a light proof box which ensures minimum light leakage during operation. The signal output is coupled to 25 microns Optical fiber which is fixed on a XYZ Fiber positioner. The fiber position can be finely adjusted without opening the cover. The fine tuning of the output signal can be done by observing the detector output. The instrument has two options. The system can be integrated with a commercial fluorescence microscope for microscopic specimens .It can be used with our innovative non-imaging confocal assembly for solution studies. User friendly software is supplied along with the equipment which is developed in Lab View, shows live count rate and displays the current correlation. The software has the capability to fit FCS data to multiple diffusion models, either online or offline. The software is developed by Tata Institute of Fundamental Research (TIFR), Mumbai. The system is installed on a 6 X 4 Feet Optical Tabletop which rests on pneumatic air isolated support. This ensures ground vibration isolation during operation. All the Opto - mechanical devices used in the setup are carefully chosen for stability and reliability. The instrument is one of the most sensitive ever developed, yet the price is affordable for acquisition by individual research laboratories. An FCS spectrometer with lifetime measurement option down to 100 ps (using time correlated single photon counting) is coming soon! The current instrument will be ungradable to the lifetime option.



SPECIFICATIONS

Instrument Features
Precise Manual alignment of the detection Fibe
1 or 2 colour excitation using 532 nm and 405 nm DPSS Laser with Power adjustable Option. Alternative wavelengths are available on request.
Time resolution down to 12.5 ns
Measurements
Fluorescence Correlation Spectroscopy
One channel or dual-channel data acquisition for auto or cross correlation
Online correlation display
Online data fitting with multiple models
Conventional fluorescence imaging
Light Source
532 nm and 405nm low noise laser
Max Power Output : 50 mW with Intensity Control Knob
Beam divergence : < 1.5mrad
Detector
Single Photon Counting Module
Correlator Card
Real time digital Correlator
Optics
Equipment integrated with Infinity corrected inverted research microscope : MODEL IX71
Optical Mirrors Coated with Broadband visible, MgF2. All lenses are aberration free, achromatic and coated.
A set of neutral density filters included 0.2, 0.3, 0.5, 1.0, 2.0, 3.0 OD mounted on a filter wheel for controlling the excitation power.
Objective
Water immersion 60 X / 1.2, WD 0.28 mm with correction collar

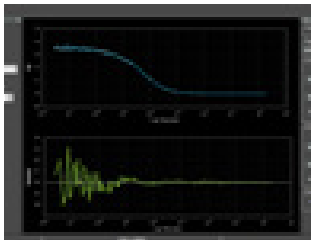
Confocal Fluorescence Cross Correlation Spectrometer



Model : HO-FCCS

Fluorescence correlation spectroscopy is nowadays a widely applied tool for studying intracellular dynamics and interactions. The cross correlation technology is much more advanced version to study the nano particle molecules. It can be considered as the direct extension of confocal fluorescence spectroscopy. Holmarc Confocal Flourescence Cross Correlation Spectrometer is a microscope with fluorescence cross correlation spectroscopy (FCCS) attachment for capturing molecular dynamics processes in cells, solutions and nano structures. This innovative product is developed with technology from Tata Institute of Fundamental Research (TIFR), Mumbai, a laboratory world-renowned for innovation in the area of FCCS. The instrument is designed for maximum sensitivity through a careful design of the optical path and attentive selection of the optical components and light detectors. We have a DPSS lasers as the light source in the instrument with wavelength 655nm of variable power output

Cross fit data of Atto 655 sample

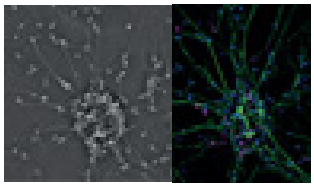


Explanation on Optical layout

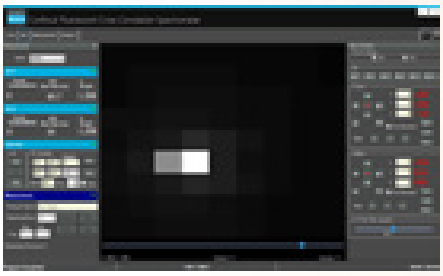
We have used 655nm 50mW extreme low noise DPSS laser with adjustable intensity. The laser line interference filter (Laser cleanup filter) is placed infront of the laser to avoid the other wavelengths if present. We need to expand the laser beam and collimate it. For beam expansion a 5X Microscope objective is used on a spatial filter mount. The expanded beam falls on the 450 mirror M1 the reflected parallel beam from M1 then falls on M2 .An achromatic triplet lens is used to make the collimated beam. The light from M2 falls on a 400mm focal length triplet at a distance of 400mm from the 5x microscope objective to get collimated output beam. The collimated beam is then made to fall on a motorized filter wheel, which consists of 5 different filters. Then we have a variable aperture to adjust the beam diameter. This collimated, diameter adjusted beam again need to be focused, The reflected beam from mirror M3 is then passed through a triplet focussing lens of 200mm focal length. This focussed beam is made to fall on a dielectric beam splitter which reflects only 655nm and transmits the other wavelengths if any. This reflected monochromatic light is then detected by the inverted microscope and the light reaches at the 60X microscope objective which passes beam of light into the sample placed above the objective. The reflected light from the fluorescent sample is then made to pass through the same dielectric beam splitter and filtered out using a fluorescent filter placed the light path. This output fluorescent light is then again made to fall on a dielectric beam splitter with a 50/50coating. Both reflected and transmitted light is then coupled to two different fibers of 25micron diameter. The position of the fiber can be controlled with the help of XYZ fiber positioners so that maximum light is coupled to the fiber. The transmitted light is known to be channel 1 and the reflected light is called channel 2. The output of both channel 1 and channel 2 is fed to two different photon detectors (2 different Avalanche photodiodes) which counts the photos emitted from the sample. These photon detectors are then coupled with two different correlation cards so that an electrical output can be obtained on your computer screen installed with FCCS software using a USB cable

Our confocal microscopes for top-class biomedical research provide imaging precision for subcellular structures and dynamic processes.

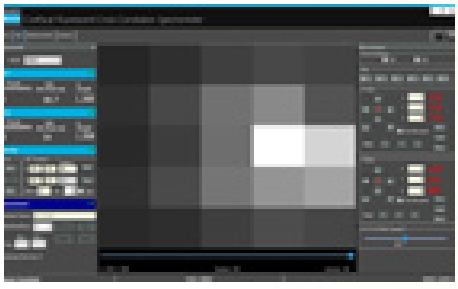




XY Scan in 500 micron interval



XY scan over 50 micron interval



Live photon count as a graphical variation

Quantitative information

Diffusion coefficients,
Hydrodynamic radii,
Average concentrations,
Kinetic chemical reaction rates,
Singlet-triplet dynamics.

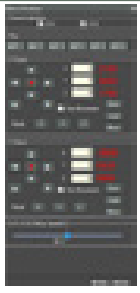


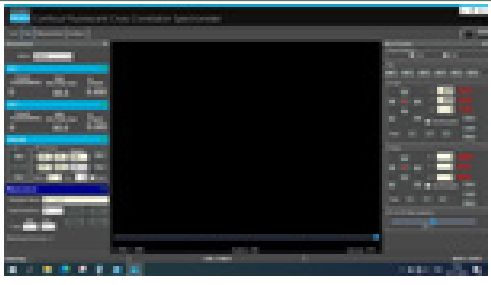
SPECIFICATIONS

1. Optical Detection Head OPTION 1	
Optical configuration	Inverted
Mechanical Design	Based on Rod Assembly
Objective Type	Infinity Corrected
Nosepiece	single
Objectives	60x confocal objective lens
	MRD07602 CFI Plan Apochromat VC 60XA WI N.A. 1.20, W.D. 0.29mm
Manufacturer	Nikon
	OR
	Olympus U plan super apochromat water immersion objective 60X/1.2, WD 0.28 mm with correction collar
Tube lense focal length	200mm
Sample stage	Manual
Travel	100x100mm
Focusing	Manual with coarse and fine adjustment
Z Resolution	1 Micron
2. LASER	
Wavelength	532nm-50mW
output power stability	<1%
cw, line width	<1nm
beam diameter	<2mm
beam divergence	1.5mrad
(tunable output power via control knob)	
3. Detector	
Excelitas	Single Photon Counting Module with FC Connector
Model	SPCM-AQRH-13FC
Wavelength range	400nm to 1060nm
Peak PDE	> 70% @ 650 nm
Active area	180 μm
Dynamic Range	> 35 Mcps
Output pulse width	10ns
Dark Count Rate	<250pcs
Dead time (count rate below 5M/c)	22ns
Connector	With FC/PC adaptor for fiber pigtails
Supply	5V included
Cooling	Thermoelectrically cooled and temperature controlled
Case operation Temperature	5˚C -70˚C
4. Correlator Card. - Auto- correlations.	
Minimum sample.	12.5 ns
Real-time channels.	288
Delay time range	12.5ns to 45minutes in multiple tau channel layout.
Input signal	standard TTL pulses, One BNC connectors
Power	12V DC powered
Dynamic-link library (DLL	
Multiple tau channel layout (sample time denoted at T, data width W):	
First 16 channels: T = 12.5ns, W = 1 bits, delay times T to 16*T;	
Second 8 channels: T = 2*12.5ns, W =2 bits, delay times 9*T to 16*T	
Third 8 channels: T = 4*12.5ns, W = 3 bits, delay times 9*T to 16*T	
Fourth 8 channels: T = 8*12.5ns, W = 4 bits, delay times 9*T to 16*T	
Sample time doubles every 8 channels and data width increment 1 bit to prevent overflow. The longest delay time is about 45minutes.Intensity limits	
Maximum intensity integrated over 480ns: 80 MHz. Clipping will happen if the input intensity exceeds the maximum.	
1. Optical Assembly / Receiving - Transmission Module	
Opto-mechanics & beam shaping optics	
Optical Filters, Filters and dichroics	

Manufacturer	Semrrock or Chroma
Optomechanical assembly for the correlation confocal measurements	
Customized optomechanical assembly - Optics include colour corrected triple-lens for the collimation, kinematic mounts and XYZ motorized fibre positioner etc.	
1. Optical Fibers	
Single core 25,50 & 100Micron VIS-NIR 1m length FC terminated Fiber Optic Patch Cord, Core Diameter 25,50 & 100Micro , Wavelength Range of 320-1600nm, Numerical Aperture NA 0.22	
Index of Refraction nd - Core : 1.458, nd - Cladding : 1.441	
Acceptance Angle	25.4°
Connector	FC

HOLMARC FCS Analysis software	
Holmarc FCCS software application can be downloaded or retrieved from the CD that received with purchase of the spectrometer.	



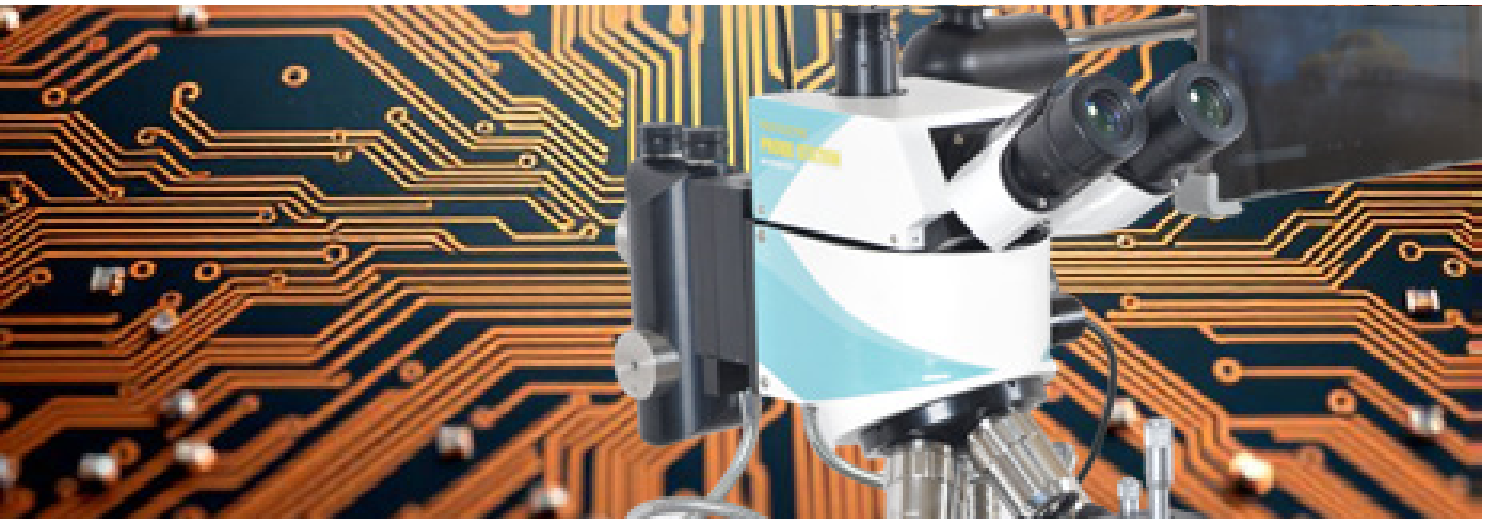


Optical system	Infinity Corrected Confocal Upright Microscope
Microscope Design	Double side Nosepiece Turret
Tube Length	200mm
Nosepiece	Revolving objective nosepiece (Nosepiece have slots for filter sliders)
Minimum Operating System / Hardware requirements:	
Processor	Pentium Dual Core or above @2GHz or above.
Operating System	Windows 7 or Higher
RAM	2GB or greater.
	USB 2.0 Host Controller required
	“CROSS” or “AUTO” cross option mode of operation will results in a cross correlation of both transmitted and reflected light and auto provides you a correlation curve of the transmitted light from the sample. click on Test, and then start to check whether sufficient light is coupled to the fiber

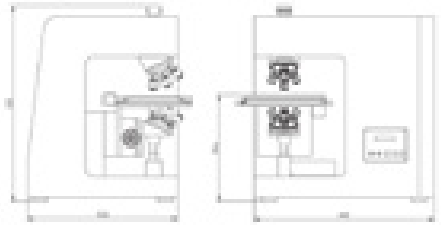
Nowadays several studies are going on biological systems, to address the smallest functional units of biological systems we need sensitive techniques. Among those techniques that allow even single molecule measurements are atomic force microscopy (AFM) or fluorescence spectroscopy. Fluorescence correlation spectroscopy (FCS) is one of the many different modes of high resolution spatial and temporal analysis of extremely low concentrated biomolecules. FCS is a correlation analysis of fluctuations of the fluorescence intensities. This method is based on the detection of single molecules excited to fluorescence in diffraction limited confocal volume elements and the time correlation of stochastic events. A sensitive detector records single photons emitted by the dye molecules. The result is an intensity trace representing random noise. Correlation functions are used to extract information about diffusion times and number of molecules in the sample. Physical models describe the source of the fluctuations and are fitted to the correlated data to quantify the information. If only one type of fluorescent dye and one detector are used, the method is called autocorrelation. To increase the flexibility of the method, two dyes and detectors can be used. This method is called cross-correlation. The measurement of translational diffusion is probably the simplest measurement which can be performed with FCS. The most frequent application of FCS consists in assaying molecular interactions (binding/debinding). The method is best suited to study the binding of a small compound (e.g. a ligand) to a bigger molecular object (e.g. the ligand’s receptor). By the use of cross-correlation protein-protein interactions (e.g. receptor dimerization) can be examined.

When we comes to fluorescence cross correlation setup we make use of either two different laser sources of two different excitation beams from the sample to analyse it. In our setup we make use of cross correlation setup with a single laser source and two excited beams to analyze the sample.

Inspection Microscope



Thermal Lens Microscope - Confocal



Model : HO-TLM-C218

Holmarc developed a 532nm laser microscope based on the thermal lens effect induced by a coaxial beam comprised of excitation and probe beams. The scheme allows the measurement of absorption factors down to 1.2 × 10−7 in a 0.35 μm3 volume by use of a heating laser power of 200 mW incident upon the sample. Results prove that a 450 nm axial resolution is possible when a water immersion objective lens with a N.A. of 1.2 is used.
Thermal lensing provides high-sensitivity measurements for thermal and spectroscopic characterization or detection and imaging of low-absorption samples. Thermal-lens microscopy combines the high sensitivity of photothermal techniques with the lateral and axial resolution of conventional microscopy. The thermal lens generated by a heating beam induces a change in divergence and beam-waist position of a probe beam that are detected with the help of an aperture placed in the path of the beam in front of a photodetector. With this detection method the signal is maximum when the thermal lens is located at a distance of one heating beam's Rayleigh range from the probe beam's waist; it is null when the thermal lens lies in the plane of the probe beam's waist.

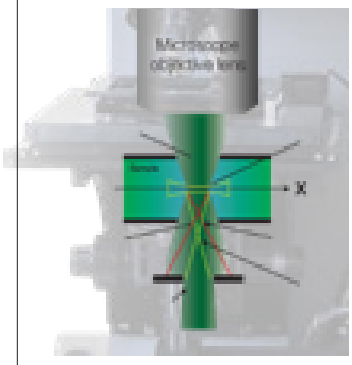
Quality Control Analysis (QC)



What it is?

Thermooptical methods make it possible to obtain information on the parameters of a material related to heat propagation (thermal conductivity, heat capacity, refractive index, density, viscosity, etc.) directly from the development of the signal in time after the onset of irradiation.

Laser



200mW 532nm low noise DPSS laser is used as the excitation (pump laser) and 5mW low noise 650nm diode laser used as probe laser. Before entering in to the objective both lasers are pass through a spatial filter and a beam expander for maximum laser spatial and coherence correction.

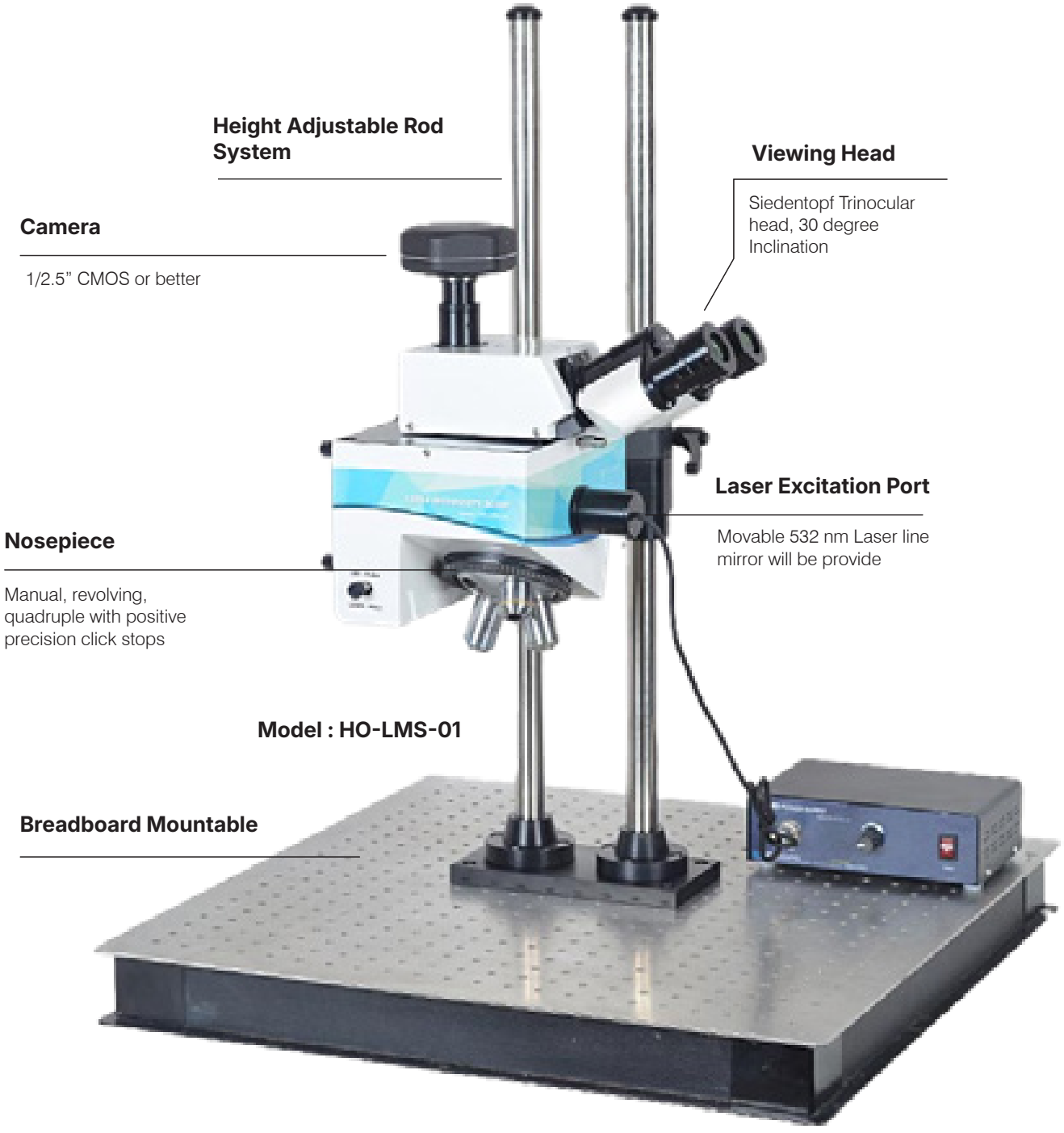


Specifications

Optical system	Infinity Corrected Confocal Upright Microscope
Microscope Design	Double side Nosepiece Turret
Tube Length	200mm
Nosepiece	Revolving objective nosepiece (Nosepiece have slots for filter sliders)
Objectives	Plan Apo Infinity-Corrected Long WD Objective
Focus control	Software controllable
Substrate Scanning	Motorized MTS series precision X Y Scanning stage
Travel X Axis	100 mm
Travel Y Axis	100 mm
Sample Positioning	Equipped with Tilting & Aligning Stage
Resolution	1Micron
Z axis travel	20 mm
Resolution	1 Micron
Excitation laser source	532 nm DPSS
Laser Power	Low noise output 200 mW
Spatial filtering unit	Objective lens based
Spot size	1 - 5 Micron
Intensity control	Continuously Variable through PC
Optical power feedback unit	Yes
Focus control	Software controllable
Light level control	4096 levels
	Probe laser source wavelength 650 nm with motorized Relative Focal Plane Adjustment
Motorized Polarizer rotator	Glan Thompson
	Laser Beam Precision Intensity Control Accessory
Light chopper	Frequency 10 - 5000Hz
Detector	Silicon Photo Diode
Interface	PC based
Alignment camera	5MP 1/2.5" CMOS camera
Active Pixels	2592H × 1944V
Pixel Size	2.2 um × 2.2 um
Field of view (mm)	2.5 x 1.9 mm
Optical Imaging resolution	1 μm (horizontal / lateral imaging)
Software	Image analysis software IMAGE Pro Ver. 2.25
Image processing	Background compensation, contrast enhancement & image filtering, particle size determination etc.

Laser Microscope

Laser Microdissection, also known as LMD or LCM (Laser Capture Microdissection), is a contact- and contamination-free method for isolating specific single cells or entire areas of tissue from a wide variety of tissue sample



Holmarc's Laser microscope, Model No: HO-LMS-02 is one of the best solutions for creating high resolution images in various scientific applications. This specific microscope uses bright field imaging with high-brightness LED illuminations and is constructed with an infinity corrected optical system. It's Siedentopf Trinocular viewing head with 30 degree Inclination and 48-75mm IP adjustment makes the user to image the samples more precisely.

Observation

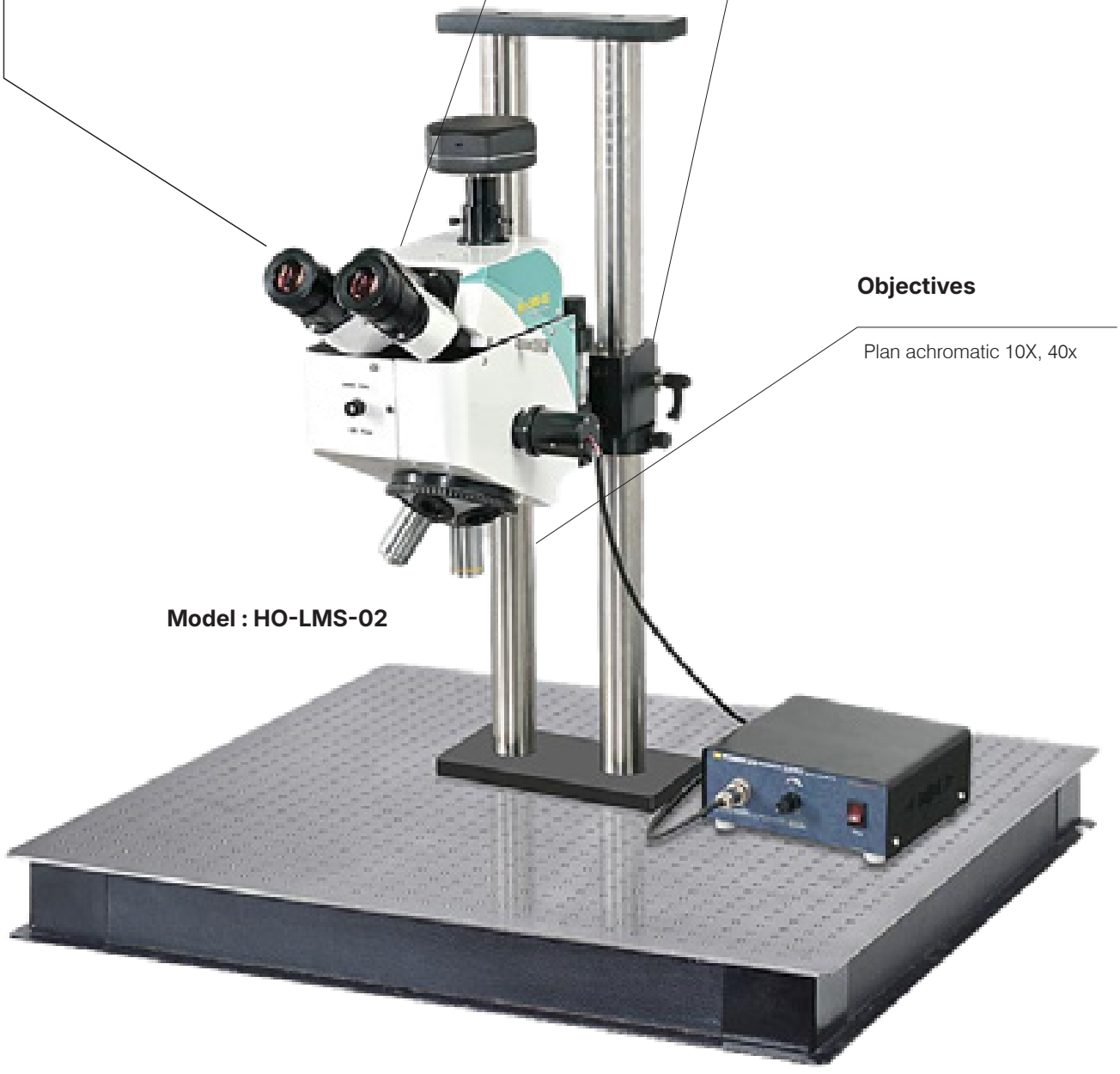
Brightfield

Height adjustable dual rod system

12 cm - 25 cm

Objectives

Plan achromatic 10X, 40x



Model : HO-LMS-02

Specifications

Model	HO-LMS-01	
. Laser Microscope	The microscope will be placed over a height adjus able dual rod system (manually operable)	
	Height adjustable range (coarse)	10" - 15"
	Fine adjustable range	+/- 25 mm
	Centre distance from the dual rod	7.5 "
	Breadboard mountable	
2. Viewing Head	a. Siedentopf Trinocular head, 30 degree Inclination, 48 - 75mm IP adjustment	
	b. Eyepiece = 10X Wide field eyepiece, FN = 20 mm, dioptre adjustable	
	c. FOV (eyepiece) with 10X objective = 2mm diameter	
3. Nosepiece	a. Manual, revolving, quadruple with positive precision click stops	
	b. RMS objective threads	
	c. Four port for adding objective lens	
	d. Objectives	Not in the scope of supply
	e. Focusing	Not in the scope of supply
4. Sample illumination	a. Two independent port for sample illumination at 180 degree to each other will be provided	
	b. One port will allow Laser based illumination using laser line mirror	
	c. Other port will allow High bright white LED with Intensity adjustable facility	
	Optical system - Infinity corrected	
	Observation Method - bright field	
5. Laser excitation port	a. Laser is not in the scope of supply	
	b. Movable 532 nm Laser line mirror will be provide	
	c. Can be moved away when laser is not using	
	d. A protective screen will be provided above the mirror to protect the camera from laser	
	.e Provision for replacing the mirror	
	f. The mirror and beam splitter (for LED) will be mounted on a moveable mechanism such a way that by adjusting a lever, one can switch between the laser mirror and the beam splitter	
	g. Only one illumination, either laser or LED, is allowed at a time	
6. Laser Mirror	a. 25.4 mm / 1" dia and 6 mm / 0.24" width	
	b. Reflectivity >99 % @532nm	
	c. Damage threshold = >5J/cm2	
Camera Specifications	a. Optical format	1/2.5" CMOS or better
	b. Active imager size	5.7 mm x 4.28 mm or better
	c. Active pixels	Min. 5 MP
	d. Pixel size	2.2 x 2.2 um or smaller
	e. Shutter type	ERS
	f. Frame rate	26.7 fps or better
	g. Spectral response	400 - 600 nm or better
	h. Exposure time	between 0.072 ms - 3000 ms
	i. Image format	RAW, JPG or PNG
	j. Operating temperature	5°C to 45°C or better
	k. Interface	USB2.0 or USB 3.0
	l. Camera Lens mount	C-mount
	m. Image grabbing software for storing in viewing in Window 10 compatible PC	

HO-LMS-02

Optical system		Infinity corrected
Observation Method		Bright field
Illumination		Co-axial top illumination
Illumination system		High bright white LED, Intensity adjustable
Additional port Laser excitation		Additional port Laser excitation
Nosepiece		Manual, Revolving, Quadruple with positive precision click stops, RMS objective threads.
Viewing head		Siedentopf Trinocular head, 30 degree Inclination, 48-75mm IP adjustment
Eyepiece		10X Wide field eyepiece, FN = 20mm, dioptre adjustable
Focusing		Manual Z stage
Microscope Objectives	1. Plan achromatic 10X	NA 0.35, Working distance 2.37 mm, FOV eyepiece 2 mm, FOV camera 0.57 mm x 0.428 mm, Resolution ~ 1 microns
	2. Plan achromatic 40X	NA 0.85, Working distance 0.42 mm, FOV eyepiece FOV eyepiece, FOV camera 0.57 mm x 0.428 mm, Resolution Resolut
Height adjustable dual rod system	Height adjustable range (coarse)	12 cm - 25 cm
	Fine adjustable range	+/- 25 mm
	Centre distance from the dual rod	20 cm
	Breadboard mountable	XYZ Sample stage is not in the scope of supply [# Dimensions = 12 x 12 x 12 cm, Travel = 15 x 15 x 15 mm]
Laser excitation port	Laser is not in the scope of supply	
	(laser spec 532nm 250mW, Fiber connection= FC)	
	Movable dichroic mirror with emission filter.	
	Dichroic mirror with emission filter can be moved away for reflected Brightfield observation.	
Dichroic filter	Reflectivity	> 98 %
	Reflection wavelength	460 - 570 nm
	Thickness	1.05 +/- 0.1 mm
	Transmission	> 90 %
	Transmission wavelength	607 - 900 nm
Emission long pass filter	Rejection wavelength	200 - 588 nm
	Transmission wavelengt	610 - 1650 nm
	Diameter	25 mm
	Thickness	3 mm

Camera Specifications	Optical format	1/2.5" CMOS or better
	Active imager size	5.70 mm x 4.28 mm
	Active pixels	2592 x 1944 (5Mp)
	Pixel size	2.2 x 2.2 um
	Shutter type	Electronic rolling shutter(ERS)
	Frame rate	Full resolution - 7 fps, 640 * 480 (BIN) - 26.7 fps
	Spectral response	380 - 900 nm (without filter)
	Exposure time	0.072 ms - 3000 ms
	Image format	RAW, BMP, JPG, PNG
	Operating temperature	-30°C to +70°C
	Sensitivity	1.76 V / lux - sec (550 nm)
	Power consumption	381 mW at 15 fps full resolution
	Interface	USB 2.0 Image grabbing software
	Lens mount	C - mount

Trinocular Inspection Microscope with Boom Stand

Model No: HOCM-MV202

Holmarc's model HOCM-MV202 inspection microscope is equipped with a Zoom stereo microscope mounted on a single-arm boom stand. It comes with a Trinocular head with wide field 10X eyepieces and a variable zoom system of 1X-5X. The total magnification will be 10X – 50X with a working distances of 160mm – 70mm. A 5MP CMOS camera with software is also provided the system for digital inspection and measurement. A high bright ring LED is provided as the light source. The 30 degree inclined eyepiece with dioptre adjustable option ensure the comfort observation for all the users including eyeglass wearers. The single-arm boom stand allows to turn the microscope head around two different axes, allowing the user to point the microscope head in various directions. This microscope offers high resolution, wide field of view, large magnifying zoom range and long working distance. It is an ideal inspection instrument for researchers in various industries.

Specifications

Observation tube	Trinocular, 30^{O} inclined
Observation	Brightfield
Zoom ratio	1X – 5X
Total Magnification	10X – 50X
Working distance	160mm – 70mm
Eyepiece	10X, dioptre adjustable
Illumination	Ring LED
Camera	
Optical format	1/2.5" CMOS
Active imager size	5.70mm x 4.28mm
Active pixels	2592 x 1944 (5MP)
Pixel size	2.2 x 2.2 um
Shutter type	Electronic rolling shutter(ERS)
Frame rate	Full resolution – 7 fps, 640*480(BIN) – 26.7 fps
Spectral response	380-650nm
Exposure time	0.072ms – 3000ms
Image format	RAW, BMP, JPG, PNG
Operating temperature	30oC to +70oC
Sensitivity	1.76V/lux-sec(550nm)
Power consumption	381mW at 15 fps full resolution
Interface	USB2.0
Lens mount	C-mount
Software	Micro_View Pro
Software features	Image grabbing, online and offline measurements, Reports

Software

Microview Pro

M agnification

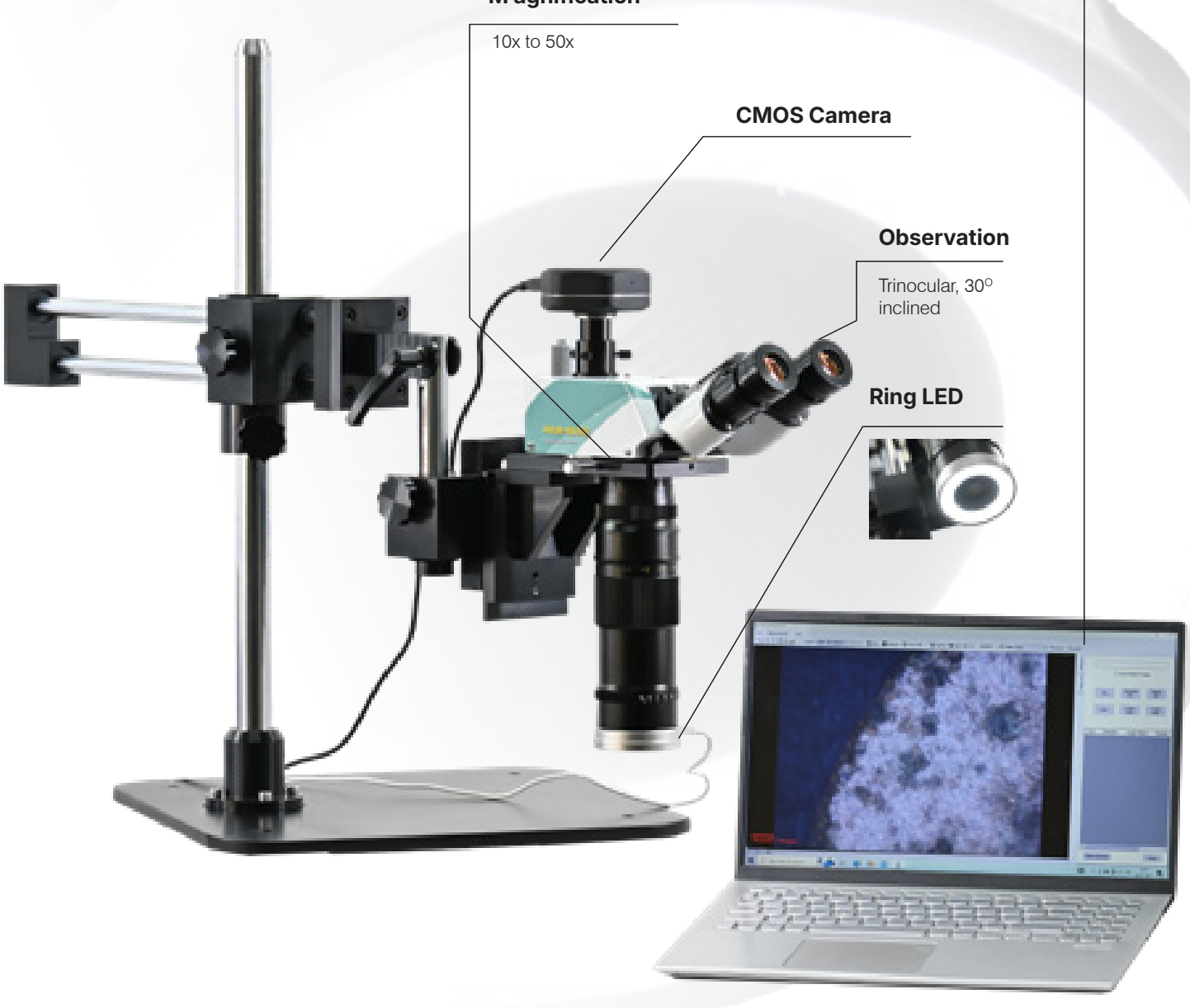
10x to 50x

CMOS Camera

Observation

Trinocular, 30° inclined

Ring LED



Laser Ablation Inspection Microscope

Model : HO-LAIM-01

The Laser Ablation Inspection Microscope Model No: HO-LAIM-01 by Holmarc is a cutting-edge tool designed for precision inspection and analysis. It utilizes laser ablation technology to remove material from the surface of a sample, allowing for detailed examination of underlying structures. This microscope is particularly useful in fields such as microelectronics, materials science, and biomedical research, where precise and non-destructive analysis is crucial. The high-resolution imaging capabilities and advanced laser ablation system make it ideal for applications such as defect analysis, quality control, and surface characterization. With its versatile functionality and precise control, the HO-LAIM-01 is an invaluable asset for researchers and professionals seeking accurate and detailed inspection results.

Specifications

MICROSCOPE UNIT	Objective Design	5X Super Long Working Distance Plan apochromatic
	Type	MICRO VIEW SLWD Series - Bright Field Inspection
	Model	HO-SLWD-5X1
	Focal Length	40 mm
	Flatfield Image Circle	42 mm
	Working Distance	40 mm
	Numerical Aperture	0.18
	Resolving Power	1.6 um
Tube lenses	Lens type	Triplet Colour Corrected
	Focal length	200 mm
	Imaging Area	1140x855 Micron (Based on 5X Objective Lens & 1/ 2.5” sensor)
Illumination Unit	Type	Angled, Flexible Arm illumination
	Illumination	LED based - Dual
	Colour	Pure White
	Luminosity control	Continuously variable
Positioning Stage	Design	XYZ Translation stage(TS-series) with digital micromete
	Travel	25 mm
	Mounting design	Optical breadboard compatible design
	Microscope Head Flip Mechanism	Yes
	Stopper unit	Magnetic Latch adjustable mechanism
Camera	Sensor	CMOS
	Sensor Size	1 / 2.5”
	Interface	USB 2.0
	Pixel Size	2.2 x 2.2 micron
	Maximum resolution	2592 x 1944, full resolution mode
	Frame rate at resolution	7 fps at 2592 x 1944 (full resolution), 37 fps at 1024 x 768 & 78 fps at 640 x 480
	Dynamic Range	70.1 dB
	Software	HOLMARC Image Analyzer PRO

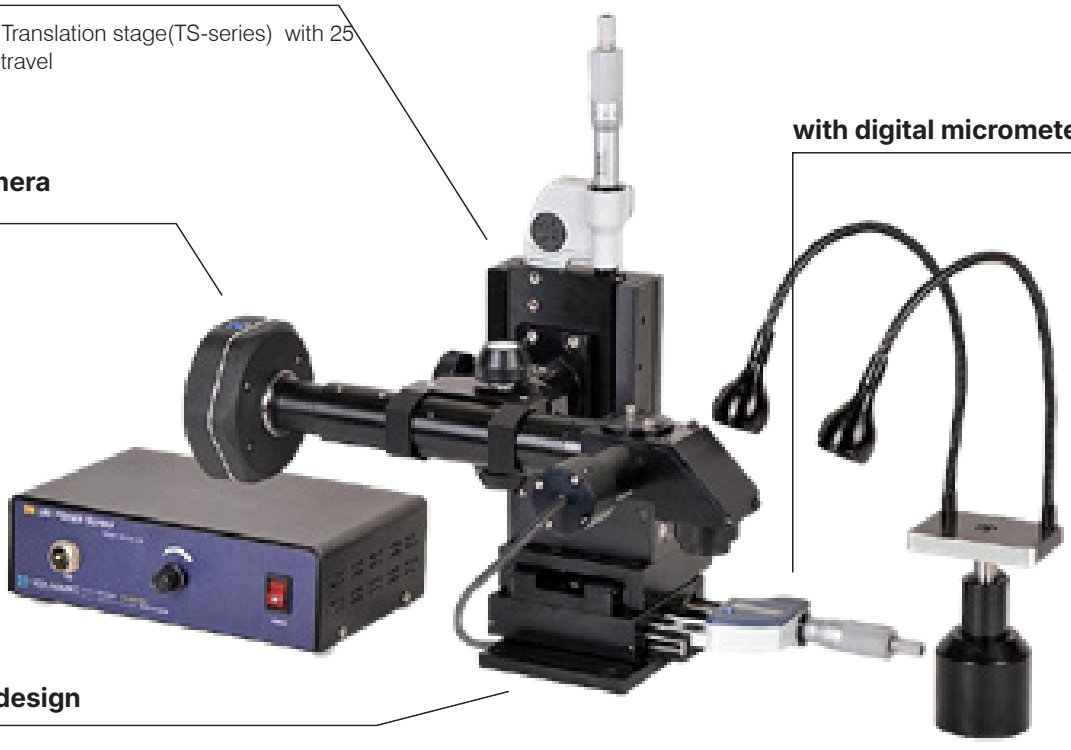


Positioning Stage

XYZ Translation stage(TS-series) with 25 mm travel

with digital micrometee

CMOS Camera



Breadboard compatible design

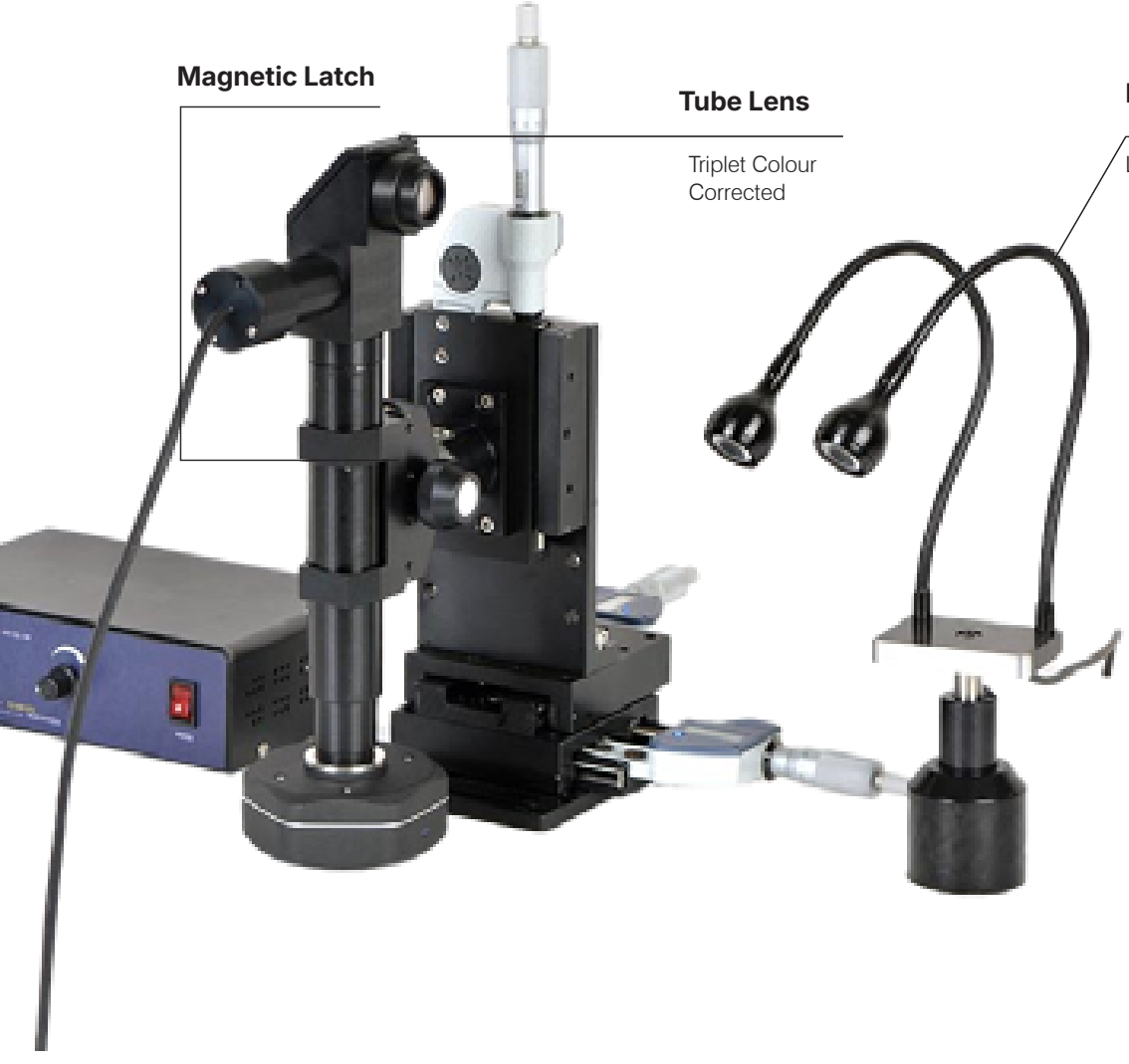
Magnetic Latch

Tube Lens

Triplet Colour Corrected

Illumination Unit

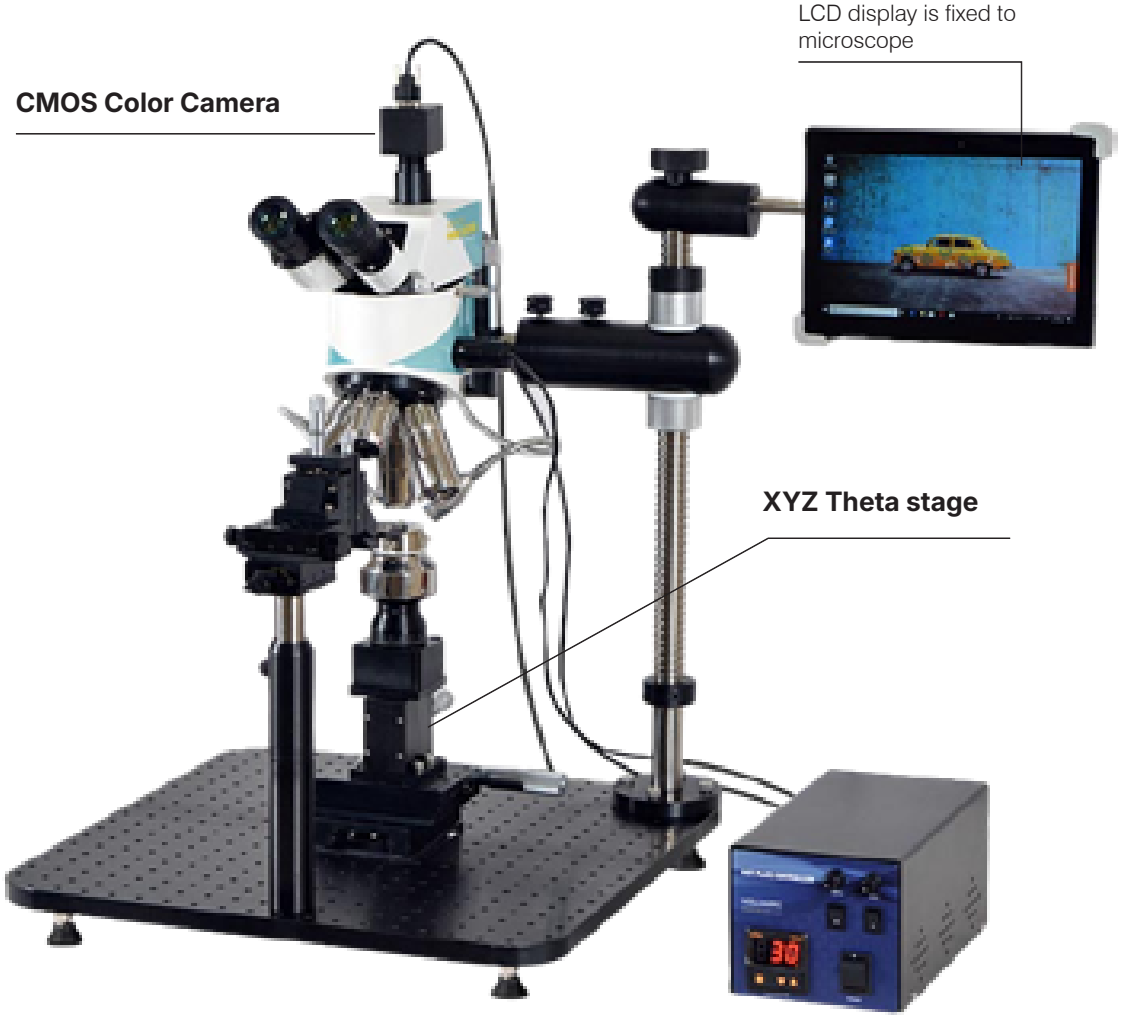
LED based - Dual



Work Station with Inspection Microscope & LCD display

Model : HO-WSPSM-T01CL

The Work Station with Inspection Microscope & LCD display Model No: HO-WSPSM-T01CL by Holmarc is a versatile tool designed for precision inspection and analysis in various fields. It features an infinity-corrected optical system with bright field observation, high-brightness white LED illumination, and a Siedentopf trinocular head for comfortable viewing. The workstation includes a high-resolution camera and a 10-inch HD LCD display, making it ideal for detailed inspections and documentation. Its applications range from quality control in manufacturing to research in laboratories, where accurate and clear imaging is crucia



Inspection microscope with Camera and LCD (1 No.)	Optical system	Infinity corrected (200 mm tube lens)
	Observation Method	Bright field
	Illumination	Reflected (Co-axial and Angled)
	Illumination system	High bright white LEDs
	Nosepiece	Revolving, quadruple with positive precision click stops
	Viewing head	Siedentopf Trinocular head, 30-degree inclination, 48-75 mm IP adjustment
	Eyepiece	Wide field eyepiece, 10X, FN = 20 mm, dioptre adjustable
	Focusing	Manual
Objectives		1. Plano apo 5X, NA = 0.18, WD = 40 mm (FOV eyepiece = 4mm, FOVCCD = 1.31 x 0.984 mm)
		2. Plano apo 10X, NA = 0.4, WD = 19 mm (FOV eyepiece = 2mm, FOVCCD = 0.655 x 0.492 mm)
		3. Plano apo 20X, NA = 0.35, WD = 17 mm (FOV eyepiece = 1mm, FOVCCD = 0.327 x 0.246 mm
		4. Plano apo 40X, NA = 0.65, WD = 7 mm (FOV eyepiece = 0.5mm, FOVCCD = 0.164 x 0.123 mm)
LCD display Specifications (windows tablet)	Display	10" HD, Full Capacitive Multi touch
	CPU	Intel Atom Quad core upto 1.83 GHz
	Memory	1 GB DDR3 RAM
	Storage	6GB built-in storage, Micro SD support up to 64GB
	OS	Microsoft windows 8.1
	Connectivity	Wi-Fi 802.11, mini-HDMIport, Micro USB port, Bluetooth 4.0, USB OTG
		LCD is fixed directly to the microscope
Sample holder with micromanipulator (1 No.)	Axis	4 (XYZ and Tilt)
	X travel	25 mm
	Y travel	25 mm
	Z travel	10 mm
	Tilt	+/- 3 degree
	Sample holding mechanism	
XYZ Theta stage with sample-substrate heater and controller (1 No.)	XYZ Travel	25 mm
	Micrometer resolution	10 μm
	Construction	Aluminum alloy B51S
	Rotation range	360 degree continuous, positioning accuracy : 0.1degree
		Heater (size 1-inch dia or 1 inch x 1 inch) on XYZ theta stage to heat the sample-substrate up to about 150 - 200 degC
Camera	Sensor size	1/2.5" CMOS Color
	Active imager size	6.55 mm (H) X 4.92 mm(V)
	Maximum resolution	2048 x 1536 (3 Mp) 10 FPS @ full resolution
	Pixel size	3.2 x 3.2 um
	Scan type	Progressive scan
	Shutter type	Electronic rolling shutter
	Exposure time	0.047 ms - 3000 ms
	Data format	8bit RAW, 24bit BMP
	Sensitivity	> 1.0 V / Lux - sec (550 nm)
	Spectral range	380 - 650 nm
	SNR	43 dB, Wide dynamic range 61 dB
	Definition	> 850 Lines
	Exposure mod	Auto / Manual / Area
	White balance	Manual / One-time / Area / Auto
	Image format	RAW / BMP / JPG / PNG

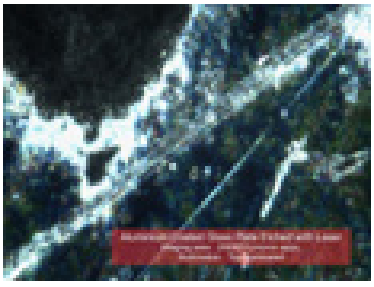
Digital Inspection Microscope

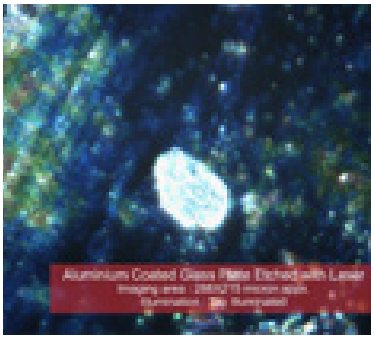
Model : DIM213D Series

Holmarc introduces a new and innovative product for digital inspection that offers automated optical inspection, imaging and documentation. Digital inspection microscope HO-DIM213D provide you with a broader range of functionality, flexibility and portability, expanding your capabilities beyond the traditional optical microscope. Our digital inspection product line features high quality digital imaging & video inspection stations and microscopy illumination products. UV to IR, we cover the entire spectrum.

Holmarc Digital Inspection System utilize the finest quality optical components for crisp, accurate and colour correct specimen viewing. Combine these with one of our fine quality CCD or CMOS cameras to build a product documentation station. It is ideal for inspection of a wide range of objects such as synthetic and natural fiber, semiconductor, integrated circuits, solder joints and facilitates various processes such as surface analysis, quality control, defect analysis, metrology, biomedical imaging etc.

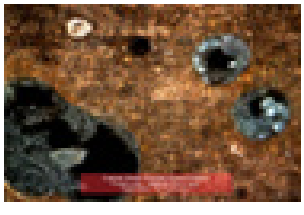
A wide range of adapters & auxiliary lenses, cameras, lighting options, video capture cards and stands are available to provide a custom solution.

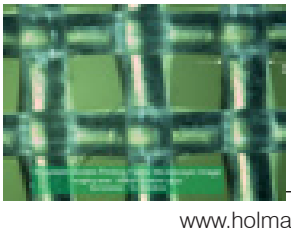


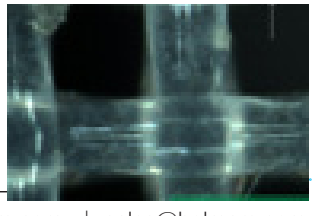












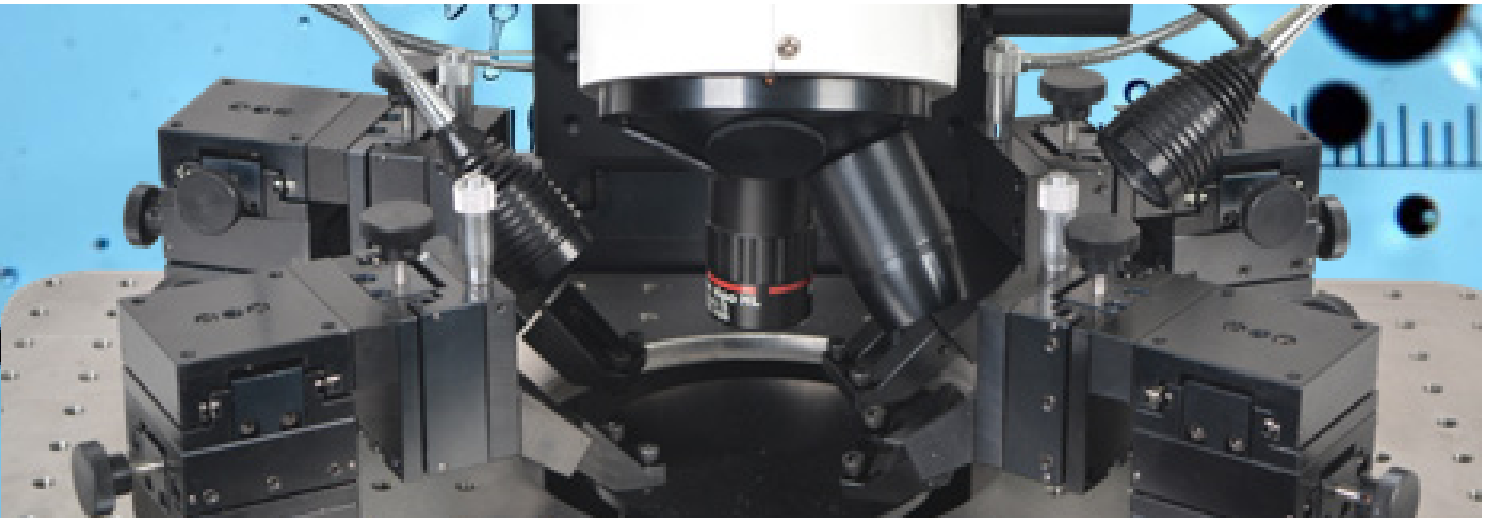
SPECIFICATIONS

Objective	
Type	Infinity Corrected Long WD
Magnification	20X
Numerical Aperture NA	0.42
Working Distance	20 mm
Focal Length FL	10 mm
Resolving Power	0.7 μm
Depth of Focus	1.6 μm
Angled Illumination Unit	
Illumination	LED based
Type	Array
Colour	Pure White
Luminosity Control	Continuously variable
Housing Material	Aluminium
Back Illumination Unit	
Condenser Lens Type	Achromatic Corrected
Numerical Aperture	0.55 max. (variable)
Working Distance	15 mm
Illumination	LED Based
Power	3 W
Colour	Pure White
Luminosity Control	Continuously variable
Polarizer	Linear polarizing film
Housing Material	Aluminium black anodized
Tube Lenses	
Lens Type	Achromatic Corrected
Focal Lengths	200 mm
Imaging Area	288 X 215 micron with 1/ 2.5” sensor, 320 x 240 micron with 1/ 2” sensor
Optional	
150 mm FL Tube lense	
Imaging Area	384 X 286 micron with 1/ 2.5” sensor, 426 x 320 micron with 1/2” sensor
250 mm FL Tube lense	
Imaging Area	230 X 171 micron with 1/ 2.5” sensor, 256 x 192 micron with 1/ 2” sensor
300 mm FL Tube lense	
Imaging Area	192 X 143 micron with 1/ 2.5” sensor, 213 x 160 micron with 1/ 2” sensor

CAMERA SPECIFICATIONS

Sensor			CMOS
Sensor Size			1 / 2.5”
Interface			USB 2.0
Pixel Size			2.2 x 2.2 micron
Maximum resolution			2592 x 1944, full resolution mode
Frame rate at resolution	Frame Rate at Resolution	:	7 fps at 2592 x 1944, full resolution 37 fps at 1024 x 768 & 78 fps at 640 x 480
Output bits per pixel			Selectable, 8 bit, 10 bit or 12 bit
Dynamic Range			70.1 dB

Probe Station Microscope

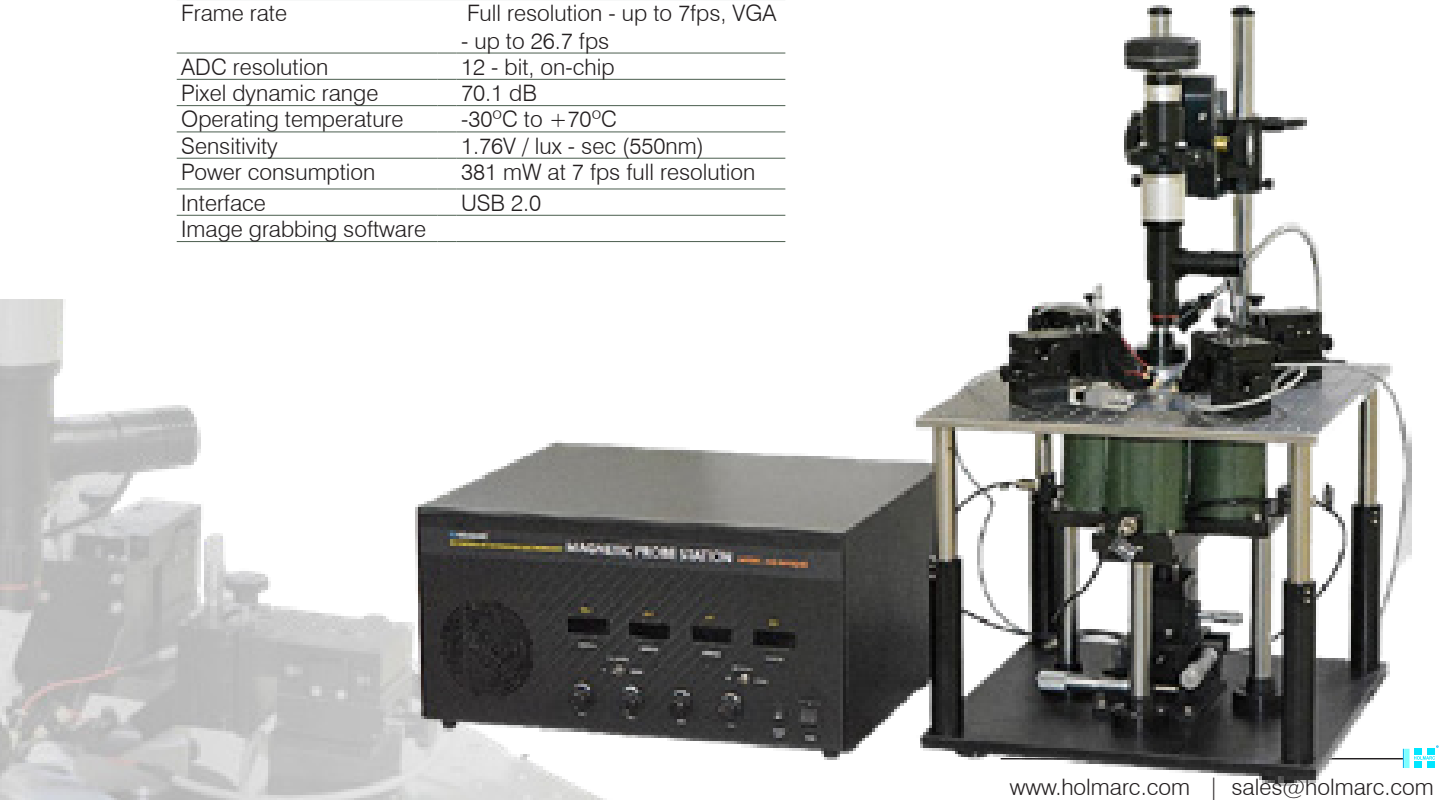


Quadrupole Magnetic Probe Station

Model : HO-QMPS-2000S

CAMERA SPECIFICATIONS

Optical format	1/2.5" CMOS
Active imager size	5.70 mm x 4.28 mm, 7.13 mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Electronic rolling shutter (ERS)
Frame rate	Full resolution - up to 7fps, VGA - up to 26.7 fps
ADC resolution	12 - bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Sensitivity	1.76V / lux - sec (550nm)
Power consumption	381 mW at 7 fps full resolution
Interface	USB 2.0
Image grabbing software	



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	SPECIFICATIONS	
Model No	HO-MPSM-T01-4MC	
Probe station System	Manual micro manipulator	
		4 Nos.
	Axes	4 (XYZ and Tilt)
	X travel	25 mm
	Y travel	25 mm
	Z travel	10 mm
	Tilt	+/- 3 degree
	Probe tip holder with BNC output	
	45-degree non-metal probe holder	
	90-degree non-metal probe holder	
	Magnetic base	
Magnetic SS platen, Supporting stands, Base plate, Z focusing stage and Boom stand for microscope : 1 set	Platen	Magnetic SS
	Platen supporting stand	Height adjustable
	Base plate	Black anodized aluminium
	XYZ Manual holder with Vacuum chuck : 1 set	
Digital probe station microscope : 1 set	Optical system	Infinity corrected
	Observation Method	Bright field
	Illumination	Reflected (Co-axial and Angled)
	Illumination system	High bright white LEDs
	Nosepiece	Revolving, Quadruple with Positive precision click stops
	Focusing	Manual
Electromagnet Unit	Design	Quadrupole
	Pole diameter	30 mm
	Pole Face	15 mm
	Air gap	15 mm
	Magnetic field	3500 Gs
	Electromagnet with PC controlled bipolar dual power supply	
	Power supply design	Quad system constant current power supply
	Operation	Manual & PC Controlled programmable operation
	Pole piece Surface Treatments	Chrome Plating
	Software	Magnet LAB Field Scan
Microscope Objective	Long Working Distance Plan Apochromatic	5X Magnification, 0.14NA, 40mm Working distance, 4 mm FOV eyepiece, 1.14 mm x 0.856 mm FOV camera
	LWD Plan Apo 10X microscope objective	NA 0.30, Working distance 31 mm, FOV eyepiece 2 mm, FOV camera 0.57 mm x 0.428 mm
	LWD Plan Apo 20X microscope objective	0.35N.A, 29 mm Working distance, 2 mm FOV eyepiece, 0.285 mm x 0.214 mm FOV camera
	LWD Plan Apo 50X microscope objective	NA 0.50, Working distance 17 mm, FOV eyepiece 0.4 mm, FOV camera 0.114 mm x 0.0856 mm
4. Probe tips	Tip diameter	50 um
	Material	Tungsten
5. Gold plated POGO tips with holder	Tip diameter	~ 1 mm
	6. Hot chuck	1 No.
	Chuck diameter	100 mm
	Temperature range	RT - 200^{o} C
	Temperature accuracy	+/- 10^{o} C
	Thermal sensor	
	Temperature control software	

HV-IV Probe System

Model : HO-000

Probe station digital microscope with Post mounting system	
Optical system	Infinity corrected
Observation Method	Bright field (digital)
Illumination	Reflected (Co-axial and Angled - 2 Nos)
Illumination system	High bright white LEDs
Intensity adjustable Nosepiece	Revolving
Quadruple with positive precision click stops Focusing	Manual, rack and pinion
Microscope Objective	1. Long working distance Plan Apo 5X NA = 0.14, Working distance = 40 mm, Field of View = 1.14mm x 0.856 mm
	2. Long working distance Plan Apo 10X NA = 0.3, Working distance = 31 mm Field of View = 0.57mm x 0.428 mm
Effective magnification at sensor	10X (with 10X objective) Effective magnification at 14"
Laptop / PC display	498 X (with 10x objective) (Depends on the size of the PC/Laptop display)

Enclosure for air tight chamber (dry air input provision)

An aluminium enclosure with hinges will be provided
Finish : Black anodised





Measurement Jig

Material : Brass
Vacuum provision for sample holding
Measurement jig will be placed on Teflon base plate
Teflon stops , HV Connectors



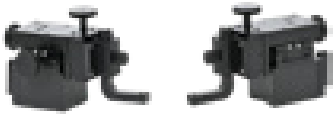


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Manual Micromanipulator (4 Nos.)

Axes	:	4 (XYZ and tilt)
X travel	:	25 mm
Y travel	:	25 mm
Z travel	:	10 mm
Tilt	:	+/-3 degree

Magnetic base, Probe connectorwith BNC connector, Probe connector holder (Delrin), Provision for HV – IV test



Probe Tip 7 MIC

Tungsten : 25 TIPS (A Pack of 25)
(Formfactor make, Model 155-202)

Material	:	Tungsten
Tip radius	:	7 um
Tip angle	:	6 degree
Length	:	32 mm
Shaft diameter	:	0.5 mm



Base plate with levelling foot

Material	:	Magnetic SS, M6 tapped holes



Temperature sensor with digital display Model PT100

Sensor range	:	0^{o}C to 100^{o}C
Sensor resolution	:	0.5^{o}C

Needle

Tungsten, 2.4u, BOX of 25
(Formfactor make, Model PTT-24-25)

Humidity sensor with digital display

Resolution	:	1 %
Sensor range	:	5% - 95%

CAMERA SPECIFICATIONS

Optical format	1/2.5" CMOS
Active imager size	5.70 mm x 4.28 mm, 7.13 mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Electronic rolling shutter (ERS)
Frame rate	Full resolution - up to 8fps, VGA - up to 70 fps
ADC resolution	12- bit, on-chip Pixel
Pixel dynamic range	70.1 dB
Operating temperature	-30^{o}C to $+70^{o}$C
Power consumption	381 mW at 15 fps full resolution
Interface	USB 2.0
software	Image grabbing



Piezoelectric Probe Station

Model : HO-PZPSM-T01C

Piezoelectric probe station will be used for measurement of piezoelectric signal of vibration energy harvesting device structures. The piezoelectric probe station comprises of (i) piezoelectric probe station main body frame, (ii) chucks, (iii) piezoelectric attenuator holder with micromanipulator, (iv) trinocular microscope, (v) micromanipulators with probe tips, (vi) sample holder and other essential accessories mounted on the main body frame.

Piezoelectric attenuator holder with micromanipulator (1 No.)

A micromanipulator with a holder can hold a attenuator of 500 gm weight Micromanipulator have XYZ travel of 10 × 10 × 10 mm with resolution 10 um. addition, micromanipulator should have provision for screw tightened mechanical fixing on the platen. A rigid insulating rod made of insulating material (Peek) is provided to integrate with attenuator through M6 tapped hole.

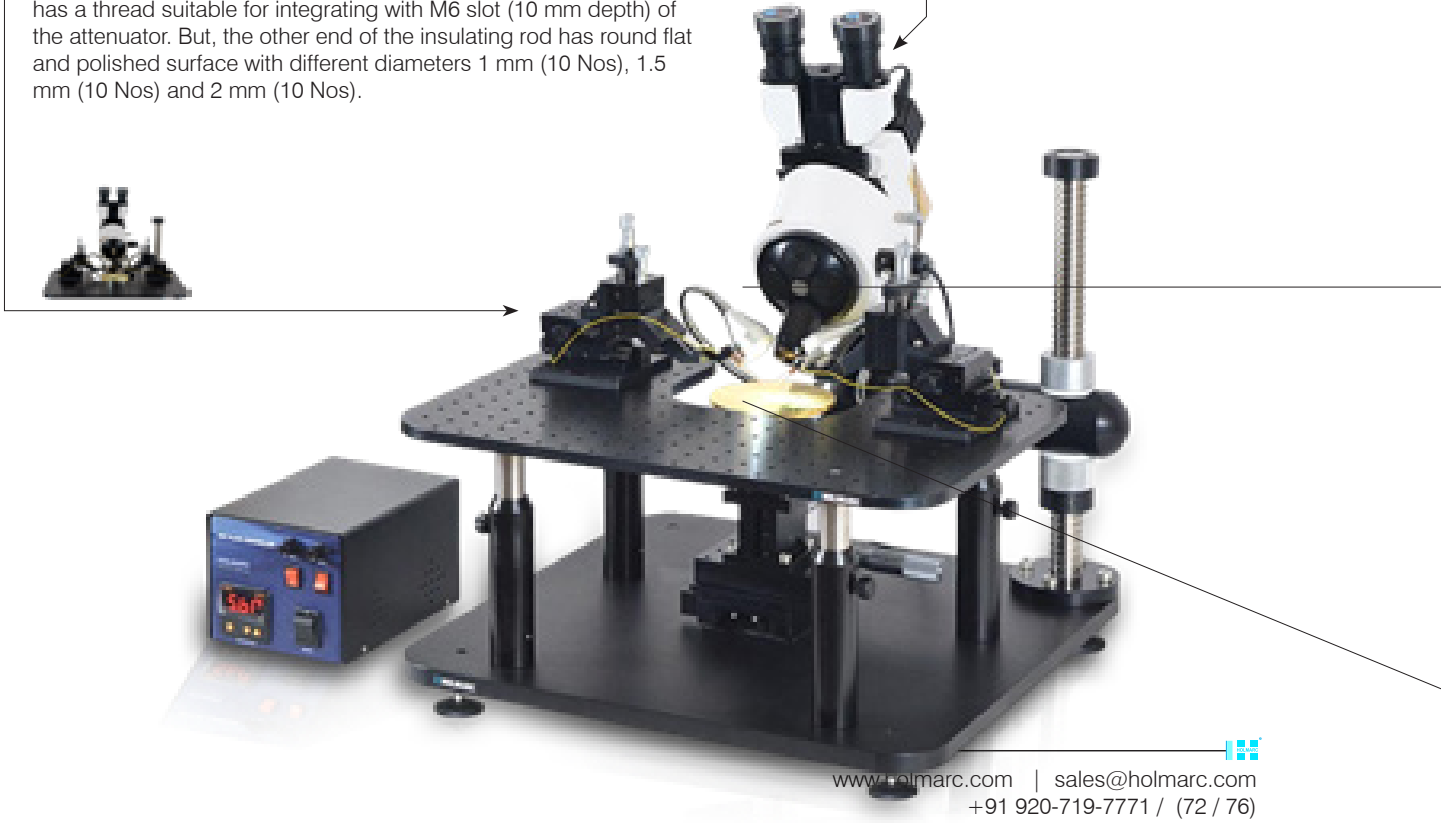
Two types of such a rigid insulating rods (made of Peek) are provided with the system.

a) In type 1, one end of the rigid insulating rod (made of Peek) has a thread suitable for integrating with M6 slot (10 mm depth) of the attenuator. The other end of the insulating rod has a slot for fixing spring-loaded gold coated pogo tips using metallic screw and suitable wiring for taking electrical connection to the SMU. Pogo tips with round flat tips of diameter 1 mm (10 Nos), 1.5 mm (10 Nos) and 2 mm (10 Nos) diameter are available with the system. 10 nos of insulating rods made of Peek are provided with the system.

b) In type 2, insulating rods (made of Peek) are spring loaded and one end of the spring loaded rigid insulating rod (made of Peek) has a thread suitable for integrating with M6 slot (10 mm depth) of the attenuator. But, the other end of the insulating rod has round flat and polished surface with different diameters 1 mm (10 Nos), 1.5 mm (10 Nos) and 2 mm (10 Nos).

Piezoelectric probe station main body frame (1 No.)

The main body frame of piezoelectric probe station has the provisions for mounting the piezoelectric attenuator holder with micromanipulator, trinocular microscope, micromanipulators and base plate. The base plate has sufficient area to accommodate at least four micromanipulators at the same time. The arrangement of base plate and the vacuum chuck / hot chuck will facilitate easy landing of the probe tip on the sample placed on the vacuum chuck / hot chuck. Base plate is compatible with micromanipulators with magnetic base. The main body frame allows desired free movement of the vacuum chuck / hot chuck stage in X-YZ direction. The base unit is rigid and sturdy structure with M6 tapped holes for table top operation



Trinocular microscope with camera (1 No.)

A trinocular microscope with provision of rotational and translational motion is provided for viewing the working area and to place the probe tip on the surface of the sample easily. One windows based display system with suitable software is provided to view and save the sample images. The microscope has the following specifications:

Optical system	Infinity corrected (200mm tube lens)
Observation Method	Bright field
Illumination	Reflected (Co-axial and Angled)
Illumination system	High bright white LEDs
Nosepiece	Revolving, quadruple with positive precision click stops
Viewing head	Siedentopf Trinocular head, 30-degree inclination, 48 - 75 mm IP adjustment
Eyepiece	Wide field eyepiece, 10X, FN = 20mm, dioptre adjustable.
Focusing	Manual
Objectives	
Objectives	Plano apo 5X
NA	0.18
WD	40 mm (FOV eyepiece = 4 mm, FOV CCD = 1.31 x 0.984 mm)
Magnification	50X @ eyepiece and 5X @ Camera
Camera specifications	
Sensor size	1/2.5” CMOS Color
Active imager size	6.55 mm (H) X 4.92 mm(V)
Maximum resolution	2048 x 1536 (3 Mp)
FPS	10 FPS @ full resolution
Pixel size	3.2 x 3.2 um
Scan type	Progressive scan
Shutter type	Electronic rolling shutter
Exposure time	0.047 ms - 3000 ms
Data format	8bit RAW, 24bit BMP
Spectral range	380 - 650 nm
SNR	43 dB
Wide dynamic range	61 dB
Definition	> 850 Lines
Exposure mode	Auto / Manual / Area
White balance	Manual / One-time / Area / Auto
Image format	RAW / BMP / JPG / PNG

Sample holder (1 No.)

Sample holder is used for electrical measurements of metal oxide pellets of diameters 8 mm to 15 mm diameter and thickness 1 mm to 5 mm. The sample holder consists of two parallelelectrodes, one of which is fixed in position and the other one is movable to get contact with the sample by adjustment of a micrometer. Contact tips of electrodes are flat rounded and made of copper with proper wiring to connect to SMU. These contact tips are isolated from the body of the sample holder. Contact tips of diameters 5 mm, 7 mmand 9 mm are supplied with the system.

5. Micromanipulator with probe tips (2 Nos)

The micromanipulators are used for fine movement and placement of the probe tips precisely on the sample for electrical measurements. Among two micromanipulators, one is left hand operated and other one is right hand operated for easy movement of the tips on the sample The micromanipulators have following specifications :

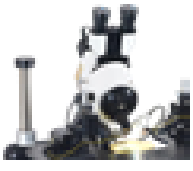
1) Independent XYZ travel : 10 x 10 x 10 mm

2) Resolution - 10 μm; Leakage current - 100 pA

3) The probe tip holder fixed firmly on the micromanipulators with the help of screw lock. The probe tip holder has a suitable mechanism for fixing the probe tips firmly on it. The probe tip holder is completely electrically isolated from the micromanipulators, base plate and base unit of the piezoelectric probe station. The probe tip holdersare able to perform low DC and AC (frequency up to 1 MHz or higher) current measurements.

4) Gold coated Tungsten tips (Qty - 10 Nos.) of tip diameter : 50 μm, compatible with the quoted tip holder of micromanipulator is provided in box / packet.

5) Micromanipulators have the provision to make electrical connections from probe tips to the Optical Measuring Instruments such as source measure unit (SMU) and C-V meter.



Chucks

Chucks have a X-Y-Z translation stage with XYZtravel of 50 mm x 50 mm x 10 mm. Chucks are complete electrical and thermal isolation from the base unit. Chucks will have a leakage current of 100 pA or less. Two types of chucks, one vacuum chuck and one hot chuck are available with this product.

a. Vacuum chuck (1 No.)
Vacuum chuck is gold coated with a diameter of 100 mm. Vacuum chuck has provision holding the sample firmly on the chuck through a vacuum pump.

b. Hot chuck (1 No.)
Temperature range: room temperature to 300°C with resolution ≤ ±1°C.
Diameter : 100 mm
Hot chuck has gold coated surface. A digital temperature controller unit with digital display is supplied with allnecessary cables and accessories.
Hot chuck can be able to maintain the temperature at the set point for ~ 6 hours with a temperature stability ≤ ±1°C.

Probe Station System T01 EC

Model : HO-PSM-T01-EC

Basic Specs	
Manual micro manipulator	2 Nos.
2 Nos.	4 (XYZ and Tilt)
X travel	25 mm
Y travel	25 mm
Z travel	10 mm
Tilt	+/- 3 degree
Probe tip holder with BNC output	
45-degree non-metal probe holder	
90-degree non-metal probe holder	
Magnetic base	
Viewing head	Siedentopf Trinocular head, 30 degree, 48 - 75 mm IP adjustment
Eyepiece	10X Wide field eyepiece, FN = 20 mm, dioptre adjustable
Focusing	Manual

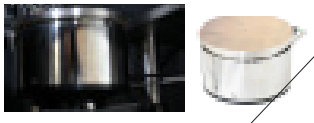
XYZ Manual sample holder with Vacuum chuck and cooling chuck : 1 set

Top plate diameter	100 mm
X axis	25 mm travel
Y axis	10 mm travel
Z axis	10 mm travel
XYZ resolution	10 microns
Cooling chuck and enclosure	
Temperature range	RT to -20°C
Temperature accuracy	+/- 1°C
Software controls	

Microscope Objectives

Long Working Distance Plan Apochromatic		
Magnification	:	5 X
Numerical Aperture	:	0.14
Working distance	:	40 mm
FOV eyepiece	:	4 mm
FOV camera	:	1.14 mm x 0.856 mm







Enclosure

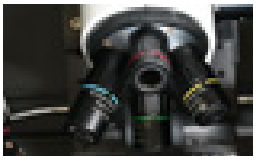
Material	:	MS with black paint
Output ports	:	BNC connectors (4 Nos)
N2 inlet and outlet port	:	1 each
Camera USB port	:	1 No.
Power socket and switch	:	Door with hinges and lock

Microscope illumination control knobs.
Humidity sensor
This cover will not be completely air tight. Minor leakage will be there.
Customer needs to fill the enclosure with N2 to reduce the icing on substrate holder at below zero degree.



Probe station Trinocular microscope and its support stand : 1 set

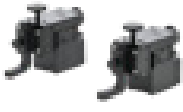
Optical system	Infinity corrected
Observation Method	Bright field
Illumination	Reflected (Co-axial and Angled)
Illumination system	High bright white LEDs
Nosepiece	Revolving, Quadruple with Positive precision click stops

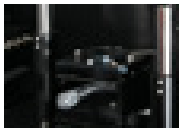


Magnetic SS micromanipulator platen, supporting stands, base plate, manual XYZ stage for microscope : 1 set

Platen	Magnetic SS
Platen supporting stand	Height adjustable
Base plate	Black anodized aluminium
Microscope XYZ stage	
XYZ travel	100 mm x 100 mm x 100 mm
Guide way	Precision ball slide
Drive	Precision lead screw
Lead screw	1 mm pitch
Lead screw type	Ground
Positioning accuracy	10 um
Construction	Black anodized aluminium







Optional Accessories

1. LWD Plan Apo 10X microscope objective	
NA	0.30
Working distance	31 mm
FOV eyepiece	2 mm
FOV camera	0.57 mm x 0.428 mm
2. LWD Plan Apo 20X microscope objective	
NA	0.35
Working distance	29 mm
FOV eyepiece	2 mm
FOV camera	0.285 mm x 0.214 mm
3. LWD Plan Apo 50X microscope objective	
NA	0.50
Working distance	17 mm
FOV eyepiece	0.4 mm
FOV camera	0.114 mm x 0.0856 mm
4. Probe tips	50 Nos
Tip diameter	50 um
Material	Tungsten
6. Hot chuck	1 No.
Chuck diameter	100 mm
Temperature range	RT - 200° C
Temperature accuracy	+/- 10° C
Thermal sensor	
Temperature control software	

Constant Temperature Coolant Circulator





CAMERA SPECIFICATIONS

Optical format	1/2.5" CMOS
Active imager size	5.70 mm x 4.28 mm, 7.13 mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Electronic rolling shutter (ERS)
Frame rate	Full resolution - up to 7fps, VGA - up to 26.7 fps
ADC resolution	12 - bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Sensitivity	1.76V / lux - sec (550nm)
Power consumption	381 mW at 7 fps full resolution
Interface	USB 2.0
Image grabbing software	

Probe Station System T01L

Model : HO-PSM-T01-EC

Trinocular microscope with LCD

High-performance optics

crisp, clear image resolution and contrast



SPECIFICATIONS

Probe station binocular microscope and its support stand = 1 set	
Optical system	Infinity corrected (200mm tube lens)
Observation Method	bright field
Illumination	Reflected (Co-axial and Angled)
Illumination system	High bright white LEDs
Nosepiece	revolving, quadruple with positive precision click stops
Viewing head	Siedentopf Trinocular head, 30 degree inclination, 48 - 75mm IP adjustment
Eyepiece	Wide field eyepiece, Magnification = 10X, FN = 20mm, Tube diameter-30mm, diopter adjustable.
Focusing	Stage height movement by roller guide (rack & pinion), Coaxial coarse / fine
Objective	Plan Apo 5X (long working distance Plan apochromatic objective)
	NA = 0.14, Working distance = 34mm, Focal length = 40mm,
FOV with Eyepiece	4mm, FOV with camera = 1.14 x 0.856mm, 1.426 diagonal
XYZ Manual sample holder = 1 set	
X axis	25 mm travel
Y axis	10 mm travel
Z axis	10 mm travel
Probe tips	
Tip diameter	50 um
Materia	Gold coated Tungsten
Manual micromanipulator = 2 Nos.	
Axes	4 (XYZ and Tilt)
X travel	25 mm
Y travel	25 mm
Z travel	10 mm
Tilt	+/- 3 degree
Probe holding mechanism	

DISPLAY



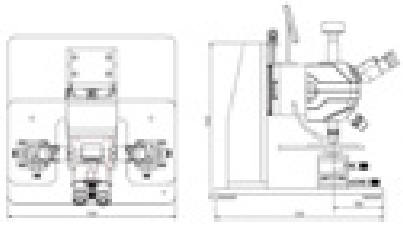
Display	7” HD, Full Capacitive Multi touch
Type	Windows tablet
CPU	Intel Atom Quad core processor upto 1.83 GHz
Memory	1 GB DDR3 RAM
Storage	16GB built-in storage, Micro SD support up to 64GB
Operating system	Microsoft windows 8.1
Connectivity	Wi-Fi 802.11, mini-HDMIport, Micro USB port, Bluetooth 4.0, USB OTG function
LCD is fixed directly to the microscope.	

CAMERA SPECIFICATIONS



Optical format	
Active imager size	5.70mm x 4.28mm, 7.13mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Global reset release (GRR), Snaphot only, Electronic rolling shutter (ERS)
Maximum data rate/ master clock	96 Mp/s at 96 MHz (2.8 V I/O), 48 Mp/s at 48 MHz(1.8 V I/O)
ADC resolution	12- bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +80°C
Power consumption	318mW at 15 fps full resolution

Probe Station System



Holmarc's probe station microscope is equipped with infinity corrected optical system for viewing and placement of the probe tips on the sample contacts. The highly corrected Long working distance apochromatic objective provide super quality images. The long working distance plan Apochromat objectives permit multiple layered samples to be viewed. HO-PSM series microscope incorporates quadruple revolving nosepiece (4-lens changeover turret) with objective mounting thread of M26 X 0.706 and parfocal distance of 95mm. High bright white LED with intensity adjustable option is provided for both Epi-scopic and angled illuminations.

Applications include failure analysis, LED, MEMS, optoelectronics, device characterization, wafer level reliability etc. We offer a complete set of accessories to allow you to position, navigate, and contact the wafer or device under test.

2 Manipulators
Model : HO-PSM-T01-2M

- Manual and Motorized Probe Positioners
- We offers a wide variety of manual and motorized probe positioners for any application
- Vibration Isolation Tables
- Slight vibrations will cause the probes to jump and miss their contacts and the microscope image will be blurred. Holmarc offers wide varieties of vibration isolation optical tables and works station for your needs. Read More...
- Digital Imaging System
- Digital imaging system improves sample navigation and software automation
- Sample Holder - Chucks
- Holmarc offers a custom chucks depending on the substrate to be tested



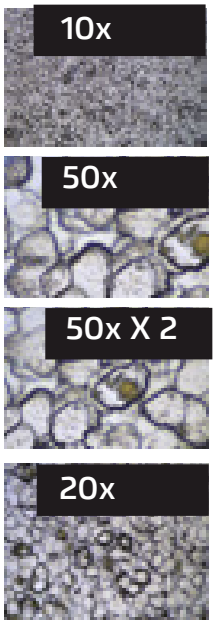
4 Manipulators
Model : HO-PSM-T01-4M

- Probe Station with 4 micro-manipulators with probes having BNC output
- 4nos. of Micro-manipulators with X = 0 to 25 mm, Y = 0 to 25 mm and Z = 0 to 10 mm and +/- 3 degrees Tilt movements
- 10 Tungsten Probe tips with diameter 50 micron
- Sample holder with XYZ manipulatio
- Manipulator supporting stand and base plate with manual z axis stage for microscope
- Optical system with Infinity corrected Tube lens and at least 5X objective, trinocular viewing head and 10 X eye-piece
- 5MP, 12 bit color camera for imaging
- Normal Configuration Laptop with USB connectivity for remote operation of the camera
- 10 nos.of Gold coated pogo tips and 5 Nos. of probe tip (Diameter50 micron- Material Gold coated Tungsten) - 1 Set (Optional)
- 10X, Microscope Objective - 1 No. (Optional)
- 20X Microscope Objective - 1 No. (Optional)

8 Manipulators
Model : HO-PSM-T01-8M

- A probe station microscope with 8 manipulators is a specialized instrument used in semiconductor research and testing.
- Microscope: It includes an optical microscope for viewing samples.
- Optical System: The microscope uses an infinity-corrected optical system.
- Objective: It typically has a long working distance plan apochromatic objective for high-quality imaging.
- Manipulators: The system has eight micromanipulators for precise positioning of probes on the sample contacts.
- Axes: Each manipulator has four axes (XYZ and tilt)
- Travel Range: X, Y, and Z Probe Holding Mechanism: Utilizes a magnetic base for probe stability.
- Sample Holder: Includes an XYZ manual sample holder





Power

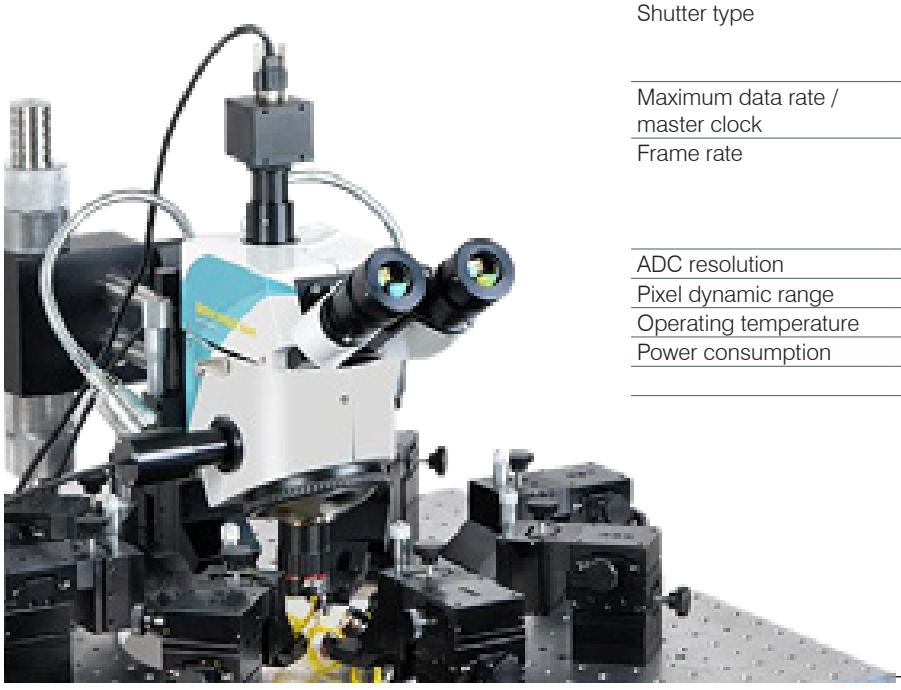
Potential

Productivity

2 Manipulators

4 Manipulators

8 Manipulators



SPECIFICATIONS	HO-PSM-T01-2M



Optical system	Infinity corrected (200mm tube lens)
Observation Method	bright field
Illumination	Reflected (Co-axial and Angled)
Illumination system	High bright white LEDs
Nosepiece	revolving, quadruple with positive precision click stops
Viewing head	Siedentopf Trinocular head, 30 degree inclination, 48 - 75mm IP adjustment
Eyepiece	Wide field eyepiece, Magnification = 10X, FN = 20mm, Tube diameter-30mm, diopter adjustable.
Focusing	roller guide (rack & pinion)
Objective	Plan Apo 5X
Type	long working distance Plan apochromatic objective
NA	0.14, Working distance : 34mm, Focal length : 40mm
FOV with Eyepiece	4 mm
FOV with camera	1.14 x 0.856 mm, 1.426 diagonal

CAMERA SPECIFICATIONS	
Optical fomat	1/2.5" CMOS
Active imager size	5.70mm x 4.28mm, 7.13mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Global reset release (GRR), Snaphot only, Electronic rolling shutter (ERS)
Maximum data rate / master clock	96 Mp/s at 96 MHz (2.8 V I/O),48 Mp/s at 48 MHz (1.8 V I/O)
Frame rate	Full resolution – Programmable upto 15 fps, VGA (640 x 480 with binning) – programmable upto 70 fps
ADC resolution	12- bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Power consumption	381mW at 15 fps full resolution

SPECIFICATIONS	HO-PSM-T01-4M	HO-PSM-T01-8M
Manual micromanipulato	4 Nos.	8 Nos.
Axes	4 (XYZ and Tilt)	4 (XYZ and Tilt)
X travel	25 mm	10 mm
Y travel	25 mm	10 mm
Z travel	10 mm	10 mm
Tilt	+/- 3 degree	+/- 3 degree
	Probe holding mechanism with BNC output	Magnetic movement - like magnetic base
		Probe holding mechanism
1. Manipulator supporting stands, base plate, manualXYZ stage for microscope	1 set	Base Plate, Manipulator Magnetic SS base plate, adjustable supporting stands
2. XYZ Manual sample holder	1 set	XYZ Manual sample holder with 4" SS chuck = 1 set
X travel	25 mm	25 mm
Y travel	10 mm	10 mm
Z travel	10 mm	10 mm
3. Probe station binocular microscope and its support stand	1 set	1 set
		Probe station binocular microscope with Boomstand and Z focusing stage= 1 set
Optical system	Infinity corrected	Infinity corrected
Observation Method	bright field	bright field
Illumination	Reflected (Co-axial and Angled (or ring LED))	Reflected (Co-axial and Angled)
Illumination system	High bright white LEDs	High bright white LEDs
Nosepiece	revolving, quadruple with positive precision click stops	revolving, quadruple with positive precision click stops
Viewing head	Siedentopf Trinocular head, 30 degree, 48-75mm IP adjustment	Siedentopf Trinocular head, 30 degree, 48-75mm IP adjustment
Eyepiece	10X Wide field eyepiece, FN = 20mm, dioptre adjustable	10X Wide field eyepiece, FN = 20mm, dioptre adjustable.
Focusing	Manual	Manual Z stage
Objectives	1. LWD Plan Apo 5X (NA = 0.14, WD = 34mm, FOVeyepiece = 4mm, FOVcamera = 1.14mm x 0.856mm)	LWD Plan Apo 5X (NA = 0.14, WD = 34mm, FOVeyepiece = 4mm, FOVcamera = 1.14mm x 0.856mm, 1.426 diagonal)
	2. LWD Plan Achro 2X (NA= 0.08, WD = 70mm, FOVeyepiece = 10mm, FOVcamera = 2.85mm x 2.14mm)	
Optional Accessories		
1. LWD Plan Apo 10X microscope objective	0.3 NA, 31mm Working distance, 2mm FOV eyepiece, 0.57mm x 0.428 mm FOV camera	
2. LWD Plan Apo 20X microscope objective	0.35 NA, 29mm Working distance, 2mm FOV eyepiece, FOV camera 0.285mm x 0.214mm	
3. Probe tips	5 Nos, 50 um Tip diameter, Gold coated Tungsten	
4. Gold plated POGO tips	10 Nos.	
CAMERA SPECIFICATIONS		
Optical fomat	1/2.5" CMOS	
Active imager size	5.70mm x 4.28mm, 7.13mm diagonal	
Active pixels	2592 x 1944 (5Mp), 2.2 x 2.2 um Pixel Size	
Color filter array	RGB Bayer pattern	
Shutter type	Global reset release (GRR), Snaphot only, Electronic rolling shutter (ERS)	
Maximum data rate	96 Mp/s at 96 MHz (2.8 V I/O),48 Mp/s at 48 MHz (1.8 V I/O)	
Frame rate	Full resolution Programmable upto 15 fps, VGA (640 x 480 with binning) –programmable 70 fps	
ADC resolution	12- bit, on-chip, 70.1 dB Pixel dynamic range	
Operating temperature	-30°C to +70°C	
Power consumption	381mW at 15 fps full resolution	

RF Probe Station System

Model : HO-PSS-RF-02

The primary purpose of an RF probe station is to position electrical, optical, or RF probes precisely on a semiconductor wafer or die for testing. It allows engineers to perform various tests, including continuity checks, functional testing, and failure analysis. The station typically consists of a stage to hold the wafer, manipulators with probe arms, and a microscope for accurate probe placement.

SPECIFICATIONS

High frequency micro manipulator - left/right = 2 Nos
100 TPI XYZ drive
True linear motion, Fine XYZ controls
Fine controls are in-line and easily accessible from the rear of the manipulator
Travel range (X / Y / Z) = 0.5" x 0.5" x 0.5"
Suitable for geometries > 1 microns
Precision of XYZ stages = 10 microns
Magnetic base
Straight configuration for left / right manipulator placement
Support different RF probe heads (GSG, GS, SG)
Planarity (Roll) adjustment range = +/- 5 degree
Planarity (Roll) adjustment resolution = 0.005 degree per degree rotation
Theta (Yaw) adjustment range = +/- 5 degree
Theta (Yaw) adjustment resolution = 0.005 degree per degree rotation
Microwave head adapter (Customer has to provide details of Microwave probe. Microwave probe is not in the scope of supply)

External magnetic field
An external magnetic field of 0.4 Tesla at a pole gap of 10 mm.
Permanent magnets with pole gap adjustable mechanical mount.
Dia. 30 mm x 20 mm Length permanent magnets.
Adjustable pole gap = 0 - 20 mm.



XYZ sample stage with Thermal - Vacuum chuck

Sample stage top plate	50 mm x 50 mm
X axis travel	25 mm
YZ axis travel	10 mm each
XYZ axis drive	100 TPI leadscrew
25.4 mm Z axis range via platen lift	
Temperature range	RT - 250°C
Cooling	Thermo electric cooling in conjunction with chiller for water cooling
Cooling below ambient about -10°C or closer to it	
Temperature increment step	1 degree
Cables and Probes should be thermally insulated	
Vacuum pump	
Manual and software control required for temperature and vacuum pump	

CAMERA SPECIFICATIONS

Optical fomat	1/2.5" CMOS
Active imager size	5.70mm x 4.28mm, 7.13mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Electronic rolling shutter(ERS)
Frame rate	Full resolution -up to8fps, VGA -upto 70 fps
ADC resolution	12- bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Power consumption	381mW at 15 fps full resolution
Interface	USB2.0

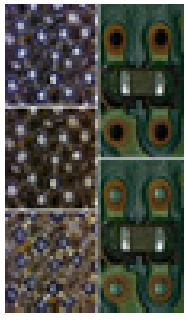


Probe station Trinocular microscope

Probe station Trinocular microscope and its support stand	1 set
Optical system	Infinity corrected
Observation Method	bright field
Illumination	Reflected (Co-axial and Angled)
Illumination system	High bright white LEDs , Intensity adjustable via software
Nosepiece	revolving, quadruple with positive precision click stops
Viewing head	Siedentopf Trinocular head, 30 degree
IP adjustment	48 - 75 mm
Eyepiece	10X Wide field eyepiece, FN = 20mm, dioptre adjustable
Focusing	Manual

Platform

Manipulator supporting Platform (magnetic SS)
Base plate, Manual XYZ stage for microscope = 1 set



Software

Image grabbing as well as temperature & vacuum controls

Objectives	
LWD Plan Acrhomatic 2X	NA = 0.08, WD = 65 mm,
Resolution	3.5microns,
FOV eyepiece	10 mm,
FOV camera	2.85 mm x 2.14 mm)
LWD Plan Apo 5X	(NA = 0.14, WD = 40 mm,
Resolution	2.3 microns,
FOV eyepiece	4 mm,
FOV camera	1.14 mm x 0.856 mm)
LWD Plan Apo 10X	(NA = 0.30, WD = 34 mm,
Resolution	1 microns,
FOV eyepiece	2 mm,
FOV camera	0.57 mm x 0.428 mm)
Optional Objectives	
1. LWD Plan Apo 50X microscope objective	
NA	0.50
Working distance	17 mm
FOV eyepiece	0.4 m
FOV camera	0.114 mm x 0.0856 mm
Resolution	0.6 microns
2. LWD Plan Apo 20X microscope objective	
NA	0.35
Working distance	29 mm
FOV eyepiece	1 mm
FOV camera	0.285 mm x 0.214 mm
Resolution	1 microns



Probe Station Platform & Accessories

Our probe station is configured to serve as a platform for precise probe head positioning. Standard probe station platforms are made of aluminium material with black anodized finish. Shape and size of the platforms are as per customer requirements. There are M6 tapped holes on 25mm grid. These platforms are available in various materials, sizes and shapes and with different patterns of holes. Heavy duty pillar posts and magnetic / slotted bases are used to create the platform. Material other than aluminium can be used as per customer requirements.

- M6 tapped holes on 25mm Grid
- Rigid aluminum material
- Black anodized finish
- Heavy duty pillar posts mounting
- Magnetic bases / slotted post base

Vibration Isolated Platforms

Holmarc manufactures vibration isolated supports and honeycomb table tops in various models. Please refer Breadboards for more detail about these products. The isolated supports find wide applications in life science laboratories for conducting vibration sensitive experiments. Pneumatic isolators are used for preventing ground vibrations to reach the work stations. The size of the platforms can be as large as 3 x 1.5 meters.

Precision Probing Systems

The probing system is manually operated, yet precise and operator friendly. A wide range of probe holders, three-axis positioners and optics packages are available to customize the solution to your application. Positioners feature rolling contact bearings for precise and smooth motion. Optional vibration isolation supports reduce the effects of steady-state and transient vibrations in test area.

Microscopes

Rigid bridge positioning mechanism is available for mounting the microscope. Probe station can also be configured with a high resolution video system, including camera and LCD monitor.

Tables

We manufacture variety of lab benches and tables, including vibration isolation systems.

Sample Holder

XYZ Sample Holder Model No. HO-LS-MISH-50

Manual
50mm Travel
Drive Micrometer
100 x 100mm platform size
10 micron straight line accuracy
M6 Mounting Holes



XYZ Sample Holder Model No. HO-LS-MISH-50A

Motorized
Drive by joystick / from a computer
25 mm travel
Lead screw drive
Stepper motor actuator
0.3 micron resolution
100 x 100mm platform size
5 micron straight line accuracy
M6 Mounting holes

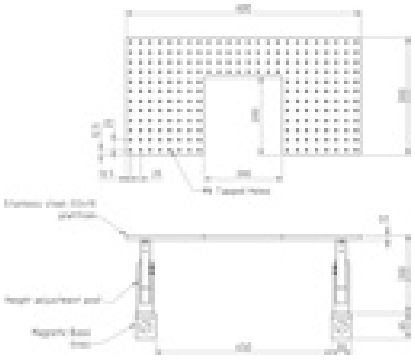




Probe Station Platform Accessories

Platform

Probe station platforms are made of aluminium material with black anodized finish. These can be constructed in honeycomb structure as well. Shape and size of the platforms are as per customer requirements. There are M6 tapped holes on 25mm grid. These platforms are available in various material, sizes and shapes and with different patterns of holes. Heavy duty pillar posts and magnetic / slotted bases are used to create the platform. Materials other than aluminium can be used as per custom specifications.



Model : HO-LS-PSA-P-600300
Size : 600 x 300 (160 x 160 mm inside cutting)

Features
M6 tapped holes on 25mm Grid
Rigid aluminum material
Black anodized finish
Heavy duty pillar posts mounting
Magnetic bases / slotted post base



Micromanipulator

The micromanipulators are available with either motorized or manual movements in all three axes (X, Y and Z axis). The manual micromanipulators are equipped with precise and stable rolling contact bearings without play and backlash. Wear and tear is negligible for all practical purposes. Coarse and fine movements are provided for all axis. Coarse movement is by rack and pinion for quick positioning where as fine movement is by either micrometer or by fine pitched lead screw. Special clamping arrangements are provided for safe fixing of sensors. Linear graduation are given by the side of the stage for repeatable positioning.



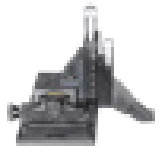
Micro-manipulator provides safe and efficient positioning of micro tool. The manupulators are designed and manufactured for either left hand side or right hand side use. In both cases when placed correctly the adjustment knobs comes to the side of the operator. We have different models for left hand side and right hand side use as specified below. Custom probe holders are also available on special request.

Manual	
Model No:	Item
MIMA-LH-12	Left Hand Micromanipulator
MIMA-RH-12	Right Hand Micromanipulator

Motorized	
Model No:	Item
MIMA-LH-12M	Left Hand Micromanipulator
MIMA-RH-12M	Right Hand Micromanipulator

- Hold up to 12mm diameter prob
- Fine movement - 10mm on Z axis
- 25mm coarse movements for all 3 axes
- Vernier reading for coarse movements
- Friction lock for all four movements
- Compatible with magnetic post stand or tilting base

4 Axis Micromanipulator (XYZ & Tilt)

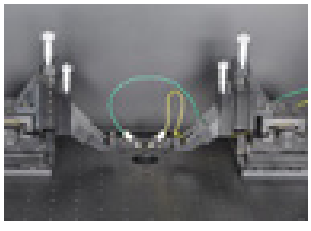


Holmarc's 4-axis micromanipulator features precise movements in the X, Y, and Z axes, along with +/- 3 degrees of tilt, making it ideal for positioning probes and samples in applications such as failure analysis, LED testing, and device characterization

Model No:	Type	Travel
MIM-4A-10	4 axis Micromanipulator	XYZ 10 mm & +/- 3 degree
MIM-4A-15	4 axis Micromanipulator	XYZ 15 mm & +/- 3 degree
MIM-4A-20	4 axis Micromanipulator	XYZ 20 mm & +/- 3 degree
MIM-4A-25	4 axis Micromanipulator	XY-25 mm, Z-10 mm & +/- 3 degree



Motorized Micromanipulator with Piezoelectric Translation



Holmarc offers precision motorized micromanipulators that will provide automated movement in all 3 orthogonal axes. Motorized Micromanipulators are used to manipulate micro sized objects or specimens under a microscope. A benefit of using motorized micromanipulators is the precision movement on a variety of axis that enables absolute manipulation far superior to traditional manual manipulation. Common actions included holding, cutting or injecting and are often controlled via joystick. All the movements are integrated and control by our motion control software.

These micromanipulators use a combination of stepper motors and piezoelectric control of translation stages to provide precise movement. The micromanipulator can move along three different axes. Coarse translation is controlled using a stepper motor that produces a displacement up to 25 mm with a step size of 0.5 μm. Fine control on the micromanipulators is achieved with piezoelectric unit that provide a displacement of either 10 μm along each axis.

Probe Station Microscope - Motorized Micro Manipulator

Micro manipulator is a tool that allows the user to move an input device that correlates to much more precise movements on the object being manipulated. A micro pipette, electrode or probe can be mounted on a micro manipulator and move as little as a micron at a time. This tool can be used for in vitro fertilization, patch clamp experimentation, extracellular recording, micro injection and any application requiring fine mechanical displacement.

- Applications
- Micro injection
- Electrophysiology recording
- Controlled environment
- Measurements

Model No:	Description
HO-PSM-M3M1L (Left Drive) HO-PSM-M3M1R (Right Drive) HO-PSM-M3M1LR (Left & Right both)	Manual XYZ 25mm Travel Stage, +/- 3 degree Tilting Stage, Additional Z Axis 25mm Travel Motorized Movement
HO-PSM-M3M3L (Left Drive) HO-PSM-M3M3R (Right Drive) HO-PSM-M3M3LR (Left & Right both)	Fully Automated, Motorized XYZ 25mm Travel Stage, +/- 3 degree Motorized Tilting Stage



MICROSCOPE HEAD SPECIFICATIONS

Type	Trinocular Microscope
Vision	Stereo
Head	Inclined at 45 Degree
Nosepiece	Turret Revolving
Objectives	2x & 4x
Camera	5MP 1/2.5" CMOS

Micromanipulator Accessories

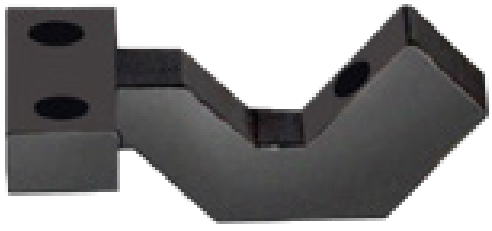
Probe Holder

A probe holder is either straight or bent, designed to hold the probe tip on one end and is held by the manipulator collet shaft on the other.

Probe holders secure the probe tip with either a pin jack or set screw probe mount. Custom probe holders are available on request.



Probe holder - for 90 degree Vertical inducing Model : MIM-PRH-90A



Probe holder - for 45degree angular inducing Model : MIM-PRH-45A

Probe Tip

The Probe Tip (or needle) is the part of the micromanipulator unit that actually touches the device under test (DUT).





SPECIFICATIONS

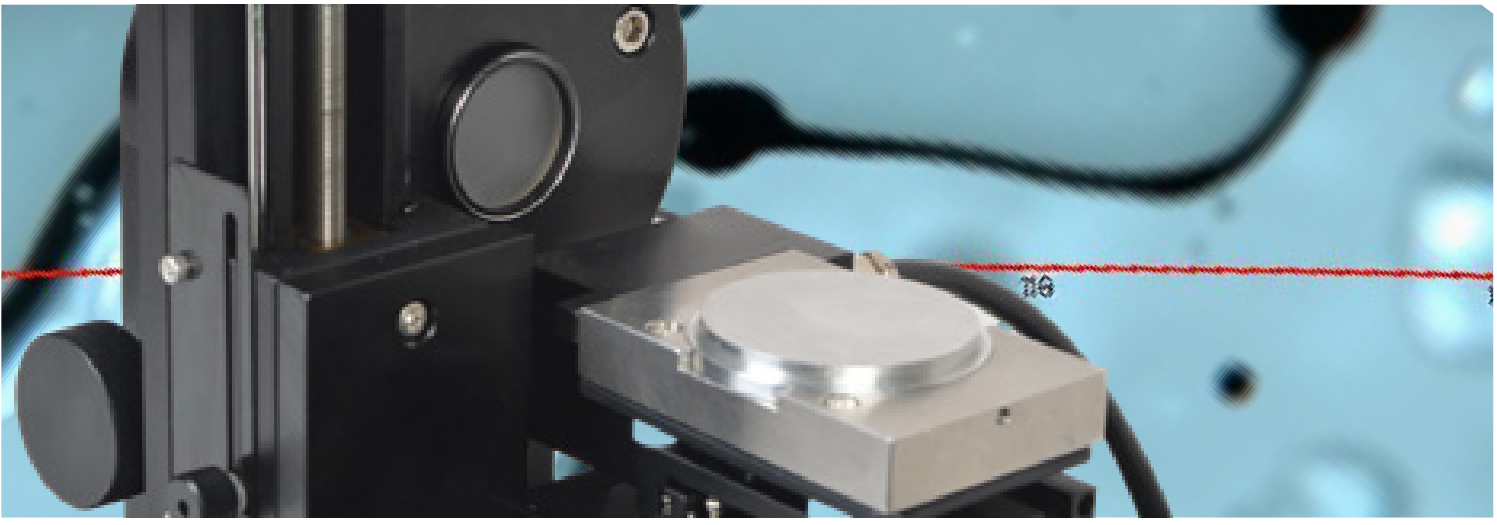
Sizes	50 Micron Tip Diameter
Material	Solid tungsten
Shank diameter	20 mil (0.5mm)
Needle length	1.26 in (30mm)
Shape	Straight

Current Rating	1 Amp
Voltage Rating	Based on placement distance
Operating Temperature	-40°C to +125°C
Contact Material	Brass
Contact Plating	Gold over Nickel

50 micron tungsten probe tip are useful for standard, general purpose probing needs. Tungsten is a good conductor and works well for the majority of probing requirements, including probing on aluminum. Probes with a tungsten shank are pliable enough so that they can be bent to a particular shape by the end user if necessary

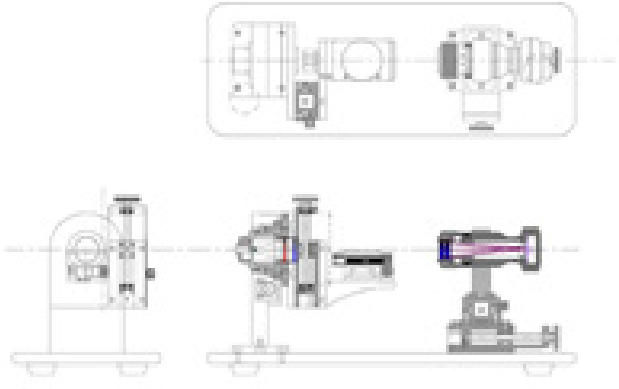
Pogo Pins are designed to mate with gold plated PCB pads or flat contacts in docking / cradle applications to function as the charging, data transfer or programming interface to a portable device. Gold plated contacts provide high reliability and signal integrity over 10,000 cycles.

Horizontal Microscope



Model : HO-HM-CB

- Plant growth study
- Study of gravity sensing in plant cells
- Surface tension study
- Liquid sample imaging



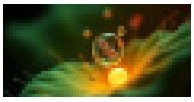
SPECIFICATIONS

Microscope type	Horizontal configuration
Imaging lens	1X Magnification - adjustable with in small range
Working distance	~ 80 mm
Field of View (FOV)	5.7mm x 4.28mm @ 1X Magnification
Illumination	Backlight (transmitted)
Illumination source	High bright White LED with diffuser, Intensity adjustable
Translating stage for focusing	50 mm travel
Center height from base	170 mm
Base plate	Black anodized Aluminium
Software	Image grabbing Software
Telescope tube setting	360 degree rotatable - lockable
Power	230V, 50Hz
Sample heating stage	Plate diameter = 40mm
	Temperature range = RT - 250 ^{o}C
	Temperature resolution = 1 ^{o}C
	PID Controller for temperature controls

Plant growth study



Study of gravity sensing in plant cells



Surface tension study



Liquid sample imaging

Horizontal Microscope Long working distance
Model No: HO-HM1X-5X

Magnification	1X - 5X
Focal length	25 mm (5X) - 85 mm(1X)
Minimum Working distance at 5 X	100 mm
Minimum Working distance at 1 X	272 mm
Optical design	Apochromatic 12 elements with 8 groups
Camera mount type	Nikon F
Iris	Manual type
Aperture	Maximum - f / 2.8, Minimum - f / 32
Illumination systems	1. Ring LED illumination, adjustable intensity
	2. Co-axial illumination, adjustable intensity
Focusing	Manual, rack and pinion
Positioning system	Manual XYZ with two rotation stages
XYZ travel	25 mm each
XYZ resolution	10 microns
Rotation stage 1 (Yaw)	360 degree, Manual
Rotations stage 2 (Roll)	45 degree, Manual
Optical axis height adjustment	150 mm - 300 mm
Mounting provision	Breadboard mountable
Camera	1/2.5" 5MP USB 2.0

FOV with Holmarc 5MP camera

@1X	5.7 mm x 4.27 mm
@2X	2.85 mm x 2.14 mm
@3X	1.9 mm x 1.43 mm
@4X	1.42 mm x 1.07 mm
@5X	1.14 mm x 0.86 mm

FOV with Photron MiniUX100

@1X	12.8 mm x 10.24 mm
@2X	6.4 mm x 5.12 mm
@3X	4.27 mm x 3.41 mm
@4X	3.2 mm x 2.56 mm
@5X	2.56 mm x 2.05 mm

Camera

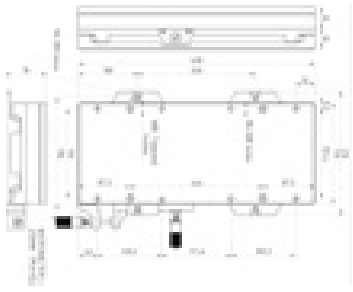
Sensor	5MP CMOS, Color
Optical format	1/2.5"
Sensor size	5.7 mm x 4.28 mm (7.13 mm diagonal)
Active pixels	2592 Hx 1944 V
Pixel size	2.2 μm x 2.2 μm
Frame rate	7 fps @ full resolution
Sensitivity	1.76V / Lux - sec
Exposure time	0.058 ~ 3000 ms
Spectral range	380 - 650 nm
SNR	38.1 dB
Dynamic range	70.1 dB
Shutter	Electronic rolling shutter
Data interface	USB2.0
Data format	8 Bit / 12 Bit RAW
Picture format	JPEG / BMP / PNG / RAW



HO-HM-CB



Microscope Translation Stage



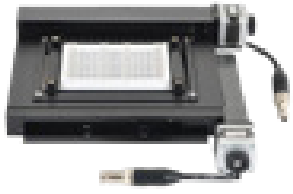
Manual Microscope Translation Stage

This microscope translation stage precisely move upright and inverted microscopes with 25 mm travel in X and Y direction. The translation stage accepts all types of instruments thanks to its large load carrying capacity. The microscope stage can be used with almost any Zeiss, Leica, Nikon or Olympus inverted or upright microscopes in addition to Holmarc's.



- 25mm travel range
- Micrometer drive
- 30 Kg load capacity
- Precise smooth movement
- 0.01 mm readout
- M6 mounting holes

Model No	Item	Travel Range
HO-LS-MIC-XY-25	Manual Microscope translation Stage	25 mm



Motorized Microscope Translation Stage

With complete hand free remote control, Holmarc's universal motorised stage allows translation of any upright or inverted microscopes. Motorized control allows programmed movements in X and Y directions using suitable control electronics. Microscope stage can be used with almost any Zeiss, Leica, Nikon or Olympus inverted or upright microscopes in addition to Holmarc's.



- Operates standalone or using a computer
- 25mm travel Leadscrew drive
- 30 Kg load capacity
- M6 mounting holes

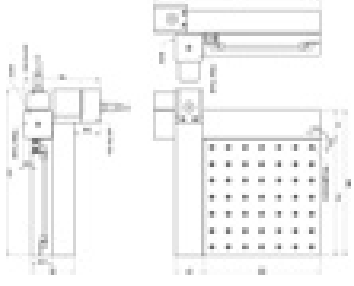
Model No	Item	Travel Range
HO-LS-MIC-XY-25M	Motorized Microscope translation Stage	25 mm

Motorized Microscope Translation Stage

These stages are meant for positioning the entire microscope in an XY plane. Manual and motorized versions are available. It features an M6-tapped hole matrix.
Operates standalone or using a computer
25mm travel Leadscrew drive
30 Kg load capacity, M6 mounting holes



Model : HO-MMTS-XY50



- xy axis integrated design, compact structure
- High precision lead screw, better repeatability
- Stepper motor drive
- Hand wheel for manual drive
- Standard holes pitch for easy installation

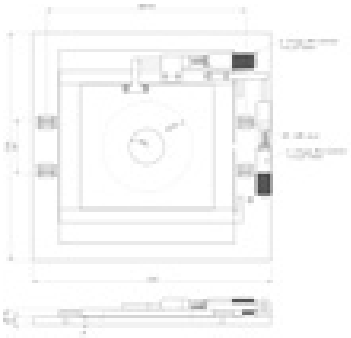
Travel Range	50 mm x 50 mm
XY Positioning Accuracy	± 3 microns
Step Size Resolution	0.625μm
Load Capacity	Up to 50 kg

Microscope XY Sample stages

Precision XY Manual Sample stage
Model : HO-XY-S25



These stages are designed, specific models of microscope to make sure of the compatibility. There are micrometer and rack and pinion driven stages. Both the axes are fitted with ball bearing guides for smooth and friction free movements. There are manual as well as motorized models to fit various microscopes.



- X Axis Travel : 25 mm
- Y Axis Travel : 25 mm
- Drive : Micrometer drive
- Least Count : 0.01 mm
- Load Capacity : 2 Kg load
- M6 mounting holes
- Precise smooth movement
- Suitable for inverted microscope

High Resolution XY Manual Sample stage
Model : HO-XY-S25

These stages are fitted with two micrometer drives for each axis, coarse and fine. Fine drive which is based on a spring loaded lever drive mechanism can achieve sub-micron resolution and sensitivity.



- Sample Size : 25 mm x 75 mm
- Travel Range : 10 mm Continuous
- Coarse travel resolution : 10 Micrometer
- Fine travel resolution : 0.1 Micrometer
- Suitable for inverted microscope

XY Motorised sample stage for small microscopes
MODEL HO-XY-MS50

This motorized XY translation stage is an integrated motorized stage with compact structure. It's usually used to automatically move the small object under the microscope. The aperture size is 50mm x 50mm, microscope slides can be mounted and clamped on it. Hand wheels are provided for manual positioning. This stage is connected with Holmarc's motion controller interface and it can be controlled by our computer software via RS232 interface on controller.



Model : HO-XY-MS50



Model : HO-XY-MS50SQ



Model : HO-XY-MS50SQ

X Travel	50 mm
Y Travel	50 mm
Actuator	Stepper Motor
Resolution	0.625 micron
Positioning Accuracy	5 Micron
Controller	Holmarc M Torque
Interface	PC Based via RS 232
Construction	Aluminium
Finish	Black Anodized

Model No	Item
HO-XY-MS50	Circle
HO-XY-MS50-SQ	Square
# Dual axis controller (sold separately)	

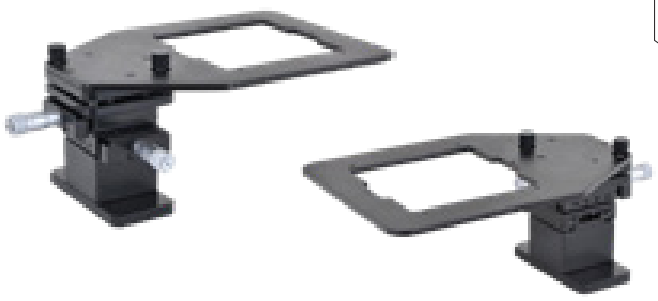
Microscopy External Positioning Systems

External XYZ Tilt sample Holder with Rigid
Model : HO-MEPS-105P

Microscopy External Positioning System (MEPS) are designed to be used with standard microscopes for custom microscopic works. It support slide holders, petri dishes, chambers and other samples. MEPS can be easily inserted in to other microscope's optical path. The stage mounts to the bottom of the compact rigid stand and can be mounted directly on to a optical breadboard. These positioner can translate a sample load up to 5kg.

X Travel	10 mm
Y Travel	10 mm
Z Travel	
Resolution	5 Microns
Positioning Accuracy	+/-2 Degree





Adapter for Petridish / Petri dish Holder for XY Scanning Stage

MA-PD35	35 mm
MA-PD40	40 mm
MA-PD60	60 mm
MA-PD80	80 mm
MA-PD94	94 mm
MA-PD100	100 mm
MA-PD145	145 mm
MA-PD150	150 mm

Adapter for 96 well plate and various size glass slides for XY Scanning Stage



AD-SQ-96W



AD-SQ-96G

External Motorized XYZ sample holder with Rigid Stand
Model No : HO-MEPS-5020M

his Microscopy External Positioning System (MEPS) is based on stepper motor translation stages and are designed to be used with standard microscopes. It can support slide holders, petri dishes, chambers and other samples. MEPS can be easily inserted in to other microscope's optical path for custom microscopic works. It can translate a load up to 20kg.

X Travel	50 mm
Y Travel	50 mm
Z Travel	50 mm
Resolution	0.625 Microns
Positioning Accuracy	+/-2 Degree





Microscopy External Positioning Systems

Holmarc's motorized XY scanning stages are designed for the replacements of manual stages found on certain microscopes and provide programable XY positioning of microscopy samples. Trapezoidal lead screw and resign nuts are used for high resolution and positioning accuracy. We can design XY scanning stages for inverted and upright microscopes from Nikon and Olympus. Adapter brackets will be provided for the XY stage that enable the stage to be fitted to a particular microscope.

Tabletop mounting brackets are also available that enable the stage to be bolted to an optical table or breadboard as part of a custom built microscope setup or for use in typical photonics applications.

Specimen Holders and Accessories : We offer a range of adapters to allow the positioning of standard microscope slides, multiwell plates petri dishes, and mounted metallurgical specimens.



Motorized Microscope XY Scanning Stage for Nikon TI-U Series



Motorized Microscope XY Scanning Stage for Olympus IX71 Series

X & Y axis Travel (XY-MR-100)	100 mm
X & Y axis Travel (XY-MR-50-150)	150 & 50 mm
Lead screw pitch	1 mm
Resolution	0.3125 microns
Positioning accuracy	< 3 micron
Speed	4 mm / sec

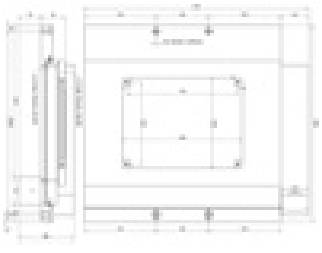
Specimen Holders and Accessories
Multiwell Plate Adapter
Petri Dish Holder
Slide / Multi Slide Holder
M4 / M6 Tapped Breadboard Plate
2 - Axis Joystick Controller
Optical Encode

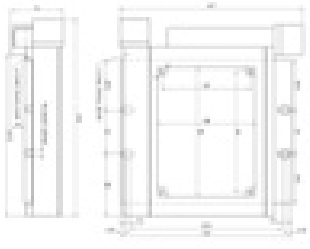
Model No:	XY-MR-100	XY-MR-50-150
Travel	X: 100mm Y: 100mm	X: 50mm Y: 150mm
Resolution	0.325 microns	0.325 microns
Accuracy	<3 μm	<3 μm
Speed	8 mm / sec	8 mm / sec
Item	Motorized XY Sample stage	Motorized XY Sample stage
Suitable microscope	Nikon Ti-u	Olympus I x 71

- Optical limit switch for home sensing
- Hand wheel for manual movement
- Optional handheld unit & joystick
- Optical Encoder integration on request
- High Position Accuracy (<3 μm)
- Range of Standard and Custom Sample Holders
- Can be integrates with Nikon, Olympus & Zeiss Upright - Inverted Microscopes



XY-MR-100





XY-MR-50-150

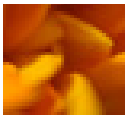
2D Transfer System



2D Transfer System with Digital Microscope 1 and 2

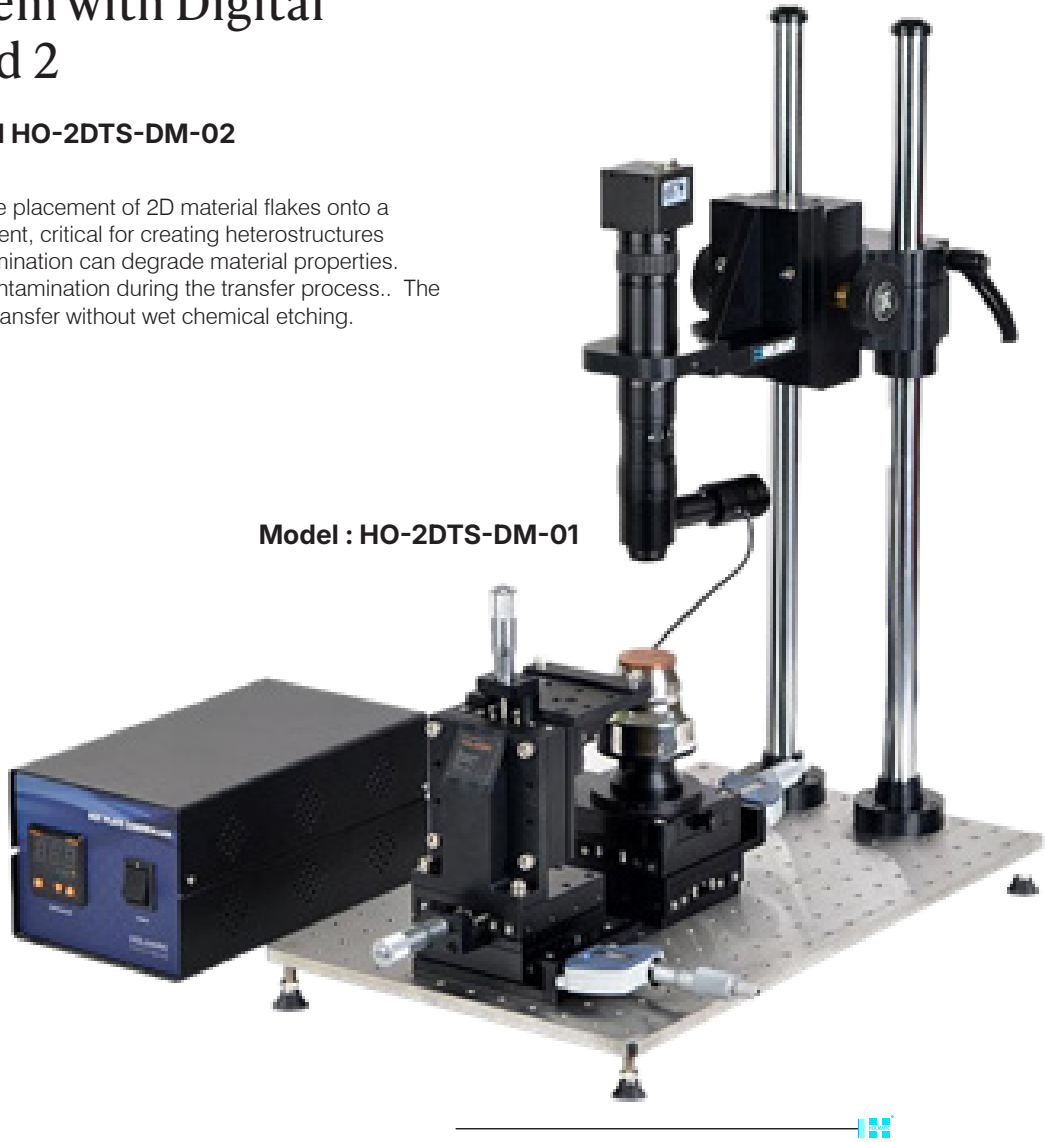
Model :HO-2DTS-DM-01 and HO-2DTS-DM-02

The 2D transfer system allows precise placement of 2D material flakes onto a substrate. It ensures accurate alignment, critical for creating heterostructures (stacks of different materials). Contamination can degrade material properties. The 2D transfer system minimizes contamination during the transfer process.. The system enables rapid and accurate transfer without wet chemical etching.





Model : HO-2DTS-DM-01



Highly Accurate Material Transfer

Non-Contaminating Transfer

Rapid Prototyping and Device Fabrication

www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

YZ theta sample stage with heater & Vacuum chuck

25 mm XY Travel and 5 mm Z Travel with Straight line accuracy of +/-3.5 um at 1 um resolution along X axis, 5 um in Y axis resolutionand 10 micronin Z axis

1 / 2.5" CMOS Camera

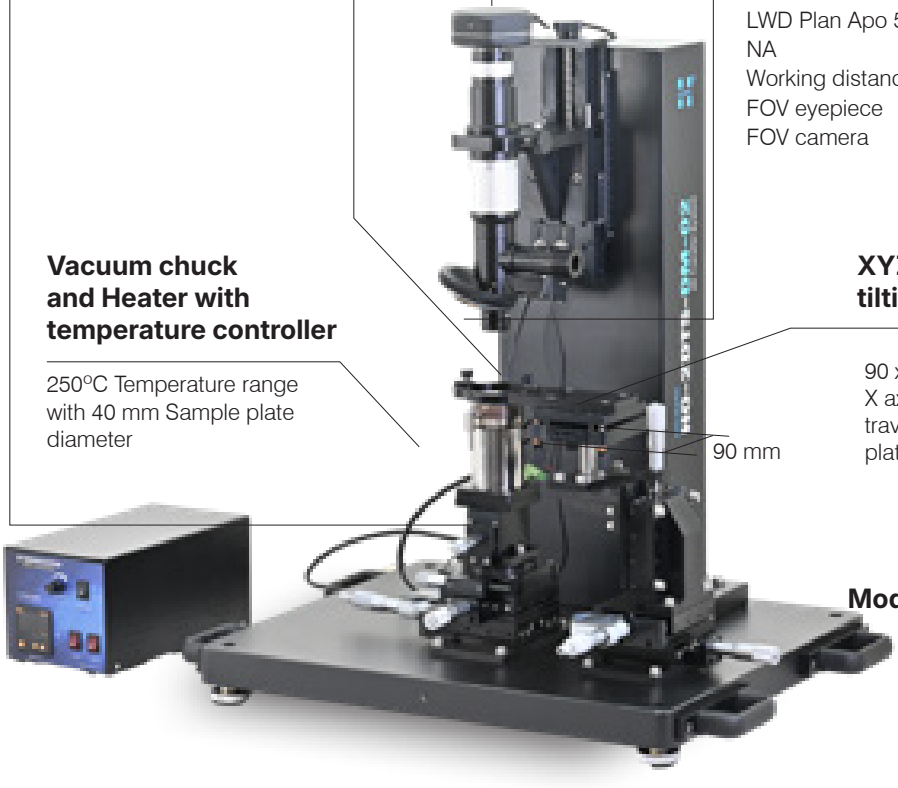
2592 x 1944 (5Mp)
380 - 650 nm Spectral response

Mounting holes

M6 tapped

Vacuum chuck and Heater with temperature controller

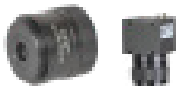
250°C Temperature range with 40 mm Sample plate diameter



XYZ Stamping stage with tilting platform

90 x 90 mm Top plate, 25 mm X axis trave, 10 mm Y & Z axes travel on a Leadscrew Tilting platform drive

Model : HO-2DTS-DM-02



Optional Accessories

1. LWD Plan Apo 10X microscope objective

NA	0.30
Working distance	34 mm
FOV eyepiece	2 mm
FOV camera	0.57 mm x 0.428 mm

2. LWD Plan Apo 20X microscope objective

NA	0.35
Working distance	29 mm
FOV eyepiece	1 mm
FOV camera	0.285 mm x 0.214 mm

LWD Plan Apo 50X microscope objective

NA	0.50
Working distance	17 mm
FOV eyepiece	0.4 mm
FOV camera	0.114 mm x 0.0856 mm

Specifications

	HO-2DTS-DM-01		HO-2DTS-DM-02
1. Base plate with levelling foot			
Material	Magnetic SS		Magnetic SS
	M6 Tapped holes at 25mm x 25mm grid		M6 Tapped holes at 25mm x 25mm grid
2.			Digital microscope with dual post setupwith coarse adjustment and fine focusing stage
Optical system	Finite corrected		Microscope objective with zoom system
Observation Method			Bright field
Illumination	Co-axial illumination		Coaxial top illumination
Illumination system			High bright white LED, Intensity adjustable
Focusing			Manual
Zoom magnification			0.5 - 5X
Zoom NA			0.023 - 0.107 mm
Light source	White LED		High bright white LED, Intensity adjustable
	Adjustable intensity		
Objective	Objective Zoom Lens		Long working distance Plan Apochromatic
	Magnification	0.7X - 4.5X	5X, 0.15 Numerical Aperture
	Zoom Ratio	6.5:1	
	1X CCD Adapter		
	1X Objective		
	Detent at 0.7X, 1X, 1.5X, 2X, 2.5X, 3X, 3.5X, 4.0X, 4.5X		
			35 mm Working Distance
Total magnification			2.5X - 25X
Auxiliary objective	2X		
	working distance	39mm	
Field of View	~4.07 mm x 3.05 mm @ 0.7X position with 2X Auxiliary lens		
	~0.63 mm x 0.475 mm @ 4.5x position with 2X Auxiliary lens		
Magnification	Maximum Magnification		
	Camera sensor	9X (with 2X auxiliary lens)	
	22" screen	~ 700X (depends on the size of active area of the screen)	
3. Glass / sample Holder	4. Image grabbing & Analysing software		
Camera Specifications			
Sensor	5MP CMOS, Color		
Optical format	1 / 2.5"		1 / 2.5" CMOS
Sensor size	5.7mm x 4.28mm (7.13mm diagonal)		5.70 mm x 4.28 mm
Active pixels	2592 H x 1944 V		2592 x 1944 (5Mp)
Pixel size	2.2 um x 2.2 um		2.2 um x 2.2 um
Frame rate	6 - 8 fps @ full resolution		Full resolution - 7 fps, 640 x 480 (BIN) - 26.7 fps
Sensitivity	1.4V / Lux - sec		
Exposure time	0.058 ~ 3000 ms		0.072 ms - 3000 ms
Spectral range	380 - 650 nm		380 - 650 nm
SNR	38.1 dB		
Dynamic range	70.1 dB		
Operating temperature			-30°C to +70°C

Sensitivity		1.76V / lux - sec (550nm)
Power consumption		381 mW at 15 fps full resolution
Lens mount		C-mount
Shutter	Electronic rolling shutter	Electronic Rolling Shutter (ERS)
Data interface	USB 2.0	USB 2.0
Data format	8 Bit / 12 Bit RAW	
Picture format	JPEG / BMP / PNG / RAW	RAW, BMP, JPG, PNG
Software	Image Analyzer	

3. XYZ theta sample stage with heater & Vacuum chuck (1 set)		
XYZ stage		
Mounting hole	M6 tapped holes	M6 tapped holes
XY Travel	25 mm	25 mm
Z Travel	5 mm	5 mm
Straight line accuracy	+/-3.5 um	+/-3.5 um
X axis resolution	1 um (Digital Micrometer)	1 um (Digital Micrometer)
Y axis resolution	5 um	5 um
Z axis resolution	10 micron	10 micron
Guide way	Precision V grooved guide way	Precision V grooved guide way
X axis drive	Digital Micrometer	Digital Micrometer
Y axis drive	Micrometer	Micrometer
Z axis drive	Micrometer	Micrometer
Construction	Aluminium alloy	Aluminium alloy
Finish	Black anodized	Black anodized

Rotation stage		
Top plate diameter	75 mm	75 mm
Readout	0.1 degree	0.1 degree
Construction	Aluminium alloy	Aluminium alloy
Finish	Black anodized	Black anodized
Tapped holes on the top plate	M6 Tapped holes	M6 Tapped holes
Mounting holes on the base	M6 CBR	M6 CBR
Design	Modular	Modular
Coarse travel	360 degree	360 degree
Fine travel	+/- 4 degree	+/- 4 degree
Drive	Micrometer	Micrometer

Vacuum chuck and Heater with temperature controller		
Sample plate diameter	40 mm	40 mm
Temperature range	RT - 250°C	RT - 250°C
Temperature increment	1°C	1°C
PID Controller		
Vacuum provision to hold the samples		
Vacuum Pump		

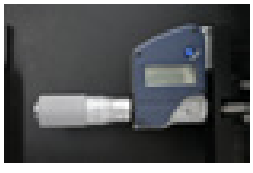
XYZ Stamping stage with tilting platform (1set)	
Top plate size	90 x 90 mm
X axis travel	25 mm
Y & Z axes travel	10 mm
	M6 tapped holes on the top plate
Y axis resolution	1 um (Digital Micrometer)
X & Z axes resolution	5 um
Guide way	Precision V grooved guide way
Y axis drive	Digital Micrometer
X & Z axes drive	Micrometer
Tilting platform drive	Leadscrew
Construction	Aluminium alloy
Finish	Black anodized

2D Transfer System with Trinocular Microscope

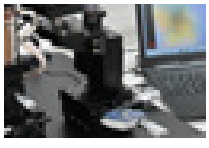
The 2D Transfer System with Trinocular Microscope 2 by Holmarc is a sophisticated imaging instrument designed for research and general-purpose applications. It features an infinity-corrected brightfield observation system, reflected illumination with flexible arm LEDs, a 10X wide-field diopter-adjustable eyepiece, and a long working distance Plan Apochromatic objective (5X magnification, NA 0.14). The system includes a 1/2.5" CMOS sensor camera with 2592 x 1944 (5MP) resolution, a motorized XYZ sample stage (25 mm travel in each direction), a 360-degree rotatable precision worm gear rotation stage, and a vacuum chuck with a heater for secure sample positioning. The intuitive joystick and push-button interface provide seamless software controls.



Digital Micrometer Drive



XYZ Stamping stage with tilting platform



XYZ theta sample stage with Heater & Vacuum chuck

RT - 200° C Temperature range





Optional accessories

LWD Plan Apo microscope objective	10X	20X	50X
NA	0.30	0.35	0.50
Working distance	34 mm	29 mm	17 mm
	2 mm	1 mm	0.4 mm
	0.57 mm x 0.428 mm	0.285 mm x 0.214 mm	0.114 mm x 0.0856 mm



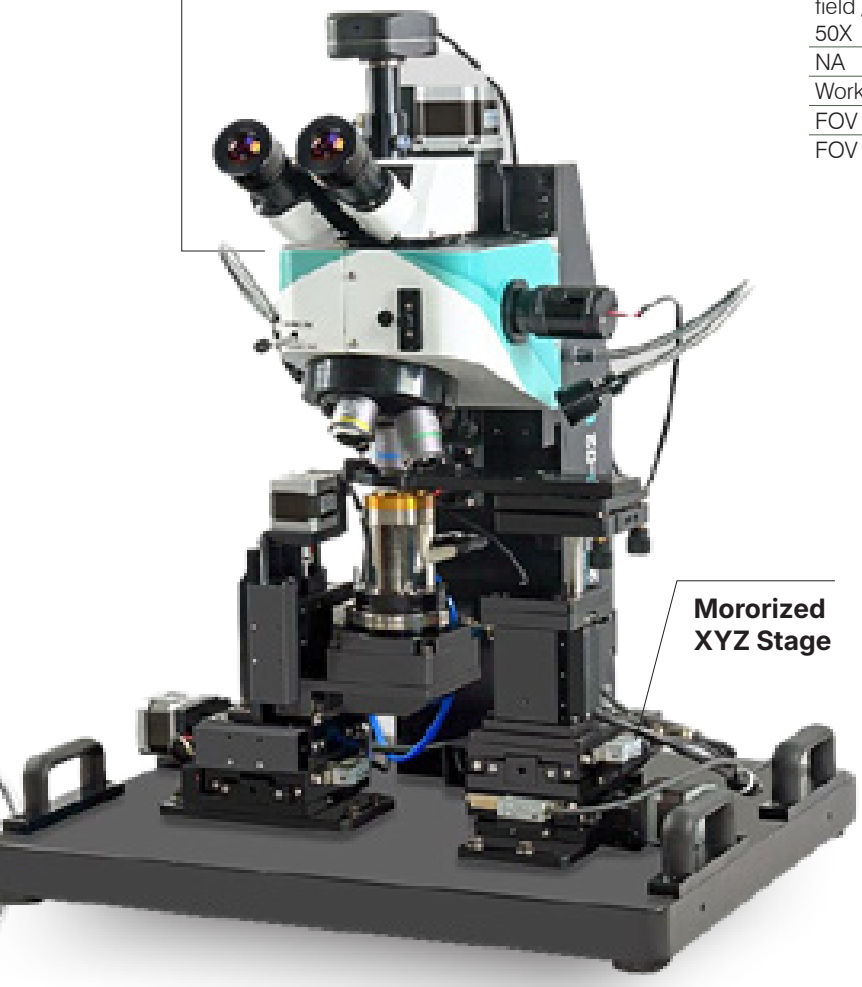
HO-2DTS-TM-01

www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

Optional accessories

Plan Apo Bright field / Dark field 50X	
NA	0.55
Working distance	8 mm
FOV eyepiece	0.4 mm
FOV camera	0.114 mm x 0.0856 mm

HO-2DTS-TM-02BD

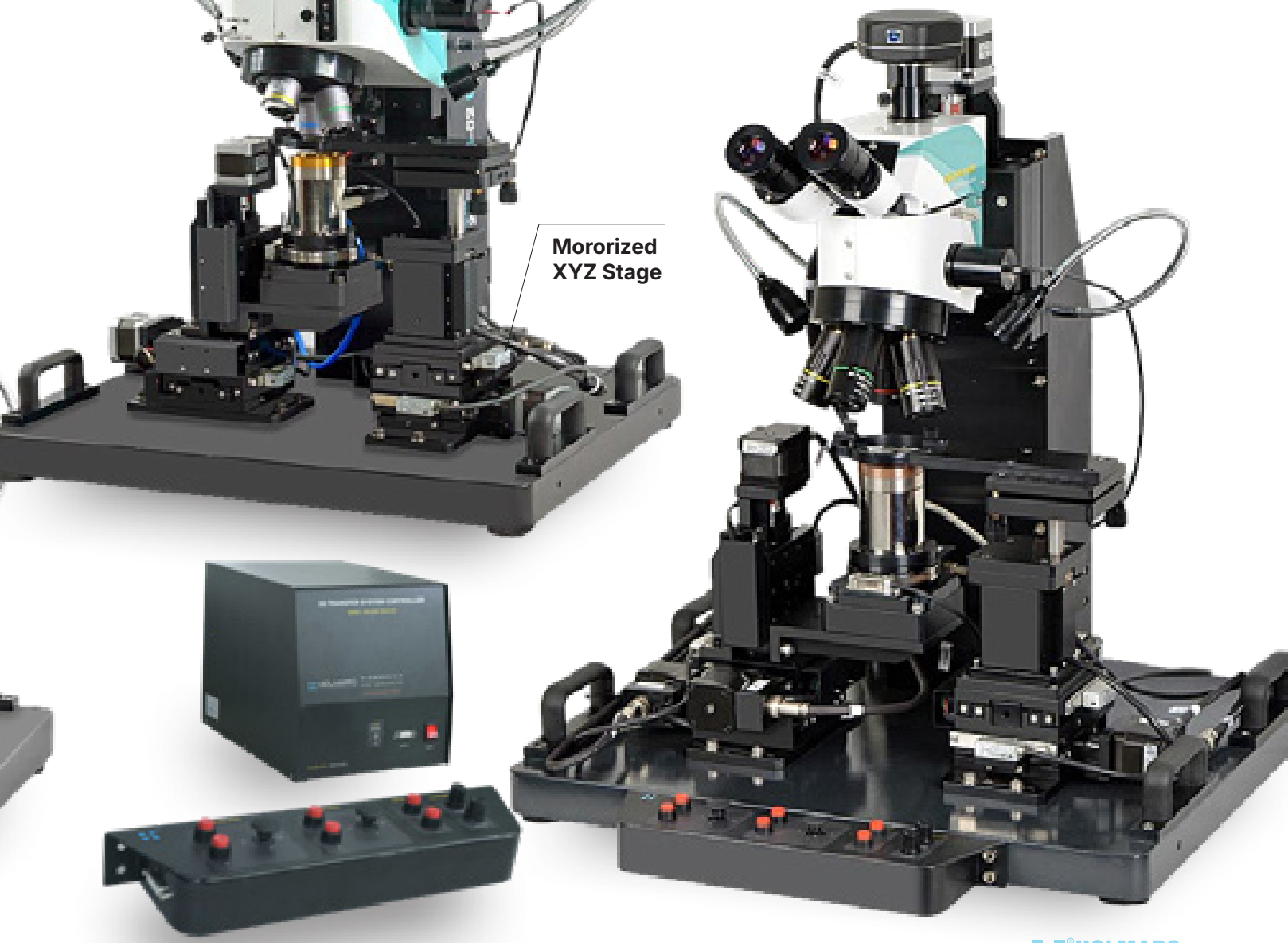


Mororized XYZ Stage

Optional accessories

Plan Apo Bright field / Dark field 50X	10X	20X	50X
NA	0.30	0.35	0.50
Working distance	34 mm	29 mm	17 mm
FOV eyepiece	2 mm	1 mm	0.4 mm
FOV camera	0.57 mm x 0.428 mm	0.285 mm x 0.214 mm	0.114 mm x 0.0856 mm

HO-2DTS-TM-01CM1



HOLMARC OPTO-MECHATRONICS LTD

SPECIFICATIONS

	HO-2DTS-TM-01	HO-2DTS-TM-02BD	HO-2DTS-TM-01CM1
1. Trinocular Microscope with Z focusing stage (1 set)			
Optical system	Infinity corrected	Infinity corrected	Infinity corrected
Observation Method	Brightfield	Bright field and Dark field	Brightfield
Illumination	Reflected (Co-axial and Angled)	Reflected (Co-axial or epi-scopic and two flexible arm LEDs	Reflected (Co-axial or Epi-scopic and two flexible arm LEDs)
Illumination system	High bright white LEDs, Intensity adjustable	High bright white LEDs, Intensity adjustable	High bright white LEDs, Intensity adjustable
Nosepiece	Manual, revolving, quadruple with positive precision click stops	Motorized, Revolving, Quadruple, Software controls	Manual, revolving, quadruple with positive precision click stops
Viewing head	Siedentopf Trinocular head, 30 degree, 48 - 75 mm IP adjustment	Siedentopf Trinocular head, 30 degree, 48 - 75 mm IP adjustment	Siedentopf Trinocular head, 30 degree, 48 - 75 mm IP adjustment
Eyepiece	10X Wide field eyepiece, FN = 20mm, dioptre adjustable	10X Wide field eyepiece, FN = 20 mm, dioptre adjustable	10X Wide field eyepiece, FN = 20mm, dioptre adjustable
Focusing	Manual	Motorized with Push button as well as software controls	Motorized with Push button as well as software controls
Microscope objective	Long working distance Plan Apochromatic	Plan Apo Bright fiel /Dark field 10X	Long working distance Plan Apochromatic
Magnification	5 X	10X and 20x	5 X
Numerical Aperture	0.15	0.3 and 0.5	0.14
Working distance	35 mm	14 mm and 4 mm	40 mm
FOVeyepiece		2 mm and 1 mm	4 mm
FOVcamera		0.57 mm x 0.428 mm and 0.285 mm x 0.214 mm	1.14 mm x 0.856 mm
RMS objective adapter	2 Nos		2 Nos
2. XYZ theta sample stage with Heater & Vacuum chuck			
	Manual XYZ stage	Motorized XYZ stage	Motorized XYZ stage
Mounting hole	m6		
XYZ Travel	25 mm XY, 5mm Z Travel	25 mm each	25 mm each
XYZ Drive		Precise lead screw stepper motor	Precise lead screw stepper motor
Line accuracy	+/- 3.5 um		
Leadscrew pitch		0.4 mm	0.4 mm
X axis resolution	1 um (Digital Micrometer)		
Y axis resolution	5 um		
Z axis resolution	10 micron		
XYZ Resolution		7.8 nm (open loop)	7.8 nm (micro step mode)
XY axis accuracy		1 microns with linear encoder (CL)	1 microns with linear encoder
Z axis accuracy		50 nm with linear encoder (CL)	
Guide way	Precision V grooved guide way	Precision V grooved guide way	Precision V grooved guide way
Xyz axis drive	Digital Micrometer		
Construction	Aluminium alloy	Aluminium alloy	Aluminium alloy
Finish	Black anodized	Black anodized	Black anodized
		Software controls for XYZ sample stage	
		Joy stick controls for XY and Push buttons for Z axis	
	Manual rotation stage	Motorized rotation stage	
Top plate diameter	75 mm	75 mm	75 mm
tapped holes	M6 12.5mm grid	M6 12.5mm grid	
Coarse travel	360 degree +/- 4 degree	360 degree rotatable	
Mount holes base	M6 CBR		
Fine travel	Precision worm gears	Precision worm gears	
design	Modular	Double bearing	
Resolution		0.01 degree	0.01 degree
Accuracy		0.01 degree with encoder	0.01 degree with encoder
Drive	Micrometer	Stepper moto	Stepper motor
Material	aluminium, Black anodized	aluminium, Black anodized	aluminium

Vacuum chuck and Heater with temperature controller			
Sample plate diameter	40 mm	40 mm	40 mm
Temperature range	RT - 200^{o} C	RT - 200^{o} C	RT - 200^{o} C
Temperature increment	1^{o}C	1^{o}C	1^{o}C
PID Controller			
Vacuum provision to hold the samples			
Vacuum Pump			
Software controls for temperature and vacuum			
3.	XYZ Stamping stage with tilting platform (1set)	Motorized XYZ Stamping stage with manual tilting platform	
Top plate size	90 x 90 mm		
X axis travel	25 mm at 5 um res		
Y & Z axes travel	10 m 1 um & 5 um res		
Tapped holes			
Y axis drive	Digital Micrometer		
XYZ Travel		25 mm each	25 mm each
XYZ drive		Precision lead screw with stepper motor	Precision lead screw with stepper motor
Leadscrew pitch		0.4 mm	0.4 mm
XYZ Resolution		7.8 nm (micro step mode)	7.8 nm (micro step mode)
XY axis accuracy		1 microns with linear encoder	1 microns with linear encoder
Z axis accuracy		1 micron with linear encoder	
Guide way	Precision V grooved	Precision V grooved guide way	Precision V grooved guide way
Construction	Aluminium alloy	Aluminium alloy	Aluminium alloy
Finish	Black anodized	Black anodized	Black anodized
Software controls for XYZ stage			
		Joy stick controls for XY and Push buttons for Z axis	
Tilting platform drive			Leadscrew, Manual
			Base plate with levelling foot
			Glass / Sample Holder
			Image grabbing & motorized control software
OTHERS		Base plate with levelling foot, Base plate with levelling foot, Image grabbing & motorized control software	
CAMERA SPECIFICATIONS			
Optical format	1/2.5” CMOS		1/2.5” CMOS
Active imager size	5.70 mm x 4.28 mm		5.70 mm x 4.28 mm
Active pixels	2592 x 1944 (5Mp)		2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um		2.2 x 2.2 um
Shutter type	Electronic rolling shutter (ERS)		Electronic rolling shutter (ERS)
Frame rate	Full resolution - 7 fps, 640 * 480 (BIN) - 26.7 fps		Full resolution - 7 fps, 640 * 480 (BIN) - 26.7 fps
Spectral response	380 - 650 nm		380 - 650 nm
Exposure time	0.072 ms - 3000 ms		0.072 ms - 3000 ms
Image format	RAW, BMP, JPG, PNG		RAW, BMP, JPG, PNG
Operating temperature	-30^{o}C to +70^{o}C		-30^{o}C to +70^{o}C
Sensitivity	1.76V / lux - sec (550 nm)		1.76V / lux - sec (550 nm)
Power consumption	381 mW at 15 fps full res		381 mW at 15 fps full resolution
Interface	USB 2.0		USB 2.0
Lens mount	C - mount		C - mount
Dimension	44 x 44 x 39 mm		44 x 44 x 39 mm

Telemicroscope



Model : HOCM-TM202

The telemicroscope by Holmarc is a specialized imaging instrument designed for observing and analyzing small areas from a considerable distance, ranging between 200 to 2000 mm. It is particularly useful in scenarios where conventional instruments cannot reach, such as imaging sessile drops in furnaces or studying temperature deformation of hot objects in ovens. Its coaxial illumination feature enables precise imaging of small parts inside confined spaces like cylinders, where ordinary illumination may not suffice. This makes it an invaluable tool for industrial, research, and educational applications requiring high-precision imaging in challenging environments





Specifications



Type	Super long working distance
Magnification	1X - 5X
Minimum Working Distance	272mm (1X) - 100mm (5X)
2X magnification working distance	200 mm
Optical Design	Apochromatic 12 Elements in 8 Groups design
Focusing Type	Two cam movement with fine focusing
Illumination Options	Co-axial & angled
Illumination	High bright warm white 3W LED
Travel	
Vertical	Max 1100 mm (Tripod based) 500 mm using rack and pinion and 600 mm slide movement.
X - Y	25 mm (10 micron resolution)
Rotation	
Roll	45°
Yaw	360°

CAMERA SPECIFICATIONS



Optical format	1/2.5” CMOS
Active imager size	5.70 mm x 4.28 mm, 7.13 mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Global reset release (GRR), Snapshot only, Electronic rolling shutter (ERS)
Maximum data rate / master clock	96 Mp/s at 96 MHz (2.8 V I/O)
Frame rate	
Full resolution	Programmable upto 15 fps
VGA (640 x 480 with binning)	Programmable upto 70 fps
ADC resolution	12- bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Power consumption	381mW at 15 fps full resolution
FOV with the above camera	
1X imaging area	5.7 x 4.27 mm
2X imaging area	2.85 x 2.138 mm
3X imaging area	1.9 x 1.425 mm
4X imaging area	1.42 x 1.069 mm
5X imaging area	1.14 x 0.855 mm

Telemicroscope

Model : HO-TLM-0IC

HOLMARC Telemicroscope TM 208 Series is designed for imaging very small area from a distance of 200-2000 mm. It allows microscopic imaging at a considerable distance from the object.

It can image a small area of unreachable places which cannot be measured with ordinary instruments. The main application of the instrument is observing the sessile drops in furnaces. It can also be used for temperature deformation study of hot object in the oven. The coaxial illumination in this unit helps for imaging the small parts of inside the cylinder. Ordinary illumination maynot work for such application.

Telemicroscope has a built-in slide focusing adjustment. This eliminate the complex focusing jobs. The magnification and field of view depend on the distance from the lens to object. Bringing the Telemicroscope as close as possible to the object will maximize magnification and give you the smallest field of view.

Features

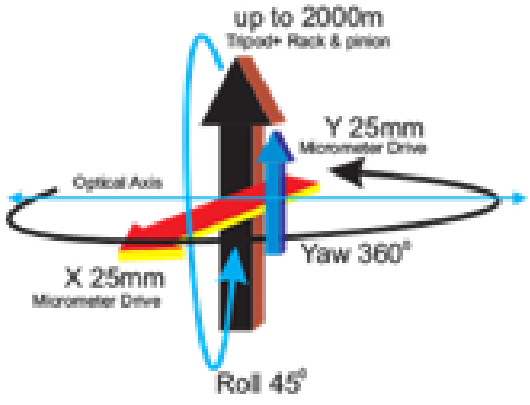
- Long working distance
- Variable Magnification
- Superior image quality
- Easy to set
- Co-axial Illumination for
- In depth viewing
- Roll, Yaw rotation stages
- XY Micrometer Drive

Specifications

Working distance range	200 - 2000 mm
Field of view	Detector size and W.D dependable min. 1000micron for 1/4" CCD @ 200 mm W.D
Magnification	5X variable within the limit
Focusing Type	Two cam movement with fine focusing
Illumination Options	Co-axial & angled
Illumination	High bright warm white 3W LED
Travel	
Vertical	Max 1100 mm (Tripod based) 500 mm using rack and pinion And 600 mm slide movement.
X - Y	25 mm (10 micron resolution)
Rotation	
Roll	45°
Yaw	360°



Telemicroscope Movements



Boom Arc Stand for Cameras

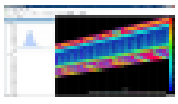


Model HO-BAS-01	
Load carrying capacity	4.5 Kg
XY fine travel using micrometer	25 mm (For fine adjusting camera)
Horizontal coarse travel	600 x 600 mm (XY)
Vertical coarse travel	750 mm

Thermal Analysis



Stress Analysis



Micro level positioning of long distant objects



Crack Monitoring etc





Telemicroscope with Boom Stand
MODEL HO-TLM-0IB



Telemicroscope withCo-axial Illumination Unit
MODEL HO-TLM-0IC



Interferometer



Fizeau Interferometer

Model : HO-OFIZ-215

Most verastile interferometer, Fizeau enables measurements of flat and spherical surfaces using non contact configuration. Its reference and measurement optical paths are the same, making this a compact, vibration-resistant system. Fizeau Interferometer is in a way similar to a Fabry-Perot interferometer as both consist of two reflecting surfaces. In a Fizeau interferometer, however, the second surface is usually totally reflecting. An angled beam splitter captures the reference and measurement beams.

Holmarc Fizeau interferometer has open and vertical configuration. It is made suitable for routine measurements of both flat and spherical surfaces. DPSS laser is used as the light source. Optical layout in vertical direction makes the placement of test components easy. The fringes are captured by CCD camera and analyzed by a computer. This equipment can be used for quality control of optics in manufacturing as well as for routine inspection in laboratories.

Fizeau Interferometer is one of the simplest and most versatile interferometers and is popular for routine measurement of both flat and spherical surfaces. It is used to measure optical components such as flats, prisms, lenses, or precision metal parts such as bearings, sealing surfaces or polished ceramics. Measurements can be made using the static fringe analysis software. The interferometer basically comes with high optical quality of λ/20 reference flat. The reflection from the test surface interferes with the reflection from the reference flat, producing the fringes. The shape and the quality of the fringes depends on the surface quality of the test flat. The fringes are digitalized using a high resolution CCD camera. By analyzing the fringes we can obtain the P-V flatness, RMS flatness, 3D surface plot etc.

The Instrument is designed vertically to fix the test sample easily. The tip / tilt test base allows the test sample to align with the reference surface. High quality aberration corrected optical design enhances performance. The reflection flats and reference spheres are optional. Custom solutions are also possible on request.



SPECIFICATIONS

Sample size	≤ 100 mm
Reference flat	λ/20 P V 100 mm diameter 25 mm thickness
Accuracy	≤ λ / 20 PV
Laser source	DPSS 5.0 mW 532 nm
Alignment	By Tip / tilt sample base
Camera	CCD Res. 1280 x 1024
Analysis	Using fringe analysis software
Weight	Approx. 25 Kg
Power supply	220V, 50Hz

- DPSS Laser Source 532nm (5 mW),
- Spatial Filter Assembly
- Beam Splitter
- Collimating lens with mount
- Reference Flat with mount
- Test Flat mount
- Zoom lens with CCD etc.

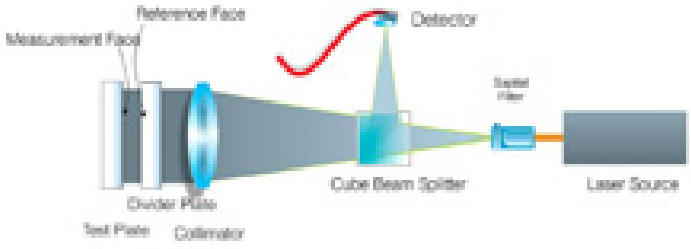
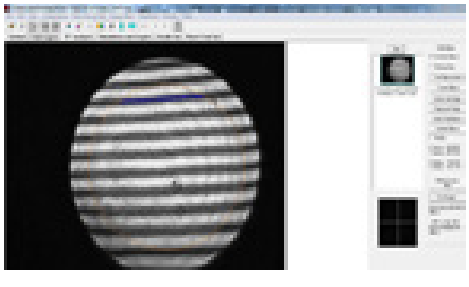
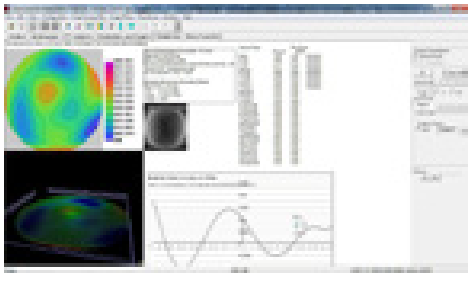


Fig. Fizeo Interferometer Schematic

Software

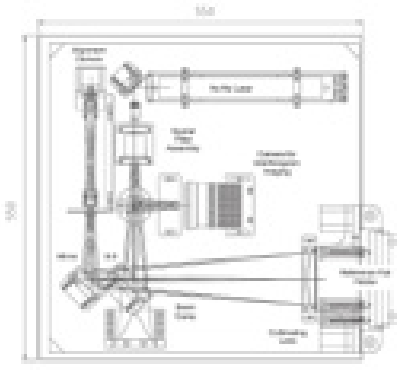




- High precision flatness measurement is possible
- Static fringe analysis software is used
- The instrument is built upright, so the test sample can be fixed easily
- High quality aberration corrected optical components are used

Fizeau Interferometer with Encoder Rail System

Model : HO-OFIZ-216A



Fizeau Interferometer is one of the simplest and most versatile interferometers and is popular for routine measurement of both flat and spherical surfaces. It is used to measure optical components such as flats, prisms, lenses, or precision metal parts such as bearings, sealing surfaces or polished ceramics. Measurements can be made using the static fringe analysis software. The interferometer basically comes with high optical quality (λ/20) reference flat. The reflection from the test surface interferes with the reflection from reference flat producing fringes. The shape and quality of the fringes depends on surface quality of the test flat. The fringes are digitalized using a high resolution CCD camera.

By analyzing the fringes we can obtain the P-V flatness, RMS flatness, 3D surface plot etc. The tip / tilt test base allows the test sample to align with the reference surface. High quality aberration corrected optical design enhances performance. Holmarc's autocollimator has stainless steel body and high precision optics with LED illumination. A kinematic stage with two axes tilt movements hold the instrument on horizontal plane. Different types of accessories are also provided for performing different applications. Customer can choose the required accessories from the optional accessories list.

SPECIFICATIONS

Max Sample Size	≤ 100 mm
Reference optics	Accepts any standard Bayonet mounts
Accuracy	≤ λ/20 PV
Laser Source	DPSS 5.0 mW / 632.8 He-Ne laser
Beam Expander	60x Microscope objective with pinhole
Collimating lens	500 mm Focal length, 100 mm diameter Achromat lens
Alignment	Camera based
Camera 1	3.0 Megapixels CCD with selectable resolution
Camera 2	5.0 Megapixels CCD with selectable resolution
Analysis	Using Fringe Analysis Software (Open fringe & Quick fringe)
Weight	Approx. 25 Kg
Power supply	220 V, 50 Hz
Translation stage	Manual linear translation stage with optical encoder
Travel & Resolution	1200 mm Travel length and 2 Micron resolution
Encoder Output	With the pc interface and software

Optical Setup

Spatial filter assembly and a positive achromatic lens are used to expand and collimated the He-Ne laser. After the collimating lens the reference flat is fixed. The light reflects back from the Reference flat. A cube beam splitter is placed near the beam expander which reflects the reflected light to the zoom lens and CCD. One portion of this reflected falls on camera 1 which is used for align mode. The reflected light from the test sample also retrace the same path and interfere.



4F Sagnac Interferometer

Model : HO-SIS-S01

4f imaging lens assembly (2 set)
38mm mirror with Kinematic mirror mounts (3 sets)
Metallic cube splitter with tilting mount (1 set)
SM1 Threaded mount for 32mm optics (5mm thick) (3 set)
C-mount provision for imaging lens
Enclosure with tripod adapter
LabVIEW codes
Image grabbing software

- 4f imaging lens assembly (2 set)
- 38mm mirror with Kinematic mirror mounts (3 sets)
- Metallic cube splitter with tilting mount (1 set)
- SM1 Threaded mount for 32mm optics (5mm thick) (3 set)
- C-mount provision for imaging lens
- Enclosure with tripod adapter
- LabVIEW codes
- Image grabbing software

CAMERA SPECIFICATIONS

Optical format	1/2.5" CMOS
Active imager size	5.70 mm x 4.28 mm, 7.13 mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Global reset release (GRR), Snapshot only, Electronic rolling shutter (ERS)
Maximum data rate / master clock	96 Mp/s at 96 MHz (2.8 V I/O)
Frame rate	
Full resolution	Programmable upto 15 fps
VGA (640 x 480 with binning)	Programmable upto 70 fps
ADC resolution	12- bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Power consumption	381mW at 15 fps full resolution
FOV with the above camera	
1X imaging area	5.7 x 4.27 mm
2X imaging area	2.85 x 2.138 mm
3X imaging area	1.9 x 1.425 mm
4X imaging area	1.42 x 1.069 mm
5X imaging area	1.14 x 0.855 mm

Shear interferometer



Shear speckle interferometer

Others

Illumination System with Motorized Polarizer Rotator

Model : HO-IMPR-01

SPECIFICATIONS

1. Compact and portable system to illuminate an object through a rotating polarizer sheet
2. High intensity LED light (Ring type) with intensity control
3. An annular back plate / screen (reflector) on the back side of the ring light to avoid light directly falling on the camera
4. An annular diffuser arrangement in front of the ring light source to generate diffused light allowing optical access
5. Linear polarizer sheet (sandwiched b/w glass plates) arranged in-front of the high intensity LED light source / ring light and the diffusor
6. Linear polarizer sheet mounted on a motorized rotator driven by stepper motor
7. Rotator specification
   a. Rotation steps 0.5 degree or less
   b. Accuracy 0.05 degree
   c. Control of rotation through computer
   d. Software to control rotator movements
   e. Sample LabVIEW codes
8. Design of the system with the following basic dimensions
   a. Length of imaging system 230 mm
   b. Diameter of the imaging lens 80 mm
   c. Diameter of polarizer sheet 130 mm
   d. Outer diameter of ring light < 130 mm
   e. Inner diameter of ring light > 80 mm
   f. Inner diameter of the diffuser 80 mm
9. Enclosure with base plate for the entire system
10. Smallest foot print for the system
11. Imaging system Not in the Scope of supply
12. Height adjustable mount of the image sensor and lens

Computer Not in the scope of supply

Speckle pattern interferometer,

Shear plate interferometer



Motorized Disc Rolling Mechanis

Model : HO-MDLM-01

Actuator Type	Motorized Linear actuator with reduction gear mechanism to push center of a circular disc which is fixed on the edges
Test specimen	Circular disc fixed along edges Disc dia - 60 mm Aperture : 50 mm
Platform	Entire system will be on a rigid platform
Disc thickness	5 mm
Disc diameter	60 mm
Drive	Stepper motor
Axial load	Approx. 100 Kg
Position accuracy	1 micron
Linear encoder resolution	1 micron
Maximum travel	10 mm
Lead screw pitch	4 mm square thread
PC controls with software	Actuator can be controlled through PC with software Sample codes for LabVIEW included. Major features include
	a. Set actuator displacement
	b. Increment and decrement of displacement at steps of minimum 1 micro meter
	c. Display of actuator / disc movement
Power Supply	220 ~ 240 VAC , 50 Hz
Circular disc	0. 5 mm, 1 mm and 2 mm thickness
Disc material	Steel
Warranty	One Year



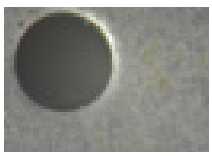
Motorized Disc Rolling Mechanis

Model : HO-MDLM-01

A) Microscope objective	Plan Apo SWLD Infinity corrected
Magnification	10 X
NA	0.30
WD	34 mm
Focal length	20 mm
Parfocal distance	95 mm
Mounting thread	M26 x 0.705 mm
B) Tube lens	Mounted
Focal length	200 mm
Clear aperture	22 mm
Wavelength range	400 - 700 nm
Working distance	178 mm
C) Extension tube	
Camera Mount	F mount
Material	Black anodized aluminium
M6 tapped hole for additional support	











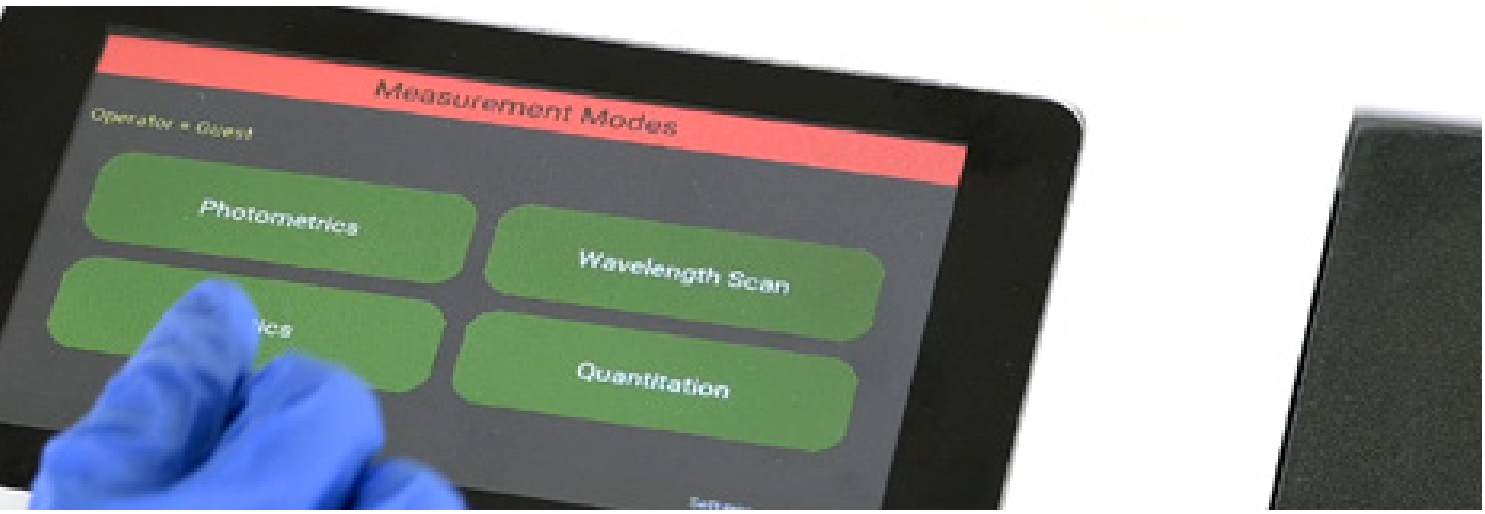
03

SPECTROPHOTOMETER

130 SPECTROPHOTOMETER
132 Spectrophotometer
132 CCD Spectrophotometer / Fluorometer
134 SPE 3000 Series Spectrophotometer
138 SPE 6000 Series
138 Spectrophotometer
142 Theta 2 Theta Advanced
142 Spectrophotometer
144 Theta 2 Theta Advanced scanning Spectrophotometer
SPA216 Series
146 Diffuse Reflectance Spectrophotometer
148 Diffused Reflectance Spectrophotometer
150 Modular Spectrophotometer



Spectrophotometer



CCD Spectrophotometer / Fluorometer

Spectra Analyte Plus

Model No: HO-SP-SCCD2080FC

HOLMARC has developed cost-effective high-performance fiber optic coupled UV/ VIS CCD spectrophotometer instrument that allows analysts to collect a full wavelength spectrum absorbance, transmittance or intensity in less than one second. Standard interface to the spectrophotometer is USB 2.0 compatible with 16-bit extended dynamic range. Spectra Analyte Windows-based spectral acquisition and analysis software is supplied along with the instrument.

The device use high-quality optics and single-piece aluminum optical bench. This design allows continuous stable operation of the instrument. It uses dual spectrum of deuterium and halogen lamp as light source. Emerging light goes through a high-quality diffraction grating, then the diffracted light is collected and sorted by the CCD array detector.

The standard sensor arrays used in the spectrometer is Toshiba TCD1304DG B/W board-level line CCD camera, based on a single-line, 3648-pixel CCD chip. The array driver electronics designed and developed by Holmarc ensures sensitive and stable operation. UV spectrophotometer models use windowless CCD to increase the UV sensitivity down to 200nm. It helps the signal sensitivity below 380nm to get improved (~20 - 50% more) in general.

Spectra Analyte UV-VIS spectrophotometer can also be used as fluorometer or in combination with spectrophotometer. Fluorometer is a device used to measure parameters of fluorescence : its intensity and wavelength distribution of emission spectrum after excitation by certain spectrum of light. It can quantitatively measure the fluorescence spectra of many compounds such as chlorophyll, fluorescein, GFP, and more.

- Measure absorbance, transmittance, fluorescence etc.
- Perform equilibrium studies of absorbance vs. time or absorbance vs. concentration.
- Perform colorimetric measurements.
- Measure emissions of gas discharge tubes, flame tests or other light sources.

Uses Dual Spectrum

Continuous and stable operation



Standard Spheres

Model No.	HO-CT216-UV	HO-CT216-4065	HO-CT216-2010	HO-CT216-3010
Wavelength Range	200 ~ 400 nm	400 ~ 700 nm	200 ~ 1000 nm	320 ~ 1,050 nm
Resolution*	0.25 nm	0.29 nm	1 nm	0.9 nm
Optical Platform	Czerny-Turner / Concave			
Effective Spectral Range	200 to 1050 nm			
Input Fiber Connector	SMA 905			
Input Fiber NA	0.22			
Stray Light	< 0.06 % @ 532 nm (< 0.1% overall)			
Detector	Toshiba TCD1304AP Linear CCD Array			
Pixel Number	3648			
Pixel Size	8 x 200 μm			
Pixel Well Depth	100,000 electron			
Signal-to-noise Ratio	1,000:1 (at full scale)-			
A / D Resolution	16 bit			
Integration Time	0.1 to 6,500 ms			
Frame Rate	up to 138 fps			
Trigger Input	Optional			
PC interface	USB 2.0			
Software	Spectra Analyte Includes DLL libraries and SDKs for easy custom application development			

Accessories for Fiber optic coupled Spectra Analyte Plus

Fiber Optic Dip Probe



NV16 spectrophotometer fiber optic model extend their capabilities to the use of dip probes for facilitating analysis while lending themselves to real-time monitoring of kinetic reactions.

The probe body material is built entirely of 316 stainless steel construction and lined with a quartz or glass. Fiber optic cable lengths can also be configured to meet customer needs.

Flow Through Cells



Our Fiber optic flow through cells are ideal for demanding applications including process control, chromatography and when monitoring reactions in remote locations. The flow through cell is built entirely of 316 stainless steel construction and lined with a quartz or glass, the flow through cell is virtually maintenance free.

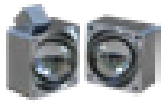
Small size and variable length fiber optic cables allow the flow through cell to be mounted just about anywhere.

Fiber Optic Reflectance Probes



Reflectance Probes are ideal for measuring the absorption characteristics of solid surfaces, powdered substrates and liquids.

Integrating Spheres for Reflectance Measurements



Fiber optic coupled integrating sphere attachments for uniform, diffused illumination and total reflectance measurements of sample.

They are suitable for solid surface analysis, color analysis and for the measurement of samples of varying gloss texture.

Cuvette holder with fiber collimator unit

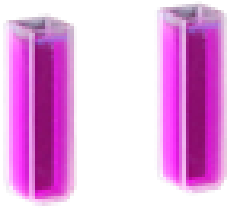


Fiber optic cuvette holders are for standard 10mm path length cuvettes. They are designed to work in UV-VIS-NIR spectral range. They have two terminals and one slot for transmittance / absorptance measurements.



SPE 3000 Series Spectrophotometer

The SPE 3000 series spectrophotometers offer high accurate measurement over wide range of sample. The Czerny turner monochromator design with high quality blazed holographic gratings offer low stray light and greater stability over the entire spectral range. The system is equipped with 7-inch touch screen which helps easy use of all the functions like wavelength scan, Photometric measurement etc. and saving the measurements. It comes with a replaceable sample holder for thin film coated glass slides & 10 mm path length cuvette holder for liquids.





Accessories

Cuvettes, Cuvette holders, Light sources, optical fiber patch cords, calibration samples, long path cuvettes, reflection probes

- Absorbance/Transmittance, Concentration & Kinetics measurements
- Single and multi-wavelength photometry
- Fast and Accurate measurement
- Live plotting of parameters on colour display and PC software
- Cuvette holder, Thin Film sample holder & Integrating Sphere.*
- Thin Film thickness measurement *
- Integrating Sphere for Solid and Powder samples*
- AUTOMATIC DARK CORRECTION
- AUTOMATIC BASELINE CORRECTION
- 2 Years warranty*

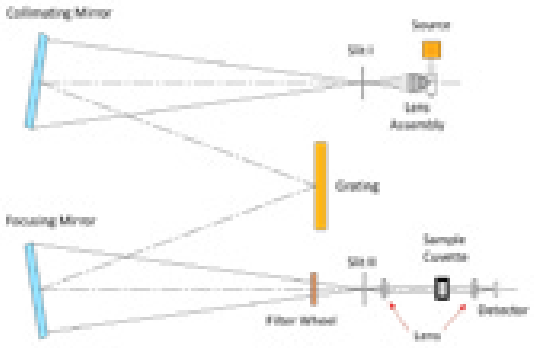
SINGLE BEAM

UV VIS NIR
ACCESSORIES

Customized accessories are available to address individual application requirements. Model SPE-3000S comes with 10 mm path length cuvettes. Cuvettes of smaller path lengths are available as optional accessory.

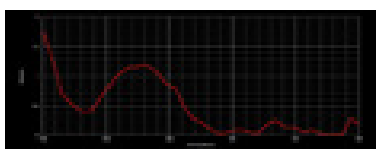
For most (99%) absorbance measurements 10 mm path length cuvettes are suitable. Cuvettes of shorter path lengths allow the measurement of concentrated samples without dilution

How it Works?



- Wavelength range between 380 to 1100nm
- Selectable scan wavelength interval 1 to 50nm
- Live absorbance plot during scanning
- Plot browser to read absorbance values at each wavelength
- Analyzer to find out absorbance and wavelength of peaks and valleys



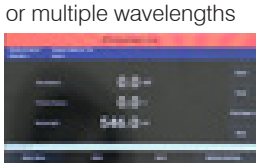




Multiple Measurement Modes

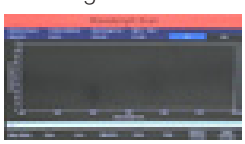
Photometric

Photometric scanning mode enables precise absorbance and transmittance measurements at single or multiple wavelengths



Wavelength

Wavelength scanning mode enables users to obtain detailed sample spectra by scanning across a range of wavelengths



Quantitation

Generates a calibration curve from the measurement of standards, and then calculates the concentrations of unknowns.



Single Beam	SPE-3000 S	SPE-3000 S-T	SPE-3000 S-TD
Name	**Single Beam Visible Spectrophotometer**	**Single Beam Visible Spectrophotometer with Thin Film Characterization**	**Single Beam Visible Spectrophotomete with Thin Film & DRS**
Type of Spectrophotometer	VISIBLE	VISIBLE single beam with additional thin film sample holder which also can be rotated and fixed at a particular angle for reflection and transmission measurement. Thin Film Pro software package is included for the thin film thickness measurement	Single beam Visible with rotatable thin film sample holder and thin film characterization. The 2-inch integrating sphere with dedicated highly sensitive detector for measuring the solid and powder samples
Measurement Modes	Transmittance, Absorbance	Transmittance, Reflectance, Absorbance, Thin film Thickness	Transmittance, Reflectance, Absorbance, Diffuse Reflectance and Thin film Thickness, Optional Band Gap
Type of Optical System	Single Beam Czerny -Turner design with 1200 l/mm holographic grating optical system	Single Beam Czerny -Turner design with 1200 l/mm holographic grating optical system	Single Beam Czerny -Turner design with 1200 l/mm holographic grating optical system
Light Source	Quartz Halogen Lamp 20W	Quartz Halogen Lamp 20W	Quartz Halogen Lamp 20W
Wavelength			
Range	340 to 1100 nm	360 to 1100 nm	340 to 1100 nm
Resolution	0.1 nm	0.1 nm	0.1 nm
Accuracy	± 0.5 nm	± 0.5 nm	± 0.5 nm
Transmittance			
Range	0 to 100 %	0 to 100 %	0 to 100 %
Resolution	0.1 %	0.1 %	0.1 %
Accuracy	± 0.2 %	± 0.2 %	± 0.2 %
Noise Level	< 0.1 %	< 0.1 %	< 0.1 %
Stability	+/-0.1% / Hr after warm-up	+/-0.1% / Hr after warm-up	+/-0.1% / Hr after warm-up
Absorbance			
Range	0 to 2.5 A	0 to 2.5 A	0 to 2.5 A
Resolution	0.002 A	0.002 A	0.002 A
Concentration			
Range	0 to 999	0 to 999	0 to 999
Display	In-built display	In-built display	In-built display
LCD	Colour Touchscreen	Colour Touchscreen	Colour Touchscreen
Size	7 Inch	7 Inch	7 Inch
Memory	1 GB	1 GB	1 GB
Detector	Silicon Photodiode, dual detector	Silicon Photodiode, dual detector	Silicon Photodiode, dual detector
PC Interface	USB	USB	USB
Software	Spectra Software compatible with Windows	Spectra Software with Thin film Pro compatible with Windows	Spectra Software with Thin film Pro compatible with Windows
Sample holder	10 pathlength Cuvette	10 path length Cuvette & Rotatable thin film slide holder	10 path length Cuvette & Rotatable thin film slide holder
Input Voltage	230V 50Hz	230V 50Hz	230V 50Hz
Other measurement modes	-	Thin film reflection and thickness measurement	Thin film reflection and thickness measurement, Solid and powder sample measurement with Integrating sphere
Dimension & Weight	500 x 400 x 260 mm, 20 Kg,	500 x 400 x 260 mm, 20 Kg,	500 x 400 x 260mm, 20 Kg

Single Beam UV	SPE 3000 S UV	SPE 3000 S UV-T	SPE 3000 S UV-TD
Name	**Single Beam UV Visible Spectrophotometer**	**Single Beam UV Visible Spectrophotometer with Thin Film Characterization** Thin Film	**Single Beam UV Visible Spectrophotomete with Thin Film & DRS** (Thin Film & Integrating Sphere)
Type of Spectro photometer	UV – VISIBLE	UV – VISIBLE single beam spectrophotometer with rotatable sample and detector for thin film characterization. Thin Film Pro software package is included for the thin film thickness measurement.	UV – VISIBLE single beam spectrophotometer with rotatable sample and detector for thin film characterization. Thin Film Pro software package is included for the thin film thickness measurement.2 inch integrating sphere with high reflective coating and Si highly sensitive Si photodiode detector for powder & solid sample
Measurement Modes	Transmittance, Absorbance,	Transmittance, Reflectance, Absorbance, Thin film Thickness	Transmittance, Reflectance, Absorbance, Diffuse Reflectance and Thin film Thickness, Optional Band Gap
Type of Optical System	Single Beam Czerny -Turner design with 1200 l/ mm holographic grating optical system	SSingle Beam Czerny -Turner design with 1200 l/mm holographic grating optical system	Single Beam Czerny -Turner design with 1200 l/mm holographic grating optical system
Light Source	Quartz Halogen Lamp 20W & Deuterium 20W	Quartz Halogen Lamp 20W & Deuterium 20W	Quartz Halogen Lamp 20W & Deuterium 20W
Wavelength			
Range	190 to 1100nm	190 to 1100nm	190 to 1100nm
Resolution	0.1 nm	0.1 nm	0.1 nm
Accuracy	± 0.5 nm	± 0.5 nm	± 0.5 nm
Transmittance			
Range	0 to 100 %	0 to 100 %	0 to 100 %
Resolution	0.1 %	0.1 %	0.1 %
Accuracy	± 0.2 %	± 0.2 %	± 0.2 %
Noise Level	< 0.1 %	< 0.1 %	< 0.1 %
Stability	+/-0.1% / Hr after warm-up	+/-0.1% / Hr after warm-up	+/-0.1% / Hr after warm-up
Absorbance			
Range	0 to 2.0 A	0 to 2.0 A	0 to 2.0 A
Resolution	0.002 A	0.002 A	0.002 A
Concentration			
Range	0 to 999	0 to 999	0 to 999
Display	In-built display	In-built display	In-built display
LCD	Colour Touchscreen	Colour Touchscreen	Colour Touchscreen
Size	7 Inch	7 Inch	7 Inch
Memory	1 GB	1 GB	1 GB
Detector	Silicon Photodiode	Silicon Photodiode	Silicon Photodiode
PC Interface	USB	USB	USB
Lamps	Tungsten Lamp & Deuterium	Tungsten Lamp & Deuterium	Tungsten Lamp & Deuterium
Light Source Switching	Automatic switching selectable for 325 nm - 370 nm range	Automatic switching selectable for 325 nm - 370 nm range	Automatic switching selectable for 325 nm - 370 nm range
Software	Spectra Software compatible Windows	Spectra Software compatible with Windows & Thin Film Pro	Spectra Software compatible with Windows & Thin Film Pro
Sample holder	10 path length Cuvette	10 path length Cuvette & Thin film sample holder	10 path length Cuvette , Thin film sample holder& Integrating sphere with detector
Input Voltage	230V 50Hz	230V 50Hz	230V 50Hz
Dimension	500 x 400 x 260 mm, 20 Kg	500 x 400 x 260 mm, 20 Kg	500 x 400 x 260 mm, 20 Kg

HOLMARC OPTO-MECHATRONICS LTD

SPE 6000 Series Spectrophotometer

The SPE 6000 S Spectrophotometer comes inbuilt colour touch screen which helps easy use of all the functions like wavelength scan, Photometric measurement etc. and saving the measurements. It utilizes a double lamp Czerny turner deign to achieve high light throughput and best spectral performance over the 190 nm to 1100nm wavelength range. The high-quality optical grating, detector and control electronics assure low stray light and greater stability over the entire spectral range. The 7-inch touch screen integration provides easy use of the system with all the software functions. The system is equipped with 7-inch touch screen.
The user-friendly spectra software provided with the instrument to use with any computer through the USB communication.



Custom Glass Cuvettes

We can manufacture quartz cells and cuvettes of custom specifications for spectrometer, spectrophotometer, colorimeter, and other instruments



For Custom Glass Cuvettes, please Specify the Material, Optical path, Dimensions (mm), Volume (ml), Beam width (mm

- Double beam optical system
- Low noise and Low stray light
- Absorbance, Concentration & Kinetics measurements
- 7“ Colour Touch screen display
- Automatic wavelength and photometric calibration
- SEPARATE LOGIN FOR ADMINISTRATOR AND USER
- AUTOMATIC DARK CORRECTION
- AUTOMATIC BASELINE CORRECTION
- Live plotting of parameters on front panel display and PC software
- Cuvette and Glass slide holder
- Thin Film Thickness measurement*
- Integrating Sphere for Solid powder samples*
- 2 Years warranty*

DOUBLE BEAM

UV VIS NIR
ACCESSORIES



- Integrating Sphere
- Thinfilm & Powder Sample Holder
- Peltier Kinetic Test System
- Flow Through System
- Variable Angle Reflection Measurement Unit

Easy to Operate,Measurements made easy and accurate

Easy to use interface design
Touch Screen Display



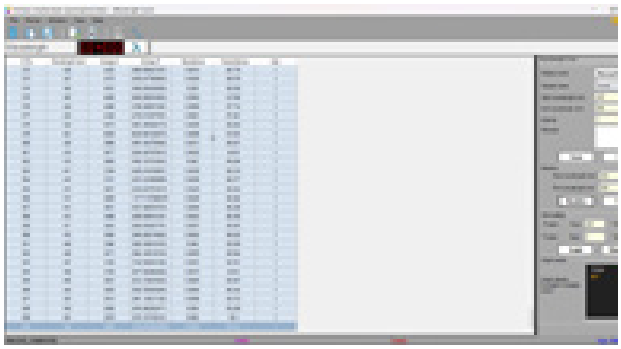
High Performance to Meet Different Needs

The instrument is equipped with an high speed scan, which can acquire a spectrum in a few seconds, with lowest level of stray light and noise in its class

- Compact Design
- Large LCD and friendly interface make the operation extremely easy.
- Precise measurements over a wide photometric range.
- Step scan function provides reliable peak assignment of samples with sharp or narrow absorption peaks.
- User-friendly graphical interfaces.
- Excellent signal-to-noise ratio for the entire UV to NIR spectral range.

Easy to Use Interface
Ergonomic Hardware Design
Low Stray Light





Wavelength Scan



Quantitation Analysis

Software Overview

- Spectrum scanning
- Photometric measurements
- Kinetic measurements
- Quantitative determination
- Multi component analyses Powerful data processing
- Printing report

Double Beam	**SPE 6000 S**	SPE 6000 S-T	**SPE 6000 S -TD**
Name	**Double Beam Visible Spectrophotometer**	**Double Beam Visible Spectrophotometer with Thin Film Characterization**	**Double Beam Visible Spectrophotometer with Thin Film and DRS**
Name		VISIBLE double beam with additional thin film sample holder which also can be rotated and fixed at a particular angle for reflection and transmission measurement. Thin Film Pro software package is included for the thin film thickness measurement	VISIBLE double beam spectrophotometer with rotatable sample and detector for thin film characterization. Thin Film Pro software package is included for the thin film thickness measurement.2 inch integrating sphere with high reflective coating and Si highly sensitive Si photodiode detector for powder and solid sample measurement. The reference diffused reflection sample will be provided with the instrument.
Measurement Modes	Transmittance, Absorbance	Transmittance, Reflectance, Absorbance, Thin film Thickness	Transmittance, Reflectance, Absorbance, Diffuse Reflectance and Thin film Thickness, Optional Band Gap
Wavelength Range	340-1100nm	340-1100nm	340-1100nm
Spectral Bandwidth	1nm	1nm	1nm
Optical System	Double Beam, Czerny-Turner design with1200 l/mm Holographic Grating	Double Beam, Czerny-Turner design with1200 l/mm Holographic Grating	Double Beam, Czerny-Turner design with1200 l/mm Holographic Grating
Wavelength Accuracy	±0.25nm	±0.25nm	±0.25nm
Wavelength Repeatability	≤0.2nm	≤0.2nm	≤0.2nm
Wavelength Resolution	0.1nm	0.1nm	0.1nm
Photometric Range	0-100%T, 0-2.5A, 0-9999C	0-100%T, 0-2.5A, 0-9999C	0-100%T, 0-2.5A, 0-9999C
Photometric Accuracy	±0.005A ±0.5%T	±0.005A ±0.5%T	±0.005A ±0.5%T
Scan Speed	High, Medium,	High, Medium, Low.	High, Medium, Low.
Stability	±0.25T / Hr	±0.25T / Hr	±0.25T / Hr
Sample Compartment	10mm Pathlength Cuvette	10mm Pathlength Cuvette, Thin Film Sample Holder	10mm Pathlength Cuvette, ,
			Thin Film Sample Holder
			Integrating Sphere
Detector	Silicon Photodiode	Silicon Photodiode	Silicon Photodiode
Lamps	Tungsten Lamp	Tungsten Lamp	Tungsten Lamp
Display	In-built display	In-built display	In-built display
	LCD: Colour Touchscreen	LCD: Colour Touchscreen	LCD: Colour Touchscreen
	Size- 7 Inch	Size- 7 Inch	Size- 7 Inch
	Memory – 1 GB (expandable)	Memory – 1 GB (expandable)	Memory – 1 GB (expandable)
Output Port	USB Port	USB Port	USB Port
Printer	USB Printer	USB Printer	USB Printer
PC Software	Holmarc Spectra scan	Holmarc Spectra scan, Thin Film Pro	Holmarc Spectra scan, Thin Film Pro
Operating System	Windows 10 or Higher	Windows 10 or Higher	Windows 10 or Higher
Security	Password Protection (Admin and User Login)	Password Protection (Admin and User Login)	Password Protection (Admin and User Login)
Power Requirements	AC 90-250V, 50/60Hz	AC 90-250V, 50/60Hz	AC 90-250V, 50/60Hz
Dimension	500x400x225mm	500x400x225mm	500x400x225mm
Weight	20kg	20kg	20kg
Accessories	Cuvette, Pendrive USB Cable, User Manual	Cuvette, Pendrive USB Cable, User Manual	Cuvette, Pendrive USB Cable, User Manual

Double Beam UV	SPE 6000 S UV	SPE 6000 S UV-T	SPE 6000 S UV-TD
Name	**Double Beam UV Visible Spectrophotometer**	**Double Beam UV Visible Spectrophotometer with Thin Film Characterization** UV -VISIBLE double beam with additional thin film sample holder which also can be rotated and fixed at a particular angle for reflection and transmission measurement. Thin Film Pro software package is included for the thin film thickness measurement.	**Double Beam UV Visible Spectrophotometer with Thin Film & DRS**
Measurement Modes	Transmittance, Absorbance	Transmittance, Reflectance, Absorbance, Thin film Thickness	Transmittance, Reflectance, Absorbance, Diffuse Reflectance and Thin film Thickness, Optional Band Gap
Wavelength Range	190-1100nm	190-1100nm	190-1100nm
Spectral Bandwidth	1nm	1nm	1nm
Optical System	Double Beam, Czerny-Turner design with1200 l/mm Holographic Grating	Double Beam, Czerny-Turner design with1200 l/mm Holographic Grating	Double Beam, Czerny-Turner design with1200 l/mm Holographic Grating
Wavelength Accuracy	±0.25nm	±0.25nm	±0.25nm
Wavelength Repeatability	≤0.2nm	≤0.2nm	≤0.2nm
Wavelength Resolution	0.1nm	0.1nm	0.1nm
Photometric Range	0-100%T, 0-2.5A, 0-9999C	0-100%T, 0-2.5A, 0-9999C	0-100%T, 0-2.5A, 0-9999C
Photometric Accuracy	±0.005A ±0.5%T	±0.005A ±0.5%T	±0.005A ±0.5%T
Scan Speed	High, Medium, Low.	High, Medium, Low.	High, Medium, Low.
Stability	±0.25T	±0.25T	±0.25T
Sample Compartment	10mm Pathlength Cuvette	10mm Pathlength Cuvette	10mm Pathlength Cuvette
		Thin Film sample Holder	Thin Film sample Holder
			Double Integrating sphere with powder and slide holder
Detector	Silicon Photodiode	Silicon Photodiode	Silicon Photodiode
Lamps	Tungsten Lamp & Dueterium	Tungsten Lamp & Dueterium	Tungsten Lamp & Dueterium
Light Source Switching		Automatic switching selectable for 325 nm - 370 nm range	Automatic switching selectable for 325 nm - 370 nm range
Display	In-built display	In-built display	In-built display
	LCD: Colour Touchscreen	LCD: Colour Touchscreen	LCD: Colour Touchscreen
	Size- 7 Inch	Size- 7 Inch	Size- 7 Inch
	Memory – 1 GB	Memory – 1 GB	Memory – 1 GB
Output Port	USB Port	USB Port	USB Port
Printer	External Printer (Optional)	External Printer (Optional)	External Printer (Optional)
PC Software	Holmarc Spectra scan	Holmarc Spectra scan, Thin Film Pro	Holmarc Spectra scan, Thin Film Pro
Operating System	Windows 10 or Higher		
Security	Password Protection (Admin and User Login)	Password Protection (Admin and User Login)	Password Protection (Admin and User Login)
Operating Temperature	10-45	10-45	10-45
Power Requirements	AC 90-250V, 50/60Hz	AC 90-250V, 50/60Hz	AC 90-250V, 50/60Hz
Dimension	500x400x225mmmm	500x400x225mmmm	500x400x225mmmm
Weight	20kg	20kg	20kg
Accessories	Cuvette, Pendrive USB Cable, User Manual	Cuvette, Pendrive USB Cable, User Manual	Cuvette, Pendrive USB Cable, User Manual

Theta 2 Theta Advanced Spectrophotometer

Reliable measurement techniques for optical characterization of thin film is a must for any laboratory. HOLMARC's Theta 2 Theta Spectrophotometer is a useful tool for characterizing absorption, transmission, and reflectivity of a variety of materials such as pigments, coatings, windows, and filters. Automated Theta 2 Theta goniometer tool is used for measuring absolute reflectance and transmittance of samples at different angles for characterization of the optical or electronic properties of materials. Reflectance measurements can identify the color of a sample or examine differences between objects for sorting or quality control.

SPA216 Series spectrophotometer gives precise measurements of spectral parameters such as reflection, transmission, and optical density in all spectral range of UV, VIS and NIR. Spectral transmission and reflection measurements at any desired angle with a resolution of 0.5° can be carried out with this spectrophotometer. Two models are available for angular photometric measurements HO-SPA-1990P & HO-SPA-3411D. HO-SPA-1990P is a scientific grade photometer equipped with high sensitive photo multiplier tube. Model : HO-SPA-3411D uses Si-Photodiode as detector. Angles for illumination and measurement can be set independently. The system is provided with motorized polarizer and analyzer to generate polarization curve of the sample at various angles.

The software developed for this instrument has facilities for setting up and calibration in addition to scanning and manual readout. Scanning is possible for a desired wavelength range too. This feature can save time whenever full wavelength range scan is not necessary. The software stores and displays the data acquired on MS Excel sheet. This helps to plot graph with ease whenever required.

We hold expertise in designing and manufacturing custom models. Wide variety of accessories (optional) such as test tube holder, long path cuvettes holder and multiple cell holder can be included depending upon the varying application needs of the customer.

Features

- Specially designed for optical characterization
- Ideal for reflectance, transmission, absorption and optical density measurements
- Design optimized for low stray light
- Interchangeable holders for solid, liquid and thin film samples
- Wide range of accessories such as polarizers, filters etc.

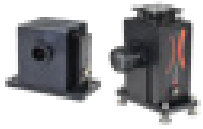


Specifications

Model	HO-SPA-3411D	HO-SPA-1990P
Bandwidth	1 nm	0.5 nm
Optical system	C-T monochromator, 1200 l/mm holographic grating	
Wavelength range	340 ~1100 nm	190 ~ 900 nm
Photometric method	Transmittance, Absorbance, Concentration	Transmittance, Absorbance, Concentration
Wavelength accuracy	± 0.5 nm	± 0.5 nm
Wavelength repeatability	± 1 nm	± 1 nm
Absorbance range	0 ~ 2Abs	0 ~ 2Abs
Photometric accuracy	± 0.002 A (0 ~ 0.5 A), ± 0.004 A (0.5 ~ 1A), ± 0.3% T	± 0.002 A (0 ~ 0.5 A), ± 0.004 A (0.5 ~ 1A), ± 0.3% T
Photometric repeatability	≤ 0.001 A (0 ~ 0.5 A), ≤ 0.002 A (0.5 ~ 1 A), ± 0.1% T	≤ 0.001 A (0 ~ 0.5 A), ≤ 0.002 A (0.5 ~ 1 A), ± 0.1% T
Stray light	≤ 0.05% T	≤ 0.05% T
Baseline straightness	± 0.002 A	± 0.002 A
Detector	Si - Photodiode	PMT
Light source	Quartz Halogen Lamp	Deuterium / Halogen
Cell holder	Two-position 10mm standard cuvette holde	Two-position 10mm standard cuvette holde
Theta 2 Theta measurement	Goniometer for Angular Measurements Type : Theta 2 Theta Measuring Stage Sample Holder : Up to 50 x 50mm size, Custom Size Available Angular Measurement Range : 30° - 180° Positioning Resolution : 0.5°	Goniometer for Angular Measurements Type : Theta 2 Theta Measuring Stage Sample Holder : Up to 50 x 50mm size, Custom Size Available Angular Measurement Range : 30° - 180° Positioning Resolution : 0.5°
Control Mode	PC control (Software : PhotoANALYTE-G)	PC control (Software : PhotoANALYTE-G)
Dimensions (L x W x H) mm	606 x 352 x 135	606 x 352 x 230
Software		Spectra Photo ANALYTE

Light Source

Quartz Halogen

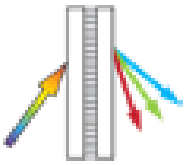


Measurements

Transmittance, Absorbance, Concentration

Holographic Gratings

1200 l/mm holographic grating



Detectors

Option A
Model HO-SPA-3411D
Si - Photodiode

Option B
Model HO-SPA-1990P
PMT

UV VIS NIR
ACCESSORIES

Wavelength

HO-SPA-3411D
340 ~1100 nm

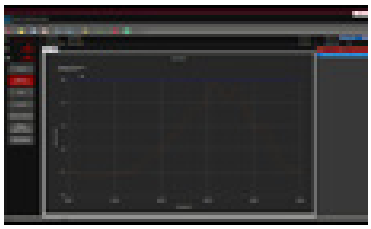
HO-SPA-1990P
190 ~ 900 nm

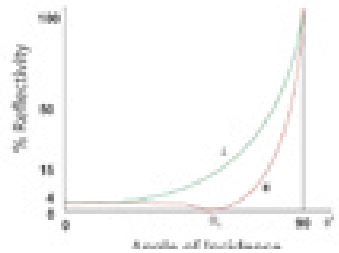


Software

- Powerful software designed for Photometry
- Spectra Photo ANALYTE
- Powerful software designed for Photometry
- Spectrum scanning
- Photometric measurements
- Quantitative determination
- Multi component analyses
- Powerful data processing abilities
- Printing report









HOLMARC OPTO-MECHATRONICS LTD

Theta 2 Theta Advanced scanning Spectrophotometer SPA216 Series

Reliable measurement techniques for optical characterization of thin film is a must for any laboratory. HOLMARC's Theta 2 Theta Spectrophotometer is a useful tool for characterizing absorption, transmission, and reflectivity of a variety of materials such as pigments, coatings, windows, and filters. Automated Theta 2 Theta goniometer tool is used for measuring absolute reflectance and transmittance of samples at different angles for characterization of the optical or electronic properties of materials. Reflectance measurements can identify the color of a sample or examine differences between objects for sorting or quality control.Integrating sphere attachment also provided for solid and powder sample measurements.

System Features

Specially designed for optical characterization
Ideal for reflectance, transmission, absorption and optical density measurements
Design optimized for low stray light
Interchangeable holders for solid, liquid and thin film samples



Specifications

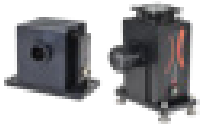
Three models	340- 1100 nm	190 – 1100 nm	190- 2400 nm
Bandwidth	1 nm	0.5 nm	
Optical system	C-T monochromator, 1200 l/mm holographic grating		
Wavelength range	340 ~1100 nm	190 ~ 900 nm	190 -2400 nm
Photometric method	Transmittance, Absorbance, Concentration		
Wavelength accuracy	± 0.5 nm	± 0.5 nm	± 0.5 nm
Wavelength repeatability	± 1 nm	± 1 nm	± 1 nm
Absorbance range	0 - 2Abs	0 - 2Abs	0 - 2Abs
Photometric accuracy	± 0.002 A (0 ~ 0.5 A)	± 0.004 A (0.5 ~ 1A),	± 0.3% T
Photometric repeatability	≤ 0.001 A (0 ~ 0.5 A)	≤ 0.002 A (0.5 ~ 1 A),	± 0.1% T
Stray light	≤ 0.05% T		
Baseline straightness	± 0.002 A		
Detector	Si – Photodiode, PMT& InGaAS		
Light source	Quartz Halogen Lamp/Deuterium &Halogen		
Cell holder	Two-position 10mm standard cuvette holder		
Theta 2 Theta measurements Goniometer for Angular Measurements			
Type	Theta 2 Theta Measuring Stage		
Sample Holder	Up to 50 x 50mm size, Custom Size Available		
Angular Measurement Range	30° - 180°		
Positioning Resolution	0.5°		
Control Mode	PC control		
Dimensions (L x W x H) mm	606 x 352 x 135	606 x 352 x 230	

Software designed for photometry

Spectrum Scanning
Photometric measurements
Quantitative determination
Multi component analysis
Powerful data processing abilities

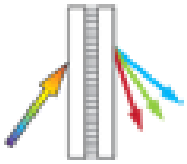
Light Source

Quartz Halogen



Holographic Gratings

1200 l/mm holographic grating



Detectors

Si – Photodiode,
PMT& InGaAS



Wavelength

Options A
340- 1100 nm

Option B
190 – 1100 nm

Option
190- 2400 nm



PC Controls

Single Glass Slide Holder



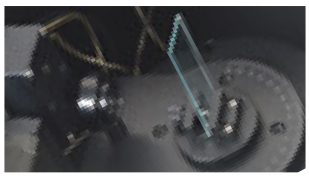
Cuvette Holder

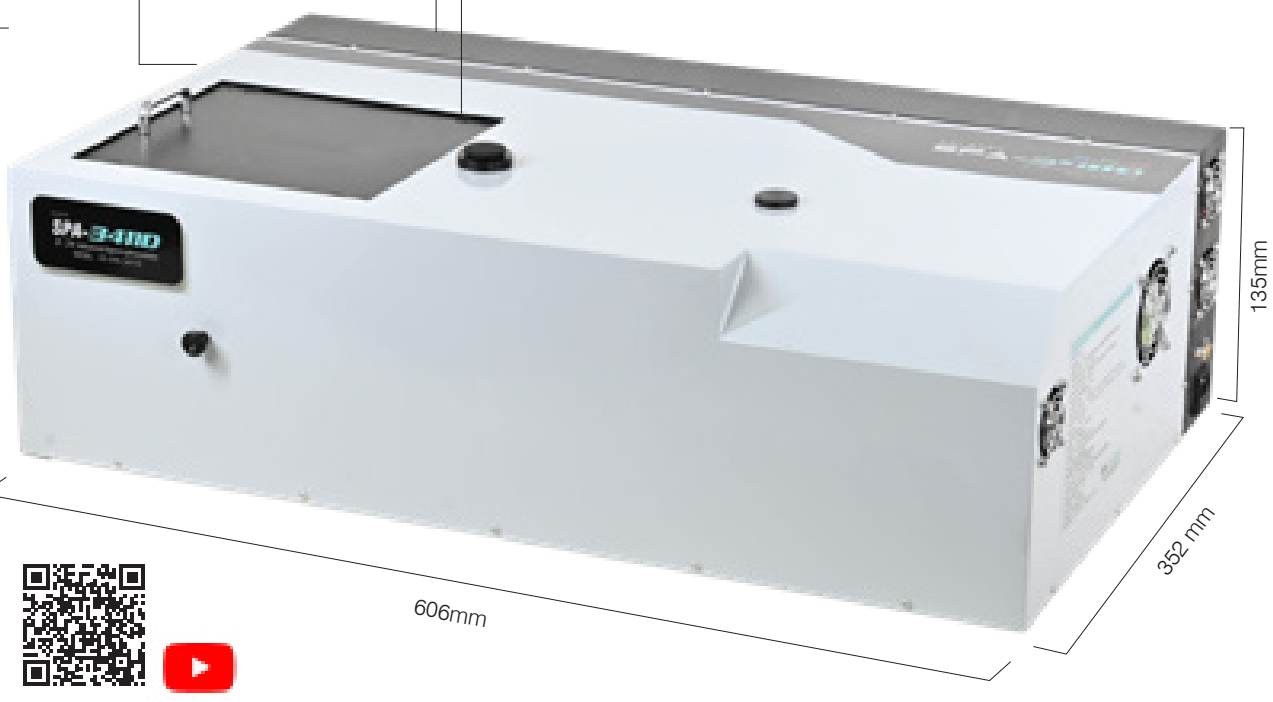
Two-position 10mm standard cuvette holder. Up to 50 x 50mm size, Custom Size Available



Goniometer

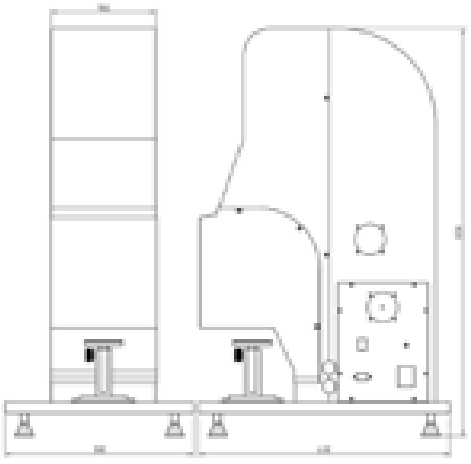
Theta 2 Theta for Angular Measurements at 30° - 180°





HOLMARC OPTO-MECHATRONICS LTD

Diffuse Reflectance Spectrophotometer



Model HO-SP-DRS 100

Diffuse reflectance spectroscopy is a well-established technique for studying the spectral characteristics of opaque solid samples, based on the principle that not only does light reflected from the material come from the surface (specular reflection) but some is reflected internally (diffuse reflectance). Diffuse reflectance spectroscopy is most readily applicable to powders, any sample that scatters radiation can be characterized using this technique.

Diffuse reflectance UV-visible spectroscopy is mostly used in the applied sciences for the analysis of dyestuffs, printing inks, paints and pigments,paper, ceramics, and so on. For color matching/analysis, visible diffuse reflectance spectroscopy is used for denture materials, tiles, cosmetics, and medicinal tablets, to name a few applications.

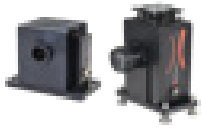
Specifications

Wavelength Range	380 to 1100 nm (Optional: 200 to 1100 nm)
Resolution	1 nm
Accuracy	± 1 nm
Spectral bandwidth	2 nm
Integrating Sphere Attachment size	100 mm
Coating	Barium Sulphate (BaS04)
Angle of incident light	0°
Wavelength range	200 to 1100 nm
Maximum size of sample	25 mm Dia
Detector	Si Photodiode
Active Area	5.8 x 5.8 mm
Light Source	50W Quartz Halogen Lamp
PC Interface	RS232 - USB
Input Voltage	230V 50Hz



Light Source

Quartz Halogen



Wavelength

200 to 1100 nm



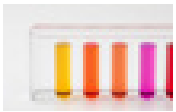
Coating

Barium Sulphate (BaS04)



Sample Size

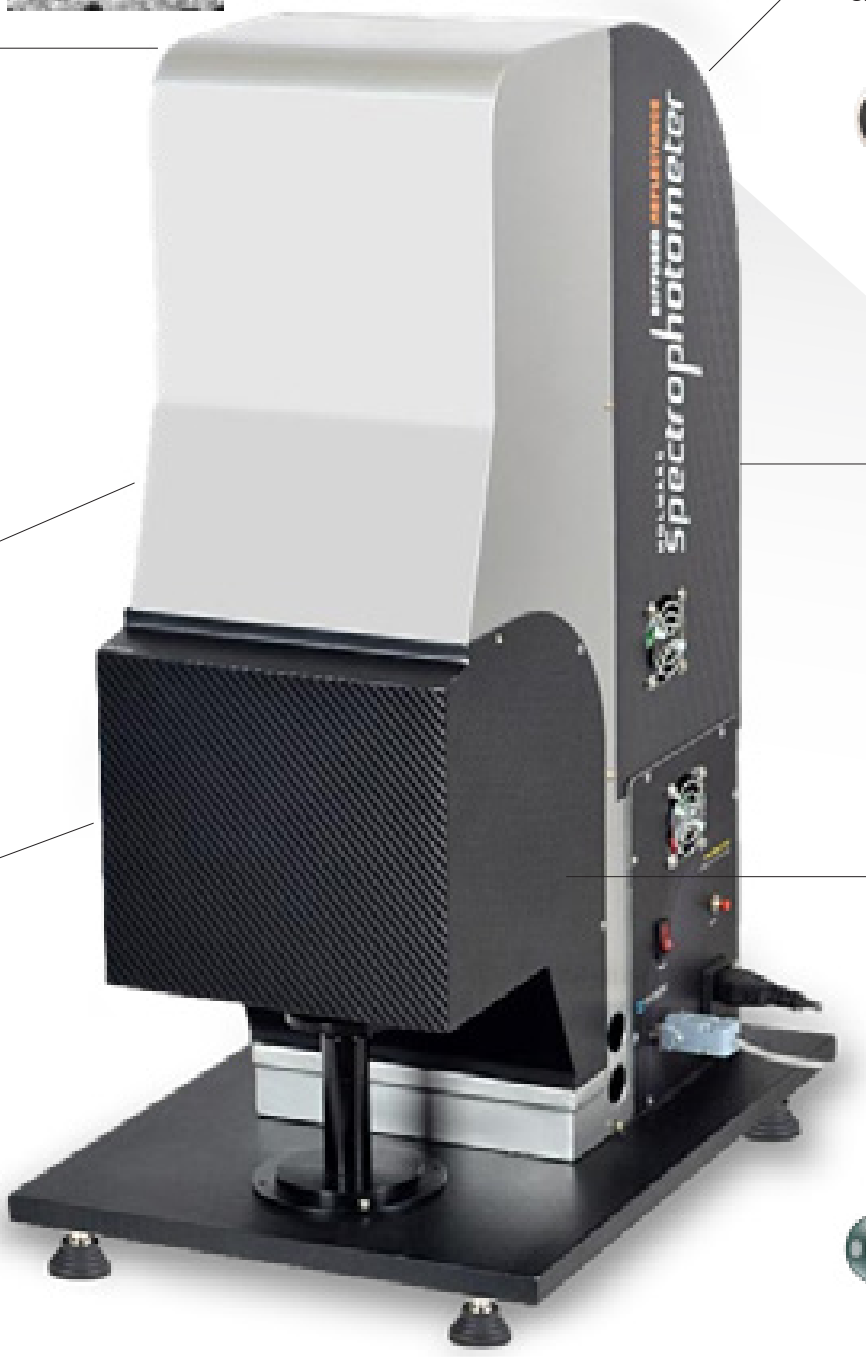
25mm Maximum



Detectors

Silicon – Photodiode,





PC Interface

Comes with RS232 PC Interface

Integrating Sphere

With 100mm Attachment size support



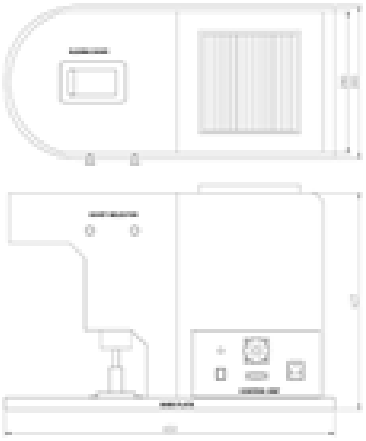


100mm
Integrating Sphere Attachment Size

380 to 1100nm
Wavelength

Diffused Reflectance Spectrophotometer

HO-SP-DRSP100
Solid & liquid sample measurement



Diffuse reflectance spectrophotometer is designed for measuring the spectral characteristics of opaque solid samples, Liquid, solids and thin film samples. Diffused reflectance measurement is based on the principle that not only does light reflected from the material come from the surface (specular reflection) but some is reflected internally (diffuse reflectance). Diffuse reflectance spectroscopy is most readily applicable to powders, any sample that scatters radiation can be characterized using this technique. While spectrophotometer setup in the instrument that measures the amount of light intensity absorbed after it passes through sample.

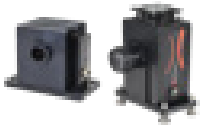
Multi-angle spectral photometric measurements / Absolute variable angle reflectance and transmission accessory can be provided on request. Model : HO-SP-DRSP100 provides researchers with more experimental information than conventional spectroscopy.



Wavelength Range	380 to 1100 nm
Resolution	1 nm
Accuracy	± 1 nm
Spectral bandwidth	2 nm
Transmittance	
Range	0 to 100 %
Resolution	0.1 %
Accuracy	± 1 %
Noise Level	± 1 %
Noise Level	< 1 %
Stability	1% / Hr after warm-up
Absorbance	
Range	0 to 2 A
Resolution	0.001 A
Concentration	
Range	0 to 999
Selectable resolution 1, 0.1, 0.01 or 0.001	
Calibration with 1 or 2 known standards	
Direct factor entry	
10 method memory	
Sample compartment Nos	2 Nos(one for 10 mm standard cuvette and other for integrating sphere)
Integrating Sphere Attachment size	100 mm
Coating	Barium Sulphate (BaS04)
Angle of incident light	0°
Maximum size of sample	25 mm Dia
Detector	Si Photodiode
Active Area	5.8 x 5.8 mm
Light Source	50W Quartz Halogen Lamp
PC Interface	USB
Input Voltage	230V 50Hz

Two Sample compartments

Quartz Halogen Light Source



Integrating Sphere

with 100mm
attachment size



Barium Sulphate Coating





Highlights

380 1100nm Wavelength Range
0to 2A Absorbance Range
2 Number of Sample Compartments

Modular Spectrophotometer

Model HO-SP-SQR-MS200F

Holmarc's Modular spectrophotometer model no HO-SP-SQR-MS200F is designed for flexible analysis of spectrophotometric applications & angular based thin film transmittance via multimode fibre. This system comes up with Monochromator model no SQR200F, Deuterium & Halogen lamps with power supply unit, spectrophotometric chamber unit, multimode fibre 1500μm with coupling unit & UV enhanced Si photo detector. Holmarc's customized type spectrophotometer is ease to operation by arranging the spectrophotometer in different modules. Chamber unit can placed either in input /output according to the customer needs. Holmarc's modular spectrophotometer is easy for cleaning solutions which spill over chamber unit. Customized Software is available with mode selection for lamps & wavelength base scanning.

Light from deuterium lamp (200nm to 380nm) & halogen (380nm to 1100nm) enters to the input slit of the Czerny turner monochromator which collects the light at output slit via multimode fibre which then directs light to the spectrophotometric chamber which detects by the Si photo detector.

200F Monochromator



Specifications

Monochromator	Czerny Turner Design, 200F Mirrors, grating density : 1200 l/mm, Wavelength range 200-1100 nm, wavelength Resolution : 0.5 nm
Source	Halogen - Deuterium combined light source, halogen 12V, 20W
Fibrer	Multimode 1500 μm, Core glass, Cladding plastic
Chamber unit	Rectangular type, With Cuvette holder & Angle based stage unit for thin film slides
Software	Customized software

- Ease of Usage - Modules of optical units
- Easy for cleaning of sample chamber
- Mode selection (UV-VIS) scanning for sample analysis
- High stabilized UV enhanced SI photo detector with control box
- Research grade cuvette samples
- Standalone monochromator unit
- High core sized Multimode fibre (with SMA) for light collection
- Mounting & dismantling of cuvette holder & Angle based goniometric sample holder unit.



Deuterium Halogen Source

Holmarc's Deuterium Halogen source is a specially designed light source that covers 200 nm to 2500 nm wavelength range. In this compact lamp house both Deuterium and Halogen lights are combined to a single optical path using and motorized rotation mechanism. Output port provided with SMA connector for fiber coupling. High quality optical design delivers maximum light coupling to the optical fiber.

Model No.	HO-HDL-01
Wavelength Range	190 nm - 2.5 μm
Source	Deuterium & Tungsten Halogen
Lamp Wattage	20W Deuterium & 20W halogen
Input Voltage	230 V

This light source can be used as a UV-VIS-NIR source for different spectroscopic applications. Filter holder, shutter, cuvette / sample holder can be provided optionally.

Customizable software

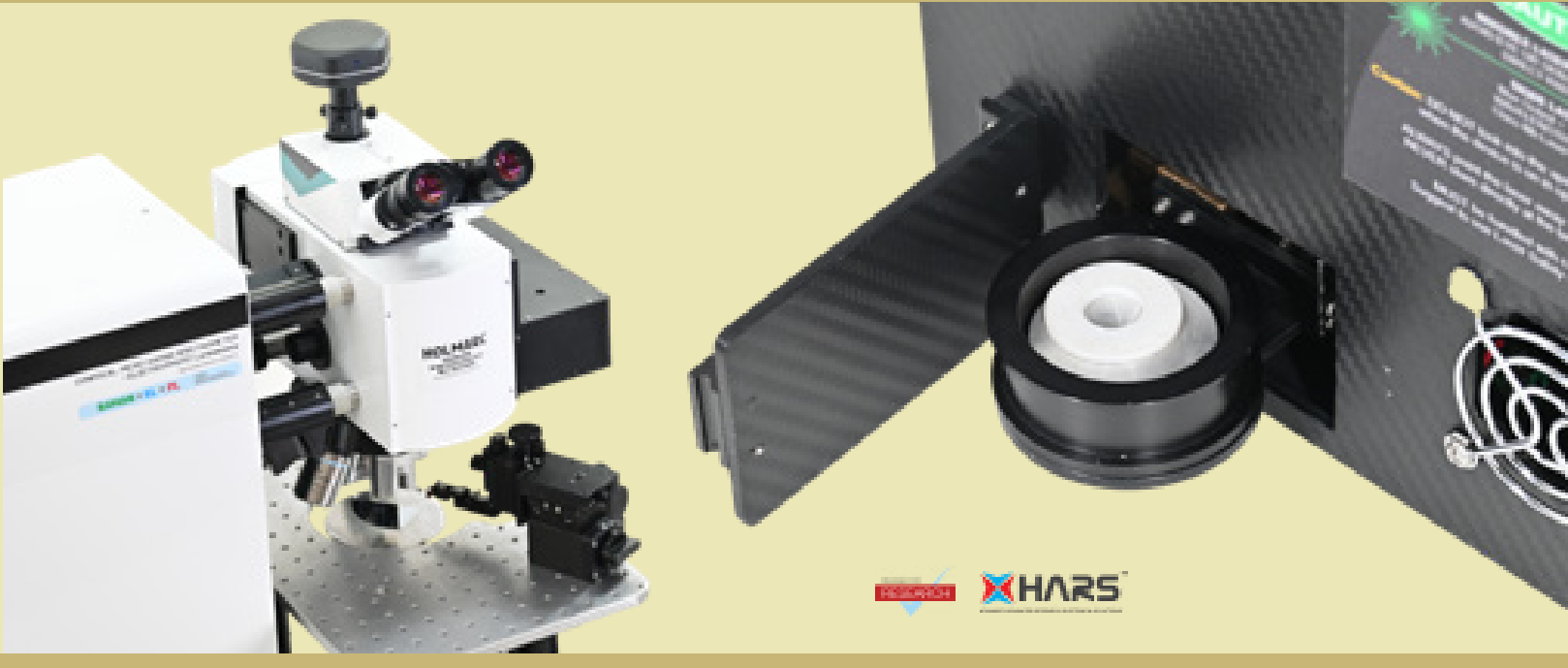




04

SPECTROSCOPY

152 SPECTROSCOPY
154 Spectrometer Goniometer
154 Spectrometer Goniometer 1
156 Spectrometer Goniometer 2
158 Scattering Photometer Single Channel Light Detection
160 Spectrometer
160 CT216 Series
162 CG216 Series
164 CD 214 Series
166 UV-VIS-NIR Scanning Spectrometer
168 Spectra CT UV-VIS-NIR CCD Based
168 Stitched Scanning Spectrometer
170 Spectra CT UV-VIS-NIR CCD Based
170 Multi Channel Scanning Spectrometer
172 Spectra UV-VIS-NIR Standard Monochromator
174 Mini Monochromator
176 Spectra UV-VIS-NIR Quasar Series
176 Scientific Monochromators
180 Spectra UV-VIS-NIR High Throughput
180 DUAL Grating f/3.5 Monochromator
182 Laser Raman Spectrometer
184 532nm Research Grade Upright
184 Raman / PL Microscope
186 Confocal Laser Raman Spectrometer
188 Confocal Raman Spectroscopy
190 Upright 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer
196 Inverted 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer
202 Upright 532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer
208 Upright INSI Raman
216 532nm RESEARCH GRADE
216 Automated Micro Raman
216 Spectrometer
220 Fluorescence Spectrometer
222 Light Sources, Detectors & Accessories
226 Light Sources
228 Broadband Light Sources
230 Faraday Modulator
232 Optical Chopper
234 Lens Assembly Spectral Measurement System



Spectrometer Goniometer



Spectrometer Goniometer 1

Model : HO-SP-RE-01

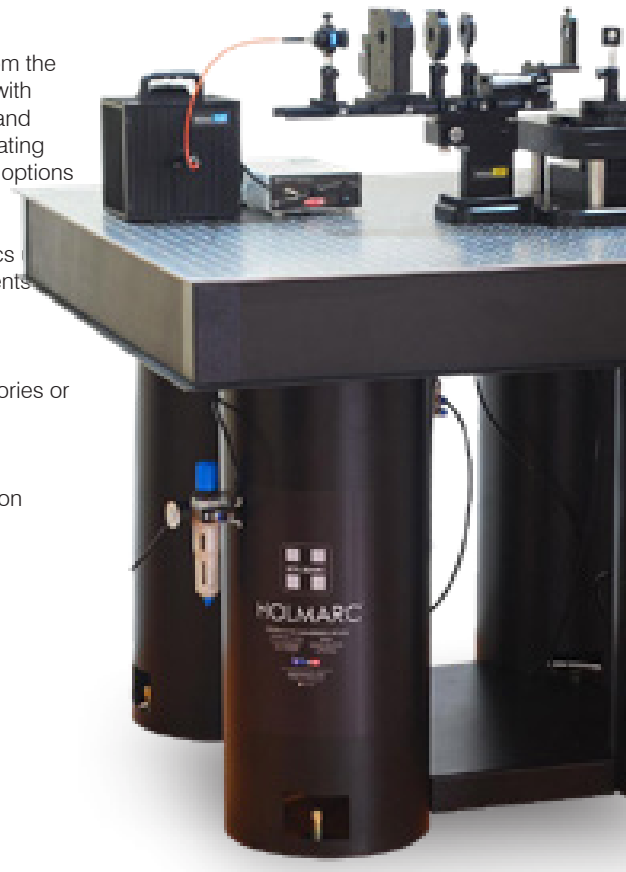
Spectrometer Goniometer (Model No: HO-SP-RE-01) is designed as a versatile instrument suitable for any optics laboratory. Its optical rail based construction allows the user to device it for multitudes of applications. Laser engraved, precise rotary graduations ensure reliable and repeatable read outs. Its sturdy movement along with its fine positioning capabilities makes the instrument suitable for many research activities other than spectroscopy.

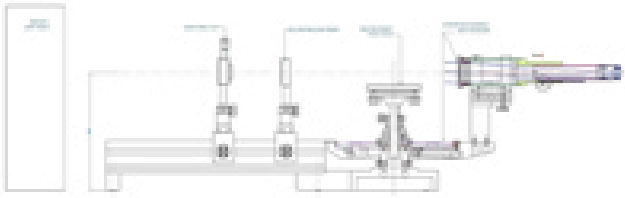
The measurement of refractive index is carried out with a dispersion prism made from the material to be tested. For the measurement of fluids, a hollow prism, which is filled with the fluid is used. It can also be used as a spectroscope for qualitative examination and measurement of emission and absorption spectra. The diffraction angle of plane grating and holographic grating can also be measured. Various accessories and mounting options are available.

All components are made of aluminium and stainless steel to avoid corrosion. Optics are of research quality. The slit used is of precision grade with micrometer adjustments for sub-micron sensitivity. The well designed mechanics of the Goniometer allows maintenance-free operation over many years.

The instrument can be used for inspection of various optical components in laboratories or workshops.

Open and flexible design facilitates quick modification of the instrument for custom applications. This goniometer can also be used for checking reflection & transmission ratios of thin films coated on glass substrate.





Custom experiments using Theta Two Theta Goniometer

Holmarc's theta 2 theta stage consists of two rotation stages arranged in such a way that axis of rotation for both the stages are same. Both stages have preloaded ball bearing guides for wobble free rotation and positioning. 360^{o} limitless movement is possible for inner and outer stages. Holmarc manufactures these stages with manual as well as motorized drive configurations.

Rotary graduations are provided in 1^{o} / 2^{o} with appropriate vernier graduations depending on the size of the stage. For motorized rotation stage, worm and gear is our standard drive mechanism. Surfaces of both stages are provided with M6 tapped holes for mounting components and sub-assemblies. Holmarc manufactures custom theta 2 theta stages to suit specific applications as well.

Resolution	
Prism Table	10 arc minute
Telescope Positioning	1 arc minute

Slit	
Design	Variable, 0 - 3mm
Micrometer controlled	
Resolution	10 Micron

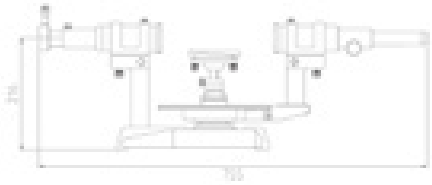
Spectroscopy
Emission spectrum,Absorption spectrum,R.P of grating & prisms, Dichroism etc.

Diffraction
Determination of Groove spacing Wavelength Biprism diffraction etc

Measuring Optical Parameters like
Optical density, Reflectivity, Transitivity



Spectrometer Goniometer 2



Model : HO-SP-RE-02

Spectrometer Goniometer Model No: HO-SP-RE-02 has conventional design where slit along with collimator is fixed on a tilt adjustable holder instead of rail and carriage as in Model No: HO-SP-RE-01 described in the preceding page. This spectrometer is well suited for all general purpose applications including the analysis of spectrum of light sources, characterization of prisms and gratings, etc. A precision rotation stage with coarse and fine movement holds the telescope. There are two rotation stages, concentrically assembled, one for telescope and other for the sample. The 216mm graduated disc features a 360° scale with divisions of 0.5° and two vernier scales separated by 180°. The vernier scale has an accuracy of 1 angular minute. The prism table is removable and features three point leveling screws and50mmheight adjustments.

The measurement of refractive index is carried out with a dispersion prism made from the material to be tested. For the measurements of fluids, a hollow prism, which is filled with the fluid is used. It can also be used as a spectroscope for qualitative examination and measurement of emission and absorption spectra. The diffraction angle of plane grating and holographic grating can also be measured. Various accessories and mounting options are available.

All components are made of aluminium and stainless steel to avoid corrosion. Optics used are of research quality. The slit used is of precision grade with fine lead screw adjustments for sub-micron sensitivity. The well designed mechanics of the Goniometer allows maintenance-free operation over many years.

This goniometer can be used for precision measurements of the optical data on prisms. It can also be used as a spectroscope for qualitative examination and measurement of emission and absorption spectra. Numerous accessories are available.

Various detectors are available for goniometer. Optical parameters in the UV-VIS-IR range can be determined with the help of suitable detector unit. We can provide special detector heads for goniometer. You are welcome, to discuss your application requirements with us.

Spectroscopy

Emission spectrum,Absorption spectrum,R.P of grating & prisms, Dichroism etc.

Diffraction

Determination of Groove spacing Wavelength Biprism diffraction etc

Measuring Optical Parameters like

Optical density, Reflectivity, Transitivity

Components Include



Spectrometer Gonimeter



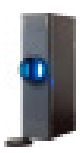
Equilateral High Index Prism



Hollow Prism



Diffraction grating



Mercury Lamp with Power Supply

Precision Adjustable Slit

Precision Adjustable Slit will be provided with RE-02 Research Goniometer

Model	HO-ED-PS6
	Micrometer controlled slits
Width	0 - 3mm - continuously variable
Height	10mm
Construction	Metallic (non corrosive)



Advanced Researcher Version
Model: HO-SP-RE-03DM

For precise determination of angular position, particularly for the optical spectra applications, Holmarc has introduced a new high precision 0.0001 degree resolution spectrometer goniometer. It features low dark current linear Si-Photodiode detection unit for low light measurements. This allows users to work with the spectrometer goniometer in the wavelength range of 320-1100 nm (UV-VIS-NIR). This instrument is suitable for custom experiments and inspection of various optical components with precision. Open and flexible design facilitates quick modification of the instrument for custom applications.

This instrument can as well be used as a spectroscope for the observation and measurement of emission and absorption spectra. Other applications include measurement and determination of optical angles of prisms, thin film characterization through the measurement of reflection and transmission, Brewster's angle spectroscopy etc. When used with a prism, it helps to observe visible light dispersed by wavelength. When used with a diffraction grating and a gas discharge tube, we can observe the emission spectrum of various gases. The wavelengths of each electron transition in the spectrum can be calculated according to the angle of deflection of the light reflected by the grating.

- Removable collimator and telescope tubes
- Custom Accessories
- Horizontal and vertical adjustments for collimator & telescope
- Precision slit 0 - 3mm adjustable with 10 micron resolution
- Slit height is adjustable from 0 - 10 mm
- Fiber optic coupling unit

The focal length of the telescope and collimator tube is 200 mm. The graduated disc features a 360 degree scale with divisions of 0.5. The prism table is removable and features three point bearing leveling screws.

Detector Unit

High precision low dark current (5pA) linear Si-Photodiode with an active area of 1.1 x 5.9 mm is used as detector in RE03DM Spectrometer Goniometer. It has spectral range of 320 - 1100 nm.

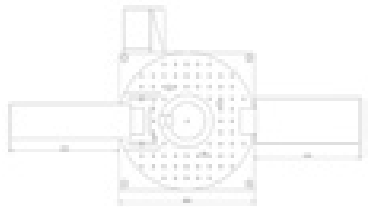


Custom experiments using Theta Two Theta Goniometer

Scattering Photometer



Scattering Photometer Single Channel Light Detection

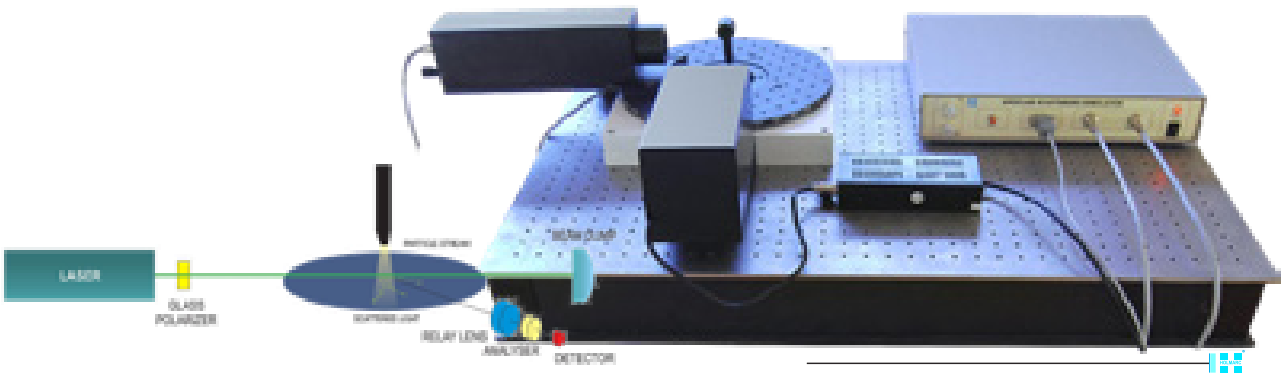


Model : HO-IAD-SG-01

A scattering photometer for measuring the intensity of light scattered by particles has been developed by Holmarc for environmental research. It is a precision instrument designed for spectroscopic measurements of scattered light. This goniometer based instrument provides controlled multi angle measurement of particles. A 100mw laser beam (532nm) is directed first to a linear polarizer and then into a scattering compartment containing the particles under study. The scattered light is focused onto APD (Avalanche Photo Diode) detector to generate an electrical signal indicating the amount of scattered light at that position. The motorized rotation stage helps to take reading at different angles. The entire operation is automated through a personal computer. Custom developed software and interfacing electronics are supplied along with the system. Laser source is mounted on a precision rotation stage with central access hole. The stage is driven by stepper motor. Sample is introduced through the center hole of the stage. As the stage along with the laser source rotates, output data from the detector is collected automatically and saved in the computer with reference to the angular position of the rotation stage.

Note : Model : HO-IAD-SG-01 comes with 100mW DPSS 532nm laser with APD Detector. Other laser and detectors can also be integrated with the system on special request

Specifications	
Resolution	0.01 degree
Maximum Speed	10 degree / sec
Traverse	280^{o}
Actuator	Stepper Motor (DPM60SH86 - 2008AF)
Load Capacity	50 Kg
Material	Aluminium
Turn Table Dimension	500 x 500 x 65 mm
Net. Weight	37 Kg



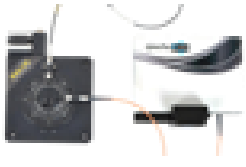
Scattering Photometer Spectral Light Detection

Model : HO-IAD-SG-02

Spectrometer (Model : HO-IAD-SG-02) has been developed for measuring the intensity of light spectrum (ranging from 350 - 1050nm) scattered by particles. It is a precision instrument designed for research applications where spectroscopic measurements need to be carried out from scattered light. Goniometer based design helps in multi angle spectral measurements.

A 50W fiber coupled Quartz halogen lamp is used as the light source for scattering measurements. Light from halogen lamp is coupled to the optical fiber which collimates it into the scattering compartment / sample chamber (containing particles under study) using precision lens system. The scattered light is focused onto a fiber optic cable connected to a compact CCD spectrometer. Software provided with the spectrometer analyze the amount of scattered light at different wavelength and position. The motorized rotation stage helps to take the reading at different angles. The entire operation is automated through a personal computer. Custom developed software and interfacing electronics are supplied along with the system.







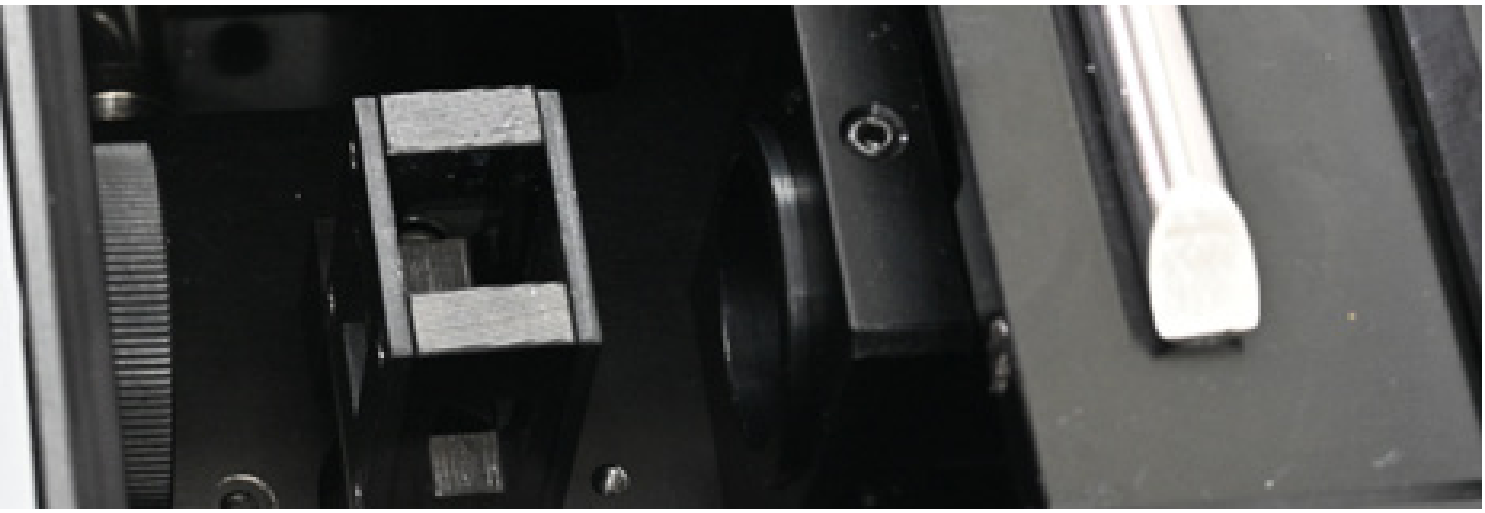
Goniometer Specifications	
Resolution	0.05 degree
Maximum Speed	10 degree / sec
Traverse	280°
Actuator	Stepper Motor (DPM60SH86 - 2008AF)
Load Capacity	10 Kg
Material	Aluminium
Turn Table Dimension	150 x 150 x 50 mm

Spectrometer Specifications	
Spectrograph f #	2.9
Optical Platform	Concave Grating
Spectral Range	350 to 1050 nm
Spectral Resolution	1 nm
Slit Options	Micrometer Controlled Variable Slit
Input Fiber Connector	SMA 905 [FC (Optional)]
Input Fiber NA	0.22
Stray Light	< 0.06 % @ 532nm (< 0.1% overall)
Detector	Toshiba TCD1304AP Linear CCD Array
Pixel Number	3648
Pixel Size	8 x 200 μm
Pixel Well Depth	100,000 electron
Signal-to-noise Ratio	1,000:1 (at full scale)
A / D Resolution	16 bit
Integration Time	0.1 to 6,500 ms
Frame Rate	up to 138 fps
Trigger Input	Yes, Optional
PC interface	USB 2.0
Software	Spectra ANALYTE Includes DLL libraries and SDKs for easy custom application development

Source Specifications	
Lamp	Quartz Halogen
Wattage	50 W
Wavelength range	340 - 2700 nm
Powersupply	Constant Current SMPS
Supply	Fixed
Lamp Housing	Forced Air Cooled Type
Optics	Concave metallic mirror
Construction	Aluminium black Anodized

Fiber Specifications	
Wavelength Range	190 - 1600 nm
Connector	SMA
Numerical Aperture NA	0.22
Acceptance Angle	25.4°
Operating Temperature	- 40 to +100°C
Length	1.5 m

Spectrometer



CT216 Series

USB 2.0 CCD Spectrometer
Model : HO-IAD-SG-01

The CT216 Series spectrometers are cost-effective high-performance CCD based instruments designed for use with a PC. The standard sensor arrays used in the spectrometer is Toshiba TCD1304DG B/W board-level line CCD camera, based on a single-line, 3648 - pixel CCD chip. It can accept light directly through its built-in slit or via optical fibre. Custom based UV spectrometer uses windowless CCD to increase the UV sensitivity down to 200 nm.

- New compact, custom-configured models
- Connected via optical fibre
- Designed for a wide range of applications
- High performance optics & electronics
- UV enhancing coating for UV Range Spectrometer

CT216 Series spectrometer uses f/4 Czerny - Turner design with plane grating for spectral dispersion. Standard interface to the CT216 Series spectrometers is USB 2.0 compatible with 16-bit extended dynamic range. Software support includes SDK and DLLs for dedicated applications development and Spectra QSR Windows-based spectral acquisition and analysis package.

The CT216 Series spectrometers are custom-wavelength range configured models which can be tuned to desired spectral range wavelength for custom applications.

-30 Degree Cooled CCD

Peltier cooling device integrated intospectrometer sensor can reduce the temperature of the CCD chip by -30°C against ambient, improving the dark baseline level by a significant factor of 2 - 3. It makes this instrument ideally suitable for measuring low light applications like fluorescence.

Czerny - Turner Design

Model No.	HO-CT216	HO-CT216-UV	HO-CT216-3582	HO-CT216-4065	HOCT216-2010	HO-CT216-3010
Wavelength Range	350 ~ 900 nm	200 ~ 400 nm	350 ~ 820 nm	400 ~ 650 nm	200 ~ 1000 nm	300 ~ 1,050 nm
Resolution *	0.5 nm	0.25 nm	0.45 nm	0.27 nm	1 nm	0.9 nm
Spectrograph f #	4	4	4	4	4	4
Optical Platform	Czerny - Turner	Czerny - Turner	Czerny - Turner	Czerny - Turner	Czerny - Turner	Czerny - Turner
Effective Spectral Range	200 to 1050 nm	200 to 1050 nm	200 to 1050 nm	200 to 1050 nm	200 to 1050 nm	200 to 1050 nm
Spectral Resolution	0.1 to 1 nm depending on choices					
Slit Options	Micrometer Controlled Variable Slit or 10, 15, 20, 25, 50, 100, 200 or 400 μm Fixed Slits					
Input Fiber Connector	SMA 905 [FC (Optional)]					
Input Fiber NA	0.22	0.22	0.22	0.22	0.22	0.22
Stray Light	< 0.06 % @ 532 nm (< 0.1% overall)					
Detector	Toshiba TCD1304AP Linear CCD Array					
Pixel Number	3648	3648	3648	3648	3648	3648
Pixel Size	8 x 200 μm	8 x 200 μm	8 x 200 μm	8 x 200 μm	8 x 200 μm	8 x 200 μm
Pixel Well Depth	100,000 electron					
Signal-to-noise Ratio	1,000 : 1 (at full scale)					
A / D Resolution	16 bit	16 bit	16 bit	16 bit	16 bit	16 bit
Integration Time	0.1 to 6,500 ms	0.1 to 6,500 ms	0.1 to 6,500 ms	0.1 to 6,500 ms	0.1 to 6,500 ms	0.1 to 6,500 ms
Frame Rate	up to 138 fps	up to 138 fps	up to 138 fps	up to 138 fps	up to 138 fps	up to 138 fps
Trigger Inpu	Yes, Optional	Yes, Optional	Yes, Optional	Yes, Optional	Yes, Optional	Yes, Optional
PC interface	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
Software	Spectra QSR V2.26 (free with spectrometer)					
	Includes DLL libraries and SDKs for easy custom application developme					

Fiber Optic Patch Cords

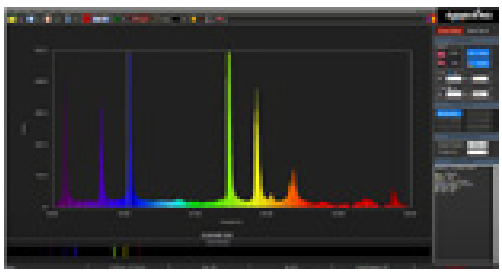
UV / VIS	VIS / NIR Models for Spectrometer
200 Micron	400 Micron
600 Micron	1000 Micron





Software

- Options for single and continuous acquisition
- Performs Emission, Absorbance & Transmission / Reflection Measurements
- Performs real time measurements & video recording
- User defined exposure time control & Frame averaging
- See list of recent measurements in 'Captured List' plane
- Grid view & Playback mode are available
- Advanced smoothing algorithms
- Automated spectra scaling and peak finding
- Wavelength calibration using Polynomial Regression & Hartman equation
- Export the details / image to Excel / CSV and jpeg
- Print plot directly



CG216 Series

USB 2.0 CCD Spectrometer

The CG216 Series spectrometers are cost-effective high-performance CCD based instruments designed for use with a PC. The standard sensor arrays used in the spectrometer is Toshiba TCD1304DG B/W board-level line CCD camera, based on a single-line, 3648-pixel CCD chip. The array driver electronics has been developed by Holmarc and designed for highly sensitive yet stable operation. More pixel numbers in the sensor makes the CG216 Series spectrometers more suitable for the applications requiring high resolution. Thanks to high sensitivity of the CCD, the spectrometer can be used for applications with low light signals as well. It can accept light directly through its built-in slit or via optical fiber. UV spectrometer uses windowless CCD to increase the UV sensitivity down to 200nm. It helps the signal sensitivity below 380 nm get improved ~20 - 50% more in general.

- New compact, custom-configured models
- Can be handheld or securely mounted
- Flexible optical input direct to slit or via fiber
- Designed for a wide range of applications
- High performance optics & electronics
- Standard design allows up to 200 - 1050 nm range
- UV enhancing coating for UV Range Spectrometer

CG216 Series spectrometer uses f/4 Czerny - Turner design with concave grating for spectral dispersion. Standard interface to the CG216 Series spectrometers is USB 2.0 compatible with 16-bit extended dynamic range. Software support includes SDK and DLLs for dedicated applications development and Spectra QSR Windows-based spectral acquisition and analysis package.

Model No.	HO-CG216-2075	HO-CG216-3290	HO-CG216-4010
Wavelength Range	200 ~ 750 nm	320 ~ 900 nm	400 ~ 1,000 nm
Resolution *	0.95 nm	0.9 nm	0.75 nm
Spectrograph f #	2.9	2.9	2.9
Optical Platform	Concave Grating		
Effective Spectral Range	200 to 1050 nm		
Spectral Resolution	0.1 to 1 nm depending on choices		
Slit Options	Micrometer Controlled Variable Slit or 10, 15, 20, 25, 50, 100, 200 or 400 μm Fixed Slits		
Input Fiber Connector	SMA 905 [FC (Optional)]		
Input Fiber NA	0.22		
Stray Light	< 0.06 % @ 532 nm (< 0.1% overall)		
Detector	Toshiba TCD1304AP Linear CCD Array		
Pixel Number	3648		
Pixel Size	8 x 200 μm		
Pixel Well Depth	100,000 electron		
Signal-to-noise Ratio	1,000 : 1 (at full scale)		
A / D Resolution	16 bit		
Integration Time	0.1 to 6,500 ms		
Frame Rate	up to 138 fps		
Trigger Input	Yes, Optional		
PC interface	USB 2.0		
Software	Spectra Analyte V2.26 (free with spectrometer)Includes DLL libraries and SDKs for easy custom application development		

-30 Degree Cooled CCD

Peltier cooling device integrated intospectrometer sensor can reduce the temperature of the CCD chip by -30°C against ambient, improving the dark baseline level by a significant factor of 2 - 3. It makes this instrument ideally suitable for measuring low light applications like fluorescence.



Perfect Choice for Spectral Applications

UV enhancing coating for UV Range Spectrom-eter



Wavelength Range

A. 200 ~ 750 nm for HO-CG216-2075
B. 320 ~ 900 nm for HO-CG216-3290
C. 400 ~ 1,000 nm for HO-CG216-4010



Fiber Optic Patch Cords

UV / VIS and VIS / NIR Models for Spectrometer

UV / VIS	VIS / NIR Models for Spectrometer
200 Micron	400 Micron
600 Micron	1000 Micron



Slit

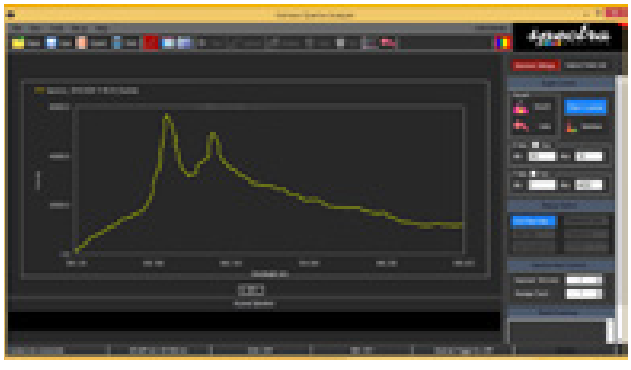
Micrometer Controlled Variable Slit or 10, 15, 20, 25, 50, 100, 200 or 400 μm Fixed Slits



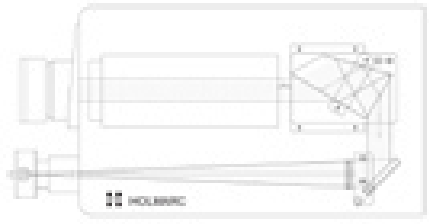


Software

- Options for single and continuous acquisition
- Performs Emission, Absorbance & Transmission / Reflection Measurements
- Performs real time measurements
- Save live to file
- User defined exposure time control
- Averaging of spectra
- Options for loading saved dark & reference data automatically when starting the application
- See list of recent measurements in 'Captured List' pane
- Grid & Playback mode
- Easily overlay captured spectrum for easy comparison
- Spectroscope View of captured spectrum simulating visual appearance through spectroscope
- Displays spectroscope lines on plot
- Batch collection of data, either continuous, external triggered or scheduled
- Flexible & intuitive display adjustments, plus cursor and peak-finding
- Peak analysis options
- Advanced smoothing algorithms
- Automated spectra scaling and peak labeling
- Fast scaling, zooming, scrolling, panning, re scaling with mouse
- Changing of legend captions
- Lock axis range to custom values
- Easy to Switch x axis Pixels Wavelengths
- Status bar at graph window displays current mouse position => fast reading of data points
- Displays saturation status of current frame. 'Normal' or 'Over Saturated'
- Easy to flip x axis
- Toggle Y axis between linear and logarithmic scaling with Ctrl + L
- Displays statistical values of the acquired spectral intensities
- Options for user wavelength calibration [Polynomial Regression & Hartman regression]
- Two User Levels : Administrator, User
- Exports single and multi spectral files to Excel / CSV and HSV
- Plot export as: Bitmap Image (.bmp) | JPG Image (.jpg) | Gif Image (.gif) | JPEG Image (.jpeg) | Png Image (.png) | Tiff Image (.tiff) | Wmf Image (.wmf)
- Print plot directly
- Copy Function to Clipboard
- Saves previous settings



CD 214 Series



USB 2.0 Spectrometer

Spectra CD214 is a CCD based prism spectrometer. It is identical to a grating instrument except that the dispersion element used is pellin broca prism. The prism has constant efficiency over its range of transmittance. Filter is not required for measurement. In many cases, it is the ideal choice for absorption and emission spectra measurement and characterization.

CD214 Series spectrometers are available from Holmarc in various resolution and wavelength range for multitudes of spectroscopic applications. Various accessories include directly attachable light sources and sample holders. Sample holder for 10mm cuvettes connects to the entrance slit of the spectrometer. The optional dual entrance and exit ports allow the user to set up two or more experiments simultaneously. The spectrometer is flexible in design so that it can be easily customized to suit specific applications.

The Spectra Prism Spectrometer is a low-cost, lab spectrometer that is ideal for general purpose laboratory and research spectroscopic applications. The use of linear CCD array with P.B prism makes it more convenient and user friendly compared to other spectroscopes. It is more reliable and cost effective compared to grating spectrometers.

Our CD214 Series Prism Spectrometer's wavelength range is from 400nm to 700nm and utilizes a detector with 3648 active pixels; that is 3648 data points in one full spectrum. The spectrometer is configured with a micrometer controlled entrance slit which opens from 0-3 mm in width by micrometer adjustment. Optical resolution is approximately 0.15 nm.

Prism

Pellin Broca
Spectrometer Prism



CCD Imaging System
Cost effective & User friendly



Specifications

Optical Platform	Constant Deviation
Spectrometer Prism	Pellin Broca
Spectral Resolution	0.1 nm
Accuracy	0.5 nm
Slit Options	Micrometer Controlled Variable Slit (0 - 3 mm)
Stray Light	< 0.06 % @ 532 nm (< 0.1 % overall)
Detector	Toshiba Linear CCD Array
Total Pixel Number	3648
Pixel Size	8 x 200 μm
Pixel Well Depth	100,000 electron
Signal-to-Noise Ratio	1,000 : 1 (at full scale)
A/D Resolution	16 bit
Exposure Time	1.0 to 6,500 ms
Frame Rate	Upto 138 fps
Trigger Input	Yes (Optional)
PC Interface	USB 2.0
Software	Spectra QSR V2.26

Model No.	Dispersion Element	Wavelength Range	Detector	Resolution
Spectra CD 214VIS	PB N-SF1	400 - 700 nm	Line CCD 3648 pixels	0.15 nm
Spectra CD 214NIR	PB N-SF1	650 - 950 nm	Line CCD 3648 pixels	0.26 nm

Light source

For the spectra prism spectrometers, directly attachable light source and sample holders are available as accessories (sold separately). The most common light source is quartz halogen lamp. Sample holder we stock generally is for 10mm cuvetts which connects to the front side of the spectrometer. Software has capabilities for capturing single or continuous spectra, custom wavelength calibration, dark subtraction and intensity comparison, simultaneous display of overlay multiple spectra, exporting dat to microsoft® excel etc. The software has facilities for spectrum saving in programmed intervals.



Low Straylight

< 0.06 % @ 532 nm (< 0.1 % overall)



Slit

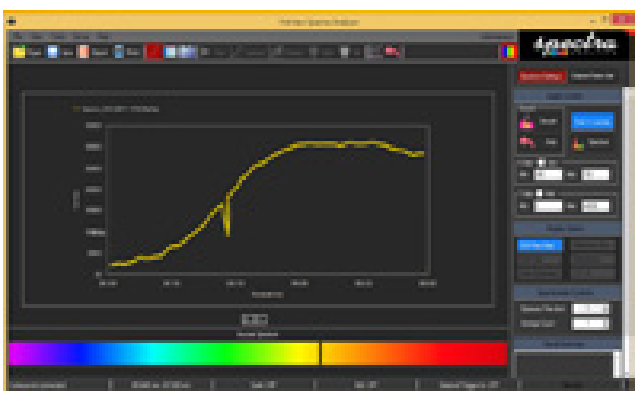
Micrometer Controlled Variable Slit (0 - 3 mm)





Software

- Options for single and continuous acquisition
- Performs Emission, Absorbance & Transmission / Reflection Measurements
- Performs real time measurements
- Save live to file
- User defined exposure time control
- Averaging of spectra
- Options for loading saved dark & reference data automatically when starting the application
- See list of recent measurements in 'Captured List' pane
- Grid & Playback mode
- Easily overlay captured spectrum for easy comparison
- Spectroscope View of captured spectrum simulating visual appearance through spectroscope
- Displays spectroscope lines on plot
- Batch collection of data, either continuous, external triggered or scheduled
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- Peak analysis options
- Advanced smoothing algorithms
- Automated spectra scaling and peak labeling
- Fast scaling, zooming, scrolling, panning, re scaling with mouse
- Changing of legend captions
- Lock axis range to custom values
- Easy to Switch x axis Pixels Wavelengths
- Status bar at graph window displays current mouse position => fast reading of data points
- Displays saturation status of current frame. 'Normal' or 'Over Saturated'
- Easy to flip x axis
- Toggle Y axis between linear and logarithmic scaling with Ctrl + L
- Displays statistical values of the acquired spectral intensities
- Options for user wavelength calibration [Polynomial Regression & Hartman regression]
- Two User Levels : Administrator, User
- Exports single and multi spectral files to Excel / CSV and HSV
- Plot export as: Bitmap Image (.bmp) | JPG Image (.jpg) | Gif Image (.gif) | JPEG Image (.jpeg) | Png Image (.png) | Tiff Image (.tiff) | Wmf Image (.wmf)
- Print plot directly
- Copy Function to Clipboard
- Saves previous settings



UV-VIS-NIR Scanning Spectrometer

Fiber Coupled

Model: HO-SP-S100 Series

Scanning spectrometer is specially designed and developed for industrial and academic research laboratories in the fields of biology, chemistry, physics, environmental science and engineering. This device works in the wavelength range of 190 to 1100nm. Scanning spectrometer can rapidly scan a range of wavelengths and record light intensity at each wavelength.

Input and output ports of the spectrometer are fitted with precise micrometer controlled variable slits. A plane holographic grating is used to diffract the input light that is subsequently focused by a second concave mirror. The holographic gratings used in the instrument minimizes stray light for high sensitivity and accuracy. A stepper-motor controlled sine drive positions the grating, which is mounted on a precision rotary table. The sine drive delivers a linear relationship between stepper motor motion and wavelength of interest. It includes a mechanism to change the wavelength selected by the software and to record the resulting changes in the measured quantity as a function of the wavelength.

The software developed for the instrument has facilities for setting up and calibration in addition to scanning and manual readout. Scanning is possible for a desired wavelength range too. This feature saves time whenever full wavelength range scan is not necessary. The software stores and displays the data acquired on MS Excel sheet. This helps to plot graph with ease whenever required.

Heavy duty aluminium construction is used for stability with respect to vibration and thermal effects. Multiple accessory options allow the user to configure the system for custom applications. The basic system and accessories are designed in modular fashion. More and more accessories can be added as the applications expand.

Features

- Fiber Coupled Input Slit
- High resolution spectral analysis
- High wavelength accuracy
- 190 - 1100nm spectral range in a single scan
- Optional photomultiplier and silicon photo diode detector
- Adjustable Input and output slit to control the spectral resolution
- Adjustable wavelength steps
- RS-232 and USB to serial port extension module
- Optional optical port with optical output and detector input ports

Specifications

Optical path configuration	Czerny-Turner type
Dispersion element	Holographic grating
Grating density	1200 grooves / mm
Relative diffraction efficiency	45 - 65% (Visible)
Scanning Wavelength Range	190 - 1100 nm
Wavelength range (Detector)	350 - 1100 nm for HO-SP-S100SA 190 - 1100 nm for HO-SP-S100SA-UV
	185 - 900 nm for HO-SP-S100MA
Resolution	0.1 nm
Wavelength Repeatability	± 0.5 nm
Slit width	0 - 3 mm (Micrometer Controlled)
Detector	Si photodiode or PMT
Interface	USB 2.0 or RS-232
Data formats	Spread sheet



Detectors

Si photodiode or PMT

There are two types of single channel detectors for using with scanning spectrometers, photomultiplier tube (Model : HO-SP-S100MA) and silicon photo diode (Model : HO-SP-S100SA and HO-SP-S100SAUV). For general emission and absorption experiments, scanning spectrometer with silicon photo diode is suitable. It can be used for spectroscopic study of LED and other optical filters. PMT detectors typically offer much high sensitivity to low light levels than silicon photo diode and are suitable for Raman spectrum, fluorescence, bioluminescence and chemiluminescence.

Dual exit port configured model is also available. It enables simultaneous use of more than one detector. It helps to work with different wavelength regions. The software allows data retrieval from each detector independently. This can be completely automated and PC-controlled.



Fiber Optic Collimators

Multi elemental aberrations corrected design

- Fiber optic collimator
- Laser to fiber coupling
- Slit to fiber coupling
- Fiber to detector coupling

Fixed collimators for custom beam sizes can be manufactured at holmarc. Please contact our engineers at sales@holmarc.com for your special requirements.

Wavelength Range

350 - 1100 nm
for HO-SP-S100SA

Holographic

Dispersion Gratings





Spectra CT UV-VIS-NIR CCD Based Stitched Scanning Spectrometer

Model: HO-SP-3S300F

HOLMARC's Model HO-SP-3S300F is a CCD based scanning spectrometer, rapidly scan a range of wavelengths and record light intensity at each wavelength. In this spectrometer, only 70nm wavelength range is covered in a single imaging, by making use of the entire 3648 pixels available in the CCD. This feature increases the resolution significantly. For obtaining spectra over full wavelength range, various spectral images are taken and stitched together using the software provided. Hence this device is named "Stitched Scanning Spectrometer". It works in the wavelength range of 200 to 1050nm.

Holographic diffraction grating used in this spectrometer disperses light by diffracting different wavelengths at different angles and it is subsequently focused by a second concave mirror. The grating is positioned in such a way to get all the wavelength of light in to a linear CCD. The required wavelength range is selected by rotating angle of the grating. The mirror and slit positions remain fixed. It utilizes a computer controlled motorized turret for automatic grating and wavelength selection. Resolution and wavelength range of the spectrometer is depends on the selection of grating. Scanning is possible for a desired wavelength range. This feature saves time whenever full wavelength range scan is not necessary. Electronics is packaged inside the housing and has RS-232 interface to the computer. For USB interface a Serial to USB converter is connected to the RS-232 output and a USB converter driver needs to be loaded on the computer so that it will recognize the USB interface as a virtual RS-232 serial port. There is also a fast and interactive graphical software interface allowing full control of all the spectrograph functions.

Features

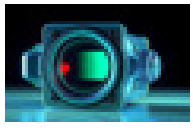
High resolution spectral analysis
High wavelength accuracy
200 - 1100nm spectral range in a single scan
Optional photomultiplier and silicon photo diode detector
Adjustable Input slit to control the spectral resolution
Selectable wavelength range
RS-232 and USB to serial port extension module
Optional optical port with optical output and detector input ports

Czerny - Turner Design

with 300mm focal length and aperture ratio of f/16

CCD Sensor

B / W line Sensor of 70nm wavelength with 3648 Pixels at 8x200 micron pixel size and a clock rate of 0.5 MHZ



Specifications	
Optical path configuration	Czerny-Turner type
Focal Length	300 mm
Aperture Ratio	f / 6
Port Configuration	Single I / P & O / P (Customizable)
Dispersion element	Holographic grating UV Optimized
Grating density	1200
Grating Size	50 x 50 mm
Relative diffraction efficiency	65 %
Wavelength range	200 - 1050 nm
Resolution with CCD (FWHM)	~ 0.058 nm
Band width per pixel	~ 0.029 nm
Slit width	0 - 3 mm, Micrometer controlled
Slit Resolution	10 Micron
Dispersion	2.459 nm / mm @ 350nm
CCD wavelength coverage	70 nm
CCD Sensor	B / W line Sensor
Number of Pixels	3648
Pixel Size	8 x 200 micron
Pixel Output Clock	0.5 MHz
ADC resolution	16 bits
Exposure Time Range	0.1ms - 6,500ms
Frame Rate	Up to 138 scans / second
Interface	USB 2.0
Compatibility	Windows 2000 XP or higher

Default slit width is 20 μm
Spectral Coverage : approximate, use for reference purpose only

www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

Build Quality

Heavy duty aluminium construction is used for stability with respect to vibration and thermal effects. Multiple accessory options allow the user to configure the system for custom applications. The basic system and accessories are designed in modular fashion. More and more accessories can be added as the applications expand.

Where it is Used?

It can be used for spectroscopic study of LED's, optical filters, general emission and absorption experiments etc.

Dual exit port configured model is also available. It enables simultaneous mounting of different detectors. It helps to work with different wavelength region. The Software allows usage of all the functions of each device independently. All systems can be made completely automated and PC controlled

Wavelength Range

350 - 1100 nm
for HO-SP-S100SA



Holographic

Holographic grating UV Optimized at a grating Intensity of 1200 and upto 50mm x 50mmm grating size



Slit

10 Micron resolution
0 - 3 mm, Micrometer controlled Slit Width





Spectra CT UV-VIS-NIR CCD Based Multi Channel Scanning Spectrometer

Model: HO-SP-3S300FS

HOLMARC's Model HO-SP-3S300FS is a CCD based scanning spectrometer designed for multichannel spectroscopic application, can hold up to 10 Nos. of 600 micron optical fibers at the input slit (Optional - can be customized as per requirements). It can rapidly scan a range of wavelengths and record light intensity of all the channels at each wavelength. In this spectrometer, only 58 nm wavelength range is covered in a single imaging, by making use of the entire 3032 x 2016 pixels available in the CCD. This feature increases the resolution significantly. For obtaining spectra over full wavelength range, various spectral images are taken and stitched together using the software provided. Hence this device is named "Stitched Scanning Spectrometer". It works in the wavelength range of 340 to 1050nm.

Holographic diffraction grating used in this spectrometer disperses light by diffracting different wavelengths at different angles and it is subsequently focused by a second concave mirror. The grating is positioned in such a way to get all the wavelength of light in to a linear CCD. The required wavelength range is selected by rotating angle of the grating. The mirror and slit positions remain fixed. It utilizes a computer controlled motorized turret for automatic grating and wavelength selection. Resolution and wavelength range of the spectrometer is depends on the selection of grating.

Electronics is packaged inside the housing and has RS-232 interface to the computer. For USB interface a Serial to USB converter is connected to the RS-232 output and a USB converter driver needs to be loaded on the computer so that it will recognize the USB interface as a virtual RS-232 serial port. There is also a fast and interactive graphical software interface allowing full control of all the spectrograph functions.

- Trigger In & Trigger Out function
- High resolution spectral analysis
- High wavelength accuracy
- 340 - 1050 nm spectral range in a single scan
- Optional photo multiplier and silicon photo diode detector attachment
- Adjustable input slit to control the spectral resolution
- Selectable wavelength range
- RS-232 and USB to serial port extension module
- Optional optical port with optical output and detector input ports

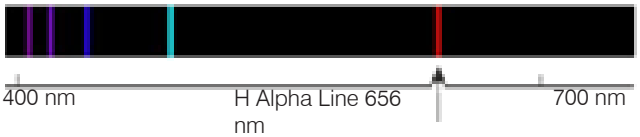
Specifications

Optical path configuration	Czerny-Turner type
Focal Length	300 mm
Aperture Ratio	f / 6
Port Configuration	Single I / P & O / P (Customizable)
Dispersion element	Holographic grating UV Optimized
Grating density	1200
Grating Size	50 x 50 mm
Relative diffraction efficiency	65 %
Wavelength range	340 - 1050 nm
Resolution with CCD (FWHM)	~ 0.058 nm
Band width per pixel	~ 0.029 nm
Slit width	0 - 3 mm, Micrometer driven
Slit Resolution	10 Micron
Dispersion	2.3 nm / mm @ 532 nm
CCD wavelength coverage	58 nm
Interface	USB 2.0

Hydrogen Absorption Spectrum



Hydrogen Emission Spectrum



About Product

Heavy duty aluminium construction is used for stability with respect to vibration and thermal effects. Multiple accessory options allow the user to configure the system for custom applications. The basic system and accessories are designed in modular fashion. More and more accessories can be added as the applications expand.

It can be used for spectroscopic study of LED's, optical filters, general emission and absorption experiments etc.

Dual exit port configured model is also available. It enables simultaneous mounting of different detectors. It helps to work with different wavelength region.
The Software allows usage of all the functions of each device independently. All systems can be made completely automated and PC controlled.

Holographic Gratings

Optimized for UV
with upto 50x50mm grating size and 1200 grating density



Slit

0 - 3 mm,
Micrometer driven Slit



Focl Length

300mm

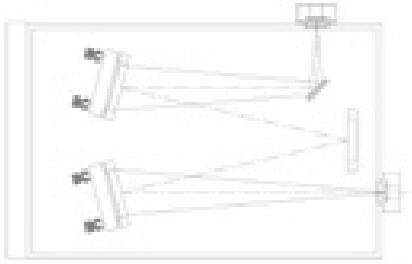


Monochromator

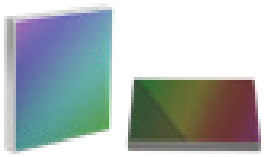


Spectra UV-VIS-NIR Standard Monochromator

Model: HO-SP-M01S | HO-SP-M03S



HOLMARC's Spectra UV-VIS-INR standard monochromators are designed for general spectroscopic research needs. These monochromators are designed using single 1200 lines / mm holographic precision grating. A microprocessor onboard controls the motor for precision wavelength positioning. The instrument can be operated either from the front panel or through a personal computer which can be interfaced with the device by using RS 232C serial port. The front panel of the device has user friendly keyboards and back lit LCDs. Input and output ports of the monochromator are fitted with precise, micrometer controlled variable slits. Mirrors are kinematically mounted for fine tuning during installation and setup. The software developed for the instrument has facilities for setting up and calibration as well. System accepts input data as wavelength or wave number.



Monochromator consists of diffraction grating, slits and spherical mirrors, all held by precision opto-mechanical mounts. The input light source, which is always application dependent, typically emits a broad spectrum of radiations. Diffraction grating disperses light by diffracting different wavelengths at different angles. The angular position of the grating is adjusted by the use of rotary stage so that light with required wavelength is passed through the exit slit and all other wavelengths are blocked, without changing position of mirrors and slits.



Precision stepper motor controlled rotation stage is used for driving the grating. Very fine resolution for the grating stage is achieved by the micro-stepping feature of the stepper motor control. Wavelength selection is made much easier in automated system compared to manually adjusted versions.

- Micrometer adjustable slits to precisely control incoming light.
- User specified gratings to meet specific applications
- Stepper motor scanning for precision wavelength positioning
- Internal shutter or filter wheel (Optional)
- Motorized slit (Optional)
- Custom configurations

Very fine resolution

Operates in Manual & PC mode



Specifications	
Model	HO-SP-M01S
Optical path configuration	Czerny-Turner type
Wavelength Range	200 - 1100 nm
Collimating & Focusing mirror	50 mm dia, 300 F
Optical Grating	1200 l / mm
Grating Size	50 x 50 mm
Absolute Diffraction Efficiency	45 - 65 %
Slit Width	0 ~ 3 mm Continuously Adjustable
Resolution	0.1 nm (@ 546 nm, 10 μm slit width)
Wavelength Accuracy	≤ 0.2 nm
Wavelength Repeatability	≤ 0.1 nm
Stray Light	≤ 10-3
Reciprocal of Linear Dispersion	2.7 nm / mm
Half-Width of Spectral line	≤ 0.2 nm @ 586 nm
A fixed diverter mirror assembly for entrance side port A exit selection diverter mirror assembly for exit ports A micrometer controlled adjustable slit for entrance and exit ports, 0 to 3mm(10micrometer increment/decrement unit)	

Model	HO-SP-M03S
Optical path configuration	Czerny-Turner type
Focusing mirror	80 mm dia, 500 F
Collimating mirror	80 mm dia, 500 F
Clear aperture	76.92 mm
Coating	Broadband Al-Coating
Folding mirror	55 x 40 mm
Grating Size	50 x 50mm (68 x 68mm Optional)
Resolution	0.05 nm @ 435.8 nm [1200 gr/mm grating, 10 μm slits]
Accuracy	+/- 0.2 nm
Repeatability	+/- 0.04 nm
Drive-step size	0.0025 nm with 1200gr/mm
Dispersion	1.7 nm / mm
Aperture	f / 6.5
Interface	RS232 & USB Standard
Focal-plane size	26 mm wide x 14 mm high

A fixed diverter mirror assembly for entrance side port A exit selection diverter mirror assembly for exit ports A micrometer controlled adjustable slit for entrance and exit ports, 0 to 3mm(10micrometer increment/decrement unit)	

Holographic Gratings	
Available Options	1200 l/mm | 1800 l/mm | 2400 l/ mm
	Monochromators are available in various port configurations.
	Single I/P & O/P port, Double I/P & O/P port
	Single I/P & Double O/P port, Double I/P & Single O/P port

Other model in standard series monochromator	
Model	HO-SP-M02S - 400 mm Focal length Monochromator
	HO-SP-M04S - 600 mm Focal length Monochromator

Mini Monochromator

Compact, Automated Scan
Model: HO-SP-150F6 Series

HOLMARC's New 125mm & 150mm focal length CT monochromators are compact mini optical system delivering a high performance, reliable solution wide scan wavelength measurement over UV-VIS-IR region (185nm - 3300nm). Its features are comparable to many larger, more expensive, conventional models. At just 16 x 8cm the 125F5 monochromator (20 x 10cm for 150mm F6 monochromator) features a compact design with a single entrance and exit slit with up to two diffraction gratings ideal for accommodation into the smallest of spaces available, particularly suitable in OEM applications. The 150F6 monochromator is ideally suited to measurements whereby a medium to lower spectral resolution is required, i.e. as tuneable light source, wavelength scan measurement system etc. Suitable for integration into a larger measurement system. Because of the compact design it can be used in a variety of sophisticated analytical and biomedical equipment such as: clinical chemistry analyzers, HPLC detectors, and UV-VIS-NIR spectrophotometers.

- Can be held in any position vertical or horizontal
- Provision to screw a rectangular to round fibre patch cord on both input and output slit
- Computer control of monochromator with QSR software (Lab View support)

Manual Mini Monochromator

125 mm F5 & 100 mm F4 - Handheld Size
Model: HO-SP-125F5 & HO-SP-100F4 Series

HOLMARC's MMS-125F5 hand held Mini Monochromator is a manually operated light weight monochromator size of that utilizes a knob dial and a precision linear engraved top for wavelength selection. For quick wavelength selection a quick release lever also provided. Precision lead screw sine bar mechanism is used for the rotation of the diffraction grating which positions the selected wavelength at the exit slit. Wavelength can be read directly in nanometers from engraved top. These are ideal choice for compact wavelength selection system. 0-5 mm micrometer controlled variable slit is used for the wavelength band width controls. Narrower slits increase resolution but decrease throughput. Wider slits increase throughput at the expense of spectral purity.
Note: It is possible to converts slit aperture to SMA connector.

Specifications

	Automatic Mini Monochromator	Manual Mini Monochromator
Optical Layout	Czerny Turner	Czerny Turner
Focal length	120, 125 & 150mm	125 & 100mm
Grating mount	Single / Dual grating turret	Single
Number of gratings	1 - 2	
Grating size	25 x 25 mm	25 x 25 mm
Aperture ratio	f/4, f/5 & f/6	f/5 & f/4
Number of entrance / exit ports	1	1
Fiber optic coupler plate	Yes, converts slit aperture to SMA connector	Yes, converts slit aperture to SMA connector
Mechanical resolution drive	0.000072°/ step	0.000072°/ step
Slit type	Fixed, Micrometer or motorized	Fixed
Slit width	10 μm - 2 mm	10 μm - 3 mm
Slit height	12 mm	12 mm
Higher order filter size	12.5 mm	
Linear dispersion	3.9 nm / mm (150 mm f)	
Wavelength accuracy	± 0.25 nm	
Computer interface	USB 2.0	
Software control		
Higher order selection	12.5 mm	Manual
Higher order filter size	Holmarc Spectra Scan	12.5 mm



Options Available

Model No.	Wavelength Range	f #	Grating	Resolution Typical Operation
HO-SP-120F4-M1	350 - 1100 nm	f 4	Single, 1200 l/mm	1.25 nm
HO-SP-125F5-M1A	190 - 1100 nm	f 5	Single, 800 l/mm	1.75 nm
HO-SP-125F5-M1B	190 - 900 nm	f 5	Single, 1200 l/mm	1.2 nm
HO-SP-125F5-M1C	350 - 700 nm	f 5	Single, 2400 l/mm	0.65 nm
HO-SP-150F6-M1A	190 - 1100 nm	f 6	Single, 800 l/mm	1.5 nm
HO-SP-150F6-M1B	190 - 900 nm	f 6	Single, 1200 l/mm	1 nm
HO-SP-150F6-M1C	350 - 700 nm	f 6	Single, 2400 l/mm	0.5 nm
HO-SP-150F6-M2A	190 - 1100 nm	f 6	Dual, 1200 & 2400 l/mm	0.5 nm
HO-SP-150F6-M2B	190 - 1600 nm	f 6	Dual, 800 & 1200 l/mm	1 nm
HO-SP-150F6-M2C	1000 - 3300 nm	f 6	Dual, 800 & 600 l/mm	1.5 nm

Options Available

Model No.	Wavelength Range	f #	Grating	Resolution Typical Operation
HO-SP-125F5-MM1A	190 - 1100 nm	f 5	Single, 800 l/mm	1.75 nm
HO-SP-125F5-MM1B	190 - 900 nm	f 5	Single, 1200 l/mm	1.2 nm
HO-SP-125F5-MM1C	350 - 700 nm	f 5	Single, 2400 l/mm	0.75 nm
HO-SP-100F4-MM2A	190 - 1100 nm	f 4	Single, 800 l/mm	2 nm
HO-SP-100F4-MM2B	190 - 900 nm	f 4	Single, 1200 l/mm	1.5 nm
HO-SP-100F4-MM2C	350 - 700 nm	f 4	Single, 2400 l/mm	1 nm

HO-SP-150F6 Series



HO-SP-125F5 & HO-SP-100F4 Series



Spectra UV-VIS-NIR Quasar Series Scientific Monochromators

125 mm F5 & 100 mm F4 - Handheld Size

Model: HO-SP-SQR Series

HOLMARC's Spectra Quasar Series Monochromators Model : HOSP-SQR500FA, HO-SP-SQR300FA & HO-SP-SQR200FA are fully automated, triple grating instruments with dual output port while Models HO-SPSQR500F, HO-SP-SQR300F & HO-SP-SQR200F are single grating instruments with single output port. All the four models are designed for fast, automated and continuous scanning over broad spectral range. The angular position of the grating is adjusted by the use of sine drive mechanism so that only the required wavelength of light is passed through the output slit.

Spectra Quasar series monochromators are ideal choice for either single or multichannel detector to be used in many applications that require medium to high spectroscopic resolution with excellent stray light performance such as fluorescence, Raman, absorption and transmission. Spectra series monochromators are fully automated with microprocessor controls and can be interfaced with the device by using RS 232C serial port.

Input and output ports of the monochromator are fitted with precise, micrometer controlled variable slits. The software developed for the instrument has facilities for setting up and calibration as well. System accepts input data as wavelength or wave number. Various configurations of input and output ports are available with precision and long life time.

Precision stepper motor controlled rotation stage is used for driving the grating. Fine resolution for the grating stage is achieved by microstepping feature of the stepper motor drives. Wavelength selection is made much easier in automated system compared to manually adjusted versions.

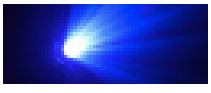
Spectra UV-VIS-IR Light Sources

HOLMARC offers a number of light sources to cover the spectral range of 200 - 2000nm which can be mounted directly to our monochromators or can be used independently. With the appropriate adapters, some of the sources can be mounted to our monochromators along with an optical chopper or filter wheel. Additional adapters and interface kits are available for focusing and launching the light directly into optical fibers.

Detector Stages for Monochromators

Holmarc manufactures custom detector mounts and stages for your application. Please contact us with your custom requirements at

sales@holmarc.com / mail@holmarc.com

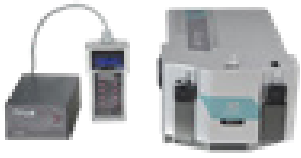


FA - Fully automated Model
F - Fixed Model



Specifications





	500FA Spectra Quasar 500F Fully Automated Monochromator	300FA Spectra Quasar 300F Fully Automated Monochromator
Optical Design	Czerny-Turner	Czerny-Turner
Input Port	Dual	Single
Output Port	Dual (One for Monochromatic Light and other for single / multi channel spectral application)	Dual (One for Monochromatic Light and other for single / multi channel spectral application)
Port Selection Mechanism	Integrated Motorized Flip Mirror based Mechanism	Manual Flip Mirror based Mechanism
Main Mirrors	Parabolic type with Enhanced Aluminum Coating	Parabolic type with Enhanced Aluminum Coating
Focal Length	500 mm	300 mm
Collimating Mirror Size	-	50 x 50 mm
Focusing Mirror Size		75 x 50 mm
Diameter	68 mm or 120 mm	
Aperture Ratio	f / 5 (with 100 x 100mm grating) or f / 7.3 (with 68 x 68mm grating)	f / 6 (with 50 x 50 mm grating)
Dispersion Element	Holographic Grating	Holographic Grating
Grating Size	100 x 100 mm (Ruled Grating) Custom grating can be provided on request	50 x 50 mm
Grating Density	600 l / mm and 1200 l / mm	600 l / mm and 1200 l / mm
Wavelength Range	200 - 2000 nm	200 - 2000 nm
Diffraction Efficiency	65 % (@ 532 nm)	65 % (@ 532 nm)
Dispersion	1.426 nm / mm	2.29 nm / mm (52.13 cm - 1/mm)
Mechanical Wavelength Range	200 - 1600 nm (@ 1200 l/mm)	200 - 2000 nm (@ 1200 l/mm and 600 l/mm)
Accuracy	0.1 nm	0.1 nm
Grating Mounting Design	Triple Grating Turret Based (Can hold up to 3 Gratings)	Dual Grating Turret Based
Mount Design	Kinematic Top Adjustable Mounts	Kinematic
Grating Rotation	Front Surface Axis	Front Surface Axis
Output Port Size	30 mm	
Focal Imaging Plane	30 x 12 mm	30 x 12 mm
Focal Plane Extension from the port	42 mm	20 mm
Scanning Speed	160 nm / second	160 nm / second
Input and Output Slit Design	Integrated Motorized Slit or Manual Slit	Integrated Motorized Slit or Manual Slit
Slit Width Range	0 - 3 mm	0 - 3 mm
Least count	1 Micron	1 Micron
Shutter	Integrated Motorized Active Shutter	Integrated Motorized Active Shutter
Filter unit	Higher order cut off filter wheel	Higher order cut off filter wheel
Calibration	Auto calibration for all motorized function	Auto calibration for all motorized function
	(Manual Calibration can be activated for wavelength calibration)	(Manual Calibration can be activated for wavelength calibration)
Software	Windows based software to control all spectrometer functions and detector readings (with Labview interface support)	Windows based software to control all spectrometer functions and detector readings (with Labview interface support)

Specifications - Spectra Quasar 500FA Monochromator

	200FA	500F
		
	Spectra Quasar 200F Fully Automated Monochromator	Spectra Quasar 500F Monochromator
Optical Design	Czerny-Turner	Czerny-Turner
Input Port	Single	Single
Output Port	Dual (One for Monochromatic Light and other for single / multi channel spectral application)	Dual (One for Monochromatic Light and other for single / multi channel spectral application)
Port Selection Mechanism	Off Axis Parabolic Flat field Corrected Optics	
Main Mirrors	Off Axis Parabolic Flat field Corrected Optics	Parabolic type with Enhanced Aluminum Coating
Coating	Enhanced Aluminium Coating	
Focal Length	200 mm	500 mm
Collimating Mirror Size		
Focusing Mirror Size		
Diameter		
Aperture Ratio	f / 4	f / 10 (with 50 x 50mm grating)
Dispersion Element	Holographic Grating & Ruled Grating	Holographic Grating
Grating Size	50 x 50mm (Custom grating can be provided on request)	
Grating Density	600 l / mm and 1200 l / mm	1200 l / mm
Wavelength Range	200 - 2000 nm	200 - 1100 nm
Diffraction Efficiency	65 %	65 % (@ 532 nm)
Dispersion	2.026 nm / mm	1.426 nm / mm
Mechanical Wavelength Range		200 - 1600 nm (@ 1200 l/mm)
Accuracy	0.1 nm	0.1 nm
Grating Mounting Design	Dual Grating Type	Single Grating
Mount Design		
Grating Rotation		Front Surface Axis
Output Port Size	Front Surface Axis	30 mm
Focal Imaging Plane	Output Port Size	30 x 12 mm
Focal Plane Extension from the port	42 mm	30 x 12 mm
Scanning Speed	160 nm / second	
Input and Output Slit Design	Integrated Motorized Slit	
Slit Width Range	0 - 3 mm stepper motor controlled	0 - 3 mm (Manual)
Least count	1 Micron	1 Micron
Shutter	Integrated motorized Active Shutter	
Filter unit	Higher order cut off filter wheel	Higher order cut off filter wheel
Calibration	Auto calibration for all motorized function	
	(Manual Calibration can be activated for wavelength calibration)	
Software	Windows based software to control all spectrometer functions and detector readings (with Labview interface support)	Windows based software to control all spectrometer functions and detector readings (with Labview interface support)

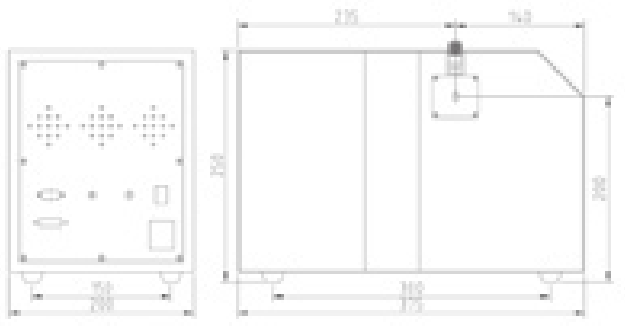
Specifications

	300F	200F
		
	Spectra Quasar 300F Monochromator	Spectra Quasar 200F Monochromator
Optical Design	Czerny-Turner	Czerny-Turner
Input Port	Single	Single
Output Port	Dual (One for Monochromatic Light and other for single / multi channel spectral application)	Single (designed for Monochromatic Light and multi channel spectral application)
Port Selection Mechanism		
Main Mirrors	Parabolic type with Enhanced Aluminum Coating	Off Axis Parabolic Flat field Corrected Optics
Coating		Enhanced Aluminium Coating
Focal Length	300 mm	200 mm
Collimating Mirror Size	50 x 50 mm	
Focusing Mirror Size	75 x 50 mm	
Diameter		
Aperture Ratio	f / 6 (with 50 x 50 mm grating)	f / 4
Dispersion Element	Holographic Grating	Holographic Grating & Ruled Grating
Grating Size	50 x 50 mm	50 x 50mm (Custom grating can be provided on request)
Grating Density	1200 l / mm	1200 l / mm
Wavelength Range	200 - 1100 nm	200 - 1100 nm
Diffraction Efficiency	65 % (@ 532 nm)	65 %
Dispersion	2.29 nm / mm (52.13 cm - 1/mm)	2.026 nm / mm
Mechanical Wavelength Range	200 - 1600 nm (@ 1200 l/mm)	
Accuracy	0.1 nm	0.1 nm
Grating Mounting Design	Single Grating	Single
Mount Design		
Grating Rotation	Front Surface Axis	Front Surface Axis
Grating Removal Port	Yes	
Output Port Size	30 mm	30 mm
Focal Imaging Plane	20 x 12 mm	30 x 12 mm
Focal Plane Extension from the port	50 mm	42 mm
Scanning Speed		160 nm / second
Input and Output Slit Design		Manual Slit
Slit Width Range	0 - 3 mm (Manual)	0 - 3 mm
Least count	1 Micron	1 Micron
Shutter		Integrated motorized Active Shutter
Filter unit	Higher order cut off filter wheel	Higher order cut off filter wheel
Calibration		Auto calibration for all motorized function
		(Manual Calibration can be activated for wavelength calibration)
Software	Windows based software to control all spectrometer functions and detector readings (with Labview interface support)	Windows based software to control all spectrometer functions and detector readings (with Labview interface support)

Spectra UV-VIS-NIR High Throughput

DUAL Grating f/3.5 Monochromator

Model: HO-HTDG 175F2



HOLMARC's 175F2 monochromator having 175 mm focal length is an out-of-plane version of Ebert-Fastie monochromator. It is designed with large optics for high light throughput and f / 3.5 aperture, optimized to provide excellent stray light rejection while minimizing aberrations. The optical configuration is designed to ensure high resolution and maximum throughput.

175F2 has computer controlled, motorized turret for automatic grating and wavelength selection. It offers 0.2 nm resolution in UV-VIS region with 1200 lines / mm grating and 0.25 nm in IR region with 600 lines / mm ruled grating, covering wavelength range of 250 nm to 1900 nm. Monochromator includes adjustable micrometer controlled input and output slit.



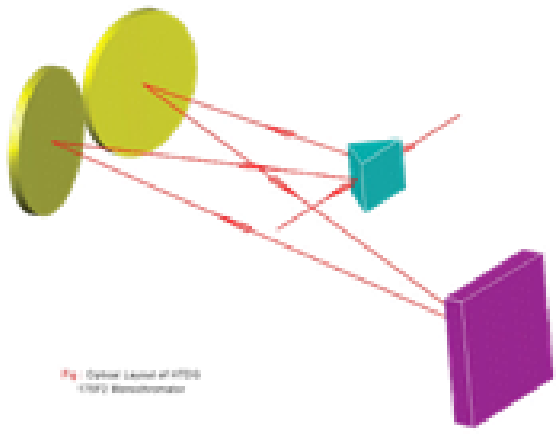
Specifications	
Focal Length	175 mm
Focal ratio F/#	F / 3.5
Wavelength Selection Method	Motorized Sine Drive
Grating	Holographic 1200 l/mm & 600 l/mm ruled precision gratings
Wavelength Range	250 - 1900 nm
Grating Size	50 x 50 mm
Grating Turret	Yes, Two grating turret with grating
Wavelength Accuracy	0.2 nm with 1200 l/mm grating
Wavelength Precision	0.1 nm
Stray Light	0.03 %
Number of ports	1 input port & 1 output port
Slit	Variable Micrometer Slit
Resolution	10 Micron
Slit opening	0 - 3 mm
Higher order cut off filter	Yes - Motorized filter wheel unit
Interface	USB 2.0
Handheld control unit	Optional
Software	Spectra SQR

Optional Hand Controller

175F2 includes a connector to utilize the optional Handheld Controller for manual operation without using computer. There is no need to memorize commands or key sequences. The backlit LCD display provides information on the selection of grating, active filter, current wavelength etc

Customization

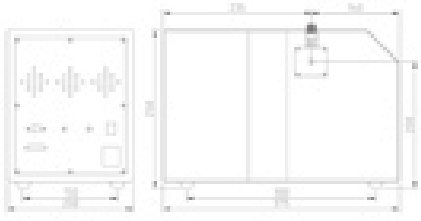
HOLMARC has built reputation for providing custom solutions. Whether you need a small modification to the existing system or a completely novel design, built from scratch up to meet your technical specifications, HOLMARC's engineering and optical design groups are ready to help.



Raman / PL Spectroscopy



Laser Raman Spectrometer



Holmarc's Laser Raman Spectrometer (Model No:HO-EDS-06) is a useful instrument for the identification of wide range of substances in physics and chemistry laboratories. The procedure followed in this equipment is illuminating a sample with DPSS green laser and using a monochromator to examine the light scattered by the sample. It is a straight forward, non destructive technique requiring no sample preparation. This spectrometer is designed for recording raman emissions from solids as well as liquids when a laser beam is passed through the sample. The apparatus suits Chemistry as well as Physics labs for characterizing materials by recording raman emissions. The set up consists of 40mW DPSS laser (532 nm), collection optics, sample mount, stages, monochromator and detector. The monochromator is PC controlled and motorized. The experiment is conducted by scanning the emission spectrum by monochromator and recording the intensity of each interested wavelength from the detector. The readings are plotted on a graph. Monochromator used in the system has high resolution and low stray light. When a light beam emitted by the laser device passes trough an external optic path and irradiates the sample, the scattered light enters the monochromator. When the grating in the monochromator is rotated, light signal passes through a slit and falls on a highly sensitive detector (PMT). The detector output is sent to the computer for further processing.

Specifications	
Laser source	532 nm 40 mW DPSS Laser
Wavelength Range	200 ~ 800nm (Monochromator)
Wavelength Accuracy	≤ 0.4 nm
Wavelength Repeatability	≤ 0.2 nm
Reciprocal of Linear Dispersion	2.7 mm
Half-Width of Spectral line	≤ 0.2 nm @ 586 nm
Monochromator	
Relative Aperture Ratio	D / F 1 / 5.5
Optical Grating	1200 l / mm
Slit Width	0 ~ 2mm Continuously Adjustable
Control Electronics and Software	Electronics hardware is integrated with monochromator, detector and laser source, so that fully automatic operation is possible from interfaced computer. Software developed is dedicated for Laser Raman spectrometer with all standard capabilities. Holmarc engineers entertain customization of this software on request.
Detector	PMT is used as detector. It is placed near exit slit in a closed enclosure. The high voltage power supply required for PMT is integrated with detector housing.

CCD Based Laser Raman Spectrometer - Compact Model

Model: HO-SP-LRS218

Raman an extremely useful and powerful analytical tool. Holmarc's new CCD based spectrometers configured for Raman spectroscopy applications that can record Raman spectrum of different liquid, solid, or powder samples. Raman spectroscopy is becoming an increasingly important spectroscopic tool for analytical chemistry. Raman spectroscopy is one of the underutilized techniques in undergraduate chemical education. Cost is a primary reason. Holmarc LRS218 Raman spectrometer is a low cost solution for measuring Raman spectrum.

System include cooled CCD array detectors for 532nm Raman or 785nm Raman (other wavelengths available on request). Coupled with a laptop computer and our Spectra LRS software, a user can quickly collect a Raman spectrum.

Features

- Computer-controlled, user-friendly interface
- Capable of automatic recording of Raman spectra
- Wavelength Selection Method
- DPSS laser is used as light source
- Both solid and liquid samples can be analyzed
- The system is assembled as a standalone unit with a footprint of 800 mm x 600mm
- High sensitive PMT is used as detector
- PMT protection circuit
- Both manual and automatic recording of data possible

Specifications	
Spectrometer Type	CT216
Design	Czerny Turner
Diffraction Gratings	1200 g/mm
Optical Resolution	2 cm-1
Signal to Noise	500 : 1
Detector Type	Cooled Line CCD
Number of pixels	3648 pixels
Digitizer	16 Bit
Power Consumption	< 10 0mA
Interface	USB powered
Spectral Range @ 532 nm	200 - 2200 cm-1
Stray Light	< 0.1 %
Operating Systems	WinXP, Vista, Win7 (32 / 64-bit)
Exposure Times	1 ms to 10 sec
Software	HOLMARC Spectra LRS



HO-SP-LRS218

532nm Research Grade Upright Raman / PL Microscope

Model: HO-SP-CRM 221

The 532nm Research Grade Upright Raman/PL Microscope by Holmarc is a high-precision instrument designed for advanced spectroscopy and photoluminescence studies. Equipped with a 532nm laser, it enables detailed Raman spectral analysis and imaging, making it ideal for material science, nanotechnology, and semiconductor research. Its motorized sample stage and high-resolution CCD detector ensure accurate mapping and data acquisition. This microscope is widely used in applications such as studying molecular structures, characterizing materials, and analyzing thin films. Holmarc's innovative design integrates advanced optics and user-friendly software, making it a reliable choice for cutting-edge research

Specifications	
Equipment Type	Upright
Optical System	Colour Corrected Infinity Optical System
Observation	7" Touch Display Unit with a dedicated PC
Sample Stage	Stepper motor controlled
Objectives	5x, 10x, 20x, 40 x and 60x Plan objectives confocal objective lens
Tube Length	200 mm
Turret	Motorized positioning and 4 slots for keeping
Condenser	Abbe condenser
Focus	Motorized Stepper motor controlled
Illumination for imaging	Top, Bottom, and Co-Axial HB-LED Based
Illumination Control	Continuously Variable PC controlled
Raman / PL	
Laser wavelength	532 nm
Type	Low noise variable power 100mW DPSS Laser
Shutter	Solenoid / Motorized Type
Spectrometer Type	Czerny-Turner
Focal Length	200 mm
Focal Ratio	f / 4
Spectral range	4000 ~ 100 cm-1 (Raman)
Spectral Resolution	0.95 cm-1
Photoluminescence	
Spectrometer Type	Czerny-Turner
Focal Length	200 mm
Focal Ratio	f / 4
Spectral Range	400 - 900 nm
Spectral Resolution	0.1 nm

Raman Filter Details

532nm, 25mm Dia., OD 6.0 Blocking Notch Filter
Center Wavelength CWL (nm) : 532.00
Optical Density OD (Average) : ≥6.0
Coating : Hard Coated
Full Width - Half Max FWHM (nm) : 17.00
Surface Quality : 60 - 40
Transmission (%) : 350 - 400nm : Tavg > 80, 400 - 1200nm : Tavg > 90
Transmission Wavelength (nm) : 350 - 1200
532 nm RazorEdge Dichroic laser beamsplitter
Edge Wavelength 1537.2 nm
Transmission Band 1 Tavg > 93% 538.9 - 824.8 nm
Angle of Incidence 45 degrees with a shift of <= 0.20% / degree
Cone Half-angle 0.5 degrees
Optical Damage Rating 1 J/cm2 @ 532 nm (10 ns pulse width)
Steepness Ultra Steep
Laser Wavelength 1 532 nm
Edge Steepness (%) 0.5%
Edge Steepness (nm) 2.7 nm
Edge Steepness (cm-1) 93.5 cm-1
Transition Width (nm) 5.3 nm
Transition Width (cm-1) 186 cm-1



Objectives

5 X, 20 X, 40 X & 60 X (User specified optional) with 200 mm tube length





Laser	
Laser wavelength	532 nm
Spectral Line Width	0.06 nm
Type	Low noise variable power 100mW DPSS Laser
Shutter	Solenoid Type

Mapping Stage	
Mapping sample stage	XYMR100 Motorized Stepper motor controlled
Travel	100 x 100 mm
Resolution	0.3125 Micron
Scanning Speed	4 mm / sec
Focusing	Motorized Stepper motor controlled
Travel	100 mm
Resolution	0.1 Micron
Controller	HOLMARC XYZ Stepper controller Unit
Joystick	3 Axis Joystick controller

Mapping Stage	
Detector Unit	Cooled Toshiba TCD1304AP Linear CCD Array (16Bit)
Number of Pixels	3648 pixels
Pixel Size	8um x 200um
Sensor Length	29.18 mm
Pixel Output Clock	0.5 MHz
Data Storage on Camera	4 Frames
ADC Resolution	16 bits
Exposure Time Range	0.1 ms - 6500 ms
GPIO	Yes (4 programmable I/O's)
Frame Rate	138 scans / second*
Trigger	Yes (Optional)
Interface	USB 2.0 or RS-232
Data formats	Spreadsheet

Imaging Camera Specifications	
Optical format	1 / 2.5" CMOS
Active imager size	5.70 mm x 4.28 mm, 7.13 mm diagonal
Active pixels	2592 x 1944 (5Mp)
Pixel size	2.2 x 2.2 um
Color filter array	RGB Bayer pattern
Shutter type	Global reset release (GRR), Snapshot only, Electronic rolling shutter (ERS)
Maximum data rate / master clock	96 Mp / s at 96 MHz (2.8 V I / O)
Frame rate	Full resolution - Programmable up to 15 fps
	VGA (640 x 480 with binning) - programmable up to 70 fps
ADC resolution	12 - bit, on-chip
Pixel dynamic range	70.1 dB
Operating temperature	-30°C to +70°C
Software	Holmarc Micro / Spectra Analyser PRO

Confocal Laser Raman Spectrometer

Model: HO-SP-CRM215

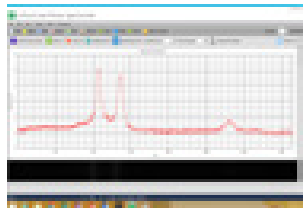
Holmarc manufactures and supplies a confocal laser Raman spectrometer as a fully assembled and ready-to-use instrument for material characterization and identification in industry as well as research labs.

Holmarc's Confocal Laser Raman Spectrometer combines an upright microscope with high N.A objective with a computer interfaced spectrometer. The microscope performs sample irradiation and signal collection. A laser beam focused by the microscope objective irradiates a small spot in the sample. The same objective collects scattered light from the sample and collimates for microscope optics and focusing at the input slit of the spectrometer. The Rayleigh line is rejected with the help of a high-OD edge filter, and Raman light is only fed into the spectrometer. The spectrometer is a Czerny-turner type with 1200 l/mm grating and line CCD detector. The exposure of the CCD and laser intensity can be adjusted to get impressive Raman signals.

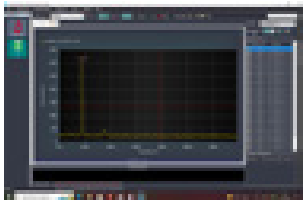
Holmarc supplies this Raman instrument along with a vibration isolated table as a standard accessory. Depending upon the application requirements, we undertake customization of the spectrometer grating, detector, and software interface.

Specifications	
Microscope Type	Upright Infinity Research Grade
Nosepiece	Revolving objective nosepiece
Objective	5 X, 20 X, 40 X & 60 X (User specified optional)
Tube Length	200 mm
Imaging Camera	5 MP USB 3.0
Sensor	1/2.5" CMOS
Illumination for imaging	Top, Bottom and Co-Axial HB-LED Based
Illumination Control	Continuously Variable
Laser wavelength	532 nm
Rayliegh rejection filter	Edge Filter
Type	Low noise variable power 100mW DPSS Laser
Shutter	Electronic
Spectrometer Type	Czerny-Turner
Focal Length	200 mm
Focal Ration	f / 4
Spectral range	200 cm-1 - 3500 cm-1(Raman)
The spectral resolution	0.95 cm-1
Mapping sample stage	XYMR100 Motorized Stepper motor controlled
Travel	100 x 100 mm
Resolution	0.3125 Micron
Scanning Speed	4 mm / sec
Focusing	Motorized Stepper motor controlled
Travel	100 mm
Resolution	0.1 Micron
Controller	HOLMARC XYZ Stepper controller Unit

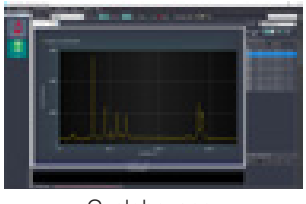
Sample Spectrum



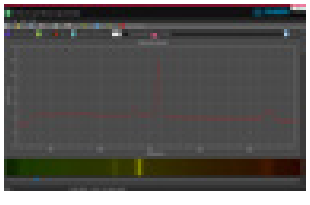
Graphene



Silicon Wafer



Cyclohexane



Graphite

Optional Acessories

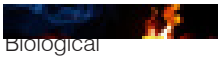
Sample Heating Unit	Model A	Model B
Temperature Rang	RT - 200 Degree C	200 - 482 Degree C
Specimen Holders	Multiwell Plate Holder	Petri Dish Holder
Motorized objective lens selection unit		

Where It Is Used

- Semiconductor



- Catalysts

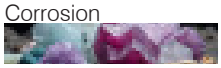


- Biological





- Corrosion



- General purpose



Microscope

Upright Infinity Research Grade with 200mm Tube Length

Objectives

5 X, 20 X, 40 X & 60 X (User specified optional) with 200 mm tube length

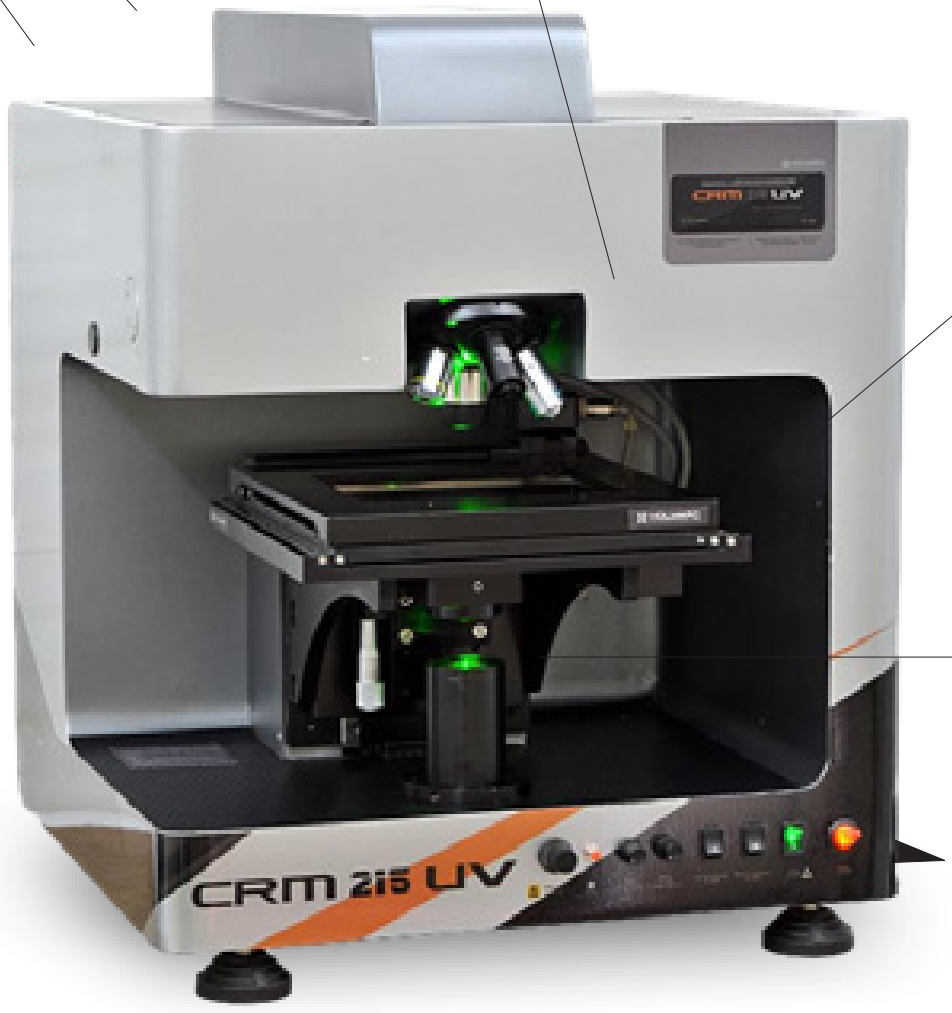


Spectrometer

Czerny-Turner with focal length 200mm f/4

Spectral Range

200 cm-1 - 3500 cm-1(Raman) with a spectral resolution of 0.95 cm-1



Mapping Stage

XYMR100 Motorized Stepper motor controlled with 100mmx100mm travel at a resolution of 0.3125 Micron



Laser

532nm Laser



Confocal Raman Spectroscopy

Confocal Raman spectroscopy is an advanced analytical method that merges Raman spectroscopy with confocal microscopy. By offering high-resolution Raman spectra from precise locations within a sample, it enables spatially resolved spectral analysis. The Holmarc CRM Series Raman Spectrometers utilize a fully automated infinity confocal microscope integrated with a high-resolution spectrometer and laser excitation system. This powerful combination facilitates detailed chemical investigations at the microscale.

The fully automatic microscope features a motorized objective turret, sample stage, and focusing capabilities. The turret accommodates six slots for inserting microscope objectives. Additionally, it is equipped with an eight-slot automatic filter wheel that includes dielectric beamsplitters and notch/edge filters. These filters are essential for applications such as Raman spectroscopy, photoluminescence, fluorescence and upconversion measurements.



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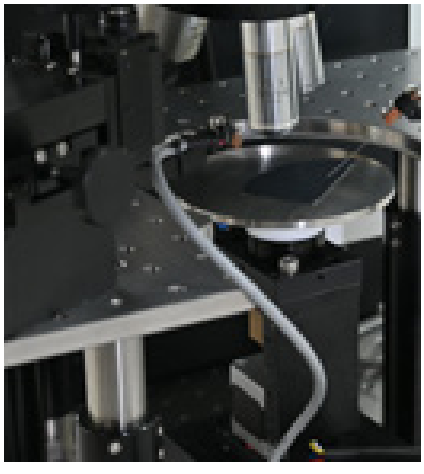


Models

HO-SP-CRM224T
HO-SP-CRM224TE
HO-SP-CRM224H
HO-SP-CRM224TR
HO-SP-CRM224TRE
HO-SP-CRM224HR
HO-SP-CRM224TEL
HO-SP-CRM224HEL
HO-SP-CRM225H-INSI

Upright

532nm RESEARCH GRADE
Automated Confocal Micro Raman
Spectrometer



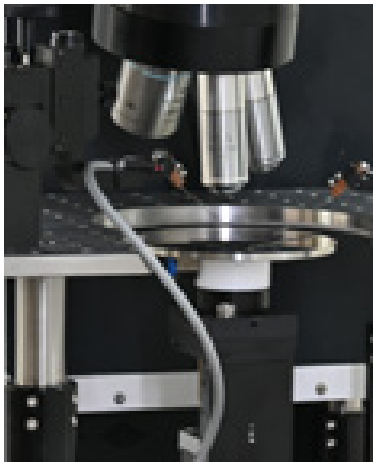
Inverted

532nm RESEARCH GRADE
Automated Confocal Micro
Raman Spectrometer



532nm

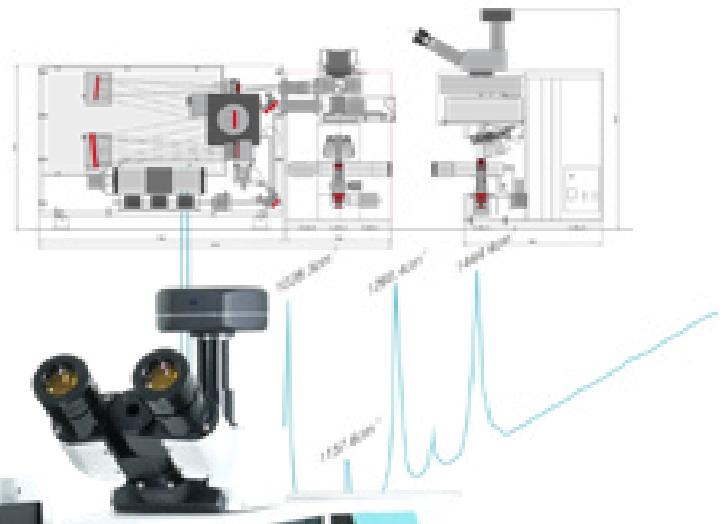
532nm Research-Grade
Probe Station based Micro
Electroluminescence/ Raman
Spectromete



Upright 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer

HO-SP-CRM224T
HO-SP-CRM224TE
HO-SP-CRM224H

Confocal Raman spectroscopy is a powerful analytical technique that combines Raman spectroscopy with confocal microscopy. It allows spatially resolved chemical analysis of samples by providing high-resolution Raman spectra from specific locations within a sample. A focused laser beam is used to illuminate the sample using the microscope, and the Raman-scattered light is collected through the same objective lens and coupled to the spectrometer.



UPRIGHT - Model No. CRM 221C



PL
Photoluminance

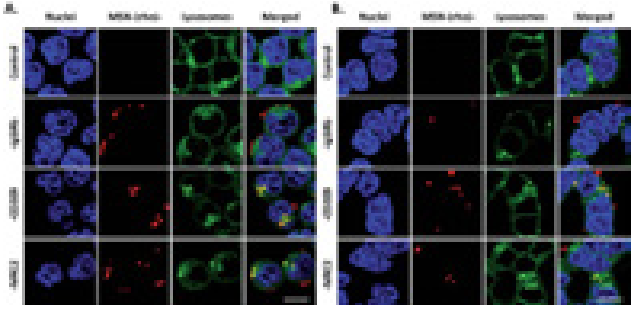
UC
Upconversion

FL
Fluorescence

EL
Electroluminescence

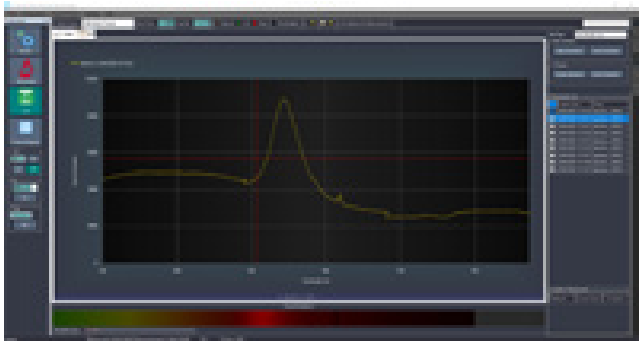
Raman Filter set

Joysticks Control

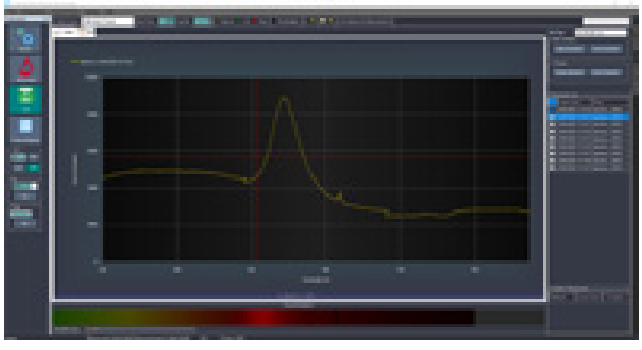


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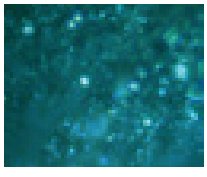
Photoluminescence
Upconversion measurments
Raman Microscopy
Electroluminescence etc.



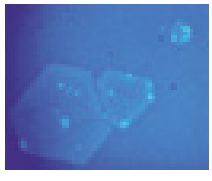
Mos2 PL1



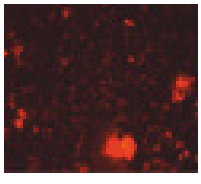
Mos2 PL3



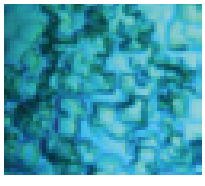
Graphene Sample



WS2 Sample Image



Ruby Pellet PL

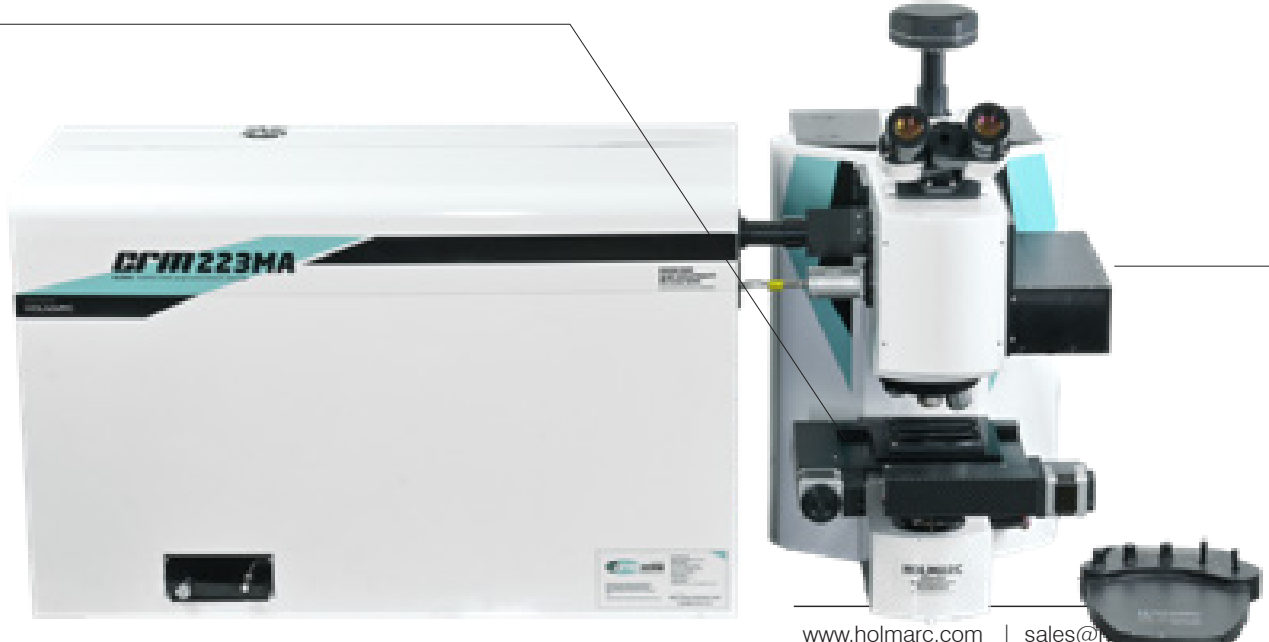


About

Fully automatic upright infinity confocal microscope integrated with a high-resolution spectrometer and laser excitation system. The new ergonomic design helps the user capture the microscopic image and Raman spectrum easily. The color-corrected infinity design microscope has a motorized turret, filter wheel, switching mirror, sample stage, and focusing features. The turret comes with six slots for holding six different magnification microscope objectives. It is also equipped with an 8-slot automatic filter wheel for dielectric beamsplitters and a notch/edge filter combination for Raman and photoluminescence applications with different wavelength lasers. The viewing head is a stereo binocular head with a 5.0 MP CMOS camera, which gives clear, sharp, high-resolution images of the sample. The coaxial illumination and bottom LED illumination can be controlled by software. The hand-held controller provided with the system makes easy adjustments of the sample stage and LED control by using the joystick key.

Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer		

Model No	HO-SP-CRM224T	HO-SP-CRM224TE	HO-SP-CRM224H
. Product Name			
Equipment type	Upright	Upright	Upright
Optical System	Colour Corrected Infinity Optical System		
Sample Stage	Stepper motor controlled	Stepper motor controlled	Stepper motor controlled
Objectives	5x, 20x, 40 x, 60x and 80x Plan objectives 45mm parafocal confocal objective lens		
Objective Turret	Motorized positioning and 6 slots for keeping		
Filter Selection Unit	8 - slot dichroic filter cube assembly		
Tube Length	200 mm	200 mm	200 mm
Condenser	Abbe condenser	Abbe condenser	Abbe condenser
Focus	Motorized Stepper motor controlled		
Illumination for imaging	Bottom and Co-Axial HB-LED Based		
Illumination Control	Continuously Variable PC-controlled		
Laser			
Laser wavelength	532 nm	532 nm	532 nm
Spectral Line Width	0.06 nm	0.06 nm	0.06 nm
Type	Low noise variable power 100mW DPSS Laser		
Shutter	Solenoid Type	Solenoid Type	Solenoid Type
Options additional lasers	**Raman 785nm, 488nm, 266nm, 1064nm, Laser Other laser wavelength available on special request**		
Mapping Stage			
Mapping sample stage	XYMR50 Motorized Stepper motor controlled		
Travel	50x50mm	50x50mm	
Resolution	0.3125 Micron	0.3125 Micron	0.3125 Micron
Scanning Speed	4 mm / sec	4 mm / sec	4 mm / sec
Focusing	Motorized Stepper motor controlled		
Travel	25 mm	25 mm	25 mm
Resolution	0.3125 Micron	0.3125 Micron	0.3125 Micron
Controller	HOLMARC XYZ Stepper controller Unit		
Scanning	Programmable	Programmable	Programmable
Joystick	3 Axis Joystick controller	3 Axis Joystick controller	3 Axis Joystick controller



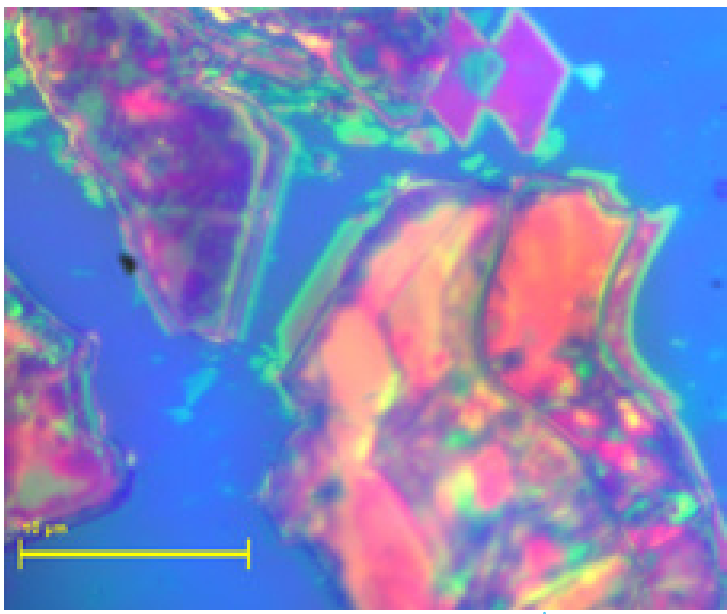
Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer		
Model No	HO-SP-CRM224T	HO-SP-CRM224TE	HO-SP-CRM224H
Raman Spectrometer			
Laser wavelength (Std)	532 nm	532 nm	532 nm
Optional lasers	- Support up to 3 lasers in combination with a motorized selection option -		
External Laser Integration	- Additional port for integrating the external lasers		
Shutter	Solenoid/Motorized Type	Solenoid/Motorized Type	Solenoid/Motorized Type
Spectrometer Type	Czerny-Turner	Czerny-Turner	Czerny-Turner
Focal Length	400 mm	400 mm	400 mm
Grating Turret	Motorized Grating Turret	Motorized Grating Turret	Motorized Grating Turret
Number of gratings	1	2	2
	-	**Supports automatic switching between 600 l/mm and 1800 l/mm gratings**	
Grating	600 l/mm	600 l/mm	600 l/mm
Raman Spectral range	3200 ~ 180 cm-1 (Raman	3200 ~ 100 cm-1 (Raman)	2800 ~ 100 cm-1 (Raman)
Wavenumber Scanning	High-Accuracy Direct Drive with Rotary Encoder		
Extended range by stitching	9000 ~ 180 cm-1 (Raman)	9000 ~ 100 cm-1 (Raman)	9000 ~ 180 cm-1 (Raman)
The spectral resolution	0.95 cm-1	0.95 cm-1 with 600l/mm grating 0.32 cm-1 with 1800l/mm grating	0.95 cm-1 with 600l/mm grating 0.32 cm-1 with 1800l/mm grating
Raman Filter set details			
		RazorEdge Dichroic laser beamsplitter	
Raman Edge Filter Specifications			
Edge Steepness (%)		**0.2%**	
Edge Steepness (nm		**1.1 nm**	
Laser Wavelength 1		**532nm**	
Transition Width (nm)		**2.7 nm**	
Transition Width (cm-1)		**90 cm-1**	
Raman Edge Filter Specifications			
Transmission Band 1		**Tavg > 93%**	
Blocking Band		**ODabs > 6**	
Edge Steepness (%)		**0.2%**	
Edge Steepness (cm-1)		**37.5 cm-1**	
Edge Steepness (nm)		**1.1 nm**	
Transition Width (nm)		**2.7 nm**	
Transition Width (cm-1)		**90 cm-1**	
Spectrometer Detector			
Detector Unit	- Cooled Linear CCD Array (16Bit) -		
Number of Pixels	3648 pixels	3648 pixels	
Pixel Size	8 um x 200 um	8 um x 200 um	
Sensor Length	29.18 mm	29.18 mm	
Pixel Output Clock	0.5 MHz	0.5 MHz	
Data Storage on Camera	4 Frames	4 Frames	
ADC Resolution	16 bits	16 bits	
Exposure Time Range	1 ms - 10,000 ms	1 ms - 10,000 ms	
Frame Rate	138 scans / second*	138 scans / second*	
Trigger	Yes (Optional)	Yes (Optional)	
Interface	USB 2.0 or RS-232	USB 2.0 or RS-232	
Data formats	Spreadsheet	Spreadsheet	
Software	Holmarc Ram Micro/Spectra Analyser PRO		

Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer

Model No	HO-SP-CRM224T	HO-SP-CRM224TE	HO-SP-CRM224H
Spectrometer Detector 2			
Make			Hamamatsu
Type			Binning type
Features			Low readout noise, high-resolution Spectroscopic line CCD camera -Wide dynamic range -Low readout noise: 4e-rms typ. -High resolution: pixel size 12 × 12 μm - TE-cooled type -Quantum efficiency: 90% or higher at peak -Wide spectral response range -MPP operation -High UV sensitivity and stable characteristics under UV light irradiation -Pin compatible with the S7030/ S7031 series
Image size			24.576 x 1.464 mm
Number of effective pixels			2048 x 122 pixels
Pixel size			12 x 12 μm
Spectral response range			200 to 1100 nm
Line rate (Typ.)			107 lines/s
Line rate (max.)			203 lines/s
Dark current (Typ.)			30 e-/pixel/s
Readout noise (Typ.)			4 e- rms
Cooling			One-stage TE-cooled, -35 Degree Cooled
Window material			AR-coated sapphire
Package			Meta



CrCl3 80X



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+91 920-719-7771 / (72 / 76)

Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer		
Model No	HO-SP-CRM224T	HO-SP-CRM224TE	HO-SP-CRM224H

Imaging Camera Specifications

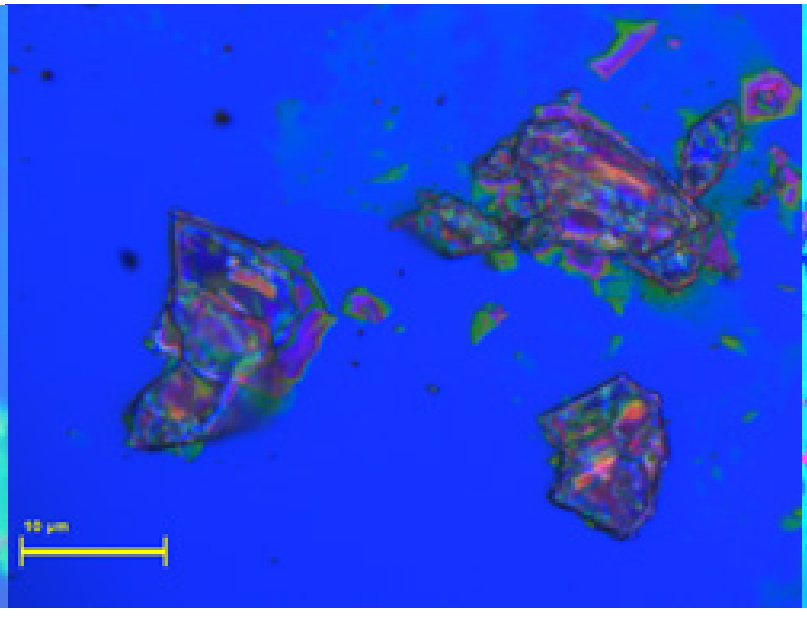
Sensor Type	CMOS, Global Shutter	CMOS, Global Shutter	CMOS, Global Shutter
Pixel Size	4.0μm×4.0μm	4.0μm×4.0μm	4.0μm×4.0μm
Optical Size	1/2.7"	1/2.7"	1/2.7"
Resolution	1280x1024	1280x1024	1280x1024
Max Frame Rate	213.9FPS	213.9FPS	213.9FPS
Effective Sensor Area	5.12mmx4.1mm	5.12mmx4.1mm	5.12mmx4.1mm
SNR	40db	40db	40db
Sensitivity	8V/Lux.S	8V/Lux.S	8V/Lux.S
Bit Depth	10bit	10bit	10bit
Trigger Mode	Hardware Trigger / Software Trigger	Hardware Trigger / Software Trigger	Trigger Mode Hardware Trigger / Software Trigger
HDR	60dB	60dB	60dB
Gain Gain	1-3×, Step : 0.125×	1-3×, Step : 0.125×	1-3×, Step : 0.125×
Image Format	RAW, BMP, JPG, PNG	RAW, BMP, JPG, PNG	RAW, BMP, JPG, PNG
Exposure Time	4us-145ms305us	4us-145ms305us	4us-145ms305us
Pixel Formats	RAW8, RAW16, BGR24, MONO8, MONO16	RAW8, RAW16, BGR24, MONO8, MONO16	RAW8, RAW16, BGR24, MONO8, MONO16
Data Interface	USB3.0	USB3.0	USB3.0
Power Supply	USB 5V	USB 5V	USB 5V
Power Consumption Operating	1.64W , Standby : 1.12W	1.64W , Standby : 1.12W	1.64W , Standby : 1.12W
Operating Temperature	-10⁰~50⁰	-10⁰~50⁰	-10⁰~50⁰
Protocols/Standards	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV

System Control and Data Collection software including Software for Sample Viewing

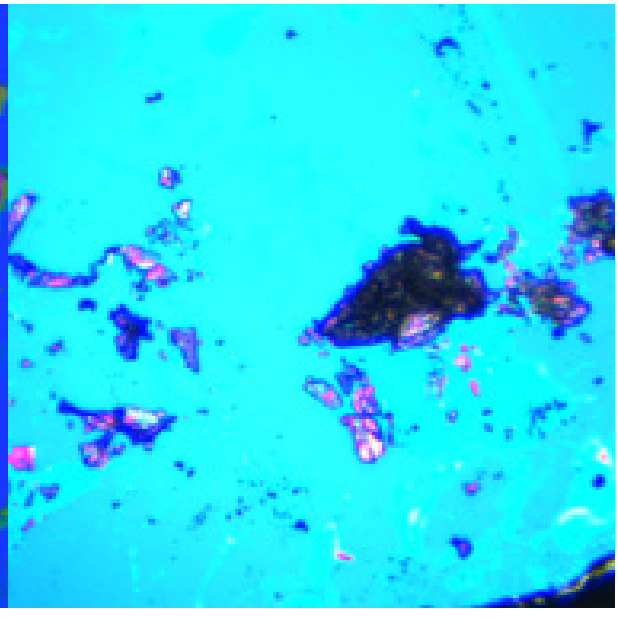
Capable of managing user-built libraries and material identification with spectral databases

Raman 785nm, 488nm, 266nm , 633nm , 1064nm Laser Other laser wavelength available

CrCl3 50X



CrCl3 5X



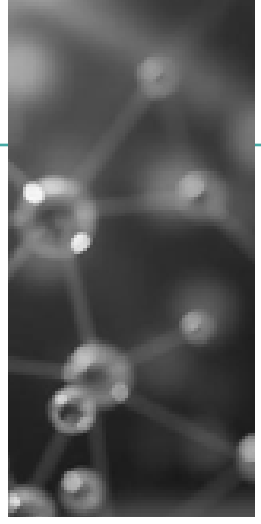
Inverted 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer

HO-SP-CRM224TR
HO-SP-CRM224TRE
HO-SP-CRM224HR

Holmarc CRM 216C is a fully automatic inverted infinity confocal microscope integrated with a high-resolution spectrometer and laser excitation system. The new ergonomic design helps the user capture the microscopic image and Raman spectrum easily. The color-corrected infinity design microscope has a motorized turret, filter wheel, switching mirror, sample stage, and focusing features. The turret comes with six slots for holding six different magnification microscope objectives. It is also equipped with an 8-slot automatic filter wheel for dielectric beamsplitters and a notch/edge filter combination for Raman and photoluminescence applications with different wavelength lasers. The viewing head is a stereo binocular head with a 5.0 MP CMOS camera, which gives clear, sharp, high-resolution images of the sample. The coaxial illumination and bottom LED illumination can be controlled by software. The hand-held controller provided with the system makes easy adjustments of the sample stage and LED control by using the joystick key.

CUSTOMIZABLE




WORK OPTIMALLY ACROSS VISIBLE AND IR WAVELENGTHS.
(PLAN SEMI-APOCHROMATIC)

4x OBJECTIVE					
Magnification	4X,	10x	20X,	40X,	100x OIL IMMERSION OBJECTIVE
Numerical Aperture	0.13 NA	0.3 NA	0.45 NA	0.6 NA	0.13 NA
Working distance	15 mm	10 mm	7 mm	4 mm	



Where it is Used?

- Nanotechnology
- Battery & solar cell research
  Material science
- Petroleum industry
- Forensics
- Life science
- Pharmaceutical Industry
- Bio-medical
- Chemical analysis
- Environment science
  Gemology

Stokes and Anti-stokes

RAMAN HYPERSPECTRAL IMAGING

Upright/ Inverted
Microscope Configuration

Shift Measurement Mode

$O.1cm^{-1}$
Diode Laser

Galvo+
High Speed Scanning

Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer		
Model No	HO-SP-CRM224TR	HO-SP-CRM224TRE	HO-SP-CRM224HR
.			
Equipment type	Inverted	Inverted	Inverted
Optical System	Colour Corrected Infinity Optical System		
Sample Stage	Stepper motor controlled	Stepper motor controlled	Stepper motor controlled
Objectives	5x, 20x, 40 x, 60x and 80x Plan objectives 45mm parafocal confocal objective lens		
Objective Turret	Motorized positioning and 6 slots for keeping		
Filter Selection Unit	8 - slot dichroic filter cube assembly		
Tube Length	200 mm	200 mm	200 mm
Condenser	Abbe condenser	Abbe condenser	Abbe condenser
Focus	Motorized Stepper motor controlled		
Illumination for imaging	Bottom and Co-Axial HB-LED Based		
Illumination Control	Continuously Variable PC-controlled		
Laser			
Laser wavelength	532 nm	532 nm	532 nm
Spectral Line Width	0.06 nm	0.06 nm	0.06 nm
Type	Low noise variable power 100mW DPSS Laser		
Shutter	Solenoid Type	Solenoid Type	Solenoid Type
Options additional lasers	**Raman 785nm, 488nm, 266nm, 1064nm, Laser Other laser wavelength available on special request**		
Mapping Stage			
Mapping sample stage	XYMR50 Motorized Stepper motor controlled		
Travel	50x50mm	50x50mm	
Resolution	0.3125 Micron	0.3125 Micron	0.3125 Micron
Scanning Speed	4 mm / sec	4 mm / sec	4 mm / sec
Focusing	Motorized Stepper motor controlled		
Travel	25 mm	25 mm	25 mm
Resolution	**0.1 Micron**	**0.1 Micron**	**0.1 Micron**
Controller	HOLMARC XYZ Stepper controller Unit		
Scanning	Programmable	Programmable	Programmable
Joystick	3 Axis Joystick controller	3 Axis Joystick controller	3 Axis Joystick controller
Raman Spectrometer			
Laser wavelength (Std)	532 nm	532 nm	532 nm
Optional lasers	Support up to 3 lasers in combination with a motorized selection option		
External Laser Integration	Additional port for integrating the external lasers		
Shutter	Solenoid/Motorized Type	Solenoid/Motorized Type	Solenoid/Motorized Type
Spectrometer Type	Czerny-Turner	Czerny-Turner	Czerny-Turner
Focal Length	400 mm	400 mm	400 mm
Grating Turret	Motorized Grating Turret	Motorized Grating Turret	Motorized Grating Turret
Number of gratings	1	2	2
	-	**Supports automatic switching between 600 l/mm and 1800 l/mm gratings**	
Grating	600 l/mm	600 l/mm	600 l/mm
Raman Spectral range	3200 ~ 180 cm-1 (Raman	3200 ~ 100 cm-1 (Raman)	2800 ~ 100 cm-1 (Raman)
Wavenumber Scanning	High-Accuracy Direct Drive with Rotary Encoder		
Extended range by stitching	9000 ~ 180 cm-1 (Raman)	9000 ~ 100 cm-1 (Raman)	9000 ~ 180 cm-1 (Raman)
The spectral resolution	0.95 cm-1	0.95 cm-1 with 600l/mm grating 0.32 cm-1 with 1800l/mm grating	0.95 cm-1 with 600l/mm grating 0.32 cm-1 with 1800l/mm grating

Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer		

Model No	HO-SP-CRM224TR	HO-SP-CRM224TRE	HO-SP-CRM224HR
Raman Filter set details			
		RazorEdge Dichroic laser beamsplitter	
Raman Edge Filter Specifications			
Edge Steepness (%)		**0.2%**	
Edge Steepness (nm		**1.1 nm**	
Laser Wavelength 1		**532nm**	
Transition Width (nm)		**2.7 nm**	
Transition Width (cm-1)		**90 cm-1**	
Raman Edge Filter Specifications			
Transmission Band 1		**Tavg > 93%**	
Blocking Band		**ODabs > 6**	
Edge Steepness (%)		**0.2%**	
Edge Steepness (cm-1)		**37.5 cm-1**	
Edge Steepness (nm)		**1.1 nm**	
Transition Width (nm)		**2.7 nm**	
Transition Width (cm-1)		**90 cm-1**	
Spectrometer Detector			
Detector Unit	- Cooled Linear CCD Array (16Bit) -		
Number of Pixels	3648 pixels	3648 pixels	NA
Pixel Size	8 um x 200 um	8 um x 200 um	NA
Sensor Length	29.18 mm	29.18 mm	NA
Pixel Output Clock	0.5 MHz	0.5 MHz	NA
Data Storage on Camera	4 Frames	4 Frames	NA
ADC Resolution	16 bits	16 bits	NA
Exposure Time Range	1 ms - 10,000 ms	1 ms - 10,000 ms	NA
Frame Rate	138 scans / second*	138 scans / second*	NA
Trigger	Yes (Optional)	Yes (Optional)	NA
Interface	USB 2.0 or RS-232	USB 2.0 or RS-232	NA
Data formats	Spreadsheet	Spreadsheet	NA
Software	Holmarc Ram Micro/Spectra Analyser PRO		
Spectrometer Detector 2			
Make	NA	NA	Hamamatsu
Type	NA	NA	Binning type
Features	NA	NA	Low readout noise, high-resolution Spectroscopic line CCD camera -Wide dynamic range -Low readout noise: 4e-rms typ. -High resolution: pixel size 12 × 12 μm- TE-cooled type -Quantum efficiency: 90% or higher at peak -Wide spectral response range -MPP operation -High UV sensitivity and stable characteristics under UV light irradiation -Pin compatible with the S7030/ S7031 series

Product Name	532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer

Model No	HO-SP-CRM224TR	HO-SP-CRM224TRE	HO-SP-CRM224HR
Image size	NA	NA	24.576 x 1.464 mm
Number of effective pixels	NA	NA	2048 x 122 pixels
Pixel size	NA	NA	12 x 12 μm
Spectral response range	NA	NA	200 to 1100 nm
Line rate (Typ.)	NA	NA	107 lines/s
Line rate (max.)	NA	NA	203 lines/s
Dark current (Typ.)	NA	NA	30 e-/pixel/s
Readout noise (Typ.)	NA	NA	4 e- rms
Cooling	NA	NA	One-stage TE-cooled, -35 Degree Cooled
Window material	NA	NA	AR-coated sapphire
Package	NA	NA	Meta
Imaging Camera Specifications			
Sensor Type	CMOS, Global Shutter	CMOS, Global Shutter	CMOS, Global Shutter
Pixel Size	4.0μm×4.0μm	4.0μm×4.0μm	4.0μm×4.0μm
Optical Size	1/2.7"	1/2.7"	1/2.7"
Resolution	1280x1024	1280x1024	1280x1024
Max Frame Rate	213.9FPS	213.9FPS	213.9FPS
Effective Sensor Area	5.12mmx4.1mm	5.12mmx4.1mm	5.12mmx4.1mm
SNR	40db	40db	40db
Sensitivity	8V/Lux.S	8V/Lux.S	8V/Lux.S
Bit Depth	10bit	10bit	10bit
Trigger Mode	Hardware Trigger / Software Trigger	Hardware Trigger / Software Trigger	Hardware Trigger / Software Trigger
HDR	60dB	60dB	60dB
Gain Gain	1-3×, Step : 0.125×	1-3×, Step : 0.125×	1-3×, Step : 0.125×
Image Format	RAW, BMP, JPG, PNG	RAW, BMP, JPG, PNG	RAW, BMP, JPG, PNG
Exposure Time	4us-145ms305us	4us-145ms305us	4us-145ms305us
Pixel Formats	RAW8, RAW16, BGR24, MONO8, MONO16	RAW8, RAW16, BGR24, MONO8, MONO16	RAW8, RAW16, BGR24, MONO8, MONO16
Data Interface	USB3.0	USB3.0	USB3.0
Power Supply	USB 5V	USB 5V	USB 5V
Power Consumption Operating	1.64W , Standby : 1.12W	1.64W , Standby : 1.12W	1.64W , Standby : 1.12W
Operating Temperature	-10⁰~50⁰	-10⁰~50⁰	-10⁰~50⁰
Protocols/Standards	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV

System Control and Data Collection software including Software for Sample Viewing

Capable of managing user-built libraries and material identification with spectral databases

Raman 785nm, 488nm, 266nm , 633nm , 1064nm Laser Other laser wavelength available


HOLMARC

Upright 532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer

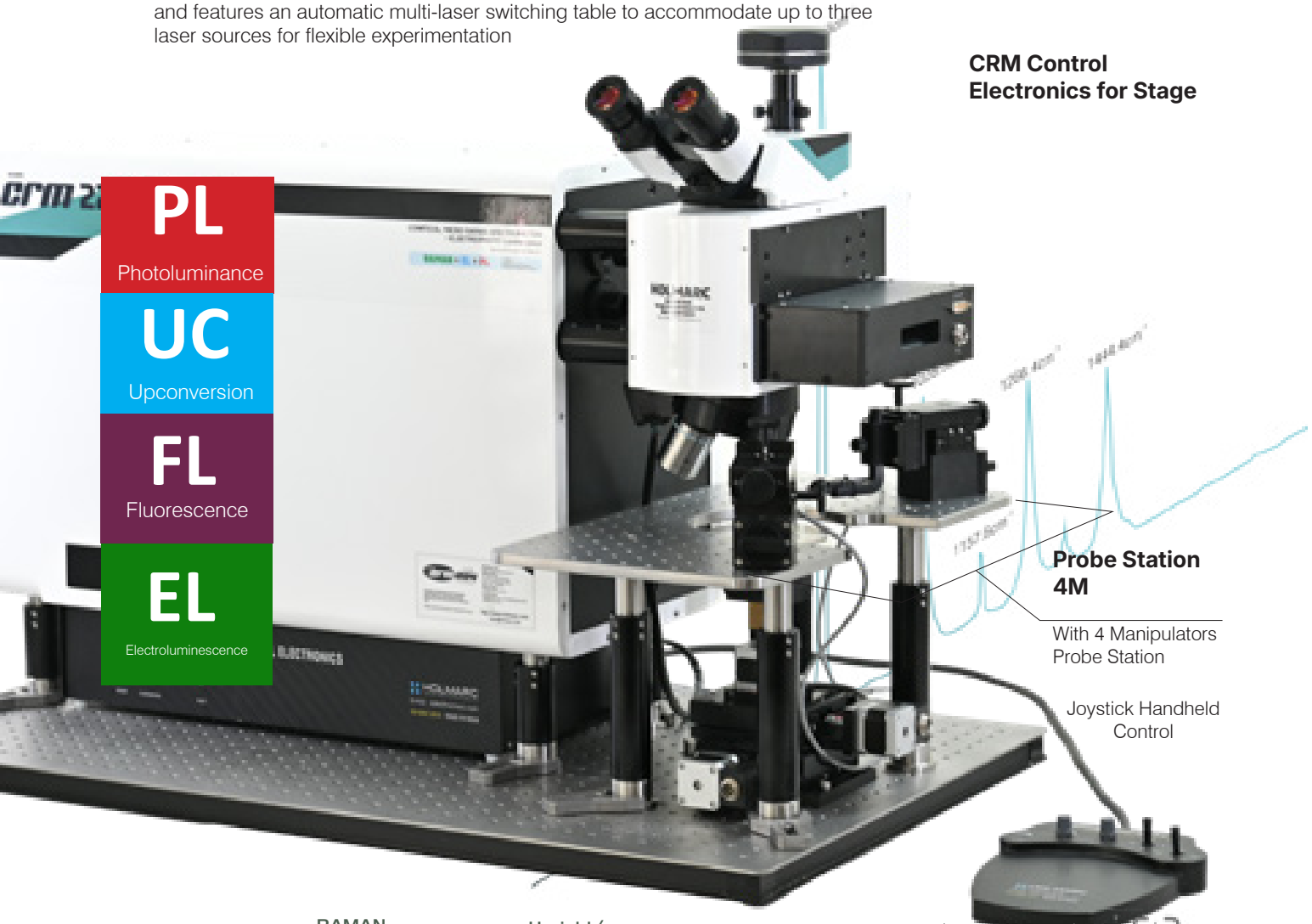
HO-SP-CRM224TEL
HO-SP-CRM224HEL

It is a state-of-the-art 532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer, designed for high-precision spectral measurements across multiple applications. This system is highly effective for capturing extremely weak electroluminescence (EL) and photoluminescence (PL) spectra, as well as performing Raman spectroscopy for material characterization. With integrated micro-manipulators, this workstation allows the application of precise voltage and current to samples for EL studies. It is also equipped with sample heating and cooling options, enabling temperature-dependent analysis.The system includes a 532nm DPSS laser, a 400mm Czerny-Turner spectrometer, a cooled CCD detector, and a motorized XYZ mapping stage with autofocus. Additionally, it supports up-conversion material studies and features an automatic multi-laser switching table to accommodate up to three laser sources for flexible experimentation

Illumination

Confocal White LED
Continuously Variable
Illumination Control

CRM Control Electronics for Stage



Stokes and Anti-stokes | RAMAN HYPERSPECTRAL IMAGING | Upright/ Inverted Microscope Configuration | Shift Measurement Mode | O.1cm^{-1} Diode Laser | Galvo^{+} High Speed Scanning

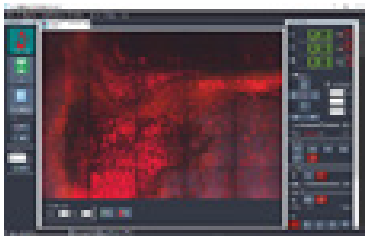
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Key Features & Advantages:

- **Ultra-Sensitive Spectroscopy** – Captures extremely weak electroluminescence, photoluminescence, and Raman spectra.
- **Multi-Function System** – Supports Raman, EL, PL, and up-conversion material studies.
- **Precision Micro-Manipulation** – 4 micro-manipulators for accurate current/voltage application.
- **Motorized Automation** – XYZ mapping stage, turret, filter selection, and laser switching for fully automated workflows.
- **Multi-Laser Support** – Accommodates up to 3 laser sources.
- **Advanced Software Suite** – Real-time data collection, imaging, and spectral analysis.
- **High-Resolution Imaging** – 20MP cooled CMOS camera for precise micro-imaging.
- **Sample Heating & Cooling Options** – Enables temperature-controlled spectral analysis.

Software

for System Control,
Micro-Spectra, Micro-Imaging,
Fluorescence,Wavenumber
Sensitivity Correction



Standard Laser

375 NM

532 NM

638 NM

785 NM



Product Name	532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer			
Model No	HO-SP-CRM224TEL		HO-SP-CRM224HEL	
Optical & Imaging System				
Equipment Type	Upright Microscope		Upright Microscope	
Optical System	Color-Corrected Infinity Optical System		Color-Corrected Infinity Optical System	
Tube Length	200 mm		200 mm	
Turret	**Motorized Positioning, 4 Slots**		**Motorized Positioning, 4 Slots**	
Sample Stage	Stepper motor controlled		Stepper motor controlled	
Objectives	Plan objectives 95mm parafocal confocal objective lens (Optional)		Plan objectives 95mm parafocal confocal objective lens (Optional)	
	50X Plan Apo HR Infinity Corrected Objective		50X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	4.00 mm	Focal Length (FL)	4.00 mm
	Magnification	50X	Magnification	50X
	Numerical Aperture (NA)	0.75	Numerical Aperture (NA)	
	Depth of Field	0.50 μm	Depth of Field	
	Working Distance (WD)	5.2 mm	Working Distance (WD)	5.2 mm
	2X Plan Apo HR Infinity Corrected Objective		2X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	100.00 mm	Focal Length (FL)	100.00 mm
	Magnification	2X	Magnification	2X
	Numerical Aperture (NA)	0.055	Numerical Aperture (NA)	0.055
	Resolving Power	5.0 μm	Resolving Power	5.0 μm
	Depth of Field	91.00 μm	Depth of Field	91.00 μm
	Working Distance (WD)	34.0 mm	Working Distance (WD)	34.0 mm
Optional Objectives	1X, 5X, 10X, 20X and 100X		1X, 5X, 10X, 20X and 100X	
	1X Plan Apo HR Infinity Corrected Objective		1X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	200.00 mm	Focal Length (FL)	200.00 mm
	Magnification	1X	Magnification	1X
	Numerical Aperture (NA)	0.025	Numerical Aperture (NA)	0.025
	Resolving Power	11.0 μm	Resolving Power	11.0 μm
	Depth of Field	440.00 μm	Depth of Field	440.00 μm
	Working Distance (WD)	11.0 mm	Working Distance (WD)	11.0 mm
	5X Plan Apo HR Infinity Corrected Objective		5X Plan Apo HR Infinity Corrected Objective	
	Magnification	5X	Magnification	5X
	Numerical Aperture (NA)	0.14	Numerical Aperture (NA)	0.14
	Focal Length (FL)	40.00 mm	Focal Length (FL)	40.00 mm
	Working Distance (WD)	34.0 mm	Working Distance (WD)	34.0 mm
	Resolution	2.0 μm	Resolution	2.0 μm
	Depth of Field	14.00 μm	Depth of Field	14.00 μm
	10X Plan Apo HR Infinity Corrected Objective		10X Plan Apo HR Infinity Corrected Objective	
	Magnification	10X	Magnification	10X
	Numerical Aperture (NA)	0.28	Numerical Aperture (NA)	0.28
	Focal Length (FL)	20.00 mm	Focal Length (FL)	20.00 mm
	Working Distance (WD)	34.0 mm	Working Distance (WD)	34.0 mm
	Resolution	1.0 μm	Resolution	1.0 μm
	Depth of Field	3.50 μm	Depth of Field	3.50 μm
	20X Plan Apo HR Infinity Corrected Objective		20X Plan Apo HR Infinity Corrected Objective	
	Magnification	20X	Magnification	20X

Product Name	532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer			
Model No	HO-SP-CRM224TEL		HO-SP-CRM224HEL	
	Numerical Aperture (NA)	0.42	Numerical Aperture (NA)	0.42
	Focal Length (FL)	10.00 mm	Focal Length (FL)	10.00 mm
	Working Distance (WD)	20.0 mm	Working Distance (WD)	20.0 mm
	Resolution	0.7 μm	Resolution	0.7 μm
	Depth of Field	1.60 μm	Depth of Field	1.60 μm
	100X 0.7 NA Plan Apo HR Infinity Corrected Objective		100X 0.7 NA Plan Apo HR Infinity Corrected Objective	
	Magnification	100X	Magnification	100X
	Numerical Aperture (NA)	0.70	Numerical Aperture (NA)	0.70
	Focal Length (FL)	2.00 mm	Focal Length (FL)	2.00 mm
	Working Distance (WD)	6.0 mm	Working Distance (WD)	6.0 mm
	Resolution	0.4 μm	Resolution	0.4 μm
	Depth of Field	0.60 μm	Depth of Field	0.60 μm
	100X 0.9NA Plan Apo HR Infinity Corrected Objective		100X 0.9NA Plan Apo HR Infinity Corrected Objective	
	Magnification	100X	Magnification	100X
	Numerical Aperture (NA)	0.90	Numerical Aperture (NA)	0.90
	Focal Length (FL)	2.00 mm	Focal Length (FL)	2.00 mm
	Working Distance (WD)	1.3 mm	Working Distance (WD)	1.3 mm
	Resolution	0.3 μm	Resolution	0.3 μm
	Depth of Field	0.30 μm	Depth of Field	0.30 μm
Objective Turret	Motorized positioning and 4 slots for keeping		Motorized positioning and 4 slots for keeping	
Filter Selection Unit	8-slot dichroic filter cube assembly		8-slot dichroic filter cube assembly	
Tube Length	200 mm		200 mm	
CONDENSER	Abbe condenser		Abbe condenser	
FOCUS	Motorized Stepper motor controlled		Motorized Stepper motor controlled	
Illumination for imaging	Bottom and Co-Axial HB-LED Based		Bottom and Co-Axial HB-LED Based	
Illumination Control	Continuously Variable PC-controlled		Continuously Variable PC-controlled	
Filter Selection	Motorized, 8-Slot Filter Wheel (for Raman, Fluorescence, and Imaging)		Motorized, 8-Slot Filter Wheel (for Raman, Fluorescence, and Imaging)	
Condenser	Abbe Condenser		Abbe Condenser	
Focus Control	Precision Motorized Servo Motor (Programmable)		Precision Motorized Servo Motor (Programmable)	
Illumination	Top, Bottom, and Co-Axial HB-LED Based		Top, Bottom, and Co-Axial HB-LED Based	
Illumination Control	Continuously Variable, PC-Controlled		Continuously Variable, PC-Controlled	
Laser System				
Primary Laser	532nm DPSS Laser			
Spectral Line Width	0.06 nm			
Laser Power	Low-Noise, Variable Power, 100 mW			
Laser Shutter	Software-Controlled			
Multi-Laser Support	Supports up to 3 lasers for Raman and PL measurements			
Micro Manipulator System for Electroluminescence (EL) Measurements				
Number of Micromanipulators	4 Nos.		4 Nos.	
Movement Axes	X, Y, Z, and Tilt		X, Y, Z, and Tilt	
X Travel	25 mm		25 mm	
Y Travel	25 mm		25 mm	
Z Travel	10 mm		10 mm	

Product Name	532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer	
Model No	HO-SP-CRM224TEL	HO-SP-CRM224HEL
Tilt Range	±3°	±3°
Probe Holding Mechanism	BNC Output	BNC Output
Probe Holders	45° & 90° Non-Metal Probe Holders	45° & 90° Non-Metal Probe Holders
Sample Stage & Mapping System		
Mapping Stage Type	Automatic XYZ Stage with Z-Axis Autofocus	
Model	XYMR50 Motorized Stepper Motor Controlled	
X-Y Travel Range	50 × 50 mm	
XY Resolution	0.3125 μm	
XY Scanning Speed	4 mm/sec	
Z Travel Range	50 mm	
Z Resolution	0.1 μm	
Controller	HOLMARC XYZ Stepper Controller Unit	
Joystick	3-Axis Joystick Controller	
Spectrometer & Detection System		
Spectrometer Design	Czerny-Turner	
Focal Length	400 mm	
Focal Ratio	f/4	
Grating Turret	**NA**	**Motorized Grating Turret**
Raman Spectral Range	9000 to 180 cm-1	**3200 ~ 100 cm-1 (Raman**
Extended range by stitching	**NA**	**9000 ~ 100 cm-1 (Raman)**
Spectral Resolution	0.95 cm-1	**0.95 cm-1 with 600l/mm grating**
Wavenumber Scanning	High-Accuracy Direct Drive with Rotary Encoder	High-Accuracy Direct Drive with Rotary Encoder
Number of Gratings	1 (Motorized Selection)	**2 (Motorized Selection)**
Grating	600 l/mm	**600 l/mm and 1800 l/mm.(Options)**
Detector System		
Detector Unit	Linear CCD Array (16Bit)	NA
Number of Pixels	3,648	NA
Pixel Size	8um x 200um	NA
Sensor Length	29.18mm	NA
Pixel Output Clock	0.5 MHz	NA
Data Storage on Camera	4 Frames	NA
ADC Resolution	16 bits	NA
Exposure Time Range	0.1ms – 6,500ms	NA
GPIO	Yes (4 programmable I/O's)	NA
Frame Rate	138 scans/second*	NA
Trigger	Yes (Optional)	NA
Interface	USB 2.0 or RS-232	NA
Data formats	Spreadsheet	NA
Software	Holmarc Ram Micro/Spectra Analyser PRO	NA
Spectrometer Detector 2 (Hamamatsu)		
Make	NA	Hamamatsu
Type	NA	Binning type

Product Name	532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer	
Model No	HO-SP-CRM224TEL	HO-SP-CRM224HEL
Features	NA	Low readout noise, high-resolution Spectroscopic line CCD camera, Wide dynamic range Low readout noise:4e-rms typ., High resolution: pixel size 12 × 12 μm TE-cooled, Quantum efficiency: 90% or higher at peak, Wide spectral response range MPP operation, High UV sensitivity and stable characteristics under UV light irradiation, Pin compatible with the S7030/S7031 series
Image size	NA	24.576 x 1.464 mm
Number of effective pixels	NA	2048 x 122 pixels
Pixel size	NA	12 x 12 μm
Spectral response range	NA	200 to 1100 nm
Line rate (Typ.)	NA	107 lines/s
Line rate (max.)	NA	203 lines/s
Dark current (Typ.)	NA	30 e-/pixel/s
Readout noise (Typ.)	NA	4 e- rms
Cooling	NA	One-stage TE-cooled, -35 Degree Cooled
Window material	NA	AR-coated sapphire
Package	NA	Meta
Imaging Camera System		
Sensor Type	CMOS, Global Shutter	CMOS, Global Shutter
Pixel Size	4.0μm×4.0μm	4.0μm×4.0μm
Optical Size	1/2.7”	1/2.7”
Resolution	1280x1024	1280x1024
Max Frame Rate	213.9FPS	213.9FPS
Effective Sensor Area	5.12mmx4.1mm	5.12mmx4.1mm
SNR	40db	40db
Sensitivity	8V/Lux.S	8V/Lux.S
Bit Depth	10bit	10bit
Trigger Mode	Hardware Trigger / Software Trigger	Hardware Trigger / Software Trigger
HDR	60dB	60dB
Gain	Gain 1-3×x, Step 0.125×	Gain 1-3×x, Step 0.125×
Image Format	RAW, BMP, JPG, PNG	RAW, BMP, JPG, PNG
Exposure Time	4us-145ms305us	4us-145ms305us
Pixel Formats	RAW8, RAW16, BGR24, MONO8, MONO16	RAW8, RAW16, BGR24, MONO8, MONO16
Data Interface	USB3.0	USB3.0
Power Consumption Operating	1.64W , Standby : 1.12W	1.64W , Standby : 1.12W
Operating Temperature	-10^0~50^0	-10^0~50^0
Protocols/Standards	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV	USB3.0 Vision, GenICam, HALCON, LabView, OpenCV
Photoluminescence & Electroluminescence Capabilities		
PL/EL Spectral Range	400 - 1050 nm	
PL/EL Spectral Resolution	0.1 nm	
Temperature Control	Sample Heating & Cooling Options Available	
Software & Control System		
	Holmarc System Control & Data Collection Micro-Spectra Measurement, Micro-Imaging Analysis, Fluorescence Correction, Wavenumber Correction, Sensitivity Correction, User-Built Libraries & Spectral Database	
Additional Raman Lasers		
	Raman 785nm, 488nm, 266nm, 266nm, 1064nm Other laser wavelength available on request.	

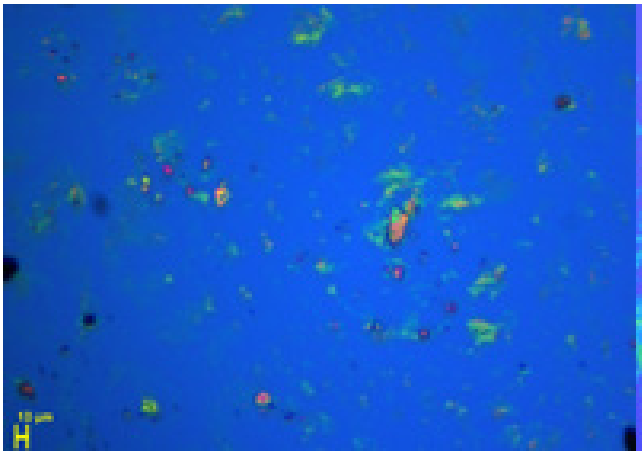
Upright INSI Raman

HO-SP-CRM225EM-INS
HO-SP-CRM225H-INS

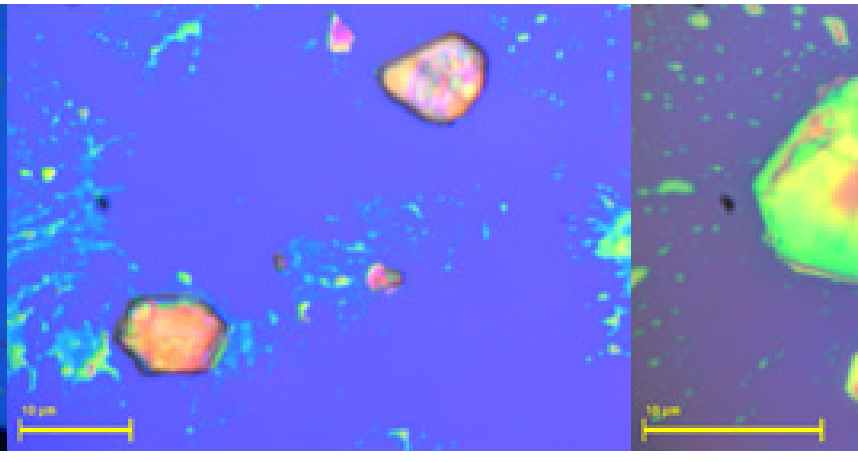
Photoluminescence
Upconversion measurments
Raman Microscopy
Electroluminescence etc.



CrCl3P 5x



CrCl3P 50x



ABOUT INSI

The HO-SP-CRM225H-INSI is a confocal micro Raman spectrometer designed for in-situ reaction monitoring and electrochemical studies. Combining 532 nm laser excitation, motorized precision controls, and a Czerny-Turner spectrometer, this system enables real-time spectral analysis with sub-micron spatial resolution. Ideal for battery research, catalysis, and corrosion studies, it integrates seamlessly with electrochemical flow cells for dynamic experiments.

At the heart of the system lies a precision-engineered confocal optical path coupled with a high-stability 532nm excitation laser, enabling researchers to obtain crystal-clear Raman spectra even for challenging samples. The integrated Czerny-Turner spectrometer, equipped with automatic grating switching, provides both wide spectral range and high-resolution measurements in a single platform.

The system's modular architecture supports numerous advanced configurations, including polarized Raman spectroscopy, temperature-controlled experiments, and multi-laser operation. Automated features such as motorized sample positioning, focus control, and objective switching ensure reproducible measurements and efficient workflows.

With its combination of analytical power, experimental flexibility, and robust construction, the HO-SP-CRM225H-INSI establishes a new standard for in-situ spectroscopic analysis, empowering researchers to uncover critical insights into material behavior under realistic operating conditions.

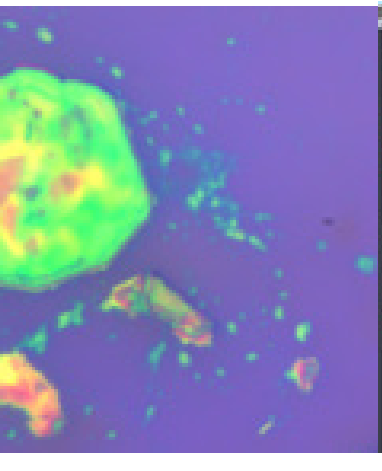
Fully Motorized Compact Inverted double deck
Z-axis Specimen stage
Motorized nosepiece for the Z-axis focusing on a resolution of 10 nm
Motorized condenser unit Optics compatible with all objectives
Motorized 6 positions Objective nosepiece turret
Motorized filter turret in 8 or more positions with individual filter cubes to image common fluntophores (DAPI/Hoechst, GFP/FITC, RFP/TRITC, CFP). High-quality bandpass filters with no cross talk when simultaneously imaging
Transmitted Uprght Ilumination LED clear visualization of optically transparent samples
Fluorescence Illumination LED source, adjustable for the intensity of more the 20000 Hours
Software control transmission and Reflected light image acquisition
Port and optics for Epifluorescence and Beight field imaging

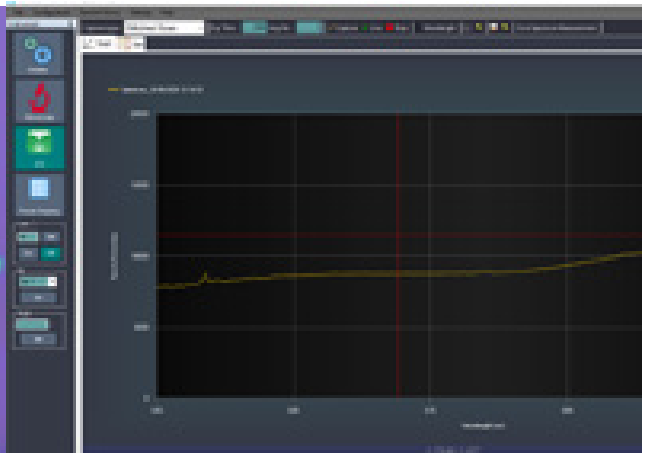
Battery Research: Li-ion/SERS studies.

Corrosion Analysis: Real-time surface monitoring.

Catalysis: Reaction intermediate detection.

CrCl3P 80x







Model	HO-SP-CRM225EM-INS		HO-SP-CRM225H-INS	
Optical & Imaging System				
Equipment Type	Upright Microscope		Upright Microscope	
Optical System	Color-Corrected Infinity Optical System		Color-Corrected Infinity Optical System	
Tube Length	200 mm		200 mm	
Turret	**Motorized Positioning, 4 Slots**		**Motorized Positioning, 4 Slots**	
Sample Stage	Stepper motor controlled		Stepper motor controlled	
Objectives	Plan objectives 95mm parafocal confocal objective lens (Optional)		Plan objectives 95mm parafocal confocal objective lens (Optional)	
	50X Plan Apo HR Infinity Corrected Objective		50X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	4.00 mm	Focal Length (FL)	4.00 mm
	Magnification	50X	Magnification	50X
	Numerical Aperture (NA)	0.75	Numerical Aperture (NA)	0.75
	Depth of Field	0.50 μm	Depth of Field	0.50 μm
	Working Distance (WD)	5.2 mm	Working Distance (WD) 5.2 mm	5.2 mm
	2X Plan Apo HR Infinity Corrected Objective		2X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	100.00 mm	Focal Length (FL)	100.00 mm
	Magnification	2X	Magnification	2X
	Numerical Aperture (NA)	0.055	Numerical Aperture (NA)	0.055
	Resolving Power	5.0 μm	Resolving Power	5.0 μm
	Depth of Field	91.00 μm	Depth of Field	91.00 μm
	Working Distance (WD)	34.0 mm	Working Distance (WD)	34.0 mm
Optional Objectives	1X, 5X, 10X, 20X and 100X			
	1X Plan Apo HR Infinity Corrected Objective			
	Focal Length (FL)	200.00 mm		
	Magnification	1X		
	Numerical Aperture (NA)	0.025		
	Resolving Power	11.0 μm		
	Depth of Field	440.00 μm		
	Working Distance (WD)	11.0 mm		
	5X Plan Apo HR Infinity Corrected Objective			
	Magnification	5X		
	Numerical Aperture (NA)	0.14		
	Focal Length (FL)	40.00 mm		
	Working Distance (WD)	34.0 mm		
	Resolution	2.0 μm		
	Depth of Field	14.00 μm		
	10X Plan Apo HR Infinity Corrected Objective			
	Magnification	10X		
	Numerical Aperture (NA)	0.28		
	Focal Length (FL)	20.00 mm		
	Working Distance (WD)	34.0 mm		
	Resolution	1.0 μm		
	Depth of Field	3.50 μm		
	20X Plan Apo HR Infinity Corrected Objective			
	Magnification	20X		
	Numerical Aperture (NA)	0.42		
	Focal Length (FL)	10.00 mm		
	Working Distance (WD)	20.0 mm		
	Resolution	0.7 μm		
	Depth of Field	1.60 μm		
	100X 0.7 NA Plan Apo HR Infinity Corrected			

Model	HO-SP-CRM225EM-INS		HO-SP-CRM225H-INS	
	Magnification	100X		
	Numerical Aperture (NA)	0.70		
	Focal Length (FL)	2.00 mm		
	Working Distance (WD)	6.0 mm		
	Resolution	0.4 μm		
	Depth of Field	0.60 μm		
	100X 0.9NA Plan Apo HR Infinity Corrected Objective			
	Magnification	100X		
	Numerical Aperture (NA)	0.90		
	Focal Length (FL)	2.00 mm		
	Working Distance (WD)	1.3 mm		
	Resolution	0.3 μm		
	Depth of Field	0.30 μm		
Objective Turret	Motorized positioning and 4 slots for keeping			
Filter Selection Unit	8-slot dichroic filter cube			
Tube Length	200 mm			
CONDENSER	Abbe condenser			
FOCUS	Motorized Stepper motor controlled			
Illumination for imaging			Bottom and Co-Axial HB-LED Based	
Illumination Control:	Continuously Variable PC-controlled			
Fiber optic probe Attachment Option	: Yes			
External Laser Coupling Option	Yes			
Laser				
Laser wavelength	532nm		532nm	
Spectral Line Width	0.06nm		0.06nm	
Type	Low noise variable power 100mW DPSS Laser			
Shutter	Solenoid Type			
Mapping Stage				
Mapping sample stage	XYMR75-50 Motorized Stepper motor controlled stage		XYMR75-50 Motorized Stepper motor controlled stage	
Travel	50x50mm		50x50mm	
	Resolution	50 nm	Resolution	0.3125 Micron
Focusing	Motorized Stepper motor controlled		Motorized Stepper motor controlled	
Travel	25mm		50mm	
	Resolution	10nm	Resolution	: 0.1 Micron
Controller	HOLMARC XYZ Stepper controller Unit		HOLMARC XYZ Stepper controller Unit	
Scanning	Programmable		Programmable	
Joystick	3 Axis Joystick controller		3 Axis Joystick controller	
Raman Lasers				
Laser wavelength	532nm		532nm	
Operating mode	CW		CW	
Spectral Line Width	0.06nm		0.06nm	
Type	Low noise variable power 100mW DPSS Laser		Low noise variable power 100mW DPSS Laser	
Variability	Continuously Variable		Continuously Variable	
Power stability rms over 4h	<3%		<3%	
Transverse mode	Multimode		Multimode	
Warm-up time (minutes)	<5		<5	
Shutter	Electronic Software controlled.		Electronic Software controlled.	
Optional lasers	support up to 3 lasers in combination with a motorized selection option		support up to 3 lasers in combination with a motorized selection option	
External Laser Integration			Additional port for integrating the external lasers.	

Model	HO-SP-CRM225EM-INS	HO-SP-CRM225H-INS
Spectrometer		
Spectrometer Type	Czerny-Turner	Czerny-Turner
Focal Length	400 mm	400 mm
Grating Turret	Motorized Grating Turret	Motorized Grating Turret
Number of gratings	2	2
	Supports automatic switching between 600 l/mm and 1800 l/mm gratings	
Spectral range	3200 ~ 100 cm-1 (Raman)	3200 ~ 100 cm-1 (Raman)
Extended range by stitching	9000 ~ 100 cm-1 (Raman)	9000 ~ 100 cm-1 (Ram
The spectral resolution	0.95 cm-1 with 600l/mm grating	0.95 cm-1 with 600l/mm grating
	0.32 cm-1 with 1800l/mm grating	0.32 cm-1 with 1800l/mm grating
Raman Filter Set Details		
RazorEdge Dichroic laser beamsplitter		
Edge Steepness (%)	0.2%	0.2%
Edge Steepness (nm)	1.1 nm	1.1 nm
Laser Wavelength 1	532nm	532nm
Transition Width (nm)	2.7 nm	2.7 nm
Transition Width (cm-1)	90 cm-1	90 cm-1
Raman Edge Filter Specifications		
Transmission Band 1 Tavg	93%	93%
Blocking Band	ODabs > 6	ODabs > 6
Edge Steepness (%)	0.2%	0.2%
Edge Steepness (cm-1)	37.5 cm-1	37.5 cm-1
Edge Steepness (nm)	1.1 nm	1.1 nm
Transition Width (nm)	2.7 nm	2.7 nm
Transition Width (cm-1)	90 cm-1	90 cm-1
Spectrometer Detector		
Sensor Type	Back-illuminated EMCCD	
Active Pixels	512 × 512	
Pixel Size	16 × 16 μm	
Image Area	8.2 × 8.2 mm	
Pixel Well Depth (Active Area)	180,000 e^-	
Pixel Well Depth (Gain Register)	800,000 e^-	
Spectrometer Detector Hamamatsu		
Make		Hamamatsu
Type		Binning type
Image size		24.576 x 1.464 mm
Number of effective pixels		2048 x 122 pixels
Pixel size		12 x 12 μm
Spectral response range		200 to 1100 nm
Line rate (Typ.)		107 lines/s
Line rate (max.)		203 lines/s
Dark current (Typ.)		30 e-/pixel/s
Readout noise (Typ.)		4 e- rms
Cooling		One-stage TE-cooled, -35 Degree Cooled
Window material		AR-coated sapphire
Package		Metal

Model	HO-SP-CRM225EM-INS	HO-SP-CRM225H-INS
Features		Low readout noise, high-resolution Spectroscopic line CCD camera, Wide dynamic range Low readout noise: 4e-rms typ. High resolution: pixel size 12 × 12 μm TE-cooled type, Quantum efficiency: 90% or higher at peak, Wide spectral response range, MPP operation, High UV sensitivity and stable characteristics under UV light irradiation Pin compatible with the S7030/S7031 series
Performance		
Max Readout Rate		-
EM Amplifier	17, 10, 5, 1 MHz	-
Conventional Amplifier	3, 1, 0.08 MHz	-
Read Noise:		-
With EM Gain:	< 1 e^- (all EM amplifier speeds)	-
Quantum Efficiency (QE)	> 95%	-
EM Gain Range	1 to 1000× (RealGain™ technology)	-
Linearity	99.9%	-
Vertical Clock Speed	0.3 to 3.33 μs (user selectable)	-
Thermostatic Precision	± 0.01°C	
Cooling & Temperature		
Cooling Type	Thermoelectric (TE) + air/liquid options	-
Min. Operating Temperature:	Air Cooled: -80°C	-
	Liquid Chilled: -100°C	-
Frame Rates (Standard Mode)		
Full Frame (512 × 512)	56 fps	-
ROI Frame Rates:		
ROI Frame Rates:	110 fps	-
128 × 128	212 fps	-
64 × 64	398 fps	-
512 × 1 (spectroscopy mode)	2,881 fps	-
Frame Rates (Crop Mode – Optically Centered)		
128 × 128	569 fps	-
64 × 64	1,490 fps	-
32 × 32	3,021 fps	-
512 × 1	11,074 fps	-
Connectivity		
PC Interface	USB 2.0	
Direct Data Access	Camera Link output for real-time processing	
Imaging Camera Specifications		
Sensor Type	CMOS, Global Shutter	CMOS, Global Shutter
Pixel Size	4.0μm×4.0μm	4.0μm×4.0μm
Optical Size	1/2.7"	1/2.7"
Resolution	1280x1024	1280x1024
Max Frame Rate	213.9FPS	213.9FPS
Effective Sensor Area	5.12mmx4.1mm	5.12mmx4.1mm
SNR	40db	40db
Sensitivity	8V/Lux.S	8V/Lux.S

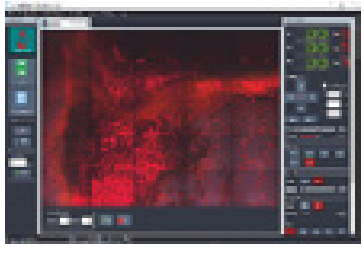
Model	HO-SP-CRM225EM-INS	HO-SP-CRM225H-INS
Bit Depth	10bit	10bit
	Trigger Mode Hardware Trigger / Software Trigger	Trigger Mode Hardware Trigger / Software Trigger
HDR	60dB	60dB
Gain Gain	1-3×, Step, 0.125×	1-3×, Step, 0.125×
Image Format	RAW, BMP, JPG, PNG	RAW, BMP, JPG, PNG
Exposure Time	4us-145ms305us	4us-145ms305us
Pixel Formats	RAW8, RAW16, BGR24, MONO8, MONO16	RAW8, RAW16, BGR24, MONO8, MONO16
Data Interface	USB3.0	USB3.0
Power Supply	USB 5V	USB 5V
Power Consumption Operating	1.64W	1.64W
Standby	1.12W	1.12W
Operating Temperature	-10⁰ C~50⁰c	-10⁰ C~50⁰c
Protocols/Standards	:USB3.0 Vision, GenlCam, HALCON, LabView, OpenCV	USB3.0 Vision, GenlCam, HALCON, LabView, OpenCV
Raman Electrochemical Flow Cell		
Model	HO-EFC-4	HO-EFC-4
Application	In-situ Raman spectroscopy coupled with electrochemical analysis.	In-situ Raman spectroscopy coupled with electrochemical analysis.
Design Parameters		
Feature Specification		
Path Length	4 mm (optimized for optical penetration)	4 mm (optimized for optical penetration)
Cell Volume	0.7 mL (low sample consumption)	0.7 mL (low sample consumption)
Body Material	Chemically inert PTFE/PEEK	Chemically inert PTFE/PEEK
Optical Window	High-purity quartz (default) / Sapphire (optional)	High-purity quartz (default) / Sapphire (optional)
Electrode Ports	3 (WE, CE, RE) – Customizable configurations	3 (WE, CE, RE) – Customizable configurations
Flow Rate Range	0.1–10 mL/min (pump-dependent)	0.1–10 mL/min (pump-dependent)
Electrochemical Properties		
Working Electrode (WE):	Options: Au, Pt, GC, or custom (user-provided). Surface area: Standard 5 mm^2 (adjustable).	Options: Au, Pt, GC, or custom (user-provided). Surface area: Standard 5 mm^2 (adjustable).
Reference Electrode (RE)	Compatible with Ag/AgCl, SCE.	Compatible with Ag/AgCl, SCE.
Potential Range	±2 V (solvent/electrode dependent)	±2 V (solvent/electrode dependent)
Electro chemical Measurements		
Electrode connections	2, 3 and 4	2, 3 and 4
Max applied potential	±15 V	±15 V
Compliance voltage	±20 V	±20 V
Maximum current	±500 mA	±500 mA
Current ranges	±5 nA to ±500 mA in 9 decades	±5 nA to ±500 mA in 9 decades
Potential accuracy	< 0.1 % FSR (Full Scale Range)	< 0.1 % FSR (Full Scale Range)
Potential resolution	450 μV on ±15 V	450 μV on ±15 V
Current accuracy	< 0.1 % FSR	< 0.1 % FSR
Current resolution	0.003 % FSR (Best: 150 fA)	0.003 % FSR (Best: 150 fA)
Input impedance	1 TΩ (//20 pF)	1 TΩ (//20 pF)
Potential bandwidth	1 MHz	1 MHz
Computer interface	USB 2.0	USB 2.0

Model	HO-SP-CRM225EM-INS	HO-SP-CRM225H-INS
No. of. channels	01 channel	01 channel
Minimum Applied current	±200pA OGFEIS Impedance Analyzer for	±200pA OGFEIS Impedance Analyzer for
Frequency range	10μHz -5MHz	10μHz -5MHz
Freq. Resolution	5ppm	5ppm
AC Amplitude range	6uV to 7.5V 100% of current range	6uV to 7.5V 100% of current range
Potentio static Dynamic EIS Galvanostatic Dynamic EIS Potentiostatic Fixed Frequency EIS (Capacitance): Mott-Schottky Comprehensive data analysis package for Fit & Simulation		
software is created to manage a multi Potentiostat Ethernet Interface can be installed on computer without any limit Software Included:		
Battery/Super capacitor testing software Corrosion software		
Voltammetry software		
Pulse Software		
Impedance Spectroscopy software Pulse Software		
Impedance Spectroscopy software Equivalent circuit fitting software		
1m electrode cables. Plugs as you need (BNC, Banana, UHF)		

Customization & Scalability

Laser Integration: Up to 8 lasers (internal + external)
Custom Probing: Fiber optic & vacuum stages optional
Integration Ready: Keithley, LabVIEW compatibility





Standard Accessories

1. 1200x900mm Optical breadboard and Passive vibration isolation support interconnected with power supply rack

2. Polarized Raman Spectroscopy
Motorized programmable Glan Thompson Polarizers for polarization dependant Raman spectrum measurements

3. Temperature-controlled Raman Measurement option
Temperature Measurement Range : RT to 200°C
Temperature Resolution: 1 °C
Control: Software based

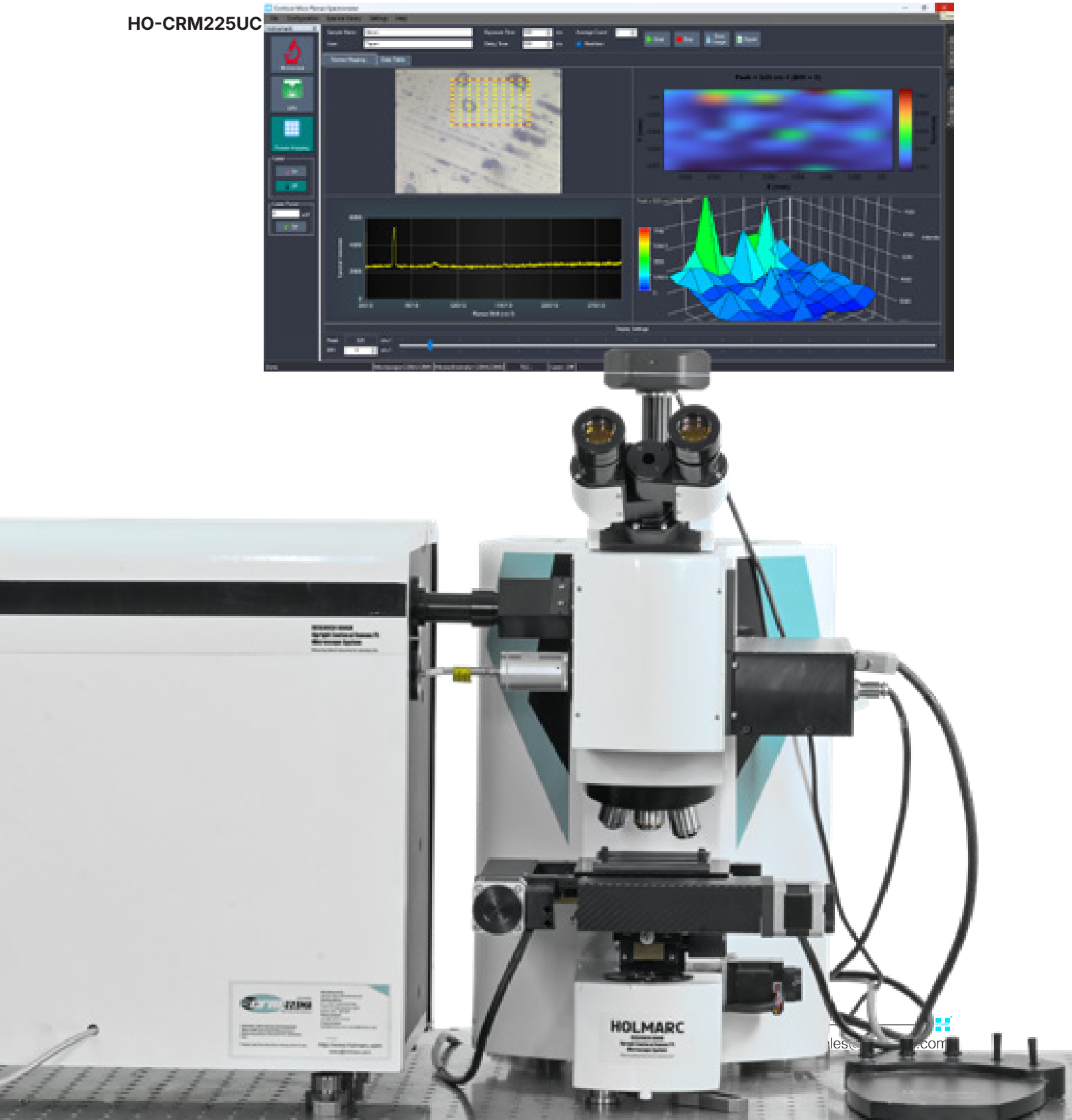
4. Dual Programmable ND Filter Wheels - 8No.s ND Filters for fine laser intensity controls

Customization & Scalability

- Laser Integration: Up to 8 lasers (internal + external)
- Custom Probing: Fiber optic & vacuum stages optional
- Integration Ready: Keithley, LabVIEW compatibility

532nm RESEARCH GRADE Automated Micro Raman Spectrometer

HO-CRM225UC



Model	HO-CRM225UC			
Optical & Imaging System				
Equipment Type	Upright Microscope			
Optical System	Color-Corrected Infinity Optical System			
Tube Length	200 mm			
Turret	**Motorized Positioning, 4 Slots**			
Sample Stage	Stepper motor controlled			
Objectives	Plan objectives 95mm parafocal confocal objective lens (Optional)			
	50X Plan Apo HR Infinity Corrected Objective		2X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	4.00 mm	Focal Length (FL)	100.00 mm
	Magnification	50X	Magnification	2X
	Numerical Aperture (NA)	0.75	Numerical Aperture (NA)	0.055
	Depth of Field	0.50 μm	Resolving Power	5.0 μm
	Working Distance (WD)	5.2 mm	Depth of Field	91.00 μm
			Working Distance (WD)	34.0 mm
Optional Objectives	1X, 5X, 10X, 20X and 100X			
	1X Plan Apo HR Infinity Corrected Objective		5X Plan Apo HR Infinity Corrected Objective	
	Focal Length (FL)	200.00 mm	Magnification	5X
	Magnification	1X	Numerical Aperture (NA)	0.14
	Numerical Aperture (NA)	0.025	Focal Length (FL)	40.00 mm
	Resolving Power	11.0 μm	Working Distance (WD)	34.0 mm
	Depth of Field	440.00 μm	Resolution	2.0 μm
	Working Distance (WD)	11.0 mm	Depth of Field	14.00 μm
	10X Plan Apo HR Infinity Corrected Objective		20X Plan Apo HR Infinity Corrected Objective	
	Magnification	10X	Magnification	20X
	Numerical Aperture (NA)	0.28	Numerical Aperture (NA)	0.42
	Focal Length (FL)	20.00 mm	Focal Length (FL)	10.00 mm
	Working Distance (WD)	34.0 mm	Working Distance (WD)	20.0 mm
	Resolution	1.0 μm	Resolution	0.7 μm
	Depth of Field	3.50 μm	Depth of Field	1.60 μm
	100X 0.7 NA Plan Apo HR Infinity Corrected Objective		100X 0.9NA Plan Apo HR Infinity Corrected Objective	
	Magnification	100X	Magnification	100X
	Numerical Aperture (NA)	0.70	Numerical Aperture (NA)	0.90
	Focal Length (FL)	2.00 mm	Focal Length (FL)	2.00 mm
	Working Distance (WD)	6.0 mm	Working Distance (WD)	1.3 mm
	Resolution	0.4 μm	Resolution	0.3 μm
	Depth of Field	0.60 μm	Depth of Field	0.30 μm
Objective Turret	Motorized positioning and 4 slots for keeping			
Filter Selection Unit	8-slot dichroic filter cube assembly			
Tube Length	200 mm			
CONDENSER	Abbe condenser			
FOCUS	Motorized Stepper motor controlled			
Fiber optic probe Attachment Option	: Yes			

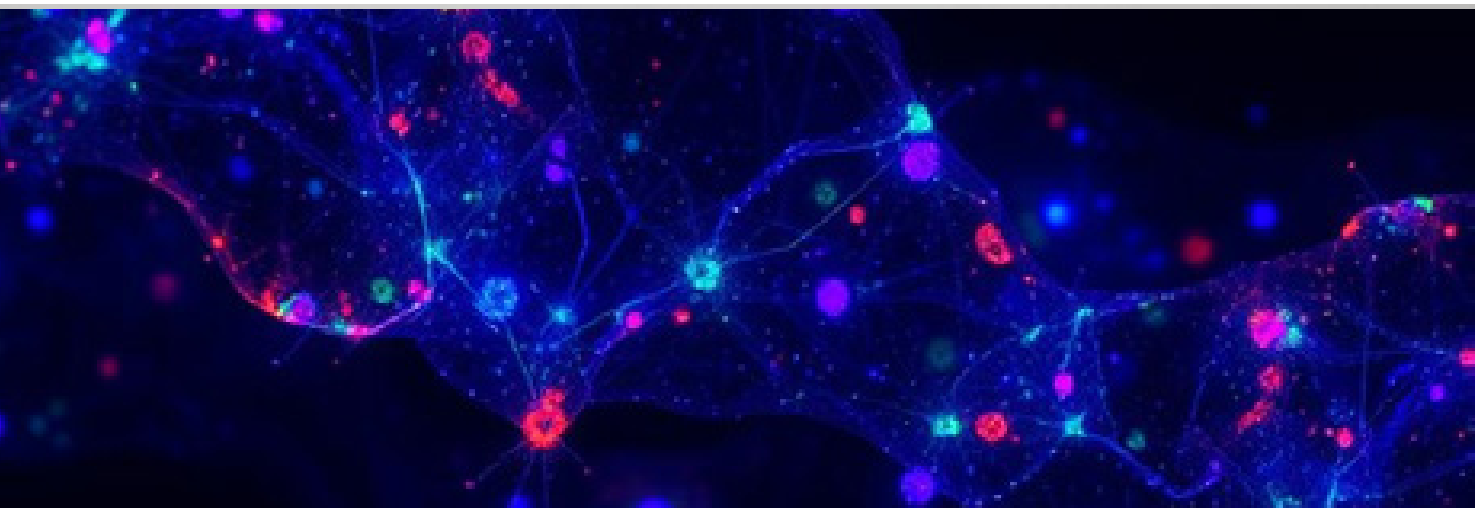
External Laser Coupling Option	Yes		
Mapping Stage			
Mapping sample stage	XYMR75-50 Motorized Stepper motor controlled stage		
Travel	50x50mm	Resolution	50 nm
Focusing	Motorized Stepper motor controlled		
Travel	25mm	Resolution	: 10nm
Controller	HOLMARC XYZ Stepper controller Unit		
Scanning	Programmable		
Joystick	3 Axis Joystick controller		
Spectrometer			
Spectrometer Type	Czerny-Turner		
Grating mount	Motorized Turret type		
Number of gratings	2		
Selectable Grating Options	600 l/mm and 1800 l/mm	Confocality	True Confocal Holes
Number of Pinholes	6	Selection	Motorized
Spatial Resolution (XY/Lateral)	< 1 um	Spatial Resolution (Z Axial):	< 1.5 um
Grating Scanning	Encoder-based rotational stage		
Spectrometer Focal Length	400 mm		
Raman Spectral range	100 cm-1 - 2800 cm-1 (up to 9,000 cm-1 on stitching)		
The spectral resolution:	0.95 cm-1 -with 600 l/mm Grating option		
	0.35 cm-1 -with 1800 l/mm Grating option		
Raman Filter set details			
	RazorEdge Dichroic laser beamsplitter		
Raman Edge Filter Specifications			
Edge Steepness (%)	0.2%		
Edge Steepness (nm)	1.1 nm		
Laser Wavelength 1	532nm		
Transition Width (nm)	2.7 nm		
Transition Width (cm-1)	90 cm-1		
Raman Filter set details			
Raman Edge Filter Specifications			
Transmission Band 1 Tavg	93%		
Blocking Band	ODabs > 6		
Edge Steepness (%)	0.2%		
Edge Steepness (cm-1)	37.5 cm-1		
Edge Steepness (nm)	1.1 nm		
Transition Width (nm)	2.7 nm		
Transition Width (cm-1)	90 cm-1		
Spectrometer Detector			
Make	Hamamatsu		
Type	Binning type		

Low readout noise, high-resolution Spectroscopic line CCD camera
Wide dynamic range Low readout noise:4e-rms typ.
High resolution: pixel size 12 × 12 μm TE-coole, Quantum efficiency: 90% or higher at peak
Wide spectral response range MPP operation, High UV sensitivity and stable characteristics under UV light irradiation
-Pin compatible with the S7030/S7031 series

Image size	24.576 x 1.464 mm
Number of effective pixels	2048 x 122 pixels
Pixel size	12 x 12 μm
Spectral response range	200 to 1100 nm
Line rate (Typ.)	107 lines/s
Line rate (max.)	203 lines/s
Dark current (Typ.)	30 e-/pixel/s

Readout noise (Typ.)	4 e- rms		
Cooling	One-stage TE-cooled, -35 Degree Cooled		
Window material	AR-coated sapphire		
Package	Metal		
Software	Holmarc Ram Micro/ Spectra Analyser PRO		
Photoluminescence & Upconversion Spectrometer			
Spectrometer Type	Czerny-Turner		
Focal Length	400 mm		
Spectral range	200-1050nm		
The spectral resolution	0.1nm		
Imaging Camera Specifications			
Sensor Type	CMOS, Global Shutter	Pixel Size	4.0μm×4.0μm
Optical Size	1/2.7”	Resolution	1280x1024
Max Frame Rate	213.9FPS		
Effective Sensor Area	5.12mmx4.1mm	SNR	40db
Sensitivity	8V/Lux.S	Bit Depth	10bit
	Trigger Mode Hardware Trigger / Software Trigger		
HDR	60dB	Gain Gain	1-3×, Step, 0.125×
Image Format	RAW, BMP, JPG, PNG		
Exposure Time	4us-145ms305us		
Pixel Formats	RAW8, RAW16, BGR24, MONO8, MONO16		
Data Interface	USB3.0	Power Supply	USB 5V
Power Consumption Operating	1.64W	Standby	1.12W
Operating Temperature	-10^{o} C~50^{o}c		
Protocols/Standards	: USB3.0 Vision, GenICam, HALCON, LabView, OpenCV		
PL Laser			
	375nm Diode Laser (Power 100 mW)		
Central wavelength	375±5nm		
Type	Low noise	Operating mode	CW
Output power (mW)	100		
Variability	Continuously Variable		
Power stability (rms, over 4 hours)	<3%	Transverse mode	Multimode
Beam diameter at the aperture (1/e 2 ,mm)	<1.5×3.5	Beam divergence, full angle (mrad)	~2.3×0.2
Warm-up time (minutes)	<5	Shutter	
Beam height from base plate	24.8mm		
Software controlled			
Internal lasers	Support up to 3 lasers in combination with a motorized selection option External Laser Integration: Additional port for integrating the external lasers.A total 8 Lasers can be integrated		
Lasers			
Laser wavelength	532nm	Operating mode	CW
Spectral Line Width	0.06nm		
Type	Low noise variable power 100mW DPSS Laser	Type	Low noise
Variability	Continuously Variable		
Power stability (rms, over 4 hours)	<3%	Transverse mode	Multimode
Warm-up time (minutes)	<5	Shutter	Electronic Software controlled.

Fluorescence Spectrometer



Model: HO-SP-FRS-225Xe

Holmarc's fluorescence spectrometer model HO-SP-FRS-215Xe is manufactured for advanced material research as well as for routine biochemical analysis. The instrument incorporates latest designs and techniques in all its eight modules namely source, entrance slit, excitation monochromator, sample chamber, emission monochromator , detector, control electronics and software.

Specifications	
Optical path configuration	Czerny-Turner type
Focal Length	300 mm
Aperture Ratio	f/3.5
Dispersion element	Holographic grating
Grating density	1200 l/mm
The spectral resolution	50 x 50 mm
Relative diffraction efficiency	65 % Max
Wavelength range	190 - 900 nm
Wavelength Selection	Scanning
Measurement Mode	Spectra Scanning
Filter Unit	Automated higher order cutoff filter
Resolution	~ 0.1 nm
Slit width	0 - 3 mm, Micrometer controlled
Dispersion with 300F	2.46 nm/mm
Wavelength Repeatability	± 0.5 nm
Light Source	300W Xenon ARC Lamp

Detector	
Detector	High sensitive PMT Side-on type
Gain Typ.	1.0 x 107 [Anode] Gain
Control	Auto Gain
Photocathode Material	Multi alkali
Peak Detection	400 nm
Luminous Sensitivity Min.	140 μA/lm [Cathode]
Luminous Sensitivity Min.	1000 A/lm [Anode]
Dark Current (after 30min.) Typ.	300 (s-1) nA [Anode]
Software	Spectra F R S Ver 2.01
Interface	USB 2.0

- Fluorescence Analysis
- UV-VIS-NIR Detection
- Research Model Performance
- Bio Applications
- Raman Spectrum Measurements
- Phosphorescence Measurements
- Material Analysis
- Photometric Measurements
- Fast scan speed
- Wide dynamic range
- Auto-Gain
- 1000 A/lm Min. Luminous Sensitivity
- Automatic Higher-Order Diffraction Cut Filter

Sample Chamber

Sample chamber in the instrument is designed for accommodating 10 mm standard cuvettes. The chamber can be customized on request.

Entrance Slit

Entrance slit is micrometer driven with 10 micron resolution and 1 micron sensitivity. Slit width can be adjusted from 0-3 mm. The slit is manually adjusted and locked in position for the experiment.

Emission Monochromator

Emission monochromator has similar specifications as that of excitation monochromator. It uses plain holographic grating with motorized wavelength drive mechanism for scanning. Motor used is stepper motor driven in micro-step mode. Collimating optics used are concave mirrors with UV enhanced coating.

Software

The instrument is fully computer based with all operating commands given from the computer. The UI of the dedicated software is made as user friendly as possible. Data is saved in the computer in standard formats.

Source

Xenon lamp is used as light source for a standard models. Source can be changed to tungsten halogen or to a combination of deuterium and tungsten-halogen depending upon the application.

Excitation Monochromator

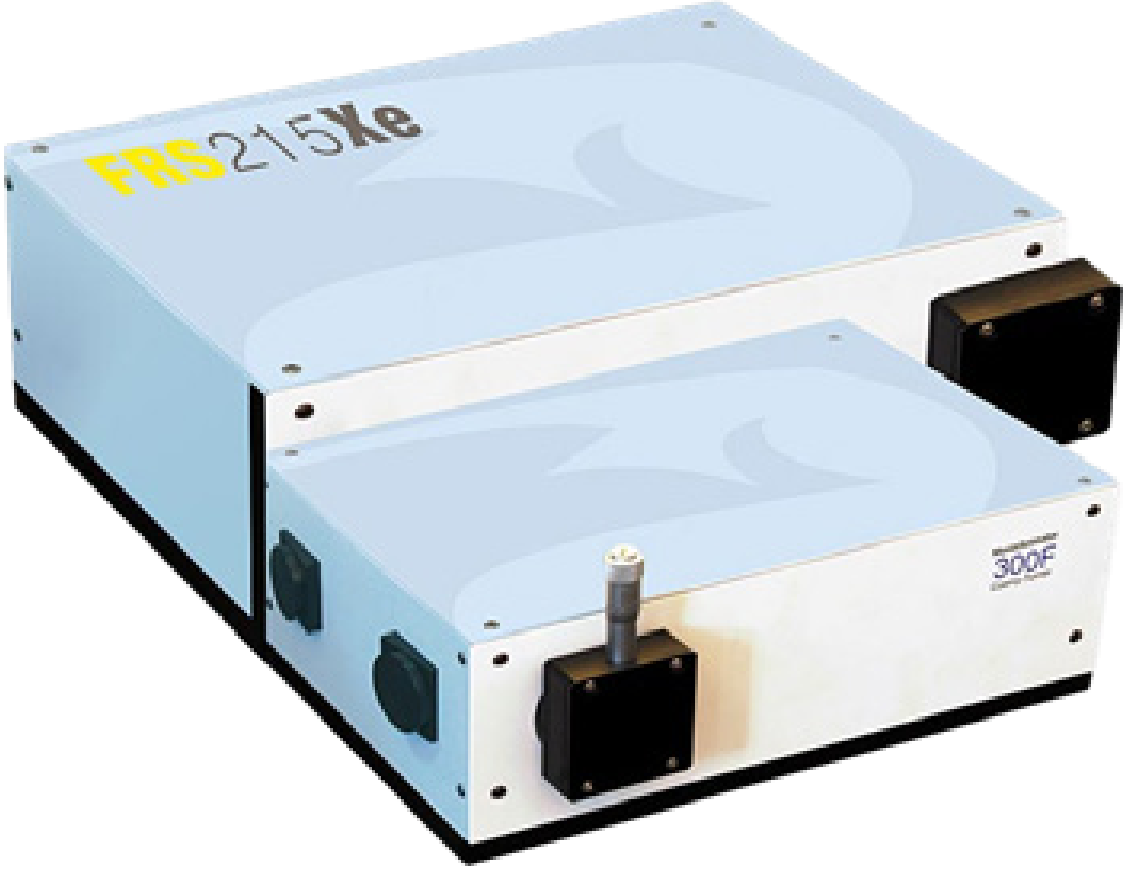
Excitation Monochomator has Czerny-Turner design with all the features of our standard device described as model : spectra-UV-VISINR . The device incorporates a plane holographic grating with 1200 lines/mm and precision motorized sine drive mechanism. Collimating optics used are concave mirrors to minimize aberrations as far as possible.

Control Electronics

Control electronics takes care of scanning functions of excitation and emission monochromators along with source and detector. Communication with computer is USB based.

Detector

The detector is highly sensitive Photo Multiplier Tubes (PMT) with integrated drive electronics to minimize electronic noise.



Light Sources, Detectors & Accessories



Accessories for Spectra Instruments

Model : HO-SPA-LSL10F
10W HIGH BRIGHT LED model : 450-650nm

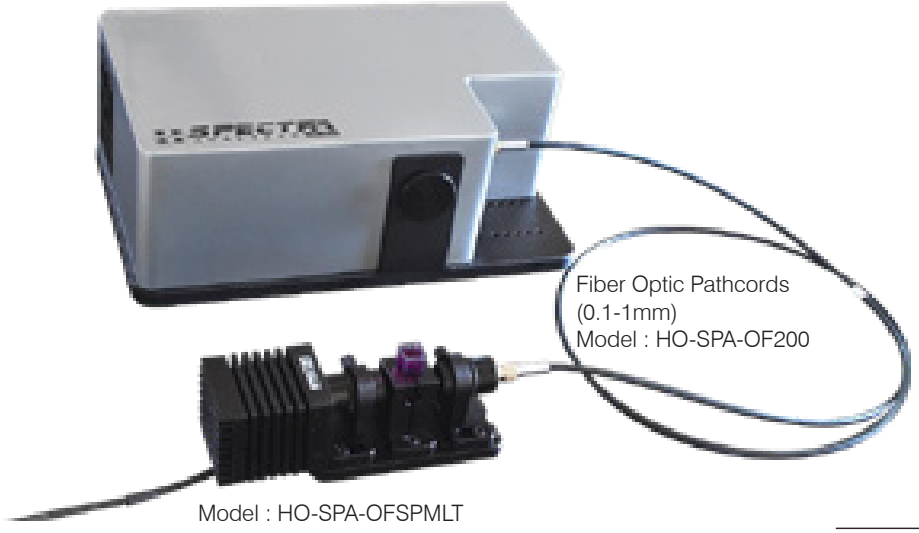
Model : HO-SPA-LSH20F
20W Halogen Model : 350-2400nm

Model : HO-SPA-LSHD20
Halogen-Deuterium model
for UV application 200-2400nm

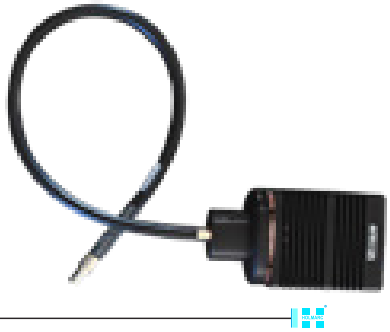
Fiber optic illumination systems - LED & Halogen-Deuterium - Up to 150W

HOLMARC has expanded its range of fiber optic illumination systems with high-power LED and Halogen-Deuterium light sources. Though designed for use as a stand-alone device, it can easily be mounted on a frame or in a rack using screws. Standard light guide adapter ensures compatibility with all fiber light guides. For efficient coupling, HOLMARC also offers light source with integrated focusing optics for other fiber diameters as well. It can be directly coupled to all spectra products. Deuterium lamp can also be incorporated in this housing for UV applications.

Model : HO-SP-VIS3965



Fiber Optic Pathcords
(0.1-1mm)
Model : HO-SPA-OF200



Model : HO-SPA-OFSPMLT

www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

Cuvette holder with fiber optic collimator unit

This fiber optics cuvette holder is designed to attach directly to light sources and can be coupled to spectrometers via optical fibers to create a small-footprint spectrophotometric system for fluorescence and absorbance experiments. The holder is suitable for UV-VIS-NIR (200-1100 nm) applications and holds 10 mm square curvettes. Filter can be directly attached to the system for transmittance / absorbance measurements.

Model : HO-SPA-OFSPMLT
Two terminal

Model : HO-SPA-OFSPML2T
Three terminal for fluorescence related measurements

Fiber optic illumination systems - Xenon & Mercury Discharge Tube

This stand-alone illuminator consists of a mercury or xenon arc lamp, lamp housing, mirror and power supply in single enclosure. It is designed to be used with a fiber optic guide which transmits intense illumination to the monochromator, spectrometer and other instruments. The lamp's cabinet accommodates a standard filter wheel which slides easily in and out of a slot in the light path. We also offer a variety of patchcords and collimating optics along with mounts.

Model : HO-SPA-LSMD-OF200
Mercury Discharge Tube
Model - std

Model : HO-SPA-LSXe-OF200
Xe Arc Lamp Model - 150W

Cuvette holder

Our cuvette holders are for standard 10 mm path length cuvettes to work in UV-VIS-NIR (~200nm - 2μm) spectral range. These holders have two terminals (Three terminal holders are also available) for fluorescence measurements and one slot for transmittance / absorbance measurements. The embedded collimating lenses are made from fused silica material.

Model : HO-SPA-OFSPM2T
Two terminal

Model : HO-SPA-OFSPM3T
Three terminal for fluorescence related measurements



CCD Camera

Model: S10141

The CCD camera model S10141 by Holmarc is a high-resolution, back-illuminated spectral CCD camera designed for spectroscopy applications. It features a pixel format of 2048 x 256 with a pixel size of 12 x 12 μm, providing excellent image quality. The camera covers a spectral range of 200 - 1050 nm with a quantum efficiency of 90%. It has a typical line rate of 80 lines per second, which can go up to a maximum of 138 lines per second. The S10141 model is equipped with one-stage TE cooling, reducing dark current to 30 e-/pixel/s, and has a readout noise of 4 e- rms. The camera also includes a 16-bit 5 MS/s ADC with programmable offset correction and gain, ensuring precise signal conditioning

Specifications

Detector	
CCD	Back-illuminated Spectral CCD
Type	Binning type High-resolution type
Image size	24.576 x 3.000 mm
Pixel Format	2048 x 256
Pixel Size	12 x 12 um
Spectral Coverage	200 - 1050 nm
Quantum Efficiency	90 %
Line rate (Typ.)	80 lines/s
Line rate (max.)	138 lines/s
Dark current (Typ.)	30 e-/pixel/s
Readout noise (Typ.)	4 e- rms
Cooling	One-stage TE-cooled
Window material	AR-coated sapphire
Peltier Cooling	Yes (-35 dgree cooled)
TEC controller Accuracy	+/- 0.01 degree C
Signal Conditioning unit	Yes
16-bit 5 MS/s ADC with programable offset correction and gain	
Power supply	USB
Communication Interface	USB High-speed communication interface with up to 480Mbit/s via virtual COM port driver

Image

Images upto 24.576 x 3.000 mm in size at 2048 x 256 pixel format in 12 x 12 um pixel size

Detector

Back Illuminated Spectral CCD Detector



Fiber Optic Patchcords

Model: HO-FOP Series

Provided with protective caps
Wide wavelength range (190nm - 1600nm)

SMA 905 0.22NA Fused Silica Fiber optic patchcords

HOLMARC offers multimode step index fiber optic patch cables with SMA905 connectors on both ends and are ideal for applications requiring optimum transmission in the UV-VIS range (190 - 1600nm). These cables incorporate fused silica (0.22 numerical aperture) fiber, sheathed in rugged 3/16" OD PVC monocoil and are available in 1.5m length. Each patch cable includes two protective caps that shield the connector ends from dust and other hazards.

Fiber Specifications	
Wavelength	UV / VIS / NIR
Wavelength Range	190 - 1600nm
Connector	SMA
Numerical Aperture NA	0.22
Numerical Aperture (NA) Tolerance	±0.02
ndex of Refraction nd - Core	1.458
Index of Refraction nd - Cladding	1.441
Acceptance Angle	25.4°
Operating Temperature	-40 to +100°C
Length	1.5m
Jacket Diameter	2.85mm
Jacket Material	PVC Monocoil

Model	Connector	Length	Core Diameter
HO-FOP-FS1505S	SMA 905	1.5 meter	50 um
HO-FOP-FS1510S	SMA 905	1.5 meter	100 um
HO-FOP-FS1520S	SMA 905	1.5 meter	200 um
HO-FOP-FS1540S	SMA 905	1.5 meter	400 um
HO-FOP-FS1560S	SMA 905	1.5 meter	600 um
HO-FOP-FS15100S	SMA 905	1.5 meter	1000 um
Different types and lengths of fibre are available on request.			

SMA 905 PMMA 0.5NA Fiber optic patchcords

Multimode High Transmission Fiber optic patchcords for easy integration in Fiber optic test system

HOLMARC can supply high quality PMMA Fiber optic patchcord for low cost fiber coupling and illumination needs. This product is lighting grade and gives good visible light transmission and flexibility.

Fiber Specifications	
Type	Multimode
Cable Diameter	3 mm
Cable Length	1, 2, 3 meter or customized
Connector loss	< 0.5 dB
Attenuation	< 180 dB / km
Core material	Polymethyl Methacrylate
Cladding material	Fluorinated Polymer
Refractive index	1.49
Numerical aperture	0.5
Refractive index profile	Step index
Connector material	stainless steel sheath / Brass insert core
Operation Condition	
Temperature range -55°C (-67°F) to +70°C (158°F) in low humidity; < 60°C at 95% R (attenuation change is within 10% after 1000 hours other than the attenuation due to absorbed water).	
Please note that fiber becomes brittle at low temperatures.	
Polymethyl Methacrylate / Fluorinated Polymer	
Numerical aperture	0.5
Core Diameter	750 Micron
Refractive index	1.49
Refractive index profile	Step index
Wavelength Range	

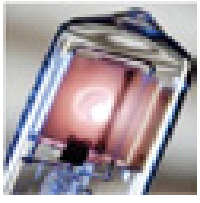
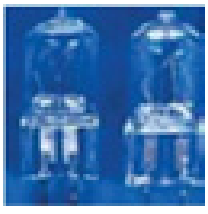
Model	Connector	Length
HO-FOP-A05	SMA 905	0.5 meter
HO-FOP-A10	SMA 905	1 meter
HO-FOP-A15	SMA 905	1.5 meter
HO-FOP-A20	SMA 905	2 meter
HO-FOP-A25	SMA 905	2.5 meter
HO-FOP-A50	SMA 905	5 meter
Different types and lengths of fibre are available on request.		





Light Sources

HOLMARC offers a number of light sources for the spectral range of 200 - 2000nm which can be mounted directly to our monochromators or can be used independently. With the appropriate adapters, some of the light sources can be mounted to our monochromators along with optical chopper or filter wheel. Additional adapters and interface devices are available for focusing and launching the light directly into optical fibers.

	Deuterium	Xenon	Tungsten Halogen
			
Spectral Range	200 - 400nm	200 - 2500nm	350 - 2400nm
	Good UV lamp, generally with higher output than Xenon lamps	250 - 2500nm (Ozone free version)	Continuous spectral output. More stable than Xenon lamps

Please contact at mail@holmarc.com for more details

Mercury Vapor Lamp

A mercury-vapor lamp is a gas discharge lamp that uses mercury in an excited state to produce light. They offer long life time as well as intense lighting for spectral applications.

Model : HO-LH-MV100W



Lamp Houses for Spectral Study

Sodium Vapor Lamp

A sodium vapor lamp is a gas discharge lamp that uses sodium in an excited state to produce light. The low-pressure sodium lamp has remarkably high luminous efficiency. The radiation is nearly mono-chromatic, yellow in color.

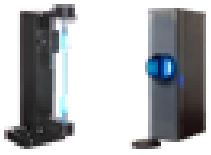
Model : HO-LH-SV35W
Model No: HO-LH-SVC





Spectrum Discharge Tube with Lamp House

Filled with spectroscopically pure gases. The following discharge tubes are available
XX - Gas
01 - Argon
02 - Neon
03 - Krypton
04 - Ammonia
05 - Carbon Dioxide
06 - Nitrogen
07 - Oxygen
08 - Mercury vapor
09 - Sulphur
10 - Hydrogen
11 - Helium:



Multi Spectrum Tube Housing for spectral calibration
Model: HO-SP-MSTH-06

HOLMARC's Multi Spectrum Tube Housing holds six spectrum discharge tubes simultaneously. It can quickly switch from one gas to another without handling the tubes. Power supply is common for all discharge tubes, which is kept inside the unit.

The gas tubes are permanently enclosed, which protect the tubes from breakage. Optical fiber can be directly attached to this unit for fiber optic spectrometers.



High Voltage Transformer Continuously Variable

Model : HE-DT-PSV
Variable discharge tube power supplies are designed to be used with different gases. The discharging action is controlled by a knob and can be adjusted to get optimum performance as each gas exhibit different discharge voltages. The complete unit is enclosed in a metallic casing.



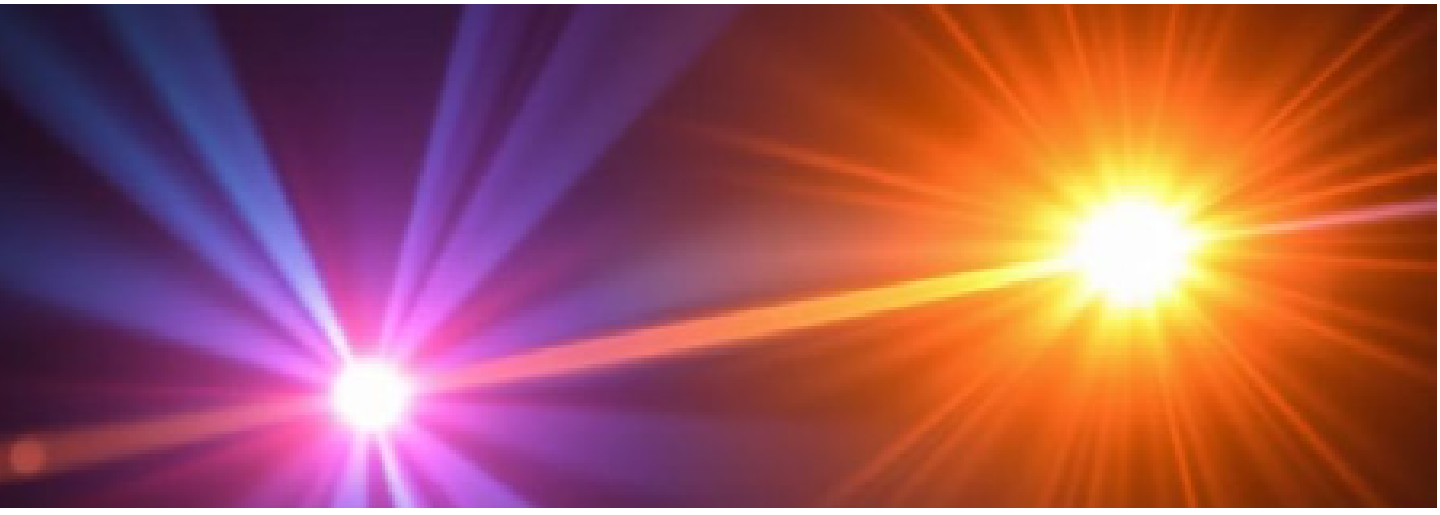


180W Blue LED Illumination Water Immersible Head with Variable Power supply

Specifications	
Construction	Aluminium
Height of illumination unit	30 cm
Number of LED's	100 nos
Led Material	InGan
Color Frequency	450 nm
Bandwidth	60 nm
Luminous Intensity per LED	50 lumen
Total Luminous Intensity	5000 lumens
Viewing Angle	140°
Radiation Pattern	Lambertian
Forward Voltage	3.0 v - 3.6 v
Typical Voltage	3.1 v
Typical Forward Current	650 ma - 700 mA
Style	STAR Configuration
Power supply	Constant current continuously variable type



Broadband Light Sources



Deuterium Lamp with power supply unit

Deuterium lamps are excellent sources of high intensity ultraviolet radiation ranging from 185nm to 400nm. Emission in visible and infrared regions are negligible. This makes deuterium lamps ideal sources for UV spectroscopy, and as UV spectral irradiance standards. Deuterium Lamp Housing has condensing lens assembly that collects and collimates the lamp's radiation. Output is a 25mm diameter beam



Lamp Specifications

Lamp	Deuterium
Wavelength Range	185 - 400 nm
Powersupply	Fixed Constant Current Switch Mode Power Supply
Lamp Housing	Forced Air Cooled Type
Construction	Aluminum
Collimation & Collection Optics Dia	25 mm

Model No.	Source
HO-SP-DL20	20 W Deuterium
HO-SP-DHL20	20 W Deuterium & 20 W Halogen Lamp Selection by flip mirror

Dual Gooseneck LED Illuminator - 4000 lumens
Model : HO-SP-DGL4000

Lamp Specifications

Source	LED CREE XM
Light output	4000 Lumen Max
Colour Temperature	6000 degree Kelvin
Luminosity control	Continuously Variable 0 - 2000 lm
LED Collimation Tube Dia	24 mm
Flex Arm Length	300 mm
Finish	Black Anodized
Power input	230V / 50Hz



Dual Gooseneck LED Illuminator has two flex and stay arms. These LED light units with intensity control give maximum light output of 4000 lumens. Each arm has 2000 lumens output white LED and focus lens. The arms are 300 mm long and there is on / off and dimmer switches to provide fine control. This unit exhibits good control and even illumination. Color temperature is 6000 degree kelvin.

LED High Bright LED Capsule
Model : HO-HBL-Y
Y - Color - R/Y/B/G/W



For ease of mounting special ultra luminous intensity LED's are housed in metallic casing. The collimating optics in front of the LED helps to get focused beam to increase its lighting efficiency. As the LED is encased in a metallic capsule, the body acts as a heat sink. Brightness is adjustable continuously. This is ideal for a variety of illumination applications where collimated light is required. Various color options are available.

Lamp Specifications

Source	LED CREE XM
Light output	4000 Lumen Max
Colour Temperature	6000 degree Kelvin
Luminosity control	Continuously Variable 0 - 2000 lm
LED Collimation Tube Dia	24 mm
Flex Arm Length	300 mm
Finish	Black Anodized
Power input	230V / 50Hz

Lamp Houses for Spectral Study

Xenon Arc lamps are excellent sources of continuous light. The bright emission from short arc between the anode and cathode makes these lamps high intensity point sources, capable of being collimated with the proper lens configuration or re imaged onto a fiber bundle.

In both models xenon arc lamp housing utilizes heat conductive forced air cooling technique, to make sure efficient cooling of the lamp and electronics. Lamp housing include condensing optics to produce a 25mm collimated light beam. 50mm collimated light beam can also be provided upon request.



Specifications

	150W Xenon arc lamp	300W Xenon arc lamp
Model :	HO-SP-XE150	HO-SP-XE300
Quartz Type	Ozone Free	Ozone Free
Wavelength Range	250 - 2500 nm	250 - 2500 nm
Wattage	150 W	300 W
Voltage	18 V	20 V
Amperage	8.5 A	15 A
Current Range	7 - 8 A	13 - 16 A
Open Circuit Voltage	60 V	60 V
Luminous Flux	2900	7000
Luminous Intensity	290	700
Average Luminance	20000 lm	27000 lm
Overall Length	145 mm	174 mm
Lamp Length	125 mm	150 mm
Tip to Shoulder Length	57 mm	63.5 mm
Bulb Diameter	20 mm	23.87 mm
Cathode / Anode Pin	M4 x 0.7	10-32 UNC-2B
Cathode / Anode Base	0.39	0.50
Arc Length	2 mm	2.54 mm
Lamp Housing	Forced Air Cooled Type	Forced Air Cooled Type
Construction	Metallic	Metallic

Deuterium Halogen Source

Holmarc's Deuterium Halogen source is a specially designed light source that covers 200 nm to 2500 nm wavelength range. In this compact lamp house both Deuterium and Halogen lights are combined to a single optical path using and motorized rotation mechanism. Output port provided with SMA connector for fiber coupling. High quality optical design delivers maximum light coupling to the optical fiber. This light source can be used as a UV-VIS-NIR source for different spectroscopic applications. Filter holder, shutter, cuvette / sample holder can be provided optionally.

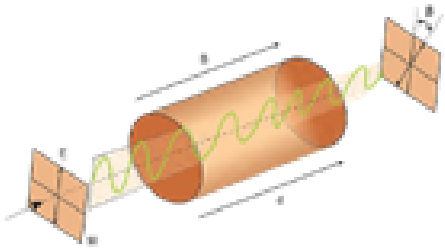


Model No.	HO-HDL-01
Wavelength Range	190 nm - 2.5 μm
Source	Deuterium & Tungsten Halogen
Lamp Wattage	20W Deuterium & 20W halogen
Input Voltage	230 V

Faraday Modulator

Polarization Modulation

In Faraday Effect, the phase modulation of two mutually perpendicular components of linearly polarized light results into polarization modulation, which is then transformed into Amplitude Modulation by analyzer. The magneto-optic modulators are based on the rotation of optical polarization as light propagates along the magnetic field in a material, by the Faraday effect. Like intensity modulation, polarization modulation does not require sophisticated stabilized laser. Since, the optical sensitivity of a polarization modulated light is about twice as high as intensity modulated signal, it provides better receiver Signal to noise ratio (SNR).



Our modulator is made of MR3-2 Faraday material placed inside a solenoid coil with modulating electric current. Water cooling system is used for longer operation, for which water inlet and outlet connectors are provided on top of the device.

Since glass material in high power laser system is damaged as a consequence of self focusing, low non-linear refractive index as well as high Verdet constant are important factors for Magnetic Optical Glass. The MR3-2 glass is made by considering all these factors and is stable, sensitive and inherently immune to interference.

Faraday modulator

The Faraday modulator used for the polarimeter have important function other than providing an easy way of optimizing the signal to noise ratio; it allows the real and imaginary parts of the refractive indices to be separated. This stems from the fact that in the modulator there is very little absorption i.e. the effect is only to modulate the angle of rotation of the linearly polarized laser beam with negligible modulation of the phase or ellipticity of the light.

The Optical Specifications

Faraday Rotator Glass	MR3-2 glass
Verdet constant	-0.329 min / Oe*cm at 632.8nm and -0.108 min / Oe*cm at 1064nm
Absorption coefficient	< 0.002 per cm at 1064nm
Transmission	≥ 86% without AR coating
Bulk laser damage threshold for material	> 25 (Joules/cm^2) at 1064nm, 10ns pulses
For stress birefringence, extinction ratio to perpendicular polarization > 40 dB	

Water Cooler for Faraday Modulator



HO-FM20C Faraday Modulator



Model No.	HO-FM05C	HO-FM10C	HO-FM015C	HO-MOM-FR20C
Aperture	5 mm	10 mm	15 mm	20 mm
Wavelength Range (nm)	380 - 1100nm	380 - 1100nm	380 - 1100nm	380 - 1100nm
Frequency Range	200 - 5000Hz	200 - 5000Hz	200 - 5000Hz	200 - 5000Hz
Resolution	+/- 1Hz	+/- 1Hz	+/- 1Hz	+/- 1Hz

Faraday Isolator (Optical Isolator)



Faraday isolators are optical components which allow light to travel in only one direction. Their mode of operation is based on the non-linear Faraday effect (magneto rotation). In principle, the function of an optical isolator is analogue to that of an electrical diode. Faraday isolators are composed of three elements: entrance polarizer, Faraday rotator and exit Polarizer.

They are used to protect a laser source from destabilizing feedback or actual damage from back-reflected light. The 5mm aperture Faraday isolators are cylindrically-shaped magneto-optic devices. Strong Neodymium Iron Boron permanent magnets are used to generate high axially-oriented fields within the magnet housing.

In operation, the magnet housing is sandwiched between input and output polarizers that have their transmission axis oriented 90 degrees relative to each other. In the reverse direction the backward traveling beam has a polarization orthogonal to the input polarizer and is therefore crossed with it, resulting in a rejected beam exiting the input polarizer.

We also provide custom designed isolators, based on your requirements. Please feel free to contact us.

Features

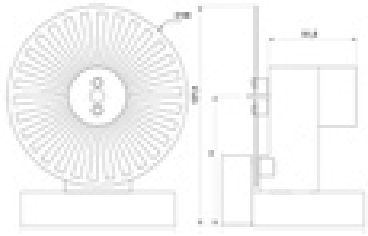
- Polarimetry & Other Optical Rotation Measurements
- Magneto-Optic Kerr Effect
- Faraday Modulation Spectroscopy (FAMOS)
- Optical Communication

Model No.	HO-FI410	HO-FI532	HO-FI632	HO-FI650	HO-FI785
Center Wavelength	410 nm	532 nm	632.8 nm	650 nm	785 nm
Aperture	5 mm	5 mm	5 mm	5 mm	5 mm
Transmission	80 / 82 %	85 / 89 %	85 / 89 %	85 / 89 %	85 / 89 %
Isolation Min / Typica	30 dB	36 / 40 dB	36 / 38 dB	36 / 38 dB	36 / 38 dB
Polarizer Type	Calcite	Calcite	Calcite	Calcite	Calcite
Rotating Medium	MR3-2 Farday Glass				
Power Handling > 25 (Joules/cm^2) at 1064 nm 10 ns pulses					



Optical Chopper

Model No: HO-IAD-OC-01



An optical chopper is a mechanical device which physically chops a light beam into discrete light pulses. It is widely used in various optical experiments. It modulates different light sources with given frequency for their subsequent analysis.

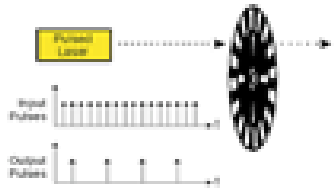
The chopping discs come in a variety of slot apertures and can be replaced with ease.

Holmarc's optical chopper is a stable device through out the frequency range. The basic system consists of control unit, rotating head and a set of four chopper discs. A DC motor drives the rotating head in closed loop control. Chopping discs are replaceable by the user with ease. A heavy base to which the rotating assembly is fixed provides stability during operation. Optical axis height is approximately 100 mm. The required disc depending on the frequency can be fixed to the rotating head. This system provide wide range of frequencies (10Hz - 3.7kHz.) A wide selection of additional discs and accessories are available to extend the frequency range and to satisfy individual requirements. Frequency is displayed directly on the digital display of the control unit. Easy-to-interchange blades are made of corrosion protected material for durability.

Specifications

Input signal	TTL (5V) pulses
Input signal frequency range	10 Hz to 4000 Hz
Minimum delay	10 micro second
Maximum delay	60 millisecond
Delay resolution	1 microsecond
User interface	Alphanumeric LCD and buttons
Input & Output connectors	BNC
Power input	90 - 260V / 50 - 60Hz

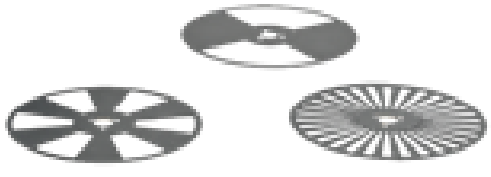
Lamp Specifications	
Two Slot	10 Hz to 200 Hz
Six Slot	100 Hz to 600 Hz
Thirty slot	200 Hz to 4000 Hz
Duty Cycle	50 %
Stability	+/- 1 Hz
Chopper Wheel Diameter	105 mm
Frequency Read Out	16 x 2 Lines LCD
Reference Pick-Up	IR LED and Photo Transistor Pair
Motor Cable Length	1.5 m
Operating Temperature	10°C - 50°C
Power input	230V, 50Hz



Faraday Isolator (Optical Isolator)

The delay generator accepts a TTL pulse train having a frequency between 10 Hz to 4 kHz, and provides a delayed version of the same signal. The amount of time delay can be set using the front panel buttons and the LCD display. It can delay the signal by 10 microseconds minimum to 60 milliseconds maximum. This device can be used for triggering a measurement device or camera when used with an optical chopper. The reference signal from the optical chopper may not be in phase with the chopped laser output. Adding a user specified delay to the reference signal will make it in phase with the laser and bring the triggering in sync with the laser pulsations.







Integrating Sphere
Model No: HO-SP-ISP Series

An integrating sphere is a valuable tool used in various scientific and industrial applications to measure and manipulate light. It's essentially a hollow sphere with a highly reflective inner coating, typically made of a diffuse white material. This special coating ensures light entering the sphere scatters and reflects multiple times before exiting through a designated port.

Holmarc integrating spheres a comes with different diameters, ports and detector configurations. The body material is aluminum and the inner walls are highly polished and coated with diffused reflecting material. Baffles are fixed inside to reduce the direct light entry to the detector port.

Custom Integrating spheres are available up to 300 mm diameter and different port configurations.

Standard Spheres

Model No.	HO-SP-ISP-50	HO-SP-ISP-100	HO-SP-ISP-150
			
Sphere size	50 mm	100 mm	150 mm
Coating	BaSO4 mix	High reflective BaSO4 mix	High reflective BaSO4 mix
No. of ports	3	4	4
Port size	12.5 mm	25 mm	25 mm
Fiber coupling port	-	Optional	Optional
Optical fiber coupler option	Yes	Yes	Yes

Detector Options
UV Silicon photodiode for 190 nm - 1100 nm
InGaAs detector for 900 nm - 2400 nm



Lens Assembly Spectral Measurement System

Model No: HO-SP-LSMS 01

The Holmarc Lens Assembly measurement system is designed for on- and off-axis optical characterization of imaging lens assemblies and zoom lenses. The complete system consists of a collimated light source, motorized sample positioning stages, an integrating sphere with positioning stages, and a high-resolution UV-VIS-IR spectrometer.

The system consists of a 150-mm collimated halogen light source, which is used as the light source with a 150-watt air-cooled halogen lamp. A variable aperture and fixed aperture slots are provided to control the input beam diameter.

The collimated beam is passing through the lens assembly sample, which is kept fixed on a motorized ZYZ and Theta stage. The motorized stages are positioned using Holmarc software with fine and coarse movement, and positions can be saved. For on-axis measurement, the theta stage is positioned at zero degrees, and the collimated halogen beam is passing through the sample. The light is then focused on the integrating sphere, which records the light intensity of the silicon photodiode and the InGaAs detector. The integrating sphere is fixed on another XYZ motorized stage. The gain of these two detectors can be individually controlled through the software. The diffused light is also collected by the optical fiber and fed into the SQR200FA spectrometer for spectral characterization of the same.

The SQR 200 FA is a dual-grating detector spectrometer with a wavelength range of 350 nm to 2400 nm and a 0.1 nm spectral resolution. The on- and off-axis spectral characterization can be performed after completing a baseline measurement of the desired wavelength range. The interval can also be selected from 0.1 nm to several nano meters.

For off-axis measurements, the sample can be rotated to the to the desired angle, and the integrating sphere is positioned precisely using the motorized stages. The complete system is fixed on a rigid optical table top and black acrylic enclosure is provided for avoiding the stray light.

Monochromator

f4 200mm dual grating high throughput Automated Monochromator



Detectors

High Sensitive Silicon Photodiode & InGaAs Detector





Integrating Sphere with motorized positioning

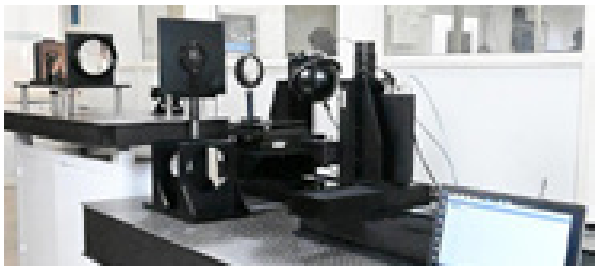
3.3 Inches with 4 Number of Ports (FIBER COUPLED) 350nm to 2400nm





Sample Positioning Stage

0 - 20 KG Load Compatibility
XYZ Kinear Travel of 150mm and
360 degree theta stage







Spectral Measurements

For More Advanced Spectroscopy
and related Products
Contact us : sales@holmarc.com

Specifications

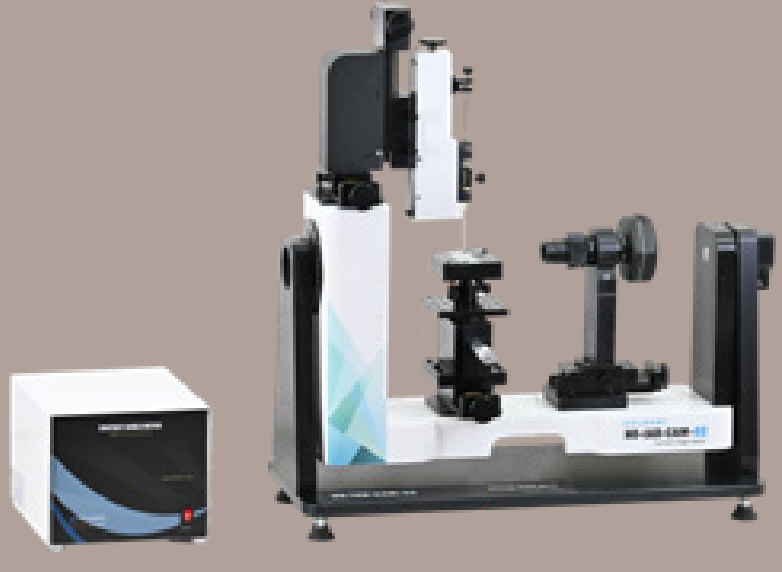
Spectrometer	
f4 200mm dual grating high throughput Automated Monochromator	
Optical Layout	Czerny Turner
Focal length	200 mm
Grating mount	Dual grating turret
Wavelength Range	200 - 2400 nm
Number of gratings	2 (1200 l/mm holographic grating & 600 l/mm precision ruled diffraction grating)
Grating size	50 x 50 mm
Aperture ratio	f / 4
Number of entrance/ exit ports	1 No.
Mechanical resolution drive	0.000072°/ step
Slit type	Fixed, Micrometer or motorized
Slit width	10 μm - 2 mm
Slit height	12 mm
Higher-order cut-off filter	Yes
Higher-order filter size	12.5 mm
Fiber optic coupler plate	Yes
Linear dispersion	2.25 nm / mm
Wavelength accuracy	± 0.15 nm
	Resolution @ 25μm Slit width & 1200l/mm Configuration : 0.1 nm
Computer Interface	USB 2.0
Software Control	Holmarc Spectra Scan
	High Sensitive Silicon Photodiode & InGaAs Detector

Sample Positioning Stage	
Number of Degrees of Freedom	6 (XYZ, Theta, Tip and Tilt)
XYZ Theta Scanning	Motorized (Stepper Motor controlled)
Linear Travel Range in XYZ Axis	150 mm
Theta	360 degree
Angular stage resolution	0.01 deg or better
Angular stage Repeatability	0.1 deg or better
Linear stage Repeatability	+/-5 Micron or better
Accuracy	+/- 10 Micron or better
Load compatibility	0 - 20 KG
Integrating Sphere with motorized positioning	
Size	3.3 inch
Number of ports	4 Nos
Port 1	Input port
Port 2	Detector
Port 3	Fiber coupled
Port 4	Fiber coupled
Coating	Avian B coating
Wavelength range	350 nm to 2400 nm
Detector	Dual- Si photodiode & InGaAs detector
XYZ motorized stage	150 ,150 and 600 mm travel resp.
Accuracy	+/- 10 Micron or better
Load compatibility	Minimum 10 Kg

05

CONTACT ANGLE METER

236 CONTACT ANGLE METER
238 Contact Angle Meter
238 Contact Angle Meter - Base Model
242 Contact Angle Meter with Dispenser to camera positioning unit, Motorized Substrate Holder,Automated Dispenser & Temperature Control
244 Contact Angle Meter
246 Contact Angle Instrument for Under -Liquid Low Energy Surfaces



Contact Angle Meter



Contact Angle Meter - Base Model

Contact angle is the angle formed by a liquid at the phase boundary where a liquid, gas and solid intersect. The shape of the drop is controlled by the three forces of interfacial tension. Static Angle and Advancing Angle are quantitative measures of the wetting of a solid by the liquid, but they can also be used as a quality control measure in surface treatments and surface cleanliness. Receding Angle is a quantitative measure of the adhesion of a solid to a liquid.

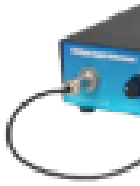


Base Model No: HO-IAD-CAM-01

Holmarc's Contact Angle Meter (Model No: HO-IAD-CAM-01) is a compact and cost effective CMOS based instrument for measuring contact angles of liquids over solid substrates. It has manual dispensing unit with camera interface for measuring contact angle of liquids on solid surfaces. The surface over which contact angle is to be measured is held in horizontal position to find out contact angle using sessile drop method.

State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled.. The surface over which contact angle is to be measured can be rotated through 180 degree from its horizontal position for advanced contact angle study and to find out contact angle hysteresis.

The wettability of a droplet is also dependent on the substrate in contact with the liquid. We provide 3 different substrates along with the equipment - made of aluminium, brass and stainless steel. However, the substrate according to customers' choice can also be loaded into the equipment.



Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer. The equipment is compatible with glass, plastic and SS syringes. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment

Technical Highlights

1. White light LED with variable intensity control ensures extreme low heat radiation.
2. Precise travel adjustment provided for CMOS with Optics assembly to fine focus the image.
3. Manual and motorized syringe pump for precise micro litre dispensing.
4. 50, 100 & 250 micro litre sample syringes provided with the system.
5. Precision height adjustment and angular displacement provided at the test base.
6. Vibration inhibiting solid construction for sharp drop images.
7. Powerful and user friendly windows software provided for image analysis.
8. Live images can be viewed on the PC monitor showing the droplet on the solid surface reassures the operator - regarding validity of the contact angle measurement.
9. Substrate can be rotated 180 degree from horizontal position.
10. Captured image and its Angle measurement table can be saved for future reference.

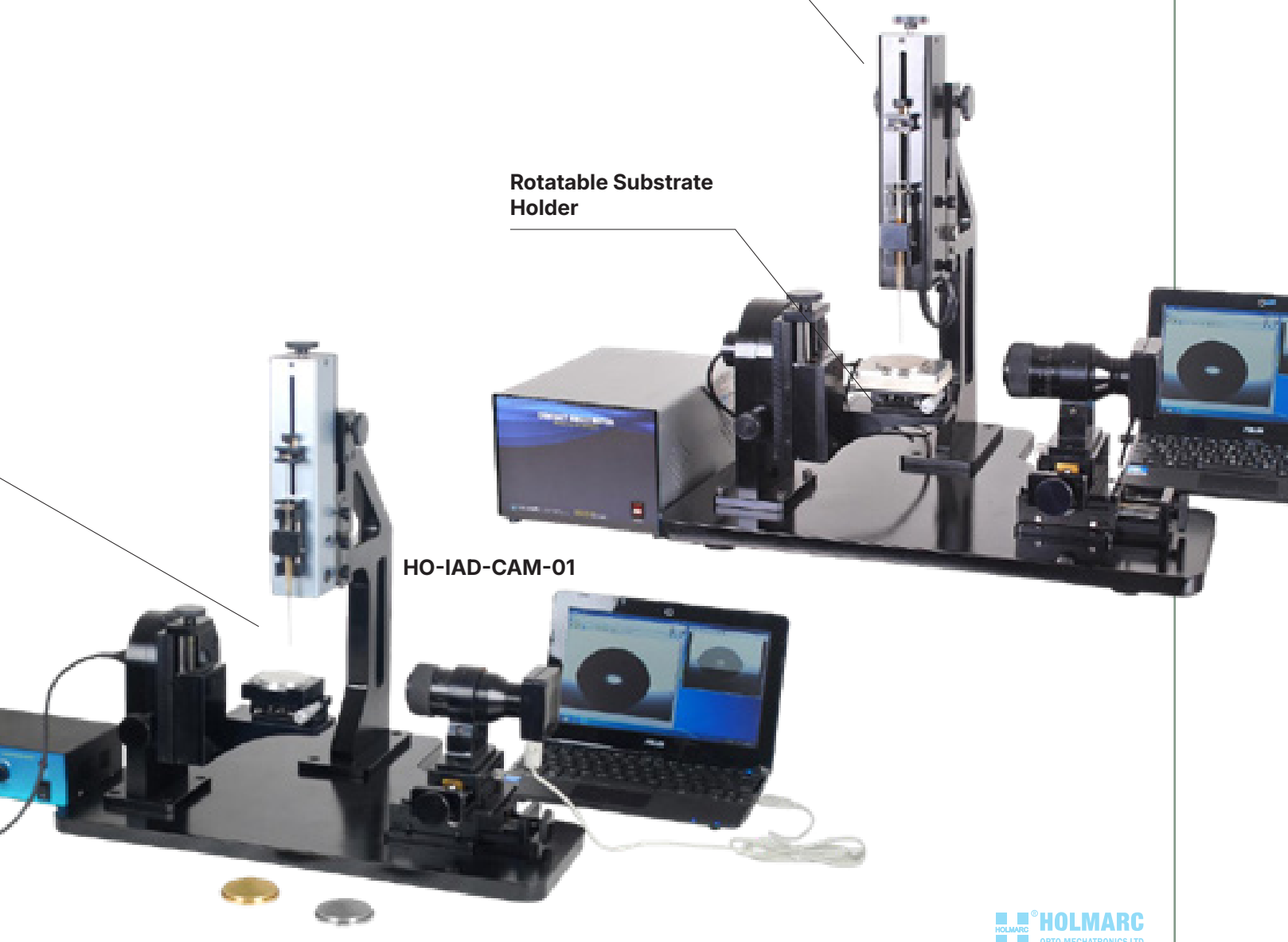
Contact Angle Meterwith Rotatable Substrate Holder & Automated Dispenser Model: HO-IAD-CAM-01A

Holmarc's Contact angle meter Model no: HO-IAD-CAM-01A is an instrument for research as well as industrial application with motorized syringe pump for precise dispensing and with camera interface for measuring contact angle of liquids on solid. Video capturing and video image processing features are included in Holmarc Contact angle analysis software.

State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled using the software. The flow rate and volume to be dispensed can be controlled from the software. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment. Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer. The equipment is compatible with glass, plastic and SS syringes.

HO-IAD-CAM-01A

Rotatable Substrate Holder

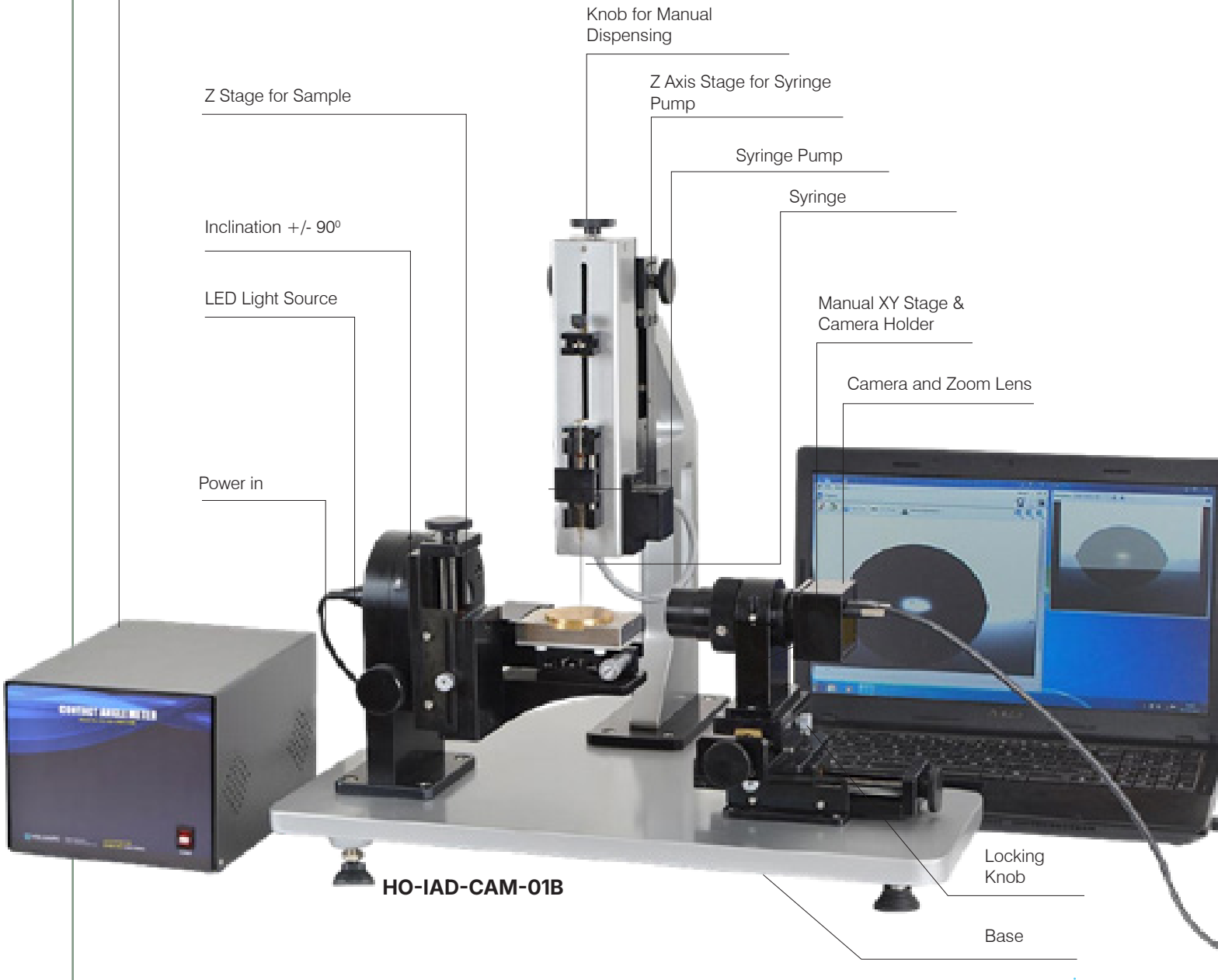


HO-IAD-CAM-01

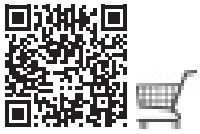
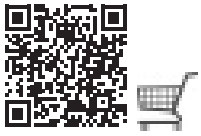
Contact Angle Meterwith Rotatable Substrate Holder, Automated Dispenser & Temperature Control
Model: HO-IAD-CAM-01B

Holmarc's Contact angle meter Model no: HO-IAD-CAM-01B is an advanced model with automated dispenser, rotatable substrate holder and temperature control. Additional feature from the Model: HO-IAD-CAM-01A is that this model is equipped with temperature control for the substrate holder (up to 100 degree Celsius from ambient). This proves to be ideal for the study of contact angle variations with respect to temperature. Video capturing and video image processing features are included in Holmarc Contact angle analysis software. The surface over which contact angle is to be measured can be rotated through 180 degree from its horizontal position for advanced contact angle studies and to find out contact angle hysteresis.

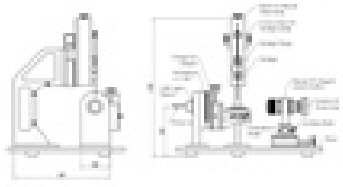
State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled using the software. The flow rate and volume to be dispensed can be controlled from the software. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment. Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer. The equipment is compatible with glass, plastic and SS syringes.



HO-IAD-CAM-01B

MODEL	HO-IAD-CAM-01	HO-IAD-CAM-01A	HO-IAD-CAM-01B
			
	Base Model	with Rotatable Substrate Holder & Automated Dispenser	with Rotatable Substrate Holder, Automated Dispenser & Temperature Control
Measuring method	Sessile drop method	Sessile drop method	Sessile drop method
Analysis method	Automatic curve fit analysis using drop snake method.	Automatic curve fit analysis using drop snake method.	Automatic curve fit analysis using drop snake method.
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.	High performance aberration corrected imaging lens with precise manual focus adjustment.	High performance aberration corrected imaging lens with precise manual focus adjustment.
Camera type and FPS	CMOS Sensor	CMOS Sensor	CMOS Sensor
Image Resolution in Pixels	2592 x 1944	2592 x 1944 (Max.)	2592 x 1944 (Max)
Video system	High performance CMOS Sensor. 3m shielded USB cable included.	High performance CMOS Sensor. 3m shielded USB cable included.	High performance CMOS Sensor. 3m shielded USB cable included.
Video Resolution in Pixels	640 x 480 at 17 fps , 1280 x 960 at 10 fps	640 x 480 at 17 fps , 1280 x 960 at 10 fps	640 x 480 at 17 fps , 1280 x 960 at 10 fps
	1920 x 1080 at 9 fps , 2048 x 1536 at 6 fps	1920 x 1080 at 9 fps , 2048 x 1536 at 6 fps	1920 x 1080 at 9 fps , 2048 x 1536 at 6 fps
	2592 x 1944 at 4 fps	2592 x 1944 at 4 fps	2592 x 1944 at 4 fps
Lighting	LED Based diffused lighting mechanism.	LED Based diffused lighting mechanism.	LED Based diffused lighting mechanism.
Dispenser	Mechanical dispenser with precise control.	Mechanical & Motorized dispenser.	Mechanical & Motorized dispenser.
Dimension	350 x 125 x 350 mm	500 x 400 x 498 mm	500 x 400 x 498 mm
Weight	30 kg (approx)	35 kg (approx)	35 kg (approx)
Power supply	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)
Test base temperature			Ambient to 100°C
Other specifications	15mm height adjustment for Sample holder.	30mm height adjustment for Sample holder.	30 mm height adjustment for Sample holder.
	180 degree rotation for the sample holder.	180 degree rotation for the Sample Holder.	180 degree rotation for the Sample Holder.
	75mm XY travel provided for the CMOS - optics assembly.	75mm XY Travel provided for the CMOS - Optics assembly.	75mm XY Travel provided for the CMOS - Optics assembly.
	Rotatable screws provided beneath the base for levelling purpose.	Rotatable screws provided beneath the base for levelling.	Rotatable screws provided beneath the base for levelling purpose.
# Laptop is not in scope of supply			

Contact Angle Meter with Dispenser to camera positioning unit, Motorized Substrate Holder,Automated Dispenser & Temperature Control



Model: HO-IAD-CAM-01BC

Holmarc's Contact angle meter Model No: HO-IAD-CAM-01BC is an advanced model that features dynamic contact angle measurements with motorized precise tilting for the substrate holder, dispenser to camera positioning unit (camera can be positioned at different angle for drop imaging), automated dispenser and temperature control. Advancing and receding contact angle can be measured at different angle (Image acquisitions are also automated) and roll-off angle can also be measured.

We are using a sessile drop optical method to find out the contact angle meter but we can incorporate a pendant drop method to find out surface free energy. Additional feature from the Model: HO-IAD-CAM-01A is that this model is equipped with temperature control for the substrate holder (up to 100 degree Celsius from ambient).This proves to be ideal for the study of contact angle variations with respect to temperature. Motorized syringe pump is provided in the equipment for precise dispensing and camera interface for measuring contact angle of liquids on solid surfaces. Video capturing and video image processing features are included in Holmarc Contact angle analysis software.

The surface over which contact angle is to be measured can be rotated through 180 degree from its horizontal position for advancing and receding contact angle by tilt plate method and roll-off angle can also be measured. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment. The wettability of a droplet is also dependent on the substrate in contact with the liquid. We provide three different substrates along with the equipment - made of aluminium, brass and stainless steel. However, the substrate according to customers' choice can also be loaded into the equipment.

Liquid Dispenser:

The system includes a motorized syringe pump with programmable flow rate of 1 - 100μl/min & 1 - 100 μl/hr ensures precise and controlled dispensing of liquids for accurate measurements. Three syringes with capacities of 50, 100, and 250 microliters are included.

Temperature Control:

The temperature of the test base is adjustable from ambient to 100°C, allowing for experiments under various thermal conditions.

Measuring Method:

The sessile drop method is employed for accurate contact angle measurements. The system utilizes automatic curve fit analysis using the drop snake method, providing reliable and precise data.

Advanced Functionalities:

Support for ROI acquisition window settings, resolution, and frame rate linkage adjustment.
Auto exposure, EDR support.
Internal and external synchronization capabilities.
Various external signal triggering options (rising edge, falling edge, low level, high level).
Automatic triggering of image changes in very small areas.
Standard shutter release cable for shooting control.
Real-time screen monitoring with a 1080P@50 frames format.
ntelligent positioning trigger key-frames and image key-frames

Optics and Illumination

Equipped with a high-performance aberration-corrected imaging lens, the system ensures clear and detailed images with precise manual focus adjustment. The LED-based diffused lighting mechanism includes fixed backlit LED illuminators and angled illuminators for top view imaging, ensuring optimal illumination for various sample types.



Camera Focus Adjustment:

The linear stage offers a travel range of ≥ 75 mm, allowing for precise positioning and focusing of the CMOS/Optics assembly.

Motorized Substrate and Sample Holder:

The substrate holder is rotatable in the range of 180° from its horizontal position and is height adjustable, accommodating different sample sizes and shapes. The system includes substrates made of aluminum, brass, and stainless steel.

Measurement Range and Accuracy:

The contact angle meter offers a measurement angle range of 0 - 180 degrees with an accuracy of ≤ 1 degree, making it suitable for a wide range of materials and surfaces.
Integrated High-Speed Camera:

Software:

The system includes Windows OS compatible processing software for live image and video capturing, as well as contact angle measurements. The software supports static and dynamic contact angle measurement, contact angle hysteresis, and roll-off angle determination.



Measuring method	Sessile drop method
Analysis method	Automatic curve fit analysis using drop snake method.
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.
Measurement angle range	0 - 180 degree
Measurement accuracy	≤ 1 degree
Camera type	CMOS Sensor
Image Res. in Pixels	2592 x 1944 (typical, max.)
Video system	High performance CMOS sensor and suitable shielded cable of minimum 3 m length
Dispenser to camera positioning unit	Designed for top view
Illumination	LED based diffused lighting
Illumination Units	Fixed backlit LED illuminator and angled illuminator for top view imaging
Liquid dispenser	Through motorized syringe pump; suitable for both motorized and mechanical type
	Three syringes with 50, 100 and 250 micro litre capacity will be included
Temperature of test base	Adjustable from ambient to 100°C
Substrate / sample holder	It will be rotatable in the range 180° from its horizontal position; Height adjustable
Substrates	Aluminum, brass and stainless steel (1 each)
Focusing	≥ 75 mm travel of CMOS / Optics assembly to fine focus the image
Other accessories	For live image / video capturing and contact angle measurements, windows operating system (OS) compatible processing software is included. The system has provision for :
	i. Static and dynamic contact angle measurement
	ii. Contact angle hysteresis, iii. Roll-of Angle
Input power	230+10 VAC, 50Hz
The system has rigid & vibration resistant construction suitable to operate on a table top	
# Laptop is not in scope of supply	

Construction and Warranty:

The system is built with rigid and vibration-resistant construction, suitable for tabletop operation. It comes with a minimum one-year warranty from the date of installation, ensuring reliability and peace of mind.

Contact Angle Meter

MODEL NO: HO-IAD-CAM-02

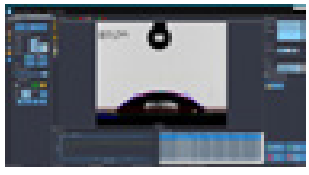
Advanced Model with new Design

Holmarc's Contact Angle Meter is a compact and cost-effective CMOS based instrument for measuring contact angles of liquids over solid substrates. It has automatic dispensing unit with camera interface for measuring contact angle of liquids on solid surfaces. The surface over which contact angle is to be measured is held in horizontal position to find out contact angle using sessile drop method. State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled. The surface over which contact angle is to be measured can be rotated through 180 degrees from its horizontal position for advanced contact angle study and to find out contact angle advanced/recede angles. The wettability of a droplet is also dependent on the substrate in contact with the liquid. The equipment is compatible with glass, plastic syringes. Chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment.

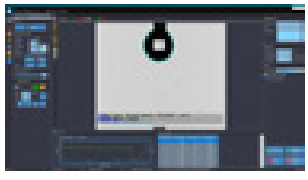
Holmarc's Contact Angle Meter is a versatile instrument widely used in both research and industrial applications. It measures the contact angle of liquids on solid surfaces, which is crucial for understanding the wettability and surface properties of materials. These information's is essential in fields such as material science, coatings, and surface engineering, where the interaction between liquids and solids plays a significant role in product performance and quality. By measuring the contact angle, researchers can determine the hydrophobicity or hydrophilicity of drug coatings, which affects the release rate and absorption of the drug in the body. Contact Angle Meter is used in the development of advanced materials, such as superhydrophobic surfaces and self-cleaning coatings. These materials have applications in various industries, including automotive, aerospace, and construction, where reducing surface contamination and improving durability are critical. By accurately measuring contact angles, researchers can optimize the design and functionality of these innovative materials.

.

Sessile drop method



Pendant Drop method



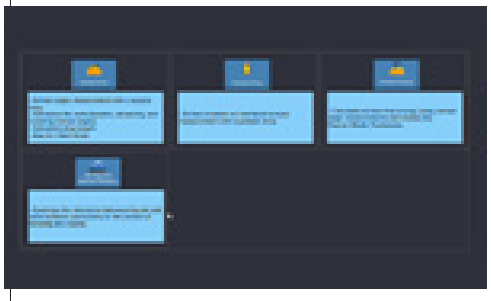
Height adjustments for Sample holder



Specifications	
CA Measuring method	Sessile drop method
CA Analysis method	Tangent method, Circle method & θ/2 method
Surface/Interfacial tension	Pendant drop method, Laplace method, Ds/De method
Surface energy	Young Laplace Equation
Dispenser	Software based automatic dispenser with precise control
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.
Angular rotation	Mechanical/automatic (optional) rotation available for advanced /receding CA studies. (0-360 degrees)
Camera type and FPS	high speed CMOS Sensor,200fps
Image Resolution in Pixels	1024*1280 pixels
Lens Assembly	EF 50mm,f/1.8 STM
Video system	High performance CMOS Sensor with 200fps or higher (customized)
Video Resolution in Pixels	1024*1280 pixels with 200fps
Lighting	software based LED controlled system
Software	User friendly software available with the instrument (customized version also available)
Dimension & weight	600 x 250 x 700 mm,35kgs(Approx)l
Power supply	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)
Other specifications	50mm XY travel provided for the CMOS - optics assembly, Height adjustments for Sample holder etc.
Rotatable screws provided beneath the sample stage for levelling purpose.	
# Laptop is not in scope of supply	

Software

User friendly software available with the instrument (customized version also available)



Contact Angle Analysis method

Sessile drop method for Measuring

Tangent method, Circle method & θ/2 method for Analysis

Pendant drop method, Laplace method, Ds/De method for Surface Tension

Young Laplace Equation for Surface Energy



Lighting

software based LED controlled system

Angular rotation

Mechanical/automatic (optional) rotation available for advanced /receding CA studies. (0-360 degrees)



Camera

high speed CMOS Sensor,200fps 1024*1280 pixels

Videos with resolution 1024*1280 pixels with 200fps



50mm XY travel provided for the CMOS - optics assembly,



35kgs(Approx)

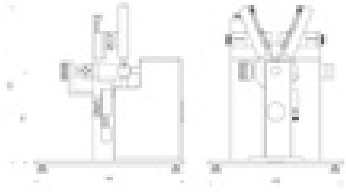
700mm

600mm

Call us now and talk with our Engineers for custom Designed Contact Angle Meter

HOLMARC OPTO-MECHATRONICS LTD

Contact Angle Instrument for Under -Liquid Low Energy Surfaces



MODEL NO: HO-IAD-CAM-02

Unlike the standard setup in which we use syringe to create and drop the liquid onto the surface, this unique instrument can be used to create two independent droplets inside a liquid bath. The droplet surface can be visualized from bottom and side-ways using a unique camera setup.

In the pendant drop deposition technique, a needle containing the drop at its end is brought near the surface. On touching the surface the drop spreads and attains equilibrium and in the process the drop gets detached from the needle spontaneously.

This mechanism inevitably requires the condition that the drop-substrate surface energy is larger than the drop needle surface energy. Hence for surfaces, for which the corresponding drop-substrate surface energy is much smaller than the drop-needle surface energy, such simple steps, as discussed above, do not occur.

Using our instrument, one can generate a drop at the tip of a needle inserted inside the liquid bath, where the low energy substrate is present. Instead of bringing the drop closer to the substrate as we do our standard contact angle meter, we take it away from the substrate so that the drop needle entity hits the liquid–fluid interface. Here this fluid can be air, or some other liquid whose film has been deliberately created on the liquid surface. The moment the drop-needle combination hits the liquid–fluid interface, the drop and the needle are subjected to different surface tension forces, thereby allowing them to get detached from each other. Consequently, the needle goes out of the liquid bath, whereas the drop remains at the interface.

System

The system includes dual Syringe pump, two 13.5mm W.D 10 X objectives, zoom lens assembly, Image combining optics, 5mp USB camera, sample positioning stage, LED light source etc.



LED Backlight

There are two backlight LED's provided along with the equipment., the top light LED and side light LED. They are integrated on the same unit which is detachable whenever required.

X - Y translation

X - Y translation for the substrate holder is provided in the equipment.
Imaging area of our CMOS sensor is 1.2 x 0.85 mm for bottom and side imaging.

Syringle Head Retraction

The automatic retraction of syringe head (two syringes will move together) is possible in the equipment. The automated retraction speed max is 4 mm / sec.



Profile views

The bottom & side profile views of the droplet are same in width and can be viewed in a single window



Integrate your camera

Provision to integrate your camera in the present equipment. Standard contact angle measurements can also be conducted and studied using this equipment.



Software Controlled

The motions are fully automated and can be controlled using dedicated software



Custom Camera Position

The camera can be positioned at different angles to the needle assembly to get a view on entire drop / drops sitting inside the cuvette.



06

HOLMARC
OPTO-MECHATRONICS LTD

METROLOGY INSTRUMENTS

248 METROLOGY INSTRUMENTS
250 Measuring Microscope
250 Auto Measuring Microscope (Dual Camera)
252 Measuring Microscope (Dual Camera)
254 Measuring Microscope
256 Metallurgy Microscope
256 Auto Metallurgy Microscope
260 Tool Maker's
260 Microscope
262 Digital Microscope
262 Telecentric Digital Inspection /
262 Measuring Microscope
264 Auto Digital Microscope
266 Traveling Microscope
268 Digital Traveling Microscope
270 Autocollimator
272 Digital Autocollimator

Measuring Microscope

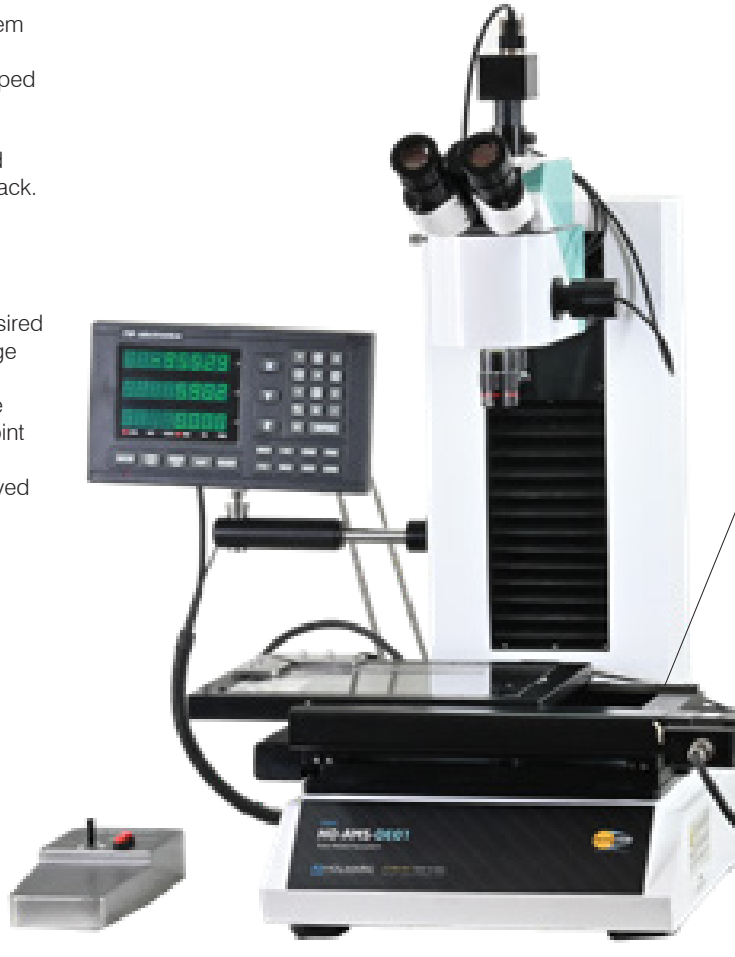


Auto Measuring Microscope (Dual Camera)

Model : HO-AMS-DE01

HO-AMS-DE01 measuring system is equipped with a dual imaging system for fast measurements. The imaging system 1 is equipped with a low magnification lens for wide area imaging and Imaging system 2 is equipped a long working distance microscope objectives for high magnification images. A 200mm*100mm sample area can be captured with imaging system 1 in just 4 frames. The high precision motorized XY stage is fitted with linear encoders and DRO will be used to display the encoder feedback. Motorized Z focusing stage with autofocusing algorithm is provided for sample focusing. In addition to the dual camera system, a binocular observation is also provided for visual inspection of the samples.

In order to take measurements, the user simply needs to click on the desired point on the stitched image from imaging system 1, and the sample stage will move there automatically. Then the starting point can be aligned with the reference cross line on the software using the imaging system 2. The software records the co-ordinate data from DRO. Now select the next point from the stitched image, and align it with the reference cross line using imaging system 2. The distance between these two points will be displayed on the software.



SPECIFICATIONS

Measuring accuracy	(3 + 0.03L) μm. L is the measuring length in mm
Reading resolution	1 μm (Linear encoder with DRO)
Observation head	Siedentopf Trinocular head, 30-degree inclination, 45-75 IP
Observation method	Brightfield (Dual imaging system)
Eyepiece	10X wide field, FN 20, Dioptre adjustable
Illuminations	1. Vertical reflected LED illumination (Epi-scopic), Intensity adjustable
	2. Angled LED illumination, Intensity adjustable

Imaging system 1	
Imaging lens	16 mm prime lens
Working distance	160 mm
Effective magnification	0.082 X
FOV camera	80 mm * 60 mm
Camera	½ " CMOS Color 3MP

Imaging system 2	
Imaging lens	LWD Plan Apo 5X Microscope Objective
Working distance	44 mm
Effective magnification (@5X objective)	50X @ eyepiece, 5X @ camera
FOV eyepeice	4 mm
FOV camera	1.31 mm * 0.984 mm
Camera	½ " CMOS Color 3MP

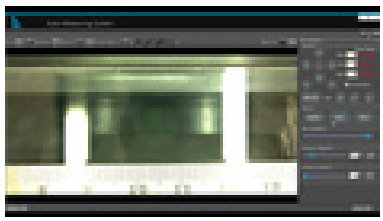
Sample stage	
Motorized XY high precision stage	
Measuring range	200 mm x 100 mm
Encoder resolution	1 μm
Display	DRO
Focusing	Motorized Z stage with autofocusing
Software	Image analyser - Automatic scanning, stitching, positioning, measurement etc.

Motorized Stage

Motorized XY high precision stage with Measuring range of 200 mm x 100 mm



Software





OPTIONAL ACCESSORIES

1. LWD Plan Apo 10X microscope objective	
NA	0.30
Working distance	34 mm
FOV eyepiece	2 mm
FOV camera	0.655 mm x 0.492 mm
2. LWD Plan Apo 20X microscope objectiv	
NA	0.35
Working distance	29 mm
FOV eyepiece	1 mm
FOV camera	0.327 mm x 0.214 mm
3. LWD Plan Apo 50X microscope objective	
NA	0.50
Working distance	17 mm
FOV eyepiece	0.4 mm
FOV camera	0.131 mm x 0.0984 mm

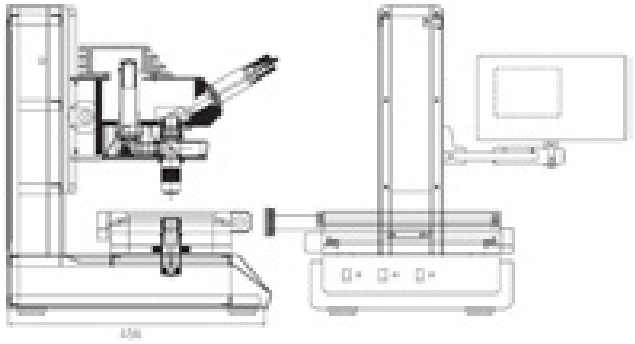
Measuring Microscope (Dual Camera)

Model : MM214V & MM214D Series

MM214 is a new series of innovative measuring microscopes from Holmarc designed for industrial and scientific measurements. These microscope are designed for delivering maximum measuring accuracy. It can be used for measurements as well as inspection of miniature parts and specimens which are too small to be measured without the assistance of a microscope. The instrument can measure semiconductors, small electronic and electrical components, biological specimens, micro-electro mechanical systems (MEMs), miniature machined parts, miniature molded items etc. The microscope has long working distance objective, eye piece fitted with reference cross wire, precision XY measuring stage, optical linear scales fitted to the X,Y and Z stages, digital read out (DRO) and object illumination systems. This instrument can be considered to be an essential tool for any laboratory either life science or physical science handling miniature components, parts and specimens

- **Machines and formed components**
- **Semiconductors**
- **Electrical and electronics parts**
- **Precision automobile components**
- **Plastic moldings**
- **Tools**
- **Medical devices**





Specifications

X,Y and Z stage

All the three linear stages have precision rolling contact bearings to ensure straight-line accuracy and repeatability in measurements. The stages are fitted with optical encoders having 1 micron resolution.

XY stage has leadscrew drives with fine and extra fine movements with hand knobs. There are clutch mechanisms for both these stages to disengage the leadscrew from the stage for quick positioning. The stage has glass top for bottom illumination. Travel for X stage is 200 mm and Y stage is 150 mm. Z stage is driven by rack and pinion through hand knobs fitted on both sides with a fine positioning mechanism on right side. Optical head is fitted to the Z stage. Vertical measurements can be taken by repeated focusing at the points of interest.

Object Illumination

There are three types of illuminations to choose from : Co-axial illumination, bottom illumination and angled illumination. In all these cases, high bright LED is used as light source for long life and cool lighting.

Digital Read Outs

Digital read outs with 1 micron resolution is fitted to the vertical column at ergonomical eye sight location. The read outs have large LED display and various programmable features like error compensation, calibration etc..

Model : HO-MM214V-50X	
Effective Magnification	50 X (up to 1000 X Available)
Vision	Binocular
Working Distance	34 mm
Working Throat	100 mm
Objective Design	PLAN APO Infinity LW Objective
Stage	XYZ High Precision Stage
Travel (X, Y & Z)	100 x 200 x 100 mm
DRO	XYZ coordinate data
Resolution	0.00005" / 0.001 mm
Z Axis Single Channel DRO 0.001mm resolution	
Illumination	Variable High Bright LED Angled, Bottom & Coaxial Illumination

Model : HO-MM214D-50X*	
Effective Magnification	50 X (up to 1000 X Available)
	C-Mount camera adapter is available in this model
Vision	Trinocular Model
Working Distance	34 mm
Working Throat	100 mm
Objective Design	PLAN APO Infinity LW Objective
Stage	XYZ High Precision Stage
Travel (X, Y & Z)	100 x 200 x 100 mm
DRO	XYZ coordinate data
Resolution	0.00005" / 0.001 mm
Z Axis Single Channel DRO 0.001mm resolution	
Illumination	Variable High Bright LED Angled, Bottom & Coaxial Illumination

Measuring Microscope

Model : MM214V & MM214D Series

Holmarc's MM214VM is a affordable measuring microscope in MM214V Series are well suited for wide range of applications from shop-floor inspection, measurement of tools and machined parts to precise measurement of test tools in a measuring room. It is designed as a monocular optical system with an angular measurement dial, suited for measuring angles. Angle measurement is performed easily by turning the angle scale disc to align the cross-hair reticle with the workpiece image. It can also be used to check the shape of screws and gears by attaching an optional reticle. Designed for those who prefer to measure with their own eye, the monocular eyepiece tube model is available. The C-Mount Video Head model provides easy video monitoring.

Bottom, Angled and co-axial illumination are provided in TM215V Series. A high bright Green LED is employed as the co-axial light source. Illumination intensity can be adjusted for most convenient and suitable illumination

The eye piece of this microscope is fitted with cross wire and measuring scale. The cross wire acts as a reference point for taking fine measurements. The XY stage used is of measurement grade fitted with precision micrometers of 1micron resolution. The micrometers can be either conventional engraved type or with digital display depending on the application. As the cross wire is fitted to only one eyepiece, these microscopes are monocular generally. Measurements are taken by movement of the stage. The crosswire is aligned with the first reference line or a point on the specimen or test object. Then the stage is moved watching the image to the second point on the object. Actual measurements are provided by micrometer reading. The depth can also be measured precisely using the micrometer on Z stage on which the optics head is fixed. By lowering or raising optics head, a point can be made in to focus or out of focus. By bringing the two points at different depths into focus one by one by moving the Z- micrometer, the depth can be obtained from the micrometer readings. Digital readout for XY stages are also available. The quick-release system is enabled on all long XY measuring stage, which is especially useful in longstroke measurements. Large-size grip knobs are provided on both sides of the column for focusing using the fine / coarse movement.

Optical limit switch for home sensing

Hand wheel for manual movement

Optional handheld unit & joystick

Optical Encoder integration on request

High Position Accuracy (<3 μm)

Range of Standard and Custom Sample Holders

Can be integrates with Nikon, Olympus & Zeiss Upright - Inverted Microscopes

Small Size Die & Mold
Drill Bits
Inserts
Fine Pitch Connector
Gears etc.

Specifications

Model : HO-TM215VM-50X*	
Effective Magnification	50 X (up to 1000 X Available)
Vision	Monocular
Working Distance	34 mm
Working Throat	100 mm
Objective Design	PLAN APO Infinity LW Objective
Angular Measurement Unit	0.1 Degree Scale
Stage	XY High Precision Stage
Travel (X, Y)	25 x 25 mm (Available range up to 400 x 200 mm)
XY Measurement Resolution	0.00005" / 0.001 mm
Illumination	Variable High Bright LED Angled, Bottom & Coaxial Illuminatio





Digital Measuring Microscope

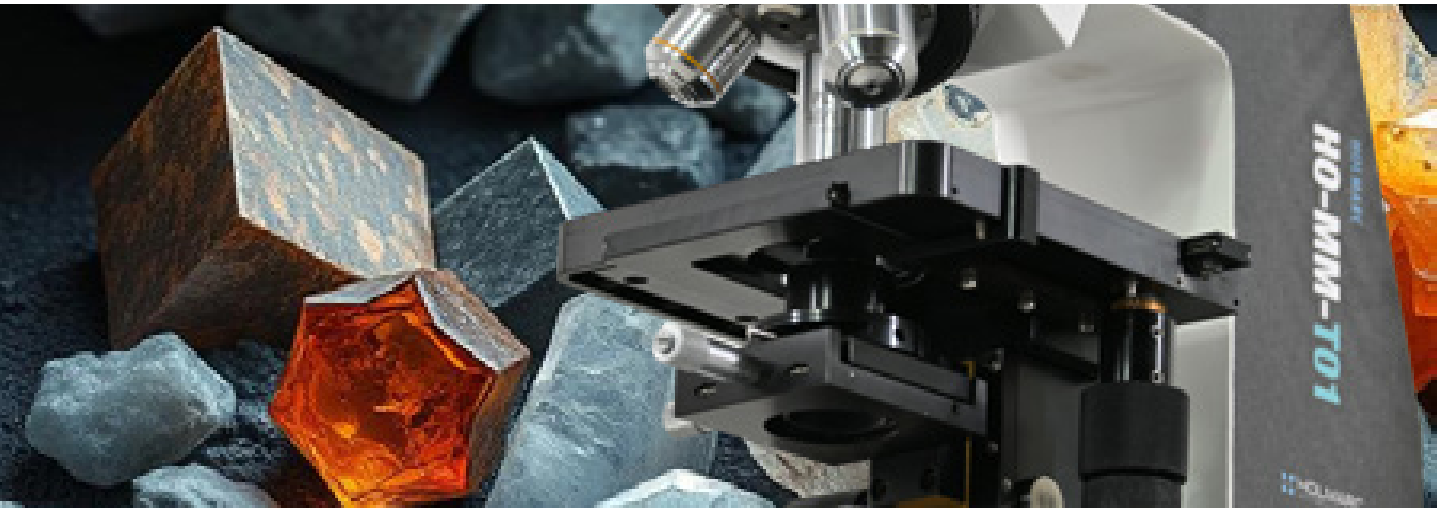
Model : HO-DMM-M1

Microscope type	Upright digital
Optical system	Infinity corrected
Observation method	Bright field
Illuminations	Transmitted Illumination. Reflected - Co-axial and Angled
Illumination systems	High bright White LED, 3W, Intensity adjustable
Nosepiece	Quadruple, Manually rotatable
Viewing head	Digital camera
	Plan Apo Long working distance
	Magnification = 5X
Microscope Objective	NA = 0.15, Working distance = 44 mm
	FOV = 1.14 mm x 0.856 mm
	Optical resolution = 2.3 micron
Z Focusing	Manual focusing stage
	Precision manual XY Stage with linear encoder
Sample XY Stage	Travel = 150mm x 150mm
	Drive = manual
	Resolution = 1 microns (XY stages)
Linear encoder	Control electronics for encoder feedback
	Encoder feedback can be readout from the camera software
Software features	Image grabbing, measurement feedback (encoder feedback)
Power Input	230V, 50Hz

Digital Camera Details

Sensor	1/2.5" 5MP Color CMOS
Sensor size	5.7 mm x 4.28 mm
Resolution	2592 x 1944 Pixels (5MP)
FPS	10 fps @ 2592 x 1944 pixels
Pixel size	2.2 um x 2.2 um
Shutter type	Electronics rolling shutter
Exposure time	109 us to 3000ms
Output image format	8bit / 12bit RAW
Photo image format	JPEG / BMP / PNG / RAW
Sensitivity	1.76 V / Lux - sec
SNR	38.5 dB
Dynamic range	67.7 dB
Interface	USB 2.0
Lens mount	C-Mount

Metallurgy Microscope



Auto Metallurgy Microscope

Holmarc's Auto Metallurgy Microscope, such as the HO-AMM-TM01 model, is a sophisticated tool designed for automated material analysis. It features motorized XYZ stages for precise sample scanning and autofocusing, along with both transmitted and epi-scopic illumination using high-brightness white LEDs. This microscope is equipped with advanced software for tasks like automated scanning, stitching, particle counting, and material analysis, making it highly efficient for industrial and research applications. Its ability to analyze opaque, transparent, and semi-transparent samples makes it invaluable in metallurgy, materials science, and quality control processes.

Model HO-MM-T01

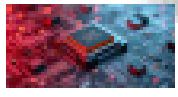
HO-MM-T01 is an upright manual metallurgy microscope designed for material analysis and inspection applications. A high bright white LED is included for the co-axial illumination of opaque samples and a white LED transmitted illumination is provided for imaging transparent and semi-transparent samples. In addition to the binocular observation, a 5MP color camera is also included for capturing the high quality images. An analysis software, Industry Pro, is provided with the system for quantitative analysis of Grain size, Inclusion, Porosity,Cementite, Phase Segmentation, and Nodularity (Ductile Iron, Gray cast Iron). Heyns lineal intersection method, three circle method, Heyns Abrams Intersection method, Random line method etc are used for the grain size measurement. Every measurement and report is generated in compliance with international standards. Custom reporting formats are also available



Gemology



Semiconductor



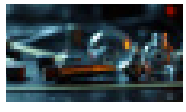
Pharmaceutical



Textile industry



Forensic metallurgy



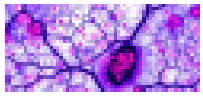
Inspection of metals



Metallurgy



Biological / Health care



Solar cells



Mineralogy



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Transmitted and Epi-scopic Illumination Model No HO-AMM-TM01

HO-AMM-TM01 is an upright metallugical microscope equipped with motorized XYZ stages for the automated operation of material analysis. The precision motorized XY stage can be used for the automated sample scanning while motorized Z focusing stage will keep the sample frame in focus with help of autofocusing algorithm. A high bright white LED is included for the co-axial illumination of opaque samples and a white LED transmitted illumination is provided for imaging transparent and semitransparent samples. An analysis software, Industry Pro, is provided with the system for quantitative analysis of Grain size, Inclusion, Porosity, Cementite, Phase Segmentation, and Nodularity (Ductile Iron, Gray cast Iron). Heyns lineal intersection method, three circle method, Heyns Abrams Intersection method, Random line method etc are used for the grain size measurement. Every measurement and report is generated in compliance with international standards. Custom reporting formats are also available



Inverted Metallurgy Model No HO-IMM-T01



Microscope HO-IMM-T01 is an Inverted Metallurgy Microscope designed for material analysis and inspection applications. A white LED with adjustable intensity is provided for the reflected illumination. The binocular head is inclined at 45 degrees and both the eyepieces are dioptre adjustable. In addition to the binocular observation, a 5MP color camera is also included for capturing the high quality images. The smooth operating, ball bearing mounted, quadruple nosepiece provides effortless objective changes. A mechanical stage with co-axial drop down knob is provided as the sample stage. A tension adjustable coaxial coarse and fine mechanism is used for the sample focusing An analysis software, Industry Pro, is provided with the system for quantitative analysis of Grain size, Inclusion, Porosity, Cementite, Phase Segmentation, and Nodularity (Ductile Iron, Gray cast Iron). Heyns lineal intersection method, three circle method, Heyns Abrams Intersection method, Random line method etc are used for the grain size measurement. Every measurement and report is generated in compliance with international standards. Custom reporting formats are also available.

HO-IMM-T01



Automatic scanning and stitching

Autofocusing

75mm x 75mm motorized sample stage

Specifications

	Model : HO-MM-T01	HO-AMM-TM01
Microscope type	Upright	Upright
Optical system	Infinity corrected	Infinity corrected
Observation methods	Brightfield	Brightfield & simple polarizing
Transmitted illumination	3W white LED – Intensity adjustable	3W white LED – Intensity adjustable
Epi-scopic (Co-axial) illumination	3W white LED – Intensity adjustable	3W white LED – Intensity adjustable
Nosepiece	Quadruple, Manually rotatable	Quadruple, Manually rotatable
Viewing head	Sidentopf Trinocular head, 30o inclination, 48-75mm IP	Sidentopf Trinocular head, 30o inclination, 48-75mm IP
Eyepieces	10X Wide field (FN20), diopter adjustable, HR	10X Wide field (FN20), diopter adjustable, HR
Microscope Objectives		
Plan Achromatic 10X		
	NA = 0.25, WD = 20.2mm | FOVeyepiece = 2mm, FOVcamera =0.57mm*0.428mm	NA = 0.25, WD = 20.2mm | FOVeyepiece = 2mm, FOVcamera =0.57mm*0.428mm
Plan Achromatic 20X	NA = 0.40, WD = 8.8mm | FOVeyepiece = 1mm, FOVcamera =0.285mm*0.214mm	NA = 0.40, WD = 8.8mm | FOVeyepiece = 1mm, FOVcamera =0.285mm*0.214mm
Plan Achromatic 40X	NA =0.60, WD = 3.98mm | FOVeyepiece = 0.5mm, FOVcamera =0.1425mm*0.107mm	NA =0.60, WD = 3.98mm | FOVeyepiece = 0.5mm, FOVcamera =0.1425mm*0.107mm
Plan Achromatic 100X	NA =0.85, WD = 0.40mm | FOVeyepiece = 0.2mm, FOVcamera =0.057mm*0.0428mm	NA =0.85, WD = 0.40mm | 0.2mm, FOVcamera =0.057mm*0.0428mm
Total Magnification	100X-1000X @ eyepiece and 10X-100X @ Camera	100X-1000X @ eyepiece and 10X-100X @ Camera.
Z focusing	Co-axial coarse and fine focusing, Manua	Motorized stage with Autofocusing
Sample XY stage		
Double layer Mechanical stage	Manual	Motorized
Travel	75mm x 50mm	75mm x 75mm
Drop down knob		
Substage condenser	Abbe condenser with Adjustable Iris, Focus adjustable	Abbe condenser with Adjustable Iris, Focus adjustable
Polarizing attachment		Polarizer –fixed, Analyser –rotatable.
Camera	1/2.5" CMOS Color 5MP, C-mount, USB2.0	1/2.5" CMOS Color 5MP, C-mount, USB2.0
Software	Industry_Pro (Metallurgy analysis software)	Industry_Pro (Metallurgy analysis software)
Standards		
Porosity	ASTM B-276	Porosity = ASTM B-276
Cementite	ASTM E 1268	ASTM E 1268
Inclusion	IS 4163:2021	IS 4163:2021
Nodularity (Ductile Iron)	ISO 947-1, IS 7754:1975, JIS G5503, GOST 3443-87	ISO 947-1, IS 7754:1975, JIS G5503, GOST 3443-87
Nodularity (Gray Cast Iron)	ASTM 247-17, ISO 945-1	ASTM 247-17, ISO 945-1
Grain Size	ASTM E-112, ASTM E-1382-91, IS 4748:2021, ISO 643:2019	ASTM E-112, ASTM E-1382-91, IS 4748:2021, ISO 643:2019

Specifications

Model : HO-IMM-T01	
Microscope type	Inverted
Optical system	Infinity corrected
Observation methods	Brightfield
Transmitted illumination	
Epi-scopic (Co-axial) illumination	
Nosepiece	
Viewing head	Sidentopf Binocular head, 45o, 55-75mm IP
Eyepieces	WF10X, FN20, Dioptric adjustment – both eyepieces
Nosepiece	Quadruple revolving, positive precision click stops, Manual. RMS thread

Microscope Objectives

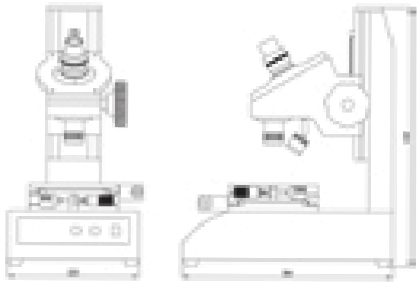
1. Plan Achromatic 10X/0.25	WD = 20.2mm
2. Plan Achromatic 20X/0.40	WD = 8.8mm
3. Plan Achromatic 40X/0.60	WD = 3.98mm
4. Plan Achromatic 100X/0.85 dry	WD = 0.40mm

Sample stage	Double layer Mechanical stage
Travel	126mm x 78mm
Focusing	Coaxial coarse and fine focusing mechanism
Camera Port	Side
Camera	1/2.5” CMOS Color 5MP, C-mount, USB2.0
Reflected Illumination	3W white LED, Adjustable intensity
Software	Industry_Pro (Metallurgy analysis software)

Standards	
Porosity	ASTM B-276
Cementite	ASTM E 1268
Inclusion	IS 4163:2021
Nodularity (Ductile Iron)	ISO 947-1, IS 7754:1975, JIS G5503, GOST 3443-87
Nodularity (Gray Cast Iron)	ASTM 247-17, ISO 945-1
Grain Size	ASTM E-112, ASTM E-1382-91, IS 4748:2021, ISO 643:2019

Tool Maker's Microscope

Model : HO-TMM Series



Multipurpose measuring devices

Ideal for Research & Industrial applications

Holmarc's Tool Maker's Microscopes are multipurpose measuring instruments that are generally used for the examination and measurement of small mechanical and electrical parts or tools. HO-TMM-01C model Tool Maker's microscope is equipped with a monocular eyepiece and camera for both visual as well as digital inspection applications. The sample XY stage is equipped with digital micrometer heads for precision measurements with 1um resolution. White LED with adjustable intensity is provided for both transmitted and flexible arm illuminations.
A software with live measurement feature is provided for measurement and documentation. These microscopes are used to view and measure linear distances, thread pitch, thread angles, tool edges, tool wear surfaces etc.

Specifications & Tolerances

Model	HO-TMM-01	HO-TMM-02	HO-TMM-03
Observation tube	Monocular, 45° Inclined, 90° Cross-hair reticle	Monocular, 45° Inclined, 90° Cross-hair reticle	Monocular, 45° Inclined, 90° Cross-hair reticle
Observation image	Errect	Errect	Errect
Eyepiece protractor	360° graduated, resolution = 6' (by Vernier)	360° graduated, resolution = 6' (by Vernier)	360° graduated, resolution = 6' (by Vernier)
Total Magnification	20 X & 30 X	20 X & 30 X	20 X & 30 X
Objectives	2 X & 3 X	2 X & 3 X	2 X & 3 X
\Working distance	67 mm & 60 mm	67 mm & 60 mm	67 mm & 60 mm
Eyepiece	10 X	10 X	10 X
Sample XY stage			
Travel	25 mm x 25 mm	50 mm x 50 mm	25 mm x 25 mm
Resolution	10 microns	10 microns	1 microns
Drive	Micrometer	Micrometer	Digital Micrometer
Rotation stage			
Travel			360°
Resolution			0.1°
Illuminations			
Bottom Illumination	High bright LED, Adjustable intensity	High bright LED, Adjustable intensity	High bright LED, Adjustable intensity
Angled Illumination	2 flexible arm LED, Adjustable intensity	2 flexible arm LED, Adjustable intensity	2 flexible arm LED, Adjustable intensity
Power supply	230V, 50Hz	230V, 50Hz	230V, 50Hz
Optional Accessories			
Digital Micrometer Head	(2 Nos. required for XY stage)		
	Travel = 25 mm, Resolution = 1 micron, (Model No. HO-TMM-DM1)		
Eyepieces	10X, FN - 13 mm, (Model No. HO-TMM-E10)		
	20X, FN - 10 mm (Model No. HO-TMM-E20)		
Objectives	5X, WD - 33 mm, NA: 0.10 (Model No. HO-TMM-MO5)		
	10X, WD - 14 mm, NA: 0.14 (Model No. HO-TMM-MO10)		

Both transmitted and reflected illumination intensities can be adjusted.

Errect image, bright field observation, clear and flare less image, wide field of view.

Long travel stages are available on request.

Angle measurement is performed easily by turning the angle scale disc to align the cross-hair reticle with the work piece image.

Erect image

Brightfield Observation

5MP Color CMOS Camera

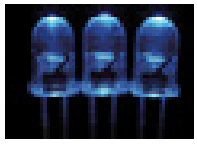
Live measurement software

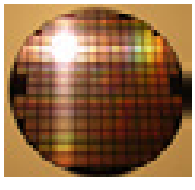
Protractor for angle measurement

1/2.5" CMOS
CAMERA

20X 30X
MAGNIFICATION

25mm x 25mm
SAMPLE XY STAGE

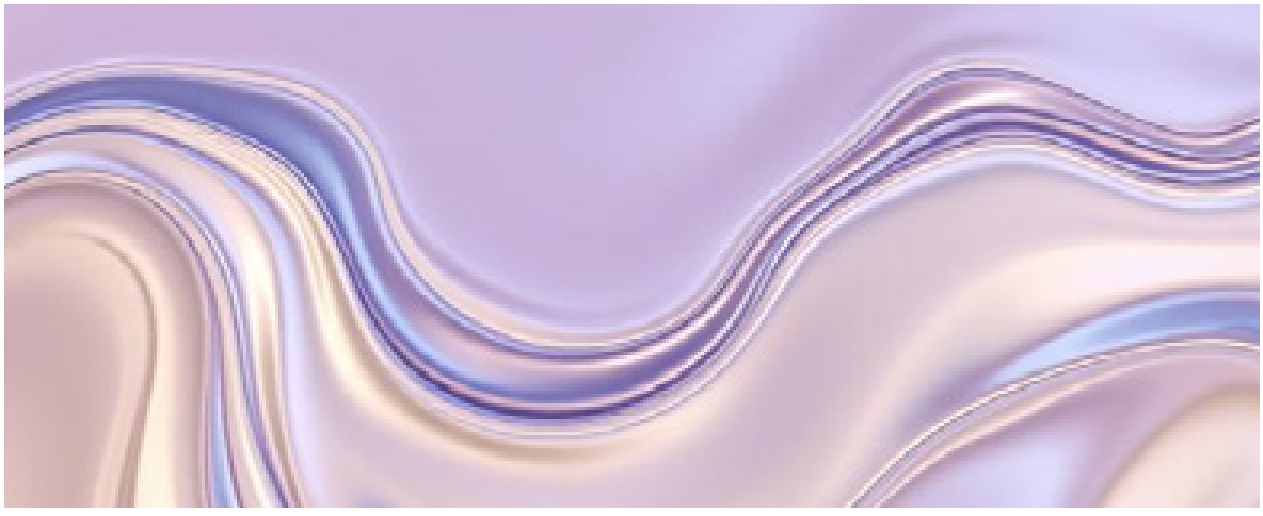








Digital Microscope



Telecentric Digital Inspection / Measuring Microscope

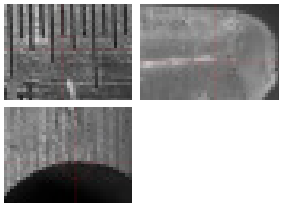
Model : HO-MM221V

MM221V is high precision digital inspection and measuring microscope that used a telecentric lens to measure dimensional tolerance on a variety of objectives. This computer based system is well suited for a wide range of applications, including shop floor inspection, tool and machines part measurement, accurate test tool measurement etc. MM221V model is equipped with transmitted, angled and co-axial LED illumination with intensity adjustable provision. A green LED is provided for the co-axial illumination. The system comes with a user friendly camera application for the inspection / measurement. The high precision XY stage is fitted with digital micrometer heads for the precise measurement with 1-micron resolution. The crosswire on the camera application can be used as the reference lines for the measurement. To take the measurement, move the XY stage with respect to the image's cross wire; the digital micrometer head will provide the corresponding readings. The depth can also be measured precisely using the digital micrometer fitted on the Z focusing stage.

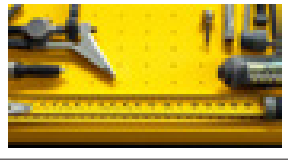
Specifications

Effective Magnification	1 X
Vision	Digital PC Based software measurement
Working Distance	40 mm
Working Throat	100 mm
Objective Design	Telecentric
Camera	3MP CMOS Color
Mount	C-Mount
Typical Distortion @ 588nm	0.0083 %
Typical Telecentricity @ 588nm	0.02°
Working Distance Tolerance	±1 mm
Angular Measurement Unit	0.1 Degree Scale
Stage	XY High Precision Stage
Travel (X, Y)	25 x 25mm (Available range up to 400 x 200mm)
XY Measurement Resolution	1 Micron
Illumination	Variable High Bright LED Angled, Bottom & Coaxial Illumination

Shop floor inspection

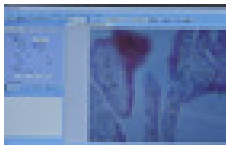


Tool and machines part measurement



Software

3MP CMOS Color



Camera

3MP CMOS Color



Camera

3MP CMOS Color

Stage

XY High Precision Stage with Digital Micrometer with 25 x 25mm (Available range up to 400 x 200mm) with 1 micron resolution





Auto Digital Microscope

Cleanliness Analysis , Sieve Analysis, Measuring

HO-AIS-B01, HO-AIS-B01-M, HO-AIS-B01-S

HO-AIS-B01 is an automated digital microscope designed for inspection as well as failure analysis in several industrial domains. The system is equipped with a 5X microscope objective and a 3MP CMOS color camera for high-resolution image capture. A high bright intensity adjustable ring LED is included for uniform top illumination of the imaging area. LED bottom illumination is also provided for imaging transparent and semi-transparent samples. A highly precise motorized XY stage is provided for automated sample scanning and a motorized Z focusing stage with an autofocus algorithm allows the user to get the best focused image in each frame.

A completed piece of user-friendly software (AM_V02) is included with the system for the automated scanning and stitching operation. The measuring window on the software will help the user to measure different parameters on the image, such as diameter, length, angle, no of particles etc.

- Aerospace industry Cleanliness analysis of lubricating or hydraulic fluids and oils
- Automotive industry - Cleanliness analysis of components and parts
- Medical industry Contamination of implants, syringes and medical instruments
- Electronics industry Inspection, cleanliness analysis, cross section analysis
- Textile industry - Qualitative and quantitative analysis of fibre
- Biological / health care - Full slide scanning (Slide scanner), stitching, documentation
- Optical industries - Component inspection
- Material analysis

Automatic scanning and stitching

Autofocusing

Documentation

Specifications

	Cleanliness Analysis	Measuring	Sieve Analysis
Model	HO-AIS-B01	HO-AIS-B01-M	HO-AIS-B01-S
Optical system	Infinity corrected	Infinity corrected	Infinity corrected
Observation method	digital Brightfield	digital Brightfield	digital Brightfield
Top illumination	High bright White Ring LED, Intensity adjustable via software	High bright White Ring LED, Intensity adjustable via software	High bright White Ring LED, Intensity adjustable via software
Transmitted illumination	High bright White LED, Intensity adjustable via software	High bright White LED, Intensity adjustable via software	High bright White LED, Intensity adjustable via software
Microscope objective	Plan Achromatic 5X objective (manually replaceable)	Plan Achromatic 5X objective (manually replaceable)	Plan Achromatic 5X objective (manually replaceable)
Focusing	Motorized with Autofocusing	Motorized with Autofocusing	Motorized with Autofocusing
Sample stage	High precision motorized XY stage, 50mm x 50mm travel	High precision motorized XY stage, 50mm x 50mm travel	High precision motorized XY stage, 50mm x 50mm travel
Camera	3MP CMOS 1/2” Color	3MP CMOS 1/2” Color	3MP CMOS 1/2” Color
Software	Particle Analyser_Pro	Micro Analysis_Pro	Sieve Analysis_Pro
Software features	Scanning, stitching, measurements, particle counting, analysis, Reports,	Live measurement, DXF comparison, Auto-measurement, scanning, stitching, reports.	Scanning, stitching, measurements, Compliance statement, Histograms, reports

Obsevation

Infinity corrected
digital Brightfield



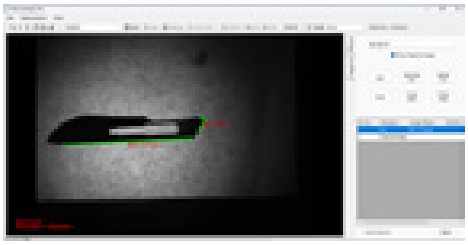
High Bright LED

High bright White Ring LED,
Intensity adjustable via software



Software

Scanning, stitching, measurements,
Compliance statement, Histograms,
reports



Objective

Plan Achromatic 5X objective
(manually replaceable



Motorized Stage

High precision motorized XY
stage, 50mm x 50mm travel

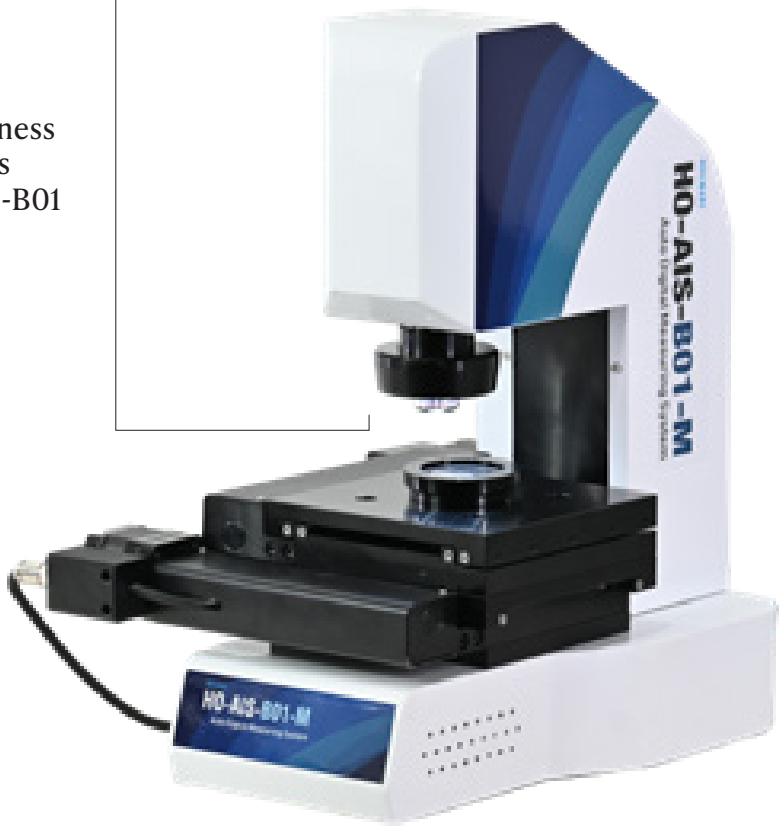




Sieve Analysis
HO-AIS-B01-S

Cleanliness
Analysis
HO-AIS-B01





Traveling Microscope



Holmarc offers traveling microscope with three axes measurement possibility; horizontal, vertical and right angled transverse motion. The instrument finds wide applications in general purpose scientific and industrial measurements. It can be used for accurate measurements of diameter of different objects. Other applications include accurate determination of small variation in the liquid levels, determination of refractive index of liquids, surface tension, viscosity etc.

	HO-TM-01	HO-TM-02
Horizontal Movements		
X Direction	Micrometer Head	Micrometer Head
Travel	150 mm 25 mm fine	50 mm
Resolution	10 micron	10 micron
Y direction	Micrometer Head	Micrometer Head
Travel	50 mm, 25 mm fine	50 mm
Resolution	10 micron	10 micron
Vertical Movement		
Z Direction	Micrometer Head	Micrometer Head
Coarse Travel	130 mm	130 mm
Fine Travel	25 mm	25 mm
Resolution	10 micron	10 micron
Observation tube		
Rotation	360 degree (lockable)	360 degree (lockable)
Eyepiece		
Magnification	10 X	10 X
Focal length	25 mm	25 mm
Broadband AR coated		
Cross hair reticle		
Objective		
Achromatic Type		
Magnification	3 X	3 X
Focal Length	60 mm	60 mm
Broadband AR Coated		
Base Construction	Cast Aluminium	Cast Aluminium
Focusing	Manual, Rack & Pinion	Manual, Rack & Pinion

We can provide custom configured traveling microscopes on request. Contact us at sales@holmarc.com, mail@holmarc.com.

Holmarc's Precision traveling microscope model HO-TM-01 is fabricated using precision roller bearing slides in each axis, where as other commercial available models are fabricated using standard dovetail design. The precision roller bearing slides give us frictionless movements which helps to perform the measurements more accurately than dovetail design. Each stage (X, Y and Z) is equipped with coarse and fine movements. Coarse movement can easily be done by moving the stage by hand and after locking the stage at a particular position the fine movement / measurement can be done by the micrometer head. The resolution of the fine movement is 10 micron. The use of micrometer head enables precise and accurate measurements unlike commonly available traveling microscopes with vernier scale readings.The microscope tube is mounted on a rotating arm which is 360 degree rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the objects. The microscope tube is fitted with 3X long working distance objective and 10X eyepiece with cross hair.

Model : HO-TM-02

Holmarc's traveling microscope model HO-TM-02 is equipped with micrometer driven horizontal X, Y, and vertical Z stages. All the assembly is mounted on a heavy wide base with three point support for extra stability and leveling. The extra wide base can also be used for placing large objects for measurements.

HO-TM-02 can be used for wide applications in general purpose scientific and industrial measurements. Other applications include accurate determination of small variation in the liquid levels, determination of refractive index of liquids, surface tension, viscosity etc.

Horizontal Vertical Movements

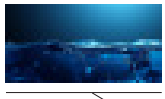
The horizontal X and Y stages are equipped with micrometer head for precise and accurate measurements. Both stages provide 50mm travel with 10 micron resolution. The vertical stage (Z stage) is equipped with 130mm coarse travel and 25mm fine travel with 10 micron resolution. The coarse movement can be done by rotating the knob by hand and after locking the stage at a particular position fine movement can be done by the micrometer.

The microscope tube is mounted on a rotating arm which is 360 degree rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the objects. The microscope tube is fitted with 3X long working distance objective and 10X eyepiece with cross hair reticle.

Surface tension



Liquid levels



Refractive index of liquids



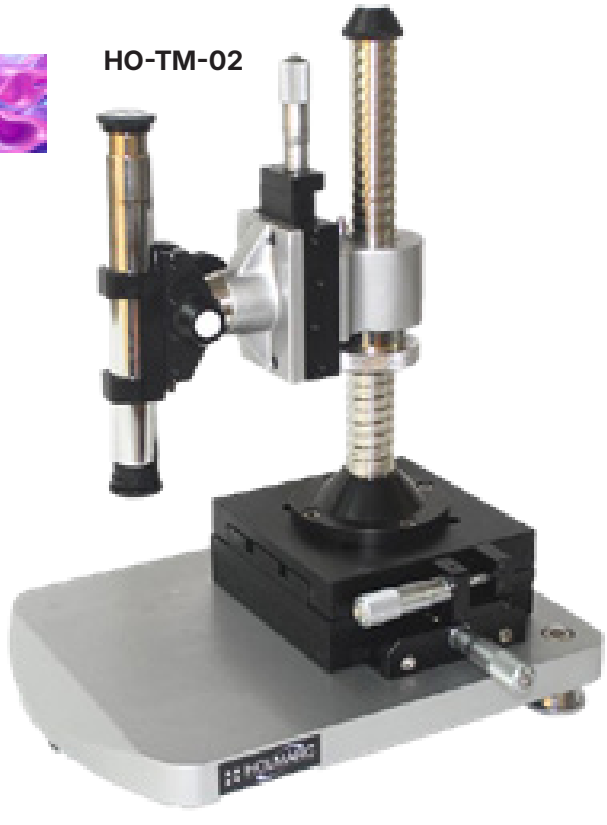
viscosity



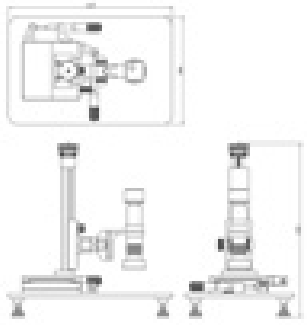
HO-TM-01



HO-TM-02



Digital Traveling Microscope



Digital Travelling Microscope HO-DTM-01

Holmarc'sdigital traveling microscope Model No. HO-DTM-01 is equipped with a 5MP CMOS color camera instead of an eyepiece. A ring type LED illuminator is provided around the objective for illuminating the objects. The microscope is mounted on a heavy wide base with four point support for extra stability and leveling. The extra wide base can also be used for placing large objects for measurements.

The horizontal (X, Y) and vertical (Z) stages are fabricated using precision roller bearing slides with micrometer head for precise and accurate measurements. Both stages provide 50 mm travel with 10 micron resolution. The vertical stage (Z stage) is equipped with 130 mm coarse travel and 25 mm fine travel with 10 micron resolution. The coarse movement can be done by moving the stage by hand and after locking the stage at a particular position the fine movement can be done by the micrometer head. The microscope tube is mounted on a rotating arm which is 360 degree rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the objects. The microscope tube is fitted with 3X long working distance objective, ring illuminator and CMOS camera. An image grabbing software is also provided with HO-DTM-01. With this software the user can capture the image by selecting suitable imaging parameters (like resolution, color or monochrome, exposure, etc.) and save it to a computer for later / further analysis. A reference cross line is integrated in the software for performing the measurements

Horizontal Movements

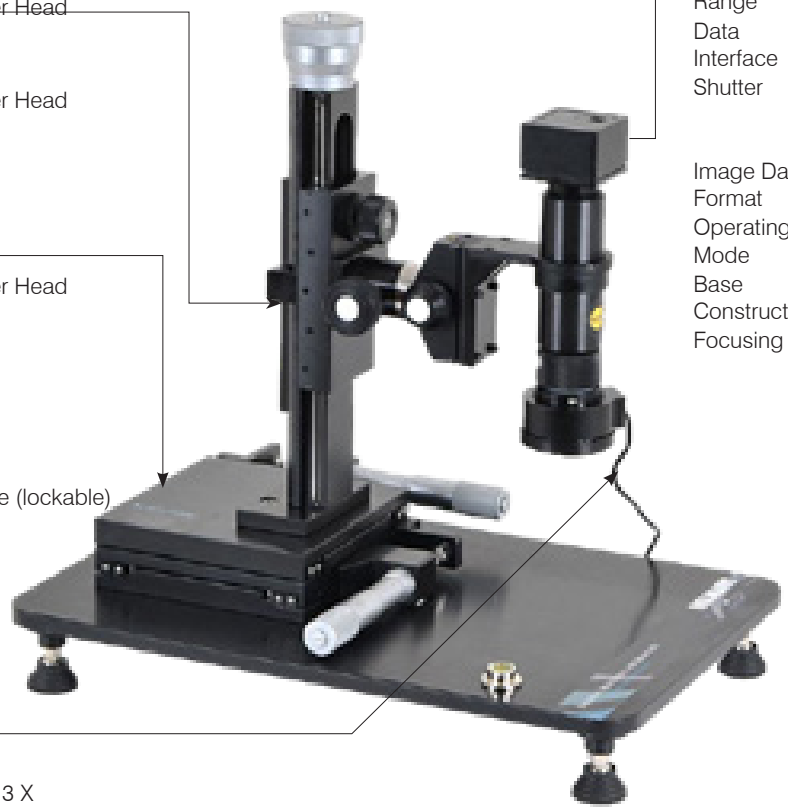
X Direction	Micrometer Head
Travel	50 mm
Resolution	10 micron
Y direction	Micrometer Head
Travel	50 mm
Resolution	10 micron

Vertical Movement

Z Direction	Micrometer Head
Coarse Travel	130 mm
Fine Travel	25 mm
Resolution	10 micron

Observation tube

Rotation	360 degree (lockable)



Objective

Achromatic Type	
Magnification	3 X
Focal Length	60 mm
Broadband AR Coated	

Camera

Sensor	CMOS Color
Resolution	2592 * 1944 pixels (5MP)
Sensor Size	1 / 2.5"
Pixel Size	2.2 um x 2.2 um
Frame Rate	6 fps
Dynamic Range	70.1 d
Signal Noise Ratio	38.1 dB
Exposure Time	0.058 ms to 3000 ms
Sensibility	1.4 V / Lux-sec
Spectral Range	380 nm - 650 nm
Data Interface	USB 2.0
Shutter	Electronic Rolling Shutter
Image Data Format	8bit RAW format
Operating Mode	Continuous
Base Construction	Cast Aluminium
Focusing	Manual, Rack & Pinion

Digital Travelling Microscope
Model : HO-DTM-5X-01

Holmarc's digital traveling microscope Model No. HO-DTM-5X-01 is equipped with a Plan apochromatic extra-long working distance 5X objective and a 5MP CMOS color camera. An intensity adjustable LED ring illuminator is provided for sample illumination. The microscope is mounted on a heavy wide base with four-point support for extra stability and leveling. The extra wide base can also be used for placing large objects for measurements. The high precision XY stages are equipped with digital micrometer for precision measurements. The Z focusing stage is fabricated using precision roller bearing slide with micrometer head for precise and accurate measurements. XY stages provide 25mm travel each with a resolution of 1 micron while the Z stage provides 130mm coarse and 25mm fine travel with 10 microns resolution. The microscope tube is mounted on a rotating arm which is 360 degrees rotatable and lockable. A rack and pinion type focusing mechanism is attached to the microscope tube for focusing the samples.

An image grabbing software is DTM_V02 is included with system for capturing the image by selecting suitable imaging parameters (like resolution, color or monochrome, exposure, etc.) and save it to a computer for later / further analysis. A reference cross line is integrated in the software for performing the measurements

Model	HO-DTM-5X-01

Horizontal Movements

X Direction	Micrometer Head
Travel	50 mm
Resolution	10 micron
Y direction	Micrometer Head
Travel	50 mm
Resolution	10 micron

Vertical Movement

Z Direction	Micrometer Head
Coarse Travel	130 mm
Fine Travel	25 mm
Resolution	10 micron
Observation tube Rotation	360 degree (lockable)

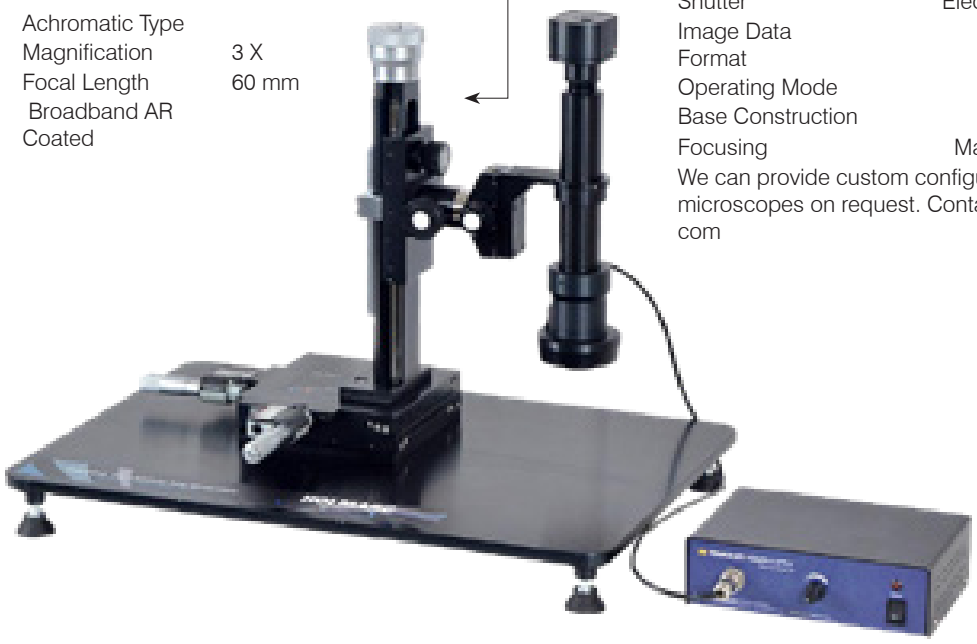
Camera

Sensor	CMOS Color
Resolution	2592 * 1944 pixels (5MP)
Sensor Size	1 / 2.5"
Pixel Size	2.2 um x 2.2 um
Frame Rate	6 fps
Dynamic Range	70.1 d
Signal Noise Ratio	38.1 dB
Exposure Time	0.058 ms to 3000 ms
Sensibility	1.4 V / Lux-sec
Spectral Range	380 nm - 650 nm
Data Interface	USB 2.0
Shutter	Electronic Rolling Shutter
Image Data Format	8bit RAW format
Operating Mode	Continuous
Base Construction	Cast Aluminium
Focusing	Manual, Rack & Pinion

We can provide custom configured traveling microscopes on request. Contact us at sales@holmarc.com

Objective

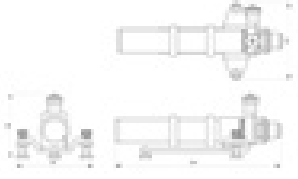
Achromatic Type Magnification	3 X
Focal Length	60 mm
Broadband AR Coated	



Autocollimator



Autocollimator is a versatile non-contact optical instrument for measurement of small angles or tilt movements with very high sensitivity. Holmarc manufactures precision visual autocollimators as well as electronics autocollimators as standard products and these instruments find multitude of applications in shop floor as well as metrology labs for precision measurements of straightness, parallelism, perpendicularity and flatness.



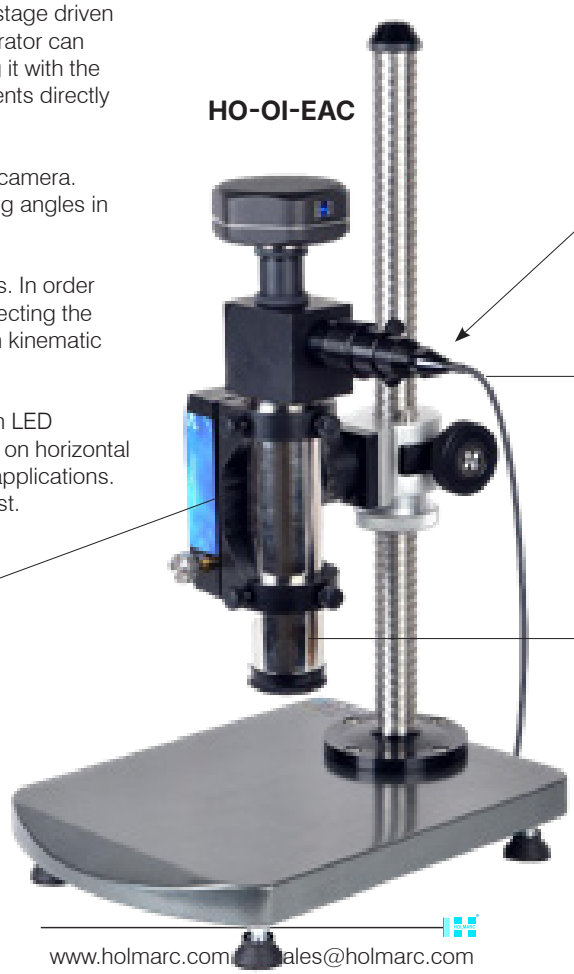
Autocollimator projects the image of anilluminated reticle to the object under inspection and receive the reflected image from the object. In visual autocollimators this reflected image of reticle will focus at the position of fixed reference cross wire. Shift in reflected image compared to the fixed reference cross wire represents angle. A dual axis linear stage driven micrometers carry the fixed cross wire near the eyepiece of the instrument. Operator can determine shift and hence the angle by moving the fixed cross wire and aligning it with the reflected reticle image. Graduations on the micrometer give angular measurements directly in arc seconds.

In Electronic autocollimator, the reflected image of reticle will focus on a CMOS camera. The software calculates the shift in reflected image and shows the corresponding angles in seconds, minutes or degrees.

In most cases, the object under inspection may not be having reflective surfaces. In order to carry out inspection, operator needs to fix a plane mirror on the object for reflecting the image back to the instrument. Holmarc supplies a front coated mirror along with kinematic mount as a standard accessory.

Holmarc's autocollimator has stainless steel body and high precision optics with LED illumination. A kinematic stage with two axes tilt movements hold the instrument on horizontal plane. Different types of accessories are also provided for performing different applications. Customer can choose the required accessories from the optional accessories list.

HO-OI-EAC



Applications

1. Measurement of parallelism of two surfaces
2. Measurement of perpendicularity of two surfaces
3. Parallel setting of rolls
4. Pitch and yaw measurement of slides
5. Measurement of roll-angle
6. Straightness Measurement
7. Flatness Measurement
8. Squareness measurement between a vertical spindle and a machine bed
9. Parallelism measurement of cylindrical bore holes
10. Testing of accuracy of rotary tables and index tables

Specifications

Model :	HO-OI-AC3	HO-OI-AC1	HO-OI-EAC
Readout	Micrometer	Micrometer	Software
Measurement axis	Dual (X,Y)	Dual (X,Y)	Dual
Resolution	3 arc seconds	1 arc seconds	0.79 arc seconds
Accuracy over full range	30 arc seconds	10 arc seconds	7.9 arc seconds
Measurement range	±0.5 degree	±20 arc minutes	± 17 arc minutes(Horizontal), ±12.5 arc minutes (Vertical)
Field of View	1 degree	40 arc minutes	34 arc minutes(Horizontal), 25 arc minutes (Vertical)
Clear aperture	30mm	35mm	30mm
Reticle Illumination	Green LED – Adjustable intensity		Green LED, Adjustable intensity
Mounting option 1	Horizontal alignment stage		Horizontal alignment stage (standard accessory)
Mounting option 2	Vertical stand with height adjustment and 3 axes freedom for alignment		Vertical stand with height adjustment and 3 axes freedom for alignment (Optional)
* Optional Acessories			

Vertical Stand with height adjustment and 3 axis freedom for alignment



Autocollimator with Vertical Stand (Height adjustment and 3 axis freedom for alignment)



Universal stand for Aotocollimator



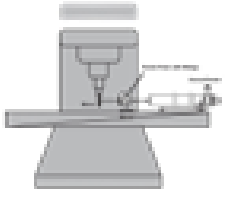
Accessories **Tripod**

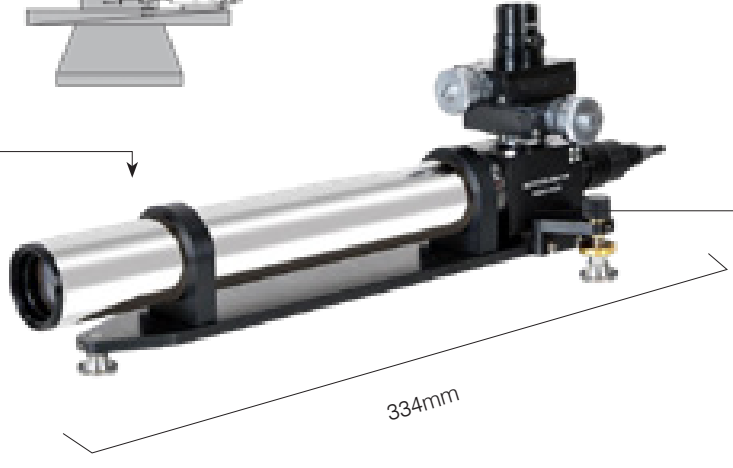


Pitch and yaw measurement using Autocollimator

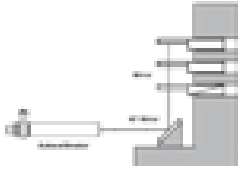


Squareness measurement between a vertical spindle and a machine bed





Parallelism measurement of cylindrical bore holes



Digital Autocollimator

DAC216 Series

HOLMARC DAC216 series Autocollimators are PC based instruments which are designed to operate in the lab as well as in a machine shop environment. No external controller is required. The standard interface is a single USB connection for power input and data output.

DAC216 series Autocollimators are high-precision dual axis angle measurement system that utilizes digital imaging technologies to measure the two angular positions relative to the reflective surface. Their exceptional accuracy and high resolution make them suitable for applications including the calibration of rotary tables, verification of angle standards and for remote or long term angular monitoring operations. The main applications are in calibration laboratories, optics labs, opto-elecronic laboratories and productions, laser based industries, space laboratories, etc.

The DAC216 series Autocollimator can be operated with a remote computer or as a stand-alone instrument. Stand-alone unit utilizes a compact tablet PC for displaying accurate deflection of reflective mirror. The tablet pc is also loaded with the fully featured software which provides graphical output of measurements and complete set of functions for the instrument setup, alignment and measurement in addition to other useful functions and information. Resolution of DAC216 series autocollimator starts from 0.16 arc-seconds in both X & Y axes with a system accuracy of ±0.16 arc-seconds at close range and ±0.32 seconds in overall range. As always, all of our products can be customized to fit your specific application.

All models come with two axis tilting platform, target mirror and DAC software. Two axis tilting platform is a three point mounting system which establishes a planar reference. A leveling base provides 3 dimensional adjustment control which allows fine adjustment in azimuth and elevation in the range of ±4° and ±1° roll adjustment.

Specifications

Angular Range	
Horizontal	
Vertical	1505 Arc Sec
	1003 Arc Sec
Angular Resolution	
Maximum	0.275 Arc Sec
Minimum	0.825 Arc Sec
Readout Rate	
Maximum	67 Frame / Sec (Res 0.825 Arc Sec)
Minimum	14 Frame / Sec (Res 0.275 Arc Sec)
Operational Range (Full Angular Range)	
Minimum	0 m
Maximum	1.83 m
Minimum measurement	10 mm dia. mirror at 1.5 m
Illumination Source	Laser or LED
Battery	Rechargeable 18650 Li-ion
Battery Backup for the Illumination	16-22 Hrs
Measurement Mode	Fully automatic - PC based
Interface	USB 2.0
Measurement Axis	X & Y

Features

- High precision
- Real-time measurements
- User-friendly interface
- Creating data reports and transferring in other programs

With measurement speed 120 fps

Choice of laser based industries

Applications in Optical Engineering / Optical Industry

- Testing of parallelism with Collimator and Telescope
- Testing of opaque wedges and plane parallel plates
- Testing of transparent wedges - evaluation by double cross
- Testing of transparent wedges - evaluation by reference mirror
- Testing of transparent wedges - simultaneous determination of wedge angle and refractive index
- Testing of transparent wedges - evaluation by angular deviation
- Testing of the 90° angle of a 90° - glass prism
- Testing 45° angles of 90° - glass prism
- Relative measurement of angular error of prisms
- Testing of camera objectives
- Radius measurement of concave spherical surfaces
- Radius measurement of convex spherical surfaces
- Measurement of focal length of lenses and optical systems

For Faster Measurement

Faster measuring autocollimators are used for applications such as scanning the angular changes of devices or assemblies using a reflector.

Model	DAC216-F286A	DAC216-F286
XY Measurement range	3470 x 2739 Arc Sec	2053 x 1540 Arc Sec
Resolution	5.4 Arc Sec	3.2 Arc Sec
Clear aperture	40 mm	40 mm
Illumination	Laser or LED	Laser or LED
Rate of Measurements	120 fps.	120 fps.
Minimal reflector diameter	Ø10 mm (mirror) Ø30 mm (glass)	Ø10 mm (mirror) Ø30 mm (glass)
Operational Range	1.5m	1.5m
Interface	USB 3.0	USB 3.0

- Measurement of the centration error of spherical surfaces
- Measurement of centration error of lenses in transmission using Collimator and Telescope Measurement of centration error of lenses in transmission using Autocollimator and Mirror
- Flatness testing of reflecting surfaces using collimator & telescope
- Flatness testing of reflecting surfaces using an Autocollimator
- Control of wedges and plane parallel plates

Mearsurement Speed

120 FPS

For high resolution measurement

Model	DAC216-R900A	DAC216-R900B
XY Measurement range	737 x 527 Arc Sec	653 x 490 Arc Sec
Resolution	0.16 Arc Sec	0.25 Arc Sec
Illumination	Laser or LED	Laser or LED
Rate of Measurements	120 fps.	120 fps.
Minimal reflector diamete	Ø10 mm (mirror) Ø30 mm (glass)	Ø10 mm (mirror) Ø30 mm (glass)
Operational Range	1.5m	1.5m
Interface	USB 3.0	USB 3.0

Mearsurement Resolution

0.16 Arc Sec



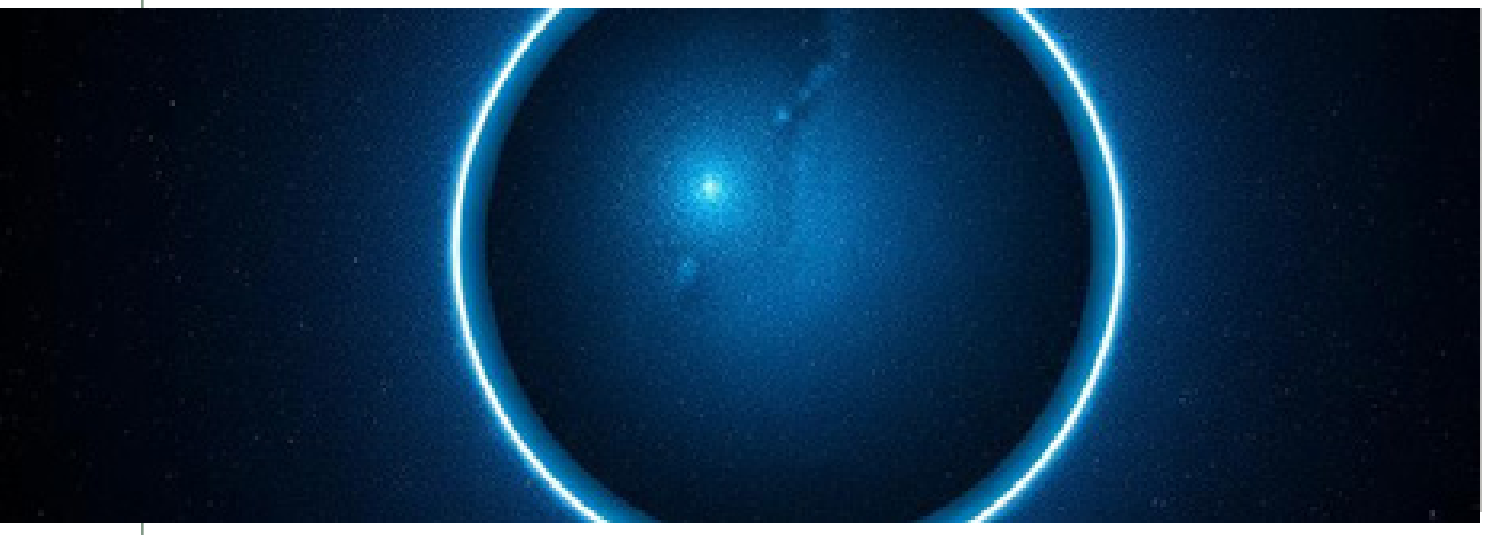
07

ANALYTICAL INSTRUMENTS

274 ANALYTICAL INSTRUMENTS
276 Ellipsometer
276 Variable Angle Laser Ellipsometer
278 Variable Angle Spectroscopic Ellipsometer
280 Magneto Optic Ellipsometry
282 MOKE
282 High Sensitivity Laser Based Magneto-Optical Kerr Effect Station
284 Spectroscopic Magneto - Optic Rotation
284 Measurement System
286 Magneto Optic Spectrometer
286 Spectroscopic Kerr / Faraday / Ellipsometry
288 Polarimeter
288 Digital Polarimeter
290 Refractometer
290 Automatic Refractometer
292 Reflectometer
292 Near Normal Spectroscopic Reflectometer
294 Quantum Efficiency
294 Quantum Efficiency & IV Measurement System
298 Quantum Efficiency & Spectral Response Measurement System
300 Quantum Efficiency
300 Measurement System - VIS IR
304 Spectral Quantum Efficiency & IV
304 Measurement Unit
308 Solar Simulator
308 Solar Simulator 1
310 Solar Simulator 2
312 Solar Simulator with IV Measurement System
313 Xenon Light Source
314 Solar Simulator & IV Measurement
314 System with Keithley SMU
316 Spectral Response Measurement Apparatus
318 Photodetector Characterization Setup
320 Schlieren Imaging System
320 Standard Models with different Mirror sizes
322 Schlieren Imaging System
324 Laser Ablation
324 Confocal Micro Laser Ablation with integrated galvano scanning unit
328 Automated Multi-wavelength Laser Scribing/ablation/ Cutting station with Micro Inspection Camera
332 Laser Induced Current Measurement
332 Confocal Real-time Laser Beam Induced Current and Photoluminescence Measurement Unit
334 Light Beam Induced Current (LBIC) Measurement
336 Impedance Tube
338 Custom Impedance Tube
340 Lees Disc Apparatus
342 Conductivity Cell Measurement Setup
344 Z - Scan Characterization Kit
344 Characterization of Transparent Optical Materials
346 Electronic Speckle
346 Pattern Interferometer (ESPI)
348 Cyclical Force Generator



Ellipsometer



Variable Angle Laser Ellipsometer

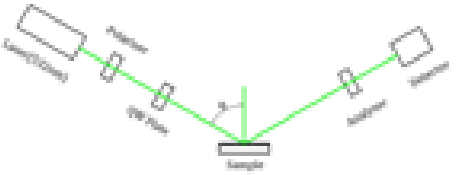
Model No: HO-VALE-01

Ellipsometry is a very sensitive optical technique which provides unequalled capabilities for thin film metrology. Ellipsometry exploits phase information and polarization state of light and so can achieve angstrom level resolution. The main advantages of ellipsometry are its non-destructive character, high sensitivity and wide measurement range. HO-VALE-01 model is suitable for educational purpose and the optical parameters like thickness and refractive indices of a single layer thin film can be determined precisely. In the ellipsometer model HO-VALE-01, a circularly polarized light is made incident on the test substrate and the reflected light which is linearly polarized is analyzed for polarization changes.

The instrument consists of two concentrically rotating arms around a precisely graduated disc that is fixed to a heavy base. The Laser, Polarizer, and Quarter wave plate are mounted on the laser arm, whereas the analyser and the detector are mounted on the detector arm. The two arms can be positioned to set the incident angle between 30 and 90 degrees with a resolution of 0.1 degree. The Polarizer, Analyzer, and the Quarter-Wave plate are mounted in precision rotary stages that are 360° rotatable with a resolution of 0.1°. Linear glass polarizers are used for both polarizer and analyser. Sample is placed on a precision micrometer driven vertical stage with height adjustment range of 10 mm and resolution 0.01 mm. For null method, detector can be replaced with a miniature screen for visual determination of null point, if required.

Ellipsometer operation

As shown in the Fig., a randomly polarized laser light (532nm) passes through a polarizer which changes the polarization of light from random polarization to linear polarization. The linearly polarized light then passes through a quarter-wave plate (set the fast axis at 45 degree) which changes the polarization state from linear to circular. After reflection from the sample thin film, the circularly polarized light becomes linearly polarized and an analyzer measures the degree of polarization. A software will be used to find out the thickness and refractive index from the measured data.



Principle of Ellipsometry

Ellipsometry is a highly sensitive optical measurement technique for optical thin films. The principle relies on the analysis of the change in the polarization state of light reflected from a surface. The change in the polarization of light reflected from the thin film surface is measured by taking the amplitude ratio of two perpendicularly polarized beams.

$$\rho = r_p / r_s = \tan\Psi e^{i\Delta}$$

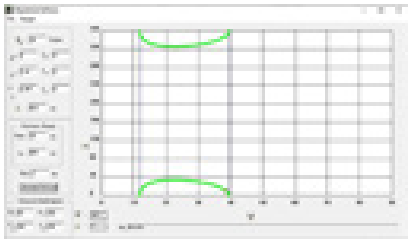
Where Ψ and Δ are the amplitude ratio and phase shift of the p and s components respectively. Since ellipsometry is measuring the ratio of two values, it is very accurate and reproducible.

Ellipsometric Solutions

Need Customization for measurements. HOLMARC's experienced support engineers will be glad to help you. Call us at +91 938-863-2098 or send us a mail to sales@holmarc.com

Holmarc can provide custom spectroscopic ellipsometers to fit a wide variety of applications.

Software

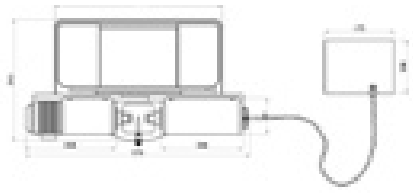


Specifications

Measurement Range	50 nm - 300 nm
Incident Angle	30° ~ 90°, Error ≤ 0.1°
Laser	DPSS (532 nm, 5 mW)
Detector	Si Photodiode (5.8 mm x 5.8 mm)
Rotation Range	
Polarizer	0° - 360°
Quarter-Wave	0° - 360°
Resolution	0.1 degree
Source Arm	
Rotation Range	70 degrees (from horizontal plane)
Main Scale Division	1 degree
Resolution	0.1 degree
Detector Arm	
Rotation Range	70 degrees (from horizontal plane)
Main Scale Division	1 degree
Resolution	0.1 degree
Sample Holder	
Height Adjustment Range	10 mm
Resolution	10 microns
Tilting Range	+/- 2 degree



Variable Angle Spectroscopic Ellipsometer



Model No: HO-SE-01XY

Spectroscopic Ellipsometer is a non-contact instrument widely used for thin film analysis and measurements. Holmarc's Spectroscopic Ellipsometer model HO-SE-01 incorporates Rotating Analyzer Ellipsometry(RAE) technology to characterize thin film samples. It uses a high speed CCD array detector to collect the entire spectrum. It measures films from nanometer thickness up to tens of microns and the optical properties from transparent to absorbing materials. It accurately measures optical constants like refractive index, film thickness and extinction coefficient.

HO-SE-01 model is equipped with a 50W Halogen lamp as the light source. A set of motorized rotatable Glan-Thompson polarizers are used as the Polarizer and the Analyser. A motorized Z stage is provided for the automatic focusing of sample and a manual tilting platform is provided for the sample alignment. A motorized XY stage with 30 mm x 30 mm travel is also provided for positioning the sample for measurement at different locations. An optical fiber with SMA connector is used to couple the reflected light from the sample to the spectrometer.

A user-friendly measurement software is provided for the initial calibration and automatic measurements. An analysis software with advanced mathematical fitting algorithm is provided for the deduction of thickness and optical properties from the measured data..

Specifications

	HO-SE-01	HO-SE-01XY
Spectral Range	450 - 800 nm	450 - 800 nm
Ellipsometer configuration	RAE	RAE
Detector	3648 pixel CCD linear sensor	3648 pixel CCD linear sensor
Spectral resolution	1 nm	1 nm
Light Source	Halogen	Halogen
Incident angle	50 - 75 degree (Resolution 0.1 degree, Automated operation)	50 - 75 degree (Resolution 0.1 degree, Automated operation)
Thickness measurement range	20 nm - 10 microns	20 nm - 10 microns
Accuracy	+/- 3 %	+/- 3 %
Resolution of measured R.I	0.001	0.001
Sample thickness	0.3 mm - 8 mm	0.3 mm - 8 mm
Sample XY Stage travel		30 mm x 30 mm (motorized)
Sample focusing	Automated	Automated
Sample alignment	Manual tilt	Manual tilt
Sample measurement	Automatic	automatic
Thickness analysis	Advanced mathematical fitting algorithms	Advanced mathematical fitting algorithms

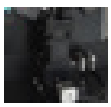
Features

- Advanced mathematical fitting algorithm
- Selection of different optical models
- User extendable optical models
- Data can be save as Excel or text files
- Dedicated software for analysis
- Automated operation
- Automatic sample focusing



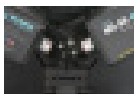
Motorized Sample XY Stage

30 mm x 30 mm



Incident angle

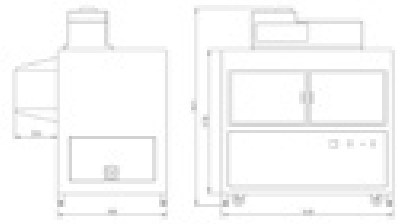
50 - 75 degree (Resolution 0.1 degree, Automated operation)



HO-SE-01XY

HO-SE-01

Magneto Optic Ellipsometry



Model No: HO-A216MOE-PH

Holmarc has introduced a new innovative high sensitivity and high magnetic field Spectroscopic ellipsometric measuring equipment utilizing the VIS-NIR wavelengths. HOLMARC A216 test station provides standardized testing solution to fit wide ranging optical rotation measurement applications. The modular hardware design allows user to take automatic liquid, solid and thin film sample measurements under magnetic and no magnetic field. Designed for magneto optic material research and testing including magnetic characterizations of ferromagnetic and ferrimagnetic films and materials. Measurement include magnetic hysteresis loops of ultrathin magnetic films and multilayers, Ellipticity measurements, Thin film thickness measurement of dielectric materials, Refractive index, Delta and psi measurements etc. System can be operated in Polar, Longitudinal and Transverse configurations. Instrument is designed for measurement in the wavelength range of 380nm to 845nm using a high sensitive photo multiplier tube made by hamamatsu. It is an extremely flexible test station based on HARS. Any magnetic thin film, crystal or solutions having magnetic field dependancy can be measured. It can be used to measure magnetic properties of magnetic thin films and nano-magnet arrays. Thin film thickness measurements under uniform magnetic field applied to the sample provides user to characterize each class of materials.

Features

- 350 - 900 nm Measurement Range
- 0.005 Degree Optical Rotation Resolution
- Fully automatic control
- Magnetic field detecting & feedback facility
- MOKE Measurements
- Ellipsometric Measurements

Specifications

Light source	Spectra Halogen, Deuterium / Halogen or Xenon Arc Lamp
Monochromator	Quasar 300F Czerny-Turner Type
Wavelength Range	350 - 900 nm
Collimating & Focusing mirror	50 mm dia, 300 F
Optical Grating	1200 l / mm
Spectral dispersion	2.6 nm / mm
Absolute Diffraction Efficiency	45 - 65 %
Slit Width	0 ~ 3 mm Continuously Adjustable
Resolution	0.1 nm
Wavelength Accuracy	0.2 nm
Wavelength Repeatability	0.1 nm
Stray Light	10-3
Reciprocal of Linear Dispersion	2.7 mm
Half-Width of Spectral line	0.2 nm @ 586 nm
Polarization analysis method	Rotation analyzing method
ARMS	Stepper Motor Controlled Auto Positioning
Spot Diameter	1 - 5 mm
Thin film Holder Sample size	
	1 - 12 mm
	Custom Holders can be provided on request)
Cuvette	10 mm Path length Quartz Cuvette
Sample chamber option	High / low temperature sample holder
Sample Feeding Unit	Stepper Motor Controlled Auto Positioning System
Electro Magnet Unit	PC Controlled Constant current operation
Cooling	Water cooled
Max. magnetic field	1.75 Tesla @ 12mm pole gap
Min. Field Detection	1 Gauss



Polarization analysis

Rotation method

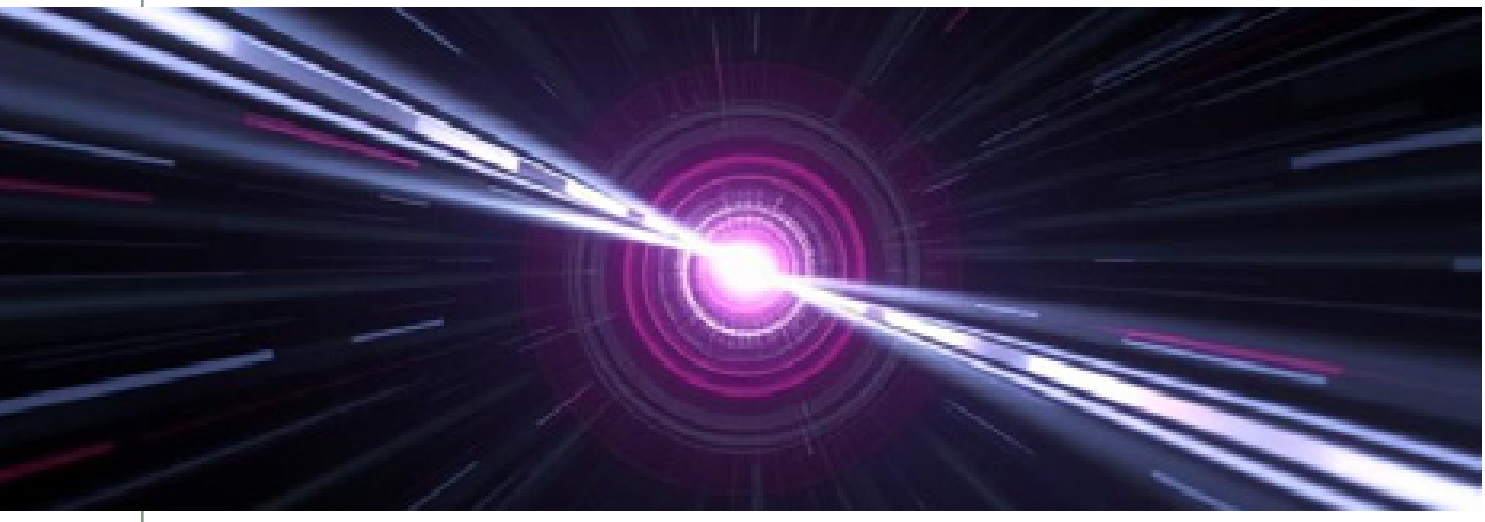


Magnetic Field

Magnetic field preciseness	± 0.05 %
Field detection	Hall probe based (PC based field measurement)
Feed back of magnetic field	Hall element
Chiller	5 ~ 25°C Chilled water (for cooling electr
Volume	2 L / min.
Power supply for Electro Magnet	Bi-Polar type (Max. ± 90 V/5A
Power supply for Electro Magnet	2.5 kVA AC 220V 50Hz
Control unit	1 kVA AC 220V 50Hz
Software	Spectra ORMS software



MOKE



High Sensitivity Laser Based Magneto-Optical Kerr Effect Station

HOLMARC MOKE LB215 is an easy to use magneto-optical Kerr effect (MOKE) laser based system which provides a convenient way to obtain the changes in magnetic moment at different fields and temperatures. 408nm, 532nm and 650nm Diode lasers are used for the measurements. Lock-in amplifier technique is employed in this instrument and the modulation is performed with an optical modulator. Sample is mounted in the center of the magnet with its surface either parallel or perpendicular to the field. The supplied high field, variable gap, dipole electromagnet allows the user to apply large fields (approx. 20,000 Gauss at 10 mm pole gap) in a longitudinal or perpendicular geometry to study hard magnetic materials. HOLMARC MOKE LB215 is supplied with ORMS software. It can manage data collection and data manipulation fast and accurate. The magneto-optical Kerr effect is a well established technique to study magnetization properties. The effect is based on the fact, that the plane of polarization of light is rotated when the light is reflected from a magnetic material. The physical origin of MOKE is the magnetic circular dichroism effect: exchange and spin-orbit coupling in a magnetic material lead to different absorption spectra for left- and right-circularly polarized light. Measuring the change of polarization of reflected beam (often referred to as Kerr angle θKerr) gives access to the magnetization state of the sample.

Easy to Operate

Variable temperature measurement or custom designs for specialpurpose measurements and configurations can be made depending upon customer's demands.

High Sensitivity

The system uses an advanced signal processing technology to get very high sensitivity.

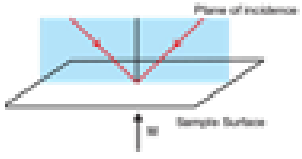


Specifications	
Laser Wavelengths	405nm, 532nm, 650nm Diode Lasers
Optical Rotation Sensitivity	0.009 Degree (Kerr rotation angle)
Optical Rotation Resolution	0.018 Degree
Ellipticity Measurement	± 0.01 deg.
Optical Rotation Measuring range	± 90 deg.
Spot size	0.1mm (Variable)
Electro Magnet Unit	PC Controlled Constant current operation
Maximum Magnetic field	20,000 Gauss @ 10mm Pole Gap
Min. Field Detection	1 Gauss
Magnetic field preciseness	± 0.05 %
Chiller	5 ~ 25°C Chilling water (for cooling electromagnet)
Field detection	Hall probe based (PC based field measurement)
Feed back of magnetic field	Hall element
Sample chamber options	High / low temperature sample holder
Sample moving Stage	X, Y & Z axis Positioner with angular tilting
Travel	X, Y & Z (±5mm) Positioning resolution of 10 Micron
Software	Spectra ORMS software

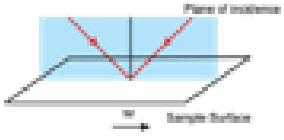
Configurations for MOKE experiments

There are three configuration for MOKE experiments namely Polar, Longitudinal and Transverse configurations. These arise from the direction of the magnetic field with respect to the plane of incidence and the sample surface.

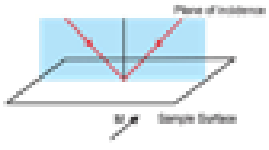
Polar MOKE
For polar MOKE, the magnetic vector is parallel to the plane of incidence and normal to the reflecting surface.



Longitudinal MOKE
For longitudinal MOKE, the magnetic field is parallel to both the plane of incidence and the sample surface.



Transverse MOKE
For the transverse MOKE geometry, the magnetic field is normal to the plane of incidence



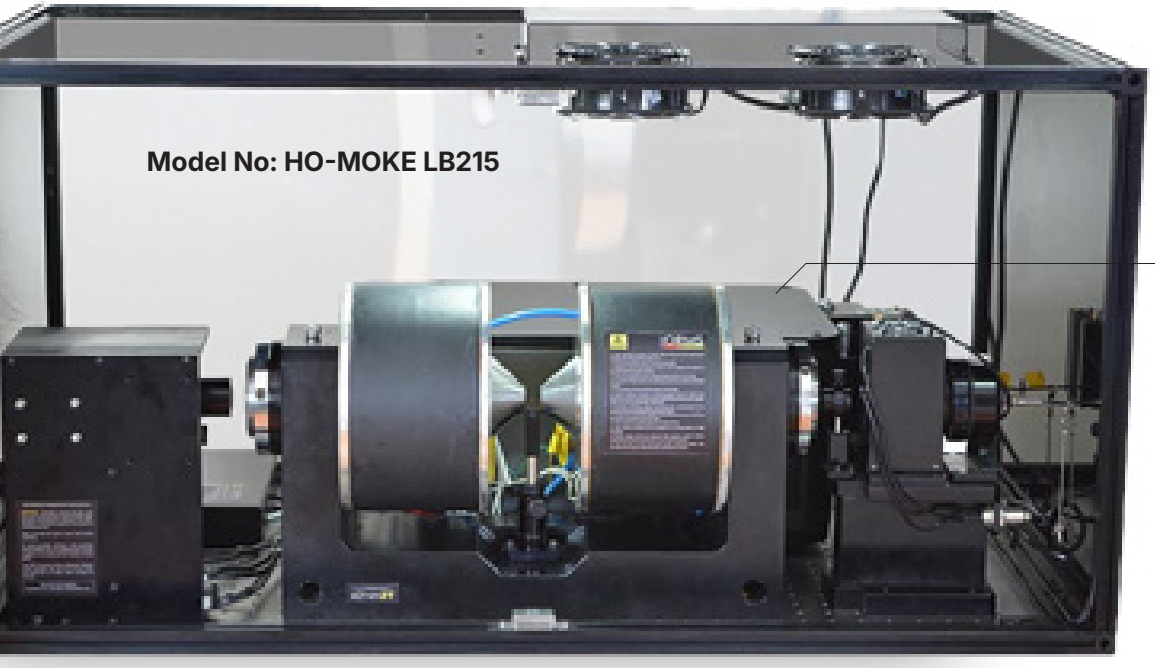
Sample Heating Cooling Options

A. Model : HC 200
Temperature Range from RT to 200°C, PID thermo control
Setting resolution : 0.1° C
Thermo sensor : Pt 100 Ohms

B. Model : NC 70
Sample holder for low temperature (Nitrogen CRYOSTAT)
Chamber to cool sample around to -70°c by liquid nitrogen.
Setting resolution : 1°C
Thermo sensor : Pt 100 Ohms

C. Model : TE 05
Heating / cooling method by TE cooler
Temperature range, -5 to 40°C
Thermo control method : PID control
Thermo stability : ± 0.5°C

MOKE is particularly important in the study of ferromagnetic and ferrimagnetic films and materials. In this non-destructive surface sensitive technique, polarization-modulated laser light reflects from a magnetic surface in the presence of a sweeping magnetic field. Since light is an electromagnetic field, it's not surprising that the magnetic field of the sample interacts with the light to cause a very slight change in the light's polarization and ellipticity. We measure these changes in the light as an intensity change through nearly crossed polarizers, recording the intensity as a function of the applied magnetic field. Using this instrument Polar, Longitudinal and Transverse Magneto-optic kerr effect can be studied. Longitudinal and polar configurations are used as routine tools for the magnetic characterizations of films. A dedicated room-temperature set-up provides for quick acquisition of in-plane hysteresis loops. These hysteresis loops provide information on the magnetic an isotropy presence in the film, and in the case of multi layers on the coupling between the layers. In the longitudinal Kerr effect, measurements yields qualitative information regarding alignment of magnetic moments in the surface plane of the sample. Measurement of the magnetization component perpendicular to the sample surface can also be studied using this setup.



Model No: HO-MOKE LB215

High Flexibility and Wide Range Magnetic Field

Specially designed electro magnets are able to apply high in-plane and out-of-plane magnetic field continuously tuneable between 20,000 Gs.

ORMS

HOLMARC OPTO-MECHATRONICS LTD

Spectroscopic Magneto - Optic Rotation

Measurement System

Faraday Rotation Measurements

Model No: HO-VIS214ORMS

It is designed for Faraday rotation angle measurements in the range of wavelength 385nm to 900nm. Magnetic field dependency of Faraday rotation can be measured precisely with this equipment. Working of this Faraday Effect Measuring Equipment is based on the rotation analyzer method. Max. magnetic field of 15,000 Gauss can be generated at pole gap of 12 mm. Optical rotation measurement resolution is ± 0.01 deg.

By using optional device, thermal dependence can be also measured. It is possible to evaluate thermal dependency property in the range of -70 to 300°C, because it can be designed to mount heating chamber and cryostat. The software allows users to control the sample temperature and magnetic field.

Specifications

Light source	Spectra 20W Quartz halogen lamp
Polarization analysis method	Rotation analyzing method
Cuvette	10 mm path length glass cuvette
	(Custom holders can be provided on request)
Sample chamber options	High / low temperature sample holder
Sample moving stage	X, Y & Z axis positioner
Travel	X, Y & Z (± 5mm)
Positioning resolution	10 micron
Angular resolution	0.1 deg.
Electro magnet Unit	PC controlled constant current operation
Cooling	Water cooled
Max. magnetic field	1.5 Tesla @ 12 mm pole gap
Min. field Detection	1 Gauss
Field detection	Hall probe based (PC based field measurement)
Feed back of magnetic field	Feed back as the sensor of hall element
Chiller	5 ~ 25°C chilling water (for cooling electromagnet)
Power supply for electro magnet	Bi-polar type (Max. ± 90V / 5A)
	2kVA AC220V 50Hz
Control unit	1kVA AC220V 50Hz
Software	Spectra ORMS software

Measuring items

- OR Measurement of Thin film, crystal, fluids etc, having Faraday effect
- Measurement Verdet Constant of Transparent Solids and Liquids
- Magnetic field vs. Faraday rotation angle at a desired wavelength
- Faraday rotation angle vs. Wavelength dispersion
- Faraday rotation angle vs. Thermal dependence (Optional Feature)

Performance

Optical rotation measurement resolution	0.00125 degree (at transparence more than 20%)
Detecting sensitivity	0.00125 deg.
Optical rotation measuring range	± 90 deg.
Measuring wavelength range	385 nm - 900 nm
Spectral bandwidth	1 nm (Variable band pass up to 10 nm)
Max. magnetic field	15,000 Gauss at 12 mm pole gap
Min. field detection	1 Gauss
Magnetic field preciseness	± 0.05%

Tepmerature Options

A. Model : HC 85

Sample chamber can be heated from room temperature to 200°C to measure temperature dependence.
Temperature Range from RT to 85°C, PID Temperature control
Setting resolution : 0.1°C
Thermo sensor : Pt 100 Ohms

B. Model : NC 70

Sample holder for low temperature (Nitrogen CRYOSTAT)
Chamber to cool sample around to -70°c by liquid nitrogen.
Setting resolution : 1°C
Thermo sensor : Pt 100 Ohms

C. Model : TE 05

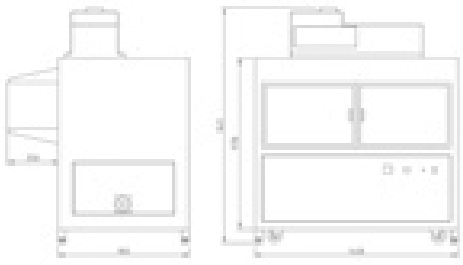
Heating / cooling method by TE cooler
Temperature range, -5 to 40°C
Thermo control method : PID control
Thermo stability : ± 0.5°C



Magneto Optic Spectrometer

Spectroscopic Kerr / Faraday / Ellipsometry

Fully Automated Optical Rotation / Thinfilm Test Station
Model: HO-A216FR/KRORMS



Specifications

Light source	Spectra Deuterium / Halogen or Xenon Arc Lamp
Monochromator	Quasar 300F Czerny-Turner Type
Wavelength Range	380 - 850 nm
Collimating & Focusing mirror	50 mm dia, 300 F
Optical Grating	1200 l / mm
Spectral dispersion	2.6 nm / mm
Grating Size	50 x 50 mm
Absolute Diffraction Efficiency	45 - 65 %
Slit Width	0 ~ 3 mm Continuously Adjustable
Resolution	0.1 nm
Wavelength Accuracy	0.2 nm
Wavelength Repeatability	0.1 nm
Stray Light	10-3
Reciprocal of Linear Dispersion	2.7 mm
Half-Width of Spectral line	0.2 nm @ 586 nm
Polarization analysis method	Rotation analyzing method
ARMS	Stepper Motor Controlled Auto Positioning
Spot Diameter	1 - 5 mm
Thin film Holder Sample size	1 - 12 mm
	(Custom Holders can be provided on request)
Cuvette	10 mm Path length Quartz Cuvette
Sample chamber option	High / low temperature sample holder
Sample Feeding Unit	Stepper Motor Controlled Auto Positioning System
Electro Magnet Unit	PC Controlled Constant current operation
Cooling	Water cooled
Max. magnetic field	1.75 Tesla @ 12mm pole gap
Min. Field Detection	1 Gauss
Magnetic field preciseness	± 0.05 %
Field detection	Hall probe based (PC based field measurement)
Feed back of magnetic field	Hall element
Chiller	5 ~ 25°C Chilled water (for cooling electromagnet)
Volume	2 L / min.
Power supply for Electro Magnet	Bi-Polar type (Max. ± 90 V/5A)
Control unit	1 kVA AC 220V 50Hz
Software	Spectra ORMS software

Features

- 380 - 850 nm Measurement Range
- 0.009 Degree Optical Rotation Resolution
- Fully automatic control
- Magnetic field detecting & feedback facility
- MOKE Measurements
- Ellipsometric Measurements



Measuring items

- OR Measurement of Thin film, crystal, fluids etc, having Faraday effect
- Measurement Verdet Constant of Transparent Solids and Liquids
- Faraday rotation / ellipticity angles
- Polar Kerr rotation / ellipticity angles
- Magnetic field vs. Faraday rotation angle property at a desired wavelength
- Faraday rotation angle vs. Wavelength dispersion property
- Faraday rotation angle vs. Thermal dependence property (Optional)



Holmarc has introduced a new innovative high sensitivity and high magnetic field Spectroscopic Faraday/Kerr effect measuring equipment utilizing the VIS-NIR wavelengths. HOLMARC A216 FR/KR test station provides standardized testing solution to fit wide ranging optical rotation measurement applications. The modular hardware design allows user to take automatic measurements of Faraday effect, MOKE & Ellipsometry in a single instrument.

Designed for magneto optic material research and testing including magnetic characterizations of ferromagnetic and ferrimagnetic films and materials. Measurement include magnetic hysteresis loops of ultra thin magnetic films and multilayers, Ellipticity measurements, Thin film thickness measurement of dielectric materials, Refractive index, Delta and psi measurements etc. System can be operated in Polar, Longitudinal and Transverse configurations.

Performance

- Optical Rotation Resolution : ± 0.009 Degree
- Detecting sensitivity : 0.009 deg (at transparence more than 20%)
- Stability : 0.03 deg (at transparence more than 20%)
- Ellipticity Measurement : ± 0.01 deg.
- Optical Rotation Measuring range : ± 90 deg.
- Measuring Wavelength Range : 380 - 850 nm
- Spectral Bandwidth : 1 nm (Variable band pass up to 10nm)
- Max. magnetic field : 11,000 Gauss @ 20 mm Pole Gap
- Min. Field Detection : 1 Gauss
- Magnetic field preciseness : ± 0.05%

Tepmerature Options

A. Model : HC 85
Sample chamber can be heated from room temperature to 85°C to measure temperature dependence property.

B. Model : NC 70
Sample holder for low temperature (Nitrogen CRYOSTAT) chamber to cool sample down to -70°c using liquid nitrogen.

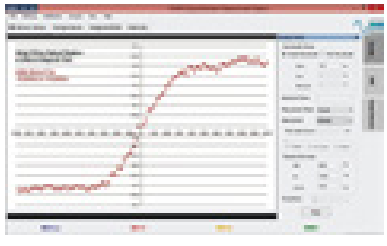
C. Model : TE 05
Heating / cooling method by TE cooler Temperature range, -5°C to 40°C

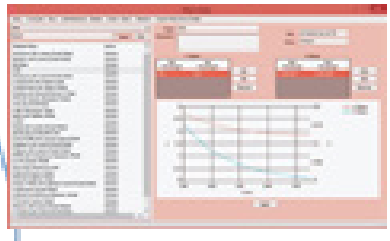
Models used in the software

- Constant Value Model
- Entered Value Model
- Cauchy's Coefficients Model
- Sellmeier's Coefficients Model
- Combination of Cauchy & Sellmier Model
- Drude Coefficients
- Lorentz-Drude Coefficients
- Brendel-Bormann Coefficients
- Adachi Coefficients
- Cauchy Lorentz Coefficients
- Amorphous Dispersion Coefficients
- Cauchy Absorption Coefficients
- Sellmeier Lorentz Drude Model Coefficients
- Cauchy Urbach Coefficients

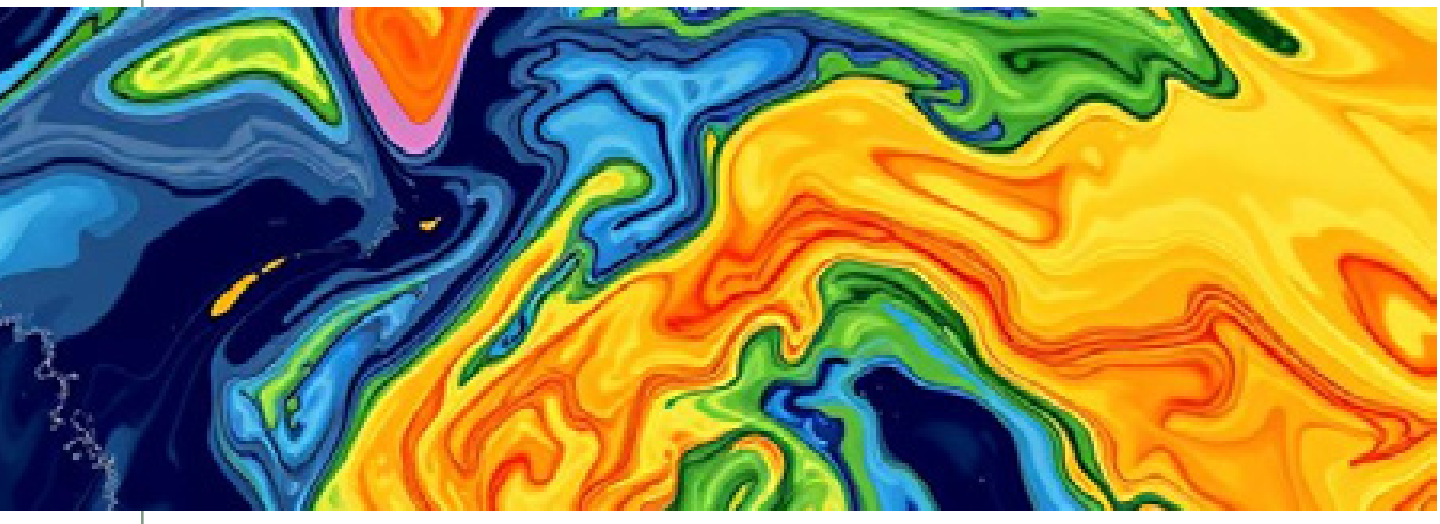


HO-A216FR /KRORMS





Polarimeter



Digital Polarimeter

Holmarc manufactures automatic digital polarimeters for industry and research with robust performance and efficiency. Symmetric angular oscillation optical null technique by Faraday Modulation is implemented in our polarimeters to achieve high resolution and repeatability. Operation is simple: place the sample filled tube in the automatic Polarimeter and press READ button. Measurement is displayed on the soft colour LCD display of the instrument.

The Polarimeter is used for determining the optical rotation of substances. By measuring optical rotation, the concentration, content, purity etc of the sample solution can be found out. Polarimeter has become one of the most useful instruments in research laboratories of sugar industry, pharmaceutical industry, oil refining, food industry, chemical industry as well as basic research in universities and R&D organizations.

Major modules in our Polarimeter include light source, Interference filter, polarizer, faraday modulator, sample chamber, analyzer and Detector. Unpolarized light from light source (LED) passes through an interference filter and polarizer so that a fixed wavelength polarized light comes out. This polarized light enters the Faraday Modulator and then passes through the sample cell. The modulated light which passed through the sample cell enters a second polarizer, known as the "Analyzer," which detects the angle of rotation. Finally, the light falls on a Silicon photo diode which converts the light intensity to an electric signal.

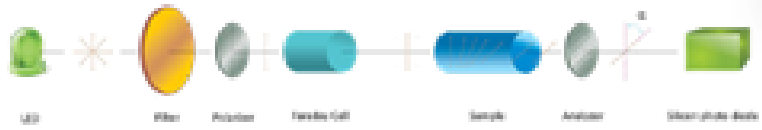
Optical rotation

Optical rotation is directly proportional to path length; the longer the tube, the greater the overall accuracy. Holmarc's Polarimeter accepts tubes up to 200mm long. A 200mm sample tube offers twice the sensitivity compared to measuring the same solution in a 100mm sample tube. Different types of sample tubes are available up to 200mm length.

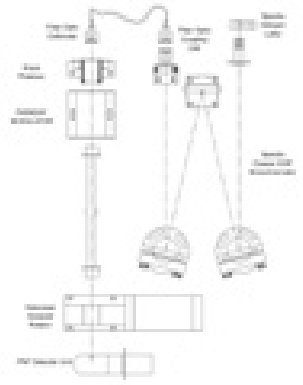




Optical Layout of Digital Polarimeter



www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)



Spectroscopic Polarimeter Model No: HO-DP-500

Specifications

Light source	LED
Optical wavelength	589 nm
Measuring range	± 180° (Switchable)
Resolution	0.009 Deg.
Repeatability	0.018 Deg.
Accuracy	± 0.03 Deg.
Measuring modes	Optical Rotation, Specific rotation, Concentration, Optical Purity & Sugar Scale.
Sample chamber	Accepts sample cells upto 200mm Length
Principle	Symmetric angular oscillation optical null principl
User interface	5.7 inch Graphical LCD & Keyboard and PC Software
Software	Suitable software included
Detector	Silicon photo diode
Power requirement	AC100 - 230 V 50 Hz

Spectroscopic Polarimeter Model No: HO-ASP-500

Holmarc manufactures high quality automatic polarimeters for industry and research with robust performance and efficiency. Symmetric angular oscillation optical null technique by Faraday Modulation is implemented in our polarimeters to achieve high resolution and repeatability.

In HO-ASP-500 a quartz halogen lamp with high spectral resolution monochromator is incorporated as light source. The measurements can be performed over wide range of analytical wavelengths from 380 - 850nm by using quartz halogen lamp. Also the wavelength accuracy is better compared to the normal interference filters. Our high quality optical system improves the light collection and flexibility of the system. All adjustments on the device are made via an easy to use touch screen .The sample parameters can be customized for different applications.

Holmarc offers full line of accessories for Polarimeter. Temperature control and temperature compensation can be incorporated to eliminate the variation of results with temperature. Wide range of polarimeter sample cells are available. Center cup tubes and continuous flow through cells can also be supplied for custom applications.

Specifications

Light source	Quartz Halogen Lamp
Detector	PMT
Monochromator	Czerny-Turner
Grating	Blazed Holographic
Wavelength Range	380 - 850 nm
Bandwidth	1 nm
Positioning Accuracy	+/- 0.25 nm

Optical Rotation	
Measuring range	± 90°
Resolution	0.009 Deg.
Repeatability	± 0.018 Deg.
Accuracy	± 0.027 Deg.

Sugar Scale Range	Sugar Scale Range
Resolution	± 0.01° Z
Repeatability	± 0.1° Z
Accuracy	± 0.1° Z
Principle of operation	Symmetric angular oscillation optical null principle.
Measuring modes	Optical Rotation, Specific rotation, Concentration, Optical Purity & Sugar Scale.
Sample chamber	Accepts sample cells up to 200mm Length

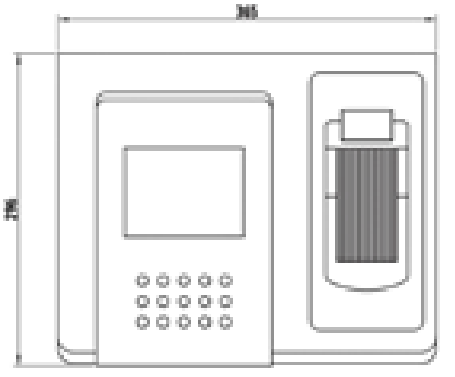


HOLMARC OPTO-MECHATRONICS LTD

Refractometer



Automatic Refractometer



AR-1700 Automatic Refractometer from Holmarc is a compact instrument used for measuring refractive index and brix at the digital, automatic level. The AR-1700 Automatic Refractometer features exceptional accuracy, automatic temperature compensation, a wide reading range and simple and fast operation. It offers outstanding flexibility to provide accurate readings for a variety of applications.

The refractive index measurement is easy, fast and non-destructive and can be used to identify and characterize materials. The sample is placed on the measuring prism and is irradiated by a 589nm (Na D-line) LED. The shadow line is detected with a high-resolution linear array CCD and hence the refractive index is obtained using internal software and is displayed. Degrees Brix (symbol °Bx) is the sugar content of an aqueous solution. It is the most commonly used refractometer scale for measuring solids dissolved in water; it corresponds directly to the refractive index scale. Temperature correction or control is necessary in refractometers because refractive index varies with temperature. In Holmarc's refractometer automatic temperature compensation (ATC) corrects readings over a range of temperatures for sucrose solutions. A temperature sensor is also integrated for the precise measurement of sample temperature.

The AR-1700 refractometer features an expanded refractive index reading range of 1.3200 to 1.6500 which enables the user to analyze a broad range of samples. The alphanumeric key pad and graphic display provide a means of entering and displaying prompts and data. Regardless of an instrument's specified accuracy, a refractometer's real world performance depends on how well the instrument is cleaned between samples. The AR-1700 addresses this issue by providing a very flat, easy to clean measurement surface with no corners or crevices that tend to trap samples causing contamination.

Automatic Refractometer

Principle of operation	Optical-Refraction Critical-Angle detection system
Refractive index	1.3200 - 1.6500
Resolution	0.0001
Accuracy	+- 0.001
Brix	+- 0.001
Brix	0 - 95 %
Resolution	0.01 %
Accuracy	+- 0.5 %
Optical Wavelength	589 nm (Na D-line)
Light Source	High perfomance LED
Filter	589 nm Interference Filter
Detector	Toshiba Linear Array CCD
Display	5" LCD Touch Display
Temperature Control	Peltier Based 25°C Constant Temperature Control
Power Supply	AC 230V / 50Hz



Spectroscopic Digital Refractometer

Specifications

Principle of operation	Optical-Refraction Critical-Angle detection system
Refractive index	1.3200 - 1.6500
Resolution	0.0001
Accuracy	+- 0.001
Brix	0 - 95 %
Resolution	0.01 %
Accuracy	+- 0.5 %
Optical Wavelength	589 nm (Na D-line)
Light Source	Broadband 50 W Quartz Halogen Lamp
Monochromator Unit	SQR120F Monochromator
Optical Layout	Czerny Turner
Focal length	120 mm
Grating mount	Single
Spectral Range	400 - 1000 nm
Wavelength Resolution	0.1 nm
Wavelength Scanning	Programmable
Illumination Design	Fiber Optic
Connector Type	SMA905
Detector	Toshiba Linear Array CCD
Measurement Software features	Refractive index measurements, RI Vs. Time, RI Vs Wavelength, etc.
Computer interface	USB 2.0
Software control	Holmarc Spectra RI



Reflectometer



Near Normal Spectroscopic Reflectometer

Model : HO-NNSR-01

Near Normal Spectroscopic Reflectometer is a fundamental instrument used for thin film thickness analysis for industry & research. Holmarc's TFSR Model No: HO-NNSR-01 is able to analyze thin film's thickness, complex refractive index & surface roughness with high speed & repeatability. TFSR theory works with complex matrix form of Fresnel equations for reflectance & transmittance. Absolute reflectance spectroscopy is the principle behind Reflectometer; which is the ratio of the intensity of the reflected light beam (usually monochromatic) to the intensity of the incident beam. Light beam which normally incidents on the sample surface in turn reflect from top & bottom of the thin film surfaces which get interfere & is directed through Optical fiber to CCD attached spectrometer via computer. On the monitor we get spectrogram with interference oscillations directly proportional to thin film thickness. Holmarc's Reflectometer can be used to analyze single, free standing & rough layer thickness of various stacks such as di-electric, crystalline, amorphous, metallic & absorbing samples. It also finds absolute transmittance & absorption directly (Customized). Roughness treatment is done with EMA modeling. It also finds Optical conductivity, molar Refractivity & Brewster's angle of sample under study (Customized).

Film Thickness range	20 nm - 35 μm
Reflectance Wavelength range	400 nm - 850 nm
Transmittance / Absorbance range	0 - 100% (Customized)
Light source	Tungsten Halogen Quartz Lamp, 50W
Detector	CCD linear array, 3648 pixels
Spectrometer	Grating spectrometer
Precision typically for SiO2 on NSF - 66	± 1 nm
Optical Power	50 W, 2 mm Light spot size
Optical fiber	Multimode Bi-furcated fiber with SMA fiber coupler
Reference Sample	Polished NSF-66/Float Glass (Microscopic slide 1 mm)
Standard Sample	ITO thinfilm on float glass, SiO2 thinfilm NSF-66
Measuring modes	Curve fitting/Regression, FFT, FFT+ CurveFit
Dispersion formulas	Cauchy's, Sellmeiers & Empirical Models
EMA models	Linear EMA, Bruggemann, Maxwell Garnett, Lorentz - Lorenz models
Material Library	Extendable Material user library

Features

- Analyze single layer films
- Curve Fit / FFT based thickness meaurement
- Fiber optic probe for reflectance measurement at normal incident angle
- CCD linear array image sensor for simultaneous measurement of reflectance at each wavelength
- User extendable materials library
- Data can be saved as an Excel or text file
- Advanced mathematical fitting algorithm
- FFT based thickness measurement
- Extraction of thickness and optical constants
- Parameterized models

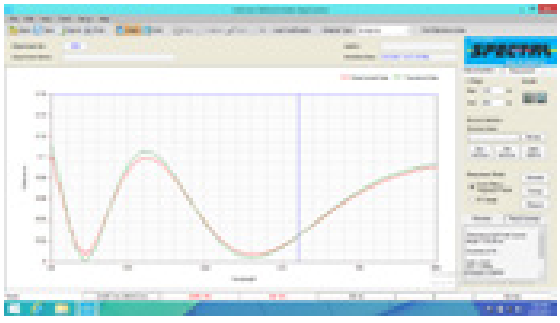


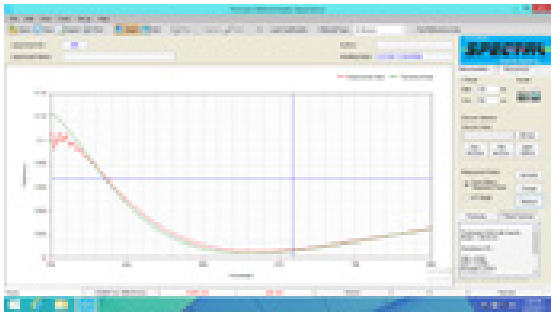
Model: HO-NNSR-02

Holmarc's Reflectometer can be used to analyze single, multi-layer, free standing & rough layer thickness of various stacks such as dielectric, crystalline, amorphous, metallic & absorbing samples. It also finds absolute transmittance & absorption directly for linear di-electric thin films. Roughness treatment is done with EMA modeling such as linear, Bruggemann & Maxwell garnet approximations. Manual scanning is provided for finding out roughness & uniformity of thin films. Without refractive index or any other optical properties, NNSR is able to find the thickness of thin / thick film & estimate its optical properties.

Specifications	
Film Thickness range	20 nm - 35 μm
Reflectance Wavelength range	400 nm - 850 nm
Transmittance / Absorbance range	0 - 100% (Customized)
Light source	Tungsten Halogen Quartz Lamp, 50W
Detector	CCD linear array, 3648 pixels
Spectrometer	Grating spectrometer
Precision typically for SiO2 on NSF - 66	± 1 nm
Optical Power	50 W
Light spot size	2 mm
Optical fiber	Multimode Bi-furcated fiber with SMA fiber coupler
Reference Sample	Polished NSF - 66 / Float Glass (Microscopic slide 1 mm)
Standard Sample	ITO thin film on float glass, SiO2 thin film on NSF - 66 Substrate
Measuring modes	Curve fitting / Regression Algorithms, FFT, FFT + Curve Fit
Dispersion formulas	Cauchy's, Sellmeiers & Empirical Models
EMA models	Linear EMA, Bruggemann, Maxwell Garnett, Lorentz - Lorenz models
Material Library	Extendable Material user library
PC Interface	USB

Sample Results

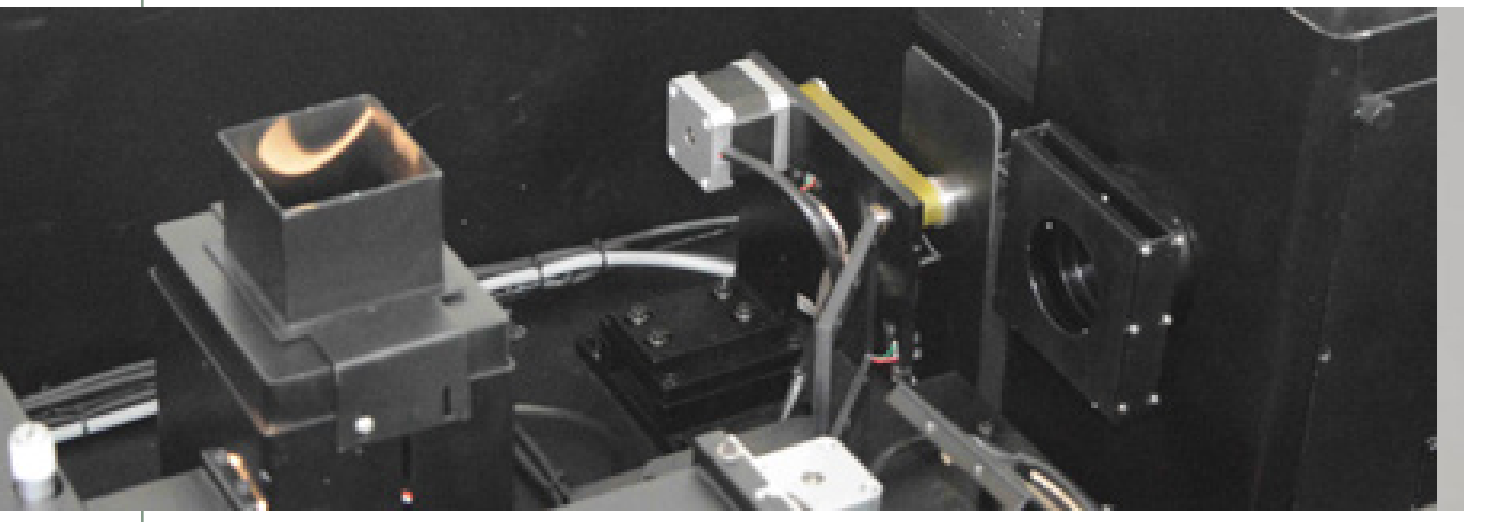








Quantum Efficiency



Quantum Efficiency & IV Measurement System

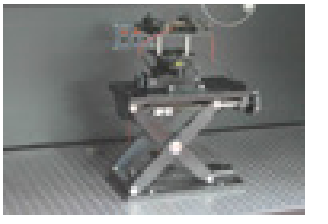
Model : HO-SC-QEIV

The spectral responsivity or quantum efficiency (QE) is essential for understanding current generation, recombination, and diffusion mechanisms in photovoltaic devices. PV cell and module calibrations often require a spectral correction factor that uses the QE. The quantum efficiency in units of electron - hole pairs collected per incident photon is computed from the measured spectral response in units of amperes per watt as a function of wavelength.

Model HO-SC-QEIV is integrated with 300W Xenon lamp with housing, optics, power supply and an easy to use software with capability to measure dark and lighted IV characteristics of solar cell and quantum efficiency measurement (300nm-1600nm).

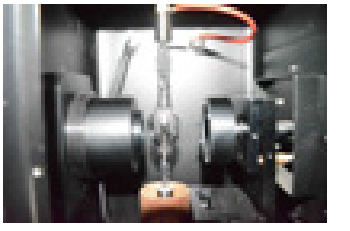
System includes a sample stage, capable of accommodating samples up to 50 mm diameter and probes to contact the sample. Light is normally incident on the sample. Fixed frequency chopper and lock in amplifier are used for modulating the light at a frequency of 400Hz for measuring spectral response. Wavelength resolution of monochromator is 0.1nm. Illumination area can be adjusted using lens assembly system.

It can also be used for characterization / measurement of the imaging systems (cameras) and other detectors in terms of linearity range, spatial non-uniformity of response (the variation of responsivity across the active area of a detector) etc. Detector characterization allows identification of the detector with the best performance for a particular application.





Light Source



300W Xenon arc lamp for IV measurement and 50 W Tungsten Halogen lamp for QE measurement

Spectral Wavelength

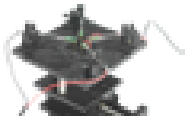
400 nm to 1100 nm



Parameters to Measure

- Spectral response curve
- External quantum efficiency
- IV curve
- Open circuit voltage
- Short circuit current
- Voltage at maximum power
- Current at maximum power
- Current density at maximum power (Jmpp)
- Fill factor (FF







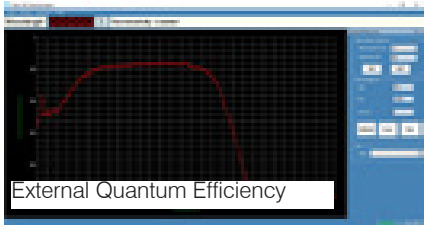
Features

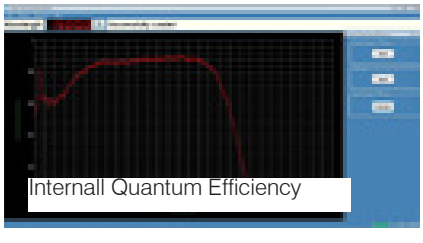
- Measurement of the spectral response and quantum efficiency of a solar cell from 400 nm to 1200nm
- 50W Halogen lamp with integrated power supply
- 300 F Quasar Monochromator (400 - 1200 nm) with order sorting filters
- Sample holder with manual X-Y positioning arrangement to align the position of the light beam on the sample
- Sample size up to 50 mm
- Built-in optical chopper and lock in amplifier
- LED bias light

HOLMARC OPTO-MECHATRONICS LTD

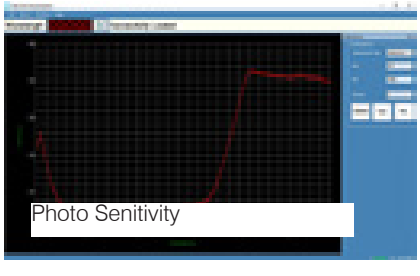
Specifications

Type of solar cell	Dye Sensitized Solar Cell, Mono/Multi crystalline Si Solar Cells, Perovskite semiconductor heterostructure etc.
Spectral wavelength	400 nm to 1100 nm
Measurement Parameters	Spectral response curve External quantum efficiency (EQE / PCE) IV curve Open circuit voltage (Voc) Short circuit current (Isc) Voltage at maximum power (Vmpp) Current at maximum power (Impp) Current density at maximum power (Jmpp) Fill factor (FF)
Mode of operation	Both AC and DC
Measurement / System Quality	Repeatability 99 %
Light Source	300W Xenon arc lamp for IV measurement and 50 W Tungsten Halogen lamp for QE measurement
Monochromator	Wavelength range of 400 nm - 1100 nm
Focal Length	250 mm
Wavelength Resolution	0.1 nm
Chopper	Available
Detector	Si photodiode
Bias Light	3W (optional)
Lock-in Amplifier	Input Range : 0 to 5V
Reference Input	0 - 5V
Gain Accuracy	± 1 %
Sensitivity	10 nA
Output Stability	500 ppm / °C depending on sensitivity
Time Constant	10ms to 10s
ADC Resolution	12 bit
Maximum acquisition speed	< 25 μs (signal)
Control Front panel / USB	
Sample holder	Mounts with pogo pin probes
Sample size	2 inch
PC and Software	The Measurement System operates automatically under the control of a computer software
Platform Diameter	50 mm


External Quantum Efficiency


Internall Quantum Efficiency


Reflectance


Photo Senitivity

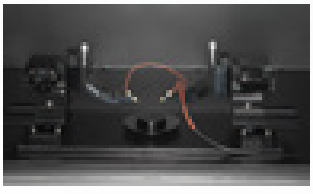
Software Features

- Controls the monochromator and the 400Hz Lock-in amplifier
- Performs scans of user defined wavelength range
- Operating system requirement : Windows XP / 7 / 8 / 8.1 / 10
- Plots spectral response of the sample at a specified wavelength range
- Export the results to spreadsheet file
- PC Interface RS232 or USB (Using a USB to serial converter)

Quantum Efficiency & IV Measurement System (Inverted)







HO-SC-QEIV500i



Quantum Efficiency & Spectral Response Measurement System

Model : HO-SC-QE

The spectral responsivity or quantum efficiency (QE) is essential for understanding current generation, recombination, and diffusion mechanisms in photovoltaic devices. PV cell and module calibrations often require a spectral correction factor that uses the QE. The quantum efficiency in units of electron - hole pairs collected per incident photon is computed from the measured spectral response in units of amperes per watt as a function of wavelength. Model HO-SC-QE is integrated with 50W Tungsten Halogen lamp with housing, optics, power supply and an easy to use software with capability to measure the spectral response and quantum efficiency of solar cell at the wavelengths from 400nm to 1200nm.
System includes a sample stage, capable of accommodating samples up to 50 mm diameter and probes to contact the sample. Light is normally incident on the sample. Fixed frequency chopper and lock in amplifier are used for modulating the light at a frequency of 400Hz for measuring spectral response. Wavelength resolution of monochromator is 0.1nm. Illumination area can be adjusted using lens assembly system.

It can also be used for characterization / measurement of the imaging systems (cameras) and other detectors in terms of linearity range, spatial non-uniformity of response (the variation of responsivity across the active area of a detector) etc.

Features

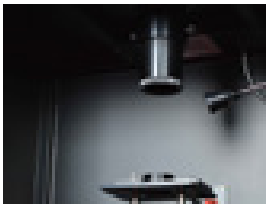
- Measurement of the spectral response and quantum efficiency of a solar cell from 400 nm to 1200nm
- 50W Halogen lamp with integrated power supply
- 300 F Quasar Monochromator (400 - 1200 nm) with order sorting filters
- Sample holder with manual X-Y positioning arrangement to align the position of the light beam on the sample
- Sample size up to 50 mm
- Built-in optical chopper and lock in amplifier
- LED bias light

Specifications

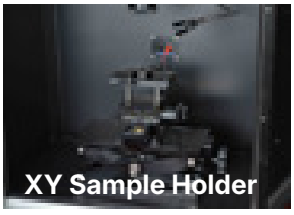
Light source	50W Halogen lamp
Wavelength range	400 nm to 1200 nm
Chopper frequency	400 Hz
Bias light	3W White LED
Sample size	Up to 50 mm
Sample holder with XY motion	
Optical Design	Czerny-Turner
Main Mirrors	Parabolic type with Enhanced Aluminum Coating
Focal Length	300 mm
Dispersion Element	Holographic Grating
Grating Density	1200 l/mm
Filter unit	Higher order cut off filter wheel

Software

- Controls the monochromator and the 400Hz Lock-in amplifier
- Performs scans of user defined wavelength range
- Operating system requirement
- Windows XP / 7 / 8 / 8.1 / 10
- Plots spectral response of the sample at a specified wavelength range
- Export the results to spreadsheet file
- PC Interface RS232 or USB (Using a USB to serial converter)



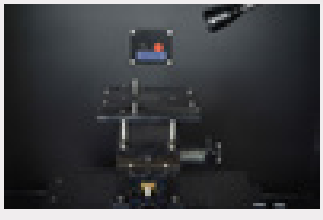






Sample Size

Upto 50mm



400nm to 1200nm

WAVELENGTH RANGE

50 W

HALOGEN LAMP

Quantum Efficiency Measurement System - VIS IR

Model : HO-SC-QE-C1

The spectral responsivity or quantum efficiency (QE) is essential for understanding current generation, recombination, and diffusion mechanisms in photovoltaic devices. PV cell and module calibrations often require a spectral correction factor that uses the QE. The quantum efficiency in units of electron - hole pairs collected per incident photon is computed from the measured spectral response in units of amperes per watt as a function of wavelength. Model HO-SC-QE is integrated with 50W Tungsten Halogen lamp with housing, optics, power supply and an easy to use software with capability to measure the spectral response and quantum efficiency of solar cell at the wavelengths from 400nm to 1200nm.

System includes a sample stage, capable of accommodating samples up to 50 mm diameter and probes to contact the sample. Light is normally incident on the sample. Fixed frequency chopper and lock in amplifier are used for modulating the light at a frequency of 400Hz for measuring spectral response. Wavelength resolution of monochromator is 0.1nm. Illumination area can be adjusted using lens assembly system.

It can also be used for characterization / measurement of the imaging systems (cameras) and other detectors in terms of linearity range, spatial non-uniformity of response (the variation of responsivity across the active area of a detector) etc.

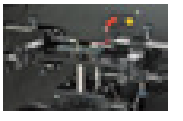
Parameters

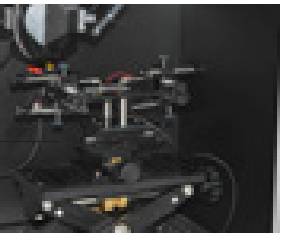
Spectral Response

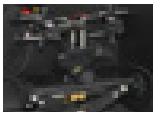
External Quantum Efficiency or Incident Photon to Current Efficiency in both AC and DC

Spectral Reflectance

IQE (Internal Quantum Efficiency)

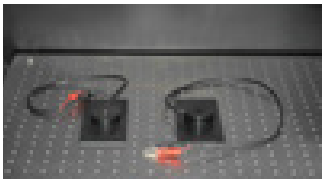


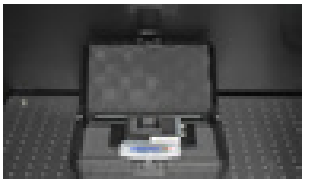




Micro positioners

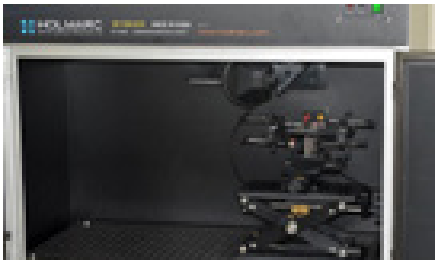
At least 2 nos of magnetic based micro positioners (one for positive terminal and one for negative terminal) with precise X,Y,Z movement using nobs in all three directions will be provided with proper spring loaded hemispherical gold coated probe tips and cables to insure proper electrical connections with samples without damaging / penetrating it





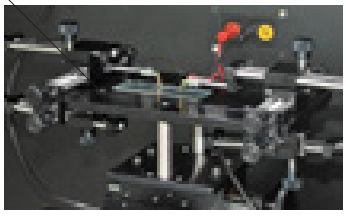


Interior View



Sample Holder

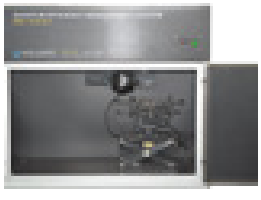
Sample holder will be designed to accommodate and measure the rigid and flexible sample of size from 1cm x 1cm (or less) to 5cm x 5cm (or more) with thickness from 0.5mm to 3mm





Housing

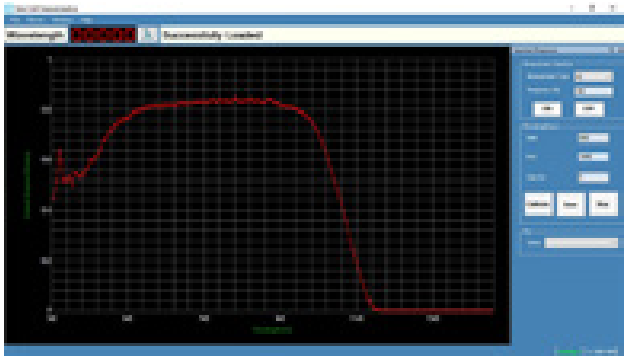
Complete system including sample will be assembled in a dark light tight enclosure to facilitate all measurements (EQE, reflectance, IQE, SR) without the requirement of a dark room

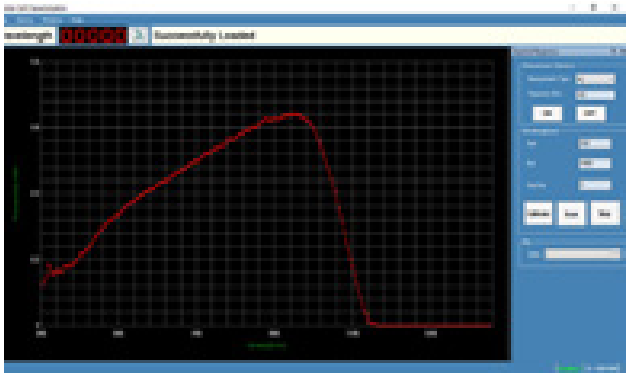
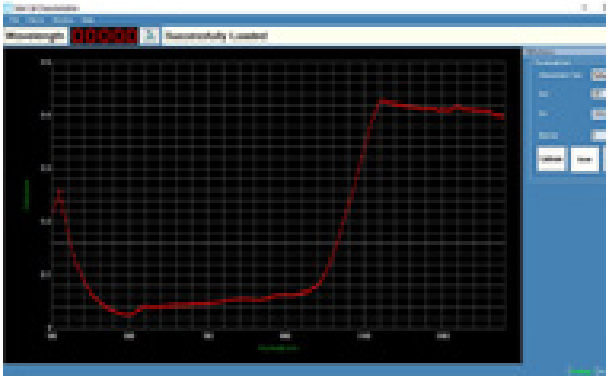


Specifications

Parameters	SR (Spectral Response)
	EQE (External Quantum Efficiency) OR IPCE (Incident Photon to Current Efficiency) in both AC and DC
	Spectral Reflectance
	IQE (Internal Quantum Efficiency)
Wavelength range	350 nm to 1500 nm
Spot Size on the sample	Shape of spot will be rectangular as per the design of instrument.
Light Sources	Single Quartz halogen lamp to cover the whole wavelength range
	Constant current power supply
	Proper housing for light source will be provided
Monochromator	Czerny Turner Configuration
Slit Size	Slit Height - should be as per optics requirement
	Slit Width - variable (at least 0.15 to 2.5 mm)
Bandwidth	5 nm or better
Grating	Dual grating turret
	600 lines / mm (Blazing wavelength : 1250nm) & 1200 lines / mm (Blazing wavelength : 500nm) gratings
Wavelength Accuracy	0.5 nm or better
Wavelength Scan Step size	1 nm to 10nm adjustable using software
Filters	Suitable combination of long pass and band pass filters to reject and allow light for high signal to noise ratio and to remove second order light peaks with multi position filter wheel will be provided.
	Selection, Switching and moving of grating, filters etc. will be auto control by software to cover entire measurement range
Optical Chopper with lock in amplifier	Optical chopper for AC measurement with control module will be provided
	Chopper Frequency : (adjustable software) from 20Hz to 200Hz
	Arrest option for DC mode measurement (i.e. 0 Hz)
	Optical sensor to provide feedback to the lock-in amplifier circuit
Reflectance Measurement Accessories	Integrating Sphere for reflection measurement for whole measurement range
	Diameter of integrating sphere ≥ 4 inch
	Integrating Sphere have separate calibrated detector for measurement in complete spectral range
	Facility to insure the spot size on the same location of the sample as during the EQE measurement will be provided
	Integrating sphere will be able to accommodate the sample of 1cm x 1cm to 5cm x 5cm such that probe beam (or light spot) can be placed at any selected location of the sample. Port reducer will be provided with integrating sphere as per requirement
	Adjustable lens to vary the focal length of the beam, so that same focal length can be set at both EQE and reflectance measurements
Reference Detectors	Two photodiodes for calibration covering the whole measurement range
	Calibration values taken from the spectral response curves provided in the datasheets of the photodiodes
Reference Cell	Reference solar cell traceable to NREL calibration with EQE data for QE testing and calibration purpose
Voltage bias capabilities for sample	Variable from -5V to +5V (selectable) for biasing the sample during the measurement will be provided with all proper connections and integration
	Step size or resolution of 0.1V
Sample Holder	Sample holder will be designed to accommodate and measure the rigid and flexible sample of size from 1cm x 1cm (or less) to 5cm x 5cm (or more) with thickness from 0.5mm to 3mm
	Sample holder will be designed to connect both the probes in front-front, front-back and backback; all the three contact configuration on the sample

Micro positioners with spring loaded hemispherical tips	At least 2 nos of magnetic based micro positioners (one for positive terminal and one for negative terminal) with precise X,Y,Z movement using nobs in all three directions will be provided with proper spring loaded hemispherical gold coated probe tips and cables to insure proper electrical connections with samples without damaging / penetrating it
	Tips / probes will be mounted properly at appropriate angle to insure the clear path for light beam. However the tilting angle will not be such that tip will slip on sample while placing or tightening
	Length of tip holding rods and movement of X, Y micro positioner will be sufficient to cover the sample of 1cm x 1cm to 5cm x 5cm
Housing	Complete system including sample will be assembled in a dark light tight enclosure to facilitate all measurements (EQE, reflectance, IQE, SR) without the requirement of a dark room
Power Requirement	Single phase, 230V, 50 Hz
	One 230V 5A wall socket is required for the device
	Extension box will be provided, if required for multiple connections

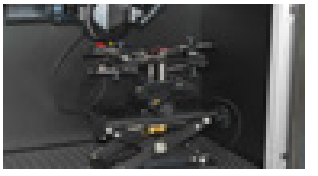


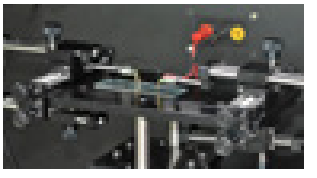



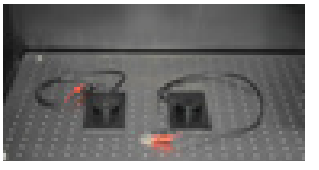
Software Features	System is completely automatic with software controlled with need for minimum manual intervention for a user friendly operation for data collection, plotting and analysis
	The software also provide the flexibility and ease of use with full manual control over for monochromator, filters, gratings etc. for diagnostic purpose
	Selection of Light source, grating, filters etc. will be auto control by software to cover the whole wavelength range for measurement
	Software is capable of measuring, recording, storing and plotting the EQE, IQE, SR, reflectance data
	Software is capable of plotting multiple graphs together
	Measurement range and step size of wavelength during the measurement will be user definable
	Data stored to disc can be directly examined within the supplied software and also can be exported to a text file readable by most third party software packages like MS-excel, Origin etc Licensed key of the software will be provided for lifetime

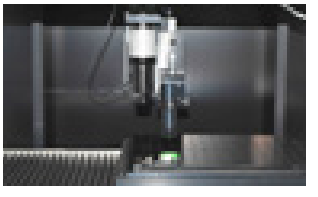
Spectral Quantum Efficiency & IV Measurement Unit

Model HO-SC-QEIV225









The spectral quantum efficiency measurement system is designed to rapidly and precisely assess the external quantum efficiency of various photovoltaic devices, such as solar cells, photodetectors, and other photosensitive structures. It operates across a wide range of external voltages and temperatures. Additionally, the system accurately measures the spectral sensitivity of photoelectric devices (such as photodiodes and photocells) across 200-2400nm wavelengths. It comes with software that automates the measurement process and supports both continuous and pulsed illumination scenarios The spectral responsivity or quantum efficiency (QE) is essential for understanding current generation, recombination, and diffusion mechanisms in photovoltaic devices. PV cell and module calibrations often require a spectral correction factor that uses the QE. The quantum efficiency in units of electron-hole pairs collected per incident photon is computed from the measured spectral response in units of amperes per watt as a function of wavelength.

Model HO-SC-QEIV225 is integrated with a 300W Xenon lamp with SQR 250FA dual grating High-resolution monochromator, Coupling directional optics, power supply, and easy-to-use software with the capability to measure dark and lighted IV characteristics of solar cells and quantum efficiency measurement (200nm-2400nm). The system includes a sample stage, capable of accommodating samples up to 50 mm diameter and probes to contact the sample. Light is normally incident on the sample. Fixed frequency chopper and lock-in amplifier are used for modulating the light at a frequency of 400Hz for measuring spectral response. The wavelength resolution of the monochromator is 0.1nm. The illumination area can be adjusted using a lens assembly system. It can also be used for the characterization/ measurement of imaging systems (cameras) and other detectors in terms of linearity range, spatial non-uniformity of response (the variation of responsivity across the active area of a detector), etc. Detector characterization allows the identification of the detector with the best performance for a particular application.

Dual grating high throughput Automated Monochromator	
Model	SQR250FA
Optical Layout	Czerny Turner
Focal length	250mm
Grating mount	Dual grating turret
Wavelength Range	200-2200nm
Number of gratings	2 (1200l/mm holographic grating & 600l/mm precision ruled diffraction grating)
Grating size	50 x 50mm
Aperture ratio	f/4.2
Number of entrance/ exit ports	1
Mechanical resolution drive	0.000072°/ step
Slit type	Stepper motor controlled continuously variable slit
Slit width	0-3mm
Resolution	1μm
Slit height	12mm
Higher-order cut-off filter	Yes, Motorized (Selection can be controlled through PC)
Higher-order filter size	12.5mm
Wavelength accuracy	± 0.15nm
Resolution @ 25μm Slit width & 1200l/mm Configuration	0.1nm
Stray light	0.01%
Input coupling optics	Yes, NA matched fused silica focusing lens
Output coupling optics	Yes, NA matched fused silica collection lens
Computer interface	USB 2.0
Trigger IN/OUT	Yes
Software control	Holmarc Spectra Scan. Windows-based software is used

The system consists of :

- 300 W Xenon Lamp with integrated power supply
- Dual grating Quasar Monochromator (200-2400 nm) with order sorting filters.
- Selectable flip mirror assembly for quantum efficiency measurement/ lighted I-V measurement. For the spectral measurements, a collimated beam of 10x10 mm diameter is used. The size of the illuminated area can be controlled using optics down to 500 microns using free space optics and 50 microns using light guides.
- Sample holding and x-y manual positioning unit arrangement help to keep the sample horizontal.
- Keithley 2450SMU
- Sample stage with manual 3-axis positioning feature
- Chopper and lock in amplifier
- Digital Inspection microscope



Probe station Digital inspection/measuring microscope

Equipment Type	Upright					
Effective Magnification	0.5-5X					
Magnification	0.5X	1.0X	2.0X	3.0X	4.0X	5.0X
Working distance(mm)	100	100	100	100	100	100
Depth of field (mm)	3.48	0.93	0.29	0.16	0.10	0.07
N.A(mm)	0.023	0.043	0.043	0.085	0.0970	0.107
Resolution (mm)	0.015	0.008	0.005	0.004	0.003	0.003
Distortion	2.97%	1.10%	0.20%	-0.03%	0.13%	0.20%

Supporting sensor size	1" Max.
Vision	Digital PC Based software for measurements
Working Distance	100mm
Mount	C-Mount
Working Distance Tolerance	±1mm
Illumination for imaging	Bottom, and Co-Axial HB-LED Based
Illumination Control	Continuously Variable PC-controlled

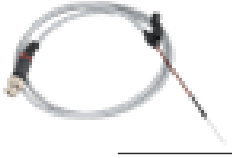


Micromanipulator

Model	MIM-4A-10
4 Axis Micromanipulator (XYZ & Tilt)	
4Travel	XYZ 10 mm & +/- 3 degree

Probe Tip

Current Rating	1 Amp
Voltage Rating	Based on placement distance
Operating Temperature	-40°C to +125°C
Contact Material	Brass
Contact Plating	Gold over Nickel



Optical Chopper System with Controller

The optical chopper in the quantum efficiency measurement system operates at 100Hz. It has a built-in lock-in amplifier circuit that can operate at the same frequency.

Frequency	10 Hz to 200 Hz
Six Slot	100 Hz to 600 Hz
Thirty slot	200 Hz to 4000 Hz
Duty Cycle	50 %
Stability	+/- 1%
Chopper Wheel Diameter	105 mm
Frequency Read Out	16 x 2 Lines LCD
Reference Pick-Up	IR LED and Photo Transistor Pair
Motor Cable Length	1.5 m
Operating Temperature	10°C - 50°C
Power input	230V, 50Hz



Calibrated Dual detector Auto selection control and measurement Module

Detector 1	High-sensitive Si photodiode Detector
Active Area	5.8x5.8mm
Spectral Response	200-1100nm
Peak Sensitivity wavelength	960nm
Dark Current ID VR = 10mV Max	5pA
Detector 2	InGaAs Photodiode control and measurement Module
Type	InGaAs Photodiode
Wavelength Range	900nm to 1700nm
Responsivity @ 1310nm (A/W)	0.8 minimum / 0.9 typical
Responsivity @ 1550nm (A/W)	0.9 minimum / 0.95 typical
Active Area Diameter (mm):	3.0
DAC	16 Bit
Sampling rate	200 reading / second

CAMERA

Sensor Type	20MP CMOS for Imaging
Sensor model	Sony
Quantum efficiency	84%@535nm
Resolution	5472(H)x3648(V)
Pixel size	2.40umx2.40um
Sensor size	15.86mm; 1inch
Shutter mode	Rolling
Frame rate	14fps @5472x3648, 53fps @2736x1824, 67fps @1824x1216
Binning	2x2, 3x3, 4x4
Exposure settings	Auto/Manual
Picture format	JPG/PNG/TIFF/DICOM
Data interface	USB3.0
Bit depth	16bit/8bit
Power supply	12V

SourceMeter:

Keithley 2450SMU Instrument
Used for measuring the current-voltage characteristics of the semiconductor structures under study in a wide range and representing 4 devices in one housing:
a current source, a voltage source, a current meter, and a voltage meter

Voltage-Ranges	20 mV – 200 V depending on the selected voltage range
Current-Ranges	10 nA – 1 A depending on the selected current range

0.012% Basic Accuracy
Wideband Noise 2 mVrms Typ
Source-Memory (SCPI 2400 Mode)
>250,000 Point Reading Buffer
>3000 Readings/Second
SCPI (2400 + 2450) + TSP Programming
GPIB, USB, Ethernet (LXI)
Front: Banana Jacks, Rear: Triax

Solar Simulator



Solar Simulator 1

Model HO-SC-SS Series

An instrument used to simulate solar light in a laboratory is called solar simulator. Holmarc's solar simulator is one of the simple and cost effective solar simulators available. We have xenon lamp as the light source, along with high quality collimating optics, airmass filter and control electronics. Also we have shutters along with the equipment so that we can control the light beam falling area. The specific design along with the control electronics makes a user friendly atmosphere while using the equipment. You can make use of this instrument in any experiment that requires a stable light source.

Stable light source

Cost effective solar simulator





www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

SPECIFICATIONS

Solar Simulator - 150W Xenon Lamp	
	
Model	HO-SC-SS300C
Light Output	0.5 Sun
Spectral Match (fraction of ideal percentage)	0.60 - 1.40
Non - Uniformity of Irradiance	< ± 10%
Temporal Light Instability	± 2 %
Illumination Head Design	360 Degree Continuous Rotatable
Illumination Diameter	50 mm
Shutter	Manual
Solar Simulator	
Light source	150W Xenon lamp
Maximum beam diameter	50 mm
Air mass filter	AM1.5G, 300 - 1100 nm
Regulation Mode	Constant current with power limit
Adjustable power (Using front panel knob)	
Digital voltage and current display	
Solar Simulator - 300W Xenon Lamp	
Model	HO-SC-SS300C
Light Output	1 Sun
Spectral Match (fraction of ideal percentage)	0.60 - 1.40
Non - Uniformity of Irradiance	< ± 10%
Temporal Light Instability	± 2 %
Illumination Head Design	360 Degree Continuous Rotatable
Illumination Diameter	50 mm
Shutter	Manual (Optional Motorized Shutter)
Solar Simulator	
Light source	300W Xenon lamp
Maximum beam diameter	50 mm
Air mass filter	AM1.5G, 300 - 1100 nm
Regulation Mode	Constant current with power limit
Dimensions	700 x 400 x 450 mm LxWxH
Weight	22 kg
Adjustable power (Using front panel knob)	
Digital voltage and current display	
Air Mass AM1.5G Filter	
Thickness	2.5 mm
Spectral Range (nm)	300 - 1100
Reflected / Absorbed Band	300 - 1100 nm
Transmission band	300 - 1100 nm
Dimensions	2” (50.8 mm) diameter
Filter Type	Air Mass
Solar Filters	AM1.5G
Spectral Range	Infrared, Visible
Filter Style	Interference
Optional Accessories	
Additional Cut off filter attachment	
Optical Fiber Attachment Unit	

Solar Simulator 2

Model HR222 Series

Designed for Solar cell / photochemistry / photobiology testing and environmental exposure testing.

The main objective of solar simulation technology is to produce illumination approximating natural sunlight in order to provide a controllable indoor test facility under laboratory conditions. Our Xenon arc lamp based solar simulators provide the closest solar spectral spectra available from artificial sources. These solar simulators, also called sun simulators, provide excellent price performance. The solar simulators can be used both in laboratory or production environments. Solar simulators are used in a wide range of research areas including photobiology, photo-oxidation, photodegradation, photovoltaics, and photocatalysis. It can be used for the testing of any processes or materials that are photosensitive, including solar cells, sun screen, cosmetics, plastics, aerospace materials, skin cancer, bioluminescence materials, photosynthesis, water treatment, crude-oil degradation, and free radical formation. In short, it can be used in any application where the effects of exposure to sunlight are to be studied.

Depending on your application requirements, we can provide a variety of Solar Simulators to fit your needs. In addition, each of Holmarc's solar simulators are customizable to best suit your requirements. The design of the solar simulator is a trade-off between power and uniformity. Higher uniformity can be achieved with lower power; or power can be increased and uniformity reduced. If your application is in Ultra Violet (UV), Infrared or specific band of wavelengths discuss your requirement with our engineers.

Our solar simulators are available with three different air mass (AM) filters: AM0, AM1 and AM1.5. Class A Spectral Match Optical Intensity Stability < 1%. Features include built in timer, monitoring the bulb operating time, automatic/programmable Shutter Control, Optical power monitoring/feedback photo detector, 360 degree rotatable head, external solar power meter Etc. Optional bandwidth filters are available for spectral measurements. Contact us for more details

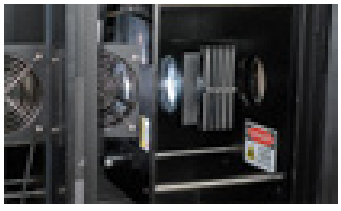
Specifications

Current Measurement Range	+/-1 A
Resolution	0.1 uA
Voltage Range	+/- 5V
Resolution	5 mV
Type	Four Quadrant Operation
Constant temperature control unit	Yes
Temperature control Range	5 - 75 Degree C
Operation	PC controlled
Software	SSTS Analyzer

SS222 Series Solar Simulator
Model: HR-SS150WRM1-50A
1 SUN Class A Solar Simulation System with an illuminated area of 50mm Diameter and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 2 %
Model: HR-SS150WRM2-50B
2 SUN Class B Solar Simulation System with an illuminated area of 50mm Diameter and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 5 %
Model: HR-SS150WRM2-50C
2 SUN Class C Solar Simulation System with an illuminated area of 50mm x 50mm and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 10 %
Model: HR-SS300WRM1-50U
5 SUN Class U Solar Simulation System with an illuminated area of 50mm diameter and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : > 10 %
Model: HR-SS300WRM1-100A
1 SUN Class A Solar Simulation System with an illuminated area of 100mm x 100mm and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 2 %
Model: HR-SS300WRM1-50A+
1 SUN Class A+ Solar Simulation System with an illuminated area of 50mm diameter and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 1 %
Model: HR-SS300WRM2-100B
2 SUN Class B Solar Simulation System with an illuminated area of 100mm Diameter and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 5 %
Model: HR-SS300WRM2-100C
2 SUN Class C Solar Simulation System with an illuminated area of 100mm x 100mm and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : 10 %
Model: HR-SS300WRM3-100U
3 SUN Class U Solar Simulation System with an illuminated area of 100mm diameter and Air Mass Filter of AM1.5
Spatial Non-uniformity of irradiance : > 10%

Solar Simulator Test station
Model: HR-SS300WRM1-100ATSP





Designed for Solar cell testing.

It includes 1SUN Class A Solar Simulation System with an illuminated area of 100mm x 100mm and Air Mass Filter of AM1.5, PC controlled source measurement unit and a constant temperature controlled sample platform. Other features include built in timer, monitoring the bulb operating time, automatic/programmable Shutter Control, Optical power monitoring/feedback photo detector, external solar power meter Etc

This instrument is also available with Keithley SMU interface & Labview compatibility. Optional bandwidth filters are available for spectral measurements. Contact us for more deta



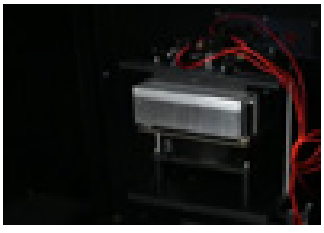
Solar Simulator with IV Measurement System

Model HO-SC-IV

Model: HO-SC-IV is integrated with 300W Xenon lamp with housing, optics, power supply and an easy to use software with capability to measure dark and lighted IV characteristics of solar cell. System includes a sample stage, capable of accommodating samples up to 50 mm diameter and probes to contact the sample. Light is normally incident on the sample. Illumination area can be adjusted using lens assembly system.

Light source	300W Xenon lamp
Filter	Air mass filter (AM1.5G)
Solar Simulator Class	A C A
Spectral Match	0.75 - 1.25
Spatial non-uniformity of irradiance	10 %
Temporal instability of irradiance	2 %
Maximum beam diameter	50 mm
Maximum intensity	1 Sun
Minimum intensity	0.7 Sun
Bias voltage	+1V to -1V
Bias voltage resolution	5 mV
Current measurement range	0.1 uA to 0.75 A
Sample size	Up to 50 mm
Sample holder with XY motion	
Quartz Type	Ozone Free
Wattage	300 W
Luminous Flux	7000 lm
Luminous Intensity	700 cd
Average Luminance	27000 cd / cm2
Regulation Mode	Constant current with power limit
Protection	Open / Short circuit proof, overtemp, over current

Interior







Software Features

Performs IV scanning in user specified range

Exports the results to spreadsheet file

Operating system requirement: Windows XP / 7 / 8 / 8.1 / 10

PC Interface: RS232 or USB (Using a USB to serial converter)



Xenon Light Source

Model HO-SC-XE Series	150W	300W
Xenon Light Source - 150W	Model HO-SC-XE150	Model HO-SC-XE300
Lamp Power	150W	300W
Lamp type	Xenon short arc, Ozone free	Xenon short arc, Ozone free
Spectral Match	0.60 - 1.40 (fraction of ideal percentage)	0.60 - 1.40 (fraction of ideal percentage)
Non-Uniformity of Irradiance	< ± 10 %	< ± 10 %
Temporal Light Instability	± 2 %	± 2 %
Illumination Diameter	50 mm	50 mm
Shutter	Manual (Optional Motorized Shutter)	Manual (Optional Motorized Shutter)
Dimensions		700 x 400 x 450 mm LxWxH
Wight		22 kg
Includes housing, power supply and beam turning assembly		
Slightly diverging collimated output beam		
Optional Accessories	Additional Cut off filter attachment	Additional Cut off filter attachment
	Optical Fiber Attachment	
	Optical Fiber Attachment	





Xenon light source is one of the essential equipment for studying solar cells. The high color temperature (6000K) of the Xenon lamps is a close match to the solar temperature. This results in very similar solar spectra in the UV and VIS although the source has some Xe emissions lines in the near IR. The purpose of the Xenon light source is to provide a controllable indoor test facility under laboratory conditions, used for the testing of solar cells, sun screen, plastics, and other materials and devices.

Solar Simulator & IV Measurement System with Keithley SMU

Model HO-SC-IVK

This model comes with a Keithley 2450 SMU, 300W Xenon lamp with housing, optics, power supply and an easy to use software with capability to measure dark and lighted IV characteristics of solar cell. System includes a sample stage, capable of accommodating samples up to 50 mm diameter and probes to contact the sample. Light is normally incident on the sample. Illumination area can be adjusted using lens assembly system.

Specifications

Light source	300W Xenon lamp
Filter	Air mass filter (AM1.5G)
Solar Simulator Class	A C A
Spectral Match	0.75 - 1.25
Spatial non-uniformity of irradiance	10 %
Temporal instability of irradiance	2 %
Maximum beam diameter	50 mm
Maximum intensity	1 Sun
Minimum intensity	0.7 Sun
Bias voltage	+20V to -20V (Max Current : +/-1A) or +200V to -200V (Max Current : +/-100mA)
Bias voltage resolution	0.5uV to 5 mV depending on the selected voltage range
Current measurement range	0.5pA to 50 uA depending on the selected current range
Sample size	Up to 50 mm
Sample holder with XY motion	
Quartz Type	Ozone Free
Wattage	300 W
Luminous Flux	7000 lm
Luminous Intensity	700 cd
Average Luminance	27000 cd / cm2
Regulation Mode	Constant current with power limit
Protection	Open / Short circuit proof, overtemp, over current

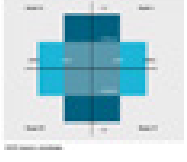
Source Meter Features

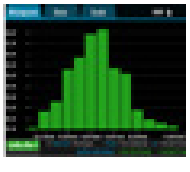
- Capabilities of analyzers, curve tracers, and I-V
- systems at a fraction of their cost
- Five-inch, high resolution capacitive touchscreen GUI
- 0.012% basic measure accuracy with 6½-digit resolution
- Enhanced sensitivity with new 20mV and 10nA
- source/measure ranges
- Source and sink (four-quadrant) operation
- Four “Quickset” modes for fast setup and measurements
- Built-in, context-sensitive front panel help
- Front panel input banana jacks; rear panel input
- triaxial connections
- 2450 SCPI and TSP® scripting programming modes
- 2400 SCPI-compatible programming mode
- Front panel USB memory port for storing data, programming, instrument configurations, and to
- upgrade the uni



Software Features

- Performs IV scanning in user specified range
- Exports the results to spreadsheet file
- Operating system requirement: Windows XP / 7 / 8 / 8.1 / 10
- PC Interface: RS232 or USB (Using a USB to serial converter)







2450 SourceMeter ® SMU Instrument

The 2450 is Keithley's next-generation SourceMeter source measure unit (SMU) instrument that truly brings Ohm's law (current, voltage, and resistance) testing right to your fingertips. Its innovative graphical user interface (GUI) and advanced, capacitive touchscreen technology allow intuitive usage and minimize the learning curve to enable engineers and scientists to learn faster, work smarter, and invent easier. The 2450 is the SMU for everyone: a versatile instrument, particularly well-suited for
characterizing modern scaled semiconductors, nano-scale devices and materials, organic semiconductors, printed electronics, and other small-geometry and low-power devices. All this combined with Keithley SMU precision and accuracy allows users to Touch, Test, Invent® with the new favorite go-to instrument in the lab for years to come..

Unlike conventional instruments with dedicated push button technology and small, obscure, limited-character displays, the 2450 features a five-inch, full-color, high resolution touchscreen that facilitates ease of use, learning, and optimizes overall speed and productivity.. The 2450 provides a full plotting and sheet view to display sweeps, measurement data, and charting right on the screen. It also supports exporting to a spreadsheet.

Protection

Open / Short circuit proof, overtemp, over current

Luminance

27000 cd / cm2



Light Source

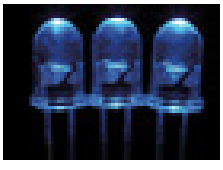
300W Xenon lamp

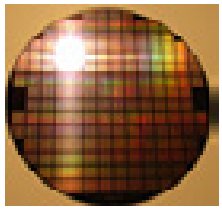
Quartz

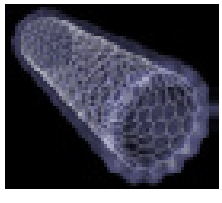
Ozone Free













Spectral Response Measurement Apparatus

Model HO-AE-SR18

Spectral response is the ratio of the current generated by the solar cell to the power incident on the solar cell or a detector. Spectral response measurement apparatus measures short circuit current of solar cell at selected wavelengths over a broad range of wavelengths.

HOLMARC's Spectral response measurement system (Model NO: HOAE-SR18) is capable of measuring the spectral response of any kind of photovoltaic devices, such as single or multi junction solar cells or sensors in an area up to 30mm2. Measurements can be taken in the wavelength range from 360 to 1100 nm at a resolution of 1nm. Current, normalized with respect to light power versus wavelength gives spectral response of the cell. Spectral response is directly related to external quantum efficiency. The measurements can be performed by interfacing to a computer.

Third party Source Measure Unit with (SMU) can be used for the measurement of the current through, and also to apply the voltage to, the sample. Holmarc also supply a complete solar cell characterization system (Model HO-SC-QEIV) which has internal source measure circuit to perform both IV and spectral response measurements.

Features

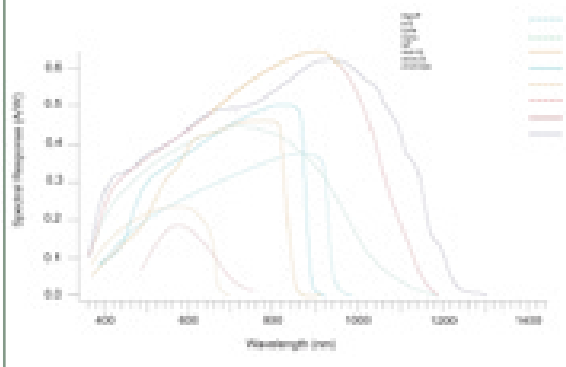
- The system can be used in standalone mode
- PC software for user interface
- Plot browser to read spectral response at each wavelength
- Wavelength range between 360 to 1100 nm
- Stepping motor scanning for precision wavelength positioning

Specifications

Light source	50W Tungsten Halogen lamp
Wavelength Range	360 nm to 1100 nm (Optional - up to 2000 nm)
Monochromator Optical Design	Czerny - Turner
Main Mirrors	Parabolic type with Enhanced Aluminum Coating
Focal Length	300 mm
Dispersion Element	Holographic Grating
Grating Density	1200 l / mm
Filter Unit	Higher order cut off filter wheel
Sample size	Up to 30 mm x 30 mm
Two probes, one movable in X axis and the other in Y axis, to make contact with the sample	
Alternative contact option through alligator clips	
Built-in transimpedance amplifier for the measurement of photocurrent through the sample	
User Interface	PC software
PC Interface	RS232 or USB (Using a USB to serial converter)

Software Features

- Controls the monochromator
- Performs scans of user defined wavelength range
- Plots spectral response of the sample at a specified wavelength range
- Export the results to spreadsheet file
- Operating system requirement: Windows XP / 7/ 8 / 8.1 / 10



Samples

Active area	5.8 x 5.8 mm
Wavelength Range	360 nm to 1100 nm
Wavelength of Peak Sensitivity	960 nm
Photosensitivity	0.58 A/W at 960 nm
Typical Short Circuit Current at 100lx	31 Micro Ampere
Dark Current	50 pA
Rise Time	10 micro second



Samples

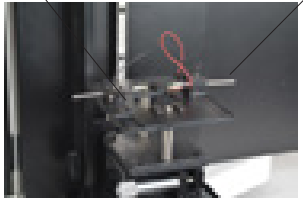
Up to 30 mm x 30 mm

Probes

Two probes, one movable in X axis and the other in Y axis, to make contact with the sample

Gratings

Holographic Gratings





Photodetector Characterization Setup

Model HO-PDC-01

No detector has a constant spectral responsivity under all conditions of use. For instance, the responsivity of photodiode detectors falls off above a certain incident power level due to saturation effects. Full evaluation of a detector requires characterisation of such effects. This information allows the identification of the detector with the best performance for a particular application. Also, a detector to be used for calibration purposes should be fully characterised in order to evaluate the uncertainty of such calibrations.

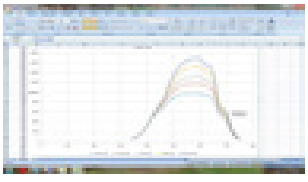
In all cases the detector under test is compared with a standard detector of known spectral responsivity / quantum efficiency.

300F Monochromator is used to select a narrow wavelength band from a broad band quartz halogen lamp. Wavelength range of monochromator is between 380 - 1100 nm (Optional wavelength ranges are available on request). The wavelength can readily be tuned continuously allowing measurement of spectral responsivity across the wavelength range for which the detector is used.

Specifications

Photocurrent measurement range	0.1 nA to 50 uA
Bias voltage	+10V to -10V
Bias voltage step size	100 mV
Light Source	50 W tungsten halogen lamp
Monochromator type	Czerny Turner with two holographic gratings and 2nd order filters
Wavelength range	380 - 1100 nm (Optional wavelength ranges are available on request)
Maximum sample size	50 mm
Sample holder with manual three axis positioning using knobs	
Pogo pins or multimeter like probe tips to make contact with the sample	
Note : PC is not in the scope of supply	

Software



Solar cell response at different temperatures



Spectral response of a photodiode

Setup



Model: HO-PDC-01

designed for characterisation / measurement of the following detector parameters:

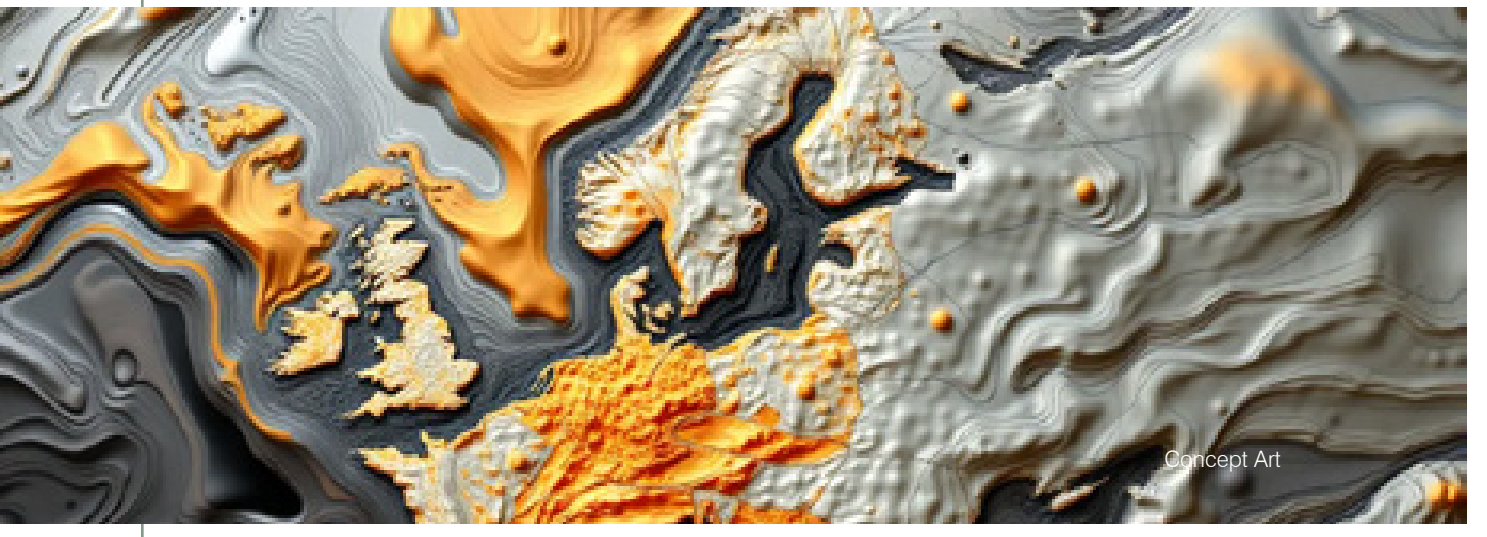
Linearity range : This is the range of incident radiant power levels over which the detector output varies linearly with incident power. (Laser-based methods is used for measuring saturation threshold of a detector).

Spatial non-uniformity of response : The variation of responsivity across the active area of a detector is determined by scanning a small spot of radiation at a selected wavelength over the surface.

Temperature coefficient of response : the variation of responsivity with temperature



Schlieren Imaging System



Standard Models with different Mirror sizes

Ideal for optical in-homogeneities studies in transparent material
Model: HO-SDIS Series

Holmarc schlieren system contains, Two aluminized parabolic mirrors overcoated with silicon monoxide and mounted in gimbal mounts, pointed LED light Source, Knife edge adjuster and a 5MP USB 2.0 digital camera. Camera is used for enabling a photographic record to serve as a permanent reference. For lower light intensities, a video camera and monitor combination may better enhance your total Schlieren system. Using video, your results are enlarged. Gimbal mounts for the parabolic mirrors eliminate unwanted linear beam translation during adjustment.

Schlieren imaging systems provide a powerful technique to visualize changes or non uniformities in refractive index of air or other transparent media. it is widely used in aeronautical engineering to photograph the flow of air around objects. Applications for the Schlieren system include: the determination of refractive index, wind tunnel research, fluid and air current flow, internal character of glass, flame analysis, sound velocity and the mass of microscopic particles.

Small scale unevenness that are commonly measured with interferometers or similar high sensitivity methods can also be tested with schlieren setups. Any inhomogeneities of the surface in a transparent material can be visualised with a schlieren setup. The small bumps or irregularities in the structure cause the same deviation of the light as in fluids.

Schlieren Imaging System is beneficial to use in fluid dynamics studies because they are sensitive to changes and do not interfere with flow. They are also used to study optical media and changes in refractive index within the material. Most commonly, schlieren systems have been applied to visualize diverse subjects such as striations in blown glass, inhalation in humans and animals, shock waves from a plane in flight, and heat emanating from a system.

Another important schlieren application is heat convection visualization. Mainly energetic questions as the thermic flux in buildings are answered with the schlieren method. An interesting example are the agricultural tests of thermal convection as seen in figure. Even small scale thermic convection on plants has been possible to visualize.

- Wind tunnel research
- Fluid and air current flow
- Internal character of glass
- Flame analysis
- Ultrasound visualization
- Heat convection visualization

Optional Features

- Custom Sizes & Lens Based Schlieren Imaging System
- To visualize instantaneous density profiles, a short duration flash rather than continuous illumination can be used
- # Flash lights can be provided on request

Model Options

Model No.	Mirror Size	Focal Length
HO-SDIS-150A	150 mm	1200 mm
HO-SDIS-150B	150 mm	1500 mm
HO-SDIS-200A	200 mm	1200 mm
HO-SDIS-200B	200 mm	1500 mm
HO-SDIS-300A	300 mm	1200 mm
HO-SDIS-300B	300 mm	1500 mm



Airflow around the leafs of a corn plant is visualized using schleren imager for agronomical research.

Viewing screen

200 mm dia diffused screen

Parabolic mirrors

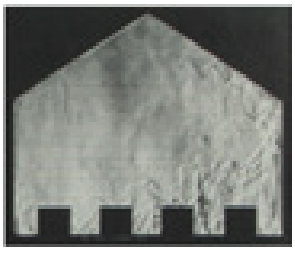
Mounted in Gimbal Mirror Mount, allows user to steer a beam in any direction desired



Knife edge

Adjustable in all three axis





A model green house section with the heat convection produced by the sun light heat

Imaging Unit

USB 2.0 5MP 1/2.5" CCD camera with Optical Zoom

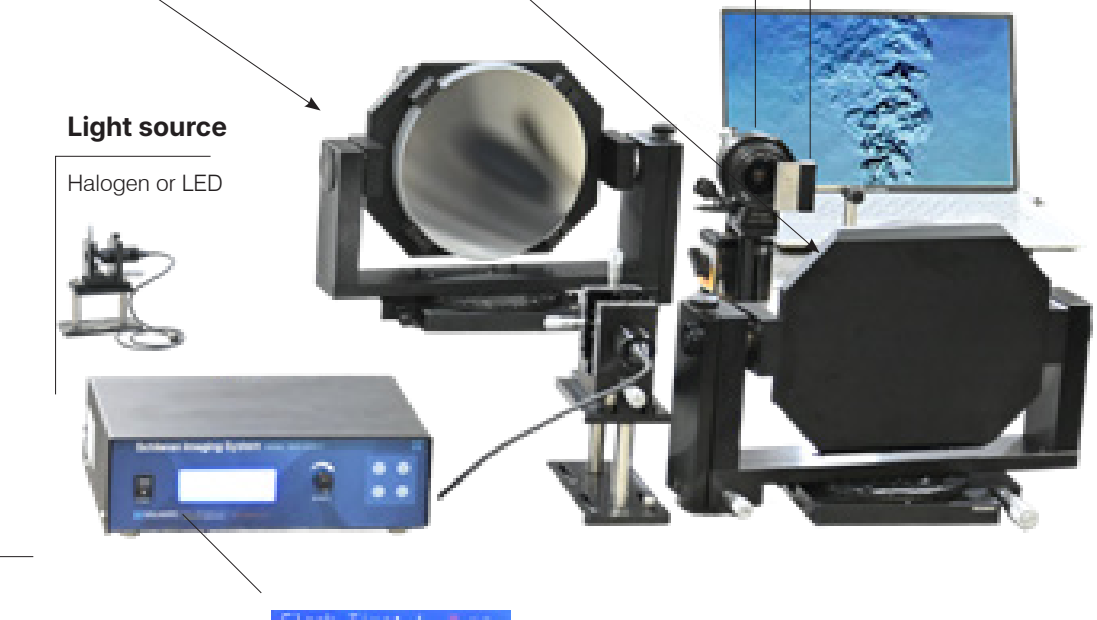


Plain mirror

First-surface to reflect the image to a convenient viewing location

Light source

Halogen or LED





Schlieren Imaging System

with Independent Mounting System
Model: HO-SDIS-200B-IM

Holmarc schlieren system contains, Two aluminized parabolic mirrors overcoated with silicon monoxide and mounted in gimbal mounts, pointed LED light Source, Knife edge adjuster and a 5MP USB 2.0 digital camera. Camera is used for enabling a photographic record to serve as a permanent reference. For lower light intensities, a video camera and monitor combination may better enhance your total Schlieren system. Using video, your results are enlarged. Gimbal mounts for the parabolic mirrors eliminate unwanted linear beam translation during adjustment.

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Viewing screen

Optical axis height from the floor	1.41 meter
Height adjustment	200 mm
Height adjustment mechanism	Manual coarse height adjustment with lock knob
Height adjustment mechanism Material	Mild Steel
Foot leveling	with leveling screws

5MP USB 2.0 CMOS camera

Sensor	CMOS, Color, 5 Mp
Optical format	1 / 2.5”
Active imager size	5.70 mm x 4.28mm (7.13mm diagonal)
Pixel size	2.2 um x 2.2 um
Frame rate	8 fps @ full resolution
Sensitivity	1.76 V / Lux - sec
Exposure time	109 us - 3000 ms
Spectral range	380 - 650 nm
SNR	38.5 dB
Dynamic range	67.7 dB
Shutter	Electronic rolling shutter
Data interface	USB 2.0
Software interface	TWAIN / DirectShow
Operating mode	Continuous output
Data format	8 Bit / 12 Bit RAW
Picture forma	JPEG / BMP / PNG / RAW

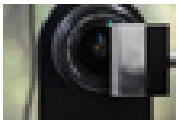




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+91 920-719-7771 / (72 / 76)

Platform for mounting Knife edge and Zoom lens

Optical axis height from the floor	1.41 meter
Height adjustment	200 mm
Height adjustment mechanism	Manual coarse height adjustment with lock knob
Height adjustment mechanism Material	Mild Steel
Foot leveling	with leveling screws



Parabolic Mirrors

Diameter	200 mm, Focal length = 1500 mm
Surface quality	40 - 20 (Scratch-dig)
Material	Borofloat, Coating = Protected aluminium
Reflectivity Ravg	2> 88% @ 450 - 2000 nm

Gimbal Mirror Mount for Parabolic Mirrors

Coarse travel	360 degree
Fine travel	+/- 6 degree
Travel range	360 degree
Linear resolution	0.01 mm (Least count for micrometer)
Sensitivity	4 arc sec
Mounting holes	M6 slots
Construction material	Aluminium alloy
Finish	Black anodized
Optical axis height from the floor	1.41 meter
Height adjustment	200 mm
Height adjustment mechanism	Manual coarse height adjustment with lock knob
Height adjustment mechanism Material	Mild Steel
Foot leveling	with leveling screws



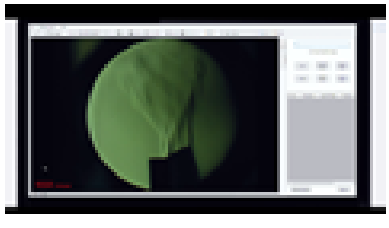
LED point light source with variable power supply and condenser optics

LED	3W high bright White
Intensity	Adjustable
Condenser Optics	Multi-element design
Optical axis height from the floor	1.41 meter
Height adjustment	200 mm
Height adjustment mechanism	Manual coarse height adjustment with lock knob
Height adjustment mechanism Material	Mild Steel
Foot leveling	with leveling screws

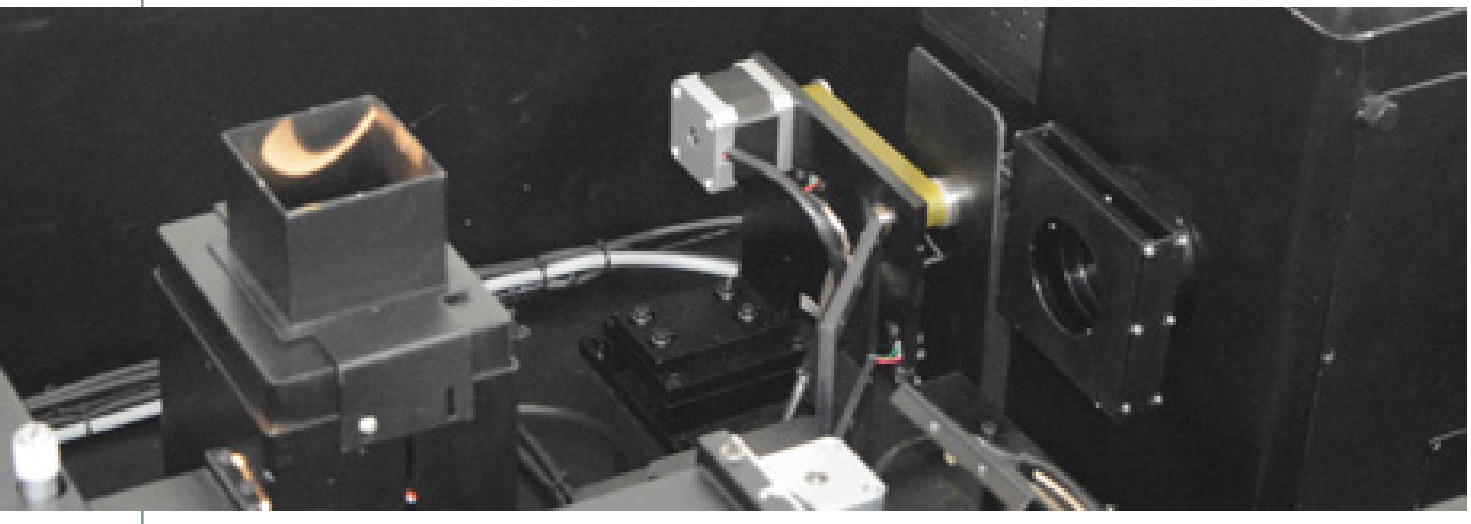


Custom Sizes & Lens Based

- Schlieren Imaging System
- To visualize instantaneous density profiles, a short duration flash rather than continuous illumination can be used
- # Flash lights can be provided on request



Laser Ablation

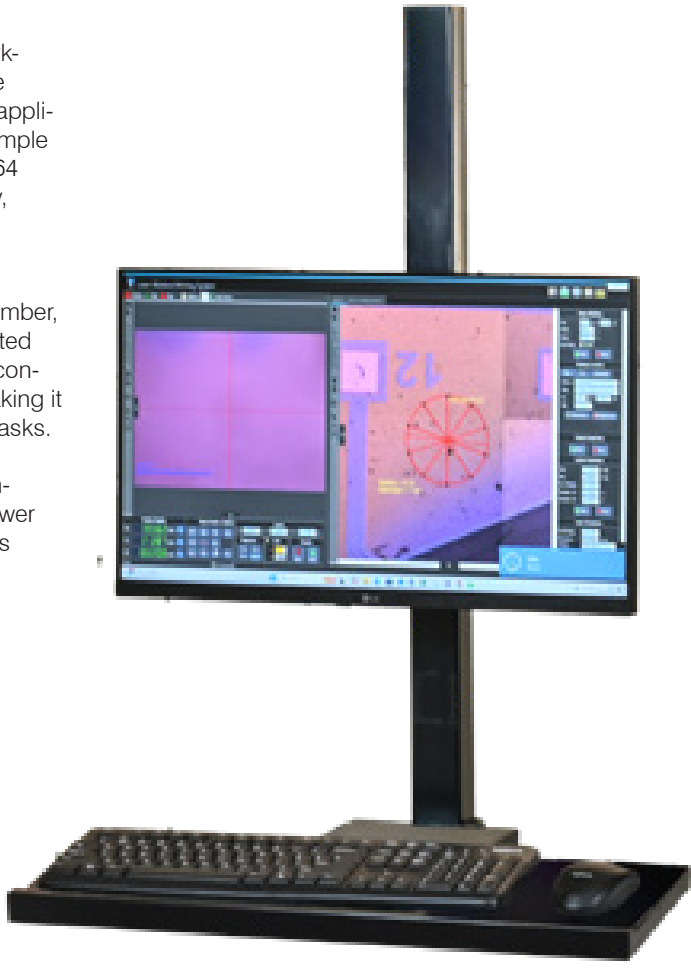


Confocal Micro Laser Ablation with integrated galvano scanning unit

The Confocal Micro Laser Ablation and Laser Scanning Microscope Workstation is a high-precision, fully automated system designed for real-time imaging, micro-scale laser ablation, and advanced material processing applications. Featuring a color-corrected infinity optical system, motorized sample scanning and rotation stages, and a high-power Nd:YAG laser (30W, 1064 nm), this workstation provides unparalleled precision in microlithography, MEMS fabrication, micro-machining, and biological research.

Equipped with a cooled 20MP CMOS imaging camera, advanced software-controlled microscope operations, and a vacuum-type sample chamber, this system enables high-resolution imaging, laser ablation, and automated post-processing inspection. The programmable turret, motorized focus control, and real-time image stitching allow precise laser pattern overlay, making it ideal for solar cell research, MEMS device tuning, and microfabrication tasks.

The system also integrates a Galvano-based laser scanning unit for high-speed scribing, cutting, and material removal over large areas. Laser power and frequency control via software ensures optimized ablation for various materials.

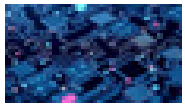


The Confocal Micro Laser Ablation and Laser Scanning Microscope Workstation is ideal for high-precision micro-scale applications,

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Micro Lithography

Pattern generation for semiconductor and microfabrication industries.



Solar Cell Research

Selective material removal and microstructuring.



MEMS

(Micro-electromechanical systems)

Device Fabrication & Resonant Frequency Control – High-accuracy ablation and tuning of MEMS structures.



Micro Machining

Precision cutting, marking, and material removal at the micron scale.



Biological Research & Cell Ablation

Controlled laser-based cell modification and analysis.

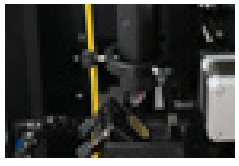


Optical System

Equipment Type	Upright Microscope
Optical System	Color-Corrected Infinity Optical System
Observation	24" Touch Display with Dedicated PC

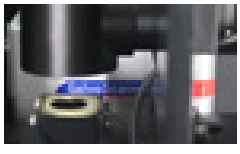
Laser Ablation System

Laser Type	Nd:YAG
Power	30W
Wavelength	1064 nm
Ablation Spot Diameter (Min)	2 Microns
Ablation Line Marking Width (Min)	2 Microns
Laser Power & Frequency Control	Adjustable via Software



Galvano

Galvano Based Laser Unit for Large-Area Scribing & Material Removal





Objectives & Optical Components

5X LWD Plan	0.15 NA, 44 mm (WD)
10X LWD Plan	0.30NA, 34 mm (WD)
20X LWD Plan	0.35 NA, 29MM (WD)
50X LWD Plan	0.50 NA, 17 mm WD

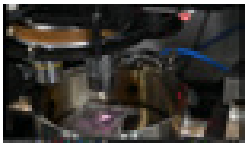


Imaging Camera Specifications

Sensor Type	Cooled 20MP CMOS (Sony)
Quantum Efficiency	84% @ 535 nm
Resolution	5472 (H) × 3648 (V)
Pixel Size	2.40 μm × 2.40 μm
Sensor Size	15.86 mm (1-inch)
Shutter Mode	Rolling
Read Noise	<1e-
Cooling	Forced Air (-15°C at Ambient 25°C)
Frame Rate	• 14 fps @ 5472 × 3648 • 53 fps @ 2736 × 1824 • 67 fps @ 1824 × 1216
Binning Options	2×2, 3×3, 4×4
Exposure Settings	Auto/Manual
Exposure Time	18 μs - 1 hour
Picture Formats	

Illumination Systems

Illumination Types	Top, Bottom, and Co-Axial HB-LED Based
Illumination Control	Continuously Variable, PC Controlled



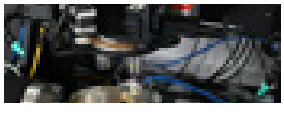
Sample Scanning & Rotation Stages

Sample Scanning Stage	Motorized, Programmable
Design	Linear Encoder-Based
Resolution	1 Micron
Sample Rotation Stage	Encoder-Based, Stepper Motor Controlled, Programmable



Sample Chamber

Type	Vacuum Chamber
Construction Material	Stainless Steel 304
Optical Window Material	Lambda/8 Polished B-K7 (High Optical Damage Threshold)



Control System & Software

Controller	HOLMARC XYZ Stepper Controller with Joystick
Software Features	Holmarc Micro/Analyser PRO •Programmable Microscope Controls •Depth Measurements •Track Saving Feature •Multiple Position Saving •Tracking •Live Image Addition, Subtraction, and Enhancement •Linear and Angle Measurements

Additional Features

Real-Time Sample Imaging & Ablation
Auto Inspection After Scribing, Cutting, or Hole Marking
Large-Area Sample Imaging (Stitched Images
Overlay of Ablation Patterns on Stitched Images
Laser Power & Frequency Adjustments via Software
Galvano-Based Laser Unit for Large-Area Scribing & Material Removal

High-Precision Laser Ablation

2-micron ablation spot with programmable laser control.

Advanced Imaging & Inspection
Real-time imaging, post-ablation auto-inspection, and stitched image generation.

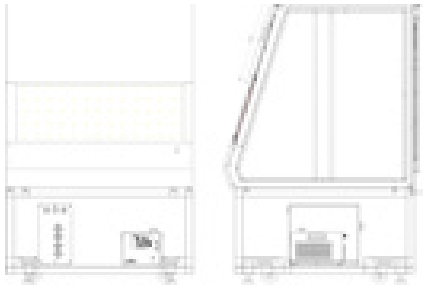
Fully Motorized & Programmable
Motorized stage, focus, turret, and illumination control.

Multi-Mode Illumination
Top, bottom, and co-axial HB-LED-based lighting.

High-Resolution Imaging
20MP cooled CMOS sensor with low noise & high quantum efficiency.

Galvano-Based Large-Area Processing
Efficient laser scribing and material removal over extended areas

Automated Multi-wavelength Laser Scribing/ablation/Cutting station with Micro Inspection Camera



Model HO-LSWS300X i

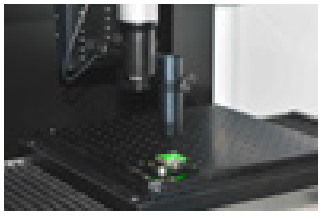
The Holmarc Automated Multi-wavelength Laser Scribing/ablation/Cutting Station with Micro Inspection Camera Model HO-LSWS300X is a versatile laser system designed for precision scribing, ablation, and cutting. It is a useful tool for creating narrower scribe lines compared to traditional mechanical methods. It is a non-contact process that minimizes micro-cracking and substrate damage. With high peak power and excellent beam quality lasers are used for scribing, resulting in cleaner lines and higher throughput. Laser scribing offers benefits such as clean scribing of hard or brittle materials, lower cost, less chipping and micro-cracking, narrower cut widths for more parts per wafer, and greater process tolerances for reliable manufacturing at low cost.

It features Precision optical assembly creating a minimum line width of 0.002mm (Line width can be varied up to 0.5mm using optics), precise repeatability (±0.002mm), a red guidance laser, motorized focusing, and an integrated microscope. The closed-chamber design ensures safety, and it finds applications in microelectronics, photovoltaics, and MEMS fabrication.

SPECIFICATIONS	
Scribing/Ablation/Cutting Area	200x200mm,150x150mm & 100x100mm (selectable)
Scribing/Cutting Method	Motorized
The minimum line width	0.001mm (Can be varied up to 0.5 mm using additional Optics)
Repeatability	±0.002mm.
Guidance Laser	Red / Green
Focusing	Motorized stepper motor controlled Focusing
Travel Range	300mm
Memory Focus button	
Design	Closed Chamber
Gas inlet	Active assist gas purging option
Imaging/Inspection/Alignment Microscope	Yes
Door Mechanism	Pull-up sliding door
Working Height	1060mm
Instrument Size (LxWxH)	1200x1200x2000mm
Computer	Integrated computer and display unit

Scribing/Ablation/ Cutting Area

200x200mm,150x150mm & 100x100mm (selectable) Motorized with Red/Green Guidence Laser in a Closed Chamber Design



Digital inspection/measuring positioning microscope

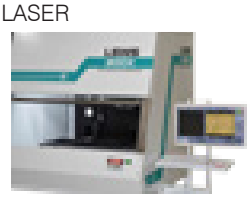
Upright 0.5 to 5x Magnification



Cutting Laser

Laser1
532nm LD PUMPED ALL-SOLID-STATE AOM Q

Laser 2
1064nm LD PUMPED ALL-SOLID-STATE AOM Q
LASER

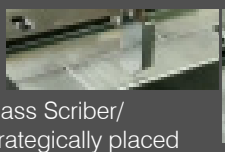


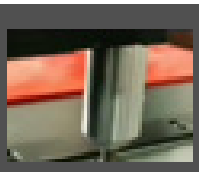
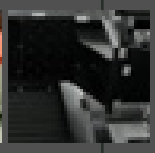
Mapping Stage

Precision Automatic XYZ stage with Z-axis Automated, 450x450mm XY Stage with 40mm/sec Scanning Speed



Precision Motorized Diamond Glass Scriber/Cutting

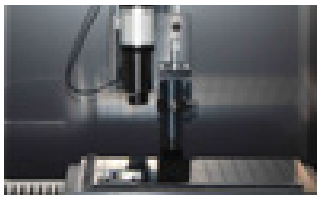


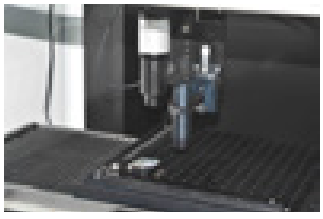



The Holmarc Precision Motorized Diamond Glass Scriber/ Cutting system features a flatbed table with strategically placed holes. These holes are connected to an air fan located beneath the flatbed. The purpose of this design is twofold: it creates an air cushion to facilitate the smooth movement of glass during registration, and it can also generate vacuum suction to securely hold the glass in position. The scribing method employed is the diamond scriber, and the cutting size is 300 x 300 mm (12 x 12 inches). The system can handle glass substrates as small as 5 x 5 mm and has a maximum cutting thickness of 3 mm. Users can adjust the cutting pressure, and a pressure sensor is included. The controller for this system is the HOLMARC XYZ Stepper controller unit, and scanning capabilities are programmable There are holes in the flatbed. The holes are connected to an air fan located under the flatbed. It is used to create an air cushion for the free movement of glass when registration, or to create vacuum suction to hold the glass in position.

Cutting Table Bed	Flatbed table
Scribing Method	Diamond Scriber
Cutting size	300 x300 mm (12 x 12'')
The minimum size of the substrate	5 x 5 mm.
Max. The cutting thickness for the glass substrate	3 mm
The cutting pressure	Adjustable
Pressure sensor	Yes
Controller	HOLMARC XYZ Stepper controller Unit
Scanning	Programmable









Q-SWITCHED

20mmx200mm, 15mmx150mm & 10mmx100mm

SELECTABLE SCRIBBING / ABLATION / CUTTING AREA

CMOS

20MP CAMERA

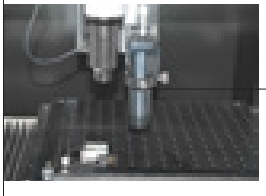
Digital inspection/measuring positioning microscope

Equipment Type	Upright					
Effective Magnification	0.5-5X					
Magnification	0.5X	1.0X	2.0X	3.0X	4.0X	5.0X
Working distance(mm)	100	100	100	100	100	100
Depth of field (mm)	3.48	0.93	0.29	0.16	0.10	0.07
N.A(mm)	0.023	0.043	0.043	0.085	0.0970	0.107
Resolution (mm)	0.015	0.008	0.005	0.004	0.003	0.003
Distortion	2.97%	1.10%	0.20%	-0.03%	0.13%	0.20%
Supporting sensor size	1" Max.					
Vision	Digital PC Based software for measurements					
Working Distance	100mm					
Mount	C-Mount					
Working Distance Tolerance	±1mm					
Illumination for imaging	Bottom, and Co-Axial HB-LED Based					
Illumination Control	Continuously Variable PC-controlled					



CAMERA SPECIFICATIONS

	:	
Sensor Type	:	CMOS
Array Diagonal	:	15.86mm
Resolution	:	0MP, 5472(H) x 3648(V)
Pixel Size	:	2.4μm x 2.4μm
Effective Area	:	13.1mm x 8.8mm
Frame Rate	:	15fps@5472x3648
Exposure Time	:	18μs-15s
Bit Depth	:	16/8bit
Camera Size	:	68mmx68mmx46mm
Data Interface		USB3.0



Mapping Stage

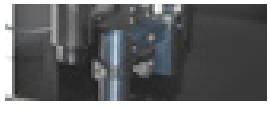
Stage	:	Precision Automatic XYZ stage with Z-axis Automated
Focus Function	:	
FOCUS and XY	:	Motorized servo motor controlled
Resolution	:	1 Micron
Positioning Accuracy	:	10 Micron with encoder
XY Stage Footage	:	450x450mm
Scanning Speed	:	40mm/sec
Controller	:	HOLMARC XYZ Stepper controller Unit



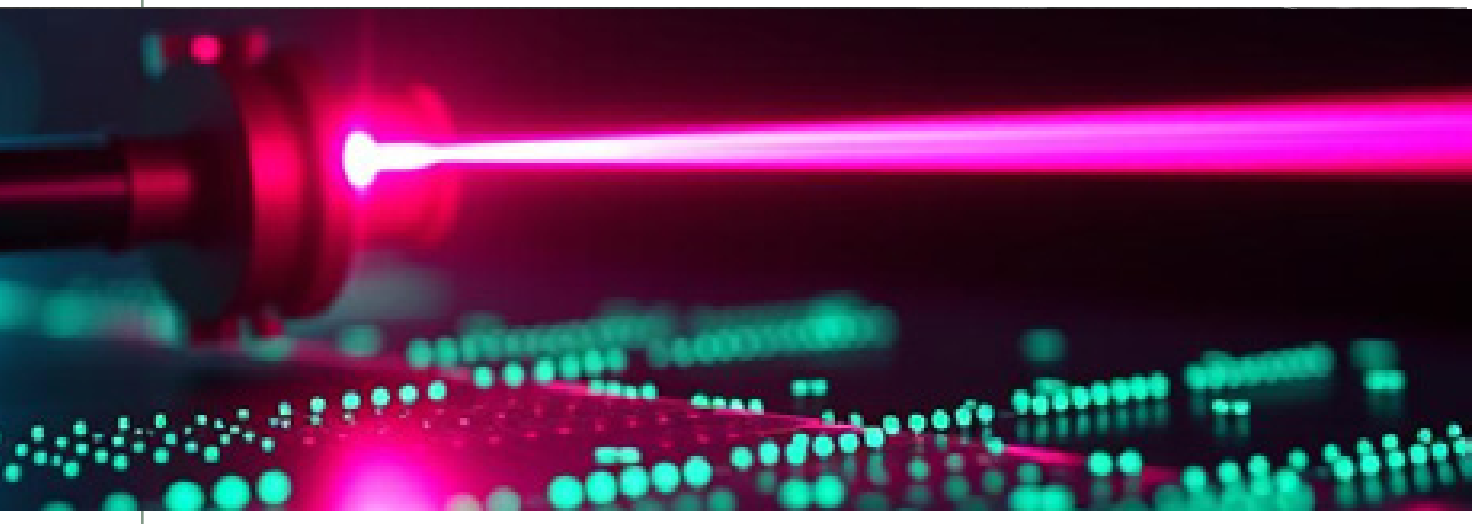
1064/532nm Scribing/ablation/Cutting Laser Specifications

532nm and 1064nm solid-state AOM Q-switched lasers have the features of high peak power, high repetition rate, and short pulse duration.

Laser 1	532nm LD PUMPED ALL-SOLID-STATE AOM Q
SWITCHED LASER	
Wavelength (nm)	532±1
Operating mode	Acousto-Optic Q-switched
Average power (W)	20W@ 50kHz
Average power (W)	Single pulse energy (mJ) * Rep. rate (kHz)
Single pulse energy (μJ)	>400uJ @50kHz
Rep. rate (kHz)	50~100
Pulse width (ns	~11@50kHz
Transverse mode	TEM00
Beam Circularity (%)	>85
M2 factor	<1.3
Warm-up time (minutes)	<10
Beam divergence, full angle (mrad)	<2
Beam diameter at the aperture	(1/e2, mm) ~3
Beam height from base plate (mm)	91
Cooled method Water Cooled	
Operating temperature	10~35 (°C)
Supply Voltage	100-240VAC or 24VDC
Dimension	640*260*124mm
Laser 2	1064nm LD PUMPED ALL-SOLID-STATE AOM Q-SWITCHED LASER
Wavelength (nm)	1064±1
Operating mode	Acousto-Optic Q-switched
Average power (W)	35W@ 50kHz
Average power (W)	Single pulse energy (mJ) * Rep. rate (kHz)
Single pulse energy (μJ)	700uJ @50kHz
Rep. rate (kHz)	50~100 Pulse width (ns) ~11@ 50kHz
Transverse mode TEM00	
Beam Circularity (%)	85
M2 factor	1.3
Warm-up time (minutes)	<10
Beam divergence, full angle (mrad)	<2
Beam diameter at the aperture (1/e2, mm)	~3
Beam height from base plate (mm) 91	
Cooled method Water Cooled	
Operating temperature :10~35 (°C)	
Supply Voltage	100-240VAC or 24VDC



Laser Induced Current Measurement



Confocal Real-time Laser Beam Induced Current and Photoluminescence Measurement Unit

The system uses a high-sensitivity APD with an onboard circuit optimized for APD evaluation. It can detect optical signals from fixed light (DC light). It also features a built-in temperature-compensated bias power supply.

Microscope

Equipment Type	Upright
Optical System	Colour Corrected Infinity Optical System
Sample Stage	Stepper motor controlled
Objectives	10x, 20x, 40 x, 60X confocal objective lens
Objective Turret	Motorized positioning
Filter Selection Unit	Motorized
Tube Length	200 mm
FOCUS	Motorized Stepper motor controlled Illumination for imaging: Co-Axial HB-LED Based Illumination Control: Continuously Variable PC-controlled

Scanning Stage

Scanning Area	250x250mm
Mapping resolution	1μm
Absolute positioning accuracy	5μm
Construction	Aluminium alloy on any rust-free Finish: Black anodized
Linear guide	Recirculation block and rail Drive: Rolled ball screw, pitch 4 mm
Actuator	Stepper motor
Maximum speed	16 mm/sec
Limit switch	Optical Limit switch on both ends Pay-Load: 8 Kg
Controller	HOLMARC XYZ Stepper Controller Unit with Joystick.

Probe Tip

Current Rating	1 Amp
Voltage Rating	Based on placement distance
Operating Temperature	-40^{o}C to +125^{o}C
Contact Material	Brass
Contact Plating	Gold over Nickel

Micromanipulator

4 Axis Micromanipulator (XYZ & Tilt)

Model	MIM-4A-10
4Travel	XYZ 10 mm & +/- 3 degree



www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

Camer Specifications

20MP CMOS for Imaging	
Sensor model	Sony
Quantum efficiency	84%@535nm
Resolution	5472(H)x3648(V)
Pixel size	2.40μmx2.40μm
Sensor size	15.86mm; 1inch
Shutter mode	Rolling
Frame rate	14fps @5472x3648, 53fps @2736x1824, 67fps @1824x1216
Binning	2x2, 3x3, 4x4
Exposure settings	Auto/Manual
Picture format	JPG/PNG/TIFF/DICOM
Data interface	USB3.0
Bit depth	16bit/8bit
Power supply	12V





Keithley 2450SMU Instrument

Source Meter	Keithley 2450SMU Instrument
Voltage-Ranges	20 mV – 200 V depending on the selected voltage range
Current-Ranges	10 nA – 1 A depending on the selected current range 0.012% Basic Accuracy
Wideband Noise	2 mVrms Typ
Sweep Types	Linear, Log, Dual Linear, Dual Log, Custom,
Source-Memory (SCPI 2400 Mode)	
>250,000 Point Reading Buffer	
>250,000 Point Reading Buffer	
>3000 Readings/ Second	
SCPI (2400 + 2450) + TSP Programming	
GPIB, USB, Ethernet (LXI)	
Front	Banana Jacks
Rear	Triax

Detector

Detector	High-sensitivity type, Active area: 3.0 mm
Type	High-sensitivity type
Effective photosensitive area	3.0 mm
Temperature stability of gain (typ.)	±2.5 %
hotoelectric sensitivity (typ.)	-1.50 × 108 V/W
Cooling	Non-cooled
Low Band Cut-off Frequency (typ.)	DC MHz
High Band Cut-off Frequency (typ.)	0.1 MHz
Response time	10 microseconds
Supply voltage (typ.)	±12 V
Measurement condition	M=30
Photoelectric sensitivity	λ=800 nm, Temperature stability of gain: 25±10 λ, M=30
Optical Coupling	Free space/Fiberoptic
Input Fiber	NA 0.22
Laser Wavelengths	405nm, 532nm and 655nm MLL-III-405-50mW, MLL-III-532-50mW & MLL-III-655-50mW
High output power stability	CW, line width<0.2nm, beam diameter <1.5mm, beam divergence<1.5mrad, PSU-III-FDA Tunable output power via control knob & PC Controlled Operation
Laser Spot Size	2μm - 50μm selectable via objective lens

Light Beam Induced Current (LBIC) Measurement

Model : HO-SC-QE-C1

Light Beam Induced Current (LBIC) measurement Laser-based solar PV response mapping / Ideal for quality control & identification of Defects. This is a valuable tool for defect analysis in solar cells used to measure the spatial distribution of recombination active defects in solar cells. It works by illuminating a laser beam onto a solar cell and measuring the resulting current. The current is higher at locations where there are more recombination defects, so by scanning the laser beam across the solar cell, a map of the defect density can be created.

Our instrument uses three lasers with wavelengths of 405nm, 532nm, and 655nm to measure the spatial distribution of recombination active defects in solar cells. The different wavelengths allow us to probe different depths within the solar cell, which helps us to identify defects that are located at different layer.

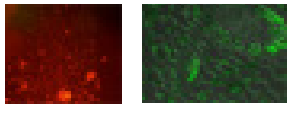
LBIC is a well-established method primarily used in the photovoltaic sector for spatially resolved measurements of recombinationactive defects in ready-processed solar cells.

Holmarc Laser Beam Induced Current (LBIC) systems Model : HO-LBIC-3LC provide rapid, high-resolution mapping of the photovoltaic response in solar cells across large areas, from individual cells to entire modules. These systems are ideal for measuring photovoltaic active regions, identifying defects, shunts, inactive areas, and coating errors.

The low-noise design ensures immunity to external light interference, and they are available in both single-wavelength and multiwavelength confgurations for testing various photovoltaic responses.

Real-Time Photoluminescence (PL) Measurement / Mapping System

Photoluminescence spectroscopy offers valuable insights into the electronically excited states of molecules and substances following light absorption.Holmarc provides various accessories for photoluminescence (PL) detection and mapping. In parallel, Light Beam Induced Current (LBIC) helps identify defects in solar cells. By combining these techniques, we enhance our understanding of photovoltaic materials and their behavior.



Accessories

1. Calibrated Reference Cell with Quartz Window
   The Solar Reference Cell consists of a 20 x 20 mm monocrystalline silicon Photovoltaic Cell encased in a 92 x 70 x 16 mm metal enclosure with a protective quartz window and a temperature sensor.
2. The temperature sensor is a 100 ohm platinum Resistance Temperature Detector (RTD).
3. The Solar Reference Cells come with an ISO/IEC 17025 accredited certificate of calibration and a compatible set of connecting cables.
4. The certificate includes:
5. Isc, Imax, Voc, Vmax, Pmax, Spectral Correction, Fill Factor, Area, and Efficiency.
6. Measurements are made in accordance with ASTM E948 and E1021, traceable to NIST and NREL

Keithley 2450SMU Instrument

Source Meter	Keithley 2450SMU Instrument
Voltage-Ranges	20 mV – 200 V depending on the selected voltage range
Current-Ranges	10 nA – 1 A depending on the selected current range 0.012% Basic Accuracy
Wideband Noise	2 mVrms Typ
Sweep Types	Linear, Log, Dual Linear, Dual Log, Custom,

Source-Memory (SCPI 2400 Mode)
>250,000 Point Reading Buffer
>250,000 Point Reading Buffer
>3000 Readings/
Second
SCPI (2400 + 2450) + TSP Programming
GPIB, USB, Ethernet (LXI)

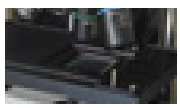
Front	Banana Jacks
Rear	Triax





XY Scanning Stage

Scanning Area	250x250mm
Mapping resolution	1μm
Absolute positioning accuracy	5μm
Construction	Aluminium alloy on any rust-free
Finish	Black anodized
Linear guide	Recirculation block and rail
Drive	Rolled ball screw, pitch 4 mm
Actuator	Stepper motor
Maximum speed	16 mm/sec
Limit switch	Optical Limit switch on both ends
Pay-Load	8 Kg
Controller	HOLMARC XYZ Stepper Controller Unit with Joystick.



Probe Tip

Current Rating	1 Amp
Voltage Rating	Based on placement distance
Operating Temperature	-40^{o}C to +125^{o}C
Contact Material	Brass
Contact Plating	Gold over Nickel



Laser

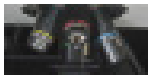
Wavelengths	405nm, 532nm and 655nm MLL-III-405-50mW, MLL-III-532-50mW & MLL-III-655-50mW High output power stability, CW, line width<0.2nm, beam diameter <1.5mm, beam divergence<1.5mrad, PSU-III-FDA Tunable output power via control knob & PC Controlled Operation
Laser Spot Size:	2μm - 50μm selectable via objective lens

Sample Inspection Camera

20MP CMOS for Imaging	
Sensor model	Sony
Quantum efficiency	84%@535nm
Resolution	5472(H)x3648(V)
Pixel size	2.40umx2.40um
Sensor size	15.86mm; 1inch
Shutter mode	Rolling
Frame rate	14fps @5472x3648, 53fps @2736x1824, 67fps @1824x1216
Binning	2x2, 3x3, 4x4
Exposure settings	Auto/Manual
Picture format	JPG/PNG/TIFF/DICOM
Data interface	USB3.0
Bit depth	16bit/8bit
Power supply	12V

Microscope

Equipment Type	Upright
Optical System	Colour Corrected Infinity Optical System
Sample Stage	Stepper motor controlled
Objectives	10x, 20x, 40 x, 60X confocal objective lens
Objective Turret	Motorized positioning
Filter Selection Unit	Motorized
Tube Length	200 mm
FOCUS	Motorized Stepper motor controlled Illumination for imaging: Co-Axial HB-LED Based Illumination Control: Continuously Variable PC-controlled



Micromanipulator

Type	4 Axis Micromanipulator (XYZ & Tilt)
Model	MIM-4A-10
4Travel	XYZ 10 mm & +/- 3 degree

Impedance Tube



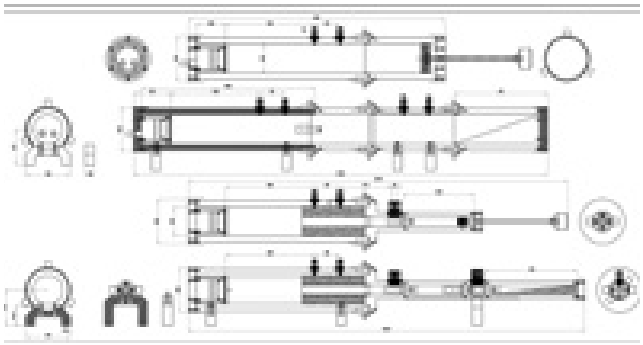
HOLMARC's Impedance tube apparatus is designed to measure acoustic absorption, reflection and transmission loss of symmetric & non symmetric materials according to ASTM standards. The metallic design of the impedance tube with a piston support is dedicated to measure reflection, transmission & absorption coefficients of different solid materials. For measurement analysis, we have software controls, the instrumental design as well as operations are based on ASTM standards. Two microphone method for reflection coefficient analysis & four microphone method (For absorption & Transmission analysis) are used. 4-port USB Hub (USB3.0) is used for sound card function which is then connected to computer. The dedicated software is used to configure the speaker & microphones according to requirements. Impedance tubes have a lot of applications in different industries such as automobile, musical instruments etc... Since the whole system is calibrated and operated according to ASTM standards you can obtain the required result in a single click on your PC installed with HOLMARC's software. The scanned result can be exported as an excel file. The flange is available in centre of tube to fix the different materials according to ASTM dimensions. We have a designed control box to control the amplitude of sound signal transmitted through the tube. Holmarc offers the complete set of Impedance Tube system, which includes: hollow tubes, microphones, sample holders, DAQ unit and measurement software as per international standards. The tube is designed using anodized aluminum to measure sound absorption coefficient and transmission loss as per test standards described in ISO 10534-2, ASTME1050 & ASTM E2611 at normal incident, that is, 0°. The measurement is based on transfer function method which separates the incident and reflected energy from the measured transfer function, and then estimates the acoustic properties of the test sample. The properties measured with this test method are useful in basic research and product development of sound absorptive materials

TUBE	LARGE	SMALL
Frequency Range	100Hz – 1600 HZ	500Hz – 6300HZ
Inner Diameter	100 mm	29mm
Sample Holder Inner diameter	100 mm	29 mm
Sample Holder Max length	200 mm	200 mm
Scanning Frequencies	1/3 Octaves	
Standard	ISO10534–2, ASTME1050, ASTME2611	
Value to be Measured	Sound Absorption Coefficient (α) and Transmission Loss (TL)	
Loud Speaker	3½ "in diameter, 30 Watts, 4 Ohm	
Microphone	1/4" in diameter, -3dB at 1.5V sensitivity, 20 -16,000 Hz frequency response	
Measurement software	Holmarc Wave Analyzer 4C	

PRODUCT FEATURES

- Measurement is based on transfer-function method according to ISO10534–2 and ASTME1050 international standards for absorption coefficient and ASTME2611 for transmission loss.
- Built-in Sine Wave generator & power amplifier.
- Quick and simple to use.
- Two kind of tube to measure full range frequencies.
- Measure in 1/3 octave frequencies.
- Measure other normal incident material properties like reflection coefficient,
- impedance ratio, resistance ratio, reactance ratio, admittance ratio, conductance
- ratio, susceptance ratio, transmission coefficient, propagation wave number in
- material, characteristic impedance in material as per ASTM standards.
- Data measured on different tubes can be combined into full-frequency.
- Direct data export to excel sheet and print report

Transmission loss measurement - Full tube

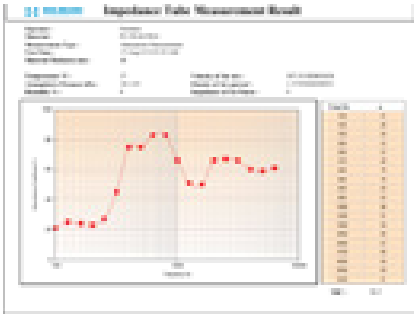


SAMPLE FOAM

Impedance tube is fitted with a 200mm sample holder to accommodate a variety of samples.



PU FILM



Tube with Built in Loud Speaker

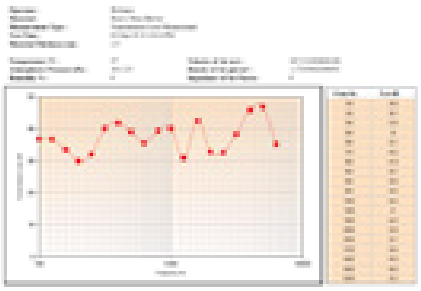
100 mm transmission loss System

extension tube.

anechoic tube.

HEAVY MASS BARRIER

100 mm anechoic tube.



100 mm transmission loss measurement sample holder.

29 mm absorption measurement sample holder.

100 mm absorption measurement sample holder.

100Hz -1600 Hz	100mm	100mm
Frequency Range	Inner Diameter	Sample Holder

Microphone

29 mm connecting tube.

HO-AE-ITA219

Speaker Connector



HOLMARC OPTO-MECHATRONICS LTD

Custom Impedance Tube

We can provide our ITA-219 Impedance tube setup with 1/4" LEMO Pressure Standard Microphone Set, GRAS 42AG Multifunction Sound Calibrator. It can be used to measure specific impedances, sound absorption coefficients (SACs), sound transmission losses (STLs) and acoustic properties (characteristic impedances, propagation wave numbers, effective densities, bulk moduli) of acoustic materials in normal incidence conditions.

GRAS 42AG Multifunction Sound Calibrator is a portable, battery operated sound source for calibration and check of microphones and sound level meters. It is designed for field use and comes with a protective casing. It conforms to the requirements in IEC 60942 for a class 1 sound calibrator. It can produce a sinusoidal signal of 250 Hz or 1 kHz at 94 dB or 114 dB. For documentation purposes, 42AG provides display of the environmental conditions: ambient air pressure, temperature. The sound is generated by a small loudspeaker integrated in the acoustic coupler. An internal reference microphone measures the level in the coupler and a feed back circuit automatically adjusts the level. Therefore, the calibration level is virtually independent of ambient conditions like temperature, atmospheric pressure and humidity within the specified range of operation.

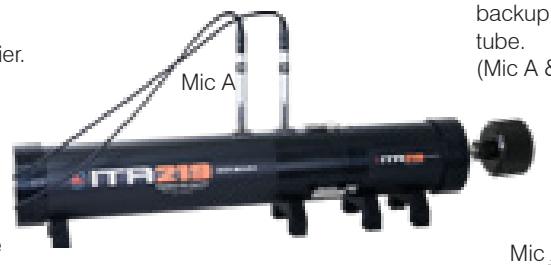
GRAS 46BP-1 is typically used for sound pressure, high frequency, and high level pressure measurements. It is suitable for general purpose acoustic measurements in couplers and at boundaries. The microphone in the 46BP-1 is very versatile when connected to the RA0086 Transmitter Adapter for 1/4" Microphones. The 46BP-1 becomes a high impedance sound source when the RA0086 takes a calibration signal directly from the signal generator and makes the microphone behave like an electrostatic loudspeaker. When used for calibrating an acoustic coupler, this gives a frequency response that is as good as when the 46BP behaves like a microphone. A front-vented version is available, 46BP-1-FV 1/4" LEMO Pressure Microphone Set, Front Vented Regarding temperature range, see the Specifications. Should higher temperature limits be required, we recommend considering the GRAS probe microphones where the microphone and preamplifier can be isolated from the hot source.



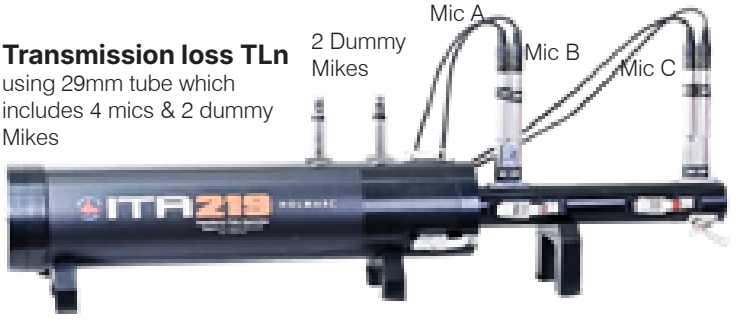
PRODUCT FEATURES

- Measurement is based on transfer-function method according to ISO10534–2 and ASTME1050 international standards for absorption coefficient and ASTME2611 for transmission loss.
- Built-in Sine wave generator & power amplifier.
- Quick and simple to use.
- Two kind of tube to measure full range frequencies.
- Measure in 1/3 octave frequencies.
- Measure other normal incident material properties like reflection coefficient,
- impedance ratio, resistance ratio, reactance ratio, admittance ratio, conductance
- ratio, susceptance ratio, transmission coefficient, propagation wave number in
- material, characteristic impedance in material as per ASTM standards.
- Data measured on different tubes can be combined into full-frequency.
- Direct data export to excel sheet and print report

Absorption measurement
with two microphones & backup piston unit for 29mm tube.
(Mic A & MicB only)



Transmission loss TLn
using 29mm tube which includes 4 mics & 2 dummy Mikes



SPECIFICATIONS - HO-SO-ITA219C3

TUBE	LARGE	SMALL
Frequency Range	100Hz – 1600 HZ	500Hz – 6300HZ
Inner Diameter	100 mm	29mm
Sample Holder Inner diameter	100 mm	29 mm
Sample Holder Max length	200 mm	200 mm
Scanning Frequencies Standard	1/3 Octaves ISO10534–2, ASTME1050, ASTME2611	
Value to be Measured	Sound Absorption Coefficient (α) and Transmission Loss (TL)	
Loud Speaker	3½ "in diameter, 30 Watts, 4 Ohm	
Microphone	GRAS 46BP-1 1/4" LEMO Pressure Standard Microphone Set Freq range: 4 Hz to 70 kHz Dyn range: 39 dB(A) to 172 dB Sensitivity: 1.5 mV/Pa	
Measurement software	Holmarc Wave Analyzer 4C	

GRAS 46BP-1 Compatibility

To perform as specified, the GRAS 46BP-1 microphone set requires a power module or an analyzer input which can supply the preamplifier with power as well as 200 V polarization voltage for the microphone.

The microphone set is terminated with a 5-pin mini LEMO connector. Ready to use cable assemblies with LEMO connectors of various types and lengths are available in standard as well as customized lengths.

The 46BP-1 is IEEE 1451.4 TEDS 27v. 1.0 compliant. If your measurement platform supports Transducer Electronic Data Sheets you will be able to read and write data like properties and calibration data.

MODEL NO: HO-SO-ITA219C3

GRAS 46BP-I I/4

Multifunction Sound Calibrator



100Hz -1600 Hz
Frequency Range

100mm
Inner Diameter

100mm
Sample Holder

HOLMARC OPTO-MECHATRONICS LTD

Lees Disc Apparatus


Concept Art

Model: HO-AE-LD18

Holmarc Opto-Mechatronics Limited's Lee's Disc apparatus is an essential tool in the textile industry for assessing the thermal conductivity of fabric materials. This instrument is used to measure how well a textile conducts heat, which is crucial for evaluating the comfort and insulation properties of fabrics. The Lee's Disc apparatus consists of two brass discs with heating elements, between which the textile sample is placed. By monitoring the heat transfer through the fabric, this device provides precise thermal conductivity measurements, enabling manufacturers to select the best materials for various applications, such as clothing, upholstery, and technical textiles. The accuracy and reliability of Holmarc's Lee's Disc apparatus ensure that textile products meet the necessary quality standards and performance requirements, contributing to the overall efficiency and effectiveness of the production process.

ASSESSING THERMAL CONDUCTIVITY

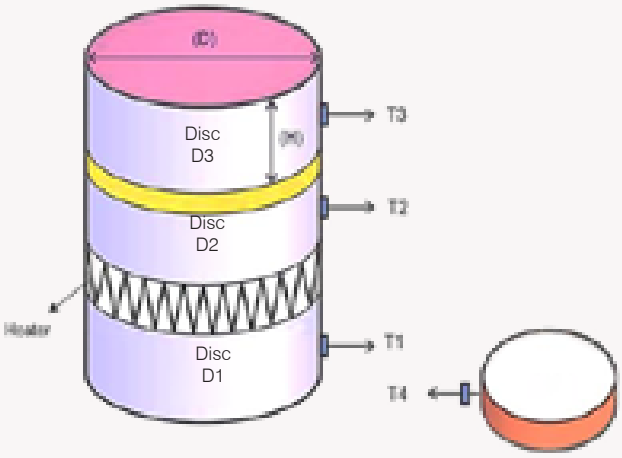
FOR POLYMER MATERIALS

PRECISE MEASUREMENTS

QUALITY AND PERFORMANCE

FRATURES

- New and integrated design
- Measure thermal conductivity of different materials
- LCD display readout for accurate measurement
- Manual and auto measurements using a single system
- Easy to use equipment



Experimental setup for Lee's Disc steady-state thermal conductivity measurement

DETERMINE THERMAL CONDUCTIVITY OF BAD CONDUCTORS (GLASS, NYLON, PLYWOOD, ETC.) IN THE FORM OF A DISC US ING LEE'S METHOD.

Four discs are used in this apparatus for much more accurate results. D1 and D2 are heating discs. D3 is the Lee's disc and D4 is for measuring the brass atmospheric temperature behaviour. In Auto mode, we use all these 4 disc temperature data for finding the result.



Conductivity Cell Measurement Setup



Model: HO-AE-CCM18

HOLMARC'S Model: HO-AE-CCM18 is a computerized conductivity setup to measure the conductivity of the semi conducting thin film samples by varying temperature in vacuum.

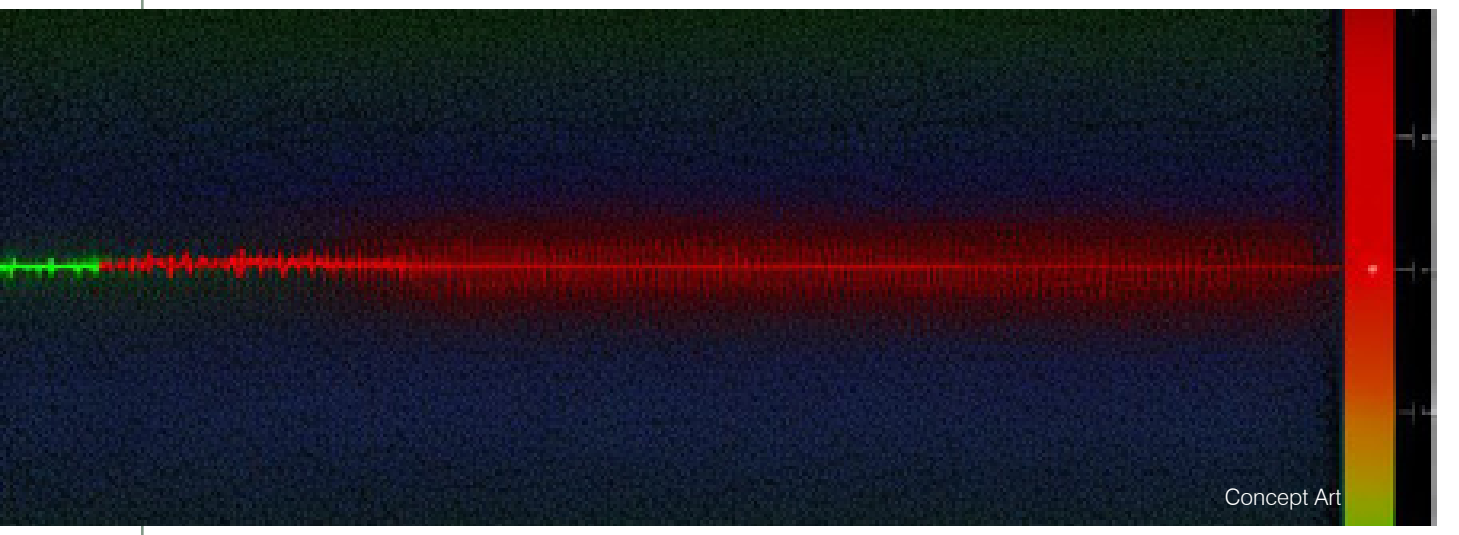
Temperature of the sample at the time of measurement can be set at a range of ambient to 150°C. The conductivity is measured at different points of temperatures, by applying a voltage range from 0 - 300V and measuring the resulting current. A curve of current is recorded and plotted against temperature by the software. The process is carried out inside a vacuum chamber of up to 10-2 mbar vacuum pressure. Rotary vacuum pump is supplied along with the instrument.

SPECIFICATIONS

Temperature range	Ambient to 150°C
Sample holder diameter	5 cm (Suitable for standard laboratory glass slide)
Drive voltage	0 to 300V
Measurement resolution	0.1 nA
Measurement accuracy	1 nA
PC interface	RS 232



Z - Scan Characterization Kit



Characterization of Transparent Optical Materials

The Z-Scan technique is a simple and popular experimental technique used to measure intensity dependent nonlinear susceptibilities of materials. Holmarc's Z-Scan System is a simple implementation of the z-scan technique that can be used to characterize optical materials.

In this method, the sample is translated along the axis of a focused Gaussian beam, and the far field intensity is measured as a function of the sample position. Analysis of the intensity versus sample position, Z-Scan curve, predicated on a local response, gives the real and imaginary parts of the third order susceptibility. In this technique, the optical effects can be measured by translating a sample in and out of the focal region of an incident laser beam.

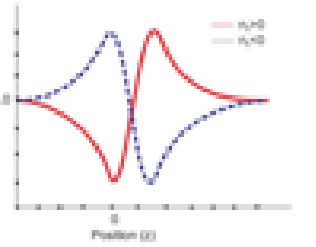
Holmarc's Z-Scan System includes precision motorized stage for linear scanning, photo diode assembly along with mechanical mounts and control electronics for motion control and data acquisition. High power 532 nm CW DPSS Laser is used as the light source. Parameters like travel distance, data acquisition intervals etc. can be programmed using computer Interface.

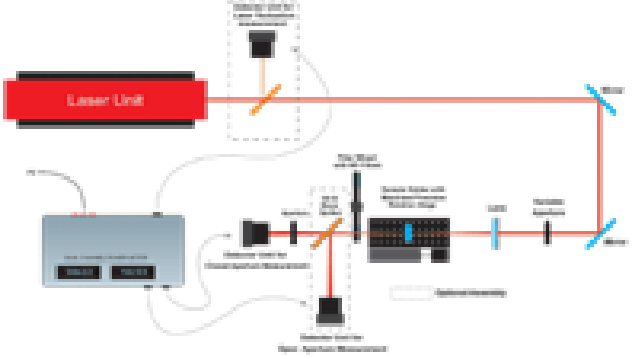
Experiment

To measure intensity dependent nonlinear susceptibilities of materials

Features

- 532nm CW DPSS Laser
- Photo detector with spectral response range of 320 - 1100 nm
- Optical breadboard make the system flexible
- User - friendly software
- Live plot during scanning





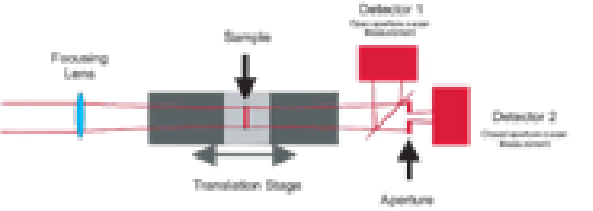


Photo Detector with Mount

Kinematic Mirror
Mount with Mirror

Variable Beam
Splitter with Mount

Achromatic Lens
with Mount

ND Filter Wheel

Filters : 6 nos
Type : Absorptive
Optical Density : 1, 2, 2.3, 3, 3.3 & 4
Material : NG4 & Ng9
Surface Quality : 40 - 20 (scratch-dig)
Clear Aperture : 90%
Surface Flatness : λ/4 @ 632.8 nm
Quantity : 1 no.



Cuvette with Holder

Laser Source with Mount

Variable Aperture with
Mount

Aperture Wheel
with Selectable
Apertures

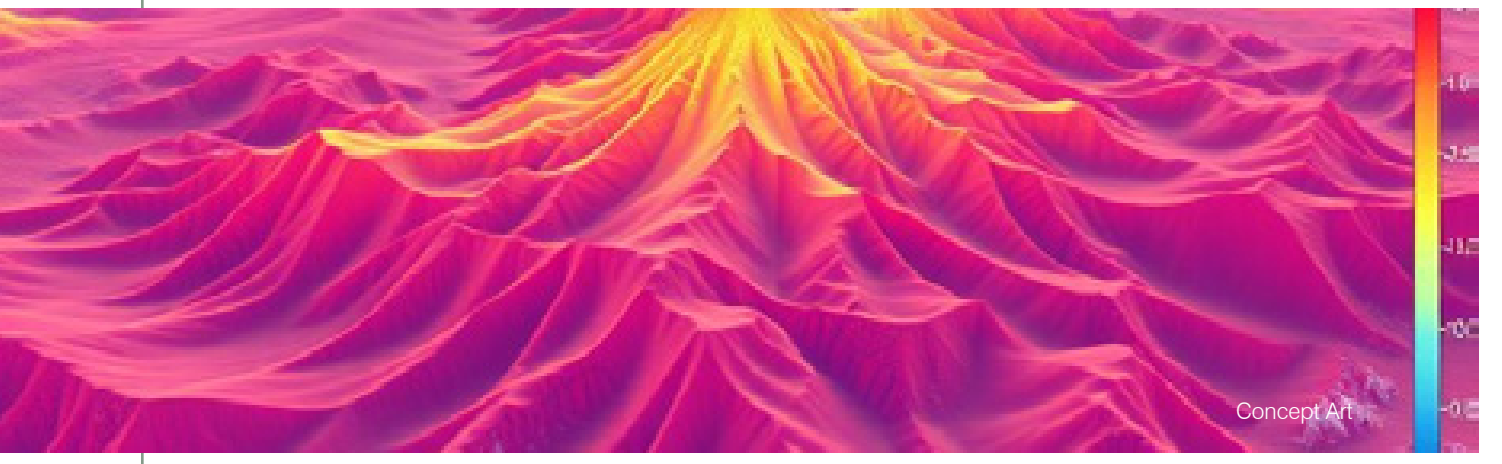


Motorized Linear Translation
Stage

Optical Breadboard with Support

Dual Channel Control Unit

Electronic Speckle Pattern Interferometer (ESPI)



Model: HO-AE-ESP18

Electronic Speckle Pattern interferometry (ESPI) is a non-destructive optical method for studying surface deformations. It relies on the interference between diffusely reflected light from the test object and a reference beam.This is one of the most sensitive interferometric technique, so that we can measure sub-micron level displacements either in plane or out of plane. The images before and after deformation are recorded by a CCD camera and analysed using an image analysis software. Deformation causes variations in the fringe pattern.These variations can be analized with the help of the software provided to find the deformations.

As this interferometer is highly sensitive to vibrational noises, Holmarc's ESPI comes with a Vibration isolation optical breadboard. A linearly polarized 632.8nm He-Ne laser with 5mW output power is used as the light source. A beam splitter splits the laser beam into two. The transmitted beam illuminates the test object uniformly via a spatial filter assembly while the reflected beam falls on a CCD as reference beam. The image of the illuminated test object is captured by zoom lens and CCD.

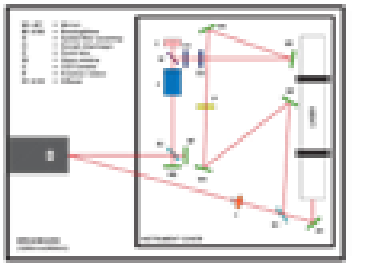
Our ESPI system allows the user to perform the Electronic Speckle Shearographic interferometry in the same system without disturbing the optical set ups and alignments. Holmarc's camera application software helps to capture and analyze the images.

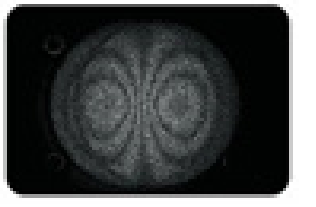
Experiment

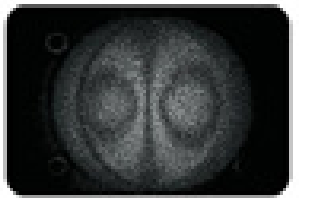
To observe and study the deformation of objects with respect to mechanical and thermal loads using electronic speckle pattern interferometer (ESPI)

To observe and study the deformation of objects with respect to mechanical and thermal loads using electronic speckle shearographic interferometer (ESSI)

Laser	He-Ne 5mW @ 632.8 nm
Beam expander	20 X microscope objective with pinhole
Zoom lens	Nikon ®
Camera	1/2.5" 5 MPC MOS Color
Software	Holmarc camera application software & image analysis software
Optical Breadboard	1200 x 900 mm size with vibration isolation support







Measurement under visible light is possible
Non contact and full field measurements
Object contour and displacement measurements

www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

Beamsplitter Mount
Mirror Mount
Test Object Mechanical Loader
Glass plate Holder with Mount
Diffuser Mount
Polarizer Rotator with Mount
Camera Lens Assembly with Mount
Beamsplitter
Mirror with Cell Supply
Glass Plate
Diffuser Plate
Heater with Control Unit



Helium Neon Laser



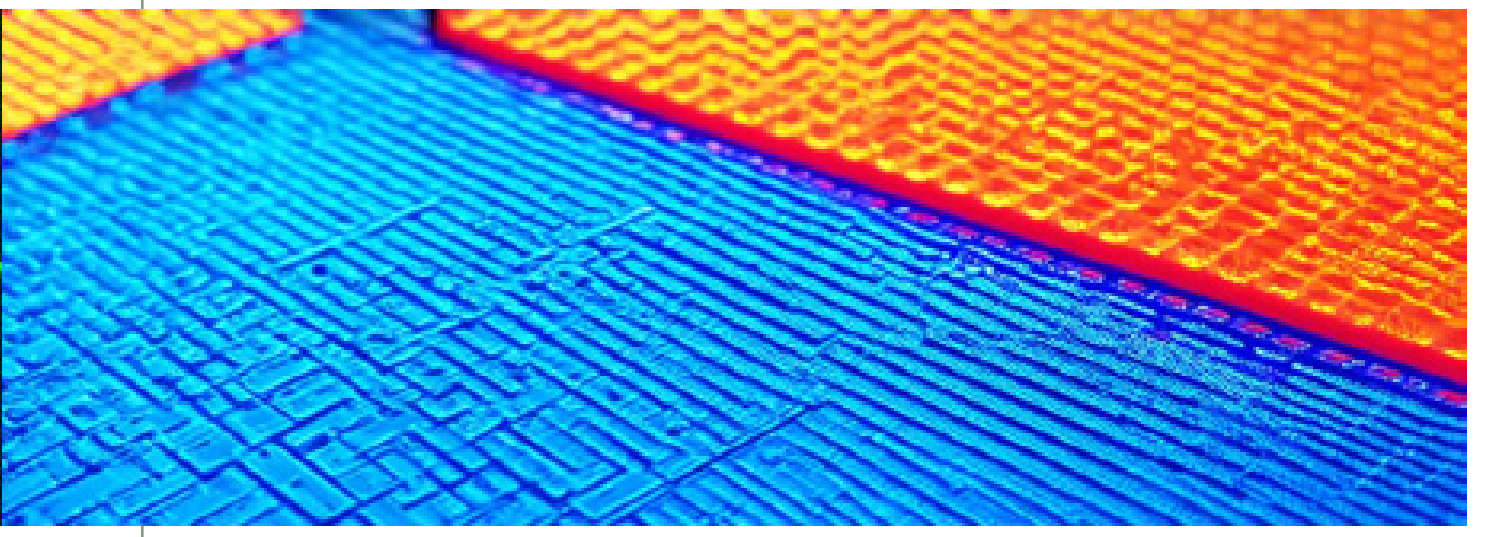
CCD Camera with Mount





Optical Breadboard with Support

Cyclical Force Generator

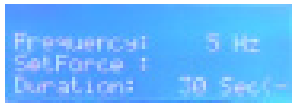


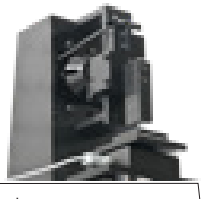
Cyclical Force Generator is used to provide cyclical impact on a piezoelectric sample for its characterization. The frequency and the force can be set using the front panel LCD and buttons. The force inducer plate is made of electrically insulating material. The measurement electronics is not included. Holmarc can supply the measurement electronics separately according to the application requirements, or the user can use their own measurement setup for the characterization. Three models are available which has different frequency ranges (10Hz or 20Hz) and sample thickness requirements (3mm, 15mm or 30mm).

	TBM-01	TBM-02	TBM-03
Motor type	AC Servo	AC Servo	Stepper
Required range of the force	1N to 100N with 1N increment	1N to 100N with 1N increment	1N to 10N with 1N increment
Force repeatability	+/- 2N	+/- 2N	+/- 2N
Range of frequency	1Hz to 20Hz with 1Hz increment	1Hz to 10Hz with 1Hz increment	1Hz to 10Hz with 1Hz increment
Maximum sample thickness	30 mm	30 mm	30 mm
Maximum compression of sample	3 mm *	15 mm *	20 mm *
Maximum sample area	100 x 100 mm	100 x 100 mm	100 x 100 mm
Built material and finish	Anodized Aluminium	Anodized Aluminium	Anodized Aluminium
Built material of force inducer plate and sample stage	Acetal resin (Delrin)	Acetal resin (Delrin)	Anodized Aluminium
Height adjustable sample loading platform			Adjustable up to 5 cm
Area of force inducer plate			100 x 100 mm
Dimensions of sample stage	100 x 100 x 15 mm	100 x 100 x 15 mm	100 x 100 mm
Dimensions of force inducer plate	1) 100 x 100 x 15 mm; quantity: 1No.	1)100 x 100 x 15 mm; quantity: 1No.	
	2) 80 x 80 x 15 mm; quantity: 1No.	2) 80 x 80 x 15 mm; quantity: 1No.	
	3) 60 x 60 x 15 mm; quantity: 1No.	3) 60 x 60 x 15 mm; quantity: 1No.	
	4)40 x 40 x 15 mm; quantity: 1No.	4) 40 x 40 x 15 mm; quantity: 1No.	
	20 x 20 x 15 mm; quantity : 1No.	5) 20 x 20 x 15 mm; quantity : 1No.	Adjustable up to 5 cm
Force sensor type	Load cell	Load cell	Load cell
Interface	Controller with LCD display	Controller with LCD display	Controller with LCD display
Power input	230 ± 10 V 50 Hz	230 ± 10 V 50 Hz	230 ± 10 V 50 Hz



TBM-01





Range of Force

1N to 10N with 1N increment

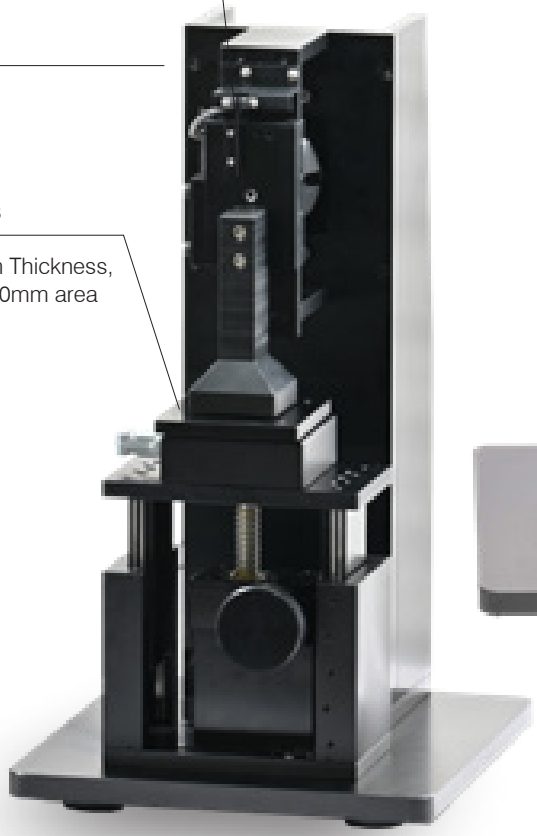
Compression

3 mm Maximum compression of sample

Samples

with 30 mm Thickness, 100mmx100mm area





TBM-02

Compression

15 mm Maximum compression of sample

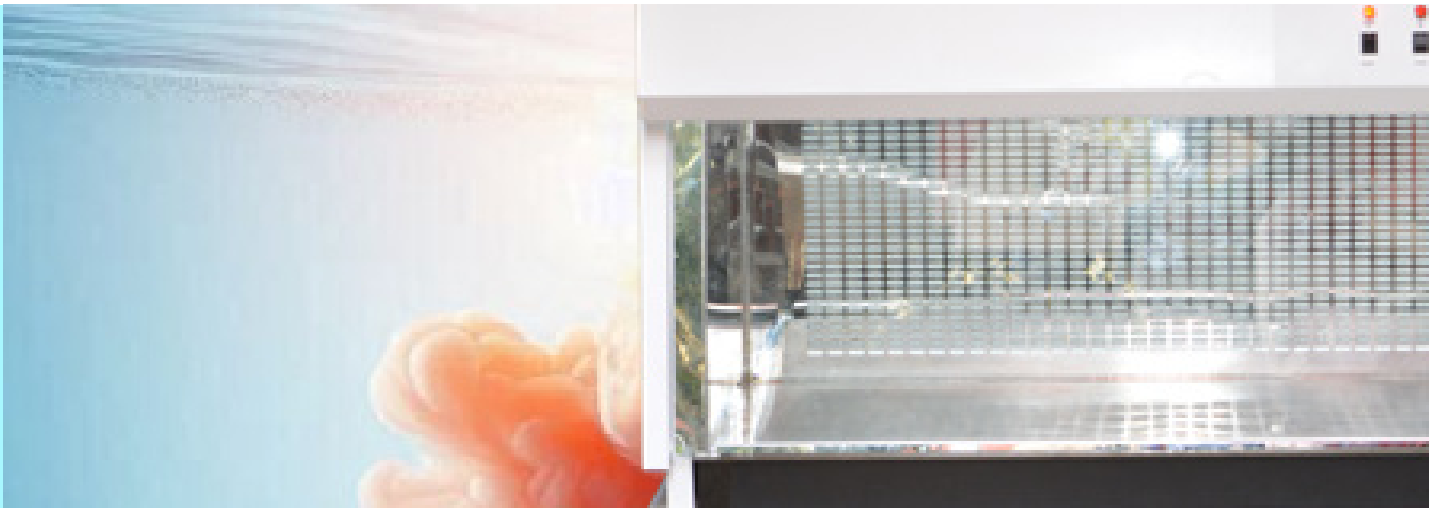


08

LAB EQUIPMENTS

350 LAB EQUIPMENTS
352 Laminar Flow Hood
352 Laminar Flow Work Table
354 Glove Box
356 Nano Fiber Electrospinning Unit
356 Nano Fiber Electrospinning Unit
360 Nano Fiber Electrospinning Unit with Support
364 Dual Pump Nano Fiber Electrospinning Unit
368 Dual Pump Nano Fiber Electrospinning Unit
372 Nano Fiber Electrospinning Unit
376 Nano Fiber Double Spinning & Yarning System
380 Industrial Electrospinning
380 Industrial Scale Needle-less Electrospinning Unit
382 Spray Pyrolysis Equipment Unit
382 Flame Assisted
382 Spray Pyrolysis Equipment
384 Spray Pyrolysis Equipment (Table Top)
386 Spray Pyrolysis Equipment
388 Vacuum Spray Pyrolysis
388 Automated Equipment
390 Programmable Multi-Nozzle
390 Spraying System
392 UV Ozone Cleaner
392 UV Ozone Cleaner 150
394 UV Ozone Cleaner 350 400
396 Silar Coating System
396 Silar Coating System
398 Silar Coating System
400 SILAR Coating System
400 with Overhead Stirrer
402 SILAR Coating System
402 with Magnetic Stirrer
404 SILAR Coating System with Magnetic Stirrer & Ultrasonic Bath
406 SILAR Coating System for Large Substrate
408 SILAR Coating System without heater and Stirrer
410 Dip Coating Unit
410 Dip Coating Unit
412 Dip Coating Unit
414 Dip Coating Unit
416 Angle Dependent Dip Coating Unit
418 Dip Coating Unit
420 Dip Coating Unit
422 Dip Coating Unit
424 Spin Coating Unit
432 Bench Top Rubbing Machine
434 Other Equipments
436 Thermocycler
438 Vacuum Oven and Ion Exchanger
440 Electrochemical Discharge
440 Machining System
442 Syringe Pump
446 Peristaltic Pump
448 4 Tesla Electromagnet - Magnet Lab
450 PC based water cooled electromagnet
452 Magnetic Stirrer and Hot Plates

Laminar Flow Hood



Laminar Flow Work Table

LMHH-TT Series

Laminar flow work tables are essential tools in various industries, particularly in fields where a clean and controlled environment is crucial for sensitive processes such as research, manufacturing, and experimentation. These tables provide a controlled airflow environment that minimizes particle contamination, ensuring optimal conditions for precision work, delicate experiments, and manufacturing processes. Among the range of laminar flow work tables developed by our company, we offer three distinct types, each tailored to specific applications:

Model No	Work table type	Mounting holes	Size of table
LMHH-TT 1200-600	Horizontal Flow Work Table with Optical Breadboard	M6 mounting holes on 25mm grid	1200 x 600 mm
LMHH 1200-600	Horizontal Laminar Flow Unit	Nil	1200 x 600 mm

1. Horizontal Flow Work Table with Optical Breadboard

This type of laminar flow work table combines the benefits of laminar airflow with the stability and versatility of an optical breadboard. The horizontal flow design ensures a uniform airflow across the work surface, minimizing the risk of particle contamination. The inclusion of an optical breadboard expands the utility of the table, allowing users to mount and align optical components with precision. This makes it particularly suitable for applications such as optical experiments, laser systems development, and photonics research where stability and cleanliness are paramount.

2. Horizontal Laminar Flow Unit

Our horizontal laminar flow unit offers a clean and controlled environment for a wide range of applications. With a horizontal airflow pattern, this unit provides a laminar flow of air across the work surface, effectively removing contaminants and ensuring a particle-free environment. This type of laminar flow work table is ideal for tasks requiring a clean workspace, such as electronics assembly, medical device manufacturing, and pharmaceutical compounding. Its versatile design makes it adaptable to various work environments, providing a reliable solution for maintaining cleanliness and precision in diverse applications



Glove Box

A glovebox (or glove box) is a sealed container that is designed to allow one to manipulate objects where a separate atmosphere is desired. Built into the sides of the glovebox are gloves arranged in such a way that the user can place their hands into the gloves and perform tasks inside the box without breaking containment. Part or all of the box is usually transparent to allow the user to see what is being manipulated. Two types of gloveboxes exist. The first allows a person to work with hazardous substances, such as radioactive materials or infectious disease agents, and the second allows manipulation of substances that must be contained within a very high purity inert atmosphere, such as argon or nitrogen. It is also possible to use a glovebox for manipulation of items in a vacuum chamber

The Cleaver Scientific Combi Box combines the benefit of UV sterilisation with the fully sealed and enclosed area of a glove box. Four 15W UV-C bulbs may be timer controlled for up to 30 minutes, or indefinitely, to decontaminate equipment and the work surface before and after use.
A side panel with safety interlock switches immediately disconnects the UV source to facilitate easy placement and removal of samples and packages, while a 15W white light bulb illuminates the entire work surface to provide excellent visibility. Two hermetically sealed non-UV transparent gloves afford the user total manoeuvrability and dexterity when handling equipment, samples and packages within the contained environment of the glove box, plus additional protection when working under the UV source.

Specifications

Glovebox Enclosure	
Material	Stainless steel (SS304), powder-coated exterior
Window	10 mm thick tempered glass/acrylic, anti-static coating
Chamber Size	Main: 1200 × 750 × 900 mm (W × D × H)
Glove Ports	2 ports (standard), 8” diameter with butyl gloves
Leak Rate	≤ 0.05 vol% per hour
Lighting	Internal LED illumination
Pressure Control	Automatic over/under-pressure protection with adjustable relief valves
Vacuum Gauge	Digital pressure display (mbar, Torr)
Airlock / Antechamber	Cylindrical, 300 mm dia × 400 mm depth, with independent vacuum pump line and purge valves

Atmosphere Control Unit

Gas Type	Nitrogen / Argon (selectable)
Purification System	Regenerable O_2 and H_2O removal (down to <1 ppm)
Gas Circulation	Closed loop, brushless blower, inert-gas safe
Regeneration	Fully automated with purge gas or forming gas
H_2O and O_2 Sensors	Integrated digital display, <1 ppm detection limit
Control Interface	Touch screen controller with safety alarms





Integrated Spin Coater

Spin Speed	200 – 8000 rpm (±1 rpm accuracy)
Substrate Size	Up to 2 inch (custom holders available)
Speed Control	Digital programmable interface (USB / RS232)
Operation	Foot switch or software-controlled inside glovebox
Vacuum Chuck	Integrated with built-in diaphragm vacuum pump
Bowl Material	Chemically resistant polymer (anti-solvent proof)

Optional Accessories

Hot Plate (GLBX compatible)	In-chamber annealing of perovskite films, up to 200°C
UV Ozone Cleaner	Pre-treatment of substrates (optional port required)
Solar Simulator Port	For connecting external AM 1.5 solar simulato
Glovebox-compatible Microscope	For alignment, inspection of micro-structures
Storage Rack / Desiccator Unit	For sealed sample storage in inert atmosphere
Solvent Purification Module	For safe handling of chlorobenzene, DMF, DMSO etc.
Purge & Safety Valves Kit	Extra purge connections for external devices

Power & Utilities

Requirement	Specification
Power Supply	230V ±10%, 50 Hz, Single phase
Compressed Gas Inlet	6 mm OD for N_2 / Ar
Vacuum Connection	KF16 port for pump connection

This glovebox setup is optimized for:
Spin-coating of perovskite precursor layers Thermal annealing in inert atmosphere Low-moisture and oxygen-sensitive process steps In-situ device testing and encapsulation

Nano Fiber Electrospinning Unit





Nano Fiber Electrospinning Unit

Floor Stand Unit

Model HO-NFES-040

Holmarc's HO-NFES-040 model electrospinning equipment is a complete unit for Nanofiber electrospinning. It is used to make nano and micro fibers ranging from 50nm to 5 microns in diameter. Many kind of polymers like Protein nanofibers, carbon nanotubes, inorganic nanofibers etc. can be synthesized using our nano fiber electrospinning unit. Our equipment uses horizontal spinning when compared to other equipments available in the market. This technology assures the quality of the spun fibers with no dip and uneven diameter. Its user friendly software, task oriented design, ease of operation and competitive pricing are certain features that place our equipment ahead of other products available in the market. Holmarc's HO-SPLF4 model syringe pump render a smooth and uninterrupted flow enabling uniform spinning. HMPSKV30 model high voltage power supply delivers 0-30 KV output voltage range with a maximum current capacity of 0.5 mA. A stationary target, an vertically moving target and Rotating mandrels of six different diameters are supplied along with the unit. HO-FH-01 model fume hood provides an enclosed atmosphere with transparent side walls to monitor the electro spinning process. The inbuilt heater can raise the process temperature up to 45°C. A common electronic control unit is integrated within the hood. The hood also has features like exhaust fan, granite work surface and optional features like high bright halogen lighting, duct of custom dimension to be connected to an exhaust duct available onsite etc.

ELECTROSPINNING

Independently Controlled Dual Channel Syringe Pump

Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

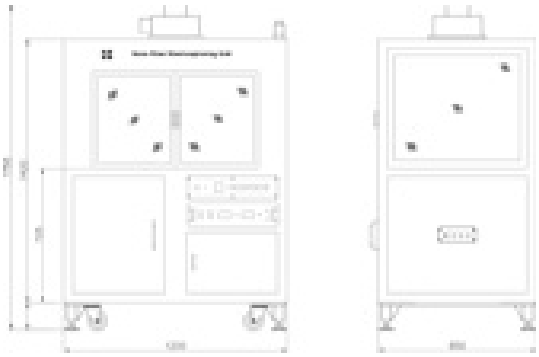


Rotating Mandrel

Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration





High Voltage Power Supply

Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection



Features

- Cabin Heating : Upto 45°C using 1000 watt coil heater
- The chamber is provided with Residual Charge Discharge Stick which is used for static removal.
- Safety switch provided to switch off H.V. Power supply when door is opened.
- LED cabin lighting and back light to view Needle tip and electro spin process.
- Exhaust fan is provided for solvent vaporization. It is also used for cooling down the equipment after spin process.
- Emergency stop is provided on the control panel to stop the equipment where there is any emergency.
- Coaxial spinneret : Our Nano fiber electrospinning unit is equiped with Coaxial spinneret which helps to produce Hollow nanofibers and Core / Sheath nanofibers. This technology can also be used to combine different characteristics of each polymer into one fiber.
- Graduation scale provided on the granite surface in X & Y direction which helps the end-user to achieve repetitive results by marking the positions of syringe pump and target.
- User friendly software enables PC interfacing that helps the regulation and control of various features like Rotating mandrel speed, Spin Duration, Syringe pump flow rate, vertical target movement etc.
- Rotating Mandrel targets of varying diameters, Stationary target and Reciprocating vertically moving target provided with the system.
- System hood has features like Exhaust fan, halogen lighting and transparent door for monitoring electrospinning process.
- Built-in Arc Protection Circuit

Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.
b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.



Specifications

I. High Voltage Power Supply

HOLMARC HO-NFES-040 comes with HMPSKV30 model high voltage power supply. It has 0 - 30kV output voltage range with a maximum current capacity of 0.5mA. Output voltage and current can be set using front panel knobs and readout from the digital panel meters.



Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection

II. Independently Controlled Dual Channel Syringe Pump

HOLMARC'S HO-SPLF4 model syringe pump provides indepedent control of two dual channel syringe pumps. The speed and flow rate can be changed on both to achieve custom fabrications of fibers. The Syringe pump also can be moved to and fro in X axis. The maximum travel distance is 200mm. The movement is controlled via PC. It can operate with standard off-the-shelf syringes made of plastic, glass or stainless steel. The microprocessor based control circuit can render a flow rate of 16 μl/hr to 630 ml/hr (with 5ml Syringe). The syringe diameter, spin duration or the target volume can be set by the user through the ElectroSpinner software interface.



Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

III. Rotating Mandrel

Rotating mandrels which comes with the electrospinning unit can be used as a target to get an aligned continuous mesh of nanofiber. It has a speed range of 300rpm to 4000rpm suitable for electrospinning. Grounding of the mandrel to the HV power supply is attained through a carbon brush contact. The rotating mandrel has a speed stability of +/- 1%. Holmarc's HO-RM-01 is a high speed rotating mandrel assembly which works with Holmarc HO-MN series mandrels of 2mm to 100mm diameter and is of 200mm length. No. of mandrels supplied are 100mm, 75mm, 50mm, 25mm, 15mm, 12mm, 6mm, 4mm, 2mm.



Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

IV. Y Plate Collector & Stationary Target

This collector can be used as Stationary target or as Y plate collector. The stationary target which acts as a collector of electro spun nanofibers, is made of stainless steel plate such that it can be held vertically on a table top. It also has connector for grounding.



Using a stationary target alone cannot attain a uniform density of fibers, as most of the fiber is collected around the point orthogonal to the syringe needle. Combined with X movement provided on the syringe pump, the Y translation stage on the target keeps the target move through a commanded motion profile. Depending on the motion profile, fibers get collected uniformly on the target. The motion profile can be created using a series of commands available in the software.

Specifications :

1. Plate Dimension 250 x 175 x 3mm
2. Travel : 150mm
3. Plate Material : Stainless Steel
4. Grounding Facility : Available
5. Programmable Y motion profile to control the nano fiber deposition characteristics
6. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration

V. Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.

VI. Fume Hood





HOLMARC's HO-FH-01 model fume hood provides an enclosed atmosphere for electrospinning. An enclosed chamber is necessary to protect the user from pollutant air caused by solvent evaporation during the process. It comes with an exhaust fan attached or optionally with a duct of custom dimension so that it can be connected to an exhaust duct available onsite.

HOLMARC's Fume Hood also has an option for in-built heater capable to provide a temperature up to 45°C. An independent PID controller ensures precise control of temperature. A common electronic control unit for all the devices in the electrospinning system is integrated within the hood.

The fume Hood has transparent side walls and front door shield made of float glass. This ensures good visibility of the process. High intensity light from the optional halogen lamp illuminates the nanofibers being spun on its way to the target. The table top is made of granite which makes the cleaning process easy.



Specifications :
1. Standalone unit with in-built power supply and wiring for the heater, lighting and exhaust
2. Transparent glass windows on three sides for easily monitoring the electrospinning process
3. Foot print: 1200mm x 850mm x 1520 mm
4. Construction Material: Stainless Steel, Aluminium & Glass
5. Epoxy coated for electrical insulation
6. Ambient to 40°C temperature control
7. Exhaust fan ventilation at the top of the hood which can be connected to an exhaust outlet available at the customer facility.

VII. Accessories



a. Normal Glass Syringe
b. Glass Syringe with tube connector
c. Spare Needle
d. Teflon Tube

VIII. UV Curing Lamp (Optional)



A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.
The controller is also provided with an ON/OFF Switch for the UV Lamp.

Nano Fiber Electrospinning Unit with Support

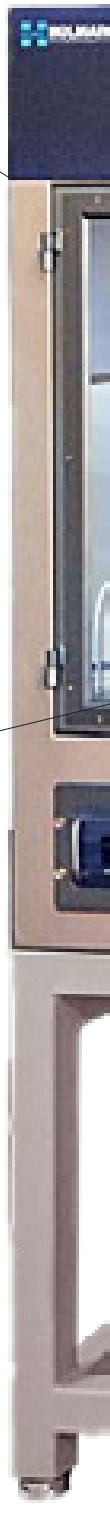
Model : HO-NFES-040B

Holmarc's (HO-NFES-040B model) Electro-spinning equipment is a compact version for Nano fiber Electro spinning. A unique support structure made of steel pipes is provided along with the equipment which when screwed and fixed together can be used as a sturdy support for the Nano fiber electrospinning unit. It is used to make nano and micro fibers ranging from 50nm to 5 microns in diameter. Many kind of polymers like Protein nanofibers, carbon nanotubes, inorganic nanofibers etc. can be synthesized using our nano fiber electrospinning unit. Our equipment uses horizontal spinning when compared to other equipments available in the market. This technology assures the quality of the spun fibers with no dip and uneven diameter. It features user friendly and task oriented design. The ease of operation and competitive pricing places our equipment ahead of other products available in the market. Holmarc's HO-SPLF4 model syringe pump render a smooth and uninterrupted flow enabling uniform spinning. HMPSKV30 model high voltage power supply delivers 0-30 KV output voltage range with a maximum current capacity of 0.5 mA. A stationary target and Rotating mandrels of six different diameters are supplied along with the unit. HO-FH-02 model fume hood provides the compact unit an enclosed atmosphere with 3 transparent side walls to monitor the electro spinning process. The hood also has features like exhaust fan, granite work surface and optional features like high bright halogen lighting, duct of custom dimension to be connected to an exhaust duct available onsite etc as with the other model. This model uses a microprocessor based control unit that interfaces the operations of the syringe pump and Mandrel

Features

- Cabin Heating : Upto 45°C using 1000 watt coil heater
- The chamber is provided with Residual Charge Discharge Stick which is used for static removal.
- Safety switch provided to switch off H.V. Power supply when door is opened.
- LED cabin lighting and back light to view Needle tip and electro spin process.
- Exhaust fan is provided for solvent vaporization. It is also used for cooling down the equipment after spin process.
- Emergency stop is provided on the control panel to stop the equipment where there is any emergency.
- Coaxial spinneret : Our Nano fiber electrospinning unit is equiped with Coaxial spinneret which helps to produce Hollow nanofibers and Core / Sheath nanofibers. This technology can also be used to combine different characteristics of each polymer into one fiber.
- Graduation scale provided on the granite surface in X & Y direction which helps the end-user to achieve repetitive results by marking the positions of syringe pump and target.
- User friendly software enables PC interfacing that helps the regulation and control of various features like Rotating mandrel speed, Spin Duration, Syringe pump flow rate, vertical target movement etc.
- Rotating Mandrel targets of varying diameters, Stationary target and Reciprocating vertically moving target provided with the system.
- System hood has features like Exhaust fan, halogen lighting and transparent door for monitoring electrospinning process.
- Built-in Arc Protection Circuit

Model HO-NFES-040



Independently Controlled Dual Channel Syringe Pump

Specifications :
1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.



Rotating Mandrel

Specifications :
1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration



High Voltage Power Supply

Specifications :
1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection



Nano Fiber Electrospinning Unit with Support

Model : HO-NFES-040B

Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.



Specifications

I. High Voltage Power Supply

HOLMARC HO-NFES-040 comes with HMPSKV30 model high voltage power supply. It has 0 - 30kV output voltage range with a maximum current capacity of 0.5mA. Output voltage and current can be set using front panel knobs and readout from the digital panel meters.



Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection

II. Independently Controlled Dual Channel Syringe Pump

HOLMARC'S HO-SPLF4 model syringe pump provides indepedent control of two dual channel syringe pumps. The speed and flow rate can be changed on both to achieve custom fabrications of fibers. The Syringe pump also can be moved to and fro in X axis. The maximum travel distance is 200mm. The movement is controlled via PC. It can operate with standard off-the-shelf syringes made of plastic, glass or stainless steel. The microprocessor based control circuit can render a flow rate of 16 μl/hr to 630 ml/hr (with 5ml Syringe). The syringe diameter, spin duration or the target volume can be set by the user through the ElectroSpinner software interface.



Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

III. Rotating Mandrel

Rotating mandrels which comes with the electrospinning unit can be used as a target to get an aligned continuous mesh of nanofiber. It has a speed range of 300rpm to 4000rpm suitable for electrospinning. Grounding of the mandrel to the HV power supply is attained through a carbon brush contact. The rotating mandrel has a speed stability of +/- 1%. Holmarc's HO-RM-01 is a high speed rotating mandrel assembly which works with Holmarc HO-MN series mandrels of 2mm to 100mm diameter and is of 200mm length. No. of mandrels supplied are 100mm, 75mm, 50mm, 25mm, 15mm, 12mm, 6mm, 4mm, 2mm.



Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

IV. Y Plate Collector & Stationary Target

This collector can be used as Stationary target or as Y plate collector. The stationary target which acts as a collector of electro spun nanofibers, is made of stainless steel plate such that it can be held vertically on a table top. It also has connector for grounding.
Using a stationary target alone cannot attain a uniform density of fibers, as most of the fiber is collected around the point orthogonal to the syringe needle. Combined with X movement provided on the syringe pump, the Y translation stage on the target keeps the target move through a commanded motion profile. Depending on the motion profile, fibers get collected uniformly on the target. The motion profile can be created using a series of commands available in the software.



Specifications :

1. Plate Dimension 250 x 175 x 3mm
2. Travel : 150mm
3. Plate Material : Stainless Steel
4. Grounding Facility : Available
5. Programmable Y motion profile to control the nano fiber deposition characteristics
6. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration

V. Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.

VI. Fume Hood

HOLMARC's HO-FH-02 model fume hood provides an enclosed atmosphere for electrospinning. An enclosed chamber is necessary to protect the user from pollutant air caused by solvent evaporation during the process. It comes with an exhaust fan attached or optionally with a duct of custom dimension so that it can be connected to an exhaust duct available onsite. HOLMARC's Fume Hood also has an option for in-built heater capable to provide a temperature up to 45°C. An independent PID controller ensures precise control of temperature. A common electronic control unit for all the devices in the electrospinning system is integrated within the hood. The fume Hood has transparent side walls and front door shield made of float glass. This ensures good visibility of the process. High intensity light from the optional halogen lamp illuminates the nanofibers being spun on its way to the target. The table top is made of granite which makes the cleaning process easy.



Specifications :
1. Standalone unit with in-built power supply and wiring for the heater, lighting and exhaust
2. Transparent glass windows on three sides for easily monitoring the electrospinning process
3. Foot print: 1000mm x 800mm x 1672 mm
4. Construction Material: Stainless Steel, Aluminium & Glass
5. Epoxy coated for electrical insulation
6. Ambient to 40°C temperature control
7. Exhaust fan ventilation at the top of the hood which can be connected to an exhaust outlet available at the customer facility.

VII. Accessories

a. Normal Glass Syringe



b. Glass Syringe with tube connector



c. Spare Needle



d. Teflon Tube

VIII. UV Curing Lamp (Optional)

A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.
The controller is also provided with an ON/OFF Switch for the UV Lamp.



Dual Pump Nano Fiber Electrospinning Unit

Model : HO-NFES-043C

Holmarc's (HO-NFES-043C model) Electro-spinning equipment features two syringe pumps on both sides of the rotating collector drum.

The distance between the syringe and drum can be adjusted. The speed, direction, travel and dispensing rate can be changed on both syringe pumps. Using this technique helps the end user to increase the production rate of nano fibers as well as two different materials can be spun simultaneously.

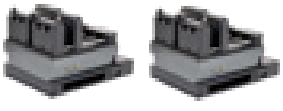
It is used to make nano and micro fibers ranging from 50nm to 5 microns in diameter. Many kind of polymers like Protein nanofibers, carbon nanotubes, inorganic nanofibers etc. can be synthesized using our nano fiber electrospinning unit. Our equipment uses horizontal spinning when compared to other equipments available in the market. This technology assures the quality of the spun fibers with no dip and uneven diameter. Its user friendly software, task oriented design, ease of operation and competitive pricing are certain features that place our equipment ahead of other products available in the market.

Holmarc's HO-SPLF4 model syringe pump render a smooth and uninterrupted flow enabling uniform spinning. HMPSKV30 model high voltage power supply delivers 0-30 KV output voltage range with a maximum current capacity of 0.5 mA. A stationary target, an XY moving target and Rotating mandrels of six different diameters are supplied along with the unit.

HO-FH-03 model fume hood provides the compact unit an enclosed atmosphere with 3 transparent side walls to monitor the electro spinning process. The hood also has features like exhaust fan, granite work surface and optional features like high bright halogen lighting, duct of custom dimension to be connected to an exhaust duct available onsite etc as with the other model. This model uses a microprocessor based control unit that interfaces the operations of the syringe pump and Mandrel.

Independently Controlled Dual Channel Syringe Pump

Specifications :
1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.









622 Kg

Features

Cabin Heating : Upto 45°C using 1000 watt coil heater
The chamber is provided with Residual Charge Discharge Stick which is used for static removal
Safety switch provided to switch off H.V. Power supply when door is opened
LED cabin lighting and back light to view Needle tip and electro spin process
Exhaust fan is provided for solvent vaporization. It is also used for cooling down the equipment after spin process
Emergency stop is provided on the control panel to stop the equipment where there is any emergency
Coaxial spinneret: Our Nano fiber electrospinning unit equips Coaxial spinneret which helps to produce Hollow nanofibers and Core / Sheath nanofibers. This technology can also be used to combine different characteristics of each polymer into one fiber
Graduation scale provided on the granite surface in X & Y direction which helps the end-user to achieve repetitive results by marketing the positions of syringe pump and target
User friendly software enables PC interfacing that helps the regulation and control of various features like Rotating mandrel speed, Spin Duration, Syringe pump flow rate, XY target movement etc.
Rotating Mandrel targets of varying diameters, Stationary target and Reciprocating XY target provided with the system
System hood has features like Exhaust fan, halogen lighting and transparent door for monitoring electrospinning process
Built-in Arc Protection Circuit

Rotating Mandrel



1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

Y Plate Collector & Stationary Target



1. Plate Dimension 250 x 175 x 3mm
2. Travel : 150mm
3. Plate Material : Stainless Steel
4. Grounding Facility : Available
5. Programmable Y motion profile to control the nano fiber deposition characteristics
6. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration

Accessories

a. Normal Glass Syringe



b. Glass Syringe with tube connector



c. Spare Needle



d. Teflon Tube



Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.



Watch now

HOLMARC OPTO-MECHATRONICS LTD

Specifications

I. High Voltage Power Supply

HOLMARC HO-NFES-040 comes with HMPSKV30 model high voltage power supply. It has 0 - 30kV output voltage range with a maximum current capacity of 0.5mA. Output voltage and current can be set using front panel knobs and readout from the digital panel meters.



Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection

II. Independently Controlled Dual Channel Syringe Pump

HOLMARC'S HO-SPLF4 model syringe pump provides indepedent control of two dual channel syringe pumps. The speed and flow rate can be changed on both to achieve custom fabrications of fibers. The Syringe pump also can be moved to and fro in X axis. The maximum travel distance is 200mm. The movement is controlled via PC. It can operate with standard off-the-shelf syringes made of plastic, glass or stainless steel. The microprocessor based control circuit can render a flow rate of 16 μl/hr to 630 ml/hr (with 5ml Syringe). The syringe diameter, spin duration or the target volume can be set by the user through the ElectroSpinner software interface.



Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

III. Rotating Mandrel

Rotating mandrels which comes with the electrospinning unit can be used as a target to get an aligned continuous mesh of nanofiber. It has a speed range of 300rpm to 4000rpm suitable for electrospinning. Grounding of the mandrel to the HV power supply is attained through a carbon brush contact. The rotating mandrel has a speed stability of +/- 1%. Holmarc's HO-RM-01 is a high speed rotating mandrel assembly which works with Holmarc HO-MN series mandrels of 2mm to 100mm diameter and is of 200mm length. No. of mandrels supplied are 100mm, 75mm, 50mm, 25mm, 15mm, 12mm, 6mm, 4mm, 2mm.



Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

IV. Y Plate Collector & Stationary Target

This collector can be used as Stationary target or as Y plate collector. The stationary target which acts as a collector of electro spun nanofibers, is made of stainless steel plate such that it can be held vertically on a table top. It also has connector for grounding.



Using a stationary target alone cannot attain a uniform density of fibers, as most of the fiber is collected around the point orthogonal to the syringe needle. Combined with X movement provided on the syringe pump, the Y translation stage on the target keeps the target move through a commanded motion profile. Depending on the motion profile, fibers get collected uniformly on the target. The motion profile can be created using a series of commands available in the software.

Specifications :

1. Plate Dimension 250 x 175 x 3mm
2. Travel : 150mm
3. Plate Material : Stainless Steel
4. Grounding Facility : Available
5. Programmable Y motion profile to control the nano fiber deposition characteristics
6. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration



V. Spinneret



a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.

VI. Fume Hood



HOLMARC's HO-FH-03 model fume hood provides an enclosed atmosphere for electrospinning. An enclosed chamber is necessary to protect the user from pollutant air caused by solvent evaporation during the process. It comes with an exhaust fan attached or optionally with a duct of custom dimension so that it can be connected to an exhaust duct available onsite.

HOLMARC's Fume Hood also has an option for in-built heater capable to provide a temperature up to 45°C. An independent PID controller ensures precise control of temperature. A common electronic control unit for all the devices in the electrospinning system is integrated within the hood.

The fume Hood has transparent side walls and front door shield made of float glass. This ensures good visibility of the process. High intensity light from the optional halogen lamp illuminates the nanofibers being spun on its way to the target. The table top is made of granite which makes the cleaning process easy.

Specifications :
1. Standalone unit with in-built power supply and wiring for the heater, lighting and exhaust
2. Transparent glass windows on three sides for easily monitoring the electrospinning process
3. Foot print: 1200mm x 850mm x 1520 mm
4. Construction Material: Stainless Steel, Aluminium & Glass
5. Epoxy coated for electrical insulation
6. Ambient to 40°C temperature control
7. Exhaust fan ventilation at the top of the hood which can be connected to an exhaust outlet available at the customer facility.

VII. Accessories



a. Normal Glass Syringe



b. Glass Syringe with tube connector



c. Spare Needle

d. Teflon Tube

VIII. UV Curing Lamp (Optional)



A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.
The controller is also provided with an ON/OFF Switch for the UV Lamp.

Dual Pump Nano Fiber Electrospinning Unit

with Humidity Control and Camera for Viewing Taylor Cone

Model : HO-NFES-043CH

This model has a humidity display unit in which the user can set the required humidity level. The humidity control unit activates the built-in humidifier or dehumidifier, depending on the user settings, to maintain the humidity level at the set value. It also features two digital cameras which captures the image of the Taylor cones at both the spinnerets. Holmarc's (HO-NFES-043CH model) Electro-spinning equipment features two syringe pumps on both sides of the rotating collector drum. The distance between the syringe and drum can be adjusted. The speed, direction, travel and dispensing rate can be changed on both syringe pumps. Using this technique helps the end user to increase the production rate of nano fibers as well as two different materials can be spun simultaneously. It is used to make nano and micro fibers ranging from 50nm to 5 microns in diameter. Many kind of polymers like Protein nanofibers, carbon nanotubes, inorganic nanofibers etc. can be synthesized using our nano fiber electrospinning unit. Our equipment uses horizontal spinning when compared to other equipments available in the market. This technology assures the quality of the spun fibers with no dip and uneven diameter. Its user friendly software, task oriented design, ease of operation and competitive pricing are certain features that place our equipment ahead of other products available in the market.

Holmarc's HO-SPLF4 model syringe pump render a smooth and uninterrupted flow enabling uniform spinning. HMPSKV30 model high voltage power supply delivers 0-30 KV output voltage range with a maximum current capacity of 0.5 mA. A stationary target, an XY moving target and Rotating mandrels of six different diameters are supplied along with the unit.

HO-FH-03 model fume hood provides the compact unit an enclosed atmosphere with 3 transparent side walls to monitor the electro spinning process. The hood also has features like exhaust fan, granite work surface and optional features like high bright halogen lighting, duct of custom dimension to be connected to an exhaust duct available onsite etc as with the other model. This model uses a microprocessor based control unit that interfaces the operations of the syringe pump and Mandrel.

Features

Humidity controller with both humidification and dehumidification
Dual digital camera for viewing Taylor cone
Cabin Heating : Upto 45°C using 1000 watt coil heater
The chamber is provided with Residual Charge Discharge Stick which is used for static removal.
Safety switch provided to switch off H.V. Power supply when door is opened.
LED cabin lighting and back light to view Needle tip and electro spin process.
Exhaust fan is provided for solvent vaporization. It is also used for cooling down the equipment after spin process.
Emergency stop is provided on the control panel to stop the equipment where there is any emergency.
Coaxial spinneret: Our Nano fiber electrospinning unit equips Coaxial spinneret which helps to produce Hollow nanofibers and Core / Sheath nanofibers. This technology can also be used to combine different characteristics of each polymer into one fiber.
Graduation scale provided on the granite surface in X & Y direction which helps the end-user to achieve repetitive results by marketing the positions of syringe pump and target.
User friendly software enables PC interfacing that helps the regulation and control of various features like Rotating mandrel speed, Spin Duration, Syringe pump flow rate, XY target movement etc.
Rotating Mandrel targets of varying diameters, Stationary target and Reciprocating XY target provided with the system.
System hood has features like Exhaust fan, halogen lighting and transparent door for monitoring electrospinning process.
Built-in Arc Protection Circuit

Independently Controlled Dual Channel Syringe Pump

Specifications :
1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

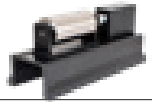


High Voltage Power Supply

Specifications :
1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection



Rotating Mandrel



1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

Y Plate Collector & Stationary Target



1. Plate Dimension 250 x 175 x 3mm
2. Travel : 150mm
3. Plate Material : Stainless Steel
4. Grounding Facility : Available
5. Programmable Y motion profile to control the nano fiber deposition characteristics
6. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration



Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.





UV Curing Lamp (Optional)

A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.
The controller is also provided with an ON/OFF Switch for the UV Lamp.

Specifications

I. High Voltage Power Supply



HOLMARC HO-NFES-040 comes with HMPSKV30 model high voltage power supply. It has 0 - 30kV output voltage range with a maximum current capacity of 0.5mA. Output voltage and current can be set using front panel knobs and readout from the digital panel meters.

Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection

II. Independently Controlled Dual Channel Syringe Pump



HOLMARC'S HO-SPLF4 model syringe pump provides indepedent control of two dual channel syringe pumps. The speed and flow rate can be changed on both to achieve custom fabrications of fibers. The Syringe pump also can be moved to and fro in X axis. The maximum travel distance is 200mm. The movement is controlled via PC. It can operate with standard off-the-shelf syringes made of plastic, glass or stainless steel. The microprocessor based control circuit can render a flow rate of 16 μl/hr to 630 ml/hr (with 5ml Syringe). The syringe diameter, spin duration or the target volume can be set by the user through the ElectroSpinner software interface.

Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

III. Rotating Mandrel



Rotating mandrels which comes with the electrospinning unit can be used as a target to get an aligned continuous mesh of nanofiber. It has a speed range of 300rpm to 4000rpm suitable for electrospinning. Grounding of the mandrel to the HV power supply is attained through a carbon brush contact. The rotating mandrel has a speed stability of +/- 1%. Holmarc's HO-RM-01 is a high speed rotating mandrel assembly which works with Holmarc HO-MN series mandrels of 2mm to 100mm diameter and is of 200mm length. No. of mandrels supplied are 100mm, 75mm, 50mm, 25mm, 15mm, 12mm, 6mm, 4mm, 2mm.

Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

IV. Y Plate Collector & Stationary Target



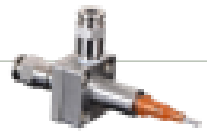
This collector can be used as Stationary target or as Y plate collector. The stationary target which acts as a collector of electro spun nanofibers, is made of stainless steel plate such that it can be held vertically on a table top. It also has connector for grounding.
Using a stationary target alone cannot attain a uniform density of fibers, as most of the fiber is collected around the point orthogonal to the syringe needle. Combined with X movement provided on the syringe pump, the Y translation stage on the target keeps the target move through a commanded motion profile. Depending on the motion profile, fibers get collected uniformly on the target. The motion profile can be created using a series of commands available in the software.

1. Plate Dimension 250 x 175 x 3mm
2. Travel : 150mm
3. Plate Material : Stainless Steel
4. Grounding Facility : Available
5. Programmable Y motion profile to control the nano fiber deposition characteristics
6. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration



V. Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.



b. Co axial Spinneret
The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.

VI. Fume Hood

HOLMARC's HO-FH-03 model fume hood provides an enclosed atmosphere for electrospinning. An enclosed chamber is necessary to protect the user from pollutant air caused by solvent evaporation during the process. It comes with an exhaust fan attached or optionally with a duct of custom dimension so that it can be connected to an exhaust duct available onsite.

HOLMARC's Fume Hood also has an option for in-built heater capable to provide a temperature up to 45°C. An independent PID controller ensures precise control of temperature. A common electronic control unit for all the devices in the electrospinning system is integrated within the hood.



The fume Hood has transparent side walls and front door shield made of float glass. This ensures good visibility of the process. High intensity light from the optional halogen lamp illuminates the nanofibers being spun on its way to the target. The table top is made of granite which makes the cleaning process easy.

Specifications :
1. Standalone unit with in-built power supply and wiring for the heater, lighting and exhaust
2. Transparent glass windows on three sides for easily monitoring the electrospinning process
3. Foot print: 1200mm x 850mm x 1520 mm
4. Construction Material: Stainless Steel, Aluminium & Glass
5. Epoxy coated for electrical insulation
6. Ambient to 40°C temperature control
7. Exhaust fan ventilation at the top of the hood which can be connected to an exhaust outlet available at the customer facility.

VII. Accessories

a. Normal Glass Syringe



b. Glass Syringe with tube connector



c. Spare Needle



d. Teflon Tube

VIII. UV Curing Lamp (Optional)

A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.
The controller is also provided with an ON/OFF Switch for the UV Lamp.



Nano Fiber Electrospinning Unit

with Horizontal & Vertical Spinning 30KV and 40 KV

30KV Model HO-NFES-043

40KV Model HO-NFES-045

Holmarc's (HO-NFES-043 model) Electro-spinning equipment is a compact version for Nano fiber Electro spinning. Motorized XY movement provided for the needle tip. The needle tip can be arranged in horizontal or vertical fashion for spinning. Collector bowl for liquid targets is also provided along with the system. It is used to make nano and micro fibers ranging from 50nm to 5 microns in diameter. Many kind of polymers like Protein nanofibers, carbon nanotubes, inorganic nanofibers etc. can be synthesized using our nano fiber electrospinning unit. Our equipment uses horizontal spinning when compared to other equipments available in the market. This technology assures the quality of the spun fibers with no dip and uneven diameter. Its user friendly software, task oriented design, ease of operation and competitive pricing are certain features that place our equipment ahead of other products available in the market.

Holmarc's HO-SPLF4 model syringe pump render a smooth and uninterrupted flow enabling uniform spinning. HMPSKV30 model high voltage power supply delivers 0-30 KV output voltage range with a maximum current capacity of 0.5 mA. A stationary target, an XY moving target and Rotating mandrels of six different diameters are supplied along with the unit. HO-FH-04 model fume hood provides the compact unit an enclosed atmosphere with 3 transparent side walls to monitor the electro spinning process. The hood also has features like exhaust fan, granite work surface and optional features like high bright halogen lighting, duct of custom dimension to be connected to an exhaust duct available onsite etc as with the other model. This model uses a microprocessor based control unit that interfaces the operations of the syringe pump and Mandrel.

Rotating Mandrel

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

Stationary Target



1. Plate Dimension 200 x 200, 200 x 100, 100 x 100, 75 x 75 mm
2. Plate Material : Stainless Steel
3. Grounding Facility : Available

Features

Cabin Heating : Upto 45°C using 1000 watt coil heater
The chamber is provided with Residual Charge Discharge Stick which is used for static removal.
Safety switch provided to switch off H.V. Power supply when door is opened.
LED cabin lighting and back light to view Needle tip and electro spin process.
Exhaust fan is provided for solvent vaporization. It is also used for cooling down the equipment after spin process.
Emergency stop is provided on the control panel to stop the equipment where there is any emergency.
Coaxial spinneret: Our Nano fiber electrospinning unit equips Coaxial spinneret which helps to produce Hollow nanofibers and Core / Sheath nanofibers. This technology can also be used to combine different characteristics of each polymer into one fiber.
Graduation scale provided on the granite surface in X & Y direction which helps the end-user to achieve repetitive results by marketing the positions of syringe pump and target.
User friendly software enables PC interfacing that helps the regulation and control of various features like Rotating mandrel speed, Spin Duration, Syringe pump flow rate, XY target movement etc.
Rotating Mandrel targets of varying diameters, Stationary target and Reciprocating XY target provided with the system.
System hood has features like Exhaust fan, halogen lighting and transparent door for monitoring electrospinning process.
Built-in Arc Protection Circuit



Independently Controlled Dual Channel Syringe Pump

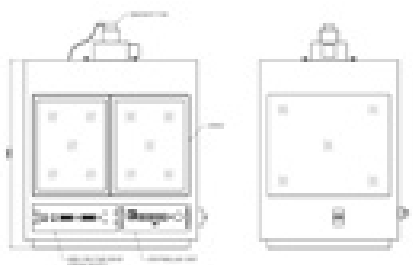


Specifications :
1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

High Voltage Power Supply



Specifications :
1. 0 - 40kV Single Output, 0.4mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stick
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection.



Specifications

I. High Voltage Power Supply

HOLMARC HO-NFES-043 comes with HMPSKV30 model high voltage power supply. It has 0 - 30kV output voltage range with a maximum current capacity of 0.5mA. Output voltage and current can be set using front panel knobs and readout from the digital panel meters.



Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stick
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection

II. Independently Controlled Dual Channel Syringe Pump

HOLMARC'S HO-SPLF4 model syringe pump provides indepedent control of two dual channel syringe pumps. The speed and flow rate can be changed on both to achieve custom fabrications of fibers. The Syringe pump also can be moved to and fro in X axis. The maximum travel distance is 200mm. The movement is controlled via PC. It can operate with standard off-the-shelf syringes made of plastic, glass or stainless steel. The microprocessor based control circuit can render a flow rate of 16 μl/hr to 630 ml/hr (with 5ml Syringe). The syringe diameter, spin duration or the target volume can be set by the user through the ElectroSpinner software interface.



Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.

III. Rotating Mandrel

Rotating mandrels which comes with the electrospinning unit can be used as a target to get an aligned continuous mesh of nanofiber. It has a speed range of 300rpm to 4000rpm suitable for electrospinning. Grounding of the mandrel to the HV power supply is attained through a carbon brush contact. The rotating mandrel has a speed stability of +/- 1%. Holmarc's HO-RM-01 is a high speed rotating mandrel assembly which works with Holmarc HO-MN series mandrels of 2mm to 100mm diameter and is of 200mm length. No. of mandrels supplied are 100mm, 75mm, 50mm, 25mm, 15mm, 12mm, 6mm, 4mm, 2mm.



Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

IV. Stationary Target

This collector can be used as Stationary target.

The stationary target which acts as a collector of electro spun nanofibers, is made of stainless steel plate such that it can be held vertically on a table top. It also has connector for grounding.



Specifications :

1. Plate Dimension 200 x 200, 200 x 100, 100 x 100, 75 x 75 mm
2. Plate Material : Stainless Steel
3. Grounding Facility : Available

V. Spinneret

a. Needle Spinneret

The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.



b. Co axial Spinneret



The Coaxial spinneret provides simultaneous flow of two different solutions. This helps to produce Hollow nanofibers and Core / Sheath nanofibers.

VI. Fume Hood

HOLMARC's HO-FH-02 model fume hood provides an enclosed atmosphere for electrospinning. An enclosed chamber is necessary to protect the user from pollutant air caused by solvent evaporation during the process. It comes with an exhaust fan attached or optionally with a duct of custom dimension so that it can be connected to an exhaust duct available onsite.



HOLMARC's Fume Hood also has an option for in-built heater capable to provide a temperature up to 45°C. An independent PID controller ensures precise control of temperature. A common electronic control unit for all the devices in the electrospinning system is integrated within the hood.

The fume Hood has transparent side walls and front door shield made of float glass. This ensures good visibility of the process. High intensity light from the optional halogen lamp illuminates the nanofibers being spun on its way to the target. The table top is made of granite which makes the cleaning process easy.

Specifications :

1. Standalone unit with in-built power supply and wiring for the heater, lighting and exhaust
2. Transparent glass windows on three sides for easily monitoring the electrospinning process
3. Foot print: 1000mm x 800mm x 1672 mm
4. Construction Material: Stainless Steel, Aluminium & Glass
5. Epoxy coated for electrical insulation
6. Ambient to 40°C temperature control
7. Exhaust fan ventilation at the top of the hood which can be connected to an exhaust outlet available at the customer facility.

VII. Accessories

a. Normal Glass Syringe



b. Glass Syringe with tube connector



c. Spare Needle



d. Teflon Tube

VIII. UV Curing Lamp (Optional)



A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.
The controller is also provided with an ON/OFF Switch for the UV Lamp.

Nano Fiber Double Spinning & Yarning System

Model: HO-NFES-SYS

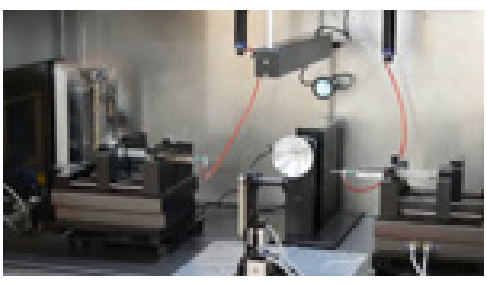
Nano Fiber Double Spinning & Yarning System is known as one of the most efficient, convenient methods to produce fibers of a nanometric scale. These nanometric fibers reveal several remarkable characteristics such as a large surface area to the volume ratio, high porosity, flexibility in surface functionality, and superior mechanical performance. Nanofibers are utilized in a wide variety of applications such as filtration and multifunctional membranes, medical usages, and military systems due to their outstanding properties.

Holmarc's Nano Fiber Double Spinning & Yarning System comprises of a bipolar high voltage supply and a set of collectors for different applications. The instrument also equips with a unique rotary collector through which user will be able to spin the fiber into threads and collect it in spools. The diameter of the fiber depends on various parameters but mainly flow rate. In order to make fiber in to yarn, two syringe pumps, one with positively charged spinneret and the other with negatively charged spinneret, are targeted to a funnel shaped collector from where fiber yarns are formed and rolled into spool. The equipment is controlled by a software compatible with Windows OS. The parameters like solution flow rate, rotating speed of the funnel or mandrel collector, duration of electrospinning, horizontal and vertical speeds of the spool etc can be controller using this software.

Features

- Cabin Heating : Upto 45°C using 1000 watt coil heater
- The chamber is provided with Residual Charge Discharge Stick which is used for static removal.
- Safety switch provided to switch off H.V. Power supply when door is opened.
- LED cabin lighting and back light to view Needle tip and electro spin process.
- Exhaust fan is provided for solvent vaporization. It is also used for cooling down the equipment after spin process.
- Emergency stop is provided on the control panel to stop the equipment where there is any emergency.
- Graduation scale provided on the granite surface in X & Y direction which helps the end-user to achieve repetitive results by marketing the positions of syringe pumps, target and rim rotator.
- User friendly software enables PC interfacing that helps the regulation and control of various features like Rotating speed of the funnel or mandrel collector, Spin Duration, horizontal and vertical speeds of the spool, Syringe pump flow rate, etc.
- Rotating Mandrel targets of varying diameters, Stationary target, Reciprocating XY target, metal funnel collector and rim rotator provided with the system.
- Coaxial spinneret : Our Nano fiber electrospinning unit equips Coaxial spinneret which helps to produce Hollow nanofibers and Core / Sheath nanofibers. This technology can also be used to combine different characteristics of each polymer into one fiber.
- System hood has features like Exhaust fan, halogen lighting and transparent door for monitoring electrospinning process.
- Built-in Arc Protection Circuit

Inside view



Independently Controlled Dual Channel Syringe Pump

Specifications :
1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.
6. Manual height adjustment platform to vary the pump height according to the target height.



High Voltage Power Supply

Specifications :
1. +/-15kV Dual Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection





Metal Funnel Collector

Specifications :
1. Rotating speed : 300 to 4000 rpm
2. Material : Aluminium
3. Diameter : 100mm





Yard Spool

1. Material : Acetal resin
2. Rotating speed : 1 to 100 rpm
3. Linear reciprocating movement : 50 mm







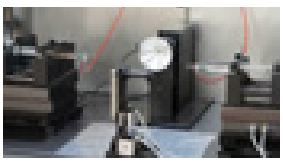
Rotating Mandrel

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration



Spinneret

a. Needle Spinneret
The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.



Specifications

I. High Voltage Power Supply

HOLMARC HO-NFES-SYS comes with HMPSKV30 model high voltage power supply. Output voltage and current can be set using front panel knobs and readout from the digital panel meters..



Specifications :

1. 0 - 30kV Single Output, 0.5mA max Current
2. Digital Voltmeter and Current meter
3. Static Removal Device - Shorting Stickv
4. Constant current / Constant Voltage mode of operation
5. Built-in ARC Circuit Protection

II. Independently Controlled Dual Channel Syringe Pump

HOLMARC'S HO-SPLF4 model syringe pump provides independent control of two dual channel syringe pumps. The speed and flow rate can be changed on both to achieve custom fabrications of fibers.The Syringe pump also can be moved to and fro in X axis. The maximum travel distance is 200mm. The movement is controlled via PC. It can operate with standard off-the-shelf syringes made of plastic, glass or stainless steel. The microprocessor based control circuit can render a flow rate of 16 μl/hr to 630 ml/hr (with 5ml Syringe). The syringe diameter, spin duration or the target volume can be set by the user through the ElectroSpinner software interface.



Specifications :

1. To dispense from standard disposable or glass syringes from 2.5 to 60ml
2. Syringe holder made of insulating material to work under high voltage conditions
3. Motor control through microcontroller to control and indicate flow rate
4. Four syringe dispensing system
5. PC based control with documentation of parameters like syringe diameter, flow rate, spray duration etc.
6. Manual height adjustment platform to vary the pump height according to the target height.

III. Metal Funnel Collector

Metal funnel collector is a funnel shaped rotating mandrel where fiber yarns are formed and rolled into spool. A thin film web of nanofiber is first formed on a metal funnel collector and is drawn initially to a 3D cone shape. With the rotation of funnel collector, a twisted nanofiber yarn is drawn from the vertex of the cone.



Specifications :

1. Rotating speed : 300 to 4000 rpm
2. Material : Aluminium
3. Diameter : 100mm

IV. Yarn Spool

Yarn Spool is compact and modular motorized positioner for rolling the nanofiber yarn into spool. Stepper motor is used as electrical actuator. Yarn Spool is XY axis configurable.

Specifications :

1. Material : Acetal resin
2. Rotating speed : 1 to 100 rpm
3. Linear reciprocating movement : 50 mm

V. Rotating Mandrel

Rotating mandrels which comes with the electrospinning unit can be used as a target to get an aligned continuous mesh of nanofiber. It has a speed range of 300rpm to 4000rpm suitable for electrospinning. Grounding of the mandrel to the HV power supply is attained through a carbon brush contact. The rotating mandrel has a speed stability of +/- 1%. Holmarc's HO-RM-01 is a high speed rotating mandrel assembly which works with Holmarc HO-MN series mandrels of 2mm to 100mm diameter and is of 200mm length. No. of mandrels supplied are 100mm, 75mm, 50mm, 25mm, 15mm, 12mm, 6mm, 4mm, 2mm.



Specifications :

1. Stainless steel drums of different sizes
2. Rotational Speed : 300 - 4000 rpm
3. Grounding facility : Available
4. Actuator : Microprocessor controlled BLDCmotor with hall sensor feedback
5. Speed stability : +/- 1%
6. PC based control with documentation of speed and duration

VI. Y Plate Collector & Stationary Target

This collector can be used as Stationary target or as Y plate collector. The stationary target which acts as a collector of electro spun nanofibers, is made of stainless steel plate such that it can be held vertically on a table top. It also has connector for grounding. Using a stationary target alone cannot attain a uniform density of fibers, as most of the fiber is collected around the point orthogonal to the syringe needle. Combined with X movement provided on the syringe pump, the Y translation stage on the target keeps the target move through a commanded motion profile. Depending on the motion profile, fibers get collected uniformly on the target. The motion profile can be created using a series of commands available in the software.

Specifications :

1. Plate Dimension 250 x 175 x 3mm
2. Plate Material : Stainless Steel
3. Grounding Facility : Available
4. Programmable Y motion profile to control the nano fiber deposition characteristics
5. PC based motion control with documentation of parameters like speed, traverse, motion profile and duration

VII. Needle Spinneret

The Flat tipped metal needles are provided for the easy flow of the nano fibers. The high voltage is connected to the tip of the needle using metal clips.

VI. Fume Hood

HOLMARC's HO-FH-03 model fume hood provides an enclosed atmosphere for electrospinning. An enclosed chamber is necessary to protect the user from pollutant air caused by solvent evaporation during the process. It comes with an exhaust fan attached or optionally with a duct of custom dimension so that it can be connected to an exhaust duct available onsite.



HOLMARC's Fume Hood also has an option for in-built heater capable to provide a temperature up to 45°C. An independent PID controller ensures precise control of temperature. A common electronic control unit for all the devices in the electrospinning system is integrated within the hood.

The fume Hood has transparent side walls and front door shield made of float glass. This ensures good visibility of the process. High intensity light from the optional halogen lamp illuminates the nanofibers being spun on its way to the target. The table top is made of granite which makes the cleaning process easy.

Specifications :

1. Standalone unit with in-built power supply and wiring for the heater, lighting and exhaust
2. Transparent glass windows on three sides for easily monitoring the electrospinning process
3. Foot print: 1000mm x 800mm x 1672 mm
4. Construction Material: Stainless Steel, Aluminium & Glass
5. Epoxy coated for electrical insulation
6. Ambient to 40°C temperature control
7. Exhaust fan ventilation at the top of the hood which can be connected to an exhaust outlet available at the customer facility.

VII. Accessories



a. Normal Glass Syringe



b. Glass Syringe with tube connector

c. Spare Needle



d. Teflon Tube

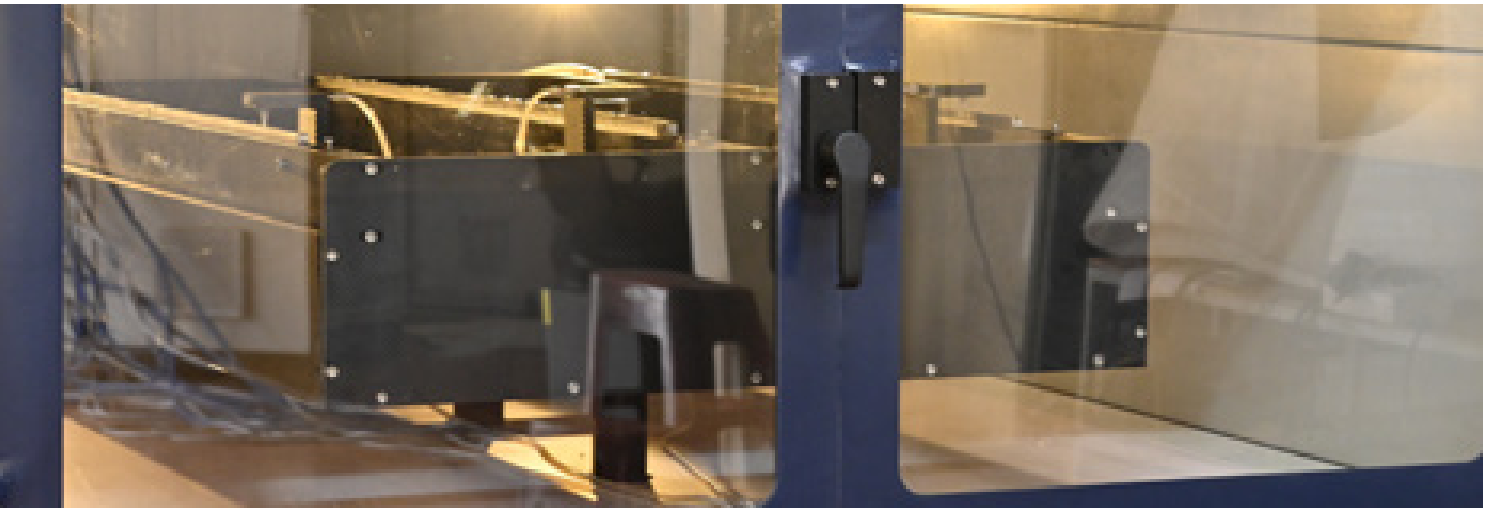
VIII. UV Curing Lamp (Optional)

A special 10W 254nm UV light can be added on top of the rotating collector drum which helps to cure the spun fibers. It can be switched on during the operation or when fiber spun is completed on the collector drum. As the UV light is harmful for our skin and eye, the glass surfaces of the chamber is protected with special coatings to reflect maximum UV.

The controller is also provided with an ON/OFF Switch for the UV Lamp.



Industrial Electrospinning



Industrial Scale Needle-less Electrospinning Unit

Model : INE1000 FibSpinner

The INE1000 FibSpinner is a high-capacity, needle-less electrospinning unit engineered for industrial-scale nanofiber production. Designed with a bottom-up spinning approach, the unit enables the uniform coating of nanofibers on substrates up to 1000 mm wide using a roll-to-roll mechanism.

Unlike traditional needle-based systems, the INE1000 employs three stainless steel thin-slit spinneret rods to facilitate needle-less electrospinning, significantly reducing clogging, maintenance, and downtime. Each spinneret is fed by an independently controlled peristaltic pump system, offering precise control of flow rate and uniform fiber distribution.

The system is controlled via a 12" touchscreen interface, allowing operators to configure process parameters, save/load recipes, and monitor system status in real-time. Integrated safety features, including high-voltage interlocks, emergency stop, and overcurrent protection, ensure user safety and equipment integrity.

This platform supports a wide range of polymer viscosities and is ideal for research, prototyping, and commercial-scale nanofiber production applications in sectors like biomedical engineering, filtration, protective textiles, and energy storage.

Spinning Type : Bottom up Spinning

PUMP SYSTEM

Three independent peristaltic pump units	Individually connected to each spinneret.
Tubing	Silicone tube of 2.4 mm ID, 5.6 mm OD
Flow Rate	0.01- 40 ml/min
Flow Rate Precision	0.01 ml/h
Tank Capacity	Tank 2 L



Feeding Area :

Needle-less Spinnerets	3 thin-slit rods
Spinneret MOC	Stainless Steel
Solution Feeding System	Adjustable speed, feeding rate and waiting time.
Adjustable speed, feeding rate and waiting time.	
Electrode Length	1000 mm Slit
Slit Dimensions	2 mm Depth, 4 mm Width

ROLL TO ROLL SYSTEM

Maximum width of the substrate fabric	1000 mm
Substrate Winding Speed	0.1 m/min - 25.0 m/min
Effective Coating Width	1000 mm
Max Roll Diameter	600 mm

Air compressor included for tightening roll shaft

HIGH VOLTAGE POWER SUPPLY

Voltage Range

Spinneret	0 to 60 kV
Collector	0 to -40 kV
Voltage Precision	0.1 kV
Maximum Current	2 mA

USER INTERFACE

12" Touch screen control panel
Easy to use GUI
Recipe save and load functions
Control of process parameters



SPINNING DISTANCE:

Distance between Rods and Collector	150 - 300 mm
Distance Adjustment Precision	1 mm

SAFETY FUNCTION :

HV supply cut off on door open event
Emergency stop button
HV Warning Ligh
Electrically Isolated & Grounded
Over Current Protection

CONSTRUCTION

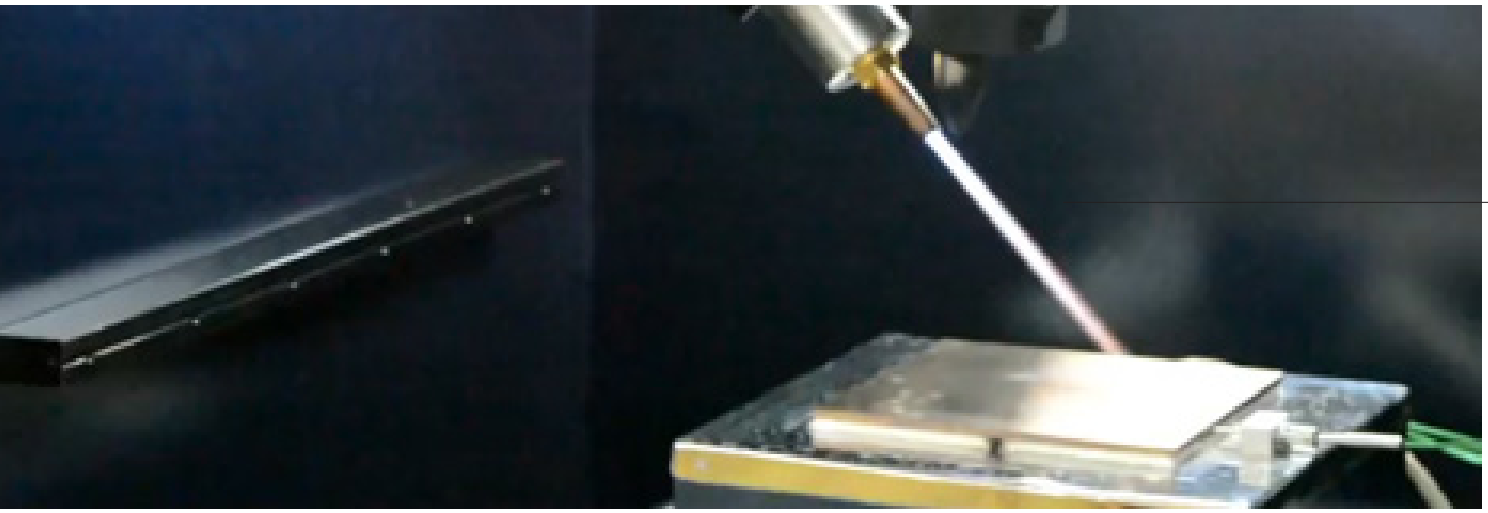
Chassis	Epoxy Painted Sheet Metal

POWER SUPPLY REQUIREMENTS

Power	230 VAC @ 18 A, 4200 W Max.



Spray Pyrolysis Equipment Unit



Flame Assisted

Spray Pyrolysis Equipment

Model: HO-TH-04FA

Holmarc's Flame Assisted Spray Pyrolysis Equipment Model : HO-TH-04FA has been developed for research in surface quality improvement of metallic alloys and ceramics. In this technique, solution is sprayed on to a heated substrate through an oxygen-acetylene flame. The equipment is fitted with accessories required for controlling the flame during the process. The solution is spayed using a positive displacement pump and compressed air through a mixing chamber and nozzle. The substrate is placed on a hot plate, temperature of which can be set at the desired level through a dedicated controller. The hot plate is mounted on a motorized XY platform to move the substrates during the coating process in the required sequence so that uniform coating is achieved. Flow rate of the solution and motion sequence of the substrate are controlled through a personal computer. The flame is initiated and set at the required intensity level manually using the control accessories fitted with the equipment. As the solution is sprayed with the help of compressed air, the equipment can be used for spray pyrolysis without flame as well. Combination of pyrolysis thin films with and without flame can also be produced on the same substrates in successive operations. The chemical reactants are selected such that products other than the desired compound are volatile at the temperature of deposition. The process is generally useful for the deposition of oxides on to metal and ceramic substrates and particularly suitable for the deposition of Al2O3, ZnO and metastable solid solutions of ZnO-MgO and ZrO2-Y2O3 on amorphous silica and Nickel based super alloys such as Nimonic-90.

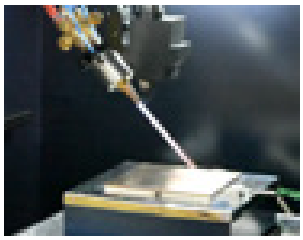
Specifications	
Actuator	Stepper motor
Dispensing unit capacity	50ml & 250ml
Dispensing rate	1 - 10ml / min.
Sprayer	
Drive speed X axis (min-max)	5 - 20mm / sec
Drive speed Y axis (min-max)	2 - 12mm / sec
Sprayer traverse	X - Y 100mm max.
Substrate base plate	
Dimension	150 x 150mm
Max. temperature	500° C
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)

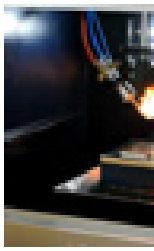
What it is

Spray pyrolysis is a process in which a thin film is deposited by atomizing and spraying a solution on a heated surface, where the constituent reacts to form a chemical compound. In flame assisted spray pyrolysis, this spray is heated by a flame produced by an oxy-acetylene gas mixture, before being deposited on to the substrate.

Sprayer

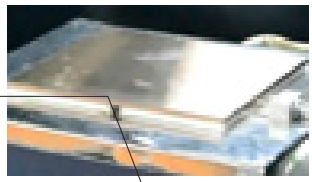
Specifications
Drive speed X axis (min-max) :
5 - 20mm / sec
Drive speed Y axis (min-max) :
2 - 12mm / sec
Sprayer traverseX - Y 100mm max.

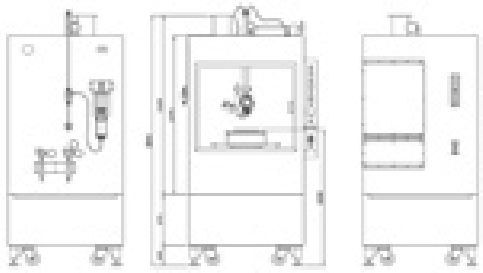




Substrate base plate

Specifications
Dimension 150 x 150mm
Max. temperature 500° C
Power input:230V, 50Hz
Serial port (RS 232)



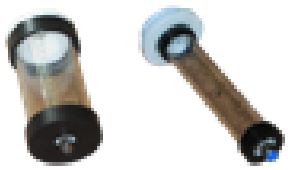


Factors affecting bonding and subsequent build up of the coating :

- Cleanliness
- Surface area
- Surface topography or profile
- Temperature (thermal energy)
- Time (reaction rates, cooling rates etc.)
- Speed
- Physical & chemical properties
- Physical & chemical reactions

492 Kg





Glass Container

Glass container holds the solution to be sprayed during the coating process. Containers of two volumes (250ml & 50ml) are available as standard accessories.



Nylon Tube

This tube carries the solution from the glass dispenser to the spray head. Nylon is resistant to most of the chemicals which has applications in spray pyrolysis.



HOLMARC OPTO-MECHATRONICS LTD

Spray Pyrolysis Equipment (Table Top)

Model: HO-TH-04BT

HOLMARC's Spary Pyrolisis Equipment (Table Top) Model: HO-TH-04 BT is more compact and sleek model that does not take too much space in your laboratory. It can be placed in any available platform. Even though Smaller in size it performs all the functions and operations of the standard model.

Holmarc's Spray Pyrolysis System has been designed for research laboratories in thin films, especially for solar cell development. The system automates various fatigue and error creating processes involved in the technique when performed manually. Moreover, ergonomically designed chamber provides clean and healthy atmosphere suitable for modern lab conditions.

Parameters like dispensing rate of the solution and speed of spray head movement which are difficult to control manually are controlled precisely by PC based automation. A positive displacement pump controlled by stepper motor and microprocessor is used to dispense solution as per requirement. The spray head movement is also controlled by stepper motor driven linear stages in X and Y direction. The temperature of the substrate heater plate is controlled independently through a dedicated controller.

Spray pyrolysis is a process in which a thin film is deposited by spraying a solution on a heated surface, where the constituent react to form a chemical compound. The chemical reactants are selected such that the products other than the desired compound are volatile at the temperature of deposition. The process is particularly useful for the deposition of oxides and has long been a production method for applying a transparent electrical conductor of Tin oxide (SnO2) or Stannic oxide to glass.

Specifications

Actuator	Stepper motor
Dispensing unit capacity	50ml & 250ml
Dispensing rate	1 - 10ml / min.

Sprayer	
Drive speed X axis (min-max)	10 - 800mm / sec
Drive speed Y axis (min-max)	1 - 12mm / sec
Sprayer traverse	X - Y 200mm max.

Substrate base plate	
Dimension	150 x 150mm
Max. temperature	500° C
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)

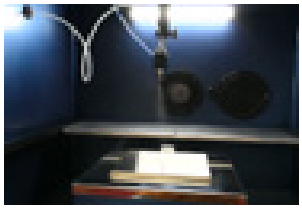
Substrate base plate

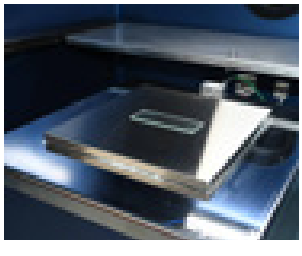
Specifications
Dimension 150 x 150mm
Max. temperature 500° C
Power input:230V, 50Hz
Serial port (RS 232)

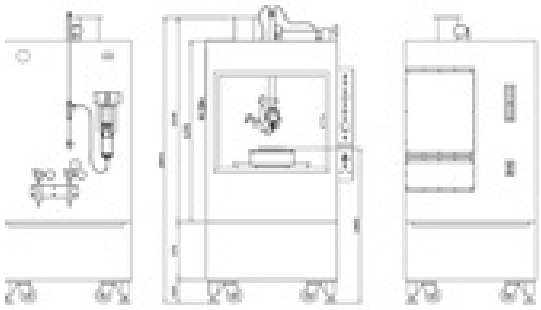


Sprayer

Specifications
Drive speed X axis (min-max) :
10 - 800mm / sec
Drive speed Y axis (min-max) :
1 - 12mm / sec
Sprayer traverse :
X - Y 200mm max.







Factors affecting bonding and subsequent build up of the coating :

- Cleanliness
- Surface area
- Surface topography or profile
- Temperature (thermal energy)
- Time (reaction rates, cooling rates etc.)
- Speed
- Physical & chemical properties
- Physical & chemical reactions





Ultrasonic Spray Head (Optional Accessory)

The standard spray head which uses a compressed air atomization nozzle can be replaced with the ultrasonic spray head which uses an ultrasonic atomizer nozzle. It breaks the solution by vibrating its nozzle at an ultrasonic frequency (Typically 40 kHz), producing a fine spray of droplets of 50 micron average size.



Syringe Pump (Optional Accessory)

Syringe pump is preferable to the glass dispenser for solutions which should be sprayed at lower flow rates (<1ml / min). It works with very low volume of solution as the syringe is directly connected to the spray nozzle, avoiding the use of lengthy tubes which should be filled first before the solution can reach the nozzle.

Spray Pyrolysis Equipment

Model: HO-TH-04
Larger Model : HO-TH-04A

Holmarc's Spray Pyrolysis system has been designed for research laboratories in thin films, especially for solar cell development. The system automates various fatigue and error creating processes involved in the technique when performed manually. Moreover, ergonomically designed chamber provides clean and healthy atmosphere suitable for modern lab conditions.

Parameters like dispensing rate of the solution and speed of spray head movement which are difficult to control manually are controlled precisely by PC based automation. A positive displacement pump controlled by stepper motor and microprocessor is used to dispense solution as per requirement. The spray head movement is also controlled by stepper motor driven linear stages in X and Y direction. The temperature of the substrate heater plate is controlled independently through a dedicated controller. A computer with windows OS can be used to control the operations through serial port. Our dedicated software for spray pyrolysis system can as well be used for documenting the relevant parameters used for sample preparation like temperature, air pressure, duration, etc. Spray pyrolysis is a process in which a thin film is deposited by spraying a solution on a heated surface, where the constituent react to form a chemical compound. The chemical reactants are selected such that the products other than the desired compound are volatile a t the temperature of deposition. The process is particularly useful for the deposition of oxides and has long been a production method for applying a transparentelectrical conductor of Tin oxide (SnO2) or Stannic oxide to glass.

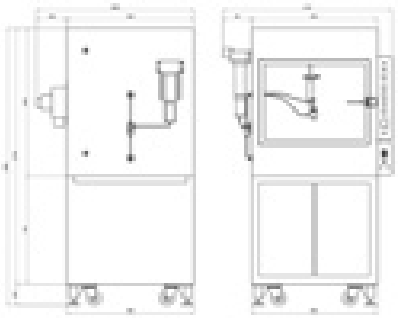
Ultrasonic Spray Head (Optional Accessory)

The standard spray head which uses a compressed air atomization nozzle can be replaced with the ultrasonic spray head which uses an ultrasonic atomizer nozzle. It breaks the solution by vibrating its nozzle at an ultrasonic frequency (Typically 40 kHz), producing a fine spray of droplets of 50 micron average size.



Factors affecting bonding and subsequent build up of the coating :

- Cleanliness
- Surface area
- Surface topography or profile
- Temperature (thermal energy)
- Time (reaction rates, cooling rates etc.)
- Speed
- Physical & chemical properties
- Physical & chemical reactions



Syringe Pump (Optional Accessory)

Syringe pump is preferable to the glass dispenser for solutions which should be sprayed at lower flow rates (<1ml / min). It works with very low volume of solution as the syringe is directly connected to the spray nozzle, avoiding the use of lengthy tubes which should be filled first before the solution can reach the nozzle.

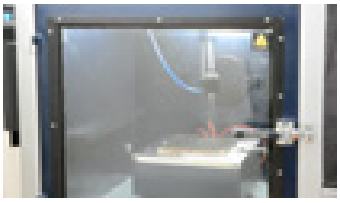


Specifications

Model	HO-TH-04	HO-TH-04A (Larger Version)
Actuator	Stepper motor	Stepper motor
Dispensing unit capacity	50ml & 250ml	50ml & 250ml
Dispensing rate	1 - 10ml / min.	1 - 10ml / min.
Sprayer		
Drive speed X axis (min-max)	10 - 800mm / sec	10 - 800mm / sec
Drive speed Y axis (min-max)	1 - 12mm / sec	1 - 12mm / sec
Sprayer traverse	X - Y 200mm max.	X - Y 250mm max.
Substrate base plate		
Dimension	150 x 150mm	250 x 250mm
Max. temperature	500° C	500° C
Power input	230V, 50Hz	230V, 50Hz
PC connectivity	Serial port (RS 232)	Serial port (RS 232)

Sprayer

Specifications
Drive speed X axis (min-max) :10 - 800mm / sec
Drive speed Y axis (min-max) :1 - 12mm / sec
Sprayer traverse: X - Y 250mm max.



HO-TH-04



Model HO-TH-04A

This is the latest model in Holmarc's line of Spray Pyrolysis Units. This model is the larger version of the standard model that provides expanded capacity and increased travel area for the spray head. This also provides a larger heating platform to spray coat substrates that are larger than standard application. This model uses a fresh new design that enables the user to carry out the spray coating process in a more convenient and efficient manner. This model can also be separated from the bottom shelf section for use as a table top unit. This unit also provides for Nitrogen purging of the enclosure.



Weight (appx.)
280 Kg

Substrate base plate

Specifications
Dimension 150 x 150mm
Max. temperature 500° C
Power input 230V, 50Hz
PC connectivity Serial port (RS 232)



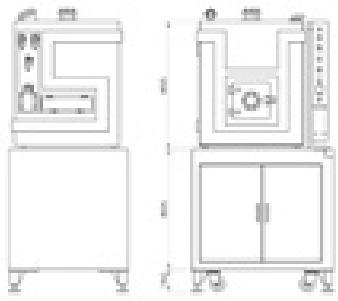
Substrate base plate Larger Version)

Specifications
Dimension 250 x 250mm
Max. temperature 500° C
Power input 230V, 50Hz
PC connectivity Serial port (RS 232)

HOLMARC OPTO-MECHATRONICS LTD

Vacuum Spray Pyrolysis Automated Equipment

Model: HO-TH-VSP-500T



Holmarc's Vacuum Spray Pyrolysis (VSP) system has been designed for advanced research in thin films, especially for solar cell development. This model facilitates the spray pyrolysis to take place in an inert atmosphere using Nitrogen purging. This model comes with Tin bath heater instead of regular stainless steel hot plate. This provides uniform and stable heating to the substrate during the coating process. The system automates various fatigue and error creating processes involved in the technique when performed manually. Moreover, ergonomically designed chamber provides clean and healthy atmosphere suitable for modern lab conditions. In vacuum spray pyrolysis, material is heated in a vacuum in order to decrease its boiling point and avoid adverse chemical reactions. The energy required to bring the material to its boiling point is reduced and the process becomes more efficient. Use of materials with high melting point becomes possible. This opens up possibilities for the use of materials which could not have been used with the traditional spray pyrolysis process. The software interface is simple yet flexible enough to create programs for different types of processes like point spray, raster spray, intermittent spray with programmable time delay etc. The flow rate is precisely controlled through the software while the process temperature, which is independently controlled using a PID temperature controller, can be documented for future reference. The control parameters of a process can be saved and recalled for later use.

The default PC interface is RS232C (Serial port). Optionally, USB to Serial converter is supplied to connect the equipment to the USB port of a PC or laptop. The equipment can be customized to have multiple dispensers which facilitates easy switching between different solutions.

Specifications

Coating Chamber - Chamber Size	700 x 700 x 800mm
Chamber Consists of , water cooling lines, nitrogen inlet port, overhead feed through, Illumination unit with a vacuum vew port etc.	
Material construction	SS304
Vacuum Pump	Oil vacuum pump
Substrate Size	100 x 100mm
Operation	500 - 600 millibar
Inert Gas Operation	Nitrogen purging
Heater Size	150 x 150mm, temperature range up to 500°C
Dispensing System	Stepper motor controlled syringe pump
Dispensing unit capacity	50ml & 250ml
Dispensing rate	1 - 10ml / min.
Drive speed X axis (min-max)	10 - 800mm / sec
Drive speed Y axis (min-max)	1 - 12mm / sec

Coating Chamber

Specifications
Chamber Size
700 x 700 x 800mm
Outer Dimensions

Weight (appx.) - 551 Kg



Factors affecting bonding and subsequent build up of the coating :

- Cleanliness
- Surface area
- Surface topography or profile
- Temperature (thermal energy)
- Time (reaction rates, cooling rates etc.)
- Speed
- Physical & chemical properties
- Physical & chemical reactions

Features

- Vacuum Pump
- Nitrogen purging
- Masking for multi layer coating
- Hot plate for substrate heating

Programmable Multi-Nozzle Spraying System

Model: HO-TH-04C3
With Hot Plate Model : HO-TH-04C3H

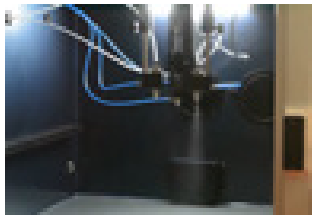
Programmable Multi-Nozzle Spraying System automates the process of multilayer spraying by using a stepper motor controlled mechanism to move the spray head in the XY plane, a stepper motor controlled dispenser to achieve precise flow rate, a compressor with a pressure regulator, a stepper motor controller and a simple easy to use software which enables the user to document the coating parameters for later use

Specifications

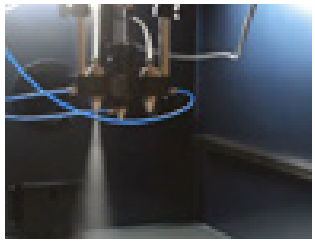
	HO-TH-04C3	HO-TH-04C3H
Number of Syringe pump nozzle	1	1
Nozzle tip	Blunt end needle	Blunt end needle
Nozzle type	Compressed air assisted	Compressed air assisted
Optimum pressure range	8 psi to 12 psi	8 psi to 12 psi
Nozzle height adjustment	Manual	Manual
Height adjustment range	5 cm to 15 cm	5 cm to 15 cm
Number of precursor dispensers	3	3
Dispenser type	Microprocessor controlled piston movement	Microprocessor controlled piston movement
Piston Actuator	Stepper motor	Stepper motor
Dispensing Rate	1 ml/min – 10 ml/min	1 ml / min - 10 ml / min
Container capacity	50 ml & 250 ml	50 ml & 250 ml
Container material of construction	Glass and Nylon	Glass and Nylon
Sprayer movement in X & Y axis	Programmable	Programmable
X travel	1 mm to 150 mm	1 mm to 150 mm
Y travel	1 mm to 150 mm	1 mm to 150 mm
X speed	10 mm/s to 800 mm/s	10 mm/s to 800 mm/s
Y speed	2 mm/s to 12 mm/s	2 mm/s to 12 mm/s
XY sprayer actuator	Stepper motor	Stepper motor
Spray area	10 cm x 10 cm	10 cm x 10 cm
User interface	PC software	PC software
Software controllable parameters	X / Y travel, speed, dispensing rate, delay & coating duration	X / Y travel, speed, dispensing rate, delay & coating duration
XY spray duration	1 min to 60 min	1 min to 60 min
Stationary spray duration	1 sec to 240 sec	1 sec to 240 sec
Hot plate area		150 mm x 150 mm
Temperature range		Ambient to 500^{0} C
		digital PID controller
PC interface	RS232C	RS232C
RS232C cable length	5 meter	5 meter
USB to serial converter	Available	Available
Compatible operating system	Windows XP / 7 / 8 / 10	Windows XP / 7 / 8 / 10
Compressor included	Yes	Yes
Pressure control	Built-in pressure regulator	Built-in pressure regulator
Power	1 hp	1 hp
Input supply voltage	230V 50Hz	230V 50Hz
Note : PC not in the scope of supply.		

Sprayer

Specifications
Number of precursor dispensers 3
Sprayer movement in X & Y axis Programmable
1 mm to 150 mm XYTravel
2 mm/s to 12 mm/s Speed







Weight (appx.) -345 Kg

Syringe Pump (Optional Acessories)

Syringe pump is preferable to the glass dispenser for solutions which should be sprayed at lower flow rates (<1ml / min). It works with very low volume of solution as the syringe is directly connected to the spray nozzle, avoiding the use of lengthy tubes which should be filled first before the solution can reach the nozzle.

Model : HO-TH-04C3H

This model comes with a hot plate of 150x150mm area and a maximum temperature of 500 Degree Celsius.

Model : HO-TH-04C3



UV Ozone Cleaner



UV Ozone Cleaner 150

Model: HO-TH-UVT150 , HO-TH-UVT250

Holmarc's UV Ozone Cleaner is a dedicated system to remove a variety of contaminants from surfaces of substrates samples. UV Ozone cleaning is a simple to use dry process which is highly effective method to clean surfaces. The cleaning effect is caused by irradiating the surface of a substrate with suitable lamps creating enough energy in the in the Ultra Violet spectrum range. It is photo-sensitized oxidation process by atomized Oxygen and high reactive Ozone. The UV radiation directly to the surface stimulates the reaction. Volatile hydrocarbon products are produced. The removal of hydrocarbons in nanometer thickness by oxidation results in ultra clean surfaces with significantly wettability. This is very important before thin film coating process of glass and ceramic surfaces.

Specifications

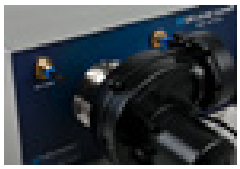
	HO-TH-UVT150	HO-TH-UVT250
UV lamp type	High Ozone UV Lamp	High Ozone UV Lamp
Number of lamps	5 nos.	6 nos.
Lamp power	4W each	4W each
UV wavelength	185 nm & 254 nm	185 nm & 254 nm
Max substrate size	150 mm x 150 mm	250 mm x 250 mm
Cleaning Duration	1 - 99 sec / min / hr	1 - 99 sec / min / hr
Construction	Stainless steel	Stainless steel
Sample feeding	Slide based	Slide based
Lamp to substrate distance	Adjustable between 8 mm and 44 mm	Adjustable between 17 mm and 56 mm
User interface	20 x 4 line alphanumeric LCD and 4 button keyboard	20 x 4 line alphanumeric LCD and 4 button keyboard
Displayed parameters	Tray temperature, Substrate temperature, Time remaining	Tray temperature, Substrate temperature, Time remaining
Set parameter	Cleaning duration	Cleaning duration
Tray temperature sensor	PT100	PT100
Substrate temperature sensor	Infrared thermometer (Non-contact type)	Infrared thermometer (Non-contact type)
Ventilation	Exhaust fan	Exhaust fan
Media (Oxygen) inlet	Pneumatic coupler	Pneumatic coupler
Safety interlock	UV lamp switched off automatically when the tray is opened	UV lamp switched off automatically when the tray is opened
Power input	230V, 50Hz	230V, 50Hz
Dimensions	400 x 536 x 215 mm (W x D x H)	

UV 150 Ozone Cleaner features very high ozone UV lamps which generate energy at 185 nanometers in addition to the low 254 nm line. It provides a tray of 176mm x 168 mm dimension for positioning samples under the UV light source. It comes with an exhaust port and inlet media for the circulation of gas in the tray. Emergency stop is also provided on the control panel to stop the equipment where there is any emergency.

UV Lamp

5 Nos
185 nm & 254 nm





Features

- Oxygen inlet port
- Ozone removal pump
- LCD display unit
- Sample temperature measurement feature
- Buzzer for indication completion of cleaning
- Locking feature for locking sample feeding tray to avoid opening during operation

Model: HO-TH-UVT150



Model: HO-TH-UVT250



UV Lamp

Substrate size

250mmx250mm



UV Ozone 250 Cleaner features very high ozone UV lamps which generate energy at 185 nanometers in addition to the low 254 nm line. It comes with an exhaust port and inlet media for the circulation of gas in the tray



UV Ozone Cleaner 350 400

Model: HO-TH-UVT350

Holmarc's UV Ozone cleaner is designed to remove thin layer of contaminants from sample surfaces under both ambient temperature & in enhancement modes. It is basically a photosensitized oxidation method which uses dry process. The source-Low pressure Hg lamp produces UVC series spectra especially 184.9 & 253.7nm spectral lines acts creator & annihilator of ozone which also used for exciting organic molecules. Overall it have simple to use set up & procedure which gives best results after precleaning. Without any precleaning it gives best results to thick photo resists, pure carbon films & quartz substrates.

Specifications

	HO-TH-UVT350	HO-TH-UVT400
UV lamp type	High Ozone UV Lamp	High Ozone UV Lamp
Number of lamps		
Lamp power		
UV wavelength	185 nm & 254 nm	185 nm & 254 nm
Max substrate size	350 mm x 350 mm	400 mm x 400 mm
Cleaning Duration	1 - 99 sec / min / hr	1 - 99 sec / min / hr
Construction	Stainless steel	Stainless steel
Sample feeding	Slide based	Slide based
Safety interlock		
Power input	230V, 50Hz	230V, 50Hz
Dimensions		

UV Lamp

185nm 254nm
High Ozone UV Lamp





HO-TH-UVT350



Substrate size

350mmx350mm





Model: HO-TH-UVT400

Safety Features

Holmarc's UV ozone cleaner arrives with well suited aluminum chamber which enclosed & blocks harmful UVC radiation from Hg source. A Flush push button close to red sign emergency stop Switch button helps to exhaust all remaining ozone & out gassing gases from tray chamber with the help of blower & additional hose. To avoid the darkening effect of metal sample surface we recommend short time period under UV ozone cleaner.

Applications

Substrate cleaning prior to thin film deposition, Manufacturing Quartz crystal resonators for clocks and frequency control which need ultra clean surfaces, Hermetic sealing of metals with non zero forces in ultra high vacuum, Manufacturing of goggles, cleaning of lenses, mirrors, solar panels, removal of photo resists, photo masks, silicon wafers etc.

Features

- Oxygen inlet port
- Ozone removal pump
- LCD display unit
- Sample temperature measurement feature
- Buzzer for indication completion of cleaning
- Locking feature for locking sample feeding tray to avoid opening during operation
- Wattage : 88W (22 numbers of 4 W tubes in 400 mm x 400 mm size chamber)









Model: HO-TH-UVT400

UV Lamp

185nm 254nm
High Ozone UV Lamp



HOLMARC OPTO-MECHATRONICS LTD

Silar Coating System



Silar Coating System

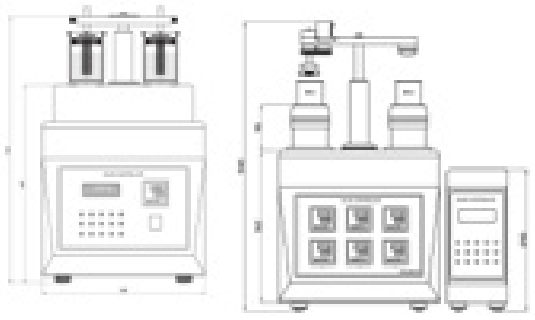
Model: HO-TH-03 , HO-TH-03A,

One of the newest solution method for the deposition of thin film is Successive Ionic Layer Adsorption and Reaction (SILAR) method, which is also known as modified version of chemical bath deposition. As it is a chemical method, a large number of varieties of substrates can be coated. Holmarc's SILAR Coating System has been designed to automate the entire process to avoid operator fatigue and errors associated with it. In manual SILAR process, the operator has to perform hundreds of repetitive dipping into the solution and water. It is very difficult to control dip duration and number of dips in a manual process which can last hours. In the automated unit, the operator need just to clamp the substrate into the holder and program the controller with required dip cycles and duration.

Specifications

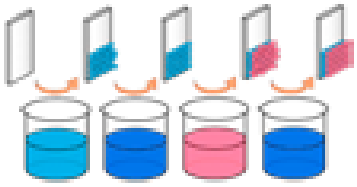
	SILAR Coating System	with Stirrer
Model	HO-TH-03	HO-TH-03A
Actuator	Stepper motor	Stepper motor
Drive mechanism	Lead screw	Lead screw
Dip duration	0 - 99 sec / min / hours	0 - 99 sec / min / hours
Number of dips	1 - 999	1 - 999
Hot plate temperature	Ambient to 80°C	Ambient to 350°C
Stirrer speed	-	2 - 200 rpm
PC connectivity	Serial port (RS 232) / USB	Serial port (RS 232) ? USB
Stroke length	75 mm	75 mm
Drawing speed (Manual mode)	-	-
Drawing speed (PC mode)	-	-
Power input	230V, 50Hz	230V, 50Hz
No. of position for beakers	6	6
No. of samples could be loaded	5	5
No. of programs	5	5
Weight (appx.)	44 Kg	48 Kg

This device can be customized as per requirement. Holmarc has developed models where a controlled heater is used for keeping the solution at specified temperature.



Model: HO-TH-03A (with Stirrer)

HO-TH-03A has a motorized substrate holder which can be used to stir the solution. By rotating the substrate along with the holder at desired speed, the solution can be kept stirred during the dipping process. The rotation speed is programmable from 2 - 200 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. Each hot plate can be set at different temperatures. The temperature can be set up to 350°C from ambient.





Successive Ion Layer Adsorption and Reaction (SILAR)

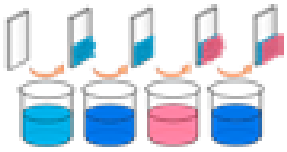
Base Model: HO-TH-03



Silar Coating System

Model: HO-TH-03A8, HO-TH-03S

HO-TH-03A8 has a motorized substrate holder which can be used to stir the solution. In this model eight beakers placed in a circular arrangement about the rotation axis of sample dipping arm. There will be heating plate for each of the beakers. Maximum diameter of hot plate surface on each of these 8 positions will be three inches. By rotating the substrate along with the holder at desired speed, the solution can be kept stirred during the dipping process. The rotation speed is programmable from 2 - 200 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. Each hot plate can be set at different temperatures. The temperature can be set up to 350°C from ambient.



Specifications

	with Stirrer	with Stirrer
Model	HO-TH-03A8	HO-TH-03S
Actuator	Stepper motor	Stepper motor
Drive mechanism	Lead screw	Lead screw
Dip duration	0 - 99 seconds / minutes / hours	0 - 99 seconds / minutes / hours
Number of dips	1 - 999	1 - 999
Hot plate temperature	Ambient - 350°C	Ambient to 80°C
Stirrer speed	Adjustable 0 - 200 rpm	Adjustable 2 rpm - 200 rpm
PC connectivity	Serial port (RS 232) / USB	Serial port (RS 232) / USB
Stroke length	75 mm	75 mm
Drawing speed (Manual mode)		200 micron / sec - 16mm / sec
Drawing speed (PC mode)		2 - 16000 micron / sec
Power input	230V, 50Hz	0
No. of position for beakers	8	6
No. of samples could be loaded	5	5
No. of programs	5	5
Weight (appx.)	76 Kg	55 Kg

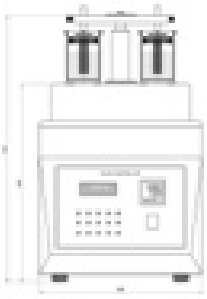
Motorized Substrate Holder

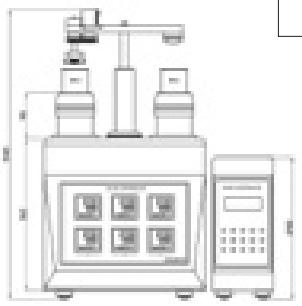
This device can be customized as per requirement. Holmarc has developed models where a controlled heater is used for keeping the solution at specified temperature.

Model: HO-TH-03S has a motorized substrate holder which can be used to stir the solution. By rotating the substrate along with the holder at desired speed, the solution can be kept stirred during the dipping process. The rotation speed is programmable from 2 - 200 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. There is a controlled heater, which is common for 6 beakers and the temperature can be set up to 80°C from ambient. The device is compact and complete with a footprint of 376 x 330 mm.

Successive Ion Layer Adsorption and Reaction (SILAR)

Base Model: HO-TH-03



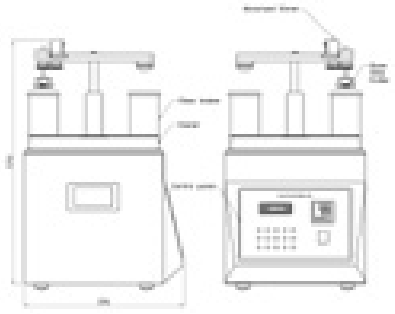


Model: HO-TH-03S (Stirrer with Adjustable speed 2-200rpm)

Model: HO-TH-03A8 (Stirrer with Adjustable speed 2-200rpm)



SILAR Coating System with Overhead Stirrer



Model: HO-TH-03E

Holmarc's SILAR Controller with Overhead Stirrer, Model: HO-TH-03E has a motorized substrate holder which can be used to stir the solution. By rotating the substrate along with the holder at desired speed, the solution can be kept stirred during the dipping process. The rotation speed is programmable from 2 - 200 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. There is a controlled heater, which is common for 6 beakers and the temperature can be set up to 200°C from ambient. The device is compact and complete with a footprint of 376 x 330 mm.

Holmarc's SILAR coating unit is an instrument with which a thin film is deposited on a glass substrate due to a chemical process called successive ion layer adsorption and reaction (SILAR). The technique involves multiple dipping of the substrate in a given solution and de-ionized water, temperature of both can vary from case to case.

SILAR coating system has been designed to automate the entire process to avoid operator fatigue and errors associated with it. In manual SILAR process, the operator has to perform hundreds of repetitive dipping into the solution and water.

It is very difficult to control dip duration and number of dips in a manual process which may last for hours. In our automated unit, all that an operator needs to do is just clamp the substrate on to the holder and program the controller with required parameters.



Specifications

Actuator	Stepper motor
Drive mechanism	Lead screw
Dip duration	0 - 99 seconds / minutes / hours
Number of dips	1 - 999
Hot plate temperature	Ambient to 200°C
Stirrer speed	Adjustable 2 rpm - 200 rpm
PC connectivity	Serial port (RS 232)
Stroke length	200 mm
Rotary speed	0 - 60 deg / sec
Drawing speed (Manual mode)	200 micron / sec - 16mm / sec
Drawing speed (PC mode)	2 - 16000 micron / sec
Stirrer speed	2 - 200 rpm
No. of position for beakers	6
No. of samples could be loaded	5
Temperature change from	Ambient to 200°C
Weight (appx.)	55 Kg


Overhead Stirrer
2-200 rpm Stirrer Speed
6 Samples
Hot plate temperature
Ambient to 200°C

SILAR Coating System with Magnetic Stirrer

Model: HO-TH-03C | HO-TH-03B1

One of the contemporary method for the deposition of thin film is Successive Ionic Layer Adsorption and Reaction (SILAR) method, which is also known as modified version of chemical bath deposition. As it is a chemical method, a large varieties of substrates can be coated.

Holmarc's SILAR Coating System has been designed to automate the entire process to avoid operator fatigue and errors associated with it. In manual SILAR process, the operator has to perform hundreds of repetitive dipping into the solution and water. It is very difficult to control dip duration and number of dips in a manual process which can last hours. In the automated unit, the operator need just to clamp the substrate into the holder and program the controller with required dip cycles and duration.

In this technique thin film is deposited on glass substrate following a chemical technique called successive ion layer adsorption and reaction (SILAR). The technique involves multiple dipping of the substrate in a given solution and deionized water. The technique involves multiple dipping of the substrate in a given solution and deionized water, temperature of both can vary from case to case.

Specifications

Model No	HO-TH-03B	HO-TH-03B1
Actuator	Stepper motor	Stepper motor
Drive mechanism	Lead screw	Lead screw
Dip duration	0 - 99 seconds / minutes / hours	0 - 99 seconds / minutes / hours
Number of dips	1 - 999	1 - 999
Hot plate temperature	Ambient to 200°C	Ambient to 200°C
Stirrer speed	0 - 999 rpm	0 - 999 rpm
PC connectivity	Serial port (RS 232)	Serial port (RS 232)
Stroke length	100 mm	100 mm
Power input	230V, 50Hz	230V, 50Hz
Weight (appx.)	130 Kg	130 Kg

Magnetic Stirrer

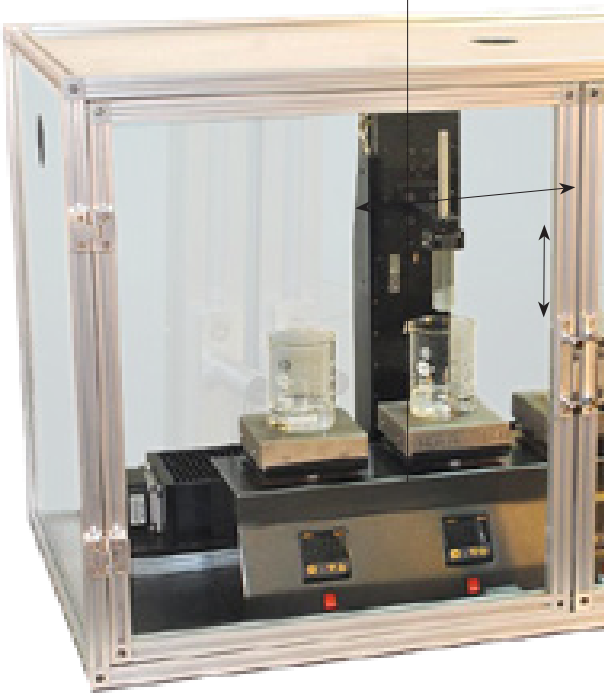
In this model 4 beakers can be used. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. The rotation speed is programmable from 0 - 10 degree/sec.



Other beaker stirs while dipping

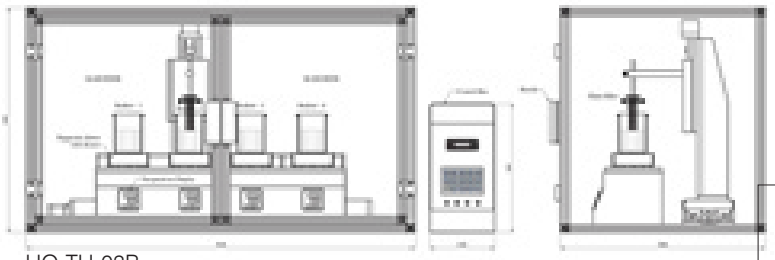
As dipping starts, stirring stops

HO-TH-03B

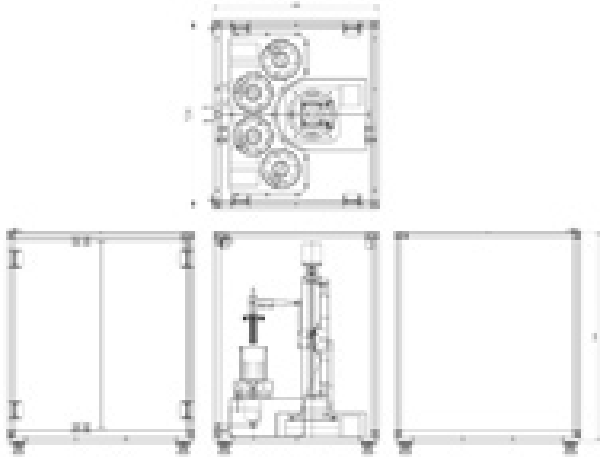


Silar Controller





HO-TH-03B



HO-TH-03B1









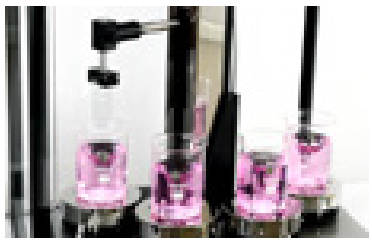
HO-TH-03B1





Magnetic Stirrer

Model HO-TH-03B1 the solution containing beakers are kept on hot plates with magnetic stirrers. The rotation speed of the stirrers can be controlled from 0 - 999 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. Each hot plate can be set at different temperatures. The temperature can be set up to 200°C from ambient.



SILAR Coating System with Magnetic Stirrer & Ultrasonic Bath

Model: HO-TH-03C

Holmarc's SILAR Coating System has been designed to automate the entire process to avoid operator fatigue and errors associated with it. In manual SILAR process, the operator has to perform hundreds of repetitive dipping into the solution and water. It is very difficult to control dip duration and number of dips in a manual process which can last hours. In the automated unit, the operator need just to clamp the substrate into the holder and program the controller with required dip cycles and duration.

In this technique thin film is deposited on glass substrate following a chemical technique called successive ion layer adsorption and reaction (SILAR). The technique involves multiple dipping of the substrate in a given solution and deionized water, temperature of both can vary from case to case.

This model has magnetic stirrers which can be used to stir the solution. The rotation speed can be controlled from 1 - 1000 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. Each hot plate can be set at different temperatures. The temperature can be set up to 200°C from ambient. There is a fifth stand in this model for keeping an ultrasonic bath.

Dip Duration

0 - 99 seconds / minutes / hours

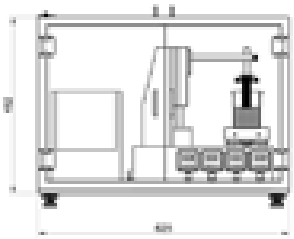


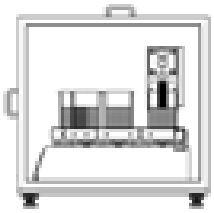


Specifications

Model No	HO-TH-03C	HO-TH-03BV1
	Magnetic Stirrer & Ultrasonic Bath	SILAR Coating System with Magnetic Stirrer and Air-tight Chamber
Actuator	Stepper motor	Stepper motor
Drive mechanism	Lead screw	Lead screw
Dip duration	0 - 99 seconds / minutes / hours	0 - 99 seconds / minutes / hours
Number of dips	1 - 999	1 - 999
Hot plate temperature	Ambient to 200°C	0 - 999 rpm
Stirrer speed	0 - 999 rpm	Serial port (RS 232)
PC connectivity	Serial port (RS 232)	
Stroke length	75 mm	75 mm
Power input	230V, 50Hz	230V, 50Hz
Weight (appx.)	130 Kg	130
Air tight chamber	-	**Available**





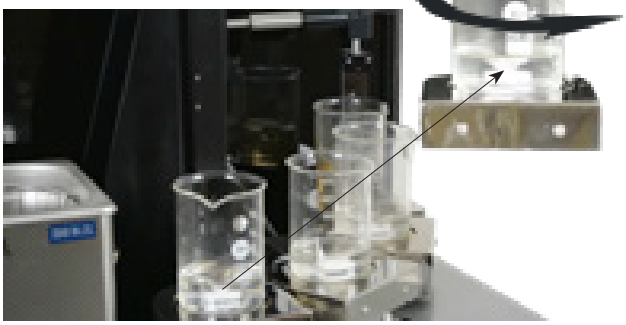


Ultrasonic Cleaner



Magnetic Stirrer

Ambient to 200°C 0 - 999 rpm



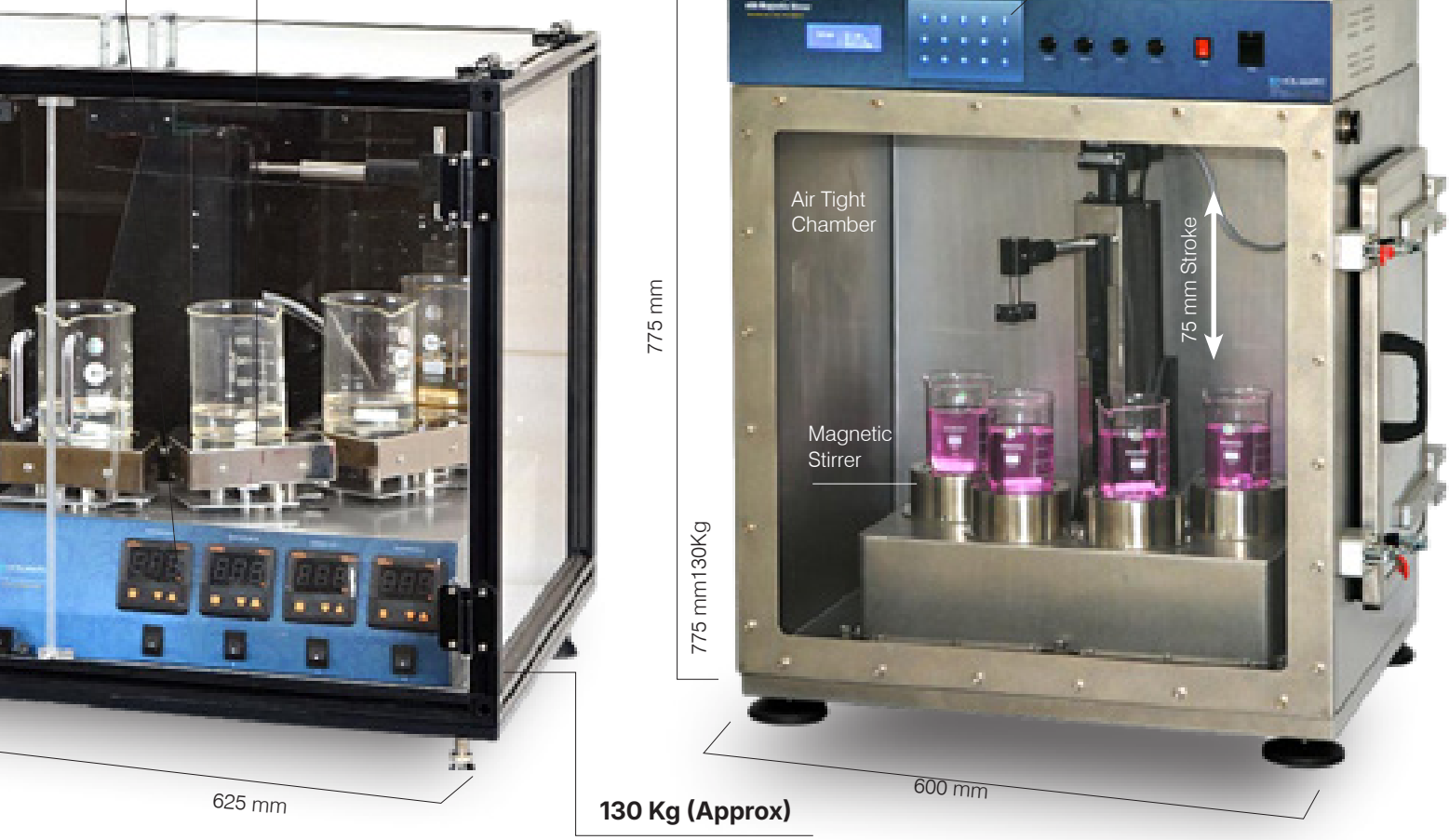
SILAR Coating System with Magnetic Stirrer and Air-tight Chamber

Holmarc's SILAR coating system with Magnetic stirrer and Air-tight Chamber (Model No: HO-TH-03BV1) features an air-tight chamber with a service window and an operating window. The unit provides inlet and outlet valves for inert gas purging. This helps to protect samples from moisture or oxygen exposure at the end of the coating process. It provides four separate platforms to place coating solutions each with magnetic stirrer. User can also control the speed of the magnetic stirrer for each beaker independently by using the knobs on the front panel of the controller.

Model: HO-TH-03BV1

Hot plate temperature

Ambient to 200°C



130 Kg (Approx)

We can provide client designed instruments on special order. For more detail, please contact us

SILAR Coating System for Large Substrate

Model: HO-TH-03F

The SILAR Coating System for Large Substrate Model: HO-TH-03F by Holmarc is designed to automate the SILAR (Successive Ionic Layer Adsorption and Reaction) process for coating large substrates. This system ensures precise control over the dipping and rinsing cycles, reducing operator fatigue and minimizing errors associated with manual processes1. Equipped with features like magnetic stirrers and temperature control, it provides consistent and high-quality coatings, making it an essential tool for advanced material science research and industrial applications

Specifications

Model No	HO-TH-03C
Number of positions for beakers	4
Beaker dimensions (L x B x H)	240 x 40 x 140 mm (Not in the scope of supply)
Hot plates at beaker positions	2 and 4
Temperature range for the hot plate	Ambient to 150°C
Integrated temperature sensors	
Dedicated PID temperature controller for each hot plate	
Sample type	Rectangular glass plate (Not in the scope of supply)
Sample dimensions	240 x 140 x 2 mm
Sample weight	230 g
Actuator	Stepper motor
Drive mechanism	Lead screw
Dip duration	0 - 99 seconds / minutes / hours
Number of dip cycles	1 - 999
User interface	20 x 4 line LCD and push buttons
PC interface	RS232C / USB
Power input	230V 50Hz

Beaker Dimensions

240 x 40 x 140 mm (Not in the scope of supply)



Hot Plates

at beaker positions 2 and 4



Sample Dimensions

240 x 140 x 2 mm
230 g Sample weight



Dip Duration

0 - 99 seconds / minutes / hours

Dip Cycles

1 - 999

Beaker Positions

4

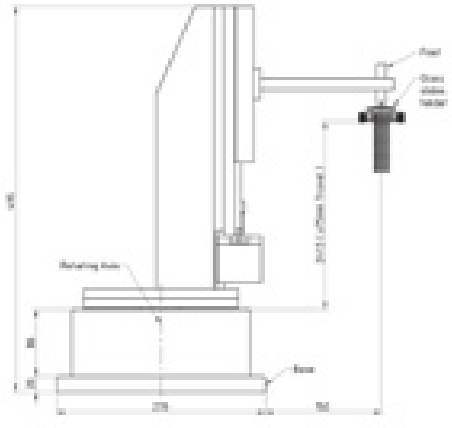


HO-TH-03F



SILAR Coating System without heater and Stirrer

Model: HO-TH-03D1



One of the contemporary method for the deposition of thin film is Successive Ionic Layer Adsorption and Reaction (SILAR) method, which is also known as modified version of chemical bath deposition. As it is a chemical method, a large varieties of substrates can be coated.

Holmarc's SILAR Coating System has been designed to automate the entire process to avoid operator fatigue and errors associated with it. In manual SILAR process, the operator has to perform hundreds of repetitive dipping into the solution and water. It is very difficult to control dip duration and number of dips in a manual process which can last hours. In the automated unit, the operator need just to clamp the substrate into the holder and program the controller with required dip cycles and duration.

In this model 4 beakers can be used. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. The rotation speed is programmable from 0 - 10 degree / sec. In this model there is no heater and stirrer. The process takes place at room temperature.

In this technique thin film is deposited on glass substrate following a chemical technique called successive ion layer adsorption and reaction (SILAR). The technique involves multiple dipping of the substrate in a given solution and deionized water. The technique involves multiple dipping of the substrate in a given solution and deionized water, temperature of both can vary from case to case.

Specifications

	without heater and stirrer	without heater and stirrer
Model No	HO-TH-03D	HO-TH-03D1
Mode of Operation	Manual (LCD)	Manual (LCD)
Actuator	Stepper motor	Stepper motor
Drive mechanism	Lead screw	Lead screw
Dip duration	0 - 99 seconds / minutes / hours	0 - 99 seconds / minutes / hours
No. of dips	1 - 999	1 - 999
Power input	230V, 50Hz	230V, 50Hz
PC connectivity	Serial port (RS 232)	Serial port (RS 232)
Stroke length	75 mm	75 mm
No. of position for beakers	4	4
No. of samples could be loaded	5	5
Platform to keep beakers	Not required	Not required
Dip min / max speed	2 microns / sec - 9000 microns / sec	2 microns / sec - 9000 microns / sec
Retrieval min / max speed	2 microns / sec - 9000 microns / sec	2 microns / sec - 9000 microns / sec

Dip min / max speed

2 microns / sec - 9000 microns / sec

Retrieval min / max speed

2 microns / sec - 9000 microns / sec



HO-TH-03D1

Dip Coating Unit



Dip Coating Unit

Model: HO-TH-01

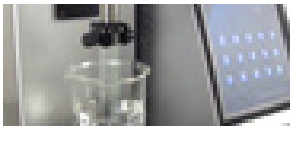
Holmarc's Dip Coating Unit has been designed in such a manner which minimizes the operator's effort. The variables like speed, duration, etc. are maintained accurately by computer control. Dip-coating process, includes five stages: immersion, start-up, deposition, evaporation and drainage. The coating thickness depends on various parameters like viscosity of the coating solution, immersion time, withdrawal speed, evaporation rate etc. Movements are achieved by a precision servo motor controlled linear stage. Adjustable stroke length and accurate speed control are the exceptional features of this model along with its capability of achieving a uniform coating. This is a compact, bench-top coating unit having structural rigidity and is free from vibrations. A microprocessor based system along with user friendly software takes care of accurate control throughout the process. Speed, traverse and idling duration can be programmed. Both manual mode and PC mode are possible in this equipment. In manual mode a user friendly front panel with keyboard and LCD display is provided to enter all the dipping and drying parameters where as in PC mode entire unit can be controlled by user friendly software. It can store up to 5 programs in manual mode, which are editable during the operation. The system is complete with its mechanics, electronics and software. Customization can be done in order to suit the developing needs of the user.

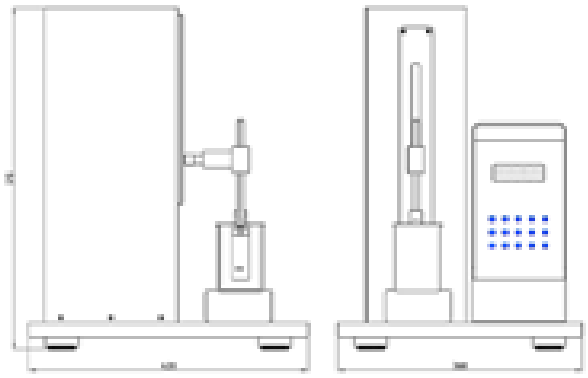
Specifications

Model No	HO-TH-01
Actuator	Servo motor
Drive mechanism	Lead screw
Speed control	Available
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)
Stroke length max.	100 mm
Maximum sample size	75 x 75 mm
Maximum load capacity	2 Kg
Drawing speed min.	18 micron / sec
Drawing speed max.	9000 micron / sec
Dimensions (appx.)	200 x 150 x 380 mm
Weight (appx.)	54 Kg

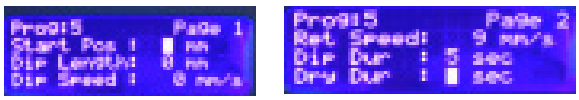
About Dip Coating

Dip coating can be defined as a coating process in which the substrate to be coated is dipped into a tank containing the coating solution and then withdrawn at a well-defined speed in order to obtain a uniform coating.Dip-coating process, includes five stages: immersion, start-up, deposition, evaporation and drainage. The coating thickness depends on various parameters like viscosity of the coating solution, immersion time, withdrawal speed, evaporation rate etc. Dip coating is an industrial coating process which can be used to manufacture bulk products such as coated fabrics and specialized coatings in the biomedical field. Dip coating is commonly used in academic research, where many chemical and nanomaterial engineering research projects use the dip coating technique to create thin film coatings.





Control



Maximum load capacity

2 Kg

HO-TH-01



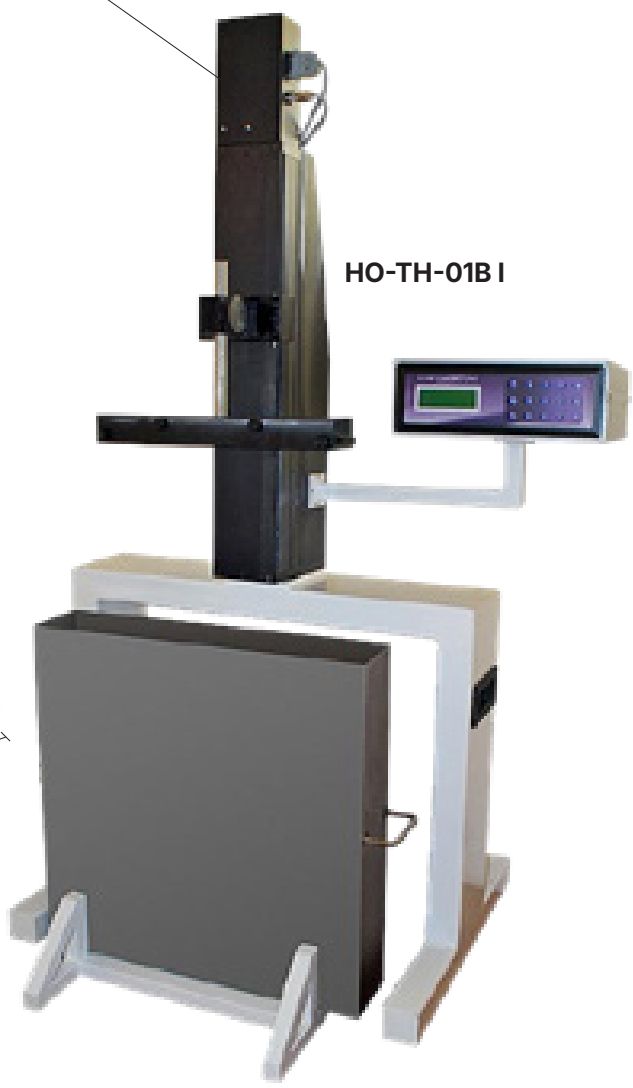
Custom Model HO-TH-01B I

Film formation in dipping is dependent on the viscosity of the fluid. The process is messy and can be highly hazardous. The viscosity of the fluid in a dip tank must remain practically constant if the deposited film quality is to remain high. Dip coating is well suited for high production coating of relatively simple shapes. Transfer efficiency is very high, all contact areas are coated, equipment requirements are low, and the process can be conveyorized and automated.

The product shown (HO-TH-01B) here has been developed for specific research applications. It can be customized to suit related research activities in thin film formation. We welcome customization queries. Dip coating is done by immersing a substrate into a tank containing the coating material, removing from the tank, and allowing it to drain. The coated piece can then be dried by force-drying or baking.



HO-TH-01B I



Weight (appx.) 54 Kg

Dip Coating Unit

Model: HO-TH-01BC

Holmarc's Dip Coating Unit has been designed in such a manner which minimizes the operator's effort. The variables like speed, duration, etc. are maintained accurately by computer control. Dip-coating process includes five stages: immersion, start-up, deposition, evaporation and drainage. The coating thickness depends on various parameters like viscosity of the coating solution, immersion time, withdrawal speed, evaporation rate etc.

Movements are achieved by a precision servo motor controlled linear stage. Adjustable stroke length and accurate speed control are the exceptional features of this model along with its capability of achieving a uniform coating. This is a compact, bench-top coating unit having structural rigidity and is free from vibrations.

A microprocessor based system along with user friendly software takes care of accurate control throughout the process. Speed, traverse and idling duration can be programmed. Both manual mode and PC mode are possible in this equipment. In manual mode a user friendly front panel with keyboard and LCD display is provided to enter all the dipping and drying parameters where as in PC mode entire unit can be controlled by user friendly software.

It can store up to 5 programs in manual mode, which are editable during the operation. The system is complete with its mechanics, electronics and software. Customization can be done in order to suit the developing needs of the user.

Specifications

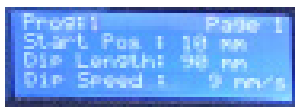
Model	HO-TH-01BC
Actuator	Servo motor
Drive mechanism	Lead screw
Speed control	Variable speed control
Stroke length max.	400 mm
Drawing speed min	2 micron / sec
Drawing speed max	16 mm / sec
Load capacity	5 Kg
Maximum substrate size	1 foot x 1 foot x 3 mm
Number of containers	3
Container size	Compatible with 1 x 1 foot, 6 x 4 inch & 10 x 3 inch substrates
User interface	20 x 4 line LCD & push buttons
Program memory	5 Programs (Unlimited in PC mode)
PC connectivity	Serial port (RS 232) & USB
Software	Windows software
Power input	230V / 50Hz

Container size

Compatible with 1 x 1 foot, 6 x 4 inch & 10 x 3 inch substrates



Control Unit





Costomized Design for your needs

Connect to sales@holmarc.com for costumized dip coating unit

Max Substrate Size

1 foot x 1 foot x 3 mm

Load Capacity

5 Kg

Drawing speed

Maximum 16 mm / sec
Minimum 2 micron / sec



EQUIPMENTS
HOLMARC
OPTO-MECHATRONICS LTD

Dip Coating Unit

Model: HO-TH-02MD

Holmarc's Multiple Dip Coater (Model No: HO-TH-02MD) comes with six beaker holders. The dip-coating solution beakers can be positioned in a circle about a rotating arm of the dip coater. Hence, it is possible to coat different solutions alternatively.

It has been designed to keep operator involvement as minimum as possible so that variables like speed, duration, etc. are maintained accurately by computer or microprocessor controller. Movements are achieved by a precision servo motor controlled stage.

Dip-coating process includes five stages: immersion, start-up, deposition, evaporation and drainage. In the dip coating method, the substrate is slowly dipped into and withdrawn from a tank containing the solution, with a uniform velocity, in order to obtain a uniform coating. This device allows multiple dipping of the substrate in different solutions.

A microprocessor based system along with user friendly software takes care of accurate control throughout the process. Speed, traverse and idling duration can be programmed. The system is complete with mechanics, substrate holder, electronics and software.

Specifications

Model	HO-TH-02MD
Actuator	Servo motor
Drive mechanism	Lead screw
Speed control	Available
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)
Stroke length max.	150 mm
Drawing speed	18 micron / sec - 9mm / sec
Dip duration	0 - 99 sec / min / hr
Max. no. of repetitive dips	1 - 999
Maximum load capacity	2 Kg

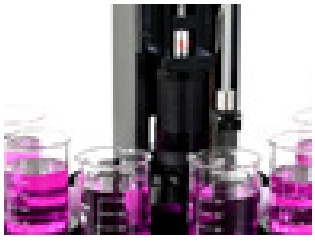
Container size

150mm Maximumn



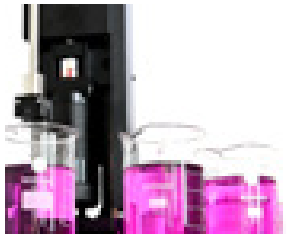
Drawing Speed

18 micron / sec - 9mm / sec



Dip Duration

0 - 99 sec / min / hr

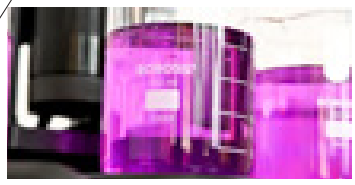


Maximum Load Capacity

2 Kg

Dips

1-999 Number of Repitative Dips



Control



Now Watch all our Product Videos on Youtube !

Angle Dependent Dip Coating Unit

Model: HO-TH-ADDC1

Holmarc Angle Dependant Dip Coating unit enables nano layer coating of substrates by dipping them in beakers containing coating solution. The dipping angle can be varied from 0 to 45 degree depending upon the requirement. There are 4 beaker holder provided for coating 4 different substrates. The dipping speed, dip duration, withdrawal speed and dry duration can be varied for each beaker independently.

Basic principle of ADDC: The substrate is drawn out of the coating solution under a well defined angle of inclination. Both surfaces are coated simultaneously resulting in different film thickness on front and back side.

One of the advantage of ADDC is the reduced number of layers or coating steps to obtain the desired thin film properties.

Specifications

Model	HO-TH-ADDC1
Actuator	Servo motor
Drive mechanism	Lead screw
Speed control	Available
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)
Stroke length max.	75 mm
Drawing speed min.	18 micron / sec
Drawing speed max.	9000 micron / sec
Dimensions (appx.)	570 x 300 x 475 mm
Program memory	8 Programs
Max. power consumption	800 Watts
Maximum load capacity	2 Kg

Stroke Length

75mm



Tilt Angle

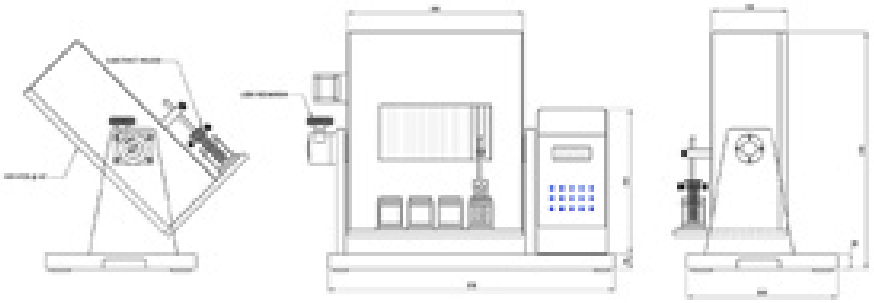




Dip



All Motorrized with Control Electronics



Load Capacity

2 Kg

Drawing Speed

18 micron / second minimum
9000 micron / second maximum

Control



EQUIPMENTS

Dip Coating Unit

with Hot Chamber Model: HO-TH-02
with Infrared Dryer Model: HO-TH-02B

In Holmarc's Dip Coating Unit Model:HO-TH-02, the substrate is dipped in the solution and then withdrawn into a heating chamber. Temperature of the chamber can be controlled and fixed up to 75°C from ambient. All other features are same as that of Model: HO-TH-01.

The system has a user friendly front panel with key board and LCD display. It can as well be controlled through a computer. Dip duration, dip speed, baking duration, withdrawal speed etc. are programable features. Servo motor is used as actuator for vibration free dipping and withdrawal.

The device is designed and manufactured as table top device with entire electronics and servo motor housed in a compact unit. A number of substrate can be held to the holder at the same time. Height of the substrate holder can be adjusted with respect to the level of the solution during the experiment.

Specifications

	Dip Coating Unit with Hot Chamber	
Model	HO-TH-02	HO-TH-02B
Actuator	Servo motor	Servo motor
Drive mechanism	Lead screw	Lead screw
Speed control	6 step variable speed	Available
Power input	230V, 50Hz	230V, 50Hz
PC connectivity	Serial port (RS 232)	Serial port (RS 232)
Stroke length max.	150 mm	150 mm
Maximum sample size	75 x 50 mm	75 x 50 mm
Drawing speed min.	18 micron / sec	18 micron / sec
Drawing speed max.	9000 micron / sec	9000 micron / sec
Dimensions (appx.)	630 x 348 x 416 mm	630 x 368 x 420 mm
Program memory	5 Programs	8 Programs
Max. Temperature		200° Celsius
Max. Substrate size		75 mm x 25 mm
Maximum load capacity	2 Kg	2 Kg
Max. power consumption	460 Watts	
Weight (appx.)	45 Kg	45 Kg



with Hot Chamber Model: HO-TH-02



IR Heater

An infrared heater is a body with a higher temperature which transfers energy to a body with a lower temperature through electromagnetic radiation. Infrared heaters can be operated in vacuum or atmosphere. Infrared heaters are usually classified by the wavelength bands of infrared emission.

HOLMARC's Dip coating unit with infrared dryer (HO-TH-02B), has a ceramic infrared heat system incorporated with it.

Infrared dryer for precise substrate heating



Ceramic infrared heat system

Ceramic infrared heating elements are used in a diverse range of industrial processes where long wave infrared radiation is required. Their useful wavelength range is 2 - 10 μm.

Ceramic Infrared heating elements emit energy with peak emission wavelengths between 3.3 to 5.7 microns. By design a coil heating element of Nickel-Chromium alloy is embedded in a glazed ceramic body, which gives protection against thermal shock and prevents attack by atmospheric oxygen.

The refractory material has a high emissivity value in the range of 0.96 which approaches the ideal black body conditions required for efficient radiation.As these heaters have high resistance to moisture laden air and corrosive atmosphere, they are ideal for solvent removal, moisture evaporation and use in other adverse conditions.

with Infrared Dryer Model: HO-TH-02B

Infrared Dryer Model

The outstanding feature of this model is the presence of an Infra-Red dryer in it. Inside the unit there is an infrared heater, which offers a maximum temperature of 200°C from ambient. After each dip, the Infrared heater helps in drying the substrate. It provides uniform heating to the substrate. The temperature is swiftly attained so that the time taken for the dipping process is greatly reduced.The coating thickness can be easily controlled by adjusting the withdrawal rate and the viscosity of the coating solution. Another advantage of this model is that it minimizes the energy consumption as the heater will be activated only after detecting the substrate and hence it can provide the substrate with accurate temperature. Dip coating unit with infrared dryer has both manual as well as PC mode. In manual mode a user friendly front panel with keyboard and LCD display is provided to enter all dipping and withdrawal parameters where as in PC mode entire unit can be controlled by user friendly software. It is also possible to save programs for future use.

HOLMARC's Dip Coating Unit with Infrared Dryer (HO-TH-02B) has been designed to keep operator involvement as minimum as possible so that variables like speed, duration, etc. are maintained accurately by microprocessor controller. Movements are achieved by a precision servo motor controlled linear stage that offers vibration and noise free operation Moreover this model dip coaters are specially designed for lower volume applications. PID Controller is used for optimum heating of the substrate. Apart from other sensors that sense the temperature of the heating chamber as a whole, the infrared sensor gives feedback of the temperature attained by the substrate by monitoring its emissivity. Our Dip coating unit can provide controlled immersion and withdrawal speeds for the substrates at user defined temperature (Max.200°C) which helps to have a uniform coating. The compact size and sophisticated design of the system make it ideal for research activities and in physics, chemistry and biotechnology labs.We hold expertise in designing and manufacturing custom models depending on the varying needs of the customer.

PC controllable & User friendly software

Dip Coating Unit

with Magnetic Stirrers & Air Tight Chamber

Model: HO-TH-03BC

Holmarc's Dip Coating Unit has been designed in such a manner which minimizes the operator's effort. The variables like speed, duration, etc. are maintained accurately by computer control. Dip-coating process, includes five stages: immersion, start-up, deposition, evaporation and drainage. The coating thickness depends on various parameters like viscosity of the coating solution, immersion time, withdrawal speed, evaporation rate etc.

Movements are achieved by precision servo motor controlled linear stages. Adjustable stroke length and accurate speed control are the exceptional features of this model along with its capability of achieving a uniform coating. This is a compact, bench-top coating unit having structural rigidity and is free from vibrations. A microprocessor based system along with user friendly software takes care of accurate control throughout the process. Speed, traverse and idling duration can be programmed. Both manual mode and PC mode are possible in this equipment. In manual mode a user friendly front panel with keyboard and LCD display is provided to enter all the dipping and drying parameters where as in PC mode entire unit can be controlled by user friendly software.

In the Model HO-TH-03BC the solution containing beakers are kept on hot plates with magnetic stirrers. The rotation speed of the stirrers can be controlled from 0 - 999 rpm. The dipping speed, dip duration, retrieval speed and dry duration can be set for each beaker. Each hot plate can be set at different temperatures. The temperature can be set up to 200°C from ambient. It can store up to 5 programs in manual mode, which are editable during the operation. The system is complete with its mechanics, electronics and software. Customization can be done in order to suit the developing needs of the user.

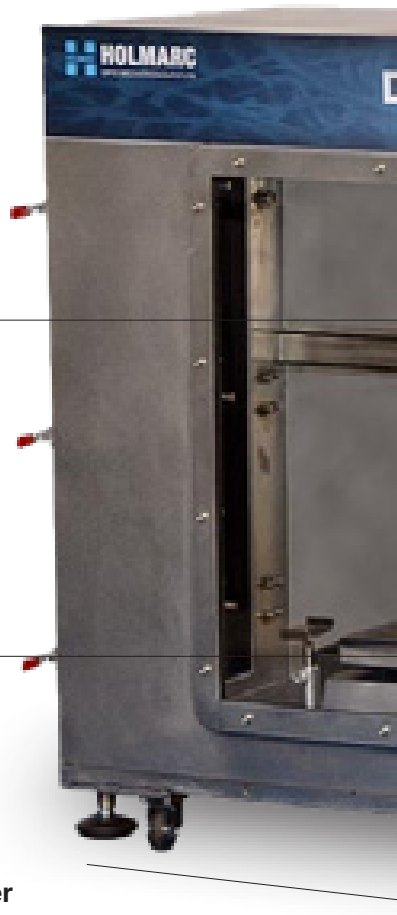
Specifications

Actuator	Servo motor
Drive mechanism	Ball screw
Dipping travel	300 mm
Horizontal travel	1100 mm
Dip duration	0 - 99 seconds / minutes / hours
Number of dips	1 - 999
Dip / Withdrawal speed	18 micron/s to 9 mm/s
Hot plate temperature	Ambient to 200°C
Hot plate diameter	70 mm
Maximum sample size	300 x 210 x 10 mm (Width x Height x Thickness)
Maximum load capacity	2 Kg
Stirrer speed	0 - 999 rpm
Stirrer capacity	250 ml
Stirrer plate dimensions	350 mm square plate with 70 mm hot plate at the center
PC connectivity	Serial port (RS 232) with USB to Serial adapter
Power input	230V/50Hz
Dimensions	2138 L x 628 x 1074 H (mm)
Construction	Stainless steel
2 side doors	Transparent front window
Chamber lamp, Leveling screws	

Horizontal Travel

300mm





Stirrer

0 - 999 rpm speed
250 ml Capacity

Chamber Lamps

Stainless Steel

Construction

Dips

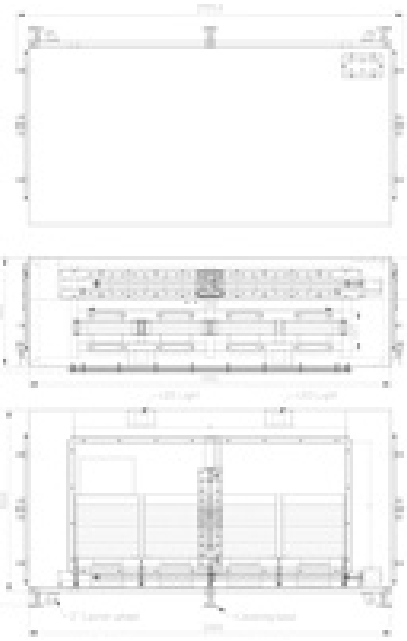
1-999 Number of Dips
0-66 seconds / minutes / hours



Load Capacity

2 Kg Maximum





Hot Plate

70mm Diameter



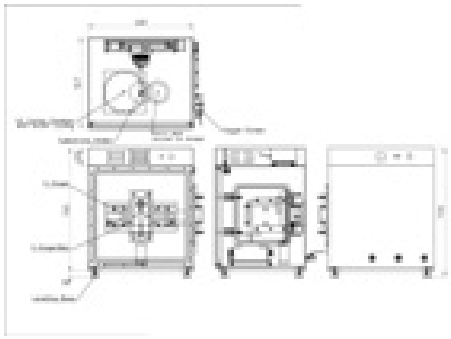
EQUIPMENTS

HOLMARC OPTO-MECHATRONICS LTD

Dip Coating Unit

with Blue Light Curing

Model: HO-TH-02C



This model has a blue light (405 nm) LED flood curing chamber to cure the coating after the dip process. The curing light intensity can be programmed from 1% to 100 % in 1% increments. A wait time after the dip, and before the curing, can be programmed. The flood curing chamber is made to prevent light leaking out to the main chamber to protect light sensitive solutions from deterioration. Valves are provided to purge the curing chamber and the main chamber with inert gas. The LEDs are cooled by circulating water through their heat sink. An immersible pump is supplied along with the instrument for this purpose. Sample holders customized according to the sample dimensions, material and shape are available.

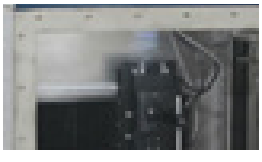
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Movements are achieved by a precision servo motor controlled linear stage. Adjustable stroke length and accurate speed control are the exceptional features of this model along with its capability of achieving a uniform coating. This is a compact, bench-top coating unit having structural rigidity and is free from vibrations. A microprocessor based system along with user friendly software takes care of accurate control throughout the process. Speed, traverse and idling duration can be programmed. Both manual mode and PC mode are possible in this equipment. In manual mode a user friendly front panel with keyboard and LCD display is provided to enter all the dipping and drying parameters where as in PC mode entire unit can be controlled by user friendly software. It can store up to 5 programs in manual mode, which are editable during the operation. The system is complete with its mechanics, electronics and software. Customization can be done in order to suit the developing needs of the user.



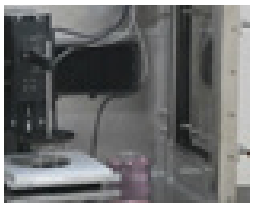
Specifications

Actuator	Servo motor
Drive mechanism	Lead screw
Speed control	Available
Power input	230V, 50Hz
User interface	20 x 4 line LCD and 15 button keyboard (Optional touchscreen display)
PC connectivity	Serial port (RS 232) & USB
Stroke length max.	100 mm
Drawing speed min	18 micron / sec
Drawing speed max.	9000 micron / sec
Curing light wavelength	405 nm
Light source	LED
Light intensity range	1 - 100 %
Wait time (Dip / idle / curing)	0 - 99 sec / min / hour
Number of cycles	1 - 999
Inert gas inlets	Available
Maximum load capacity	2 Kg
Dimensions (appx.)	Sta
Weight (appx.)	85 Kg



Blue Curing Light

405 nm, LED



Load Capacity

2 Kg



85 Kg

See a Tutorial

Long Travel Dip Coating Unit

Specifications

Actuator	Servo motor
Drive mechanism	Lead screw
Speed control	Available
Power input	230V / 110V 50 / 60Hz
User interface	User friendly key board and LCD display
Stroke length max.	1000 mm
Drawing speed min.	18 micron / sec
Drawing speed max.	9000 micron / sec
Dipping speed	min 30 to max 600 mm/minute
Withdrawal speed	min 30 to max 600 mm/minute
Load Capacity	10 Kg

Model: HO-TH-12T



Watch it in Action

Spin Coating Unit

Model: HO-TH-05

With UV Curing System Model: HO-TH-05C

Holmarc's Spin Coater, Model no: HO-TH-05 is a dedicated tabletop system to spin coat small substrates in research laboratories with well controlled spin process parameters. The high speed and duration range allows the user to achieve the desired thickness or thinness of the film. The spin head actuator is a precision DC servo motor, which requires less maintenance, with accurate speed and acceleration control. A vacuum chuck powered by oil-less vacuum pump holds the substrate at the spinning head. The device has user friendly front panel having keyboard and LCD for programming the spin process. Spin duration, spin speed, acceleration, etc. are all programmable parameters through the front panel. As the program memory is non-volatile, the recorded parameters are not lost in case of any power failure. This model is equipped with a memory of 9 pre-set, editable programs, each having 9 steps. The device is compact and complete with electronics built into the unit within a footprint of 275 x 400 mm. All components in the device are corrosion protected to make it clean room compatible. The spin chamber is constructed in nylon with a diameter of 200mm. A transparent protective covering on top of the chamber makes spin coating a hassle free experience. Three sets of nylon anti-corrosive vacuum chucks are provided along with the equipment for holding substrate from 15 x 15 mm square to 100 x 100 mm square. Solvent drainage and vacuum release facilities are also provided in this device. Holmarc can provide customized models as per requirement.

Specifications

HO-TH-05 HO-TH-05C

User Interface	24 x 4 Line Alpha-numeric LCD and 16 button keyboard
Actuator	Brushless DC servo motor
Program Memory	9 programs with 9 steps for each program
Speed Profile	Speed, Duration and acceleration
Spin Speed	60 - 9999 RPM
Speed Resolution	1 RPM
Speed Accuracy	+/- 1 %
Acceleration / Deceleration	10 - 2000 rpm / s (Ramp & dwell time can be indirectly set by entering acceleration)
Duration	1 - 99 sec / min / hr for each step
Sample Chucks	3 Nos. (25 mm, 32 mm & 45 mm)
Maximum Sample Diameter	100 mm
Minimum Sample Diameter	13 mm
Bowl Material	Polypropelene
Bowl Size	8 inches
Transparent lid with sample dispensing port	
Drainage hose	
Safety interlock to prevent spinning when the bowl is open	
Sample Holder	PTFE disk with silicon rubber O ring
Sample Mounting	Secured by vacuum holding
Vacuum Connector	8 mm dia Snap-in hose connector
N2 Purge Connector	
Vacuum pump On / Off and release Switch	
Dimension (mm)	400 (L) x 275 (W) x 350 (H)
AC Input	230 V
Maximum power consumption	260 W (with vacuum pump)

SPIN COATING

About Spin Coating

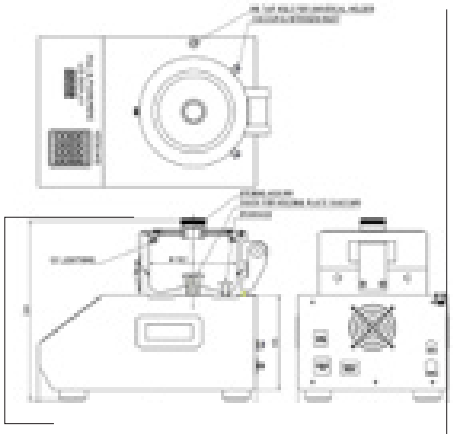
Spin coating is one of the most common techniques used to deposit uniform thin films to flat substrates. It is used in a wide variety of industries and technology sectors. The advantage of spin coating is its ability to quickly and easily produce very uniform films, ranging from a few nanometers to a few microns in thickness. In this technique, a small amount of coating material is applied on the center of the substrate, which is either spinning at low speed or not spinning at all. The substrate is then rotated at high speed in order to spread the coating material by centrifugal force. Rotation is continued while the fluid spins off the edges of the substrate, until the desired thickness of the film is achieved. The applied solvent is usually volatile, and simultaneously evaporates. So, the higher the angular speed of spinning, the thinner the film. The thickness of the film also depends on the viscosity and concentration of the solution and the solvent.

Spincoating is ubiquitous in organic electronics, nanotechnology, semiconductor industries and other Industrial sectors.



Vaccum Pump

Oil free	
Max flow rate	45 lpm
Max vacuum	27 inches Hg
Mac Pressure	60 psig
Power	1/4 hp
Dimensions	300 x 130 x 200 mm



Spin coating is widely used in microfabrication of functional oxide layers on glass or single crystal substrates using sol-gel precursors, where it can be used to create uniform thin films with Nano scale thicknesses. It is used intensively in photolithography, to deposit layers of photoresist about 1 micrometer thick.



HO-TH-05

Optional Accessories

- Digital Pipette for dispensing of liquid into the substrate
- Stand is used for holding manual pipette
- Vacuum adaptor to fix Petri dishes of sizes ranging from 30 mm - 100 mm diameter
- Mechanical clips or locks to hold samples without vacuum

Spin Coating Unit with UV curing system

Model: HO-TH-05C

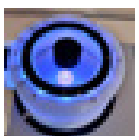
Holmarc's Spin Coating unit, Model no: HO-TH-05C has been designed with many additional features than that of Model: HO-TH-05. In this model of spin coater, UV LED curing system is used whenever there is a need for curing and drying of coatings. It also provides gases purge facility for additional supply of gases inside the chamber. Vaccum Chucks provide flat, rigid surface for mounting substrates of different sizes and shapes. A vaccum chuck powered by oil- less vaccum pump holds the substrate at the spinning head. In-built sample dispensing system (optional accessory) helps to supply volatile solution in milli liter volume. The syringe holder height can be adjusted and rotated freely along the support rod. All required safety measures are provided for high speed rotation and spillage. It also provides facility for drainage. The system has a user friendly front panel with key board and LCD display. The programs are easy to set up with up to 9 steps per program. All other features are same as that of Model: HO-TH-05. Three sets of nylon anti-corrosive vacuum chucks are provided along with the equipment for holding substrate from 15 x 15 mm square to 100 x 100 mm square.

UV Curing

UV light source	5 mm LED
Number of LEDs	12
Wavelength range	365 - 395 nm
Curing time	1 - 99 sec / min / hr
Automatic in-bowl curing immediately after the spin process	

Nylon Vaccum Chucks 14mm, 22 mm, 36 mm diameter







HO-TH-05C

Optional Accessories

Vacuum adaptor to fix Petri dishes of sizes ranging from 30 mm - 100 mm diameter Mechanical clips or locks to hold samples without vacuum Digital Pipette for dispensing of liquid into the substrate Stand used for holding manual pipette

Spin Coating Unit

with Integrated Syringe Pump Model: HO-TH-05S
with Integrated 4 Channel Syringe Pump Model: HO-TH-05TS4

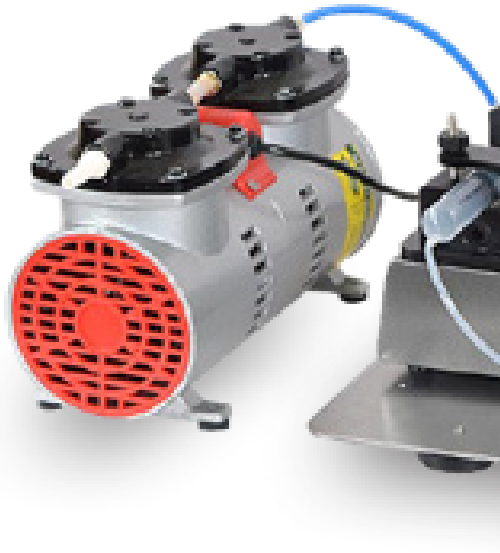
Holmarc's Spin Coating Unit with Integrated Syringe Pump, Model no: HO-TH-05S is a dedicated tabletop system to spin coat small substrates in research laboratories with well controlled spin process parameters. The high speed and duration range allows the user to achieve the desired thickness or thinness of the film. The spin head actuator is a precision DC servo motor, which requires less maintenance, with accurate speed and acceleration control. A vacuum chuck powered by oil-less vacuum pump holds the substrate at the spinning head. HO-TH-05S has an integrated syringe pump to dispense precise volume of solution to the substrate automatically at the start of, or during, the spinning process. The pump is connected to the spinning bowl through Silicon tubing. The device has user friendly front panel having keyboard and LCD for programming the spin process. Spin duration, spin speed, acceleration, etc. are all programmable parameters through the front panel. As the program memory is non-volatile, the recorded parameters are not lost in case of any power failure. This model is equipped with a memory of 9 pre-set, editable programs, each having 9 steps. The device is compact and complete with electronics built into the unit within a footprint of 275 x 400 mm. All components in the device are corrosion protected to make it clean room compatible. The spin chamber is constructed in nylon with a diameter of 200mm. A transparent protective covering on top of the chamber makes spin coating a hassle free experience. Three sets of nylon anti-corrosive vacuum chucks are provided along with the equipment for holding substrate from 15 x 15 mm square to 100 x 100 mm square. Solvent drainage and vacuum release facilities are also provided in this device. Holmarc can provide customized models as per requirement.

Applications

Spincoating is ubiquitous in organic electronics, nanotechnology, semiconductor industries and other Industrial sectors.

Spin coating is widely used in microfabrication of functional oxide layers on glass or single crystal substrates using sol-gel precursors, where it can be used to create uniform thin films with Nano scale thicknesses. It is used intensively in photolithography, to deposit layers of photoresist about 1 micrometer thick.

Specifications	HO-TH-05S	HO-TH-05TS4
Actuator	Brushless DC moto	Brushless DC motor
Spinning speed	60 - 9999 rpm	60 - 9999 rpm
Substrate diameter	30 mm to 70 mm	30 mm to 70 mm
Power input	230V, 50Hz	110V / 220V / 230V, 50Hz / 60Hz
Read out	20 x 4 line LCD	20 x 4 line LCD
Spin chamber	Nylon	Nylon
Acceleration	5 - 2000 rpm / sec	5 - 2000 rpm / sec
Spinning Speed Accuracy	< 5%	< 5%
Programmable parameters	Speed , Acceleration, Dwell time and No. of step	Speed , Acceleration, Dwell time and No. of steps
Maximum no of steps	9	9
Program memory	9 programs (non - volatile)	9 programs (non - volatile)
Dimension	400mm Depth x 275mm W x 500mm H	400mm Depth x 275mm W x 500mm H
Weight (appx.)	34 Kg	46 Kg
Syringe pump dispenser	-	
Dispensing Volume	1 - 999 microliter or ml	1 - 999 microliter or ml
Flow rate	1 - 999 microliter / min or ml / min	1 - 999 microliter / min or ml / min
Duration	1 - 99 sec / min / hr	1 - 99 sec / min / hr
No of Channels	4	Automatic dispensing integrated with spin process



Features

- Chuck diameters : 14mm, 22 mm, 36 mm (Outer diameter of the O ring)
- Transparent Safety Lid over the Working Chamber
- Non-volatile Program Memory
- User friendly design
- Back Panel Power On / Off Switch
- nlet and outlet for Inert Gas Purging, 6mm tubing

Watch Product Tutorial

Nylon Chuck

14mm, 22 mm, 36 mm

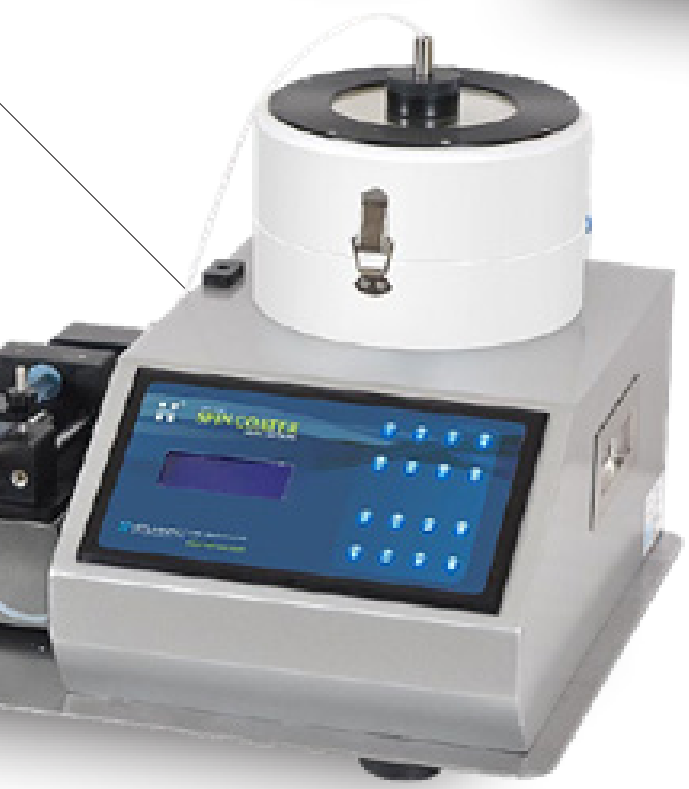


4 Channel Syringe PumpPump

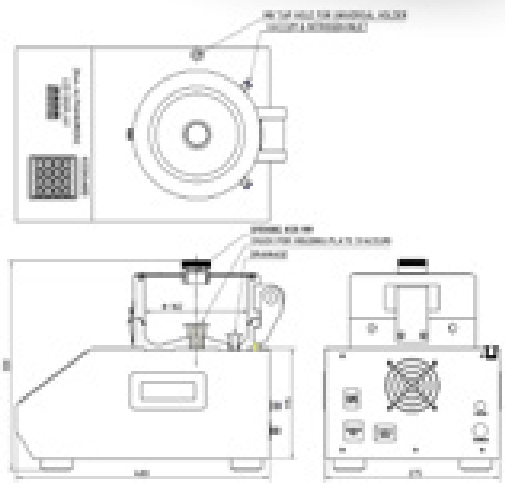
Automatic dispensing integrated with spin process at Dispensing Volume 1 - 999 microliter or ml

HO-TH-05TS4





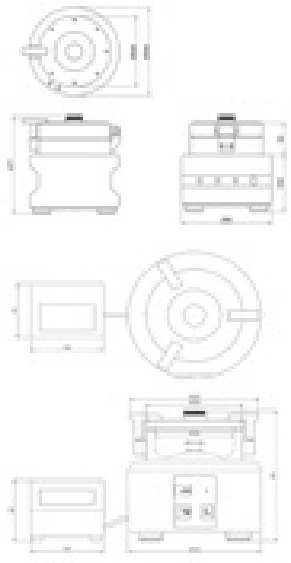
HO-TH-05S



Optional Acessories

- Digital Pipette for dispensing of liquid into the substrate
- Stand is used for holding manual pipette
- Vacuum adaptor to fix Petri dishes of sizes ranging from 30 mm - 100 mm diameter
- Mechanical clips or locks to hold samples without vacuum

Spin Coating Unit



Glove Box Compatible

Holmarc's Spin Coater compatible with glove box, Model no: HO-TH-05G is a dedicated system suitable for use inside glove box to spin coat small substrates in research laboratories with well controlled spin process parameters. This model offers separate controller which has user friendly front panel having keyboard and LCD for programming the spin process. The user can, hence operate the spin coater in the remote location. Start and Stop switches are provided near the spinning chamber to initiate the spinning process within glove box without removing user's hands from the gloves. Spin duration, spin speed, acceleration, etc. are all programmable parameters through the front panel of the controller. The spin head actuator is a precision DC servo motor with accurate speed and acceleration control. A vacuum chuck powered by oil-less vacuum pump holds the substrate at the spinning head. Three sets of nylon anti-corrosive vacuum chucks are provided along with the equipment for holding substrate from 15 x 15 mm square to 100 x 100 mm square. The nylon made spin chamber is compact within a footprint of 296 x 266 mm and easy to install into the glove box. A transparent cover on top of the chamber protects the surroundings by keeping the spin off solution inside. All components in the device are corrosion protected to make it clean glove box compatible.

Specifications	HO-TH-05G	HO-TH-05GV
User Interface	20 x 4 line alphanumeric LCD and 16 button keyboard	5 inch Touchscreen Display
Material of Construction	Epoxy coated mild steel cover with polypropylene bowl	Polypropelene (Full body, including spinner bowl) Glovebox compatible, Detachable display unit
Actuator	Brushless DC servo motor	Brushless DC servo motor
Program Memory	9 programs with 9 steps for each program	Infinite number of programs with 10 steps for each program
Speed Profile	Speed, Duration and acceleration	Speed, Duration and acceleration
Spin Speed	10 - 10000 RPM	60 - 9999 RPM
Speed Resolution	1 RPM	1 RPM
Speed Accuracy	+/- 1 %	1 RPM
Acceleration / Deceleration	5 - 2000 rpm / s (Ramp & dwell time can be indirectly set by entering acceleration)	10 - 2000 rpm/s (Ramp and dwell time can be indirectly set by entering acceleration)
Duration	1 - 10000 sec for each step	1 - 99 sec / min / hour for each step
Sample Chucks	3 Nos. (10 mm, 22 mm & 35 mm)	3 Nos. (25 mm, 32 mm & 45 mm)
Maximum Sample Diameter	100 mm	100 mm
Minimum Sample Diameter	10 mm	13 mm
Bowl Material	Polypropylene	Polypropylene
Bowl Size	8 inches	8 inches
Lid Type	Lid with transparent window and sample dispensing port	Transparent lid with sample dispensing port
Drainage hose	Included	Included
Safety Interlock	Safety interlock to prevent spinning when the bowl is open	Safety interlock to prevent spinning when the bowl is open
Sample Holder	PTFE disk with silicon rubber O ring	PTFE disk with silicon rubber O ring
Sample Mounting	Secured by vacuum holding	Secured by vacuum holding
Vacuum Connector	8 mm dia Snap-in hose connector	8 mm dia Snap-in hose connector N2 Purge Connector
Vacuum Pump Control	Vacuum pump On / Off and release Switch	Vacuum pump On / Off and release Switch
electrical feed connectors	1 (KF40 compatible)	Sold Seperately
Spin Chamber Dimensions (mm)	250 x 277 (Dia x H)	250 x 277 (Dia x H)
Power Input (Factory set)	Power Input (Factory set)	230 V AC Input
Maximum power consumption	260 W (with vacuum pump)	260W (With vacuum pump)
Dimensions		274 mm diameter (No display unit), 277 mm Heigh
Main Body Dimensions		273 x 283 mm (Diameter x Height)
Display Unit Dimensions		150 x 117 x 133 mm (W x D x H)

Spin Coating Unit with Polypropylene body

Holmarc's Spin Coater, Model no: HO-TH-05GV is a dedicated tabletop system to spin coat small substrates in research laboratories with well controlled spin process parameters. The high speed and duration range allows the user to achieve the desired thickness or thinness of the film. The spin head actuator is a precision DC servo motor, which requires less maintenance, with accurate speed and acceleration control. A vacuum chuck powered by oil-less vacuum pump holds the substrate at the spinning head.

The device has user friendly front panel having 5 inch touchscreen LCD for programming the spin process. Spin duration, spin speed, acceleration, etc. are all programmable parameters through the front panel. As the program memory is non-volatile, the recorded parameters are not lost in case of any power failure. This model is equipped with a memory for unlimited number of pre-set, editable programs, each having 10 steps.

Features

- Full Polypropylene body
- Glovebox compatible
- Chuck diameters : 14 mm, 22 mm, 36 mm (Outer diameter of the O ring)
- Transparent Safety Lid over the Working Chamber
- Unlimited Program Memory
- User friendly touchscreen interface
- Inlet and outlet for Inert Gas Purging, 6 mm tubing

HO-TH-05GV



Features

- Chuck diameters : 14mm, 22 mm, 36 mm (Outer diameter of the O ring)
- Transparent Safety Lid over the Working Chamber
- Non-volatile Program Memory
- User friendly design

HO-TH-05S



Vaccum Pump

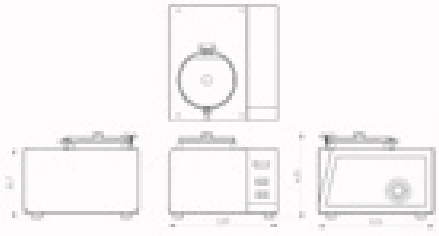
Oil free	
Max flow rate	45 lpm
Max vacuum	27 inches Hg
Mac Pressure	60 psig
Power	1/4 hp
Dimensions	300 x 130 x 200 mm

Optional Accessories

- Vacuum adaptor to fix Petri dishes of sizes ranging from 30 mm - 100 mm diameter
- Mechanical clips or locks to hold samples without vacuum
- Digital Pipette for dispensing of liquid into the substrate
- Stand used for holding manual pipette

Spin Coating Unit

Larger version
Model HO-TH-05LS



Holmarc's Spin Coater, Model: HO-TH-05LS, is a dedicated tabletop system to spin coat substrates up to 150 mm (6 inch) diameter, with well controlled spin process parameters in a research laboratory. The high speed and duration range allow the user to achieve the desired thickness or thinness of the film. The spin head actuator is a precision DC servo motor, which is maintenance free, with accurate speed and acceleration control. A vacuum chuck powered by oil-less vacuum pump holds the substrate at the spinning head.

The device has user friendly front panel having keyboard and LCD for programming the spin process. Spin duration, spin speed, acceleration, etc. are all programmable parameters through the front panel. As the program memory is non-volatile, the recorded parameters are not lost in case of any power failure. This model is equipped with a memory of 9 pre-set, editable programs, each having 9 steps.

The device is compact and complete with electronics built into the unit within a footprint of 600 x 400 mm, excluding the vacuum pump. All components in the device are corrosion protected to make it clean room compatible. The spin chamber is constructed in nylon with an internal diameter of 245 mm. A transparent protective covering on top of the chamber makes spin coating a hassle free experience. Three sets of PTFE anti-corrosive vacuum chucks are provided along with the equipment for holding substrate from 15 x 15 mm square to 150 x 150 mm square. Solvent drainage and vacuum release facilities are also provided in this device. Holmarc can provide customized models as per requirement.

Speed

60 - 8000 RPM

Acceleration / Deceleration

5 - 2000 rpm / s

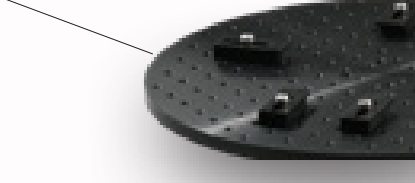
Duration

1 - 99 sec / min / hour



Sample Diameter

15-150mm(max)



Specifications

User Interface	20 x 4 line LCD
Actuator	Brushless DC servo motor
Program Memory	9 programs (non - volatile)
Speed Profile	Speed, Duration and Acceleration
Spin Speed	60 - 8000 RPM
Speed Resolution	1 RPM
Speed Accuracy	+/- 1 %
Acceleration / Deceleration	5 - 2000 rpm / s (Depending on the chuck size)
Duration	1 - 99 sec / min / hour for each step
Sample Chucks	5 Nos. (15 mm, 25 mm, 50 mm, 75mm & 100 mm)
Maximum Sample Diamete	150 mm
Minimum Sample Diameter	15 mm
Bowl Material	Polypropylene (PP)
Lid with transparent window and sample dispensing port	
Safety interlock to prevent spinning when the bowl is open	
Sample Holder	PTFE disk with silicon rubber O ring
Sample Mounting	Secured by vacuum holding
Vacuum Connector	8 mm dia Snap-in hose connector
Solvent drainage and vacuum release facilities	
Nitrogen / Inert Gas Inlet	
Vacuum pump On / Off and Release Switches	
Power Input (Factory set)	230V/50Hz or 110V/50Hz
Maximum Power Consumption	350W (With vacuum pump)
Dimensions	537 x 573 x 425 mm (W x D x H)

Applications

- Spincoating is ubiquitous in organic electronics, nanotechnology, semiconductor industries and other Industrial sectors.
- Spin coating is widely used in microfabrication of functional oxide layers on glass or single crystal substrates using sol-gel precursors, where it can be used to create uniform thin films with Nano scale thicknesses. It is used intensively in photolithography, to deposit layers of photoresist about 1 micrometer thick.

Transparent Safety Lid



Features

- Chuck diameters : 15mm, 25 mm, 50 mm, 75mm & 100 mm
- Transparent Safety Lid over the Working Chamber
- Non-volatile Program Memory
- User friendly design
- Inlet and outlet for Inert Gas Purging, 6mm tubing



HO-TH-05LS

Control

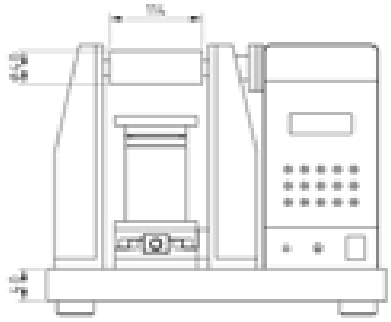
Chuk

5 Nos.
15mm, 25 mm, 50 mm, 75mm & 100 mm

Bench Top Rubbing Machine

RUBBING MACHINE

Rubbing Machine has been developed for LCD R&D Labs. The system is intended for tracing grooves on the polyimide to orient the liquid crystal molecules. The grooves are made using a special rubbing cloth having depth of a few Angstrom. The substrate is held by a vacuum chuck for which a vacuum pump is included and integrated with the system. Maximum size of glass substrate which can be loaded is 100 mm x 100mm. The substrate along with vacuum chuck is held on a rotation stage so that it can be rotated and positioned at any required angle from 0 to 180 degrees for various rubbing orientations. The system has been developed as a standalone unit in which speed of the roller and speed of the substrate can be varied. Rubbing machine is developed in technical collaboration with Professor Surajit Dhara, School of Physics, University of Hyderabad.
his personal website : www.surajitdhara.in



	HO-IAD-BTR-01	HO-IAD-BTR-02	HO-IAD-BTR-03
Substrate holder			
	Motorized linear stage for substrate movement	Motorized linear stage for substrate movement	Motorized linear stage for substrate movement
	Actuated by stepper motor	Stepper motor	Stepper motor
Travel	80 mm	300 mm	100 mm
Minimum speed	0.05 mm / sec	0.05 mm / sec	0.05 mm / sec
Maximum speed	9 mm / sec	6 mm / sec	10mm/sec
Maximum size of movable substrate plate	100 mm x 100 mm	200 mm Dia.	
	f) Substrate fixed on a rotation stage which can be rotated +/- 45 degree	Substrate fixed on a rotation stage which can be rotated +/- 45 degree	
Vertical Stage			
Blank (+) dist	-	-	99 steps [1 step = 10 μm]
Blank (-) dist	-	-	99 mm
Spindle			
Rubbing wheel actuator	Brushless DC motor with speed control	Brushless DC motor with speed control	Brushless DC motor
Spindle Control	0 - 3000 rpm	0 - 3000 rpm	0 - 3000 rpm
	Display of speed on LCD screen	Display of speed on LCD screen	Display of speed on LCD screen
	Speed control of the spindle by a knob	Speed control of the spindle by a knob	Speed control of the spindle by a knob
Input	230 VAC	230 VAC	230 VAC
	The System can be used in standalone model	The System can be used in standalone model	The System can be used in standalone model
Substrate holding	By vacuum (Vacuum pump included)	By vacuum (Vacuum pump included)	By vacuum (Vacuum pump included)
Vacuum pump	Oil free	Oil free	Oil free
Rubbing cloth	Velvet (Not included)	Velvet (Not included)	Velvet (Not included)

Motorized Linear stage



Motorized Vertical stage



Programmable Features

- Movement range for the substrate
- Speed of movement (substrate stage)
- No. of repetitions / Duration of operation

HO-IAD-BTR-01



HO-IAD-BTR-02M



Motorized linear stage

300mm Travel @ 6mm/sec



Programmable Features

- Tilting Adjustments for leveling the substrate.
- Vertical stage for adjusting the height.
- Vaccum release button

Motorized linear stage

100mm Travel @ 6mm/sec

Vertical stage

99 steps [1 step = 10 μm]

HO-IAD-BTR-03



HO-IAD-BTR-02



HOLMARC OPTO-MECHATRONICS LTD

Other Equipments

Load Cell Display Unit

Model: HO-LDU Series

The load cell display unit is a precise instrument made to accurately measure and display weight. For a number of industrial and scientific applications, it ensures accurate weight readings by converting mechanical weight into electrical signals. We have two differnt models, HO-LDU-20N and HO-LDU-5KN.

A 230V power supply and a crisp two-line, 16-character LCD display are features of both models. Strain gauge technology is used in these units. The load cell slightly deforms when force is applied, and this change is converted into an electrical signal that enables preuse measurements. They are perfect for uses in material handling, logistics, manufacturing, and quality control where precise weight measurements are essential for effectiveness and security.

Specifications	HO-LDU-20N	HO-LDU-5KN
Display	Digital display of force	Digital display of force
Maximum measurable force	20 N	5000 N
Fine resolution	0.1 N	1 N
Maximum error	+/- 2 %	+/- 2 %
Calibration	Factory calibrated	Factory calibrated
Mounting	Can be mounted onto a beam using a built-in hook	Can be mounted onto a beam using a built-in hook
Load mounting	Provision to mount a hook which carries the load	Provision to mount a hook which carries the load

Highlights

Factory calibrated

Digital display of force

HO-LDU-5KN

HO-LDU-20N



Magnetic Detection Probe

Holmarc Magnetic Detection Probe model HO-UGM-01 is used for the measurement of magnetic field up to 20 Tesla. It has digital display along with a software interface to plot time vs magnetic field values. It can also measure alternating magnetic fields up to 10 Hz.

Specifications HO-UGM-01

Display Units	Gauss (G), Tesla (T) and Oersted (Oe)
Display Resolution	up to 3 and 1/2 digits
Frequency Response	DC to 10 Hz
Probe features	Probe zero
Reading rate	up to 30 rdg./s
DC measurement range	1 G to 20 KG with accuracy of ± 2 % of reading value
AC measurement range	1 G to 200 G with accuracy of ± 2 % of reading value
Probe compatibility	Compatible to the supplied unit only
PC Interface	PC Interface
Windows software with time Vs magnetic field plot	

Lock-in Amplifier

A lock in measurement extracts signals in a defined frequency band around the reference frequency, efficiently rejecting all other frequency components. A lock in amplifier performs multiplication of its input with a reference signal. The ideal lock-in amplifier will detect only the part of the input signal having the same frequency and phase as of the reference signal.

Holmarc Lock-in amplifier model HO-LIA-02 provides a cost-effective solution to perform lock-in measurements in a variety of applications. It accepts modulated signal and the reference signal and provides amplified output of the input signal component which matches with the frequency and phase of the reference signal. The input coupling mode, input gain, time constant, phase shift and the output gain can be controlled using front panel knobs and switches.

HO-LIA-02



HO-UGM-01



Specifications HO-UGM-01

Input	High or low impedance differential or single ended via front panel BNC
Sensitivity	3 μV to 1 V
Frequency	10 Hz to 100 kHz
Maximum input voltage	± 13 V
Reference input voltage range	0 to +5V
Gain Accuracy	1 %
Gain Stability	200 ppm / °C
Dynamic Reserve	60 dB
Time Constant	100 μs to 30 s
Phase Control	90° steps + fine shift in range 0° - 100°
Phase Drift	0.1° / °C
Power input	230V/50 Hz or 110V/60Hz

Thermocycler

Model: HO-THC-01

Thermocycler is a device used to test and study the degradation of materials which are subjected to continuous cycling between hot and cold temperatures during their service life. It can also be used for hot and cold treatment of materials. It simulates artificial aging due to cyclical temperature changes. Exposure time, temperatures and cycle count can be set as per the user requirements.

During operation, an open specimen basket is alternately immersed in a bath of warm liquid followed by a bath of cold liquid. A very high rate of temperature change is achieved with this thermal-cycle design, and this gives a particularly realistic simulation of the temperature changes in the oral cavity for dental applications.

Holmarc Thermocycler Model HO-THC-01 comes with stainless steel hot and cold water baths which can be maintained at temperatures between 5 degree Celsius and 60 degree Celsius. The sample material is carried in a stainless steel basket which is immersed in hot and cold baths using a pivoting arm driven by a stepper motor. The temperatures, immersion time and the number of cycles are controlled by the microcontroller based electronic control unit (ECU), which accepts the user input through a 20x4 line alphanumeric LCD and front panel push buttons.

Specifications	HO-THC-01
Warm bath temperature	Ambient to 60°C
Cold bath temperature	5°C to Ambient
Exposure time of the specimen basket adjustable per bath from 0 to 999 seconds	
Number of cycles	1 - 300000
Automatic start-up function	After a power failure, the trial is automatically continued when the power is restored (Useful for long trials which are not permanently supervised)
Maximum specimen mass	1 Kg
Specimen basket size	10 x 10cm and 14 x 14cm

Warm bath temperature

Ambient to 60°C





Cycles

1 - 300000

Specimen basket Exposure time

0 to 999 seconds

now see it in action

Cold bath temperature

5°C to Ambient

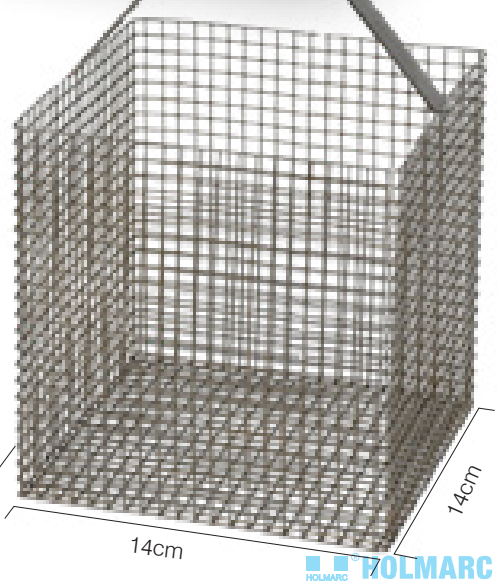












Specimen basket

1 Kg Maximum specimen mass

HOLMARC
OPTO-MECHATRONICS LTD

Vacuum Oven and Ion Exchanger

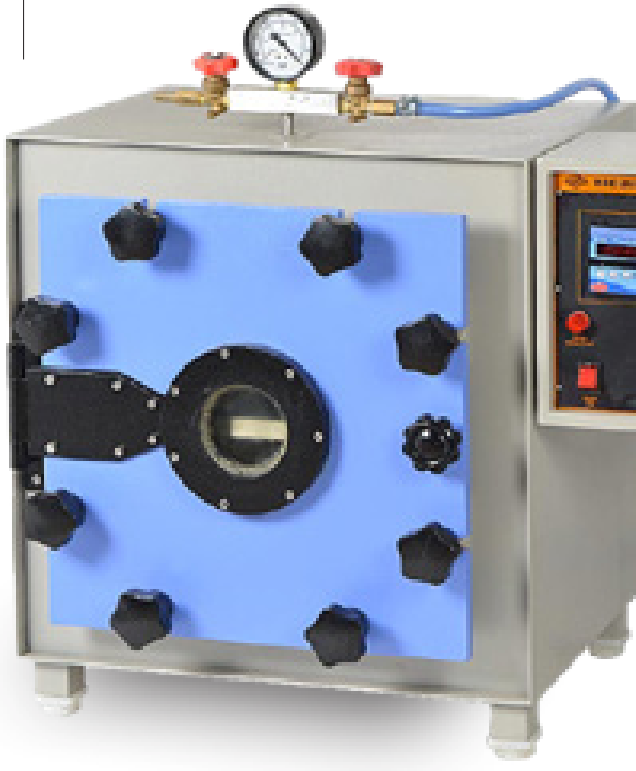
Vaccum Oven Model: HO-VO-01

Vacuum oven has application in various settings such as laboratory research, engineering, and industry. The fundamental principle involves the creation of a vacuum to lower chamber pressure below water vapor pressure, inducing the boiling of substances that are both hygroscopic and heat-sensitive. This low-pressure environment not only facilitates drying but also minimizes oxidation.

Trays containing materials for drying are positioned within the oven, and pressure reduction is achieved through a rotary vane vacuum pump. The oven door is securely sealed and linked to the vacuum pump for pressure reduction. Precise and uniform temperature control is maintained by a microprocessor based controller with a digital display. A dual-layer tempered glass door enables transparent observation.

Specifications	HO-VO-01
Chamber Size	300 x 300 x 300 mm
Temperature range	50 to 250 Degree Celsius
Vacuum gauge	-760 mm of Hg
Input Voltage	230V AC
Microprocessor based digital temperature controller	
Stainless steel inner chamber	
Powder coated Mild Steel outer enclosure	
Glass wool insulation to minimize heat loss	
Heavy gauge extruded Aluminium frame	
Toughened glass window	
Vacuum On / Off valve	
Rotary Vacuum Pump Included	

HO-VO-01





Ion Exchanger
Model: HO-TH-06

Holmarc's Ion exchanger, is a dedicated device for forming thin films by dipping the substrate in melt kept in hot chamber. Temperature of the heater can be controlled and fixed up to 400°C from ambient. Speed, duration, etc. are maintained accurately by computer control. Movements are achieved by a precision servo / stepper motor controlled linear stage.

The system has a user friendly front panel with key board and LCD display. It can as well be controlled through a computer. Dip duration, dip speed, withdrawal speed etc. are programmable features.

Servo motor (Optional) is used as actuator for vibration free dipping and withdrawal. The device is designed and manufactured as table top device with entire electronics and servo motor housed in a compact unit. Height of the substrate holder can be adjusted with respect to the level of the solution during the experiment.

FORM THIN FILMS

Specifications

Actuator	Stepper motor (Servo - Optional)
Drive mechanism	Precision rolled ball screw
Speed control	Available
Power input	230V, 50Hz
PC connectivity	Serial port (RS 232)
Stroke length max.	150 mm
Drawing speed min.	2 micron / sec
Drawing speed max	9000 micron / sec

Substrate

Hot Chamber

Control

Temperature
Speed
Duration

HO-TH-06



HOLMARC OPTO-MECHATRONICS LTD

Electrochemical Discharge Machining System

Model: HO-ECDM-01

The Electrochemical Discharge Machining (ECDM) is a non-conducting machining process which combines the features of Electric Discharge Machining (EDM) and Electrochemical Machining (ECM). The material is removed by thermal melting and chemical dissolution. Both conductive and non-conductive materials can be machined. The discharge occurs between the positively polarized tool electrode and the negatively polarized auxiliary electrode immersed in an electrolyte bath along with the work piece.

The system consists of an XYZ stage with CNC controller, a rotating tool holder with carbon brush contact for supplying the electric potential to the tool, an additional Z stage for continuously adjusting the gap between the tool and the work piece, a tank for keeping the electrolyte and the work piece and a 300V power supply to produce the discharge

Specifications

Motorized XYZ Stage with base plate and vertical column	
Motor Type	AC servo motors
Three axis CNC Controller and Software	
Additional Z stage for gap control	
Platform size of the XY stage	450 X 450 mm
Travel	100 x 100 x 100 mm (XYZ)
Resolution	1 μm in each axis
Position accuracy	5 μm in each axis
Speed	0.01 to 8 mm/s in all axes
XY stage mounted on the machine base plate	
Z stage mounted on the vertical column	
Acrylic tank on the XY stage for carrying work piece and electrolyte	

Spindle	
Spindle motor with 3mm collet	
Rotation speed	10 - 2000 rpm
Selectable direction of rotation	
Oscillatory rotation	

300V DC Power Supply	
Output voltage	0 - 300V (Variable using front panel knob)
Microprocessor controlled pulsed mode of operation	
Software controlled pulse width	
On time	1 - 999 ms
Off time	1 - 999 ms
On time + Off time	1000 ms Maximum

Software

Third party CNC software for XYZ movement and spindle start / stop control Holmarc software for power supply, gap control and spindle rotation settings USB connectivity

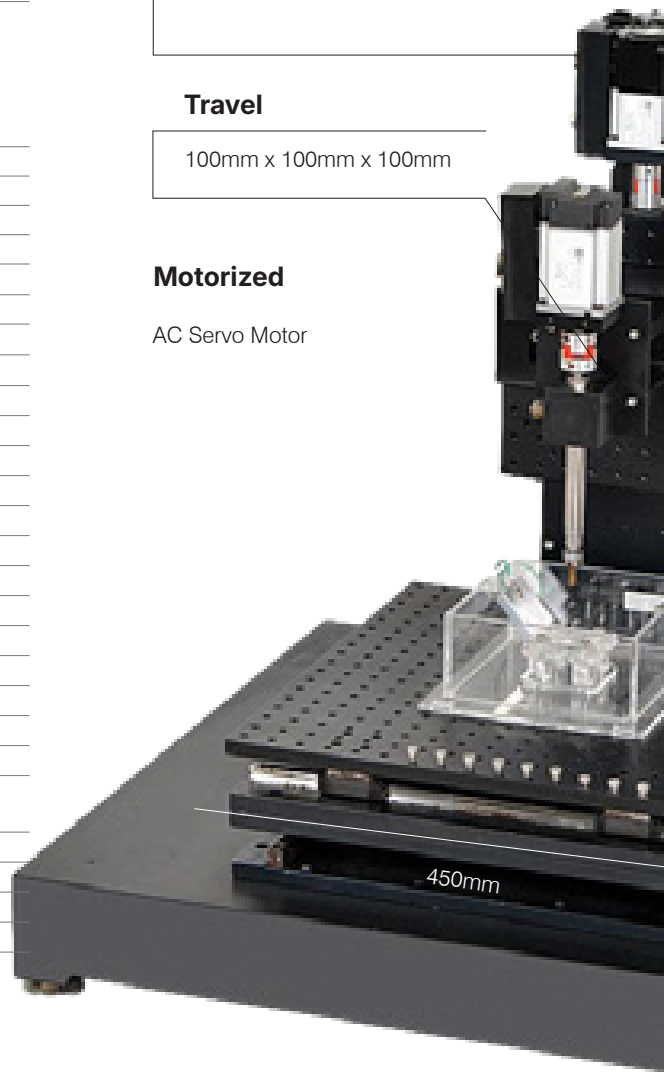
Input voltage	230V 50 Hz

Travel

100mm x 100mm x 100mm

Motorized

AC Servo Motor



Discharge Rate Measurement System

Model: HO-DRM-01

Holmarc Discharge Rate Measuring System Model HO-DRM-01 is a device used to measure the discharge rate of a liquid from a source, by collecting the liquid inside a jar placed on a weighing scale connected to PC. The software records the weight of the liquid in the jar at a rate of two measurements per second, for a duration specified by the user. The measured values are plotted as the change of weight against time. If the user enters the density of the liquid, the plotted curve can be converted to change of volume or flow rate against time.

Specifications

Measured parameters	Weight (g), Volume (ml) & Flow rate (ml/s)
Capacity	5 liter or 5 kg
Measurement frequency	2 measurements per second
Duration	10 minutes (Customizable)
PC interface	RS232 or USB
Power input	230V 50Hz
User friendly Windows software	





UV Laser Writing System for Photolithography

Model: HO-LWS-PUV-T

Holmarc's UV Laser Writing System is a direct writing photolithography system used to create micro geometric features on a substrate coated with photoresist layer. This mask-less system is equipped with an intensity adjustable fiber coupled 405nm laser and a servo motor driven high precision XY stage with CNC software for writing complex patterns. A quadruple motorized turret with different objectives is provided for creating different spot size at the focus point. A 3MP camera with Yellow LED illumination is provided for focusing the sample for best feature size. A user friendly software is provided for initial setting of the sample substrate and a CNC software is provided for writing the patterns from dxf drawing files.

Specifications

Laser	405nm fiber coupled laser
Focusing mode	Microscope objective based
Spot diameter	<10um (depends on the objective magnification)
Intensity	3mW at the sample position
Focusing	Motorized, software controls

Motorized XY-Theta sample stage	
XY travel	100 mm x 100 mm
XY resolution	1 um
Unidirectional repeatability	3 um
Positioning accuracy	5 um

Microscope objectives
1. Infinity Plan achromatic 60X objective
N A 0.75, Working distance 1.22 mm
2. Infinity Plan achromatic 100X objective
N A 0.85, Working distance 0.4 mm



INTERIOR



HOLMARC OPTO-MECHATRONICS LTD

Syringe Pump

SPLF Series

Holmarc's SPLF series syringe pumps are versatile products ideal for precise dispensing of fluids in laboratory experiments, available at an economical price. Our bench-top Syringe Pump has been designed for safe and ultra-smooth fluid flow for lab applications and can be easily set up inside a standard fume cupboard. Holmarc manufactures syringe pumps in various models for single syringes, two syringes, four syringes and ten syringes. These pumps can operate with standard off the shelf syringes in plastic, glass and stainless steel. The dispensing rates / flow rates possible with this device are very wide in range and can vary from 15.63μl/hr to 36.2ml/min, depending on the size of syringe used. The unit has built in electronics with keyboard and display for programming the operational attributes to work in standalone mode. This series of pump shows all the pertinent, real-time information on the LCD display. The Information displayed includes flow rate and total time remaining. Computer interfacing is also possible whenever required with RS 232C serial integrated into the control electronics of the system. This model supports dispensing as well as withdrawal. Powerful drive motors and innovative design have been combined with software control to deliver ultra-smooth and steady flow rates. Apart from all these, this device can be customized as per requirement.

SPLF 2D Series

This model can accept two different size syringes which varies from 5 ml to 60 ml. Any type of syringes can be used in the unit including glass, plastic or stainless steel. This pump is ideal for more complex multi-step reactions and has multi-mode operation including infusion only or withdrawal only. A piston holder is provided in order to bring the piston back to home position. In our dual syringe model no: SPLF 2D, two syringes can operate independently with different flow parameters. This device can store up to 5 programs which can be reviewed or changed during operation. The front panel display allows the user to see all of the pump's operating parameters to ensure proper operation during the experiments. Syringe size and flow rate are easily displayed, as well as the time remaining.

SPLF 2D Series

In SPLF-H series pumps, temperature control of the syringe is possible. A glass syringe equipped with heating coil is provided along with this device. The temperature of the solution in the syringe is controllable up to 60°C from ambient. This heating option is available in various models with single syringe, two syringes, four syringes and ten syringes

Syringe	Standard off the shelf syringes, 5ml to 60 ml, any manufacturer
Flow rate range	15.63 μl / hr to 36.2 ml / min
	Actual volume may vary depends on syringe size & manufacturer
Temp. control	60°C (in selected models)

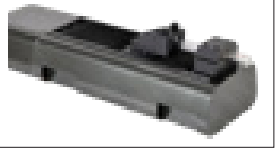
Model No	Item	Temperature control (room temp.)	No: of Syringes
HO-SPLF 1	Single Syringe Pump	-	One
HO-SPLF 1H	Single Syringe Pump with temperature control	60° C	One
HO-SPLF 2	Dual Syringe Pump		Two
HO-SPLF 2H	Dual Syringe Pump with temperature control	60° C	Two
HO-SPLF 4	Four Syringe Pump		Four
HO-SPLF 4H	Four Syringe Pump with temperature control	60° C	Four
HO-SPLF 10	Ten Syringe Pump		Ten
HO-SPLF 10H	Ten Syringe Pump with temperature control	60° C	Ten
HO-SPLF 2D	Independently controlled Dual Syringe Pump		Two
HO-SPLF 2DH	Independently controlled Dual Syringe Pump with Temperature control	60° C	Two

About Syringe Pump

A syringe pump is a device which can either infuse or withdraw liquid samples / fluids, at user defined flow rates and with selectable target volumes. Syringe pumps with simultaneous infusion and withdrawal with opposing syringes on a single drive, are also available. Syringe pumps are widely used in medical field as well as in laboratory and research fields. Applications of syringe pumps includes electro spinning, electro spraying, micro dialysis, dispensing / dilution, organ / tissue perfusion and fluid circulation. Syringe pumps are also useful in microfluidic applications, such as micro reactor design and testing, and in chemistry for slow incorporation of a fixed volume of fluid into a solution.

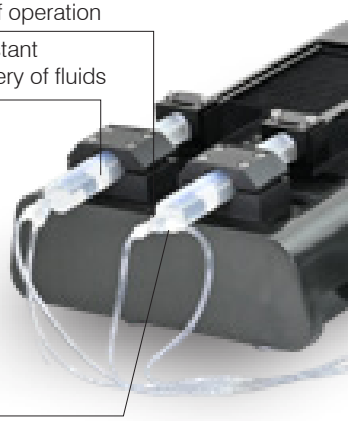
High Pressure Syringe Pump
Model: HO-SPLF-1-P60

Syringe pump which can support 60 bar back pressure



Smooth and continuous mode of operation

Constant delivery of fluids



Compatible with glass, plastic and SS syringes

Independently Controlled High Pressure Four Channel Syringe Pump With Continuous Flow
Model No: HO-SPLF-4D-P60-C

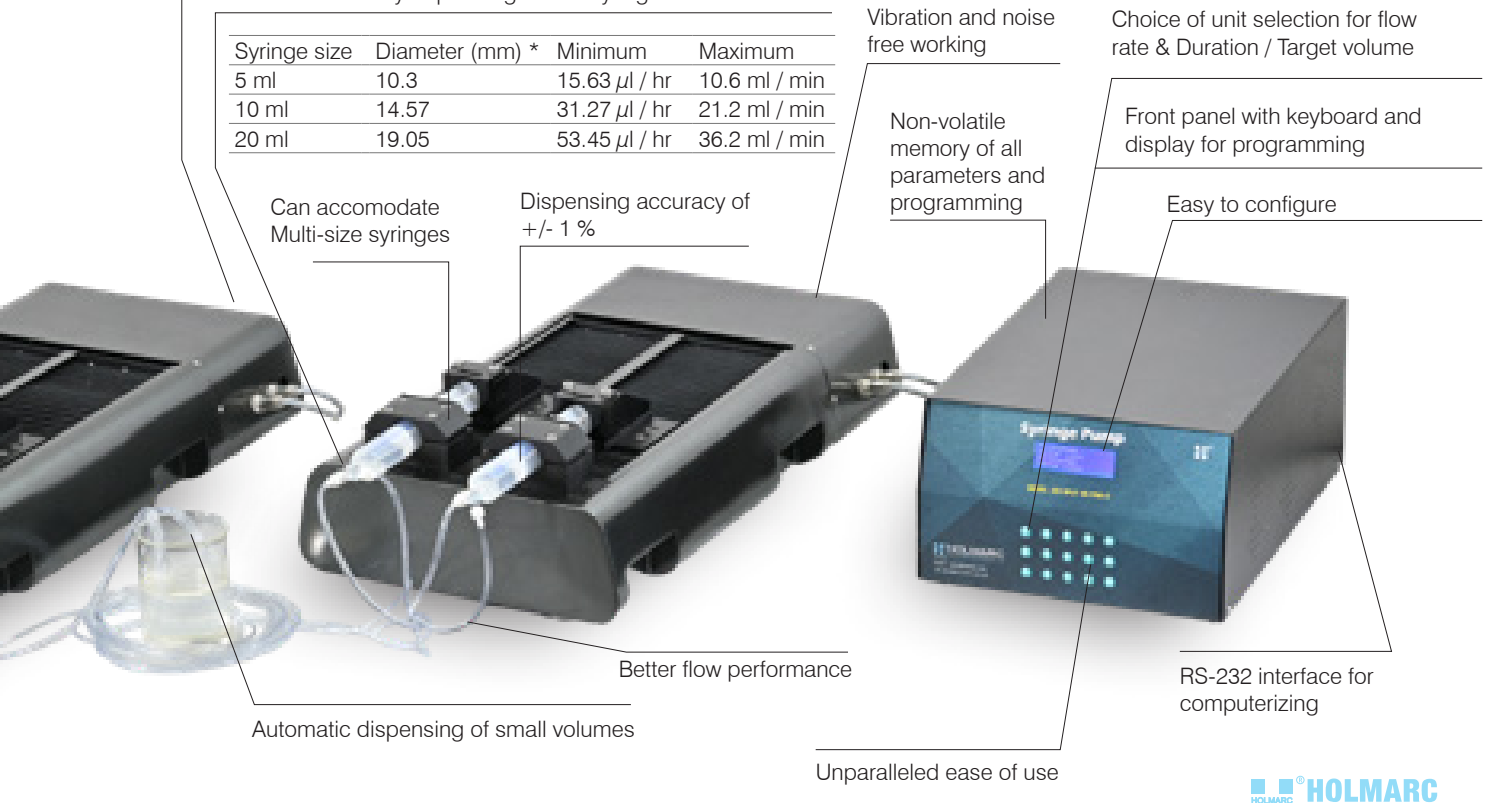
This model can work with high back pressures up to 60 bar. It has four independent channels which can be operated simultaneously or sequentially at different flow rates. It also comes with two dual pump tubing kits which facilitates continuous flow of two different liquids from two reservoirs at different flow rates..

Specifications

Number of Syringe Holders	4 (All the four syringes can be operated at the same time at different flow rates)
Maximum back pressure	60 bar
Tubing kit for continuous flow mode (Not suitable for corrosive liquids)	
Sequential flow mode	
Syringe size	20 ml & 60 ml
Drive mechanism	Microprocessor controlled stepper motor 1/16 microstepping, driving a leadscrew
Pusher advance per microstep (1/16 step)	0.3125 micron
Volume per microstep (1/16) with 20ml syringe	0.089 µl
Max stepping rate	10000 step / sec
Min step rate	1 step / 6 secs
Linear Travel Rate - Min.	0.1875 mm / hr
Linear Travel Rate - Max.	18 cm / min
Flowrate range	55 µl/hr to 37 ml/min (20 ml syringe)
Nominal linear force	80 kg
User interface	20 x 4 line LCD with numerical keypad & PC Software
PC interface	RS232 (Serial Port)
Number of programs	5 (Standalone mode)
Number of programs	Unlimited (PC mode)
Controllable parameters	
Flow rate	55 µl/hr to 37 ml/min (20 ml syringe)
Syringe Diameter	10mm to 27mm
Duration	1 second to 18 hours
Target Volume	0.1ml to 60ml

Flow rate will vary depending on the syringe size :

Syringe size	Diameter (mm) *	Minimum	Maximum
5 ml	10.3	15.63 µl / hr	10.6 ml / min
10 ml	14.57	31.27 µl / hr	21.2 ml / min
20 ml	19.05	53.45 µl / hr	36.2 ml / min



Manual Micro Syringe Pump
Model No: HO-MM-SP-01 / HO-MM-SP-02

Manual micro syringe pump is a convenient instrument for controlled dispensing or withdrawal of fluids. It provides economical method for any application requiring injecting / withdrawing a calibrated volume under manual control. It can be employed in applications like chromatography, micro injections etc.

- For injecting and withdrawing precise fluid volumes
- Compatible with glass, plastic or stainless steel syringes
- Micrometer driven mechanism
- Delivers precise fluid volumes

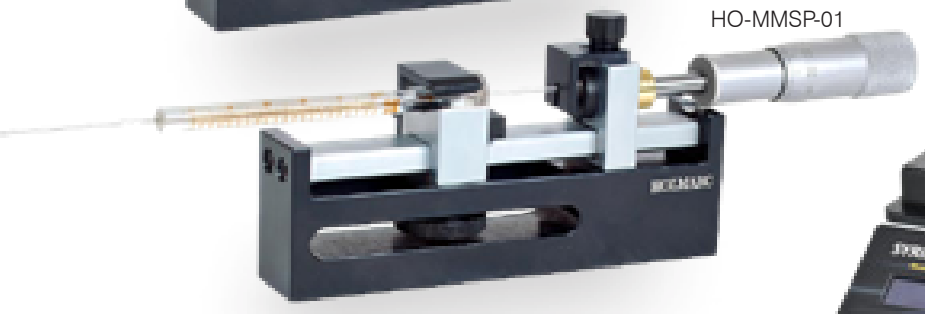
Two models are available. One with graduated micrometer having 10micron resolution and the other with digital micrometer having one micron resolution. Digital micrometer provides convenient digital readings in microns. The resolution of the injection volume depends on the syringe used and resolution of micrometer.

Model No	HO-MMSP-01	HO-MMSP-02
Micrometer drive range	25 mm	25 mm
Linear resolution	10 μ	01 μ
Volume Resolution		
10 μl syringe	0.0018 μl / div	0.0018 μl / div
25 μl syringe	0.00416 μl / div	0.00416 μl / div
50 μl syringe	0.012 μl / div	0.012 μl / div
100 μl syringe	0.0167 μl / div	0.0167 μl / div
250 μl syringe	0.0417 μl / div	0.0417 μl / div
500 μl syringe	0.0833 μl / div	0.0833 μl / div

HO-MMSP-02



HO-MMSP-01

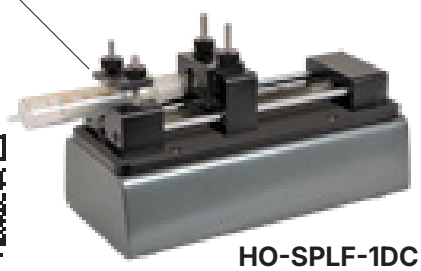


Single Channel OEM Syringe Pump
Model: HO-SPLF-1DC

- 1 Syringe Holder
- 5 ml to 60 ml Syringe size
- Microprocessor controlled stepper motor 1/16 microstepping, driving a leadscrew Drive mechanism
- Pusher advance per microstep (1/16 step) at 0.3125 micron
- 0.089 μl Volume per microstep (1/16) with 20ml syringe10000 step/sec Max stepping rate
- 1 step / 6 secs Min step rate
- Linear Travel Rate of Min - 0.1875 mm / hr, Max - 18 cm / min
- 20 Kg Nominal linear force
- RS232 (Serial Port) PC interface
- 24V DC / 4A Power input
- Unlimited Number of programs
- 5 Steps

Flow Rates (Controllable)

size	Min	Max
5 ml	15.63 μl / hr	634 ml / hr
10 ml	31.27 μl / hr	1270 ml / hr
20 ml	53.45 μl / hr	2171 ml / hr
30 ml	68.65 μl / hr	2789 ml / hr
50 ml	123.0 μl / hr	4998 ml / hr
60 ml	104.2 μl / hr	4234 ml / hr



HO-SPLF-1DC

HO-SPLF-02A





Manual Micro Syringe Pump
Model No: HO-SPLF-ES2 / HO-SPLF-ES4

Syringe pump provided for Nano fiber electrospinning unit can withstand high voltages. This is possible due to the non conducting material used for its construction. They isolate the syringe pump inner electronic circuits from the high voltage external environment. Nano fiber electrospinning Syringe pump can withstand voltages as high as 30KV.

Holmarc's SPLF-ES series syringe pumps are versatile and cost effective products for precise dispensing of fluids in laboratory experiments. The pump can operate with standard off the shelf syringes in plastic, glass and stainless steel. The dispensing rates / flow rates possible with the device are very wide in range and can vary from 2.8 micro-l/hr to 19ml/min. The unit has built in electronics with keyboard and display for programming the operational attributes to work in standalone mode. Computer interfacing is also possible when ever required with RS 232C serial in tegrated into the control electronics of the system. Holmarc manufactures syringe pumps in various models for single syringes, two syringes , four syringes and ten syringes as described in the chart below. In our dual syringe model no: SPLF-ES 2D, two syringes can operate independently with different flow parameters.

Model	Item	No: of Syringes
HO-SPLF-ES 1	Single Syringe Pump	One
HO-SPLF-ES 2	Dual Syringe Pump	Two
HO-SPLF-ES 4	Four Syringe Pump	Four
HO-SPLF-ES 10	Ten Syringe Pump	Ten
HO-SPLF-ES 2D	Independently controlled Dual Syringe Pump	Two
HO-SPLF-ES 4D	Independently controlled Dual Syringe Pump	2 Sets



HO-SPLF-ES2
HO-SPLF-ES4



Motorized Translation Stages

RCMTS-125 series stages are designed to carry heavy loads,

Syringe pump with height adjustment
HO-SPLF-1VM

This syringe pump comes with a motorized translation stage, for applications where pump has to be moved in a linear axis. The angle bracket provided can be used for mounding the stage vertically on an optical table. The height can be adjusted using the software, in a range of 300 mm. The syringe pump is a single channel model with temperature control. Holmarc can supply other models of syringe pumps also in this configuration.

Single channel syringe pump with height & temperature control	
Number of Syringe Holders	1 No.
Syringe temperature control range	Ambient to 80 Degree Celsius
Syringe size	5 ml to 60 ml
Drive mechanism	Microprocessor controlled stepper motor 1 / 16 microstepping, driving a lead screw
Pusher advance per micro step	0.3125 micron (1/16 step)
Maximum step rate	10000 step / sec
Minimum step rate	1 step / 6 secs
Linear Travel Rate Min.	0.1875 mm / hr
Linear Travel Rate Max.	18 cm / min
Nominal linear force	20 kg
Illumination Diameter	50 mm
User interface	PC software
PC software	Unlimited
Number of steps	5

Controllable parameters	
Flow rate (10 ml syringe)	32 µl / hr to 20 ml / min
Syringe Diameter	10 mm to 27 mm
Duration	1 second to 18 hours
Target Volume (10 ml syringe)	1µl to 10ml
Pump heigh	0 to 300 mm (At 1 mm resolution)

Motorized vertical stage for mounting the syringe pump
RCMTS-125-300

300mm Travel
16 mm / sec Max Speed
20 micron Positioning accuracy
500 x 500 mm Aluminium Base plate



Syringe

10ml, Glass
Luer tip (Luer slip)
Needle dimensions
a) ID 0.51 mm, OD 0.82 mm - 1 No
b) ID: 1.36 mm, OD: 1.65 mm - 1 No.

HO-SPLF-1VM

Peristaltic Pump

Model: HO-LS-PP Series

Holmarc offers wide range of peristaltic pumps for dispensing, filling, dosing, sampling and transferring applications. The advantage of using peristaltic pump is that no contamination will occur to the fluid or to the pump. To use a different fluid, all you need to do is to change the tubing used to pump the fluid. The flow rate will be accurate and there will not be any reverse flow or back flow. Our equipment is ideal to use with corrosive or viscous liquids. Instant start or stop and reverse facility are available in our standard model.

Peristaltic pump from Holmarc are driven by heavy duty stepper motors along with the micro stepping drives. Drive and control electronics are assembled in compact housing along with the pump mechanism.

Front panel of the device is provided with the LCD and keyboard for programming the flow parameters. Replacement mechanism for flow tube is made as user friendly as possible. The device is handy compact and portable and work silently. Holmarc peristaltic pumps are inexpensive to maintain and are easy to install and operate.

Peristaltic pumps do not contaminate fluids as none of the pump components comes in contact with the fluids other than the tube. Holmarc's peristaltic pumps are inexpensive to maintain and are easy to install and operate.

Specifications

Model	HO-LS-PP-01
Flow rates	0.5 to 5 ml / min
Flow factor	0.01 to 9.99
Accuracy	+/- 2
Speed	0.2 to 5 rpm
Motor	Stepper Motor
Remote	Stop / Start
Power supply	220 - 240v 50/60 Hz supply
User Interface	20 x 4 Line LCD & 4 Keys Keyboard
Tubing	Platinum cured Silicone tubing
Tube length	50 cm (Longer tube can be purchased at additional cost)

Features

- Single slit
- Contamination free pumping
- No reverse flow or back flow
- Accurate and repeatable flow rate
- Instant start or stop facility
- Complete isolation of pumped fluid
- Ergonomic design, Ease to use
- Almost maintenance free
- Clear, easily read LCD illuminated display
- Stepper Motor used for driving the system

Highlights

Contamination free pumping

No reverse flow or back flow



Multi channel peristaltic pump

Peristaltic pump employs a contamination - free pumping mechanism. The pumps can be effectively used for many biological research activities. It can pump abrasive, highly corsrosive, viscous, high density liquids. We can customize the design as per required flow rate, number of channels, tube diameters etc.. The peristaltic pump is characterized by a special combination of fluid handling mechanism and design flexibility for multichannel applications. It is sometimes important in research laboratories and production plants to move several fluid channels simultaneously. Controlling multiple channels together can be a must for many applications. Varying the speed of the motor will at once vary the flow in all channels.

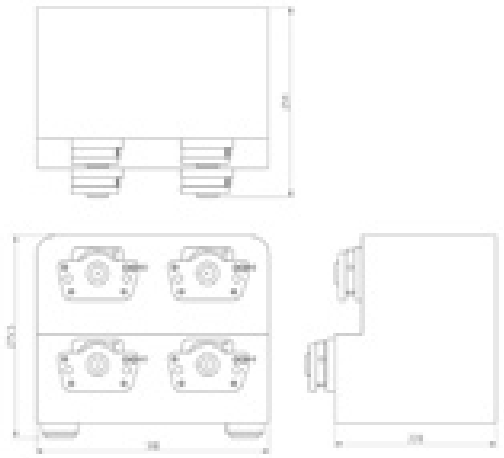
Model	Item
HO-LS-PP-01	Single channel
HO-LS-PP-02	Two channel
HO-LS-PP-04	Four channel
HO-LS-PP-06	Six channel



Independently Controlled 4 Channel Peristaltic Pump Model: HO-LS-PP-M01

Holmarc offers wide range of peristaltic pumps for dispensing, filling, dosing, sampling and transferring applications. The advantage of using peristaltic pump is that no contamination will occur to the fluid or to the pump. To use a different fluid, all you need to do is to change the tubing used to pump the fluid. The flow rate will be accurate and there will not be any reverse flow or back flow. Our equipment is ideal to use with corrosive or viscous liquids. Instant start or stop and reverse facility are available in our standard model.

Peristaltic pump from Holmarc are driven by heavy duty stepper motors along with the micro stepping drives. Drive and control electronics are assembled in compact housing along with the pump mechanism. Front panel of the device is provided with the LCD and keyboard for programming the flow parameters. Replacement mechanism for flow tube is made as user friendly as possible. The device is handy compact and portable and work silently. Holmarc peristaltic pumps are inexpensive to maintain and are easy to install and operate. Peristaltic pumps do not contaminate fluids as none of the pump components comes in contact with the fluids other than the tube. Holmarc's peristaltic pumps are inexpensive to maintain and are easy to install and operate. Each pump can run in any sequence with delay in between. And this sequence can be repeated multiple times



Specifications

Flow rates	0.5 to 5 ml / min
Flow rate resolution	0.1 ml / min
Flow factor	0.01 to 9.99
Accuracy	+/- 2 %
Speed	0.2 to 5 rpm
Motor	Stepper Motor
Power supply	220 - 240v 50/60 Hz supply
User Interface	PC Mode
Tubing	Platinum cured Silicone tubing
Tube length	50 cm (Longer tube can be purchased at additional cost)
Dimensions	318 x 259 x 275 mm (W x D x H



HO-LS-PP-M01

Features

- Single slit
- Contamination free pumping
- No reverse flow or back flow
- Accurate and repeatable flow rate
- Instant start or stop facility
- Complete isolation of pumped fluid
- Ergonomic design, Ease to use
- Almost maintenance free
- Clear, easily read LCD illuminated display
- Stepper Motor used for driving the system

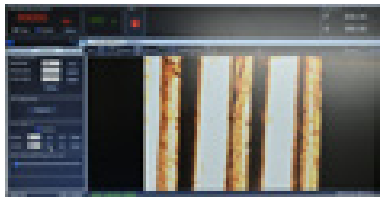
4 Tesla Electromagnet - Magnet Lab

Model: HO-EM7000S

EM7000S is a HOLMARC New Magnet LAB range high magnetic field PC controlled Dipole Electromagnet that can provide fields above 3.5 Tesla @ 5 mm field gap. Designed to meet industrial, educational, and research needs of very high, uniform field strengths in a wide range of air gaps. The HOLMARC Magnet LAB range dipole electromagnet systems are intended to work based on automated PC controlled operations.

The EM7000S comes with a standard set of 125mm diameter poles that tapered into a 25mm. optimize maximum field but several pole options are available. HOLMARC can also design custom poles that achieve a specific performance. Poles are interchangeable and are available with an axial access bore.

- Hall Effect Measurements
- Magneto-Optical Rotation Measurements
- Magnetic Separation experiments
- Magnetic alignment of Small Components
- Chemical Reaction Rate Studies



Hall probe / monitor

Input requirement	220 VAC, 50 Hz, single phase
Magnetic Field Range	Up to 4 Tesla
Resolution	1.0 gauss
Display	6 digits LED
Size	Portable
Hall probe	Transverse probe rectangular with fixtures
Ports for remote control	USB port
Software and interface	LabView drivers and PC software

Bipolar power supply

Power supply design	Quad system constant current power supply
Input requirement	220 VAC, 50 Hz, single phase
Output	Constant current Bipolar with continuous variation through zero
Output voltage	70V Max.
Output current	4 Amps Continuously Variable
Resolution	0.1 Amps
Stability	0.005 % up to ≥ 8 hrs
Over temperature protection	Coil-over temperature protection
Power failure protection	Sudden power failure protection
Protection	MCB and fuses in the input
Remote Monitoring	USB port will be available for remote monitoring
External programming	The power supply will be able to be controlled and monitored via USB interface. Output Polarity and current value will be controllable remotely via external programming.
Software and interface	LabVIEW driver or software will be provided for computer control (Optional)
Cables and Accessories	All necessary power and interface cables and accessories
Power supply size	550 mm x 550 mm x 1210 mm
Weight	125 kg

Optional Rotating base (Accessory)



- A detachable rotating base with mounting screws to mount the heavy electromagnet
- 360 - degree rotation
- 0.1 degree Resolution
- Both manual and stepper motor controlled rotation
- A stepper motor controller will be provided for computer control of the rotation stage
- USB port will be available for remote control and monitoring
- LabView drivers and PC software
- Power and interface cables

Additional accessories required for the electromagnets

- 8 mm hollow Pole piece
- XYZ manual / motorized translation stage
- Electromagnet rotary table (Manual / Motorized)
- 45 degree bracket for electromagnet (Cryostat positioning)
- 4 probe measurement unit
- XYZ sample stage
- Theta sample stage
- Cuvette holder
- Thin Film sample holder
- Motorized pole piece adjuster



Magnetic field vs Pole Gap

POLE GAP (mm)	Magnetic Field (Gauss)		
	HO-EM3000S	HO-EM5000S	HO-EM7000S
5	21233	25100	33700
10	10900	16961	28600
15	7380	11482	24020
20	5596	8706	20700
25	4515	7024	17660
30	3788	5894	15300
35	3266	5082	13360
40	2873	4469	11800
45	2565	3990	10320
50	2318	3606	9260
55	2115	3290	8420



Electromagnet



Magnetic Field	3.3 T @ 5 mm pole gap
Electromagnet Height	650 mm
Electromagnet Depth	610 mm
Electromagnet Width	420 mm
Electromagnet Frame size	610 mm x 420 mm x 650 mm
Pole Piece Diameter	125 mm
Pole Gap Adjustments	50 mm Independently Variable Poles
Spool Diameter	430 mm
Frame Material	Cast Iron Profile
Optical Height	325 mm
Total Weight including Frame	325 kg
Frame Wheel	Yes
Frame	The frame will be compatible for use along with a rotationbase. The frame will be attachable (or detachable) with suitable screws on a rotation base.
Pole Pieces	2 Nos., easily removable / replaceable Pole pieces
	One Flat pole piece with 120 mm Tapered pole piece
Coil Separation (Coil Gap)	160 mm
Airgap (Pole gap)	Continuously adjustable from 0 to 100 mm or highe
Yoke Construction	Single-yoke electromagnet
Yoke Material	Soft Iron high permeability alloy
Mounting	Mounted on a Metal Profile stand
Cooling	Water-cooled for continuous operation for more than 4 hours
Maximum Magnetic Field Intensity	5000 Gauss for an air gap (Pole gap) of 55 mm with a flat pol
Uniformity	Magnetic Field will be uniform over 5 cm3
Stability of magnetic field	< 0.005 %

Water cooling (Chiller)

Input requirement	220 VAC, 50 Hz, single phase
Water tubing and fitting	Standard 6mm Tube
Water circulation	Water circulation
Water flow rate	7.6 L / min or higher
Water inlet temperature	10°C to 15°C

- PC controlled programmable operation
- Water Cooled Coils for excellent field stability
- Fully Adjustable Pole Gap
- Easily removable / replaceable Pole pieces
- Flat, Faraday, & Custom Pole Pieces option

HOLMARC OPTO-MECHATRONICS LTD

PC based water cooled electromagnet

Model: HO-EM5000S

Holmarc's model HO-EM-5000S based electromagnet comes with water cooling with a built-in chiller unit for continuous duty operation. It has two modes of operation - constant current mode and constant field mode. The constant current mode sets a user specified current in the coils, while the constant field mode maintains the user speicifed field strength by measuring the same with a hall probe and adjusting the coil current continuously in closed loop. The In As hall probe comes with a post and post holder making it easy to position at the desired position between or near the poles.

The pole gap can be adjusted up to 50 mm manually and the field strength can be calibrated against different pole gaps. The coil temperature is continuously measured to detect over heating. The unit is connected to PC through a serial port or a USB port. The easy to use Windows software facilitates flexible operation. The field strength and the coil current can be controlled through the software.

Specifications

Magnetic field strength	-1.6T to +1.6T (At 10 mm pole gap)
Coil current	-3.5A to +3.5A
Operating mode	Constant field & Constand current modes
Transducer	Hall probe - In As
Field measurement resolution	1 mT
Accuracy	+/- 0.5 %
Hall probe height	100mm to 150mm adjustable
Hall probe mount	Post and post holder made of anodized Aluminium alloy
Current display	3 ½ digit, 7 segment LED
Current display resolution	0.01 A
PC interface	USB or RS232
Software displayed parameters	Field strength & current
Pole gap	0 to 50mm adjustable
Cooling	Water cooled with built-in chiller unit
Coil temperature sensor	PT100
Coil temperature display	7 segment LED with over temperature cut-off
Input power	230V, 50Hz

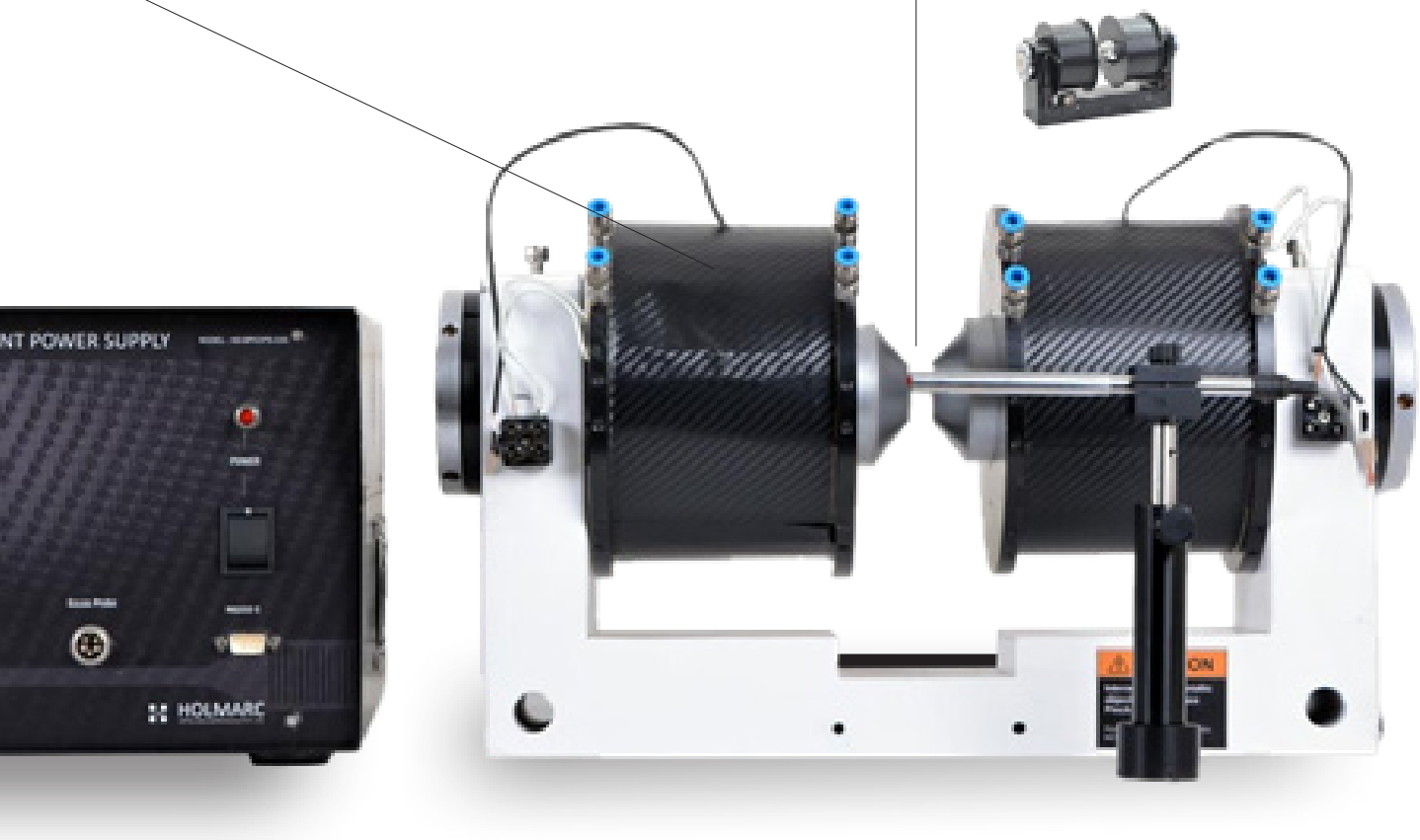


Coil Current

-3.5A to +3.5A

Magnetic field strength

1.6T to +1.6T (At 10 mm pole gap)



Magnetic Stirrer and Hot Plates

Digital Magnetic Stirrer

Model: HO-MS-01

Holmarc's Digital Magnetic Stirrer is a state of the art device that provides an extra degree of precision for your applications in research and other activities. A magnetic stirrer is a laboratory device that employs a rotating magnetic field to cause a stir bar immersed in a liquid to spin very quickly, thus stirring it. It is an essential tool for research labs.

Holmarc' Digital Magnetic Stirrer combines stylish design and functionality in a compact device. Its user friendly keyboard and LCD display can be used to input required programs and parameters. The unit boasts inbuilt software with capabilities of storing multiple programs. The microprocessor controlled unit makes for smooth and silent operation. We can input the required speeds on the digital consol and view instantaneous changes on the display. Speeds up to 1500 rpm are possible in this manner.

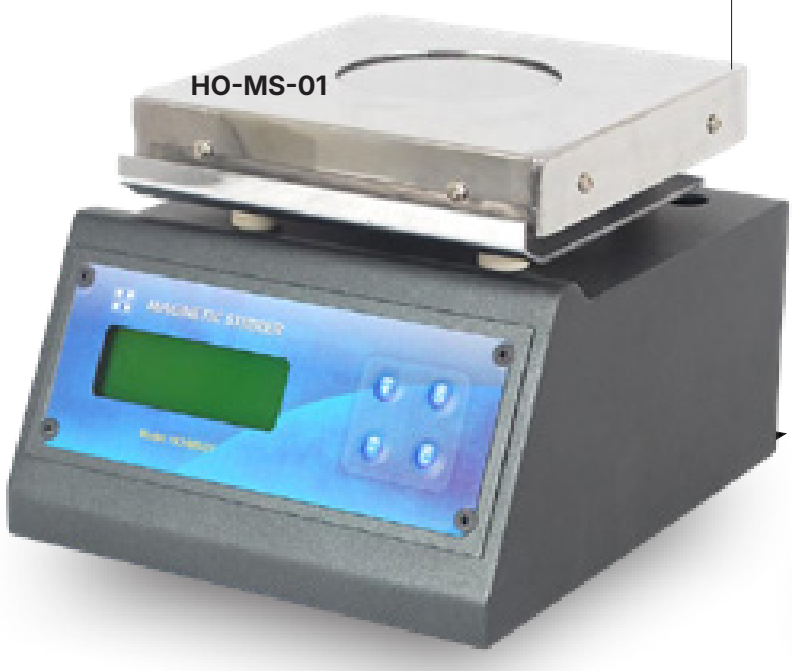
Specifications	
Capacity (Water)	1 Litre
Speed range	200 - 1500 rpm
Speed stability	+/- 2 rpm
3 stirring bars of different sizes	
User interface	20 x 4 line alphanumeric LCD & 4 button keyboard
Real time display of speed	
9 program non-volatile memory	
9 steps for each program	
Different values for speed & duration for each step	
Operating ambient temperature	5 - 40°C
Input voltage	230V 50Hz

Customized Stirring Systems

On request we can provide temperature control unit and multiple point stirrers having different stirring positions,individual dimensions and stirring point distances. All of our products can be customized for your special needs. Customization is our business, our competence and our passion.

Multiple Point Stirrers

Multiple Point Stirrers are available designed for chemical, biotechnology and medical applications of all kinds. All of our stirrers are developed for the hard daily lab use and uncompromising continuous operation.



200°C
1200 rpm



HO-MS-02

Digital Magnetic Stirrer with Hot Plate
Model: HO-MS-02

Holmarc Digital Magnetic Stirrer with hot plate combines stylish design and functionality in a compact device. Its user friendly keyboard and LCD display can be used to input required programs and parameters. The unit boasts inbuilt software with capabilities of storing multiple programs. The microprocessor controlled unit makes for smooth and silent operation. We can input the required speeds on the digital consol and view instantaneous changes on the display. Speeds up to 1500 rpm are possible in this manner. This model also incorporates heating platform for place the beaker. It comes with accurate heating control and temperatures up to 200°C.

Holmarc's Digital Magnetic Stirrer is a state of the art device that provides an extra degree of precision for your applications in research and other activities.

A magnetic stirrer is a laboratory device that employs a rotating magnetic field to cause a stir bar immersed in a liquid to spin very quickly, thus stirring it. It is an essential tool for research labs.

Specifications

Capacity (Water)	1 Litre
Speed range	200 - 1500 rpm
Speed stability	+/- 2 rpm
Temperature range	Ambient temperature to 200°C
Heating rate (1 liter Water)	12°C / min
Temperature sensor	PT 100
Temperature control	Microprocessor based PID control
Temperature control accuracy	+/- 1°C
Connection for external temperature sensor (Optional)	K type Thermocouple
Hot plate material	Stainless steel
3 stirring bars of different sizes	
User interface	20 x 4 line alphanumeric LCD & 4 button keyboard
Real time display of speed & temperature	
9 program non-volatile memory	
9 steps for each program	
Different values for speed, temperature & duration for each step	
Operating ambient temperature	5 - 40°C
Input voltage	230V 50Hz
Dimensions	180 x 155 x 222 mm

- Compact and User friendly device
- Fully digital console with LCD and keyboard
- Microprocessor controlled operation
- Maximum rpm of 1500
- Multiple programs with multiple steps with independent durations
- Heating platform - 200°C (different models are available)

Hot Plate
Model: HO-HPC-01, 02

Holmarc's HO-HPC-01, 02series hot plate is a versatile instrument equipped with high uniformity heaters controlled with an accurate digital thermostat to assure even heating across the entire surface of the hot plate. The controller, which is placed remotely (can be placed within 1 meter from plate) facilitates microprocessor-controlled feedback which maintains consistent, repeatable temperature settings which is ideal for repetitive procedures.

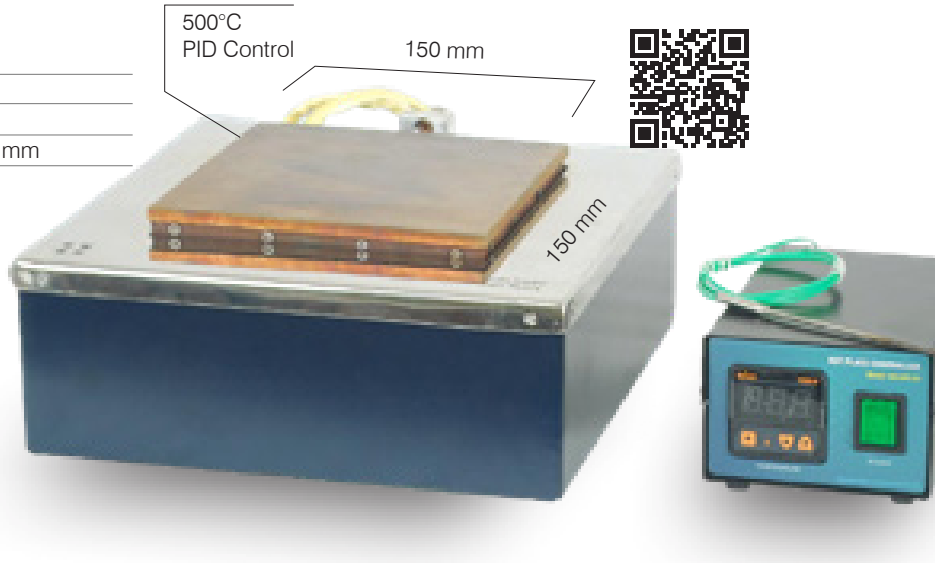
The heating surface is made of high quality Stainless steel (316 L grade) which is machined smooth and flat and it contains Nichrome heating coil. The hot plate surface is resistant to spillage and corrosion. Our hot plate features an operating temperature up to 500°C from ambient with good uniformity across the plate surface. K type thermocouple temperature sensor is included in the Hot plate for accurate temperature measurements.

Holmarc's HO-HPC-01, 02 series hot plates are portable, tabletop models and areavailable in two plate dimensions: 250 x 250 mm & 150 x 150 mm. Depending on the region of use, two power options are also available for the Hotplate; 110 V & 220V AC.

Hot plate find application in the field of spraypyrolysis, in electronics industry, probing, characterization inspection and failure analysis of semiconductor wafers and chips, surface annealing, metal disposition, baking and in chemical laboratories.

Model No	HO-HPC-01	HO-HPC-02
Temperature range	Ambient to 500°C	Ambient to 500°C
Controller	PID temperature controller with solid state relay	
Sensor	K type Thermocouple (Built-in, with the controller)	
Hot plate material	Stainless Steel	Stainless Steel
Hot plate dimensions	150 x 150mm	250 x 250mm
Overall dimensions	325 x 285 x 164mm (without the controller	425 x 385 x 115mm (without the controller)





Hot Plate with XYZ Positioner
Model: HO-HPX-01

Holmarc's HO-HPX-01 hot plate comes with micrometer driven position control in X, Y and Z axes. It also has manual inclination control. It is a versatile instrument equipped with high uniformity heater controlled with an accurate digital thermostat to assure even heating across the entire surface of the hot plate.

The heating surface is made of high quality Stainless steel (316 L grade) which is machined smooth and flat and it contains Nichrome heating coil. The hot plate surface is resistant to spillage and corrosion. Our hot plate features an operating temperature up to 200°C from ambient with good uniformity across the plate surface. PT100 temperature sensor is included in the Hot plate for accurate temperature measurements.

Depending on the region of use, two power options are also available for the Hotplate; 110 V & 220V AC.

Hot plate find application in electronics industry, probing, characterization inspection and failure analysis of semiconductor wafers and chips, surface annealing, metal disposition, baking and in chemical laboratories.

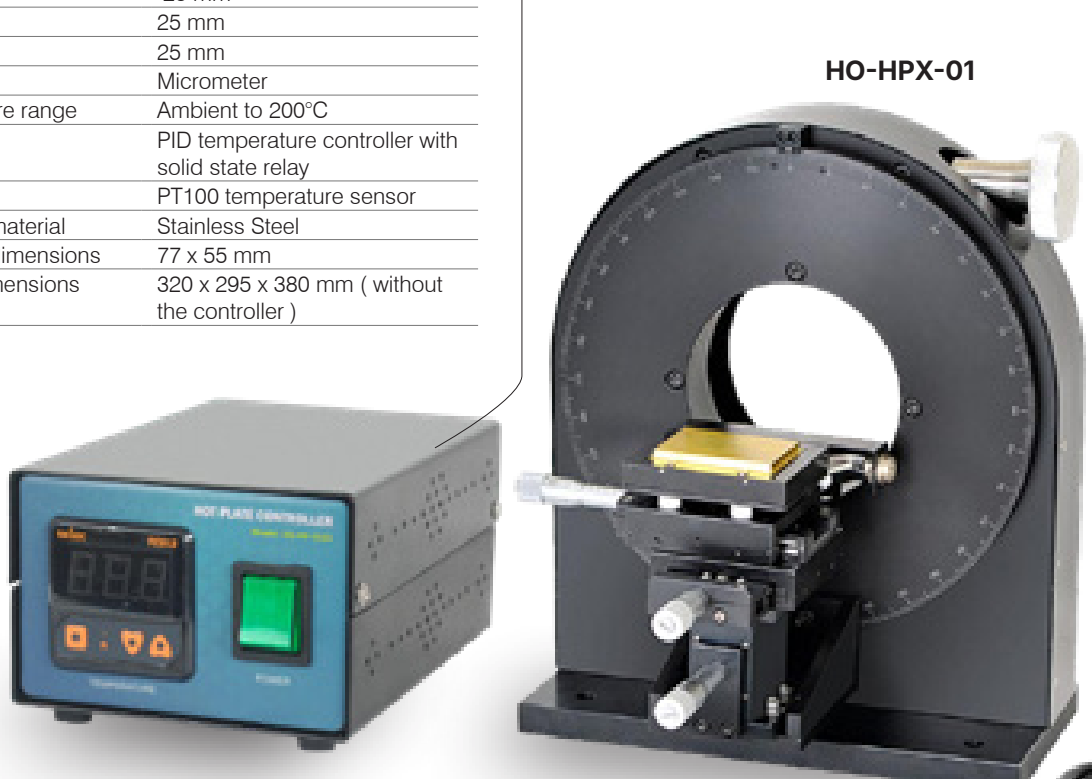
Specifications

Inclination	+/- 60 Degree
X Travel	25 mm
Y Travel	25 mm
Z Travel	25 mm
Drive	Micrometer
Temperature range	Ambient to 200°C
Controller	PID temperature controller with solid state relay
Sensor	PT100 temperature sensor
Hot plate material	Stainless Steel
Hot plate dimensions	77 x 55 mm
Overall dimensions	320 x 295 x 380 mm (without the controller)

Controller

The controller, which is placed remotely (can be placed within 1 meter from plate) facilitates microprocessor-controlled feedback which maintains consistent, repeatable temperature settings which is ideal for repetitive procedures.

HO-HPX-01



Mini Sample Heater
Model: HO-HET Series

It is a resistive heating system consists of separate, easily exchangeable resistive heaters which are loaded on a heater holder with power contacts and thermocouple. Samples are clamped onto the heater using special adaptor. It can be used with confocal laser Raman, Micro thermal imaging camera system etc. Special holders can be provided on request.

Model No	HO-HET-2048	HO-HET-RT20
Temperature range	200 to 480°C	RT to 200°C
Power	200W Max	50W Max
Sample size	5 x 5 mm Max.	5 x 5 mm Max.
Sample fixation	Clamping	Clamping
Temperature readout	Thermocouple	Thermocouple
Input Voltage	230 V / 50 Hz	230 V / 50 Hz
Temperature control electronics include PID controller and power sup		

Desktop Dispensing Unit
Model: HO-LSDDU-A3

Holmarc manufactures desktop dispensers for automated dispensing of fluids to well plates/ test tube arrays. Our standard model HO-LS-DDU-A3 is a three axes system which has a dispensing area of 300 mm x 300 mm. The system operates through a personal computer. Various dispensing attributes are programmable through the computer.

Specifications

Operating Range	X Axis / 300 mm Y Axis / 320 mm Z Axis / 100 mm
Repeatability	± 0.01 mm per axis
Resolution	X Y & Z axis 0.01 mm
Drive system	Stepping motor
External interface	RS 232 C - one channel for pc
Dispense area	300 x 320 mm
Resolution	20 microns
Drive system	Stepper motors
Computer interface	Rs 232 C

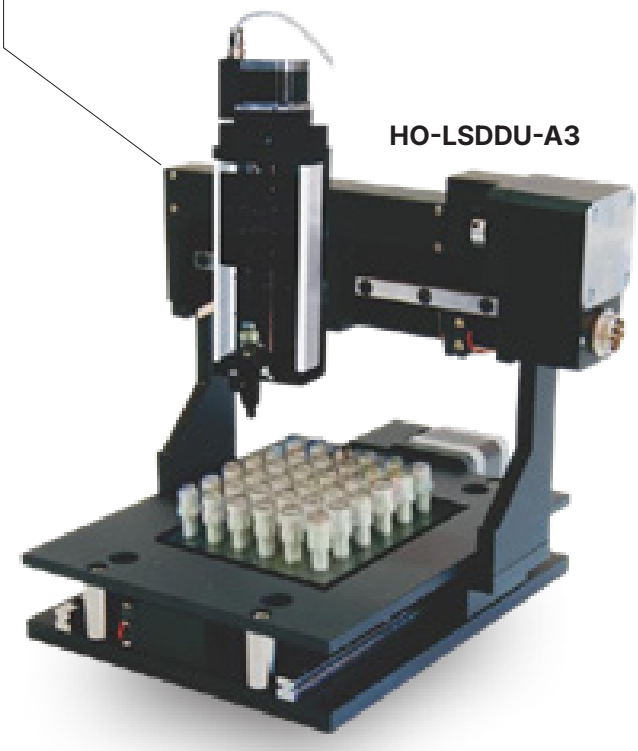
Digitally Controlled

Built-in cut off sensor

HO-HET-2048



HO-LSDDU-A3



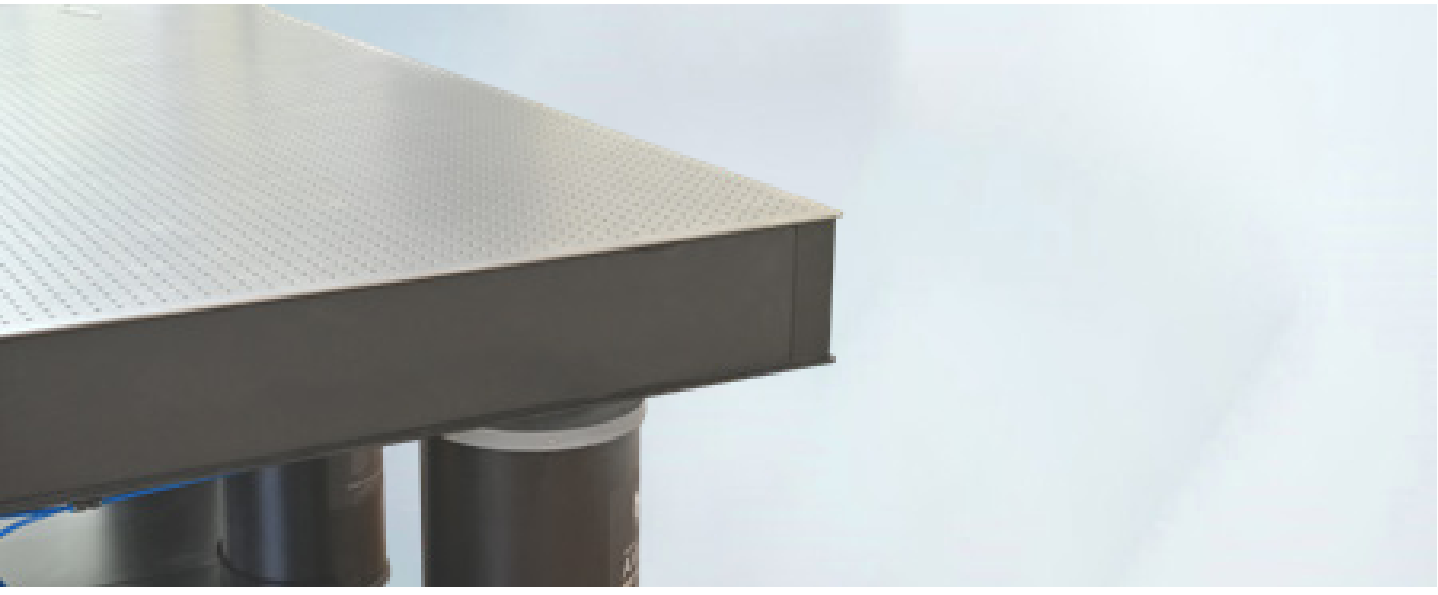
09

BREADBOARDS, TABLETOPS, RAILS & CARRIAGES

456 BREADBOARDS, TABLETOPS, RAILS & CARRIAGES
458 Solid Breadboards
458 Mini Breadboards
460 Standard Solid Breadboards
463 Heavy Duty Breadboards
464 Extra Large Breadboards
465 Solid Breadboards with aperture
465 Custom Breadboards & Support
466 Mounting Accessories
468 Honeycomb Breadboards
469 Honeycomb Breadboards Extreme Light Weight
470 Honeycomb Breadboards Light Weight
471 Honeycomb Breadboards
471 Standard
472 Honeycomb Tabletops
474 Tabletop Support
474 Passive Support (Automated Pressure & Level Controlled)
476 Passive Vibration Isolation System
478 Rigid Tabletop Support
478 with Height Adjustment
480 Desktop Vibration Isolation Support
482 Overhead Shelves
486 Overhead Shelf with Curtain
488 Wooden Drawer Shelf
490 Enclosures
492 Metallic Enclosures
494 Small Size Transparent Enclosures & Black Enclosures
495 Black Enclosures
496 Enclosure Construction System
498 Acoustic Enclosure
499 Vertical Laminar Flow with
499 Optical Table and Side Curtains
500 Optic Rails
500 Dovetail Triangular
500 Optical Rail & Carrier
502 HC - 2 Rail & Carriers
503 HC - 3 Rail & Carriers



Solid Breadboards

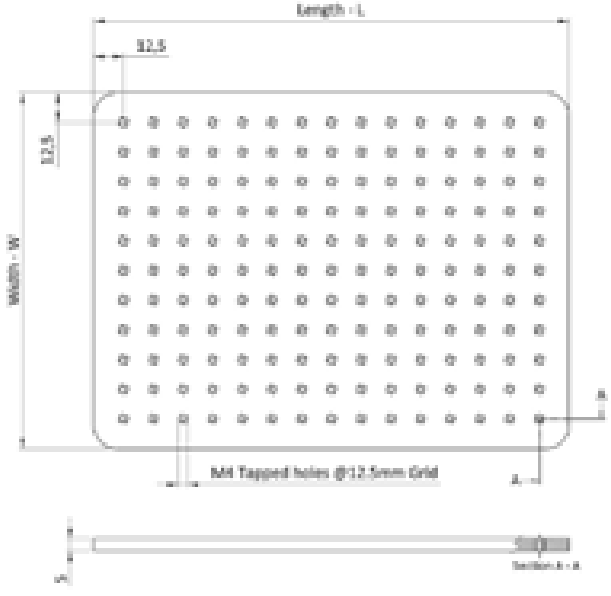


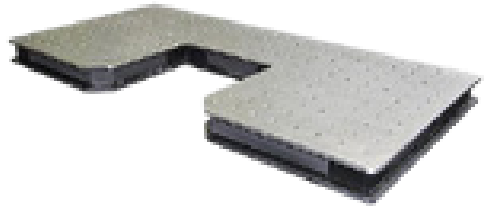
Mini Breadboards

Mini breadboards are used mainly to construct small optical experimental setups. The thickness of mini breadboard is 5mm. There are M4 tapped holes on 12.5mm grid. These breadboards are also available in vacuum compatible version.

On request tapped holes other than M4 can be provided on any array.







Specifications

- 5 mm thick
- M4 Standard Tapped Holes on 12.5mm Grid
- Stainless Steel construction
- Satin Finish
- Machining Tolerance +/- 0.3 mm over 300 mm length
- Surface flatness +/- 0.15mm over 300 mm square area

CUSTOM SIZES

Make your Choice !!! These BB series breadboards are available in various shapes, sizes and with different patterns of tapped holes other than standard models.
Please send us yours design or contact us at sales@holmarc.com

Specifications

Aluminium Anodized

Aluminium	Dimensions			Mounting
Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
MBB-75100-AL	100	75	5	M4
MBB-75150-AL	150	75	5	M4
MBB-75200-AL	200	75	5	M4
MBB-75250-AL	250	75	5	M4
MBB-100100-AL	100	100	5	M4
MBB-100150-AL	150	100	5	M4
MBB-100200-AL	200	100	5	M4
MBB-100250-AL	250	100	5	M4
MBB-150150-AL	150	150	5	M4
MBB-150200-AL	200	150	5	M4
MBB-150250-AL	250	150	5	M4
MBB-200200-AL	200	200	5	M4
MBB-200250-AL	250	200	5	M4
MBB-250250-AL	250	250	5	M4

Aluminium Non Anodized

Non Anodized	Dimensions			Mounting
	L (mm)	W (mm)	T (mm)	Mounting Hole
MBB-75100-NA	100	75	5	M4
MBB-75150-NA	150	75	5	M4
MBB-75200-NA	200	75	5	M4
MBB-75250-NA	250	75	5	M4
MBB-100100-NA	100	100	5	M4
MBB-100150-NA	150	100	5	M4
MBB-100200-NA	200	100	5	M4
MBB-100250-NA	250	100	5	M4
MBB-150150-NA	150	150	5	M4
MBB-150200-NA	200	150	5	M4
MBB-150250-NA	250	150	5	M4
MBB-200200-NA	200	200	5	M4
MBB-200250-NA	250	200	5	M4
MBB-250250-NA	250	250	5	M4

Stainless Steel

Stainless Steel	Dimensions			Mounting
Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
MBB-75100-SS	100	75	5	M4
MBB-75150-SS	150	75	5	M4
MBB-75200-SS	200	75	5	M4
MBB-75250-SS	250	75	5	M4
MBB-100100-SS	100	100	5	M4
MBB-100150-SS	150	100	5	M4
MBB-100200-SS	200	100	5	M4
MBB-100250-SS	250	100	5	M4
MBB-150150-SS	150	150	5	M4
MBB-150200-SS	200	150	5	M4
MBB-150250-SS	250	150	5	M4
MBB-200200-SS	200	200	5	M4
MBB-200250-SS	250	200	5	M4
MBB-250250-SS	250	250	5	M4

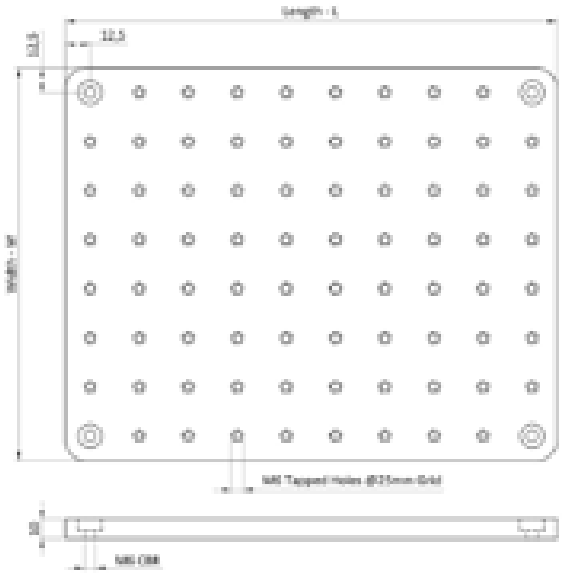
Standard Solid Breadboards

BB Series

Standard Solid Breadboards are commonly used platforms for building optical setups. It's thickness is 10mm. There are M6 tapped holes on 25mm grid. These breadboards are also available in vacuum compatible versions.

On request, tapped holes other than M6 can be provided on any array.





Specifications

10 mm thick
M6 Standard tapped holes on 25mm Grid
Aluminium construction
Black anodized finish for aluminium
Machining tolerance +/- 0.3 mm over 300 mm length
Surface flatness +/- 0.15mm over 300 mm square area

Tapped M6 holes on 25mm Grid

Solid 10 mm thick aluminum construction



CUSTOM CONFIGURABLE

41 ALU

25

Make your Choice !!! These BB series breadboards are available in various shapes, sizes and with different patterns of tapped holes other than standard models.
Please send us yours design or contact us at sales@holmarc.com

Stainless Steel Through holes

Aluminium through holes

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-SS	100	100	10	M6
BB-200200-SS	200	200	10	M6
BB-200400-SS	400	400	10	M6
BB-300400-SS	400	400	10	M6
BB-400400-SS	400	400	10	M6
BB-400600-SS	600	600	10	M6
Customised Size				
BB-L -W-AL-SS	L	W	10	M6

Aluminium through holes

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-AL-T	100	100	10	¼-20
BB-100200-AL-T	200	100	10	¼-20
BB-150400-AL-T	400	150	10	¼-20
BB-200200-AL-T	200	200	10	¼-20
BB-200400-AL-T	400	400	10	¼-20
BB-300300-AL-T	300	300	10	¼-20
BB-300400-AL-T	400	400	10	¼-20
BB-400400-AL-T	400	400	10	¼-20
BB-400600-AL-T	600	600	10	¼-20
Customised Size				
BB-L -W-AL-T	L	W	10	1/4-20

Non Anodized Aluminium through holes

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-AL-NT	100	100	10	¼-20
BB-200200-AL-NT	200	200	10	¼-20
BB-200400-AL-NT	400	200	10	¼-20
BB-300400-AL-NT	400	300	10	¼-20
BB-400400-AL-NT	400	400	10	¼-20
Customised Size				
BB-L -W-AL-N	L	W	10	¼-20

Anodized Solid Aluminium Breadboard with M6 1/4 - 20 through Holes Dual Density

Aluminium through holes

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-AL-DT	100	100	10	M6
BB-100200-AL-DT	200	100	10	M6
BB-150400-AL-DT	400	150	10	M6
BB-200200-AL-DT	200	200	10	M6
BB-200400-AL-DT	400	200	10	M6
BB-300300-AL-DT	300	300	10	M6
BB-300400-AL-DT	400	300	10	M6
BB-400400-AL-DT	400	400	10	M6
BB-400600-AL-DT	600	400	10	M6
Customised Size				
BB-L -W-AL-D	L	W	10	M6

Anodized Solid Aluminium Breadboard with M6 through Holes Dual Density

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-AL-D	100	100	10	M6
BB-100200-AL-D	200	100	10	M6
BB-150400-AL-D	400	150	10	M6

BB-200200-AL-D	200	200	10	M6
BB-200400-AL-D	400	200	10	M6
BB-300300-AL-D	300	300	10	M6
BB-300400-AL-D	400	300	10	M6
BB-400400-AL-D	400	400	10	M6
BB-400600-AL-D	600	400	10	M6
Customised Size				
BB-L -W-AL-D	L	W	10	M6

Anodized Solid Aluminum breadboards- wit 1/4 - 20blind holes

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-AL-BT	100	100	10	¼-20
BB-100200-AL-BT	200	100	10	¼-20
BB-150400-AL-BT	400	150	10	¼-20
BB-200200-AL-BT	200	200	10	¼-20
BB-200400-AL-BT	400	200	10	¼-20
BB-300300-AL-BT	300	300	10	¼-20
BB-300400-AL-BT	400	300	10	¼-20
BB-400400-AL-BT	400	400	10	¼-20
BB-400600-AL-BT	600	400	10	¼-20
Customised Size				
BB-L -W-AL-BT	L	W	10	¼-20

Anodized Solid Aluminum breadboards- wit M6 blind holes

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-AL-B	100	100	10	M6
BB-100200-AL-B	200	100	10	M6
BB-150400-AL-B	400	150	10	M6
BB-200200-AL-B	200	200	10	M6
BB-200400-AL-B	400	200	10	M6
BB-300300-AL-B	300	300	10	M6
BB-300400-AL-B	400	300	10	M6
BB-400400-AL-B	400	400	10	M6
BB-400600-AL-B	600	400	10	M6
Customised Size				
BB-L -W-AL-B	L	W	10	M6

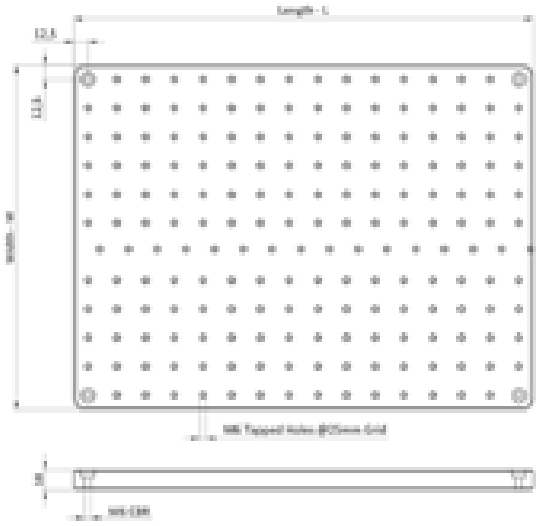
Solid magnetic ss breadboards with m6 blind holes (both side usable)

Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
BB-100100-SSM	100	100	10	M6
BB-200200-SSM	200	200	10	M6
BB-200400-SSM	400	200	10	M6
BB-300400-SSM	400	300	10	M6
BB-400400-SSM	400	400	10	M6
BB-400600-SSM	600	400	10	M6
Customised Size				
BB-L -W-AL-SSM	L	W	10	M6

Heavy Duty Breadboards

Heavy duty breadboards are available in 18mm thickness. These breadboards are heavy and can be used for building rigid optical setups.





18 mm thick
M6 standard tapped holes on 25mm grid
Aluminium alloy construction
Black anodized finish for aluminium alloy
Machining tolerance +/- 0.3 mm over 300 mm length
Surface flatness +/- 0.15mm over 300 mm square area

Aluminium through holes				
Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
HBB-300300-AL	300	300	10	M6
HBB-300400-AL	400	300	10	M6
HBB-400400-AL	400	400	10	M6
HBB-400600-AL	600	400	10	M6
Customised Size				
HBB-L -W-A	L	W	10	M6

Extra Large Breadboards



Aluminium extra large breadboards--with M6 through holes

Aluminium
through holes

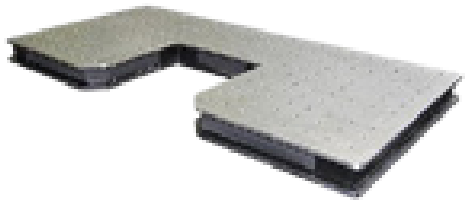
Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
EBB-500500-AL	500	500	12	M6
EBB-500600-AL	500	600	12	M6
EBB-600600-AL	600	600	12	M6
EBB-750750-AL	750	750	12	M6
EBB-800800-AL	800	800	12	M6
EBB-900900-AL	900	900	12	M6
EBB-900900-AL	900	900	12	M6

Aluminium extra large breadboards--Imperial standard through holes

Aluminium
through holes

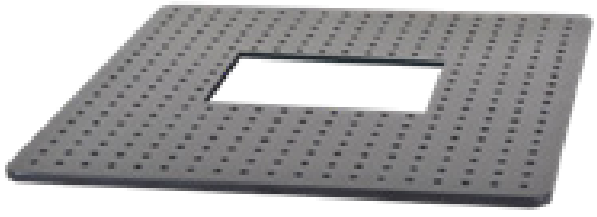
Model No:	L (mm)	W (mm)	T (mm)	Mounting Hole
EBB-500500-AL-T	500	500	12	¼-20
EBB-500600-AL-T	500	600	12	¼-20
EBB-600600-AL-T	600	600	12	¼-20
EBB-750750-AL-T	750	750	12	¼-20
EBB-800800-AL-T	800	800	12	¼-20
EBB-900900-A	900	900	12	¼-20
EBB-900900-AL	900	900	12	¼-20

Solid Breadboards with aperture



U Shaped Aluminium breadboards

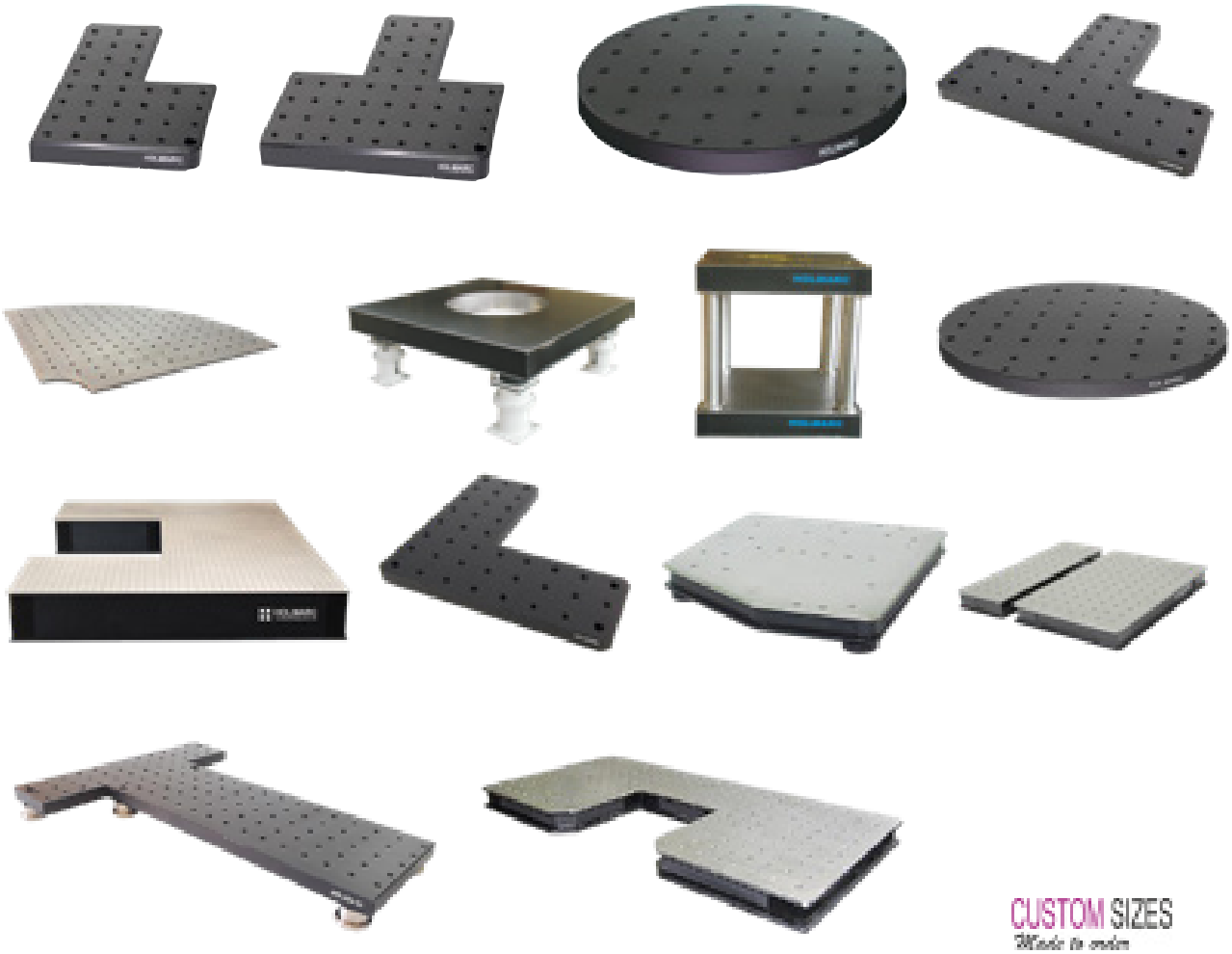
U Shaped Magnetic Stainless Steel breadboards



Aluminium breadboards with centre aperture

Magnetic SS breadboards with centre aperture

Custom Breadboards & Support



Mounting Accessories

Angle Brackets : HOLMARC Angle Brackets are rigid, angled mounting plates with slotted faces. They are designed to mount aluminium breadboards to an optical table for achieving vertical or angled working surface. The 30, 45 and 90 degree angles are accurate upto +/- 0.05 degree.

90° Bracket : is designed to mount aluminium breadboard perpendicular to optical table for achieving vertical working surface.



Fig. 45B-AL Vertical 45 Degree Angle Brackets

Specifications

Material	Aluminium Alloy
Treatment	Anodized
Color	Black
Machining Tolerance	+/- 0.3 mm over 300 mm length
Thickness	15mm +/- 0.5mm
Mounting angle	90˚ / 45˚
Surface Finish	Satin Finish
Mounting Holes	M6 tapped holes at 25mm Grid

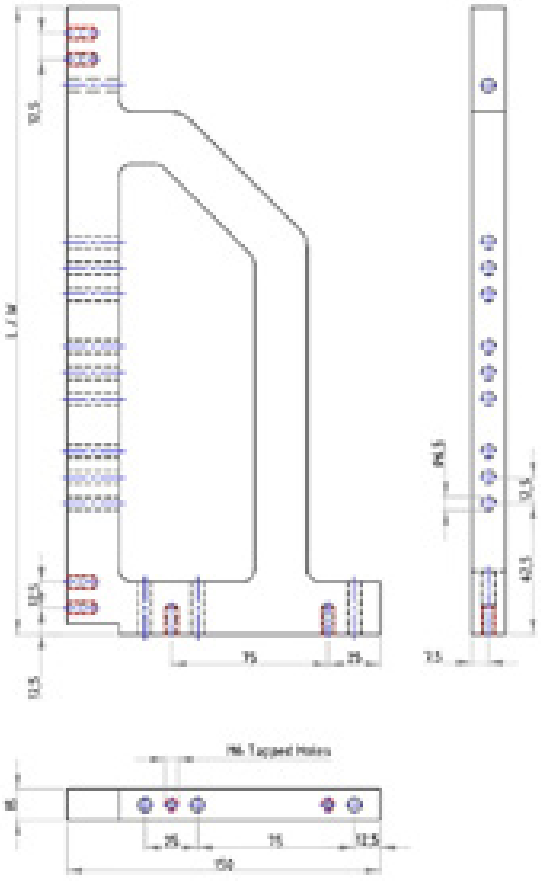




Fig. 90B-AL Vertical 90 Degree Angle Brackets with Standard Solid Breadboard

MODEL 90B-100-AL



90° Bracket		Aluminium Black Anodized	
Model No:	L / W (mm)	T (mm)	Mounting Hole
90B-100-AL	100	15	M6 CLR
90B-150-AL	150	15	M6 CLR
90B-200-AL	200	15	M6 CLR
90B-250-AL	250	15	M6 CLR
90B-300-AL	300	15	M6 CLR
90B-350-AL	350	15	M6 CLR

MODEL 90B-250-AL



45° Bracket		Aluminium Black Anodized	
Model No:	L / W (mm)	T (mm)	Mounting Hole
45B-100-AL	100	15	M6 CLR
45B-150-AL	150	15	M6 CLR
45B-200-AL	200	15	M6 CLR
45B-250-AL	250	15	M6 CLR
45B-300-AL	300	15	M6 CLR
45B-350-AL	350	15	M6 CLR

Accessories:
Our breadboards are compatible with a variety of accessories, including:
Brackets
Leveling Feet
Handles
Posts
For detailed information on available accessories, please refer to our Accessories Page

Custom Product configurations

Breadboard with custom hole pattern Custom mounting accessories
Breadboard with custom profiles

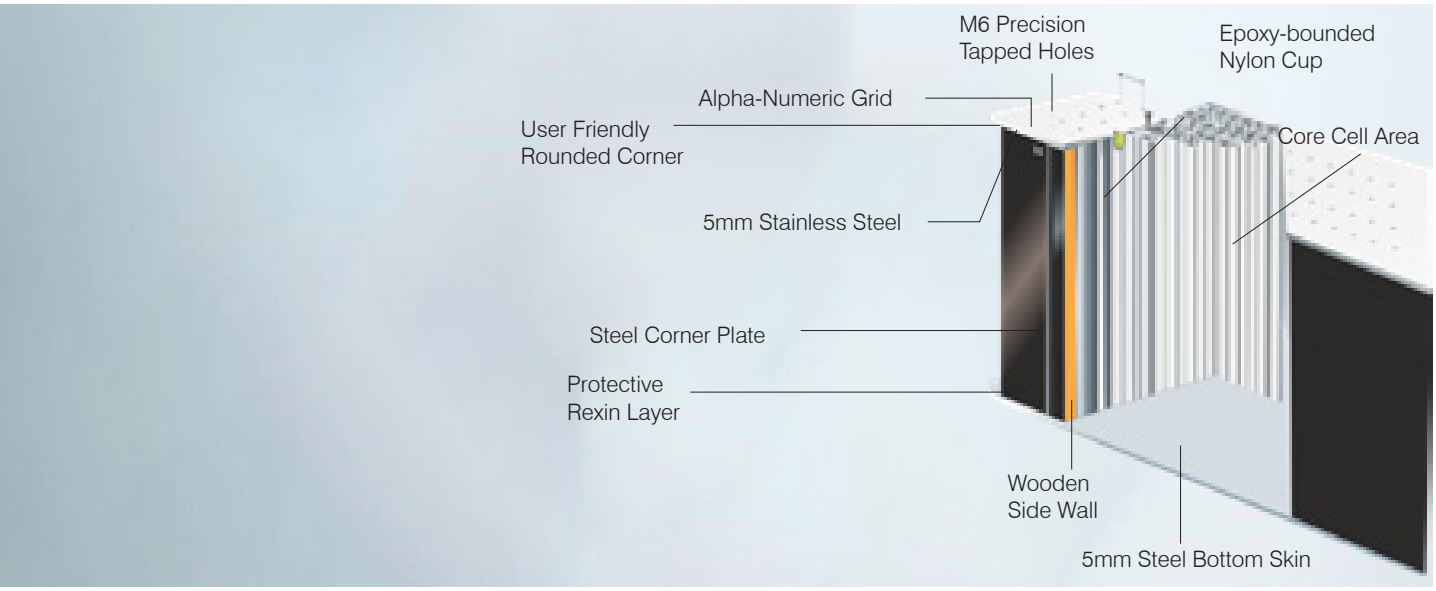


Fig. 90B-AL Vertical 90 Degree Angle Brackets

Breadboard Vertical Mounting Accessories

<< 90° Bracket
90° Bracket is designed to mount aluminium breadboard perpendicular to optical table to achieve vertical working surface

Honeycomb Breadboards



Optical LAB Work Table (Economy Version) **EDU 2001 Series**

HOLMARC EDU 2001 Series is an easy-to-assemble optical work table based on a lightweight honeycomb optical breadboard. The worktable is supported on all 4 sides by steel sheet frames and are are designed to be lightweight, portable and rigid support for optical breadboards. Working height of EDU 2001 Series worktable is 750mm including optical breadboard.





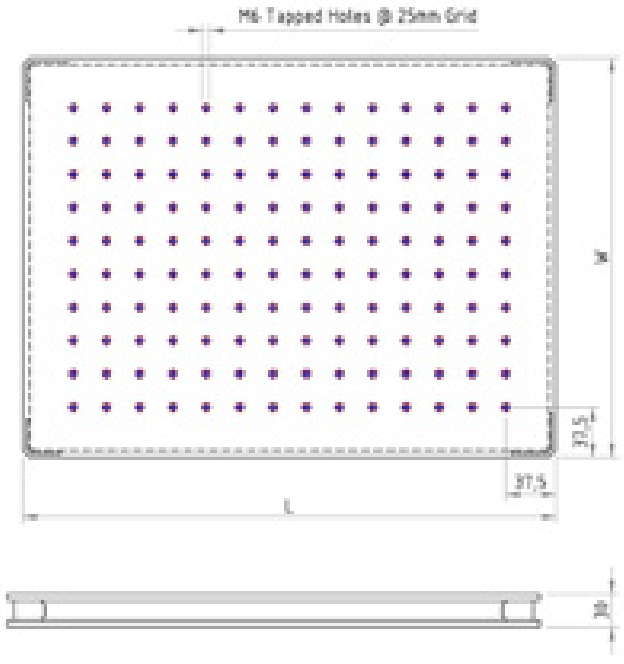
Honeycomb Breadboards Extreme Light Weight

Extreme light weight breadboards are available in various sizes. These models are only 30mm thick. It has honeycomb core made of aluminium to reduce weight. These breadboards are perfect for optical systems where mobility is more important than high level of rigidity and damping.



30mm thickness

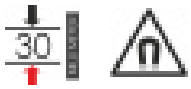
Aluminium honeycomb core



Specifications

- Thickness : 30 mm
- 3 mm thick magnetic SS top skin (SS410)
- Bottom skin made of 2 mm thick epoxy coated aluminium
- Aluminium honeycomb core
- Core cell size of 6 sq. cm.(Approx.)
- Nylon cups under each tapped hole
- + / - 0.1 mm flatness on top over 300 mm x 300 mm area (non-cumulative error)
- M6 tapped holes at 25 mm grid
- Distance of the first raw of mounting holes from the edge is 37.5 mm
- Semi solid epoxy bonding
- Side walls finished with black form sheet having matte finish

Non magnetic breadboards are used where the Optical experiment setups to be built are sensitive to magnetic properties of breadboard construction materials. These special breadboards are constructed of 304 grade stainless steel on top and aluminium on bottom part. This alloy of steel contains less iron than typical stainless steel, which reduces its ferromagnetic properties. The honeycomb structure is constructed from aluminium.



Honeycomb Breadboards Extreme Light Weight - Magnetic

Model No:	L (mm)	W (mm)
ELLBB 60-30	60	30
ELLBB 60-60	60	60
ELLBB 90-60	90	60
ELLBB 90-90	90	90
ELLBB 120-90	120	90
ELLBB 120-120	120	120
ELLBB 180-120	180	120

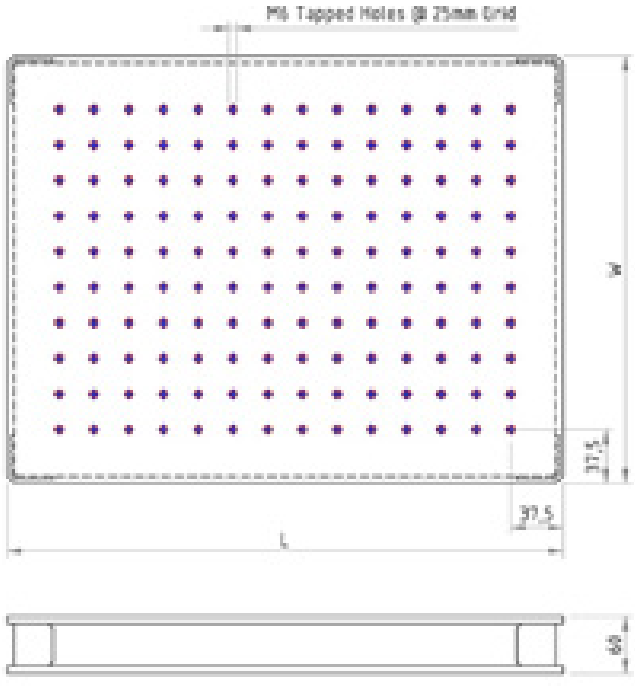
Honeycomb Breadboards Extreme Light Weight - Non Magnetic

Model No:	L (mm)	W (mm)
ELLNMBB 60-30	60	30
ELLNMBB 60-60	60	60
ELLNMBB 90-60	90	60
ELLNMBB 90-90	90	90
ELLNMBB 120-90	120	90
ELLNMBB 120-120	120	120
ELLNMBB 180-120	180	120

Honeycomb Breadboards Light Weight

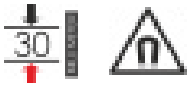
Light weight breadboards are constructed using 3mm thick ferromagnetic stainless steel sheet as top skin and 2mm thick aluminium sheet as bottom skin. It has honeycomb core made of aluminium to reduce weight. These light weight breadboards exhibit high natural frequency and nominal broadband damping.

We also manufacture non-magnetic version of these breadboards. In these breadboards top skin and bottom skin are made of non-magnetic stainless steel.





Top skin plate: magnetic SS 3mm thick
Bottom skin plate: 2 mm thick epoxy coated



Non magnetic breadboards are used where the Optical experiment setups to be built are sensitive to magnetic properties of breadboard construction materials. These special breadboards are constructed of 304 grade stainless steel on top and aluminium on bottom part. This alloy of steel contains less iron than typical stainless steel, which reduces its ferromagnetic properties. The honeycomb structure is constructed from aluminium.

Specifications

Thickness : 60 mm
3mm thick magnetic SS top skin (SS410) /(SS304)
Bottom skin made of 2 mm thick epoxy coated aluminium
Aluminium honeycomb core
Core cell size of 6 sq. cm.(Approx.)
Nylon cups under each tapped hole
+ / - 0.1 mm flatness on top over 300 mm square area
M6 tapped holes at 25 mm grid
Distance of the first raw of mounting holes from the edge is 37.5 mm
Semi solid epoxy bonding
Side walls finished with black form sheet having matte finish
Compressed wooden particle boards as side walls to damp acoustic vibrations.

Honeycomb Breadboards Light Weight - Magnetic

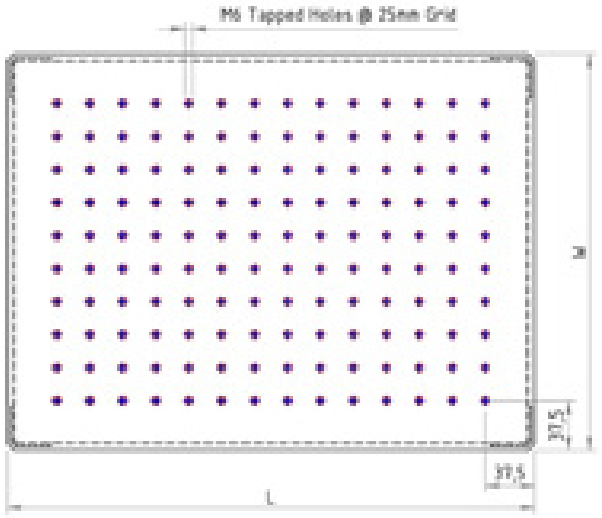
Model No:	L (mm)	W (mm)
LLBB 60-30	60	30
LLBB 60-60	60	60
LLBB 90-60	90	60
LLBB 90-90	90	90
LLBB 120-90	120	90
LLBB 120-120	120	120
LLBB 180-120	180	120

Honeycomb Breadboards Light Weight - Non Magnetic

Model No:	L (mm)	W (mm)
LLNMBB 60-30	60	30
LLNMBB 60-60	60	60
LLNMBB 90-60	90	60
LLNMBB 90-90	90	90
LLNMBB 120-90	120	90
LLNMBB 120-120	120	120
LLNMBB 180-120	180	120

Honeycomb Breadboards Standard

Honeycomb breadboards from Holmarc use magnetic stainless steel (SS410 series) as top skin. Core of the breadboard is honeycomb structure made from aluminium. Thickness of these breadboards generally vary between 60 mm and 100 mm. Honeycomb breadboards can be placed on any working tables to quickly build optical working surfaces which will add the convenience of tapped holes grid in addition to the rigidity and stability of honeycomb structure. These can as well be used to build extra elevated working surfaces on optical tables. With suitable angle brackets and clamps, vertical working surfaces can also be created.



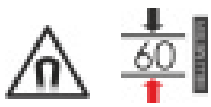




Specifications

- 5 mm thick magnetic SS top skin (SS410) /(SS304)
- Bottom skin : 5 mm thick epoxy coated steel
- 0.25 mm thick aluminium honeycomb core
- Core cell size of 6 sq. cm.(approx.)
- Nylon cups under each tapped hole
- +/- 0.1 mm flatness on top over 300 mm x 300 mm area (non-cumulative error)
- M6 tapped holes on 25 mm grid
- Distance of the first raw of mounting holes from the edge is 37.5 mm
- Semi solid epoxy bonding
- Side walls finished with black form sheet (matte finish)
- Compressed wooden particle boards as side walls to dampen acoustic vibrations.

Top skin plate: magnetic SS 5mm thick
Bottom skin plate: 5 mm thick epoxy coated stee



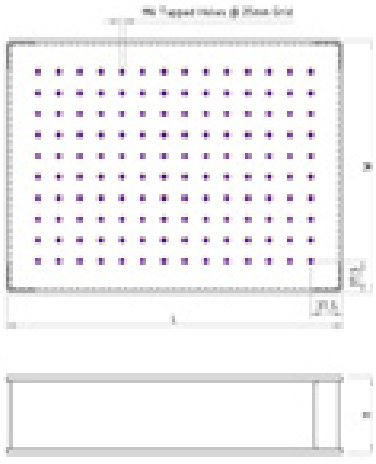
Honeycomb Breadboards Standard - Magnetic

Model No:	Length (mm)	Width (mm)	Height (mm)	
BB 60-30	600	300	60	
BB 60-60	600	600	60	
BB 90-60	900	600	100	
BB 90-90	900	900	100	
BB 120-90	1200	900	100	
BB 120-120	1200	1200	100	
BB 180-120	1800	1200	100	

Honeycomb Breadboards Standard - Non Magnetic

Model No:	Length (mm)	Width (mm)	Height (mm)	
BBNM 60-30	600	300	60	
BBNM 60-60	600	600	60	
BBNM 90-60	900	600	100	
BBNM 90-90	900	900	100	
BBNM 120-90	1200	900	100	
BBNM 120-120	1200	1200	100	
BBNM 180-120	1800	1200	100	

Honeycomb Tabletops

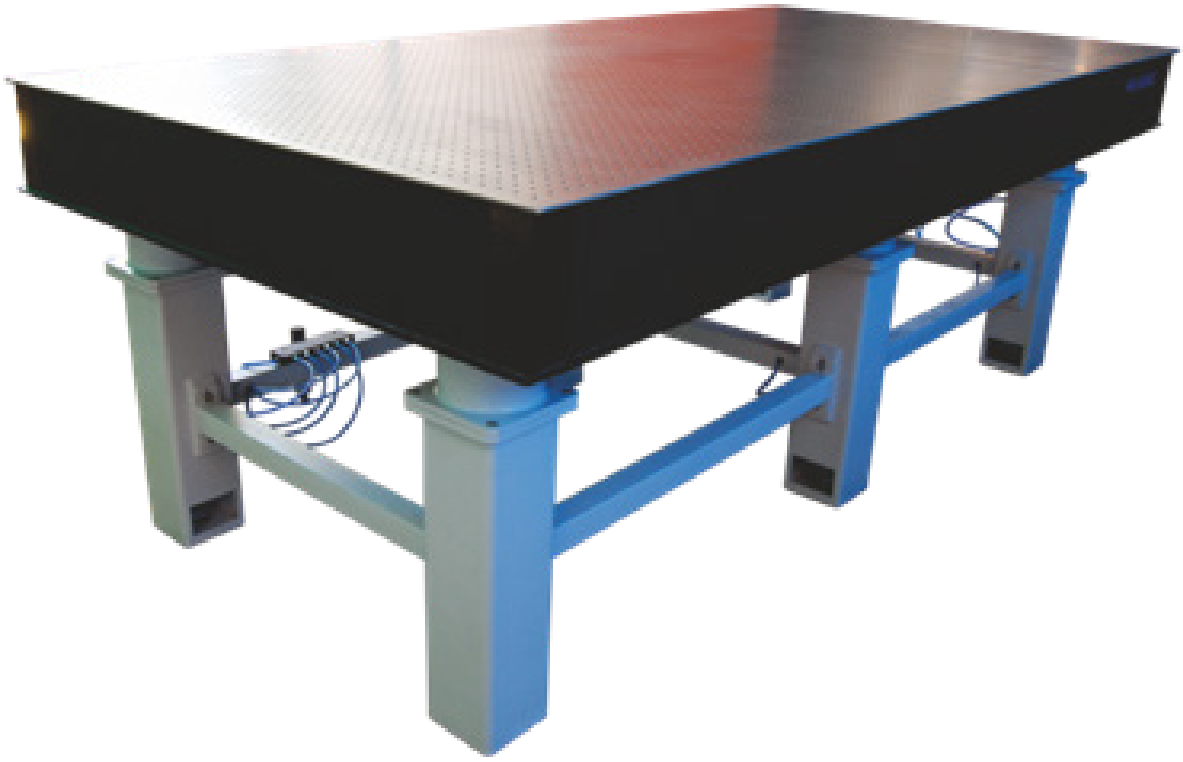


Honeycomb tabletops from Holmarc provide rigid and stable optical working surfaces with the convenience of tapped holes at 25mm grid for mounting components and modules. Honeycomb core made of 0.25mm thick aluminium sheet. Though compressed particle boards are used as side walls in most cases due to its vibration damping properties, Holmarc can also provide tabletops with steel and aluminium side walls. Semi-solid epoxy is used to construct the honeycomb core as well as to bind top and bottom skins to the core. This special epoxy binding absorbs low frequency vibrations to a certain extent and provide considerable damping even without the use of isolated supports.

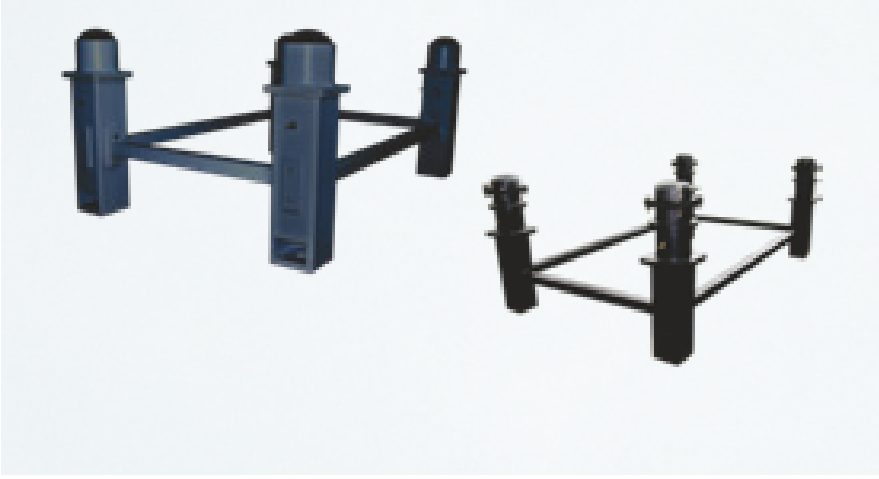
Specifications

5 mm thick non-magnetic SS top skin (SS410) /
0.25 mm thick aluminium honeycomb core
Core cell size of 6 sq. cm.(approx.)
Nylon cups under each tapped hole
+/- 0.1 mm flatness on top over 300 mm x 300 mm area (non-cumulative error)
M6 tapped holes at 25 mm grid
Distance of the first raw of mounting holes from the edge is 37.5 mm
Semi solid epoxy bonding
Side walls finished with black form sheet having matte finish
Compressed wooden particle boards as side walls to dampen acoustic vibrations.





Honeycomb non magnetic tabletops are used where the Optical experiment setups to be built on top of the tabletops are sensitive to magnetism. These special tabletops are constructed of 304 grade stainless steel on top and bottom part. This alloy of steel contains less iron than typical stainless steel, which reduces its ferromagnetic properties. The honeycomb structure is constructed from aluminium.



Specifications

5 mm thick non-magnetic SS top skin (SS304)
Bottom skin made of 5 mm thick epoxy coated non-magnetic steel (SS304)
0.25 mm thick aluminium honeycomb core
Core cell size of 6 sq. cm.(approx.)
Nylon cups under each tapped hole
+/- 0.1 mm flatness on top over 300 mm x 300 mm area (non-cumulative error)
M6 tapped holes at 25 mm grid
Distance of the first raw of mounting holes from the edge is 37.5 mm
Semi solid epoxy bonding
Side walls finished with black form sheet having matte finish
Compressed wooden particle boards as side walls to dampen acoustic vibrations.

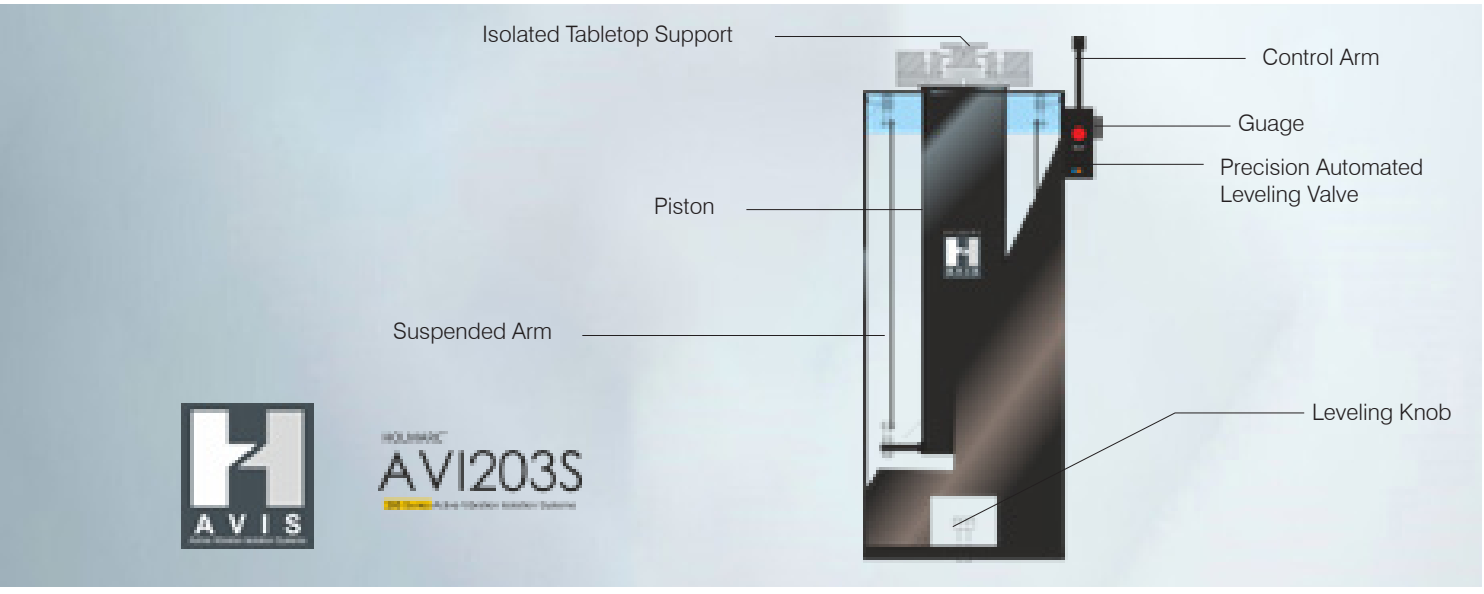
Honeycomb Tabletops- Magnetic (SS410)

Model No:	Length (mm)	Width (mm)	Height (mm)
TT 90-90	90	90	15
TT 120-90	120	90	15
TT 120-120	120	120	15
TT 180-120	180	120	20
TT 240-120	240	120	20
TT 300-120	300	120	20
TT 180-150	180	150	20
TT 240-150	240	150	20
TT 300-150	300	150	20
TT 360-150	360	150	20

Honeycomb Tabletops- Non Magnetic (SS304)

Model No:	Length (mm)	Width (mm)	Height (mm)
TTNM 90-90	90	90	15
TTNM 120-90	120	90	15
TTNM 120-120	120	120	15
TTNM 180-120	180	120	20
TTNM 240-120	240	120	20
TTNM 300-120	300	120	20
TTNM 180-150	180	150	20
TTNM 240-150	240	150	20
TTNM 300-150	300	150	20
TTNM 360-150	360	150	20

Tabletop Support



AVI203S & AVI204S AVI Series

Passive Support (Automated Pressure & Level Controlled)

HOLMARC's Passive Support - Automated Pressure & Level Controlled vibration isolation system that effectively isolates the optical table from vertical and horizontal vibrations throughout the critical 3 to 50 Hz frequency range, since most common large-amplitude sources of vibrations found in laboratories vibrate within this range of frequencies. If the source of compressed air is removed, the Optical Tabletop will lower until it securely rests on the supports and the table will no longer be isolated from floor vibrations.

Our AVI Series automated optical table supports can be used to significantly reduce the vibrations transmitted to an optical table setup in a noisy environment



Fig, AV1203S Series Active vibration isolation system with TT 240-120 Honeycomb Tabletop



Pneumatic Isolation Preassure Valve



Featured vibration isolator technology

Superior vibration control

Maintenance free operation

Specially designed for Interferometry and other high vibration sensitive experiments

QC Holmarc AVIS

All Products are manufactured and marketed by HOLMARC™ Opto-Mechatronics Pvt. Ltd

Specifications

Vertical Resonant Frequency	1.25 Hz
Horizontal Resonant Frequency	1.0 Hz
Vertical Transmissibility at Resonance	10 dB
Horizontal Transmissibility at Resonance	12 dB
Vertical Transmissibility at 5Hz	-20 dB (90%)
Horizontal Transmissibility at 5Hz	-24 dB (94%)
Vertical Transmissibility at 10Hz	-32.5 dB (97.5%)
Horizontal Transmissibility at 10Hz	-30 dB (97%)
Maximum Load Capacity (set of four)	600 - 800 kg
Height Adjustment Range	-10 mm, +5 mm
Self Leveling Repeatability	± 0.5 mm
Height	700 mm
Air Pressure (Maximum)	80 psi
Finish	Black Paint
The specification data above was measured under a 600 kg load (24% of max	

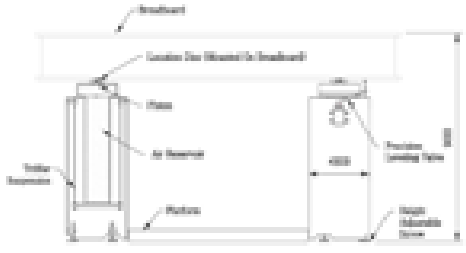
Model No:	Suitable for Tabletop Model
AVI203S-4	Tables up to TT 120-240
Includes four numbers of AVI203S along with compressor and accessories for interconnection	
AVI203S-6	Tables above TT 120-240
Includes six numbers of AVI203S along with compressor and accessories for interconnection.	

Accessories

Accessories	Accessory Order Code
Overhead Table Shelf	OTS
Faraday Cages	FCU
Transparent Enclosure	TEU
Semi Transparent Enclosure	SEU
Opaque Full body Enclosure	OEU
Central Rack	CRS
Bottom Rack	BRS
Arm Rest & Support Rails	ARS
Accessories code can be added along with the rigid tabletop support model number under bracket for ordering. Eg. RTS 120-120 (OTS, ARS, BRS, SEU)	

Model No	Diameter	Height	Load Capacity
AVI2303S	300mm	700mm	350kg
AVI204S	200mm	700mm	250kg

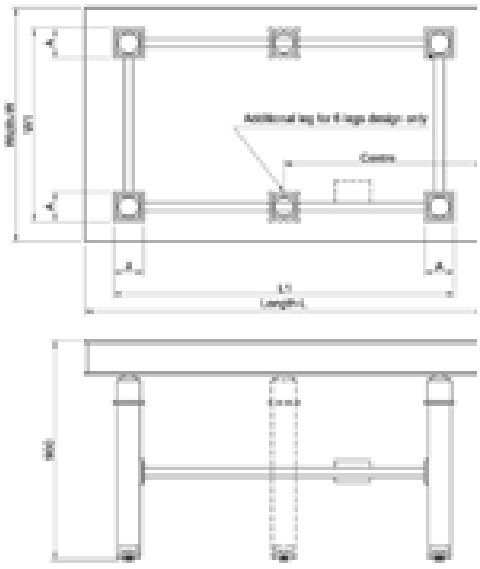






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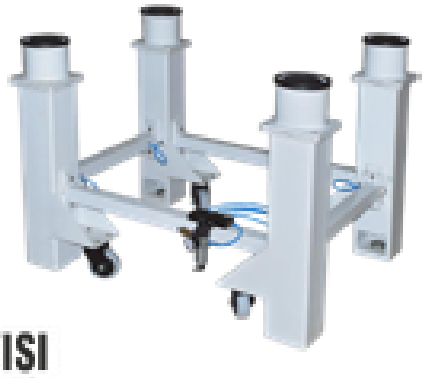
Passive Vibration Isolation System



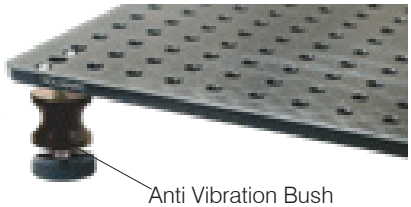
Interconnected Legs

In PVISI series passive vibration isolation systems, isolated legs are interconnected by pneumatic tubes for air filling. Air can be filled through the inlet valve in one of the isolators. Once the air is pumped using a compressor, it is uniformly distributed to all the isolator legs. The pressure of air to be filled is 25-35 PSI. Air filter is provided to supply moisture free air to the system to avoid condensation in air. Air needs to be filled in the legs at least once in a month.

Isolated supports isolates the table top from vertical and horizontal disturbances. The system has vertical and horizontal natural frequencies of 4 - 8 Hz and effectively isolates vibrations in the critical range of 10- 50 Hz.



PVISI SERIES



Isolation of Vibration Reduce Noise Transmission

Anti Vibration Bush

Rigid Leveling Foot



Anti Vibration Components

Easy installation & maintenance free

Selectable in Independent or Interconnected Legs options

Accessories	Accessory Code
Overhead Table Shelf	OTS
Faraday Cage	FSC
Transparent, Semitransparent & Opaque Full Body Endosure	TEU, SEU & OEU
Central Rack	CRS
Bottom Rack	BRS
Heavy Duty Casters	HDC

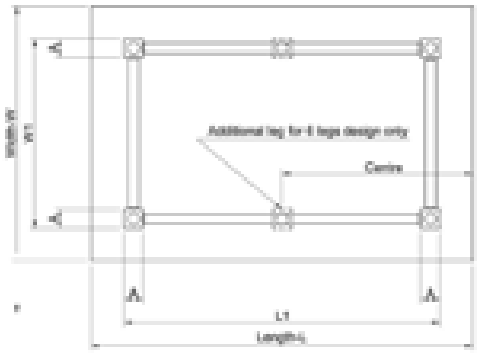
Model No	Suitable for Tabletop Model	L x W (mm)	L1 x W1 (mm)	A (mm)	No. of Legs
PVISI 60-60	TT 60-60	600 x 600	500 x 500	135	4
PVISI 90-60	TT 90-60	900 x 600	800 x 500	135	4
PVISI 90-90	TT 90-90	900 x 900	800 x 800	135	4
PVISI 120-90	TT 120-90	1200 x 900	1000 x 700	135	4
PVISI 120-120	TT 120-120	1200 x 1200	820 x 820	135	4
PVISI 180-120	TT 180-120	1800 x 1200	1420 x 820	135	4
PVISI 240-120	TT 240-120	2400 x 1200	2020 x 820	135	4
PVISI 300-120	TT 300-120	3000 x 1200	2620 x 820	135	6
PVISI 180-150	TT 180-150	1800 x 1500	1420 x 820	135	4
PVISI 240-150	TT 240-150	2400 x 1500	2020 x 1120	135	4
PVISI 300-150	TT 300-150	3000 x 1500	2620 x 1120	135	6
PVISI 360-150	TT 360-150	3600 x 1500	3220 x 1120	135	6

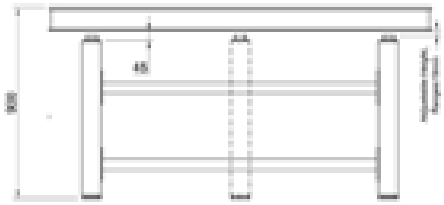
Note: For larger Tabletops, 6 or 8 legs have to be used depending on load. Motorized pump is supplied along with the system.

RTS - SERIES

Rigid Tabletop Support

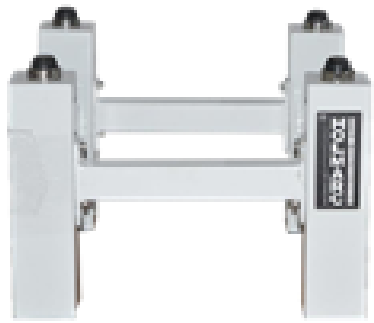
Rigid table top support system has four vertical members made from rectangular steel tubes and eight horizontal members made from 50 mm x 50 mm steel tubes. These members can be joined by nuts & bolts at the lab site. The honeycomb surface rest on four heavy-duty bolts on the top of the support system, which can also be adjusted for leveling. The adjustment range is +/- 4 cm. The support system is given moon light finish by epoxy paint.











Motorised Pump Model : CP-100

Note: For larger Tabletops, 6 or 8 legs have to be used depending on load. Motorized pump is supplied along with the system.



Model No	Suitable for Tabletop Model	L x W (mm)	L1 x W1 (mm)	A (mm)	No. of Legs
RTS 60-60	TT 60-60	600 x 600	500 x 500	90	4
RTS 90-60	TT 90-60	900 x 600	800 x 500	90	4
RTS 90-90	TT 90-90	900 x 900	800 x 800	90	4
RTS 120-90	TT 120-90	1200 x 900	1000 x 700	90	4
RTS 120-120	TT 120-120	1200 x 1200	820 x 820	90	4
RTS 180-120	TT 180-120	1800 x 1200	1420 x 820	90	4
RTS 180-150	TT 180-150	1800 x 1500	1420 x 1120	90	4
RTS 240-120	TT 240-120	2400 x 1200	2020 x 820	135	4
RTS 240-150	TT 240-150	2400 x 1500	2020 x 1120	135	6
RTS 300-120	TT 300-120	3000 x 1200	2620 x 820	135	6
RTS 300-150	TT 300-150	3000 x 1500	2620 x 1120	135	6
RTS 360-150	TT 360-150	3600 x 1500	3220 x 1120	135	6
Note: For larger Tabletops, 6 or 8 legs have to be used depending on load. Motorized pump is supplied along with the system.					

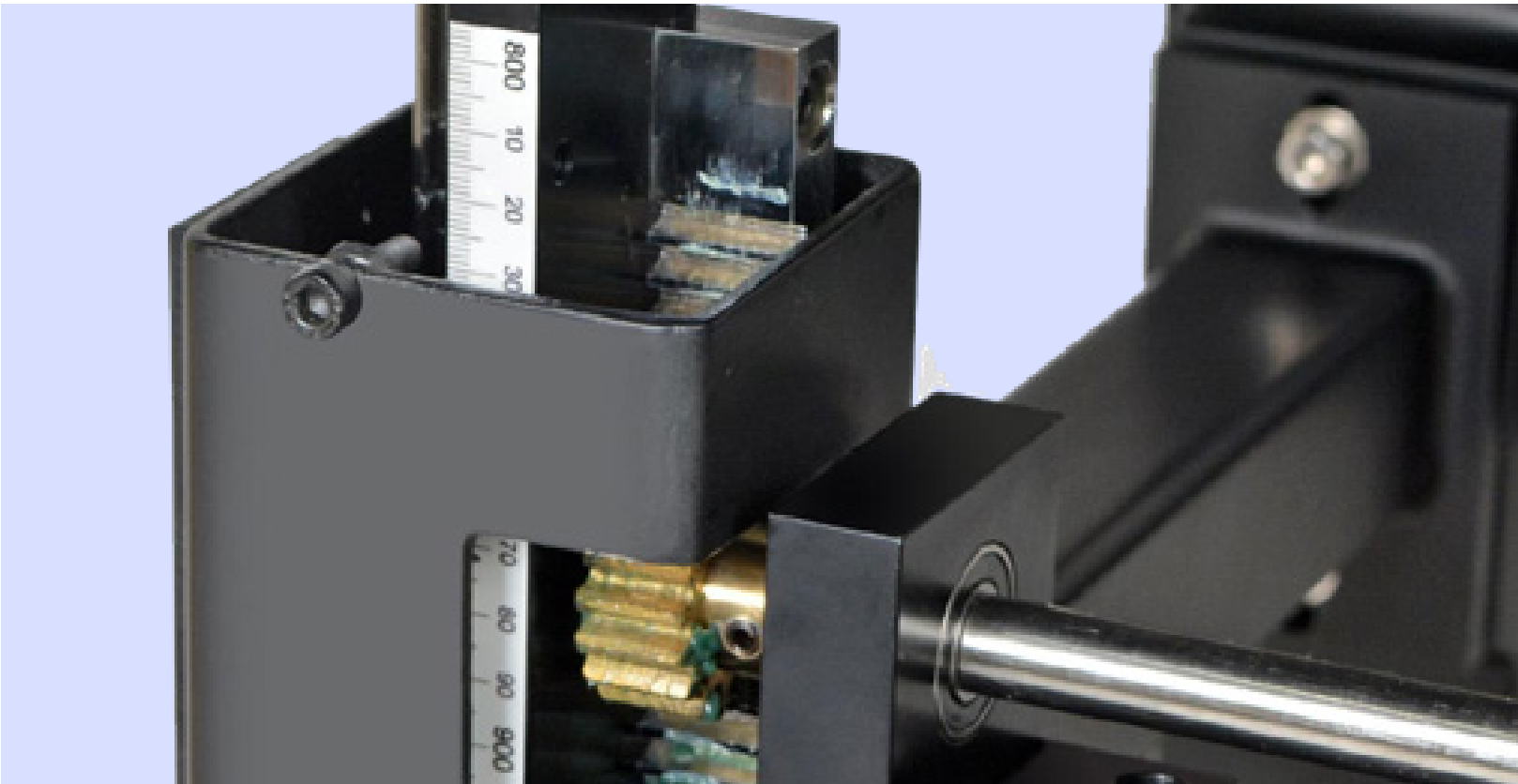
Rigid Tabletop Support with Height Adjustment

his support system has four vertical members made from rectangular steel tubes and eight horizontal members made from 50 mm x 50 mm steel tubes. These members can be joined by nuts & bolts at the lab site. The honeycomb surface rests on four heavy-duty bolts on the top of the support system, which can also be adjusted for levelling. The support system is given black finish by epoxy paint.



Specifications

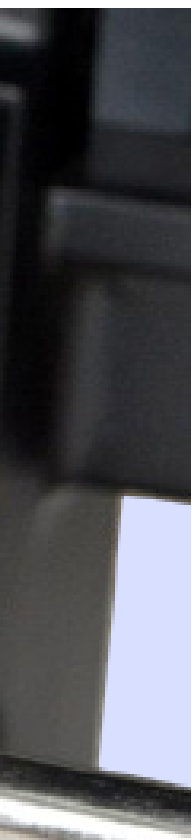
Breadboard support size	900 x 600 x 100 mm
Height adjustment range	+300 mm
Height adjustment mechanism	Screw adjustment with hand wheel
Caster wheel and knob locking mechanism	
The leg dimensions	75 x 75 mm
A graduation scale in one of the table legs in mm	
The material such as MS square tube, resin bushing and Hardened steel guide rods are used.	
Locking screws for each leg to avoid shake / backlash	
Lift of the table will be uniform in the horizontal plane	





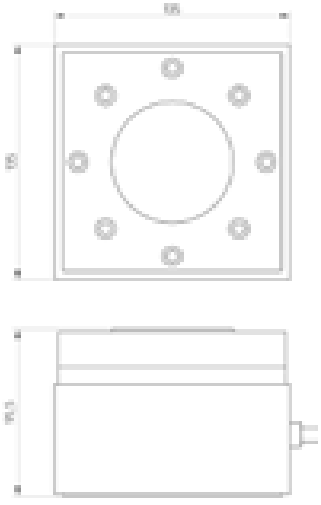






HOLMARC
OPTO-MECHATRONICS LTD

Desktop Vibration Isolation Support



Model : DVIS - 01

Holmarc's desktop vibration isolation supports are designed to use with breadboards and small optical tables. They provide portability and localized air suspension for small-scale experiments and vibration sensitive instrumentation. This system utilizes air isolation method for vibration isolation. These are time and space saving isolators which are ideal to use with microscopes and other optical systems. Four independent air cushion legs along with an oil free air compressor are required for a setup. The system gets ready for use by just placing breadboards / tabletops on to these supports. DVIS Supports a wide range of breadboards and optical table sizes. Though normally supplied as a set of four, extra mounts can be used to increase load capacity.

Rigid, non-isolating support frame can be upgraded to desktop vibration isolation support. Contact our technical support engineer at service@holmarc.com. Note : Optical breadboard must be purchased separately,



Top Skin

5mm thick magnetic stainless steel (SS410 series) sheet as top skin.

Bottom Skin

5mm thick steel sheet as bottom skin.

Equipped with Pneumatic controller unit

Specially designed for high vibration sensitive instrumentation

Model	:	Suitable for Optical Breadboard
DVIS - 01	:	Light weight series (suitable for breadboards upto 4 ft x 3 ft)



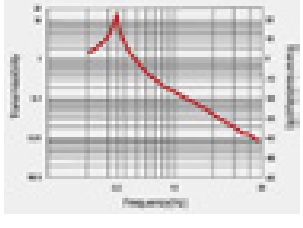


Fig. Desktops Vibration Isolation support Transmissibility Graph

Honeycomb Breadboard Standard (BB Series)

These light weight breadboards exhibit high natural frequency and nominal broadband damping.

Oil free air compressor

Oil free air compressor will be supplied along with the Desktops Vibration Isolation Support.

Pneumatic Controller Unit

Regulator Unit, Manifold and Pressure Gauge are kept inside. Once the air is pumped using a compressor, it is uniformly distributed to all the isolator legs.

Desktops Vibration Isolation Support



The breadboard sits on four inflated rubber cushions. All the four supports can either be independant or interconnected. In the case of interconnected legs compressor is supplied along with the system

The breadboard sits on four inflated rubber cushions. All the four supports will be independant. Portable foot pump will be supplied along with the support

Model : EDU 2001

Optical Lab Work Table Economy Version

Holmarc EDU 2001 Series is an easy to assemble optical work table based on a light weight honeycomb optical breadboard. The work table is supported on all 4 sides by steel sheet frames and are designed to be light weight, portable and rigid support for optical breadboards. Working height of EDU 2001 Series work table is 750 mm including optical breadboard.



Model	Length (cm)	Width (cm)
EDU 2001-L66	60	60
EDU 2001-L96	90	60

CUSTOM WORK TABLES



Bread board with single rigid support

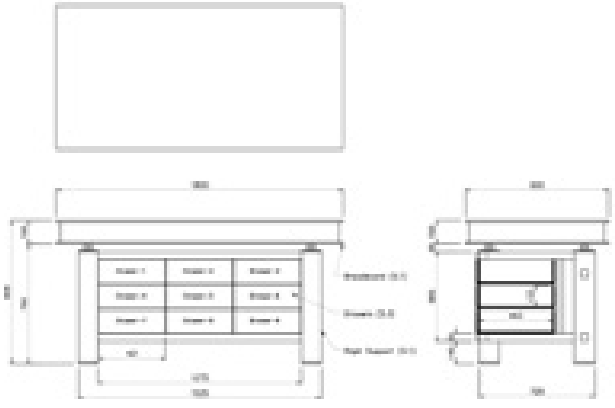


Overhead Shelves

CANTILEVER TYPE

Overhead Shelf





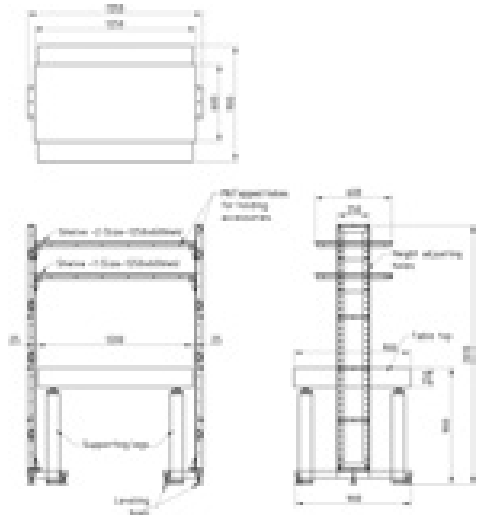
HOLMARC offers optical table shelves to meet your need for more organized and ergonomic lab space. Shelves are designed to be highest quality and sturdy to provide safe and reliable accessory options. Overhead shelves can be used for mounting vibration producing equipment above the optical breadboard. The height of shelf can be easily adjusted. Shelves can be positioned at any position along the rail.

Model No:	Supported Breadboard (L)
OHS-B-1200	1200 mm
OHS-B-1500	1500 mm
OHS-B-1800	1800 mm
OHS-B-2400	2400 mm
OHS-B-3000	3000 mm

Overhead Shelf - Cantilever	
Platform size	1800 mm (L) × 600 mm (W
Number of platforms	2
Minimum height from table	400 mm
Maximum height from floor	1900 mm
Frame material	Mild steel with powder coating or paint (Black Color)
Platform material	25 mm thick MDF with lamination
Power strip board	16 power points (230V / 5 A each) with individual switches to be provided at the bottom side of lower platform
Type of strip Board	Option 1. Regular Switch Board
Illumination	1200 mm long White LED tube light (minimum 22W) to be provided at the bottom side of lower platform

STANDING TYPE

Overhead Shelf



HOLMARC offers optical table shelves to meet your need for more organized and ergonomic lab space. Shelves are designed to be highest quality and sturdy to provide safe and reliable accessory options. Overhead shelves free standing type can be used for mounting vibration producing equipment above the optical breadboard. The height of shelf can be easily adjusted. Shelves can be positioned at any position along the rail.

Standard unit consists of height adjustable 2 sets of overhead shelve and supporting structure. Height can be adjusted in 50mm increments using M10 screws. Structures are based on steel welded design with black powder coat finish. Platform material is multiwood (extruded 'U' Pvc polyester resin). M6 Mounting holes provided across the shelves and supporting structure for mounting accessories like additional shelves, bottom shelve computer stand, power strip, tool organiser etc. Electrical wires from the instruments can be organized by cable strips (sold separately). For lighting needs LED tube lighting and spots lights are available.

- Additional Shelve
- Bottom Shelve
- Storage Systems
- Power Strips
- Monitor Mounting Arm
- Cable Routing Clips
- LED Lights
- L-Clamp

Maximized table space, ergonomics and utility
Mechanical isolation for the equipment
Convenient location of instruments
Height adjustable design for overhead shelves
Leveling feet for uneven floors
Steel welded design, black powder coat finished

Custom shelfing units(Optional)
Electrical outlets (230V / 50Hz) on each side of the shelf



Specifications

Overhead Shelf - Standing Type	
Structural material	Steel welded design
Finish	Black powder coat
Platform material	Multiwood
Platform adjustable height increments	50 mm
Maximum platform height	..... mm
Minimum gap between two platform	..... mm

Model No	
OHS-1200	1200 mm
OHS-1500	1500 mm
OHS-1800	1800 mm
OHS-2400	2400 mm
OHS-3000	3000 mm

OPTIONAL ACCESSORIES

Additional Shelves

It consists of platform, mounting bracket and suitable mounting screws. Construction based on steel welded design with black powder coat finished. Platform is made of multiwood (extruded 'U' Pvc polyester resin). M6 Mounting holes provided across the shelves for mounting accessories like , power strips, LED Lights, storage box etc.

Model No	Suitable over head shelves
AR-OHS-1200	OHS-1200
AR-OHS-1500	OHS-1500
AR-OHS-1800	OHS-1800
AR-OHS-2400	OHS-2400
AR-OHS-3000	OHS-3000

Bottom Shelves

It consists of platform and mounting bracket and suitable mounting screws. Construction based on steel welded design with black powder coat finished. Platform is made of multiwood (extruded 'U' Pvc polyester resin). It saves space when installing a laser and other equipment beneath optical tabletops. Laser Ports in a Tabletop are used to let a laser beam or cables through.

Model No	Suitable over head shelves
BR-OHS-1200	OHS-1200
BR-OHS-1500	OHS-1500
BR-OHS-1800	OHS-1800
BR-OHS-2400	OHS-2400
BR-OHS-3000	OHS-3000



Storage Systems



a. Storage box unit with 8 storage boxes

This unit can be mount on the side structure, 8 storage (2 x 4) boxes can be fix in this unit to store screws and other small things. Quick access box organizer is mounted infront of rack shelves.

Model No	No: of storage box in mounting board
OHS-SBU-08	8

b. Quick access Storage box

Model No	No: of storage box in mounting board
OHS-SBU-1	1
OHS-SBU-2	2
OHS-SBU-3	3

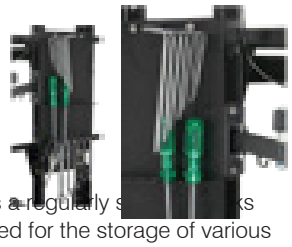
Quick access box organizer is mounted infront of rack shelves for convenient accessing of mostly used components.

d. Quick access Storage box

Model No	No: of storage box in mounting board
OHS-PEG-QA-1	For allen keys
OHS-PEG-QA-2	For Screw drivers
OHS-PEG-QA-3	10 hooks for hanging tools

e. This type of tool organizer is mounted infront of rack shelves for quick accessing the mostly required tools. It provide easy access and organization for the tools. These are small type of holders allows only one or two types of tool set.

c. Quick access Storage box



Tool Organizer - Pegboard is a regularly s ks of metal black board designed for the storage of various tools, Including allen keys, screw drivers, spanners. It offers maximum toolboard storage versatility having 250 x 400mm of pegboard storage space.

Pegboard can be mount on the side wall of the shelves supporting structure .

Model No
OHS-PEG-10

Cable Routing clips - Cable Holder

These small clips are side load type, Ideal for keeping wires out of sight and away from possible damage. It is designed to be installed on a shelf panel edge. It can hold a single cord or cable firmly in any desired route. The extra-wide opening allow easy insertion and removal of cables.



Cable routing clip have M6 screw holes for fixing any direction on the platform or on the vertical structure.

Model No		
OHS-CRL-25	Cable routing clip	(20 Nos.)

Electrical Power Strips



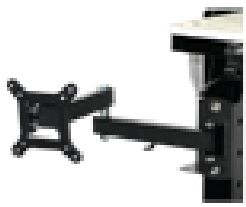
Suitable clamps are provided for each power strips for fixing directly to the to shelves by using M6 screw. Power strips can be mounted on the bottom, back and front side or vertically on the structure. Electrical lines can be easily routed by using cable routing clips (Please see the model OHS-CRL-25 cable routing clip).

All models consist of one power strip, six meter cable and three pin power plug.

Model No	Power strip Type
OHS-PS-1	Single power socket with switch
OHS-PS-5	Five power socket with switch
OHS-PS-10	Ten power socket with switch
OHS-PS-16	Sixteen power socket with switch

Monitor Mounting Arm

Single monitor mounting arm adjusts effortlessly for easy use. Arm extends and retracts, tilt to change reading angles. Built to hold monitors up to 10 Kg. M6 Mounting holes pitch 100 mm provided on the vertical structure for fixing universal monitor mounting arm .



Model No
OHS-MSA-1

LED Lightings

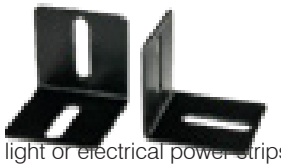


HOLMARC offers two options for under shelves lab lighting, LED strips light and LED Spot lighting. LED power cables can be easily routed by using cable routing clips. LED Light strips and spot lightings are mounted underside of the overhead shelf. It is ideal for lighting the entire work surface, LED light strips are attaches via L-Clamps.

All models consists of two meter cable with two pin and L-Clamp for mounting.

Model No	
OHS-LED-1	1 Feet LED Tube
OHS-LED-2	2 Feet LED Tube
OHS-LED-4	4 Feet LEDd Tube
OHS-LED-SP-1	Flexible arm LED Spot Light

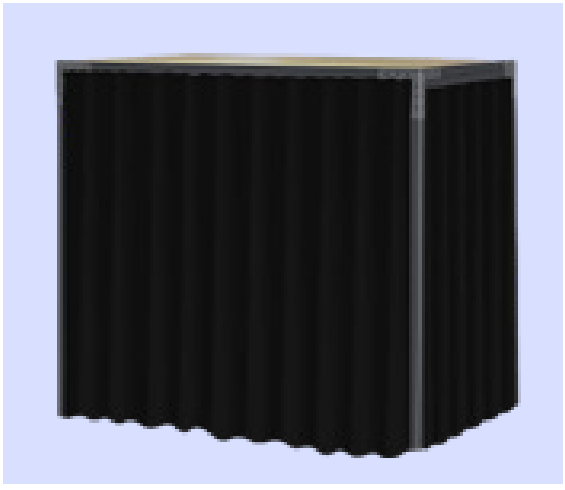
L-Clamp

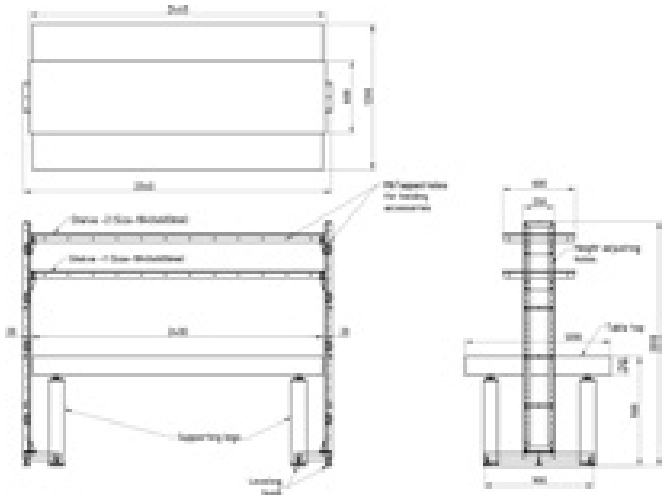


L Clamps are used to fix LED light or electrical power strips in any position on overhead shelves. Two M6 slots and four M3 tapped holes are provided on the L- clamp for mounting needs.

Model No	
OHS-LC-25	L-Clamp - 10Nos.

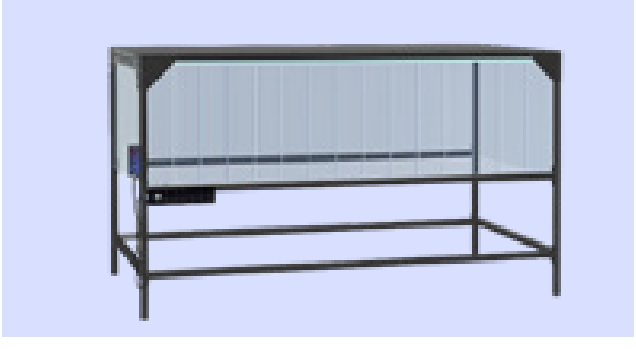
Overhead Shelf with Curtain





Specifications

Structural material	Steel welded design
Finish	Black painted finish
Top cover	Multiwood
Platform height from breadboard	Platform height from breadboard
Curtain material	Black cloth / Transparent curtain
Compatible accessories	Electrical power strip, Monitor mounting arm, LED light , Fan with Heppa filter













Freestanding frame with black curtain

Model No	A	B
FSF-90-90-B	90	90
FSF-120-90-B	120	90
FSF-120-120-B	120	120
FSF-180-120-B	180	120
FSF-240-120-B	240	120
FSF-300-120-B	300	120
FSF-180-150-B	180	150
FSF-240-150-B	240	150
FSF-300-150-B	300	150
FSF-360-150-B	360	150

Freestanding frame with black curtain and internal shelf

Model No	A	B
OHS-90-90-B	90	90
OHS-120-90-B	120	90
OHS-120-120-B	120	120
OHS-180-120-B	180	120
OHS-240-120-B	240	120
OHS-300-120-B	300	120
OHS-180-150-B	180	150
OHS-240-150-B	240	150
OHS-300-150-B	300	150
OHS-360-150-B	360	150

Freestanding frame with transparent curtain

Model No	A	B
FSF-90-90-T	90	90
FSF-120-90-T	120	90
FSF-120-120-T	120	120
FSF-180-120-T	180	120
FSF-240-120-T	240	120
FSF-300-120-T	300	120
FSF-180-150-T	180	150
FSF-240-150-T	240	150
FSF-300-150-T	300	150
FSF-300-150-T	360	150

Freestanding frame with transparent curtain and internal shelf

Model No	A	B
OHS-90-90-T	90	90
OHS-120-90-T	120	90
OHS-120-120-T	120	120
OHS-180-120-T	180	120
OHS-240-120-T	240	120
OHS-300-120-T	300	120
OHS-180-150-T	180	150
OHS-240-150-T	240	150
OHS-300-150-T	300	150
OHS-360-150-T	360	150

Wooden Drawer Shelf

BDS SERIES





Specifications

Drawer	
Type of Drawer	Designed for maximum utilization of the space under the table
No of Drawers	9 Nos arranged in 3 rows and 3 columns
Material of Construction	High quality MDF

Wooden Drawer Shelf - MET-DS Series

Model No	No of Drawers in one column	No of column	Total No of drawers	Inside dimensions of each drawer (Length x Width x Depth)	Overall dimensions (Width x Height x Depth)	Suitable breadboard support models
BDS-400-A	4	1	4	530 x 300 x 110	400 x 700 x 600	90 x 90 mm & above
BDS-400-B	3	1	3	530 x 300 x 130	400 x 650 x 600	90 x 90 mm & above
BDS-600-D	4	1	4	530 x 500 x 110	600 x 700 x 600	120 x 90 mm & above
BDS-600-E	3	1	3	530 x 500 x 130	600 x 650 x 600	120 x 90 mm & above
BDS-400-2A	4	2	8	530 x 300 x 110	800 x 700 x 600	150 x 90 mm & above
BDS-400-2B	3	2	6	530 x 300 x 130	800 x 650 x 600	150 x 90 mm & above
BDS-400-3B	3	3	9	530 x 300 x 130	1200 x 650 x 600	180 x 90 mm & above
BDS-600-2D	4	2	8	530 x 500 x 110	1200 x 700 x 600	180 x 90 mm & above
BDS-600-2E	3	2	6	530 x 500 x 130	1200 x 650 x 600	180 x 90 mm & above
BDS-600-EE	3	2	6	530 x 500 x 130	600 x 650 x 600	250 x 120mm & above

Metal Drawer Shelf - MET-DS Series

MET-DS-400-A	4	1	4	530 x 300 x 110	400 x 700 x 600	90 x 90mm & above
MET-DS-400-B	3	1	3	530 x 300 x 130	400 x 650 x 600	90 x 90mm & above
MET-DS-600-D	4	1	4	530 x 500 x 110	600 x 700 x 600	120 x 90mm & above
MET-DS-600-E	3	1	3	530 x 500 x 130	600 x 650 x 60	120 x 90mm & above
MET-DS-400-2A	4	2	8	530 x 300 x 110	800 x 700 x 600	150 x 90mm & above
MET-DS-400-3A	4	3	12	530 x 300 x 110	1200 x 700 x 600	180 x 90mm & above
MET-DS-400-2B	3	2	6	530 x 300 x 130	800 x 650 x 600	150 x 90mm & abov
MET-DS-400-3B	3	3	9	530 x 300 x 130	1200 x 650 x 600	180 x 90mm & above
MET-DS-600-2D	4	2	8	530 x 500 x 110	1200 x 700 x 600	180 x 90mm & above
MET-DS-600-2E	3	2	6	530 x 500 x 130	1200 x 650 x 600	180 x 90mm & above
MET-DS-600-EE	3	2	2	530 x 500 x 130	600 x 650 x 60	250 x 120mm & above

2 nos of independent drawer shelves

19” Rack Shelf

19-IN-RS SERIES



Model No:	Rack Height	No of column	Overall dimensions (Width x Height x Depth)
19-IN-RS-12U-A	12 U	1	500 x 700 x 600
19-IN-RS-14U-B	14 U	1	500 x 650 x 600
19-IN-RS-12U-D	12 U	2	1000 x 700 x 600
19-IN-RS-14U-E	14 U	2	1000 x 650 x 600

Accessories for 19” Rack Shlef	Model No:	Height
2U Drawer Shelf	2U-DS-A	2U
3U Drawer Shelf	2U-DS-B	3U
4U Drawer Shelf	2U-DS-C	4U
Cantilever Rack Shelf	2U-DS-D	2U
Cantilever Rack Shelf with Optical Breadboard	2U-DS-DD-E	2U

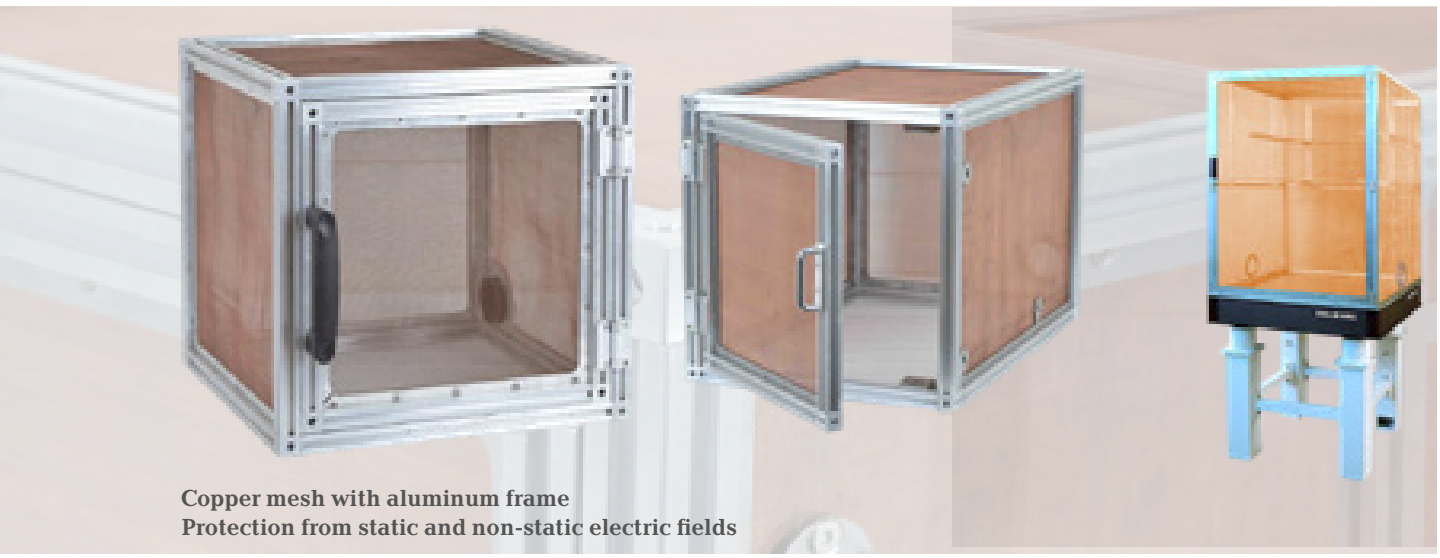
Enclosures



Faraday Cage

Holmarc's benchtop faraday cage incorporates detachable aluminium frame and copper mesh to shield electromagnetic interference. Magnetic closures and large access doors or detachable front panel used in our models provide much convenient access.

These are compatible with all HOLMARC make standard breadboards / tabletops and fits directly without modifications / changes.



Copper mesh with aluminum frame
Protection from static and non-static electric fields

Wooden Drawer Shelf - MET-DS Series	
Frame material	Aluminium
Mesh material	Copper
Copper mesh visibility	30 %
Copper mesh wire dia.	0.254 mm
Side panel fixing method	Screwable side panel
Number of cable ports with endcaps	2 Nos.
Door	Front door or screwable panel

Model No	Size	About
FRC-60-60-HD	600 x 600 x 600	Enclosure with hinged front door & detachable side panels
FRC-60-60-DT		Enclosure with detachable panels on all sides
FRC-90-60-HD	900 x 600 x 750	Enclosure with hinged front door & detachable side panels (900 mm side)
FRC-90-60-DT		Enclosure with detachable panels on all sides
FRC-90-90-HD	900 x 900 x 900	Enclosure with hinged front door & detachable side panels
FRC-90-90-DT		Enclosure with detachable panels on all sides
FRC-120-90-HD	1200 x 900 x 900	Enclosure with hinged front door & detachable side panels (900 mm door width on 1200 mm side)
FRC-120-90-DT		Enclosure with detachable panels on all sides
FRC-120-120-HD	1200 x 1200 x 900	Enclosure with hinged front door & detachable side panels (900 mm door width on 1200 mm side)
FRC-120-120-DT		Enclosure with detachable panels on all sides
FRC-180-120-HD	1800 x 1200 x 900	Enclosure with hinged front door & detachable side panels (900 mm door width on 1200 mm side)
FRC-180-120-DT		Enclosure with detachable panels on all sides
FRC-A-B-C-SLD	A x B x C ***	Enclosure with hinged front door & detachable side panels (900 mm max. door width on larger side)
FRC-A-B-C-HD		Enclosure with detachable panels on all sides



Metallic Enclosures

Holmarc's Metalic Enclosure consists of aluminium panels and aluminium extrusion frame with black powder coating. There are two options for front door – hinged or sliding. Two cable ports with endcaps are provided on the back side of the enclosure. Power outputs and roof LED light with on / off switches can be integrated with the enclosure, if specified at the time of ordering.

LED cabin lighting

Options for front door : hinged / sliding



Specifications

Frame material	Aluminium
Panels	2 mm thick aluminium
Visibility	0 %
Side panel fixing method	Tightened by rubber beading inside frame slots
Number of cable ports with endcaps	2 Nos.
Front door	Hinged or sliding
Finish	Black powder coated

Model No	Size (L x B x H) mm	Type
MTE-60-60-HD	600 x 600 x 600	Enclosure with hinged front door
MTE-60-60-SLD	600 x 600 x 600	Enclosure with sliding front door
MTE-90-60-HD	900 x 600 x 750	Enclosure with hinged front door (longer side)
MTE-90-60-SLD	900 x 600 x 750	Enclosure with sliding front door (longer side)
MTE-90-90-HD	900 x 900 x 900	Enclosure with hinged front door
MTE-90-90-SLD	900 x 900 x 900	Enclosure with sliding front door
MTE-120-90-HD	1200 x 900 x 900	Enclosure with hinged front door (longer side)
MTE-120-90-SLD	1200 x 900 x 900	Enclosure with sliding front door (longer side)

Accessories (LED Light and Power Socket)		
Model No	Type	
PS-15A-1	15A power socket with switch	1 No
PS-15A-2	15A power socket with switches	2 Nos
PS-15A-3	15A power socket with switches	3 Nos
LED-RF-1	Roof LED with Switch	1 No
LED-RF-2	Roof LED with Switches	2 Nos

Transparent Version of these Enclosures



Holmarc's Transparent Enclosure consists of acrylic panels and machined aluminium frame. Front door is available with two options : hinged door or sliding door. Enclosure frame has black powder coated finish. Back side of the enclosure has two cable ports with end caps. Mounting clamps are provided for fixing the enclosure with breadboard. Power outputs and roof LED light with on / off switches are integrated with enclosure, if specified with the model by the customer.

Specifications

Frame material	Aluminium
Panels	3 - 12 mm thick acrylic
Visibility	95 %
Side panel fixing method	Side panel fixing method
Number of cable ports with endcaps	2 Nos.
Front door	Hinged or sliding
Finish (frame)	Black powder coated

Model No	Size (L x B x H) mm	Type
TE-60-60-HD	600 x 600 x 600	Enclosure with hinged front door
TE-60-60-SLD	600 x 600 x 600	Enclosure with sliding front door
TE-90-60-HD	900 x 600 x 750	Enclosure with hinged front door (longer side)
TE-90-60-SLD	900 x 600 x 750	Enclosure with sliding front door (longer side)
TE-90-90-HD	900 x 900 x 900	Enclosure with hinged front door
TE-90-90-SLD	900 x 900 x 900	Enclosure with sliding front door
TE-120-90-HD	1200 x 900 x 900	Enclosure with hinged front door (longer side)
TE-120-90-SLD	1200 x 900 x 900	Enclosure with sliding front door (longer side)
TE-120-120-HD	1200 x 1200 x 900	Enclosure with hinged front door
TE-120-120-SLD	1200 x 1200 x 900	Enclosure with sliding front door
TE-180-120-HD	1800 x 1200 x 900	Enclosure with hinged front door (longer side)
TE-180-120-SLD	1800 x 1200 x 900	Enclosure with sliding front door (longer side)
TE-A-B-C-HD	A x B x C ***	Enclosure with hinged front door (longer side)
TE-A-B-C-SLD	A x B x C ***	Enclosure with sliding front door (longer side)
Accessories (LED Light and Power Socket)		
Model No	Type	
PS-15A-1	15A power socket with switch	1 No
PS-15A-2	15A power socket with switches	2 Nos
PS-15A-3	15A power socket with switches	3 Nos
LED-RF-1	Roof LED with Switch	1 No
LED-RF-2	Roof LED with Switches	2 Nos

Small Size Transparent Enclosures & Black Enclosures

Holmarc's Small Size Enclosures consists of acrylic panels (Transparent or Black) and extruded aluminium frame. Front door is available with two options : hinged and sliding door. Enclosure frame is black powder coated. Two cable ports with end caps are provided on the back side of the enclosure. Mounting clamps are provided for fixing the enclosure with breadboard.

Acrylic panels with aluminum frame

Transparent panels



Specifications

Frame material	Aluminium
Panels	2 - 3 mm thick transparent acrylic
Side panel fixing method	Tightened by rubber beading inside frame slots
Number of cable ports with endcaps	2 Nos.
Front door	Hinged or sliding
Finish (frame)	Black powder coated

TSE-300-300-SLD	300 x 300 x 300	Enclosure with sliding front door
TSE-300-300-HD	300 x 300 x 300	Enclosure with hinged front door
TSE-600-300-SLD	600 x 300 x 300	Enclosure with hinged front door (600 mm side)
TSE-600-300-HD	600 x 300 x 300	Enclosure with sliding front door (longer side)
TSE-600-600-SLD	600 x 600 x 300	Enclosure with sliding front door
TSE-600-600-HD	600 x 600 x 300	Enclosure with hinged front door
TSE-900-600-SLD	900 x 600 x 450	Enclosure with sliding front door (900 mm side)
TSE-900-600HD	900 x 600 x 450	Enclosure with hinged front door (900 mm side)
TSE-900-900-SLD	900 x 900 x 450	Enclosure with sliding front door
TSE-900-900-HD	900 x 900 x 450	Enclosure with hinged front door
TSE-A-B-C-SLD	A x B x C ***	Enclosure with sliding front door (longer side)
TSE-A-B-C-HD	A x B x C ***	Enclosure with hinged front door (longer side)

*** Order by specifying A, B & C (Example)

1. TSE-950-650-500-SLD Enclosure with sliding door (950 mm side)

2. TSE-850-450-300-HD Enclosure with hinged door (850 mm side)

Black Enclosures



Acrylic panels with aluminum frame

Black panels

Specifications

Frame material	Aluminium
Panels	2 - 3 mm thick black acrylic
Side panel fixing method	Tightened by rubber beading inside frame slots
Number of cable ports with endcaps	2 Nos.
Front door	Hinged or sliding
Finish (frame)	Black powder coated

BLE-300-300-SLD	300 x 300 x 300	Enclosure with sliding front door
BLE-300-300-HD	300 x 300 x 300	Enclosure with hinged front door
BLE-600-300-SLD	600 x 300 x 300	Enclosure with hinged front door (600 mm side)
BLE-600-300-HD	600 x 300 x 300	Enclosure with sliding front door (longer side)
BLE-600-600-SLD	600 x 600 x 300	Enclosure with sliding front door
BLE-600-600-HD	600 x 600 x 300	Enclosure with hinged front door
BLE-900-600-SLD	900 x 600 x 450	Enclosure with sliding front door (900 mm side)
BLE-900-600HD	900 x 600 x 450	Enclosure with hinged front door (900 mm side)
BLE-900-900-SLD	900 x 900 x 450	Enclosure with sliding front door
BLE-900-900-HD	900 x 900 x 450	Enclosure with hinged front door
BLE-A-B-C-SLD	A x B x C ***	Enclosure with sliding front door (longer side)
BLE-A-B-C-HD	A x B x C ***	Enclosure with hinged front door (longer side)

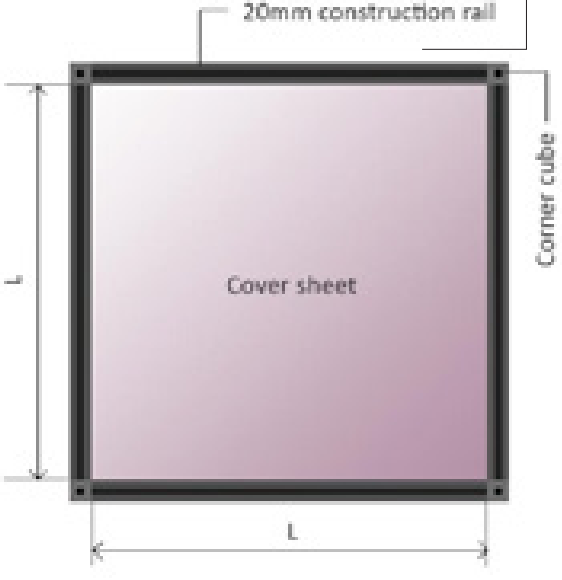
*** Order by specifying A, B & C (Example)

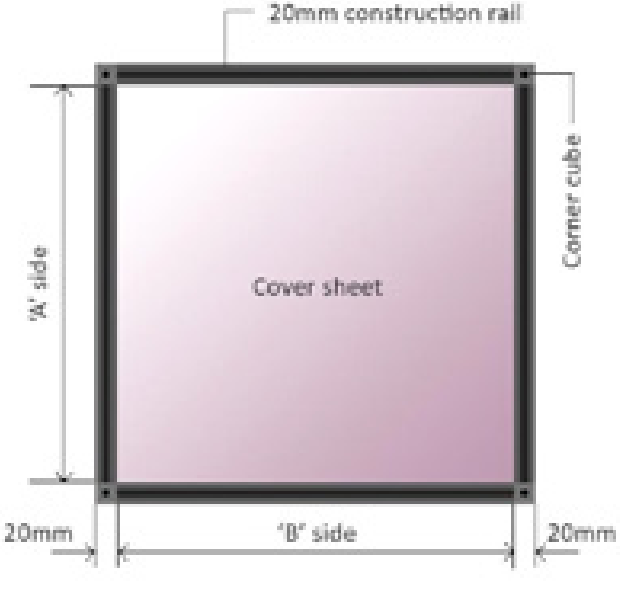
1. BLE-950-650-500-SLD Enclosure with sliding door (950 mm side)

2. BLE-850-450-300-HD Enclosure with hinged door (850 mm side)

Enclosure Construction System







* Maximum length upto - 1800 mm only

1. 20 mm construction rail		
Model No	Length (mm)	Mounting
BX-20RL-210	210	M4 tapped holes on both ends
BX-20RL-260	260	
BX-20RL-310	310	
BX-20RL-360	360	
BX-20RL-410	410	
BX-20RL-460	460	
BX-20RL-510	510	
BX-20RL-560	560	
BX-20RL-710	710	
BX-20RL-860	860	
BX-20RL-960	960	
BX-20RL-1200	1200	
BX-20RL-XXX	Custom length *	

2. Corner Cube		
Model No	Length (mm)	Mounting
BX-20-CC	20 x 20 x 20	M4 CBR

3. Hinges
Model No
BX-20-HG
Magnetic latch with holder
BX-20-MGH

5. Handles	
Model No	Type
BX-20-SSU	Stainless steel U shaped handle along with mounting plate screws and T nut
BX-20-PH4	Plastic handle (4 inch) with insert screws and T nut

6. Cover Sheets		
Model No	L x W (mm)	Type
BX-20-3TAS-A-B	A x B	3 mm thick transparent acrylic sheet (custom size *)
BX-20-3BAS-A-B	A x B	3 mm thick black acrylic sheet (custom size *)

Method to specify A and B
'A' side rail length + 10 mm
'B' side rail length + 10 mm
Eg:
A' side rail length = 360 mm, then L = 370 mm
'B' side rail length = 510 mm, then W = 520 mm

7. Rubber beading - Rubber beading is used for tightening the panels inside aluminium frame.	
Model No	Size
BX-20-RB	5 meters

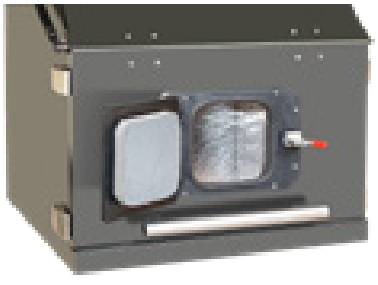
8. Clamps	
Model No	Type
BX-20-TB	Table clamp for fixing to breadboard

9. T-nut and Screws		
Model No	Type	Qty
BX-20-TN	T - nut	50 per pack
BX-20-M4-10	M4 x 10 screw	50 per pack
BX-20-M3-10	M3 x 10 screw	50 per pack
Allen key	Allen key set	1 set
Spring washer	Spring washer	50 per pack

Acoustic Enclosure













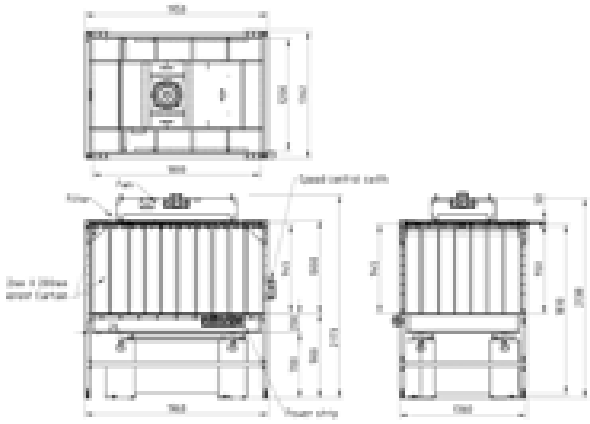




Specifications

Body	MS painted
Inner side walls	Acoustic Insulation Foam Kit
Close Cell	XLPE x 25 mm thick with Scrim Alu. Foil Facing
Enclosure size	2.11 ft x 2.11 ft x 2.6 ft
Main door	Hinged push up main door with a small access door
Foam Specs	Close Cell XLPE, 26 kg/m3 density, Grey
	Fire-resistant 'BS476 Class-0' flammability

Vertical Laminar Flow with Optical Table and Side Curtains



The vertical laminar flow work table with an optical table and side curtains is designed to meet the specific needs of optical experiments and sensitive research applications. Featuring a vertical laminar airflow pattern, this table directs clean air downward, creating a clean zone around the work area. The inclusion of an optical table provides a stable platform for optical setups and experiments, ensuring precise alignment and accurate measurements. Additionally, side curtains enhance containment, minimizing the risk of external contamination and maintaining a controlled environment for delicate procedures. This configuration is well-suited for optical microscopy, spectroscopy, and other experiments requiring a clean and stable workspace.

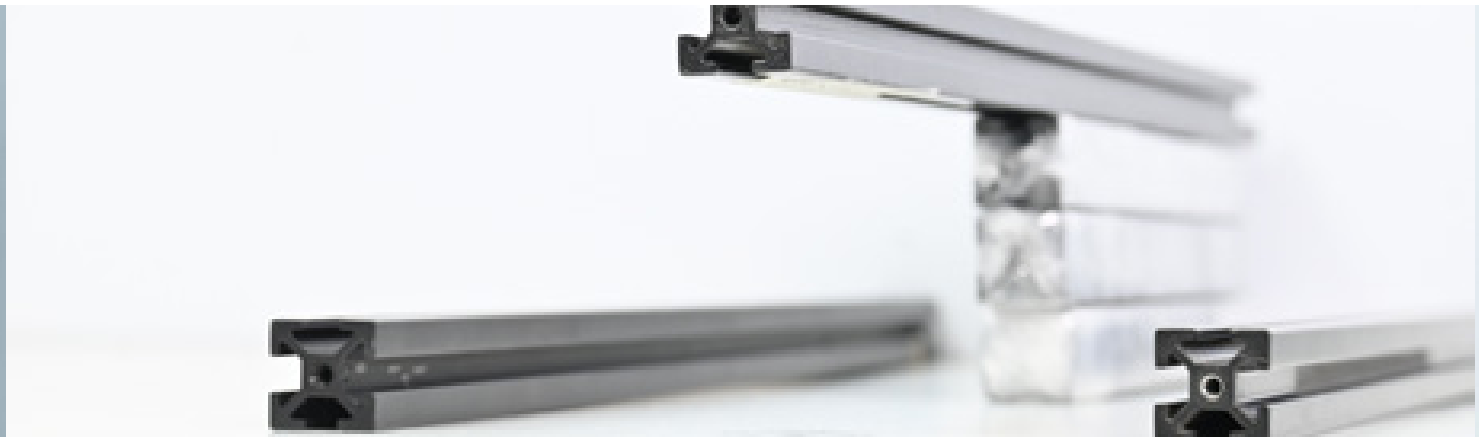


Freestanding frame with Black curtain		
Model No	Length	Width
LMHV-90-90-B	90	90
LMHV-120-90-B	120	90
LMHV-120-120-B	120	120
LMHV-180-120-B	180	120
LMHV-240-120-B	240	120
LMHV-300-120-B	300	120
LMHV-180-150-B	180	150
LMHV-240-150-B	240	150
LMHV-300-150-B	300	150
LMHV-360-150-B	360	150

LMHV-90-90-T	90	90
LMHV-120-90-T	120	90
LMHV-120-120-T	120	120
LMHV-180-120-T	180	120
LMHV-240-120-T	240	120
LMHV-300-120-T	300	120
LMHV-180-150-T	180	150
LMHV-240-150-T	240	150
LMHV-300-150-T	300	150
LMHV-360-150-T	360	150

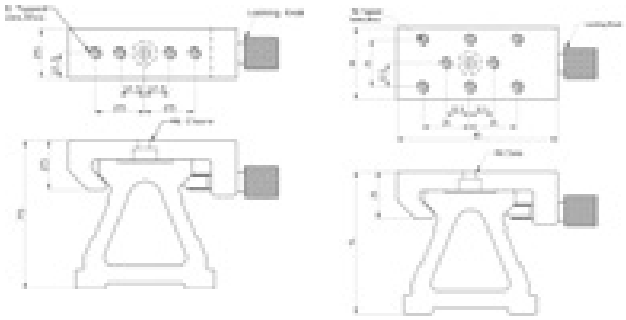
HOLMARC OPTO-MECHATRONICS LTD

Optic Rails



Dovetail Triangular Optical Rail & Carrier



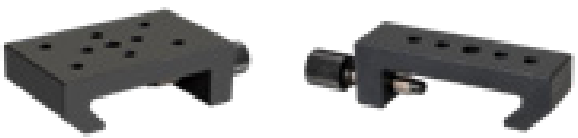


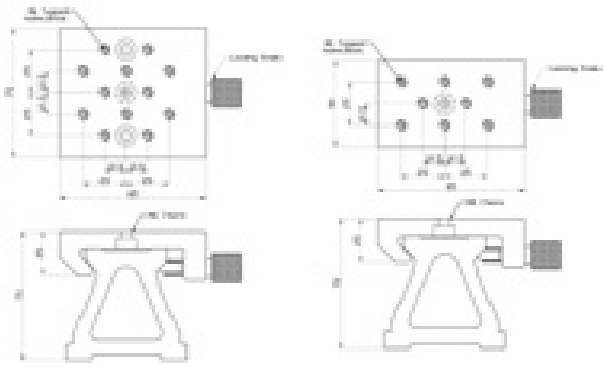
Specifications

Heavy duty
Aluminum material
Black anodized finish
Quick changeable rail carriage

Optic Rails	
Model No	Length (mm)
RL-HC4-500	500
RL-HC4-750	750
RL-HC4-1000	1000
RL-HC4-1250	1250
RL-HC4-1500	1500
RL-HC4-2000	2000

Carrier for Dovetail Triangular Optical Rail

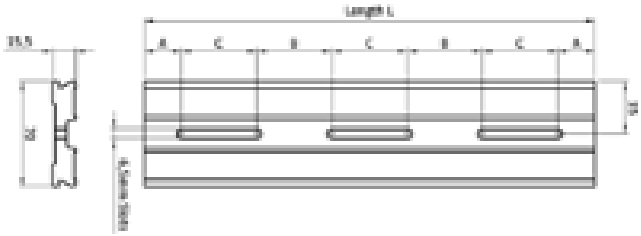




These carriers are compatible with our Dovetail Triangular Optical Rail. They are available in three different lengths ranging from 25 mm to 100 mm. The carriers can be locked anywhere on the rail. Both M6 and M4 tapped holes are provided on it for mounting components.

Model No	Length (mm)
RLC-HC4-25	25
RLC-HC4-38	38
RLC-HC4-50	50
RLC-HC4-75	75
RLC-HC4-100	100

Rail with Dovetail design & Carriers





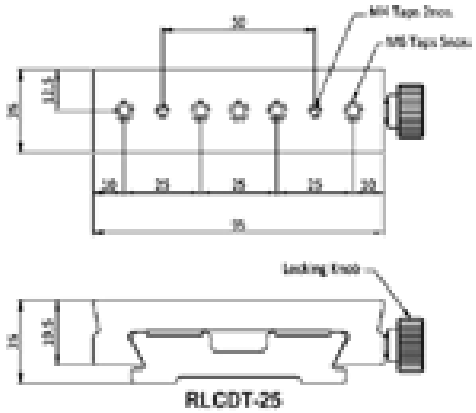
Model No	Length (mm)	A (mm)	B (mm)	C (mm)
RLDT-300	300	25	50	50
RLDT-350	350	25	75	50
RLDT-400	400	25	50	50
RLDT-450	450	12.5	75	50
RLDT-500	500	12.5	125	75
RLDT-550	550	37.5	125	75
RLDT-600	600	37.5	75	75
RLDT-650	650	25	100	75
RLDT-700	700	50	100	75
RLDT-750	750	37.5	125	75
RLDT-1000	1000	50	200	75

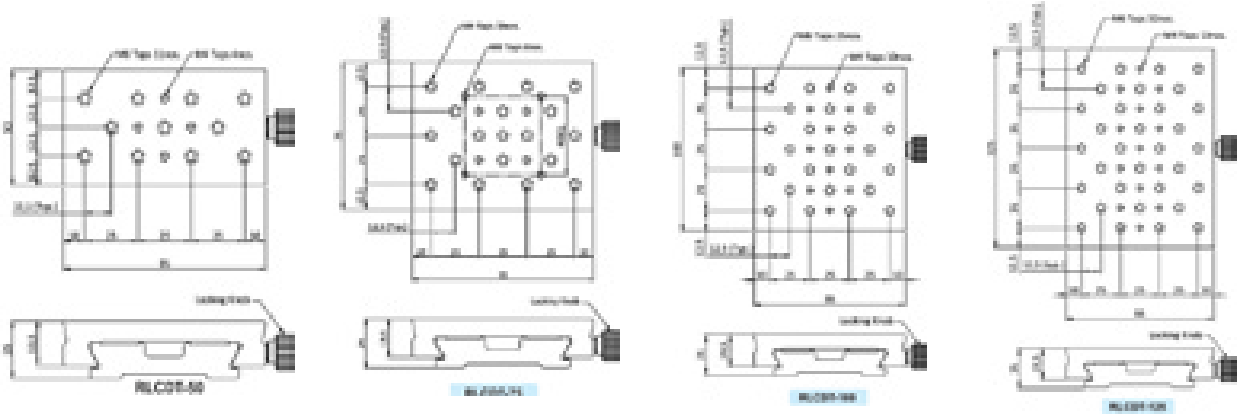
- 15.5 mm thick
- Aluminium alloy
- M6 C'bored slots

Carriers

These carriers are compatible with our rails having dovetail design. They are available in standard width of 95mm and of various lengths ranging from 25 mm to 150 mm. The carriers can be locked anywhere on the rail. Both M6 and M4 tapped holes are provided on it for mounting components

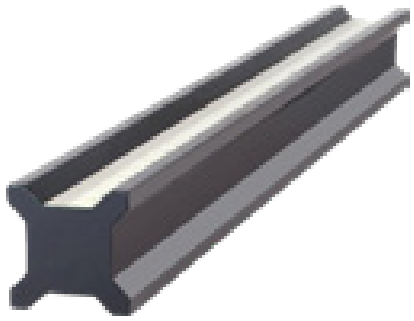






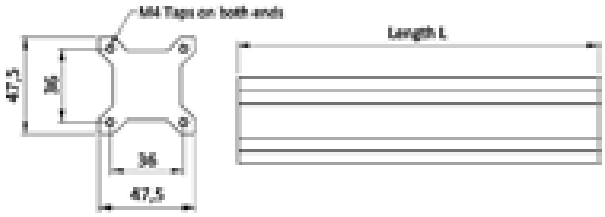
HC - 2 Rail & Carriers

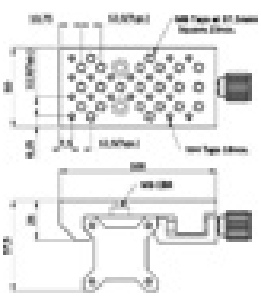




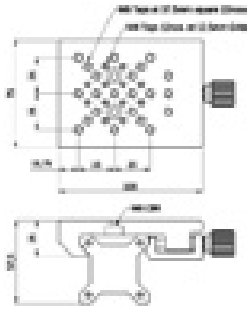
HC-2 Rail

Model No	Length (mm)
RL-HC2-250	250
RL-HC2-500	500
RL-HC2-750	750
RL-HC2-1000	1000
RL-HC2-1250	1250
RL-HC2-1500	1500
RL-HC2-2000	2000
Note : Rails exceeding 2 m are available on request	

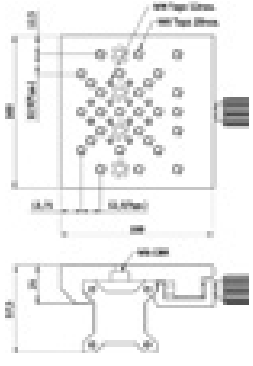




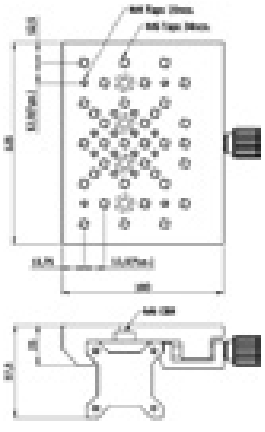
MODEL RLC-HC2-50



MODEL RLC-HC2-75



MODEL RLC-HC2-100



MODEL RLC-HC2-125

Carrier for HC - 2 Rails

These carriers are compatible with our HC-2 rails. They are available in standard width of 100mm and of various lengths ranging from 50 mm to 150 mm. The carriers can be locked anywhere on the rail. Both M6 and M4 tapped holes are provided on it for mounting components.

Model No	Length (mm)
RLC-HC2-25	25
RLC-HC2-50	50
RLC-HC2-75	75
RLC-HC2-100	100
RLC-HC2-125	125
RLC-HC2-150	150
length from knob center to edge	



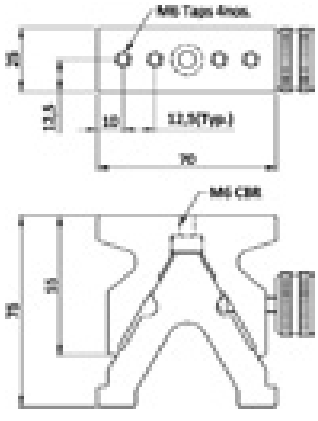
HC - 3 Rail & Carriers

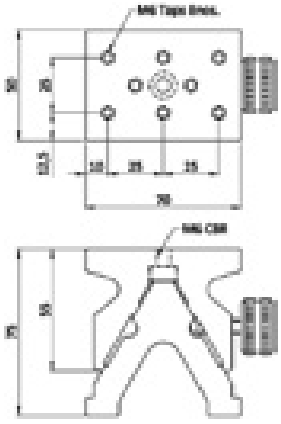
Carrier for HC - 3 Rails

These carriers are compatible with our HC-3 rails. They are available in three different lengths ranging from 25 mm to 75 mm. The carriers can be locked anywhere on the rail. Both M6 and M4 tapped holes are provided on it for mounting components.









MODEL RLC-HC3-25

MODEL RLC-HC3-50

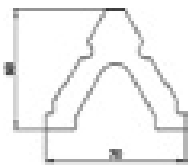
Model No	Length (mm)
RLC-HC3-25	25
RLC-HC3-50	50
RLC-HC3-75	75
length from knob center to edge	

HC-3 Rail

HC-3 rails are triangular shaped aluminium extrusions. They are available in various lengths ranging from 0.5 to 2m. They are rigid in structure and are light weight. Linear scale with 1mm graduation are provided on the side for quick position reference.



Aluminium extrusions
Ground finish





Model No	Length (mm)
RL-HC3-500	500
RL-HC3-750	750
RL-HC3-1000	1000
RL-HC3-1250	1250
RL-HC3-1500	1500
RL-HC3-2000	2000

Accessories

Vertical mounting base :

Vertical Mounting Bases are required for stable mounting of the rails and other optical components to the breadboard or optical workstation. We supply bases compatible with our standard HC-1 and HC-2 rails for vertical mounting. They are available in different sizes as per the user requirement. They are given black anodised finish and are given necessary holes for mounting purposes

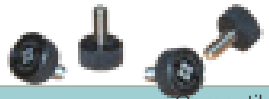




Model No	Compatible Rail	Base Plate Size
BP-RLC-HC2-75	HC-2	75 x 75 x 12
BP-RLC-HC2 -100	HC-2	100 x 100 x 12
BP-RLC-HC1 -100	HC-1	100 x 100 x 15
BP-RLC-HC1 -175	HC-1	165 x 165 x 15

Base with leveling screws

Bases are required for stable mounting of the rails and other optical components to the breadboard or optical workstation. We supply bases compatible with our standard HC-1, HC-2 and HC-3 rails. These bases are provided with leveling screws that enable users to level the rail as per requirement. They are given black anodised finish and are given necessary holes for mounting purposes.



Model No	Compatible Rail
BPL-RLC-HC3	HC-3
BPL-RLC-HC2	HC-2
BPL-RLC-HC1	HC-1

10

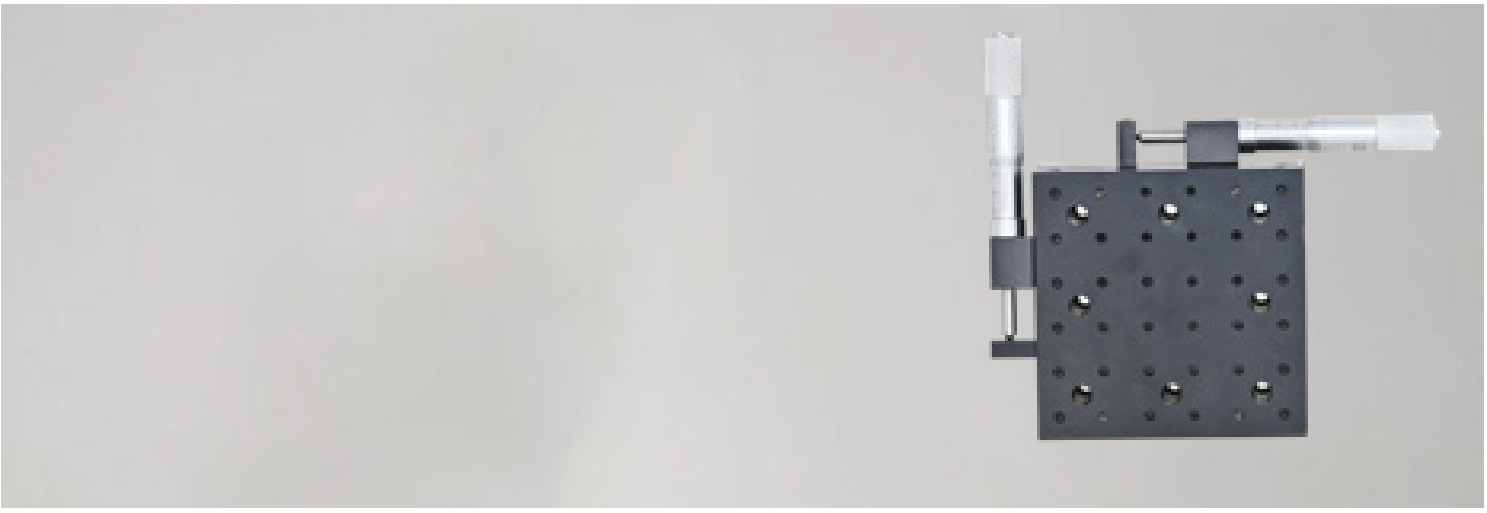
OPTO MECHANICS

504 OPTO MECHANICS
506 Platforms
506 Precision Tilting Platform
508 Kinematic Mirror Mounts
517 Adapters & Accessories
523 Gimbal Mirror Mounts
526 Cube / Prism mounts
528 Beam Steering Device
530 Lens Tube Assembly System
534 Rod Assembly
537 Lens Mounts
543 Filter Mounts
548 Polarizer Mounts
549 Laser Mounts
551 Apertures
554 Fiber Chuck and Holders
558 Optical Chopper
559 Motorised Shutter
560 Post Mounting Systems
560 8 mm Post System
561 PH Series Post Holders
562 12mm Post System
562 P Series Post
564 P-LE Series Post
565 PH Series Post
566 Pedestal Adapter
566 Pedestal Post Holder
566 PF Series Pedestal Fork
567 Post Collar
567 Translating Post Holder
568 Translating Pedestal Post Holder
568 12.7mm Post System
568 P Series Post
570 PH Series Post Holders
571 Pedestal Post Holder

572 Translating Post Holder
572 Ø12.7 mm
573 Translating Pedestal Post Holder
573 Ø12.7 mm
573 16 mm Post System
573 P16D Series Posts
574 P16D-LE Series Posts
574 PH-16D Series Post Holder
575 Pedestal Adapter
575 PPH Series Pedestal Post Holder
575 PF Series Pedestal Fork
576 PF Series Pedestal Fork
576 Translating Post Holder
576 Translating Pedestal Post Holder
577 Post Bases
579 Post Clamps
580 Slotted Plates
581 Opto Mechanical Kit
581 Heavy Duty Post System
581 Damped Heavy Duty Post
582 Post Spacer
582 Heavy Duty Post Base
582 Mounting Clamp
583 Large Mounting Clamp
583 Compact Post Clamp
583 Dual Rod System
584 C & V type clamps
584 C - Type Clamps
584 V - Type Clamps
584 Table Clamps
585 Tools & Accessories
585 Metric - English Thread Adapters
586 Set Screws
586 Nylon tipped set-screws
587 Copper tipped set-screws
587 Thumb Screws
587 Nylon tipped thumb screws
588 SHC Screws
588 Metric Socket Cap Screws
588 Metric Set Screws
589 Metric Allen Key, Washers & Nut
589 All in One Screw kit
590 Lab Jacks
590 Manual Labjack
591 Motorized Labjack
592 Heavy Duty Labjack
593 Motorized Heavy Duty Labjack
594 Controller for Motorized Lab jack
596 Motorized Vertical Translation Stages

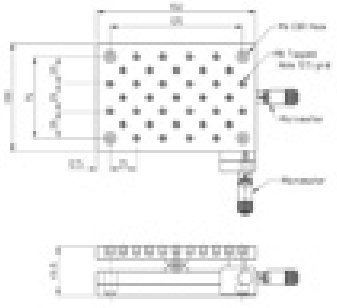


Platforms



Precision Tilting Platform

Model: TRSD-100-150



Precision Tilting Platform with Advanced Precision for Your Scientific Needs

Introducing the Holmarc TRSD-100-150 Tip-Tilt Platform, designed for high-precision adjustments in scientific research and industrial applications. This platform allows for meticulous control and stability, essential for optical experiments, laser positioning, and precise instrumentation alignment. Constructed from anodized aluminium, it promises durability and long-lasting performance.

Specifications

Tilting Range	± 2.5 degrees in both X and Y axes
Drive Mechanism	High-precision micrometer with 0.5 mm pitch
Platform Size	100 x 150 mm
Height	45.5 mm
Load Capacity	Up to 5 kg
Material	Anodized Aluminium for enhanced durability
Mounting Options	Heavy-duty and pillar post mountable
Accessories	Heavy duty post and heavy duty post base (sold separately)

Precision instrumentation alignment
Optical experiments and setups
Laser positioning
Scientific research requiring fine adjustment



Accessories
Heavy Duty Post : Ensures robust and stable support for the platform
Heavy Duty Post Base : Provides a firm foundation for mounting the tilt platform (#sold separately)

Detailed Specifications

Tilting Range : ± 2.5 degrees, providing fine adjustment for precise positioning
Drive : Micrometer screw with a 0.5 mm pitch for smooth and accurate tilt adjustments
Platform Size : 100 mm x 150 mm, offering a substantial area for various applications
Height : 45.5 mm, ensuring a compact design that fits seamlessly into your setup
Load Capacity : Capable of supporting up to 5 kg, ideal for a wide range of instruments and devices
Mounting Options :
Top Mounting : M6 mounting holes for secure attachment of equipment
Bottom Mounting : M6 counter bore holes for stable and flexible installation
Material : Made from high-quality anodized aluminium for enhanced durability and longevity

4 Axis Platform Model: TRSD-100-150

Versatile Precision Platform for Advanced Applications

Holmarc 4A-100-150 4 Axis Platform is engineered to meet the highest standards of precision and flexibility. With its comprehensive range of motion across four axes, this platform is ideal for complex setups in scientific research, optical experiments, and industrial applications. Constructed from anodized aluminium, it guarantees durability and reliable performance in demanding environments

Specifications

Four-Axis Movement	Includes tilting, vertical (Z) and horizontal (X) adjustments
Drive Mechanisms	Micrometer : For precise tip-tilt adjustments with a 0.5mm pitch
	Leadscrew : For smooth X and Z axis movements
Platform Size	150 x 100 mm
Height Range	154.5 mm to 229.5 mm
Load Capacity	Up to 5 kg
Material	Anodized Aluminium for enhanced durability
Mounting Options	M6 tapped holes on top and M6 counter bore holes for breadboard mounting

Precision instrumentation alignment
Optical experiments and setups, Laser positioning
Scientific research requiring fine and multi-axis adjustments
Industrial applications needing robust and versatile platforms



Accessories
Heavy Duty Post : Ensures robust and stable support for the platform
Heavy Duty Post Base : Provides a firm foundation for mounting the tilt platform (#sold separately)

Detailed Specifications

Model No. : 4A-100-150
Platform Size : 150 mm x 100 mm
Minimum Height : 154.5 mm
Maximum Height : 229.5 mm
Tilting Range : ± 2.5 degrees for precise angular adjustments
Z Axis Travel : 75 mm for vertical positioning
X Stage Travel : 100 mm for horizontal positioning
Load Capacity : Capable of supporting up to 5 kg
Drives :
Micrometer : For accurate tip-tilt adjustments
Leadscrew : For stable and precise X and Z movements
Mounting Options :
Top Mounting : M6 tapped holes for secure attachment of equipment
Bottom Mounting : M6 counter bore holes for breadboard installation
Material : High-quality anodized aluminium for durability and resistance to wea

Single Axis Tilting Platfrom Model: TRSD-100-150

Precision Tilting for Diverse Applications

The Holmarc ST-100-150 Single Axis Tilt Platform is designed to provide precise angular positioning for various scientific and industrial applications. With a robust leadscrew drive and a wide tilting range, this platform ensures accurate and stable adjustments. The anodized aluminium construction enhances durability, making it a reliable choice for demanding environments.

Specifications

Tilting Range	0 to 60 degrees for extensive angular adjustment
Drive Mechanism	Leadscrew with link plate mechanism for smooth and precise tilting
Platform Size	150 x 100 mm
Height	56 mm
Load Capacity	Up to 3 Kg
Material	Anodized Aluminium for enhanced durability
Mounting Options	M6 tapped holes on top and M6 CBR slots on the base for versatile mounting solutions

Precision instrumentation alignment
Optical experiments and setups
Laser positioning
Scientific research requiring fine angular adjustments
Industrial applications needing robust and precise tilt platforms



Accessories
Heavy Duty Post : Ensures robust and stable support for the platform
Heavy Duty Post Base : Provides a firm foundation for mounting the tilt platform (#sold separately)

Detailed Specifications

Model No. : ST-100-150

Platform Size : 150 mm x 100 mm

Height : 56 mm

Tilting Range : 0 to 60 degrees, providing a wide range of angular adjustment

Load Capacity : Capable of supporting up to 3 Kg

Drive : Leadscrew with link plate mechanism for precise and stable tilt adjustments

Mounting Options :

Top Mounting : M6 tapped holes on a 25 mm grid for secure attachment of equipment

Base Mounting : M6 CBR slots for breadboard installation

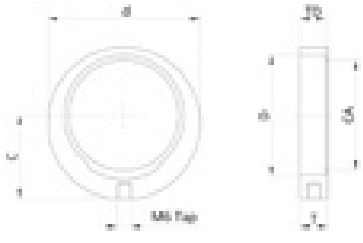
Material : Made from high-quality anodized aluminium for durability and resistance to wear

Kinematic Mirror Mounts



Rigid Mirror Mounts
RMM Series

RMM Series rigid mirror mounts are post mountable. Optics is held by nylon tipped set screw in a 3 point contact stepped bore of the device. Rigid mirror mounts are manufactured from aluminium alloy 6061 grade and given black anodized finish.M6 mounting hole is provided for post mounting applications.



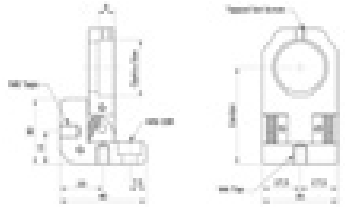
Model No	RMM - 12.5	RMM - 25	RMM - 38	RMM - 50	RMM - 75
					
Optics Size D	12.5 mm or 0.5”	25 mm or 1”	38 mm or 1.5”	50 mm or 2”	75 mm or 3”
C	13.5	21.5	27	35.5	49.5
d	24	38	50	65	90
TD	9	11	11	11	14
CA	11	23	35	47	72
T	10	12	12	12	16

Optic mounts are used for holding optical components such as mirrors, lenses, prisms, filters etc. in an experimental setup. Optic mounts can be simple rigid mounts or can be with multi-axes positioning capabilities.

- Aluminium alloy - 6061 grade
- Black Anodized Finish
- M6 Mounting hole provided

Rigid flip Mounts
FLRMM Series

Rigid Flip Mirror Mounts can be used for sudden entry of a mirror or beam splitter in an optical path by flipping action. These mounts assures precise positioning and repeatability.

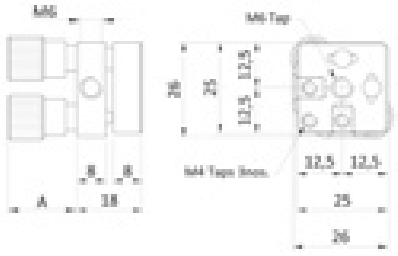


Model No	FLRMM - 12.5	FLRMM - 25	FLRMM - 50
			
Optics Size	12.5 mm or 0.5”	25 mm or 1”	50 mm or 2”
Center Height	38	45	60

- Aluminium alloy
- Black Anodized Finish

Plain Mirror Mounts
MM Series

Front surface of the mount is plain. Optics can be fixed to the front surface of the mount using adhesive. Two types of plane mirror mounts are available. MM-AK-T series mounts provide translation in addition to tilting. This type of mount has three lead screws, two of them for tilting and third one for translation. Concentric M4 CBR holes and M6 tapped holes are provided at two adjacent sides for vertical mounting of mirror mount.One M6 mounting hole is provided at the back plate for horizontal mounting in prism mounting applications.



Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6
Mounting Orientation	Vertical & Horizontal
Material	Aluminium



Model No	Optics Size	Mounting Hole
MM-AK-25	25 mm or 1”	M6
MM-AK-38	38 mm or 1.5”	M6
MM-AK-50	50 mm or 2”	M6
MM-CS-25	25 mm or 1”	M6
MM-CS-38	38 mm or 1.5”	M6
MM-CS-50	50 mm or 2”	M6
MM-Mu-25	25 mm or 1”	M6
MM-Mu-38	38 mm or 1.5”	M6
MM-Mu-50	50 mm or 2”	M6



Model : MM-AK-25

Plane Mirror Mount with Translation		
MM-AK-T-25	25 mm or 1”	M6
MM-AK-T-38	38 mm or 1.5”	M6
MM-AK-T-50	50 mm or 2”	M6
MM-CS-T-25	25 mm or 1”	M6
MM-CS-T-38	38 mm or 1.5”	M6
MM-CS-T-50	50 mm or 2”	M6
MM-Mu-T-25	25 mm or 1”	M6
MM-Mu-T-38	38 mm or 1.5”	M6
MM-Mu-T-50	50 mm or 2”	M6



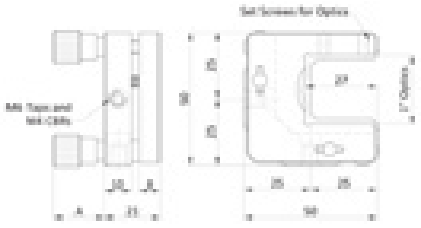
CS Series - Covered Lead Screw Drive Mu Series - Micrometer Drive		
A - 17 ± 3	A - 24.5 ± 3	25 mm or 1”
A - 19 ± 3	A - 19 ± 3	38 mm or 1.5”
A - 19 ± 3	A - 24.5 ± 3	50 mm or 2.0”



Model : MM-Mu-25

MM SeriesBlack anodized finish
Lead Screw / Micrometer Driv

Kinematic Mount For Rectangular Optics
KMR Series



In KMR series mirror or beam splitter mounts, optics is held in a square pocket machined in the tilting plate of the mount. Nylon tipped soft set-screws are used to tighten the optics in this pocket. Back plate is L shaped. We can use beam splitter, mirror, filter etc. along with this mount.

Two types of KMR series mirror or beam splitter mounts are available. KMR - AK - T series mounts provide translation in addition to tilting in two axis.

Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal
Material	Aluminium

M6 Mounting hole provided
Vertical & horizontal mounting orientation

Model No	Optics Size	Mounting Hole
KMR-AK-25	25 mm or 1”	M6
KMR-AK-38	38 mm or 1.5”	M6
KMR-AK-50	50 mm or 2.0”	M6
KMR-LS-25	25 mm or 1”	M6
KMR-LS-38	38 mm or 1.5”	M6
KMR-LS-50	50 mm or 2.0”	M6
KMR-CS-25	25 mm or 1”	M6
KMR-CS-38	38 mm or 1.5”	M6
KMR-CS-50	50 mm or 2.0”	M6
KMR-Mu-25	25 mm or 1”	M6
KMR-Mu-38	38 mm or 1.5”	M6
KMR-Mu-50	50 mm or 2.0”	M6



Plane Mirror Mount with Translation		
KMR-AK-T-25	25 mm or 1”	M6
KMR-AK-T-38	38 mm or 1.5”	M6
KMR-AK-T-50	50 mm or 2.0”	M6
KMR-LS-T-25	25 mm or 1”	M6
KMR-LS-T-38	38 mm or 1.5”	M6
KMR-LS-T-50	50 mm or 2.0”	M6
KMR-CS-T-25	25 mm or 1”	M6
KMR-CS-T-38	38 mm or 1.5”	M6
KMR-CS-T-50	50 mm or 2.0”	M6
KMR-Mu-T-25	25 mm or 1”	M6
KMR-Mu-T-38	38 mm or 1.5"	M6
KMR-Mu-T-50	50 mm or 2.0”	M6



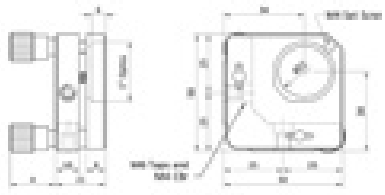




CS Series	Mu Series	< < Select your drive	
A - 17 ± 3	A - 25.5 ± 3	25 mm or 1”	CS Series - Covered Lead Screw Drive Mu Series - Micrometer Drive
A - 19 ± 3	A - 25.5 ± 3	38 mm or 1.5”	
A - 19 ± 3	A - 25.5 ± 3	50 mm or 2.0”	

Kinematic Mount For Circular Optics
BM Series

Optics is mounted in a stepped bore at one corner with the help of nylon tipped set screw. Three drive choices are available in BM series mirror / beam spliter mounts.



Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal
Material	Aluminium

BM-AK-12.5		12.5 mm or 0.5”	M4
BM-AK-25		25 mm or 1”	M6
BM-AK-38		38 mm or 1.5”	M6
BM-AK-50		50 mm or 2.0”	M6
BM-LS-12.5		12.5 mm or 0.5”	M6
BM-LS-25		25 mm or 1”	M6
BM-LS-38		38 mm or 1.5”	M6
BM-LS-50		50 mm or 2.0”	M6
BM-CS-12.5		12.5 mm or 0.5”	M4
BM-CS-25		25 mm or 1”	M6
BM-CS-38		38 mm or 1.5”	M6
BM-CS-50		50 mm or 2.0”	M6
BM-Mu-25		25 mm or 1”	M6
BM-Mu-38		38 mm or 1.5”	M6
BM-Mu-50		50 mm or 2.0”	M6



Model : BM-CS-T-50



Model : BM-AK-50

Mount with Translation			
BM-AK-T-12.5		12.5 mm or 0.5”	M4
BM-AK-T-25		25 mm or 1”	M6
BM-AK-T-38		38 mm or 1.5”	M6
BM-AK-T-50		50 mm or 2.0”	M6
BM-LS-T-12.5		25 mm or 1”	M6
BM-LS-T-25		25 mm or 1”	M6
BM-LS-T-38		38 mm or 1.5”	M6
BM-LS-T-50		50 mm or 2.0”	M6
BM-CS-T-12.5		12.5 mm or 0.5”	M4
BM-CS-T-25		25 mm or 1”	M6
BM-CS-T-38		38 mm or 1.5”	M6
BM-CS-T-50		50 mm or 2.0”	M6
BM-Mu-T-25		25 mm or 1”	M6
BM-Mu-T-38		38 mm or 1.5”	M6
BM-Mu-T-50		50 mm or 2.0”	M6



Model : BM-Mu-50



Model : BM-Mu-T-50





< < Select your drive

CS Series	Mu Series		
A - 19 ± 3	A - 25.5 ± 3	25 mm or 1”	CS Series - Covered Lead Screw Drive Mu Series - Micrometer Drive
A - 21 ± 3	A - 25.5 ± 3	38 mm or 1.5”	
A - 23 ± 3	A - 25.5 ± 3	50 mm or 2.0”	

0.25mm linear resolution
Black Anodized Finish

Precision Lock

Kinematic mount for circular optics with precision lock are available on request.



Thin Optics Adapters

These are suitable for mounting thin beam splitters, mirrors or filters on a threaded cell. 1 mm to 3 mm diameter optics can be held in thin optics adapter.

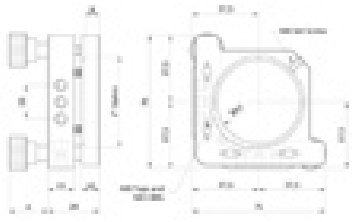


45° Mirror Holders

Suitable for fixing mirrors or beam spliters at 45°s on the kinematic Mount. Nylon tipped set screw is used for fixing the optics on to the adapter.



Kinematic Mount For Circular Optics
KMC Series



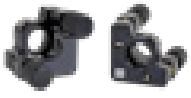
In KMC series Mirror / Beam splitter mount, optics is mounted at the center of the mirror mount. This mirror mount is suitable for circular mirrors, beamsplitters, lenses etc.

Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal
Material	

+/- 3 degree angular tilt is possible
Made of aluminum alloy



Model No		Optics Size	Mounting Hole
KMC-AK-12.5		12.5 mm or 0.5”	M4
KMC-AK-25		25 mm or 1”	M6
KMC-AK-38		38 mm or 1.5”	M6
KMC-AK-50		50 mm or 2.0”	M6
KMC-LS-12.5	Model : KMC-AK-25	12.5 mm or 0.5”	M4
KMC-LS-25		25 mm or 1”	M6
KMC-LS-38		38 mm or 1.5”	M6
KMC-LS-50		50 mm or 2.0”	M6
KMC-CS-12.5	Model : KMC-CS-12.5	12.5 mm or 0.5”	M4
KMC-CS-25		25 mm or 1”	M6
KMC-CS-38		38 mm or 1.5”	M6
KMC-CS-50		50 mm or 2.0”	M6
KMC-Mu-25	Model : KMC-CS-25	25 mm or 1”	M6
KMC-Mu-38		38 mm or 1.5”	M6
KMC-Mu-50		50 mm or 2.0”	M6
Mount with Translation			
KMC-AK-T-12.5		12.5 mm or 0.5”	M4
KMC-AK-T-25		25 mm or 1”	M6
KMC-AK-T-38		38 mm or 1.5”	M6
KMC-AK-T-50		50 mm or 2.0”	M6
KMC-LS-T-12.5	KMC-CS-T-25	12.5 mm or 0.5”	M4
KMC-LS-T-25		25 mm or 1”	M6
KMC-LS-T-38		38 mm or 1.5”	M6
KMC-LS-T-50		50 mm or 2.0”	M6
KMC-CS-T-12.5	KMC-Mu-T-25	12.5 mm or 0.5”	M4
KMC-CS-T-25		25 mm or 1”	M6
KMC-CS-T-38		38 mm or 1.5”	M6
KMC-CS-T-50		50 mm or 2.0”	M6
KMC-Mu-T-25	KMC-CS-50	25 mm or 1”	M6
KMC-Mu-T-38		38 mm or 1.5”	M6
KMC-Mu-T-50		50 mm or 2.0”	M6







CS Series	Mu Series		
A - 19 ± 3	A - 25.5 ± 3	25 mm or 1”	
A - 21 ± 3	A - 25.5 ± 3	38 mm or 1.5”	CS Series - Covered Lead Screw Drive Mu Series - Micrometer Drive
A - 23 ± 3	A - 25.5 ± 3	50 mm or 2.0”	

Kinematic Mirror Mount D Shaped
KMD Series

Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal, Left & Right orentation
Material	Aluminium

+/- 3 degree angular tilt is possible
Made of aluminum alloy

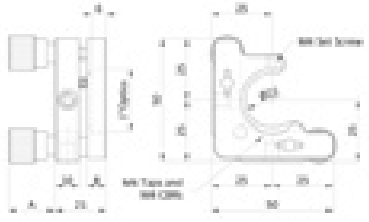


Optics Size 12.5 mm or 0.5" M4 Threaded holes Model No	Optics Size
KMD05R - AK	D shaped right handed Kinematic mirror mount with hex adjusters
KMD05R - AKT	D shaped right handed Kinematic mirror mount with hex adjusters and traslation
KMD05L - AK	D shaped left handed Kinematic mirror mount with hex adjusters
KMD05L - AKT	D shaped left handed Kinematic mirror mount with hex adjusters and traslatio
KMD05R - LS	D shaped right handed Kinematic mirror mount with knob adjusters
KMD05R - LST	D shaped right handed Kinematic mirror mount with knob adjuster and traslation
KMD05L - LS	D shaped left handed Kinematic mirror mount with knob adjuster
KMD05L - LST	D shaped left handed Kinematic mirror mount with knob adjuster and traslation



Optics Size 25 mm or 1"M6 Threaded hole & M4 Cbr hole	
KMD25R - AK	D shaped right handed Kinematic mirror mount with hex adjusters
KMD25R - AKT	D shaped right handed Kinematic mirror mount with hex adjusters and traslationn
KMD25L - AK	D shaped left handed Kinematic mirror mount with hex adjuster
KMD25L - AKT	D shaped left handed Kinematic mirror mount with hex adjusters and traslation
KMD25R - CS	D shaped right handed Kinematic mirror mount with knob adjusters
KMD25R - CST	D shaped right handed Kinematic mirror mount with knob adjuster and traslation
KMD25L - CS	D shaped left handed Kinematic mirror mount with knob adjuster
KMD25L - CST	D shaped left handed Kinematic mirror mount with knob adjuster and traslation

Kinematic Mount With Maximum Aperture
BMX Series



In BMX series maximum aperture mirror / beam splitter mount, optics is mounted at the center of the mount. Obstruction from the mount will be minimum. There is more freedom in setting up reflection or transmission angle.

Two types of BMX series mirror/beam splitter mounts are available. BMX - AK - T series mounts provide translation in addition to tilting in two axis.

Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal
Material	Aluminium

M6 & M4 mounting holes
Black Anodized Finish

Model No		Optics Size	Mounting Hole
BMX-AK-25	 Model : BMX-CS-25	25 mm or 1”	M6
BMX-AK-38		38 mm or 1.5”	M6
BMX-AK-50		50 mm or 2.0”	M6
BMX-LS-25		25 mm or 1”	M6
BMX-LS-38		38 mm or 1.5”	M6
BMX-LS-50		50 mm or 2.0”	M6
BMX-CS-25	 Model : BMX-AK-25	25 mm or 1”	M6
BMX-CS-38		38 mm or 1.5”	M6
BMX-CS-50		50 mm or 2.0”	M6
BMX-Mu-25	 Model : BMX-CS-38	25 mm or 1	M6
BMX-Mu-38		38 mm or 1.5”	M6
BMX-Mu-50		50 mm or 2.0”	M6



Mount with Translation			
BMX-AK-T-25	 Model : BMX-CS-50	25 mm or 1”	M6
BMX-AK-T-38		38 mm or 1.5”	M6
BMX-AK-T-50		50 mm or 2.0”	M6
BMX-LS-T-25		25 mm or 1”	M6
BMX-LS-T-38	 Model : BMX-AK-T-50	38 mm or 1.5”	M6
BMX-LS-T-50		50 mm or 2.0”	M6
BMX-CS-T-25		25 mm or 1”	M6
BMX-CS-T-38		38 mm or 1.5”	M6
BMX-CS-T-50		50 mm or 2.0”	M6
BMX-Mu-T-25	 Model : BMX-Mu-T-50	25 mm or 1”	M6
BMX-Mu-T-38		38 mm or 1.5”	M6
BMX-Mu-T-50		50 mm or 2.0”	M6

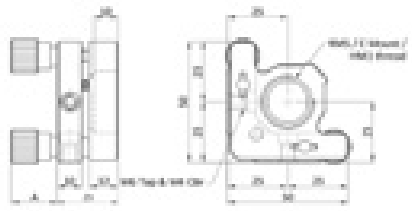






CS Series	Mu Series		
A - 19 ± 3	A - 25.5 ± 3	25 mm or 1”	
A - 21 ± 3	A - 25.5 ± 3	38 mm or 1.5”	CS Series - Covered Lead Screw Drive
A - 23 ± 3	A - 25.5 ± 3	50 mm or 2.0	Mu Series - Micrometer Drive

Kinematic Lens Mounts / Objective Lens Mounts



KLM series threaded type mounts are suitable for mounting Lenses, Microscope objectives, C mount microscopic objectives and camera lenses, lens tubes, condenser lens, beam expanders etc. In KLM series kinematic mounts, optics is held in the threaded bore by a threaded ring or suitable threaded optical components. This mount is post mountable type with M6 mounting hole at the bottom.

Specifications



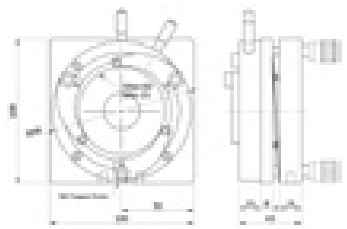
Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 / M4
Mounting Orientation	Vertical & Horizontal
Material	Aluminium



Model No.	Max. Optic Size. (mm)	Thread Type
KLM - 25	For 1"/25mm optics and 1"/25 mm lens tubes	HM1
KLM - 50	For 2"/50mm optics and 2"/50 mm lens tubes	HM2
KMMOH	For Microscopic Objectives	RMS thread
KLM - C	For Camera Lens or Microscopic Objective	C Mount thread

Mount with tilt and Translation		
KLM - T - 25	For 1"/25 mm optics and 1"/25 mm lens tubes	HM1
KLM - T - 50	For 2"/50mm optics and 2"/50 mm lens tubes	HM2
KMMOH - T	For Microscopic Objectives	RMS thread
KLM - T - C	For Camera Lens or Microscopic Objective	C Mount thread

Kinematic Cirular Optic Mount with adjustable jaw



Circular optics can be easily inserted and removed in this type of mounts. Self centering jaw provided in this model can secure optics up to 13 mm thickness in varying diameters of 6 to 60 mm.

Specifications

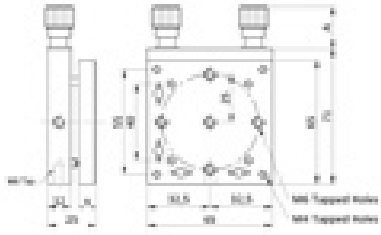
Maximum Optics Size	Diameter 60 mm x 13 mm
Lead screw Pitch	100 TPI
Angular Tip / Tilt	+/- 3°
Linear Resolution	0.25 mm
Sensitivity	4 arc sec
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal
Optics Size	Minumum 6 mm Maximum 60 mm
Optics Thickness	13 mm Maximum
Drive	100 Micrometer / 100 TPI leadscrew

Lead Screw / Micrometer Drive
Compatible with optics from 6 to 60mm diameters



Model No.	Max. Optic Size. (mm)	Thread Type
KMC-SC60 CS	6 mm to 60 mm	100 TPI Leadscrew
KMC-SC60 Mu5	6 mm to 60 mm	100 TPI Micrometer

Top Adjustable Plane Mirror Mounts TAPM Series



Top adjustable TAPM Series Mirror mounts are plane surfaced with center mounting tapped hole for circular adapter. These are also provided with mounting holes at corners for accommodating prism with suitable clamp. M6 tapped holes are provided on two adjacent sides for mounting in vertical direction. One M6 mounting hole is provided at the back plate for horizontal mounting in prism mounting applications.

Specifications

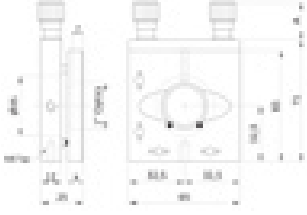
Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6
Mounting Orientation	Vertical & Horizontal
Material	Aluminium

Model No	Platform Size	Mounting Hole
TAPM-CS-65	65 x 65	M6
TAPM-CS-75	75 x 75	M6
TAPM-CS-100	100 x 100	M6
TAPM-Mu-50	65 x 65	M6
TAPM-Mu-75	75 x 75	M6
TAPM-Mu-100	100 x 100	M6
		CS Series - Covered Lead Screw Drive Mu Series - Micrometer Drive
A - 17 ± 3	A - 24.5 ± 3	25 mm or 1”
A - 19 ± 3	A - 24.5 ± 3	38 mm or 1.5”
A - 19 ± 3	A - 24.5 ± 3	50 mm or 2.0”



Black Anodized Finish
Vertical & horizontal mounting orientation

Top Adjustable Mounts TABM Series

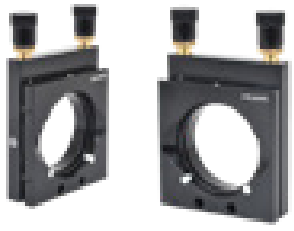


op adjustable mount helps tilting of optics without causing any obstruction to the beam and takes less space compared to rear adjustable mirror mounts. Optics is held in a stepped bore and tightened by nylon tipped set screw.

Specifications

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6
Mounting Orientation	Vertical & Horizontal
Material	Aluminium

Model No	Platform Size	Mounting Hole
TABM-CS-25	25 mm or 1”	M6
TABM-CS-38	38 mm or 1.5”	M6
TABM-CS-50	50 mm or 2.0”	M6
TABM-CS-75	75 mm or 3.0”	M6
TABM-Mu-25	25 mm or 1”	M6
TABM-Mu-38	38 mm or 1.5”	M6
TABM-Mu-50	50 mm or 2.0”	M6
TABM-Mu-75	75 mm or 3.0”	M6
		CS Series - Covered Lead Screw Drive Mu Series - Micrometer Drive
A - 17 ± 3	A - 24.5 ± 3	25 mm or 1”
A - 19 ± 3	A - 24.5 ± 3	38 mm or 1.5”
A - 19 ± 3	A - 24.5 ± 3	50 mm or 2.0”



Black Anodized Finish
Vertical & horizontal mounting orientation

Adapters & Accessories



Corrosion free
Variety of products

Flip base

This mount is used for holding optics of 25 mm and 50 mm diameter at an angle of 0 degree or 90 degree.

Model No :	Suitable Mirror mounts
FLB - 25	25 mm mounts
FLB - 38	38 mm mounts
FLB - 50	50 mm mounts
FLB - 25 - B	25 - 50 mm mounts

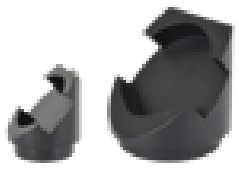


Fixed Angle Rigid Mirror Holder

This mount is used for holding optics of 25 mm and 50 mm diameter at an angle of 30 degree or 45 degree.

Specifications	
Mounting angle	30 degree, 45 degree
Material	Aluminium
Post mounting	by M6 threaded holes
Mirror mounting	by circular step provided on the mount

Model No:	Optic Size	Angle
30-MM-25	25 mm/1”	30°
45-MM-25	25 mm/1”	45°
30-MM-50	50 mm/2”	30°
45-MM-50	50 mm/2”	45°

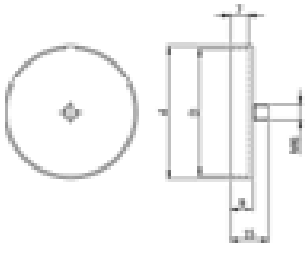


Circular Mirror Adapters

CA - MM series circular mirror adapters are suitable for mounting circular optics into MM series kinematic mirror mounts. All CA - MM series circular adapters follow same mounting methods. Small adapters can be easily fixed to bigger mounts.

Model No:	Optic Size	d	D
CA-MM-10	10 mm	12	10
CA-MM-12.5	12.5 mm or 0.5”	14.5	12.5
CA-MM-25	25 mm or 1”	27	25
CA-MM-50	50 mm or 2”	52	50



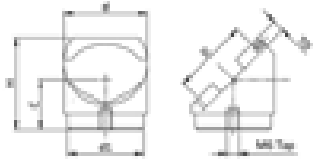


45° Mirror Holder

45 - MM series 45° mirror mount holders are suitable for mounting circular optics to MM series and TAMM series kinematic mirror mounts. All 45 - MM series circular holders follow same mounting methods. Small circular adapters can be fixed easily to bigger mounts.

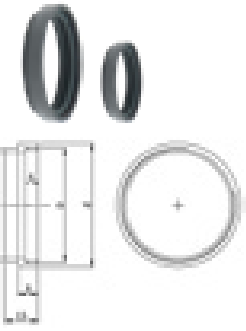


Model No:	Optic Size	d	d1	H	C	TD
45-MM-10	10 mm or 0.4”	30	25	32	16	6
45-MM-12.5	12.5 mm or 0.5”	30	25	32	16	6
45-MM-25	2 5 mm or 1”	30	25	37	22	6
45-MM-38	38 mm / 1.5”	42	38	46	25	8
45-MM-50	50 mm or 2”	55	50	60	30	10
Compatible with BM Series, KMC Series, BMX Series, TAPM Series Mounts						



Thin Optics Adapter

Optics in the range of 1 mm to 3 mm can be held in these thin optic adapters. These are suitable for mounting thin beam splitters, mirrors or filters on a threaded cell.



Model No:	Optic Size (D)	d	CA	d1
ADN-25	25 mm or 1”	30	23	25.4
ADN-38	38 mm or 1.5”	44	35	38.1
ADN-50	50 mm or 2”	55	47	50.8
Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts				

Rotation Adapters

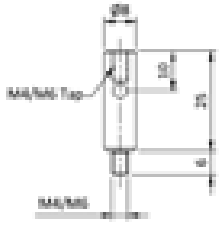
Rotation adapters have angular readout. It is used to fix kinematic mounts directly using nylon tipped set screw



Model No:	D	d	d1	d2
RA-25	25 mm or 1”	38	25	28
RA-50	50 mm or 2”	65	50	55
Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts				

Post Adapter

Rotation adapters have angular readout. It is used to fix kinematic mounts directly using nylon tipped set screw.





Model No :	Type Male - Female
PA - M4M4	M4 - M4
PA - M4M6	M4 - M6
PA - M6M4	M6 - M4
PA - M6M6	M6 - M6

Lens Adapters

Suitable for lens having edge thickness up to 10 mm.

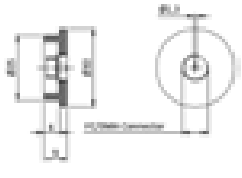


Model No	D	d	CA	d1
ALDN-25	25mm or 1”	30	23	25
ALDN-38	38mm or 1.5”	42	42	38
ALDN-50	50mm or 2”	55	47	47
Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts				

Fiber Holder

Kinematic mount of 25 mm optical diameter is suitable for mounting this adapter. Bare fiber can be fixed with FH - 25 - FCH adapter by a fiber chuck and holder provided with the adapter. In FH - 25 - FC and FH - 25 - SMA adapters, FC connector and SMA connecters are provided.







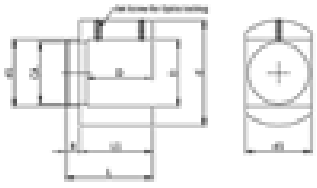
Model No :	Type Male - Female
FH-25-FCH	For bare fiber
FH-25-FC	FC Connectorized fiber
FH-25-SMA	SMA Connectorized fiber

Cube Beam Splitter Adapter



Cube prism is mounted using nylon tipped set screw.

Model No	D	d	d1	CA	D	L1	L
CBSA-10	10 mm or 0.4”	30	25	8	10	12	20
CBSA-12.5	12.5 mm or 0.5”	30	25	10	12.5	15	23
CBSA-15	15 mm or 0.6”	30	25	12	15-0.0 + 0.3	15-0.0 + 0.3	26
CBSA-20	20 mm or 0.8”	30	25	17	20	23	31
CBSA-25	25 mm or 1”	30	25	22	25	28	36
CBSA-38	38 mm or 1.5	60	38	35	38	42	50
CBSA-50	50 mm or 2”	75	50	47	50	54	62



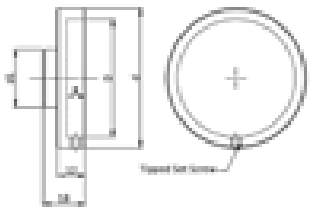
Circular Mirror Adapter



Circular Mirror Adapter has three point contact. Optics are held in position using nylon tipped set screw.

Model No	Optic Size	d	d1
CMA-10	10 mm or 0.4”	25	25
CMA-12.5	12.5 mm or 0.5”	25	25
CMA-25	25 mm or 1”	32	25
CMA-38	38 mm or 1.5”	50	38
CMA-50	50 mm or 2”	60	50

Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts

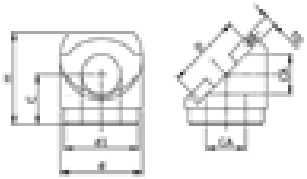


45 Degree Optic Adapters



Model No:	Optic Size	d	d1	H	C	CA	TD
45-BM-10	10 mm or 0.4”	30	25	32	16	6	6
45-BM-12.5	12.5 mm or 0.5”	30	25	32	16	8	6
45-BM-25	25 mm or 1”	30	25	37	22	15	6
45-BM-38	38 mm / 1.5	42	38	46	25	20	8
45-BM-50	50 mm or 2”	55	50	60	30	30	10

Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts



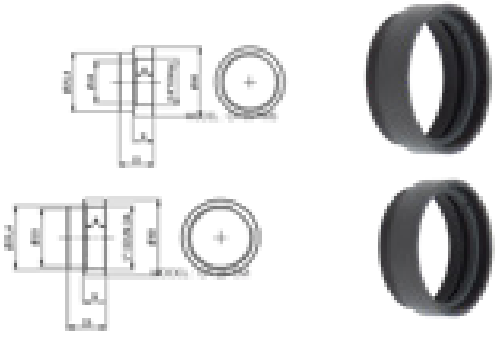
Suitable for fixing mirrors or beam splitters at 45° onto the kinematic Mount. Nylon tipped set screw is used for fixing the optics into the adapter.

Objetive Lens Adapters

Objective lens like Microscope objective with RMS and C mount threads or camera lenses can be fixed to kinematic mounts using an objective lens adapter

Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts

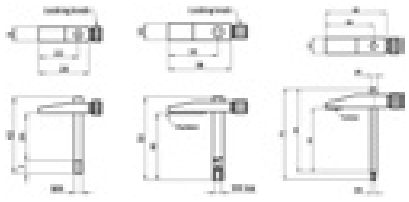
Model No	Optic Size
CA-25-RMS	RMS Thread
CA-25-CM	C Mount



Cube / Beam Splitter / Prism Clamp

Soft nylon pad is provided for avoiding scratches on optics

Suitable for prism or cube

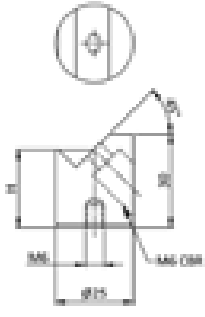




Model No	Optic Size
CBSPC-25	Up - 15 mm
CBSPC-38	Upto - 25 mm or 1”
CBSPC-50	Up to 50 mm or 2”

45 degree Mirror Mount Holder

M6 / M4 Screw mounting option
Available in 3 different heights
Used to fix kinematic mounts or rigid mounts at 45 degrees
Aluminium alloy
Black anodized finish

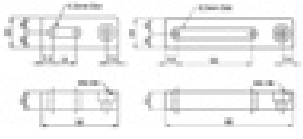




Model No	Optic Size
45-MMH-15	15 mm
45-MMH-30	30 mm
45-MMH-50	50 mm

Slotted post mounting base plate

Slotted adapter is suitable for holding the optic mount on a post system with its surface centered.

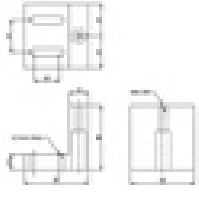




Model No	Optic Size
SB-KM-15	Small
SB-KM-50	Large

Base Plate L Shaped

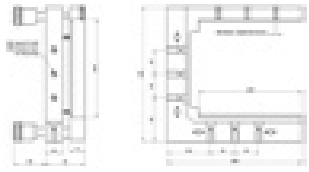
L shaped base plate can be used to hold mounts at a fixed height from optical table. It’s base helps to fix it without tilting.





Model No	Height
LBP-KM-25	25 mm
LBP-KM-50	50 mm
LBP-KM-75	75 mm

Kinematic Mount For Large Rectangular Optics



In this series, rectangular optics of large size can be mounted.
Nylon tipped soft set-screws are used to tighten the optics.



Specifications

Angular Tip / Tilt	+/- 2°
Linear Resolution	0.25 mm (100 Tpi)
Sensitivity	4 arc sec.
Mounting Hole	M6 Tapped / M4 CBR
Mounting Orientation	Vertical & Horizontal
Drive	100 Micrometer / 100 TPI leascrew
Material	Aluminium
Finish	Black anodized

Model No	Optic Size	
KMR-75 CS	100 TPI Lead screw	75 mm x 75 mm
KMR-100 CS	100 TPI Lead screw	100 mm x 100 mm
KMR-125 CS	100 TPI Lead screw	125 mm x 125 mm
KMR-75 Mu5	100 TPI Micrometer	75 mm x 75 mm
KMR-100 Mu5	100 TPI Micrometer	100 mm x 100 mm
KMR-125 Mu5	100 TPI Micrometer	125 mm x 125 mm
Compatible with BM Series, KMC Series, BMX Series, TABM Series Mounts		

- Safe mounting for rectangular optics
- Comes with Lead Screw & Micrometer Drive

Kinematic Mount for Large Circular Optics



This mirror mount is suitable for fixing optics of large diameters. Optics of 75 mm, 100 mm and 125 mm diameters can be mounted in these devices.

Specifications

Angular Tip / Tilt	:	+/- 2°
Linear Resolution	:	0.25 mm (100 Tpi)
Sensitivity	:	4 arc sec.
Mounting Hole	:	M6 Tapped / M4 CBR
Mounting Orientation	:	Vertical & Horizontal
Drive	:	100 Micrometer / 100 TPI leascrew
Material	:	Aluminium
Finish	:	Black anodized

Model No	Drive	Optics Size
KMC-75 CS	100 TPI Lead screw	Dia - 3" x 12 mm
KMC-100 CS	100 TPI Lead screw	Dia - 4" x 18 mm
KMC-125 CS	100 TPI Lead screw	Dia - 5" x 22 mm
KMC-75 Mu5	100 TPI Micrometer	Dia - 3" x 12 mm
KMC-100 Mu5	100 TPI Micrometer	Dia - 4" x 18 mm
KMC-125 Mu5	100 TPI Micrometer	Dia - 5" x 22 mm

Ensure firm mounting of circular optics

Comes with Lead Screw & Micrometer Drive

Kinematic Self Centering Jaw Mount for Circular Optics

These mounts are used to mount optics of varying diameters (5 mm to 104 mm).
Optics is held by self centering adjustable jaw.

Key Features
Optics size 5 to 104 mm
Optics thickness : 22 mm
Optics held by self-centering adjustable jaw, screw adjusters are used for fixing optics firmly

Specifications		
Angular Tip / Tilt	:	+/- 3°
Linear Resolution	:	0.25 mm (100 Tpi)
Sensitivity	:	4 arc sec.
Mounting Hole	:	M6 tapped holes for post mounting. Base plate having M6 clear slots are also provided.
Drive	:	100 Tpi lead screw for tilting
Optics diamater (Minimum)	:	12 mm
Optics diamater (Maximum))	:	Depends on the model mentioned below
Optics thickness (Maximum)	:	22 mm
Material	:	Aluminium
Mounting Orientation	:	Vertical & Horizontal (both
Finish	:	Black anodized



Model No	Drive	Optics Size
KMC-SC-75 CS	100 TPI Lead screw	75 mm x 75 mm
KMC-SC-100 CS	100 TPI Lead screw	100 mm x 100 mm
KMC-SC-125 CS	100 TPI Lead screw	125 mm x 125 mm
KMC-SC-75 Mu5	Micrometer	75 mm x 75 mm
KMC-SC-100 Mu5	Micrometer	100 mm x 100 mm
KMC-SC-125 Mu5	Micrometer	125 mm x 125 mm

Kinematic Concave Mirror or Optical Flat Holders

Five Axis Adjustment
These mounts are used to mount optics of varying diameters (5 mm to 104 mm).
Optics is held by self centering adjustable jaw.

Specifications		
Angular Tip / Tilt	:	+/- 3°
Travel X		50 mm
Travel Y & Z		25 mm
Linear Resolution		0.25 mm (100 Tpi)
Sensitivity		4 arc sec.
Mounting Hole		Base plate having
Drive		100 Tpi lead screw for tilting and micrometer for XYZ stage
Optics diamater (Minimum)		2 mm
Optics diamater (Maximum))		102 mm
Material		Aluminium
Finish		Black anodized



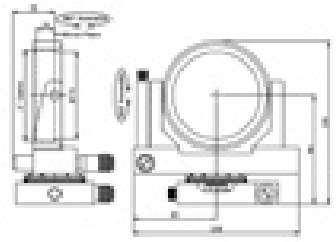
Model : 5A-OFH



Model : 5A-OFH-125

Model No	Minimum & Maximum Optic Dimater	Maximum Optic Holding thickness
5A - OFH	2 mm - 102 mm	22 mm
5A - OFH - 125		

Gimbal Mirror Mounts



GMM Series

Gimbal mirror mounts provide 360°coarse positioning in two axes about the mirror surface in addition to fine adjustment of 6°. Two types of fine adjustments are possible, one is micrometer drive with 10 micron least count and the other is with lead screw of 0.25 mm linear resolution per rotation. Switching between coarse and fine movement is by using a knob or a set-screw provided on the gimbal mount.

Optics upto 12.5 mm thickness can be held in 50 mm gimbal mirror mount and up to 10mm can be held in 25mm gimbal mount. In both models, optics are fixed with the help of threaded ring.

Provides +/- 60 fine adjustment
Fabricated from Black Anodized Aluminum



Model : GMM-Mu-25



Model : GMM-Mu-50

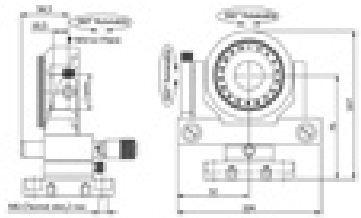


Model : GMM-Mu-100

Coarse Travel θx / θy	360 Degrees
Fine Travel θx / θy	+/- 6 degree
Linear Resolution	0.25 mm / Rotation
Linear Resolution	0.01 mm (Least Count for micrometer)
Sensitivity	4 arc sec.
Mounting hole	M6 Slots
Rotation axis laid ON	Mirror plane
Construction material	Aluminium alloy
Finish	Black Anodized

Model No.	Optics Size	Maximum Optic Thickness	Drive	Post Mounting adapter Model
GMM-Mu-25	25 / 1”	10 mm	Micrometer	AD-GMM-25
GMM-Mu-50	50 / 2”	12.5 mm	Micrometer	AD-GMM-50
GMM-Mu-75	75 / 3”	12.5 mm	Micrometer	AD-GMM-75
GMM-Mu-100	100 / 4”	12.5 mm	Micrometer	AD-GMM-100

Gimbal Mirror Mounts with Rotation



Gimbal mirror mount with rotation provide 360 degree coarse positioning in two axes about the mirror surface in addition to fine adjustment of 6 degrees for theta x and theta y and 360° manual rotation with 1° resolution for theta z. Two types of fine adjustments are provided. One is micrometer drive with 10 micron least count and the other is with lead screw of 0.25 mm linear resolution per rotation. Switching between coarse and fine movement is by using a knob or a set-screw provided on the Gimbal mount. Optics up to 12.5 mm thickness can be held in 50 mm Gimbal mirror mount and up to 10 mm can be held in 25 mm gimbal mount. In both models, optics are fixed with the help of threaded ring.



Provides 360° rotation
Lead screw of 0.25mm linear resolution

Coarse Travel θx / θy	360°
Fine Travel θx / θy	+/- 6°
Travel Range θz	360°
Linear Resolution	0.01 mm (Least Count for micrometer)
Resolution θz	1°
Sensitivity θx / θy	4 arc sec.
Mounting hole	M6 Slots
Construction material	Aluminium alloy
Finish	Black Anodized

Model No.	Optics Size	Maximum Optic Thickness	Drive	Post Mounting adapter Model
GMM - Mu - 25-P	25 / 1”	10 mm	Micrometer	AD - GMM - 25
GMM - Mu - 50-P	50 / 2”	12.5 mm	Micrometer	AD - GMM - 50

Gimbal Mirror Mounts for Large Optics



Large Gimbal Mounts are suitable for fixing large optics, with maximum diameter of 200 mm. Fine adjustment is done by a micrometer with least count of 10 microns. Switching between coarse and fine movement is by using a knob or a set-screw provided on the Gimbal mount. 200 mm / 8" Gimbal mirror mount, can hold mirrors upto 35 mm thick

Coarse Travel θx / θy	360°
Fine Travel θx / θy	+/- 6°
Travel Range θz	360°
Linear Resolution	0.01 mm (Least Count for micrometer)
Sensitivity θx / θy	4 arc sec.
Mounting hole	M6 Slots
Construction material	Aluminium alloy
Finish	Black Anodized

Model No.	Optic size (mm)	Mirror Thickness	D (mm)	C (mm)	X (mm)	H (mm)
GMM-125	125 / 5"	25	125	150	230	225
GMM-150	150 / 6"	25	150	150	255	26
GMM-200	200 / 8"	25	200	223	336	348

Gimbal Mirror Mounts for Extra Large Optics

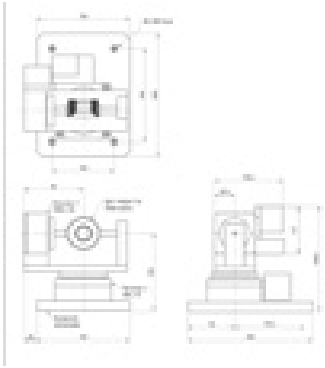


Extra Large Gimbal Mounts are suitable for fixing large optics, with maximum diameter of 400 mm. Fine adjustment is done by a micrometer with least count of 10 microns. Switching between coarse and fine movement is by using a knob or a set-screw provided on the Gimbal mount. 400 mm / 16" Gimbal mirror mount, can hold mirrors upto 35 mm thick.

Coarse Travel θx / θy	360°
Fine Travel θx / θy	+/- 3°
Travel Range θz	360°
Linear Resolution	0.01 mm (Least Count for micrometer)
Sensitivity θx / θy	4 arc sec.
Mounting hole	M6 Slots
Construction material	Aluminium alloy
Finish	Black Anodized

Model No.		Optic size (mm)	Optics bore size	Mirror Thickness	H (mm)
GMM-250		250	250.5	25	250
GMM-10		10"	254.5	25	250
GMM-300		300	300.8	25	275
GMM-12		12"	305.3	25	275
GMM-360		360	360.8	29	305
GMM-14		14"	356.1	29	305
GMM-400		400	401	25	375
GMM-16		16"	407	25	375

Gimbal Mirror Mounts
Motorized



Gimbal mounts with stepper motor drives are suitable for remote positioning of the mirror in pitch and yaw directions. Suitable controller with hand held user interface is also available from Holmarc. Knob which is directly attached to motor shaft is provided for manual positioning of the mirror when ever required. These mounts are available for mirrors upto the size of 200 mm diameter as standard product. Holmarc can make these gimbal mounts for larger mirrors as well (up to 500 mm diameter). Please contact our application engineers for assistance.

*Dual axis controller and software will be sold separately.

Travel θx / θy	360°
Positioning accuracy	0.1 degree
Sensitivity θx / θy	4 arc sec.
Mounting hole	M6 Slots
Construction material	Aluminium alloy
Finish	Black Anodized



Minimum incremental

Model No.	Gear Ratio		Half step resolution		Motion		Maximum speed	
	Azimuth	Elevation	Azimuth	Elevation	Azimuth	Elevation	Azimuth	Elevation
MO-GMM-25	90:1	72:1	0.01	0.0125	0.00125	0.0015	16	20
MO-GMM-50	90:1	72:1	0.01	0.0125	0.00125	0.0015	16	20
MO-GMM-75	90:1	72:1	0.01	0.0125	0.00125	0.0015	16	20
MO-GMM-100	90:1	72:1	0.01	0.0125	0.00125	0.0015	16	20
MO-GMM-4	90:1	72:1	0.01	0.0125	0.00125	0.0015	16	20
MO-GMM-150	180 : 1	90 : 1	0.005	0.01	0.0006	0.00125	8	16
MO-GMM-6	180 : 1	90 : 1	0.005	0.01	0.0006	0.00125	8	16
MO-GMM-200	240 : 1	180 : 1	0.0038	0.005	0.0004	0.0006	6	8
MO-GMM-8	240 : 1	180 : 1	0.0038	0.005	0.0004	0.0006	6	8



Model No	Optic size (mm)	Optics bore size	Mirror thickness	Center height (mm)	Positioning accuracy
MO-GMM-25	25 / 1”	25.8	15	125	0.1degree
MO-GMM-50	50 / 2”	51.2	15	125	0.1degree
MO-GMM-75	75 / 3”	76.5	15	150	0.1degree
MO-GMM-100	100	100.5	20	150	0.1degree
MO-GMM-4	4”	102	20	150	0.1degree
MO-GMM-150	150	105.5	25	190	0.1degree
MO-GMM-6	6”	152.9	25	190	0.1degree
MO-GMM-200	200	200.5	25	250	0.1degree
MO-GMM-8	8”	203.7	25	250	0.1degree

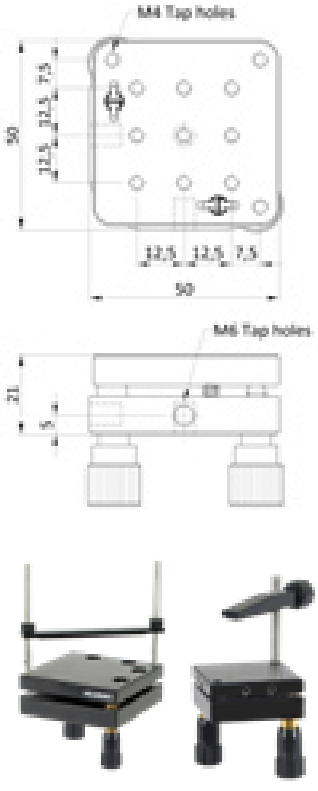
Cube / Prism mounts

Kinematic Platform Mount
KPM Series

KPM series Kinematic platforms are available for optics up to 90 mm size. M6 and M4 tapped holes are provided on a 12.5 mm grid for mounting various optical or opto-mechanical components over the platform. M6 tapped holes are provided at the back plate of kinematic platform for post mounting applications (2 vertical positions and 1 horizontal position are possible). Suitable prism clamps are provided along with kinematic platform.

Angular tip / tilt	+/- 3°
Translation range	6 mm (selected models only)
Linear resolution	0.25 mm
Sensitivity	4 arc sec.
Mounting hole	M6 / M4
Mounting orientation	Vertical & horizontal
Material	Aluminium
Finish	Black anodized

Model No	Type	Cube Size
KPM-38	Kinematic platform mount with Plain Surface	12.7
KPM-50	Kinematic platform mount with Plain Surface	25
KPM-75	Kinematic platform mount with Plain Surface	38
KPM-90	Kinematic platform mount with Plain Surface	50
KPMS-38	Kinematic platform mount with Single Post	12.7
KPMS-50	Kinematic platform mount with Single Post	25
KPMS-75	Kinematic platform mount with Single Post	38
KPMS-90	Kinematic platform mount with Single Post	50
KPMD-38	Kinematic platform mount with Dual Post	12.7
KPMD-50	Kinematic platform mount with Dual Post	25
KPMD-75	Kinematic platform mount with Dual Post	38
KPMD-90	Kinematic platform mount with Dual Post	50
Kinematic Platform Mount with Translation		
KPM-T-38	Kinematic platform mount with Plain Surface	12.7
KPM-T-50	Kinematic platform mount with Plain Surface	25
KPM-T-75	Kinematic platform mount with Plain Surface	38
KPM-T-90	Kinematic platform mount with Plain Surface	50
KPMS-T-38	Kinematic platform mount with Single Post	12.7
KPMS-T-50	Kinematic platform mount with Single Post	25
KPMS-T-75	Kinematic platform mount with Single Post	38
KPMS-T-90	Kinematic platform mount with Single Post	50
KPMD-T-38	Kinematic platform mount with Dual Post	12.7
KPMD-T-50	Kinematic platform mount with Dual Post	25
KPMD-T-75	Kinematic platform mount with Dual Post	38
KPMD-T-90	Kinematic platform mount with Dual Post	50

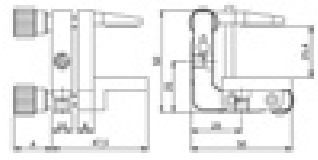


Available for up to 90mm size

M6 and M4 tapped holes provided

Kinematic Prism Mount
KTM Series

KTM series kinematic prism mounts enable horizontal & vertical mounting. Left / Right orientations can be easily arranged using detachable platform. Suitable prism clamps are provided along with kinematic prism mounts. Tilt adjustment screws have 0.25 mm / rev. pitch threads. Construction material is aluminium with black anodized finish. M6 / M4 mounting options are provided for fixing it with standard 12 mm or 16 mm posts.





Detachable platform

Left right orientations possible

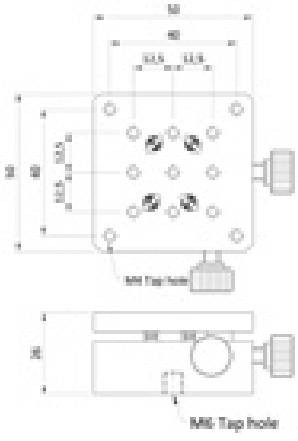
Angular tip / tilt	+/- 3°
Translation range	6 mm (selected models only)
Linear resolution	0.25 mm
Sensitivity	4 arc sec.
Mounting hole	M6 / M4
Mounting orientation	Vertical & horizontal
Material	Aluminium
Finish	Black anodized

Model No	Optic Size	Mounting Hole
KTM-25	Upto 1" / 25	M6 / M4
KTM-50	Upto 2" / 50	M6 / M4

Kinematic mirror mount with rectangular optics with translation		
KTM-T-25	Upto 1" / 25	M6 / M4
KTM-T-50	Upto 2" / 50	M6 / M4

Dual Axis Tilt Platform Mount
TRS Series

TRS series dual axis tilt platform mounts are available for optics up to 50 mm. M6 and M4 tapped holes are provided on a 12.5 mm grid for mounting various optical or opto-mechanical components over the platform. There are 3 sets of M6 tapped holes at the back plate of platform for post mounting applications. Suitable prism clamps are provided along with kinematic platform.



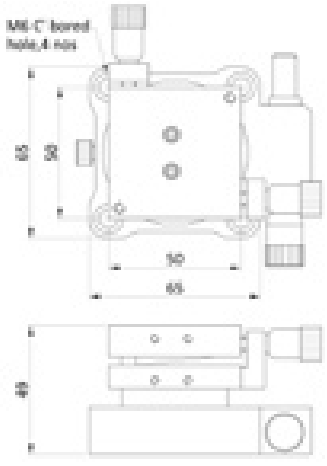
Angular tip / tilt	+/- 3°
Translation range	6 mm (selected models only)
Linear resolution	0.25 mm
Sensitivity	4 arc sec.
Mounting hole	M6 / M4
Mounting orientation	Vertical & horizontal
Material	Aluminium
Finish	Black anodized

Model No:	Type	Optic Size	Mounting Hole
TRS-25	Dual axis tilt platform mount with Plain Surface	Upto 38	M6
TRS-50	Dual axis tilt platform mount with Plain Surface	Upto 50	M6
TRSS-25	Dual axis tilt platform mount with Single Post	Upto 38	M6
TRSS-50	Dual axis tilt platform mount with Single Post	Upto 50	M6
TRSD-25	Dual axis tilt platform mount with Dual Post	Upto 38	M6
TRSD-50	Dual axis tilt platform mount with Dual Post	Upto 50	M6



Available for up to 50mm optic size
Vertical and horizontal mounting orientations

Tilt and Rotation Stage
PMRP Serie



PMNP-R series prism/cube mounts have three degrees of freedom, two tilt and one rotation. M6 C'bored holes are provided at the base forn mounting to breadboard with suitable base plates. Prism or cube can be placed on the top of the plane surface of this mount.

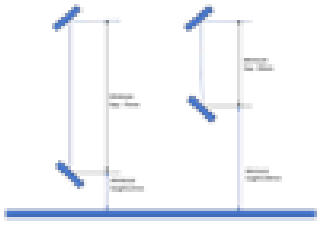
Angular tip / tilt	+/- 3°
Translation range	6 mm (selected models only)
Linear resolution	0.25 mm
Sensitivity	4 arc sec.
Mounting hole	M6 / M4
Mounting orientation	Vertical & horizontal
Material	Aluminium
Finish	Black anodized

Model No:	Type	Optic Size	Thickness (T)
PMRP-CS-25	Plain Surface	Upto 1"	21 mm
PMRP-CS-38	Plain Surface	Upto 1.5"	24 mm
PMRP-CS-50	Plain Surface	Upto 2"	24 mm
PMRS-CS-25	Single Post Clamp	Upto 1"	21 mm
PMRS-CS-38	Single Post Clamp	Upto 1.5"	24 mm
PMRS-CS-50	Single Post Clamp	Upto 2"	24 mm
PMRD-CS-25	Dual Post Clamp	Upto 1"	21 mm
PMRD-CS-38	Dual Post Clamp	Upto 1.5"	24 mm
PMRD-CS-50	Dual Post Clamp	Upto 2"	24 mm



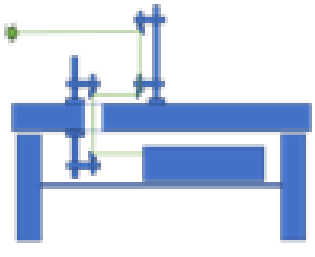
Beam Steering Device

BSD Series



Precision Laser Beam Steering with Adjustable Height and Direction
Holmarc is pleased to introduce the BS-25 and BSD-25-L Beam Steering Devices, designed for precise laser beam steering with variable height and direction. These versatile devices are ideal for a wide range of optical applications, ensuring accuracy and reliability.

Model	BSD-25	BSD-25-L
Minimum Height	100 mm (using M25MH mirror holders	25 mm (using M25MH-L mirror holder)
Minimum Gap	30 mm	100 mm
Mirror Holders	2 (bottom and top)	
Mirror Size	1 inch (25mm) diameter	
Adjustability	Height adjustable, tiltable, rotatable	
Post Type	Heavy duty	
Base Plate Options	Pedestal fork or Slotted base plate	
Component Availability	Mirror holders, heavy-duty post, base plate, pedestal fork and pedestal adapters can be bought separately	





Benefits

Precision Control

Achieve accurate beam direction and height adjustments for precise experiments.

Robust Design

Heavy duty construction ensures long-term stability and reliability.

Customizable Setup

Flexible base plate options and specialized mounts cater to specific experimental needs.

Versatility

Suitable for both high and low-height optical setups

Beam steering device with slotted base

Model	Min & Max beam height from base
BSD-25-25-B	100 - 75
BSD-25-30-B	100 - 125
BSD-25-50-B	100 - 325
BSD-25-60-B	100 - 425
BSD-25-L-25-B	25 - 155
BSD-25-L-30-B	25 - 200
BSD-25-L-50-B	25 - 400
BSD-25-L-60-B	25 - 500

Beam steering device with pedestal fork

Model	Min & Max beam height from base
BSD-25-25-B	100 - 75
BSD-25-30-B	100 - 125
BSD-25-20-P	100 - 75
BSD-25-30-P	100 - 125
BSD-25-50-P	100 - 325
BSD-25-60-P	100 - 425
BSD-25-L-20-P	25 - 155
BSD-25-L-30-P	25 - 200
BSD-25-L-50-P	25 - 400
BSD-25-L-60-P	25 - 500

Beam steering parts can also be purchased separately

Posts

Model	Item details
HDP - 150	Heavy duty post 150 mm long
HDP - 200	Heavy duty post 200 mm long
HDP - 250	Heavy duty post 250 mm long
HDP - 300	Heavy duty post 300 mm long
HDP - 500	Heavy duty post 500 mm long
HDP - 600	Heavy duty post 600 mm long

Base plates

Model	Item details
AHDP - 38	Pedestal Adapter
PF - 38	Pedestal fork
MB - 50	Magnetic base
HD - SQ	Square base
HD - R	Round base

Mirror Mounts

Model	Item details
M25MH	1 inch mirror holder min. height - 100 mm
M25MH-L	1 inch mirror holder min. height - 25 mm

Dual Adjustable Mirror Holders

- Equipped with two mirror holders, one at the bottom and one at the top.
- Both holders are height adjustable, tiltable and rotatable, allowing for precise control of the laser beam's direction and height.

Heavy-Duty Construction

- The mirror holders are mounted on a robust heavy-duty post, providing maximum stability and durability.
- Ideal for rigorous experimental and industrial environments.

Variable Height Adjustment

BSD-25 :
Minimum height : 100 mm
Minimum gap between input laser and output laser : 30 mm
BSD-25-L :
Minimum height : 25 mm
(using M25MH-L mirror holder)
Minimum height : 75 mm

Customizable Base Plate

Choose between a pedestal or fork base plate based on specific mounting requirements.
Compatible with breadboard mounting for enhanced flexibility.

Component Flexibility

Each component, including mirror holders, heavy-duty post, base plate, pedestal fork and pedestal adapters, can be purchased separately.
Allows customers to assemble a beam steering setup tailored to their specific requirements.

Compatible Mirror Sizes

Supports mirrors of 1 inch (25 mm) diameter.
Find your suitable Mirrors

Customizable Options

For customized needs, we offer larger mirror options and prism mounting solutions.
Contact us for more information on bespoke configurations.

Applications

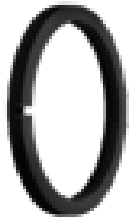
Optical experiments
Precision laser alignment
Industrial laser beam steering
Research and development laboratories

Lens Tube Assembly System

Spacer Rings

Spacer rings are used to maintain gap between two optics. These spacers can be stacked for maintaining gap between optics from 1 mm.



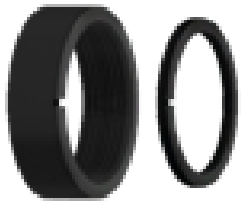


Model No:	Item	Minimum Order Qty
SR-1-25	Spacer Ring for 25 mm / 1" Optics	25 Nos.
SR-2-25		25 Nos.
SR-3-25		25 Nos.
SR-5-25		10 Nos.
SR-10-25		5 Nos.
SR-20-25		5 Nos.

Threaded Rings

Threaded rings of thickness ranging from 2 mm to 20mm can be selected for convenient applications. Spanner slots are provided for easy fastening of optics.

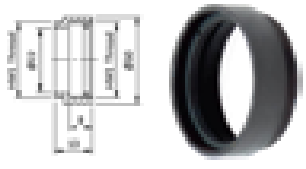




Model No:	Item	Minimum Order Qty
TR-2-25	Spacer Ring for 25 mm / 1" Optics	25 Nos.
TR-3-25		25 Nos.
TR-5-25		25 Nos.
TR-10-25		10 Nos.
TR-20-25		5 Nos.

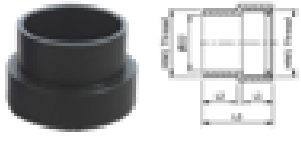
Lens Cells

Thin Lens Cell



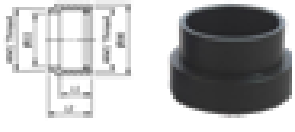
Model No:
TLC-25-8

Focusing Lens Cell - Short



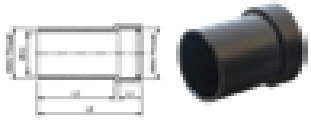
Model No:	Length L1, L2, L3
FLCS-25-12	12, 25, 39
FLCS-25-15	15, 25, 42

Short Lens Cell



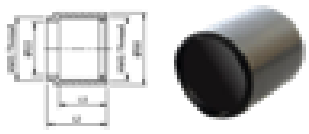
Model No:	Length L1, L2, L3
SLC-25-12	12, 17
SLC-25-15	15, 20

Focusing Lens Cell - Thread



Model No:	Length L1, L2, L3
FLCS-25-12-TL	12, 40, 54
FLCS-25-15-TL	15, 40, 57

Long Lens Cell



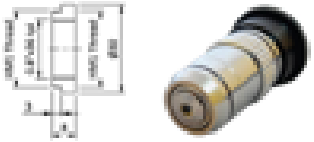
Model No:	Length L1, L2,
LLC-25-20	20, 25
LLC-25-25	25, 30
LLC-25-35	35, 40

Focusing Lens Cell - Medium



Model No:	Length L1, L2,
FLCL-25-20	12, 20, 34
FLCL-25-25	25, 20, 47
FLCL-25-35	35, 20, 57

RMS - Objective Adapter



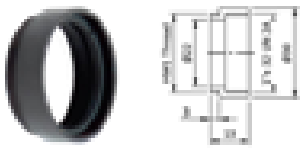
Model No:
RMS - OAD - 25

Focusing Lens Cell - Long



Model No:	Length L1, L2, L3
FLCL-25-20-TL	12, 40, 54
FLCL-25-25-TL	25, 40, 67
FLCL-25-35-TL	35, 40, 77

C Mount Objective Adapter



Model No:
C - OAD - 25

External Locking Ring



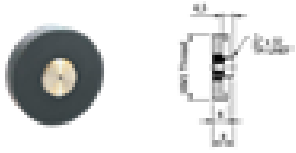
Model No:
ELR - 25

Lens Tubes



Model No:	Length L1, L2
LCT-25-25	25-30
LCT-25-30	30-35
LCT-25-35	35-40
LCT-25-50	50-55
LCT-25-75	75-80
LCT-25-100	100-105
LCT-25-125	125-130

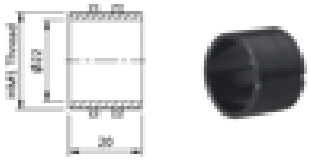
External Locking Ring



Model No:

FAD-25 FC	FC Fiber Adapter
FAD-25-MA	SMA Fiber Adapter

Internal Coupler



Model No:

INC - 25

External Coupler



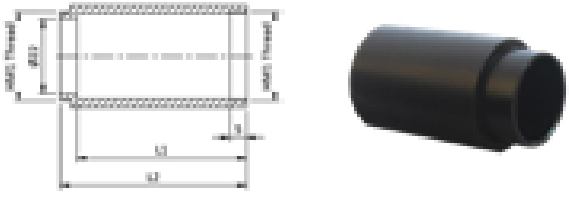
Model No:

EXC - 25

Externsion Tube

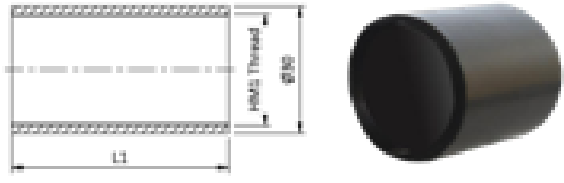
Model No:

ELCT-25-5	5, 10
ELCT-25-10	10, 15
ELCT-25-15	15, 20
ELCT-25-25	25, 30
ELCT-25-50	50, 55
ELCT-25-100	100, 105
ELCT-25-150	150, 155
ELCT-25-175	175, 180
ELCT-25-200	200, 205



Full Thread Lens Tube

Model No:	Length L1
FLCT-25-10	10
FLCT-25-15	15
FLCT-25-25	25
FLCT-25-35	35
FLCT-25-50	50

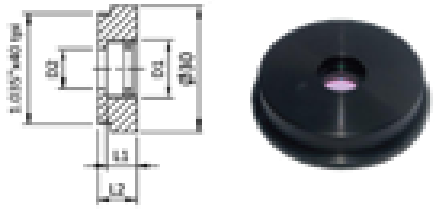


Small Optic Cell End Type

Model No:	Length L1
SOC-25-6	6 mm
SOC-25-9	9 mm
SOC-25-12.7	12.7 mm
SOC-25-18	18 mm

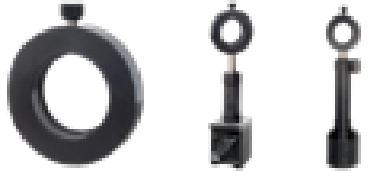
Small Optic Internal

SOA-25-6	6 mm
SOA-25-9	9 mm
SOA-25-12.7	12.7 mm
SOA-25-18	18 mm



Lens Tube Holder

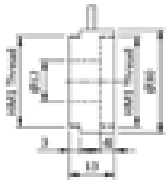
Model No:	Holding Method
LTH-25	30 mm dia bore
LTH-25T	HM1 thread



Note : Post, post holder and bases are sold separately

Variable Aperture

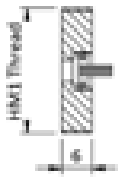
Model No:
SSID - 25 - 22





Laser Adapter

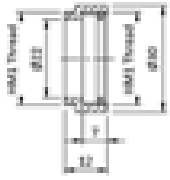
Model No:
TO - 56

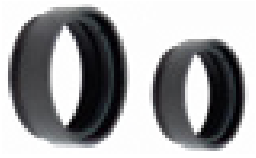




Filter Cell Adapter

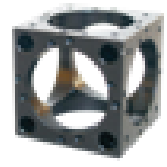
Model No:
FLC-25-8





Cube





One side of the cube is over sized for inserting plate beam splitter mount or cube beam splitter. Other sides are threaded type suitable for lens tubes

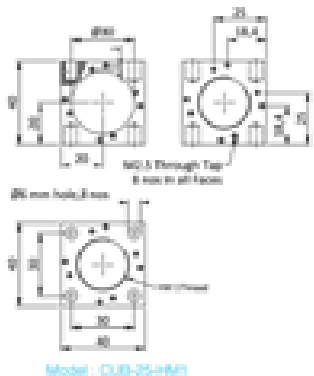
Aluminium alloy anodized finish
Can be used in rod assembly system

6 mm rods can be accommodated. It is used in rod assembly system for building optical setup. All other features provided are for launching this cube in to rod assembly unit.

Model No:	Type
CUB-25-30	Cube with 30 mm bore
CUB-25-HM1	Cube with HM1 thread

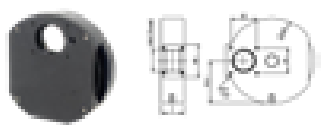
Filter Wheel

25 mm or 1” diameter filters can be fixed on this filter wheel .This filter wheel is suitable for rod assembly system with internal threading for lens tubes. It can also be used in an optical system by using a post/post holder and M6 or M4 tapped holes provided for fixing to post. Filters are fixed in the wheel through threaded ring by removing the side cover.



- Post mountable design
- Suitable for lens tube assembly system
- Suitable for Rod assembly system
- 6 No.s of 1” diameter filters can be used for LM-FW1
- 12 No.s of 1” diameter filters can be used for LM-FW2
- Numbers indicating densities of the filters are imprinted on the wheel
-

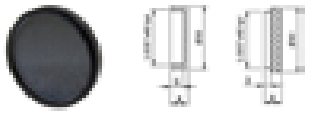
Model No:	Optic Size	No. of Filters	Thickness (T)
LM-FW1	25 mm/ 1”	Upto 6	17
LM-FW2	25 mm/ 1”	Upto 12	28



-

Beam Blocker

Two types of beam blockers are available, one with external thread and the other with internal thread. They are suitable for blocking beams from cube assembly or lens in tube.



Model No:	Type
BB-25-INT	With internal threading
BB-25-EXT	With external threading

Rod Assembly





Assembly Rods

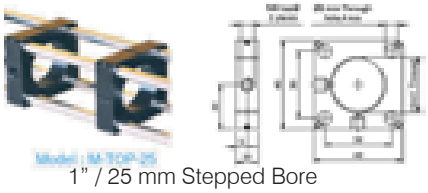
6 mm diameter rods
Precision ground finish
M3 tapped holes at both ends

Model No:	Length (mm)
CGRD-CG-50	50
CGRD-CG-75	75
CGRD-CG-100	100
CGRD-CG-150	150
CGRD-CG-200	200
CGRD-CG-250	250

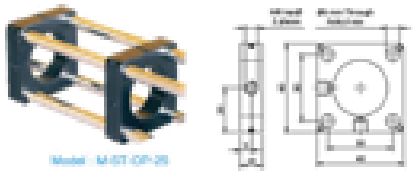
Optic Plates

Through Threaded Optic Plate

Model No:
M-TOP-25
M-ST-OP-25
M-OP-25
M-OP-30
M-PS-OP-30
M-CUB-OP-30
M-CUB-OP-25

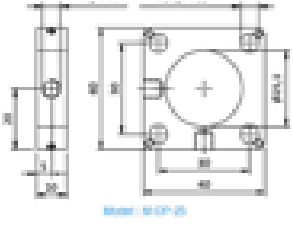


1" / 25 mm Stepped Bore
Optic Plate - Threaded Type

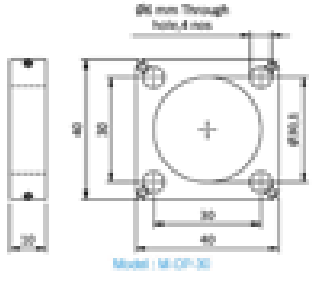


25 mm Unthreaded Optic Plate

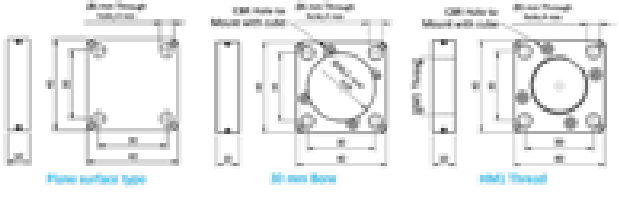


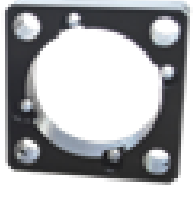


30 mm Unthreaded Optic
Plate

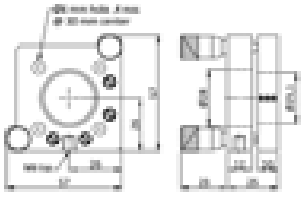


End Plate





Kinematic Optic Plate

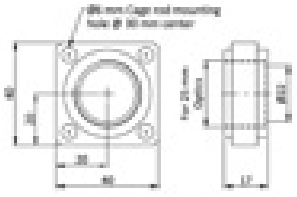




Translators are used for moving optics in Kinematic, XY and Z Directions, All translators are having 25 mm bore and are suitable for mounting optics, accessories and adapters having 25 mm size.

Model No:	Optic Size	Type
M-KM-25	Ø 25 mm	Through bore thread
M-TKM-25	Ø 25 mm 1"	HM1

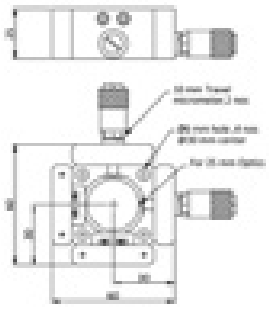
Course Rotator

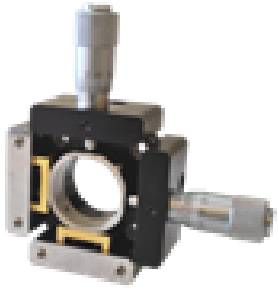




Model No:
M - PMR 25

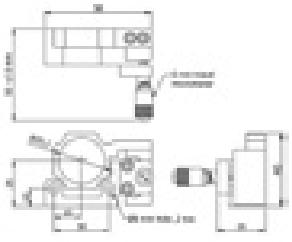
Translators

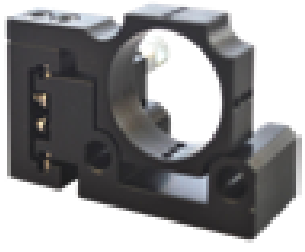




XY Translator

Model : M - TR - XY25
- Compatible with rod assembly
- 2 mm travel X&Y Axis
- Micrometer drive
- 25 mm diameter optics holder
- Optics held by grub screws





Z Translator

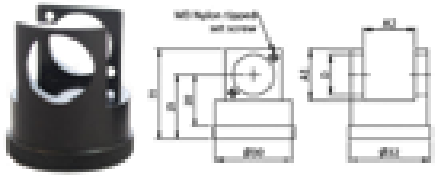
Model : M - TR - XY25
- Compatible with rod assembly
- 2 mm travel X&Y Axis
- Micrometer drive
- 25 mm diameter optics holder
- Optics held by grub screws

Model No:	Model No:
XY Translator	M - TR - XY25
Z Translator	M - TR - Z25

Cube Accessories

Cube Prism Holder

25mm cube prism can be placed inside the cube using this prism holder. Nylon tipped set screws are used to fix the prism to the cube prism holder. The holder can be rotated manually and locked with an accuracy of 2°.



Model No:	Cube size
CUB-CB-25-25	25 mm cube
CUB-CB-25-15	15 mm cube

Plate Beam Splitter Holder

25mm Plate beam splitters can be placed inside the cube using Plate beam splitter holder. Holder can be rotated manually with a positioning accuracy of 2° and can be locked by a set screw and allen key.



Model No:	
CUB-PB-25-25	Dia-25 mm x 2 mm
CUB-PB-25-15	Dia-15 mm x 2mm

Adapters



Fiber Connectors



Fiber Chuck



Iris Diaphragm



Iris Diaphragm



Pin Hole Cell

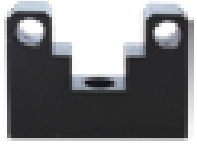


Lens Cell

Item	Model	Suitable Cage Plate / Type of cage plate
Lens Cell	M-OP-LC25	M-TOP-25
Filter Cell	M-OP-FL25	M-TOP-25
M.O Adapter	M-OP-MO	M-TOP-25
FC Fiber Connector	M-OP-FC01	M-TOP-25
Fiber Chuck	M-OP-FC02	M-TOP-25
Pinhole Cell	M-OP-P H01	M-TOP-25
Iris Diaphragms	M-OP-ID18	M-TOP-25

Adapters

Item	L1, L2	Suitable Cage Plate / Type of cage plate
LNST-CG-12.5	16.5	M-TOP-25
LNST-CG-25	28	M-TOP-25
LNST-CG-30	34	M-TOP-25
LNST-CG-38	41	M-TOP-25



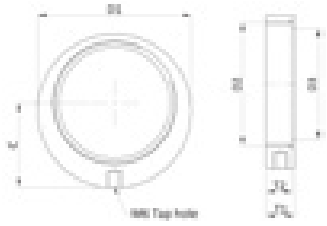
Base Mounting Platform

Base mounting plate has M6 tapped holes at bottom for mounting on post or base.

Item
M-OP-BMP-M6



Lens Mounts



Rigid Lens Mounts
RLM Series

RLM series rigid lens mounts are post mountable. Optics are held by threaded ring inside a threaded bore of the device. Rigid lens mounts are manufactured in aluminium alloy and given black anodized finish. Rigid lens mounts can be customized as per customer's optics size or requirement.

Construction material	Aluminium alloy
Finish	Black Anodized

Model No	Optics Size	D1	D2	D3	T1	T2 (without ring)	C	Thread
RLM-10	10 mm or 3/8"	22	10.2	8.5	10	9	10	HM10
RLM-12.5	12.5 mm or 0.5"	24	13	11	10	9	14.5	HM125
RLM-18	19 mm or 0.75"	31	19.3	16	10	9	15.5	HM18
RLM-20	20 mm	32	20.3	18	10	9	18	HM20
RLM-25	25 mm or 1"	35	25.7	23	12	11	18.5	HM1
RLM-30	30 mm or 1.2"	42	30.6	23.5	12.5	11.5	21.5	HM30
RLM-32	32 mm	44	32.3	25	12.5	11.5	24	HM1-32
RLM-38	38 mm or 1.5"	50	38.3	27	12.5	11.5	25	HM1.5
RLM-50	50 mm or 2"	65	51.2	47	12	11	35.5	HM2
RLM-75	75 mm or 3"	90	76.5	75	16	14	49.5	HM3
RLM-100	100 mm or 4"	120	101.8	94	23	20	66	HM4



Optics size ranges from 0.375" to 4"
Suitable for lens tubes, objective lens, condenser lens etc.

Rigid Camera Lens Mounts

These rigid mounts can be used to holed lens assemblies in an optical set up using standard post system.

Mounting Method for assembly lens	Split Clamp
Mounting Method for C-Mount lens	C Mount Thread
Material	Aluminium
Post Mounting	by M6 Threaded Holes

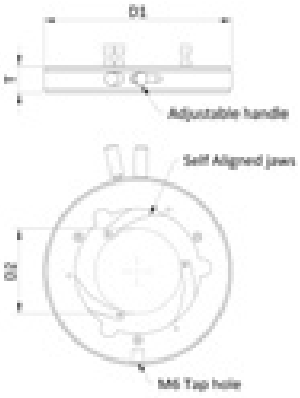
Model No	Type
MOH - R	RMS Mount
MOH - C	C Mount
SP - CA - 25	Special mount for camera lens



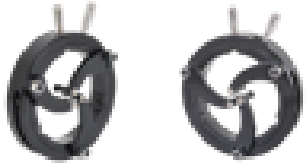
Self Centering Lens Mounts

Self-centering lens mounts are suitable for experiments where frequent replacement of lens is required. The lens is held using three spring loaded calipers. The calipers are released by two levers projecting from the mount. The lens is held in position by spring tension and can be locked in position by a knob.

- Self aligning jaws
- M6 mounting hole
- Post mountable
- Aluminium alloy
- Black anodized finish
- Upto 3" optics can be mounted



Model No	Lens Size Min - Max (mm)	D1 (mm)	D2 (mm)	T (mm)
SCLM - 50	6 - 50	90	(max - 50) (min - 6)	16
SCLM - 75	6 - 75	125	(max - 75) (min - 6)	16
SCLM - 100	6 - 100	125	(max - 100) (min- 6)	16

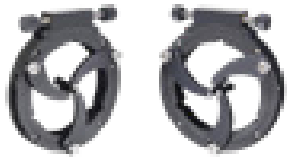


Model : SCLM - 75

Self centering Mount with Adjustable knob

This self centering mount can be used to holed comparatively large optic (upto 104 mm dia) using self centering jaws. These jaws are held in position by adjustable lead screws for firm clamping.

Model No	Optice size
SCLM-AK- 50	6 - 50
SCLM-AK- 75	6 - 75
SCLM-AK- 100	6 - 100



Model : SCLM-AK- 75



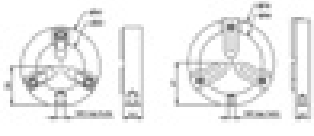
Minimum optics dimater	20 mm
Maximum optics diameter	104 mm
Maximum thickness	22 mm
Locking	by two screw adjusters
Sensitivity	4 arc sec.
Mounting hole	M6 Tapped hole for post mounting

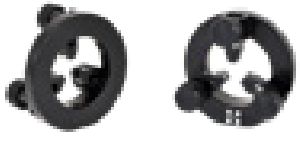
Circular Adjustable Lens Mount

Lens is held between nylon tips having angular grooves. These nylon tips provide protection for optics. Lenses of various sizes can be mounted with the help of this mount.

Nylon tips with angular grooves
Easy insertion and removal of optics

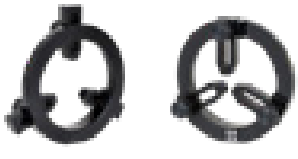
- Three point contact design
- Up to 50 mm diameter optics can be held
- Can be directly fixed to standard post with M6 set screw





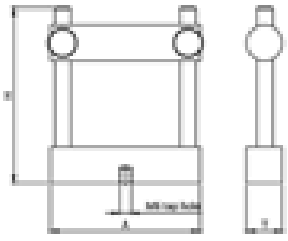
Model : ALM-C-25

Model No	Optic Size (mm)	Center height (mm)
ALM-C-25	5 - 25	24
ALM-C-50	25 - 50	37



Model : ALM-C-50

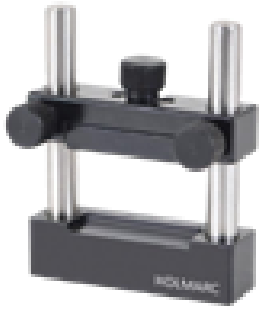
Bar Type Adjustable Lens Mount



Bar type lens mounts are suitable for fixing cylindrical lenses, optical plates etc. These are post mountable with M6 mounting hole provided at the bottom of the mount. M4 / M6 locking screws are provided for fixing sliding bar at desired position. Construction material is aluminium.

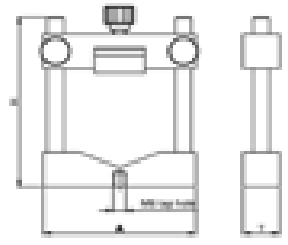
Cylindrical lenses can be held
4 mm pitch lead screw drive

- Bar type mounting design
- Optics Up to 165mm can be held
- Suitable for cylindrical lens
- Can be fixed directly to M6 threaded post



Model No	Maximum Size (mm)	A (mm)	H (mm)	T (mm)
ALM - B - 50	50	85	90	15
ALM - B - 90	90	126	145	18
ALM - B - 135	135	165	200	25
ALM - B - 165	165	200	245	25

V Type Adjustable Lens Mount



Holds lenses upto 100 mm diameter
M6 set screws for perfect fitting

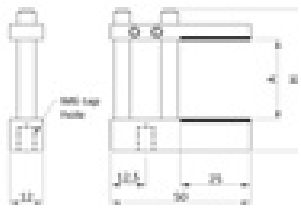
- Three point contact design
- Can hold optics up to 100mm diameter
- Suitable for holding cylindrical objects like laser tube, lens tube etc.
- Can be fixed directly to standard post with M6 set screw



Easy to hold lenses, cylindrical lenses, optical rods etc. with three point contact using linearly adjustable non rotating bar with M6 locking screws. Adjustable lens mounts are made of aluminium alloy. These are post mountable with M6 mounting hole at the bottom.

Model No	Maximum Size (mm)	A (mm)	H (mm)	T (mm)
ALM - 25	25	47	42	12
ALM - 50	50	88	75	18
ALM - 75	75	114	100	18
ALM - 100	100	154	140	18

Cylindrical Lens Mounts
CLM Series

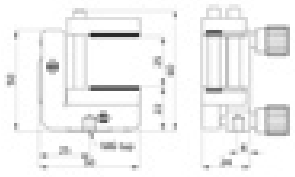


This CLM series lens mounts are suitable for rectangular or square cylindrical lenses. These can be used to mount lenses up to 50 mm.
Perfect for rectangular or square cylindrical lenses
M6 mounting holes
Suitable for rectangular/square cylindrical lenses
Rubber pad is affixed to the holding surface for protecting optics
M6 mounting holes
Post mountable



Model No	A	H
CLM - 15	15 mm	34 mm
CLM - 25	25 mm	44 mm
CLM - 30	30 mm	54 mm
CLM - 50	50 mm	79 mm

Kinematic Cylindrical Lens Mount



Translation range upto 6mm
Both vertical & horizontal mounting orientation

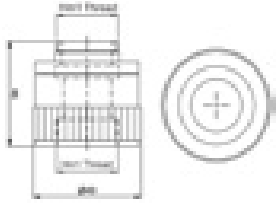
These mounts have two tilt adjustments by 100 tpi lead screws. Optics is held by a clamp which slides on a post.

Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm / Rotation
Sensitivity	4 arc sec.
Mounting Hole	M6 / M4
Mounting Orientation	Vertical & Horizontal



Model No	Optice size
KCLM - 50	6mm to 25mm
KCLM - 75	6mm to 50mm

Focus Adjustable Lens Mounts



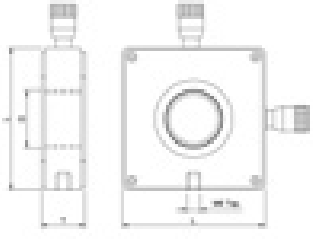
This focus adjustable lens mount is used to adjust the focus of a lens by backward and forward motion of the lens mounted in it. The focal adjustment is done by rotating focusing head provided on the mount without rotating the lens inside. Lens is held in position by threaded rings inside a threaded bore of the device.

Fine travel range : 10mm
Optics held by threaded rings
Up to 2" optics can be mounted
Compatible to RLM Series Mounts
Aluminium alloy construction
Black anodized finish



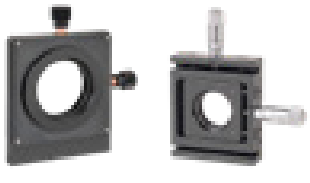
Model No	Optic dia (mm)	Suitable mounts
FALM - 25	25 / 1"	RLM - 25
FALM - 50	50 / 2"	RLM - 50

YZ Lens Mounts / Objective Lens Mounts



This YZ lens mount provides linear adjustments along YZ axis using precision spring loaded lead screws.

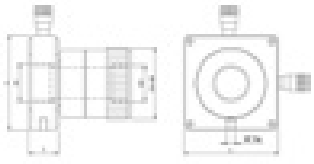
YZ travel range 4 mm
Optics held by threaded rings
Up to 2" optics can be mounted
M6 mounting holes
Post mountable
Aluminium alloy and stainless steel construction
Black anodized finish



Model No	Optic Size	Thread Type	D (mm)	L (mm)	T (mm)
YZLM-25	25 / 1"	HM1	25	65	20
YZLM-50	50 / 2"	HM2	50	90	20
XYMOH	RMS Thread	RMS	18	50	12

Spring loaded lead screws
Can mount lenses with
different diameters

XYZ Lens Mounts

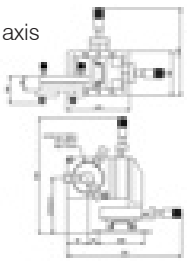


This XYZ lens mount consists of focus adjustable mount in X axis and translation movement in Y and Z axes. In this case our FALM series lens mount is fixed to YZ mounts (YZLM series).
Focus adjustable upto 10 mm
1" to 2" lenses can be mounted
YZ travel range : 4 mm , X travel : 10 mm
Optics held by threaded rings, Up to 2" optics can be mounted
M6 mounting holes, Aluminium alloy and stainless steel construction
Black anodized finish



Model No	Optic Size	D	D1	L	T
XYZLM-25	25 / 1"	25	25	65	20
XYZLM-50	50 / 2"	50	50	90	20

Five Axis Lens Mount for 25mm to 75mm Optics



This multi-axis lens mount consists of three precision liner stages driven by micrometers to provide fine positioning along X, Y and Z axis. It also has two axis kinematic adjustments for any optics mounted on it.
Allows 25mm Travel in XYZ directions
Fine tilting beam axis arrangement, XYZ travel range : 25 mm
Tilting range : +/- 2.5 degree
Optics held by adjustable jaws, Optics size 20 to 75mm can be mounted
Base mountable, Aluminium alloy construction, Black anodized finish



Model No	Optic Size
5XYKM-50	20 to 75

Five Axis Lens Mount Large Optics

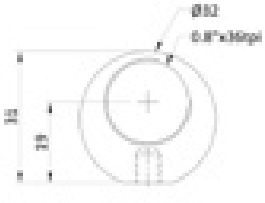
These mounts have three linear adjustments with translation stages and two tilt adjustments with a kinematically held mounting surface. The optics is secured by self centering jaws.



Angular Tip / Tilt	+/- 3°
Travel X	50 mm
Travel Y & Z	25 mm
Linear resolution	10 microns
Sensitivity	4 arc sec.
Mounting Hole	M6 Clear Slots base plate
Drive	100 tpi lead screw for tilting and micrometer for XYZ stage
Minimum optics diamater	20 mm
Maximum optics diameter	104 mm

Provides linear & tilt adjustments
Compatible with optics from 20 to 104 mm diameters

Model No	Optic Size
5ALM - 75	20 mm to 75 mm
5ALM - 100	20 mm to 104 mm



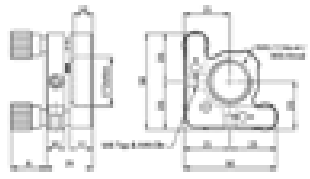
Rigid Objective Lens Mounts

Rigid objective lens mounts have standard RMS threads or C Mount threads.
These mounts are aluminium alloy 6061 contraction with black anodized finish. M6 mounting hole is provided for post mounting application.
Includes RMS or C threads, Suitable for Microscope objectives
Aluminium alloy, Black anodized finish



Model No	Thread Type	Inside D
MOH - R	"RMS" thread	Microscopic Objective
MOH - C	"C" Mount Thread	Microscopic objective or 'C' Mount objective

Kinematic Lens Mounts / Objective Lens Mounts



KLM series threaded type mounts are suitable for mounting Lenses, Microscope objectives, C mount microscopic objectives and camera lenses, lens tubes, condenser lens, beam expanders etc. In KLM series kinematic mounts, optics is held in the threaded bore by a threaded ring or suitable threaded optical components. This mount is post mountable type with M6 mounting hole at the bottom.

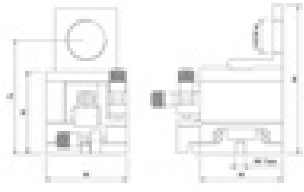


Angular Tip / Tilt	+/- 3°
Translation Range	6 mm (Selected Models Only)
Linear Resolution	0.25 mm / Rotation
Sensitivity	4 arc sec.
Mounting Hole	M6 / M4
Mounting Orientation	Vertical & Horizontal
Material	Aluminium

Model No.	Max. Optic Size. (mm)	Thread Typee
KLM - 25	For 1"/25mm optics and 1"/25 mm lens tubes	HM1
KLM - 50	For 2"/50mm optics and 2"/50 mm lens tubes	HM2
KMMOH	For Microscopic Objectives	RMS thread
KLM - C	For Camera Lens or Microscopic Objective	C Mount thread
	Mount with tilt and Translation	
KLM - T - 25	For 1"/25 mm optics and 1"/25 mm lens tubes	HM1
KLM - T - 50	For 2"/50mm optics and 2"/50 mm lens tubes	HM2
KMMOH - T	For Microscopic Objectives	RMS thread
KLM - T - C	For Camera Lens or Microscopic Objective	C Mount thread

Upto 3° angular tilt

Holds camera lenses, lens tubes etc



XYZ Objective Mounts

XYZMOH Series microscope objective mounts have 10mm travel in X direction. This mount is also suitable for PHC-1 and PHC-2 series pinhole cell.



10 mm travel in X direction
4 mm travel in Y&Z direction
20 arc sec. sensitivity
Plane bearing system
Aluminum alloy
Black anodized finish

Model No
XYZMOH

5 axis Objective Mounts 5AMOH Series

5AMOH series microscope objective mounts have precision movements in five directions. The positioner employs three precision linear stages for X, Y and Z-axes and a kinematic mount for precision tilt adjustments in two planes.For linear stages, precision, preloaded rolling contact ball bearing guideways are used for frictionless and stick-slip free positioning. The device is constructed in aluminium alloy and finished by black anodizing.



10 mm travel in X direction
6 mm travel in Y&Z direction
+/-2 degree tilting
20 arc sec. sensitivity
Aluminum alloy
Black anodized finish
Suitable for PHC - 1 and PHC - 2 series pinholes

Model No
5AMOH

Filter Mounts



Stackable Flip Filter Mount
FP-FCH Series

Stackable design
Black anodised finish



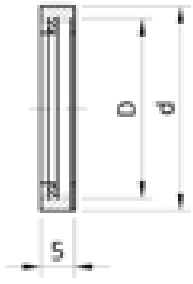
Optics Sizes	0.5" , 1" & 2"
Flipping range	0 to 90 degree
Flipping accuracy at 0 degree	10 urad
Mounting holes	M6 tapped holes and M4 CBR hole
Design	Stackable design
Material	Aluminium black anodised



FP-FCH-12.5	Suitable for 0.5 inch or 12.5 mm optics , M6 / M4 post mountable
FP-FCH-25	Suitable for 1 inch or 25 mm optics , M6 / M4 post mountable
FP-FCH-50	Suitable for 2 inch or 50 mm optics , M6 / M4 post mountable
FP-SH-75	haft for stacking up to 6 filters , qty 2 nos in one set

Filter Cells

Filter cell is a circular mount having inside treads.Filter is held inside the cell by treaded rings.



Can hold 3mm thick filters
Cell diameter upto 54 mm are available

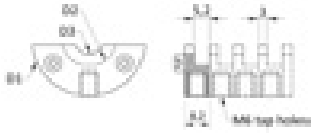
5 mm thickness for the cell
Up to 3 mm thick filter can be held



Model No	Optic Diameter : D	Cell Diamter : d
CFC - 12.5	12.5 mm / 0.5"	18 mm
CFC - 25	25 mm / 1"	30 mm
CFC - 38	38 mm / 1.5"	44 mm
CFC - 50	50 mm / 2"	54 mm

Quick Change Multiple Filter Holder

This filter holder has semi - circle shape so that filter can be inserted or replaced quickly . The holders can be stacked together as well.



Can hold 6 filters with different thickness
Semicircle shape for the ease of inserting filters

Model No	Optic Diameter : D	Filter Cell model	D1	D2	D3
QC - FCH - 12.5	12.5 mm / 0.5"	CFC - 12.5	38	18	10
QC - FCH - 25	25 mm / 1"	CFC - 25	50	30	22
QC - FCH - 38	38 mm / 1.5"	CFC - 38	62	44	34
QC - FCH - 50	50 mm / 2"	CFC - 50	70	54	42

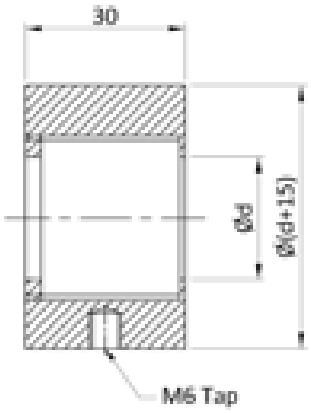


Filter Cell Holder - FCH Series

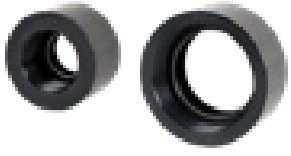
This holder has M6 tapped holes for post mounting. Filter cell is mounted inside the holder by threaded rings

Upto 5 filters can be placed
M6 tap holes for post mounting

- Up to 5 filter cells can be stacked
- The cells held by threaded rings
- M6 mounting hole
- Post mountable
- Aluminium construction
- Black anodized finish



Model No	Optic Diameter : D	d	Suitable Filter Cells
FCH - 12.5	12.5 mm / 0.5”	18	CFC - 12.5
FCH - 25	25 mm / 1”	30	CFC - 25
FCH - 38	38 mm / 1.5”	44	CFC - 38
FCH - 50	50 mm / 2”	54	CFC - 50



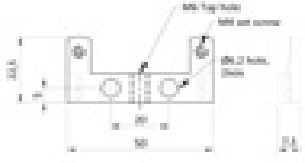
Square Filter Holder
SFH Series

These mounts are suitable for holding filters of square or rectangular shapes. The device can be mounted using standard posts having M6 tapped holes.

SFH SeriesLeaf springs to hold filters
Holds square & rectangular filters

Suitable for rectangular/square filters
Quick removal of filters
Optics held by leaf springs
Up to 6 filter holders are stackable
M6 mounting holes
Post mountable

Model No
SFH - 50
SFHD - 25





Model : SFHD - 25



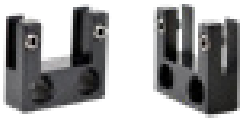
Model : SFH - 50

Rectangular Filter Holder
RFH Series

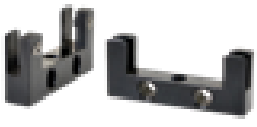
In this holder, filters are fixed by nylon tipped setscrews. This filter holder is post mountable, having M6 tapped hole at bottom.
Nylon tipped set screw to hold optics
Post mountable with M6 tap holes
Economical
Suitable for rectangular / square filters
Optics held by nylon tipped set screw
M6 mounting holes
Post mountable
Aluminium alloy
Black anodized finish

Model No
RFHD - 25
RFH - 50



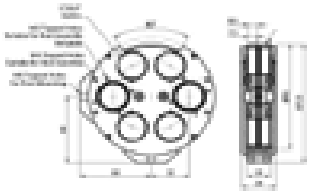


Model : RFHD-25



Model : RFH-50

Filter Wheel



Filter Wheel FW series can hold up to 12 filters of 1 inch diameter at a time. Filters are held by threaded ring. The filter wheel can be rotated and positioned at desired location.

Can hold upto 12 filters
Single & dual filter holders

Up to 12 filters can be held
3 point spring loaded ball latches
Filters held by threaded rings
M6 mounting hole
Post mountable
Aluminium alloy
Black anodized finish



Model No	Optic Size	Number of Filters	Type of Filter wheel
FW - 0.5 - 1	12.5 mm / 0.5”	6	Single Filter Wheel
FW - 0.5 - 2	12.5 mm / 0.5”	12	Dual Filter Wheel
FW 1 - 1	25 mm / 1”	6	Single Filter Wheel
FW 1 - 2	25 mm / 1"	12	Dual Filter Wheel

Stackable Filter Wheel

4° filter inclination
Upto 4 filter wheels in a single mount

Two or more filter wheels (upto 5) can be stacked in this device for multiple filter assembly. Standard wheels can accommodate four filters.



Model : SFW - 1



Model : SFW - 2

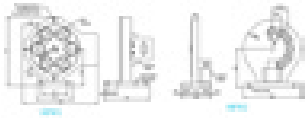


Model : SFW - 3

Number of filters which can be held in a single filter wheel	4 nos
Number of filter wheel which can be stacked in the mount	5 nos
Optics Size	25 mm / 1”
Maximum Thickness	4 mm
Optics Held By	Threaded Ring
Filter Inclination	4 degree
Mounting Hole	M6 Tapped hole for post mounting
Construction	Aluminium
Finish	Black Anodized

Model No	Optic Size	Number of filter wheel	Number of Filters
SFW - 1	25 mm / 1”	1	4
SFW - 2	25 mm / 1”	2	8
SFW - 3	25 mm / 1”	3	12
SFW - 4	25 mm / 1”	4	16

Motorized Filter Wheel with Controller



In this model of motorized filter wheel, selection of filters is by a stepper motor mechanism. It facilitates fast and accurate selection of filters in an optical system. Using a suitable stepper motor controller and drive, this device can be integrated to an optical experiment setup, making light filtering process fast and flexible.

Accurate selection of filters
Fast & flexible light filtering



Number of filters can be held in a single filter wheel	5 nos, 6 nos, or 12 nos
Optics Size	12.5 mm, 25 mm / 1", 50 mm / 2"
Maximum Thickness	8 mm
Optics Held By	Threaded Ring
Filter Inclination	4 degree
Mounting Hole	M6 Tapped hole for post mounting
Construction	Aluminium
Finish	Black anodized

Up to 8 mm thick filters can be held
Post mountable
Separate base plate provided for mounting directly to breadboard
M6 / M4 Mounting holes



Model No	Optic Size	Number of filters in a wheel	Type
MFW - 1	25 mm / 1"	6	Single Filter Wheel of 6 filters of dia - 25 mm / 1"
MFW - 2	25 mm / 1"	12	Single Filter Wheel of 12 filters of dia - 25 mm / 1"
MFW - 0.5	12.5 mm / 0.5"	6	Single Filter Wheel of 6 filters of dia - 12.5 mm / 0.5"
MFW - 0.5 - 5	12.5 mm / 0.5"	5	Single Filter Wheel of 5 filters of dia - 12.5 mm / 0.5"

Plate Holder / Glass Slide Holders

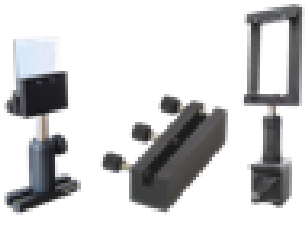


Plate / glass slide holders can be used for holding glass plates rigidly. The plates are held in position by adjustable screws.

Plate thickness upto 8mm
Locking knobs to hold plates tightly

Maximum plate thickness	1 mm to 8 mm
Mounting hole	M6 Tapped hole for post mounting
Material	Aluminium

Model No	Size H x W x L (mm)	Number of Locking knobs
CPL - 25	25 x 25 x 25	1
CPL - 50	25 x 25 x 50	2
CPL - 75	25 x 25 x 75	3
CPL - 100	25 x 25 x 100	4

Plate Holder / Glass Slide Holders

This plate holder can be used for mounting plates of thickness upto 22 mm. The holder can be mounted on post.



Easy mounting
Suitable for plates of thickness from 5 to 22 mm

Maximum plate thickness	5 mm to 22 mm
Optics held by	Plastic padded screw
Mounting hole	M6 tapped hole / M4 CBR hole for post mounting
Material	Aluminium

Model No	Size H x W x L (mm)	Number of Locking knobs
CPC - 25	25 x 25 x 37	1
CPC - 50	25 x 50 x 37	2
CPC - 75	25 x 75 x 37	3
CPC - 100	25 x 100 x 37	4

Diffuser Plate with Rotator

This device consists of a circular glass diffuser fixed to the shaft of a DC motor. The controller for this device provide speed adjustments from 300 - 1500 rpm.



Disc rotation speed	300 rpm min to 1500 rpm Max
Disc diamter	200 mm dia
Mounting hole	M6 tapped hole / M4 CBR hole for post mounting
Controller	Speed control using front panel knob
Motor	DC motor

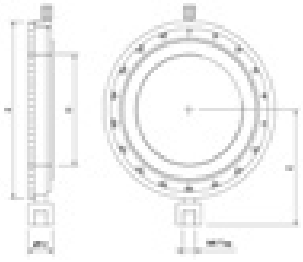
DC Motor is used as actuator
Compatible with Circular glass diffusers



Model No	Glass disc Size	Clear apreture
DPR - 100	Dia - 100 x 3	30 mm
DPR - 150	Dia - 150 x 3	55 mm
DPR - 165	Dia - 165 x 3	60 mm
DPR - 200	Dia - 200 x 3	80 mm
DPR - 250	Dia - 250 x 3	100 mm
DPR - 300	Dia - 300 x 3	105 mm

Polarizer Mounts

Manual Polarizer Rotators
PMC Series



Polarizer rotators are suitable to rotate polarisers, wave plates, crystals etc. Four types of manual polariser rotators are available for different applications. Suitable adapters for various optic sizes are available on request.

Polarizer Rotator, PMC Series
PMC Series can be rotated and locked at desired position. Single polarizer mount and dual polarizer mounts are available in PMC series.

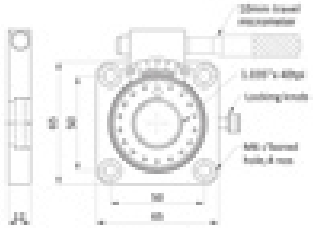


360° Rotation with locking knob
Graduated Circular degree scale from 0 to 360°

- 1° resolution, Manual 360° rotation
- Optics held by threaded ring, Threaded bore depth : 12 mm
- M6 mounting holes, Post mountable, Aluminium alloy, Black anodized finish

Model No	Optic Diameter	Thread	D	d	c
PMC - 25	25 mm / 1”	HM1	25 mm	56 mm	40 mm
PMC - 50	50 mm / 2”	HM2	50 mm	81 mm	53 mm

Precision Polarizer Rotator
PMP Series



Precision rotary adjustments are possible in this mount. Plate/sheet polarizes are held between two threaded rings inside a threaded bore. For other shapes, adapters have to be used.

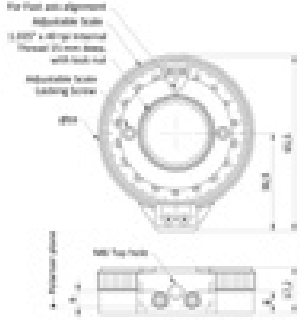
PMP SeriesMicrometer Driven controller
Precision rotary & fine adjustments



- 0.1 resolution, Manual 360° rotation, +/- 3° Precision Movement
- Drive by Micrometerm, Readout from vernier
- Optics held by Threaded Ring, Threaded Bore Depth : 12 mm
- M6 mounting holes, Post mountable, Aluminium alloy, Black anodized finish

Model No	Optic Diameter
PMP - 25	25 mm / 1”
PMP- 50	50 mm / 2”

Polarizer Rotator/Wave Plate Rotator With Fast Axis Dial PMC-FA



This polarizer mount provides continuous 360° rotation with 0.5 degree resolution within vernier scale. Outside surface is knurled to ensure grip while positioning. There is M6 tapped hole at the bottom for post mounting. Fast axis of the mounted wave plate can be set to the desired reading with the help of a dial which is rotatable independently.

- Able to set fast axis dial, 360 degree continuous rotation
- 0.5 Degree resolution, Suitable 1” and 2” optics
- Suitable for wave plates & polarizing optics
- For smaller optics, adapters can be used, Post mountable with M6 screws
- Aluminium alloy & black anodized finish

Model No	Optic Diameter	Thread	D
PMC - 25	25 mm / 1”	HM1	25 mm
PMC - 50	50 mm / 2”	HM2	50 mm

Laser Mounts

Kinematic Diode Laser Mount
Model : HO-KDLM-20



Kinematic diode laser mount can be used to position diode lasers by fine tilting the beam axis in two perpendicular planes.

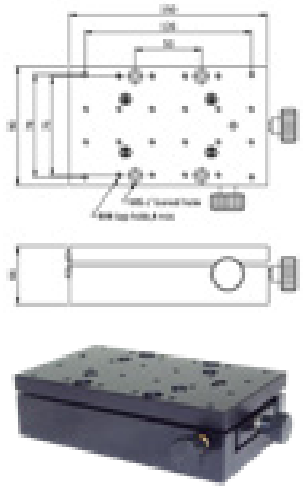
Custom laser adaptors are available. Please contact us at sales@holmarc.com

Model No:	
Fine adjustments	Using 80 tpi leadscrews
Adjustment range	+/- 3°
Sensitivity	20 arc sec
Construction	Aluminium alloy
Finish	Black anodized
Maximum diameter of the diode module	25 mm

Compatible with Diode Lasers

Fine tilting beam axis arrangement

DPSS Laser Mount

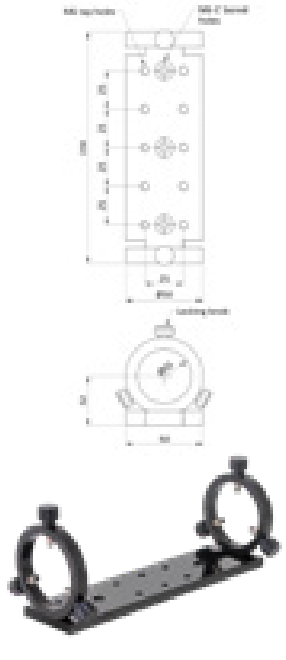


These mounts are manufactured with mounting holes suitable for DPSS lasers. Three lead screws supported by the kinematic design of the mount enables tilt as well as linear adjustments. The base of the mount has holes suitable for breadboard mounting.

- Tilting range +/- 2 degrees
- Driven by 80 tpi leadscrews
- 20 arc sec. sensitivity
- Aluminium alloy
- Black anodized finish
- Breadboard mountable

Model No:	Platform Size	Tilting Range
HOM-DPSS-G-15090	150 x 90 mm	+/- 2 degree
HOM-DPSS-19090	190 x 90 mm	+/- 2 degree

He-Ne laser Mount



This laser holder can be mounted using standard posts having M6 tapped holes. Two posts and post holders have to be used for stability. The device can be directly mounted to breadboards and stages by making use of two M-6 C'bored holes provided at the base.

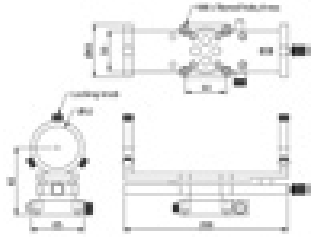
Laser is held inside two rings each having three adjustment thumb screws. Tilt and position can be adjusted by the use of thumb screws.

Aluminium alloy construction
Black anodized finish

Model No:	Min Dia Laser (mm)
HeLM - 30	32 mm
HeLM - 50	50 mm

Suitable He-Ne Lasers
Provides fine centering adjustability

He-Ne Laser Mount Tilt And Rotation



Holmarc's gimbal laser mounts provide 360° coarse positioning in two axes in addition to fine adjustments. Laser is held in position by nylon tipped setscrews.

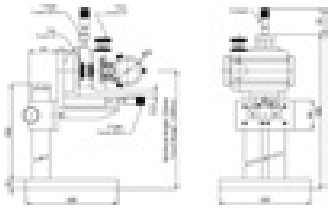
360° Rotation with ±2° Fine Adjustment
Provides fine centering adjustability

Coarse adjustment range	360° (Azimuth & elevation)
Fine adjustment range	+/- 2° (Azimuth & elevation) Fine adjustments by 80 tpi lead screws
Sensitivity	20 arc sec
Construction	Aluminium alloy
Finish	Black anodized



Model No	Min Dia Laser (mm)
GY-He-LM-30	32 mm
GY-He-LM-50	50 mm

Height Adjustable XZ Tilt & Rotation Laser Mount



This laser mount is fixed to a pillar system so that the entire laser assembly can be positioned anywhere on the pillars. Linear adjustments along X and Z axis are provided by micrometer driven translation stages. Tilt control is given by a thumb screw.

X travel	25 mm
Z travel	25 mm
Pitch	± 3°
Yaw	± 3°
Minimum height	150 mm
Maximum height	450 mm
Maximum laser diameter	50 mm
Material	aluminium
Mounting holes	M6 CLR slots



Model No	Max Laser Dia:
HA-LM-50	50 mm

Base Mountable XZ Tilt & Rotation Laser Mount



This laser mount has a base plate with M6 slots for fixing to breadboards or optical tables. There are micro meter driven translation stages for X and Z axis adjustments.

X travel	25 mm
Z travel	25 mm
Pitch	± 3°
Yaw	± 3°
Minimum height	150 mm
Maximum height	450 mm
Maximum laser diameter	50 mm
Material	aluminium
Mounting holes	M6 CLR slots



Model No	Max Laser Dia:
HA-LM-50	50 mm

Apertures

Motorized Variable Aperture



Actuator	Stepper motor
Aperture type	Circular
Aperture diameter	2 mm to 11 mm (Adjustable via software or front panel)
Resolution	1 mm
PC interface	RS232 / USB
Front panel LCD display shows aperture diameter	
Front panel buttons for Open and Close function (1 mm on single press)	

Pinholes - Mounted
Holmarc manufactures precision pinholes for spatial filtering and other similar applications. Standard pinholes are available in either copper or stainless steel substrates

HPRA - Series



Material : Copper
25 mm outer diameter
20 Micron thickness
Compatible with PHC - 3 pinhole cells

HPRA-3-5	5.0 μm +/- 1.0 μm
HPRA-3-10	10.0 μm +/- 1 μm
HPRA-3-15	15.0 μm +/- 1.5 μm
HPRA-3-20	20 μm +/- 2 μm
HPRA-3-25	25 μm +/- 2 μm
HPRA-3-30	30 μm +/- 2 μm
HPRA-3-35	35 μm +/- 2 μm
HPRA-3-50	50 μm +/- 2 μm
HPRA-3-100	100 μm +/- 2 μm
HPRA-3-200	200 μm +/- 2 μm

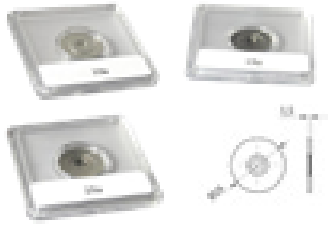
PIN - H - Series



Material : Stainless Steel
9.35 mm outer diameter
20 Micron thickness
Compatible mounts available

Model No.	Size
PIN-H-025	0.25 mm
PIN-H-050	0.50 mm
PIN-H-075	0.75 mm
PIN-H-100	1.00 mm
PIN-H-200	2.00 mm
PIN-H-300	3.00 mm

PINH - Series



Material : Stainless Steel
25 mm outer diameter
20 Micron thickness
Compatible with PHC - 3 pinhole cells

Model No.	Size
PINH-5.0	5.0 μm +/- 1.0 μm
PINH-10	10.0 μm +/- 1 μm
PINH-15	15.0 μm +/- 1.5 μm
PINH-20	20 μm +/- 2 μm
PINH-25	25 μm +/- 2 μm
PINH-30	30 μm +/- 2 μm
PINH-35	35 μm +/- 2 μm

Pinhole Cells

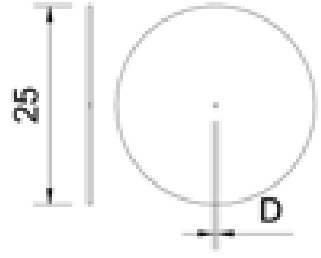


Model No : PHC - 3
These pinhole cells are suitable for 25 mm dia. mounted pinholes. It can be used with rigid, kinematic, XY, XYZ and 5 axis stages. The cell comes with standard RMS thread for fixing to various mounts.

RMS external thread
Material : Aluminium
Finish : Black anodized

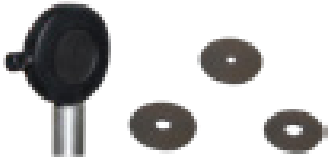
Round Apertures - AS Series

These apertures are made in aluminium substrate and finished by black anodizing. The aperture can be mounted to our standard RLM-25 lens mount.

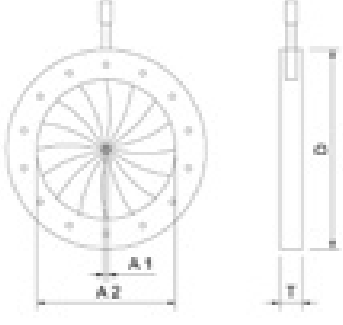


Material	aluminium
Finish	black anodized
25 mm outer diameter	
0.5 mm thickness	
Compatible with RLM - 25 mount	

Model No.	Diameter D
AS - 0.5	0.5 mm
AS - 1	1 mm
AS - 2	2 mm
AS - 3	3 mm
AS - 4	4 mm
AS - 5	5 mm
AS - 6	6 mm
AS - 7	7 mm
AS - 8	8 mm
AS - 9	9 mm
AS - 10	10 mm



Variable Aperture
Std Variable Round Aperture - SSID Series



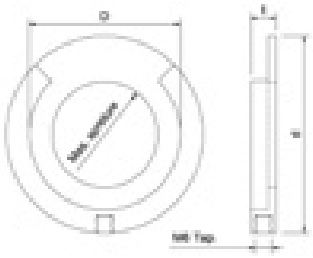
Holmarc manufactures variable aperture in four different sizes. These are precision devices which offer near perfect circular apertures.

Made of brass and aluminium
Leaves made of spring steel
Compatible with MSSID Series mounts
Black anodized finish for casing
Black zinc finish for leaves

Model No.	Max Aperture	Min Aperture	D (mm)	Thickness (mm)
SSID-12	12 mm	0.8 mm	19.8	5.0
SSID-20	20 mm	0.8 mm	30	5.5
SSID-25	25 mm	0.8 mm	37	5.5
SSID-37	37 mm	1.2 mm	53	6.0
SSID-50	50 mm	2 mm	70	7.5



Std Variable Round Aperture Mount - MSSID Series



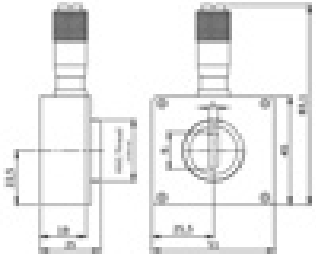
These mounts are specially suited for Holmarc's variable apertures. There is M6 tapped hole at the bottom for post mounting.

Aluminium alloy construction
M6 mounting hole
Black anodized finish
Compatible with SSID series apertures

Model No.	Max Aperture	Min Aperture	D (mm)	Thickness (mm)
MSSID-12	19.8	8.0	35.8	SSID-12
MSSID-20	30	9.0	50.0	SSID-20
MSSID-25	37	8.5	53.0	SSID-25
MSSID-37	53	9.0	69.0	SSID-37
MSSID-50	70	10.5	86.0	SSID-50



Std Variable Slit - SVRA Series



Variable slits manufactured by Holmarc has micrometer drive which shows slit opening directly on the graduations.

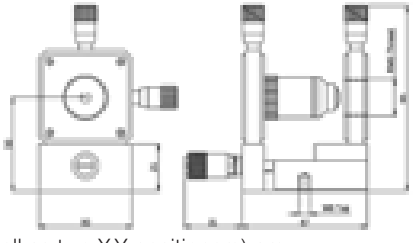
Slit has 15mm length
0-2 mm opening
Opens equally from center
Polished steel blades
M6 mounting hole
Post mountable
Aluminum alloy construction
Black anodized finish



Model No.
SVRA

Spatial Filter Mount - Laser Fiber Coupler SFAS Series

All the translation movements (Z axis stage as well as two X-Y positioners) are provided with preloaded ball bearing guide ways for play less and stick-slip free positioning.

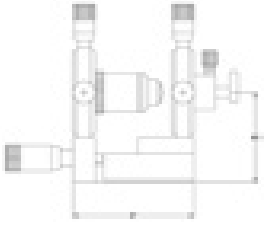


Model No.
SFAS
SFAS - VC



Laser Fiber Coupler

All the translation movements (Z axis stage as well as two X-Y positioners) are provided with preloaded ball bearing guide ways for play less and stick-slip free positioning.
3 mm XY adjustment
10 mm linear movement
Fiber Chuck / FC Connector Compatible
Compatible with std microscope objective
M6 mounting hole
Post / base mountable
Black anodized finish



Model No.	Connector Type
LFC - 1	Fiber Chuck (FC1)
LFC - 1 FC	FC, Connector

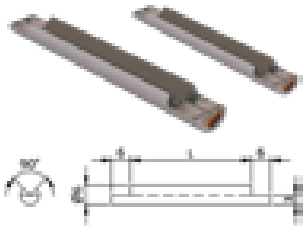


Fiber Chuck and Holders



Fiber Chuck - FC - 1 Series

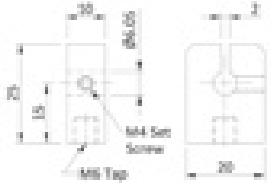
This fiber chuck can be used for mounting optical fibers safely and rigidly. The chuck is a V grooved rod having both ends flattened. Fiber is held in position inside the groove by rubber clamps as shown in the photograph.



Model No.	Length L
FC-1-20	20 mm
FC-1-30	30 mm
FC-1-50	50 mm
FC-1-65	65 mm

2 Nos of Rubber clamps supplied with every FC1 Fiber chuck.

Fiber Chuck Holder - FCH Series



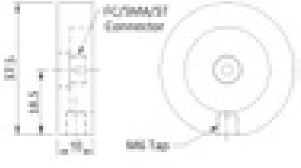
Fiber chuck holders helps to mount fiber chucks in a post system.

Suitable For Bare type and FC, SMA series Fiber Connectors



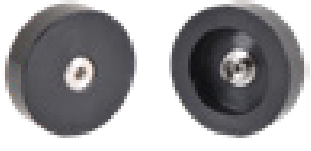
Model No.
FCH - I - 20

Fiber Chuck SMA / FC / ST Fiber Holders



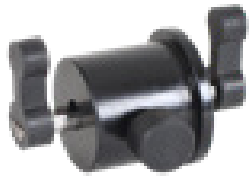
Fiber chuck holders helps to mount fiber chucks in a post system.

Suitable For Bare type and FC, SMA series Fiber Connectors

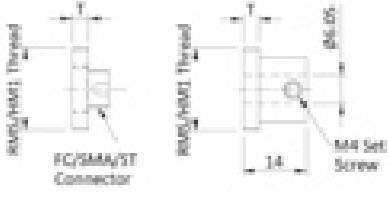


Threaded Chuck Holder For Fiber Chucks / Connectors

These chuck holders have external threads, suitable for using with many standards mounts as listed below.



RMS thread / HM1 thread
Aluminium alloy
Black anodized finish
Suitable for RMS / HM1 threaded allignment mounts or adapters



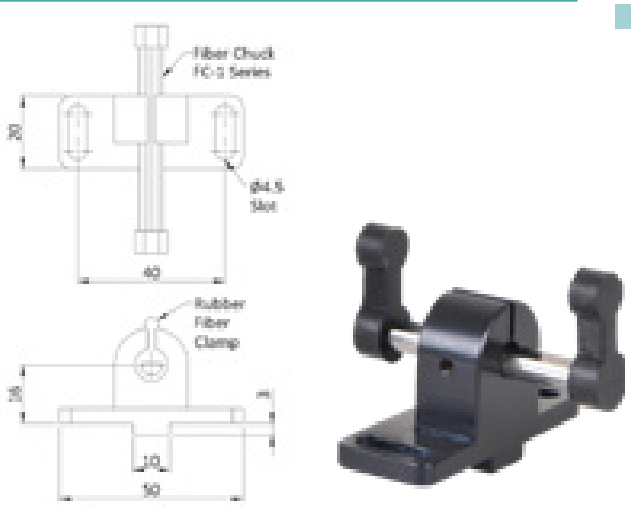
Model No.	Thread	Connecter / Chuck Type
FCH-TI-FC-1	RMS	Fiber Chuck FC1
FCH-TI-SMA	RMS	SMA Fiber Connector
FCH-TI-FC	RMS	FC-Fiber Connector
FCH-TI-ST	RMS	ST-Fiber Connector
FCH-T2-FC-1	HM1	Fiber Chuck Fc1
FCH-T2-SMA	HM1	SMA Fiber Connector
FCH-T2-FC	HM1	FC-Fiber Connector
FCH-T2-ST	HM1	ST-Fiber Connector

Adapters

Adapters for fiber chuck

Adapters is used to hold fiber chuck safely in an optical system. Adapter has counter bored slots for mounting to stages / optical tables.

- Suitable for bare fiber
- Aluminium alloy
- Black anodized finish
- Fiber chuck FC-1 sold separately
- For 6mm dia FC-1 chuck

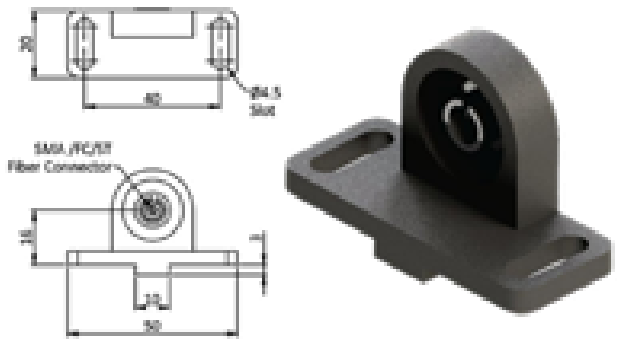


Model No.
TC-FCH

Adapters for SMA / FC / ST Fiber Connector

This adapter model is made for various standard fiber connectors.

- Suitable for SMA / FC / ST fiber connector
- Aluminium alloy
- Black anodized finish

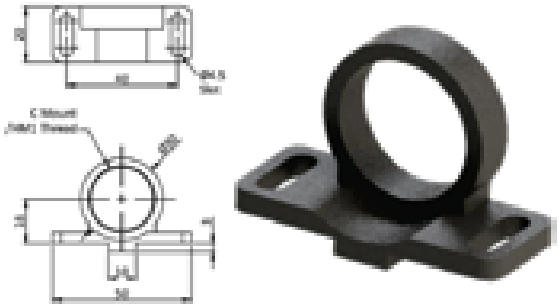


Model No.	Type
TC-SMA	SMA connector
TC-FC	FC connector
TC-ST	ST connector

HM1 / C Mount Threaded Adapter

This adapter model is made for various standard fiber connectors.

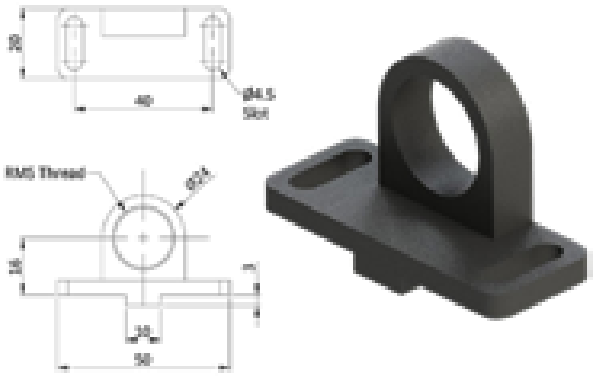
- Suitable for C mount objectives
- Black anodized finish
- Aluminium alloy
- Suitable for HM1 threaded Components (Lens tube / fiber holder etc...)



Model No.	Thread
TC - HM1	HM1 thread
TC - CM	C Mount thread

RMS Threaded Adapter (For Microscope Objectives)

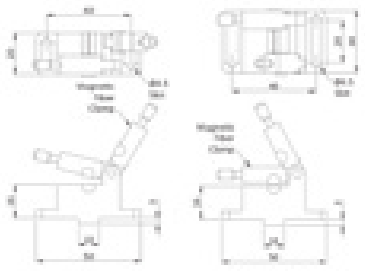
RMS threaded adapter has inside threads suitable for standard microscope objectives.



Model No.	Thread
TC - RMS	RMS thread

- Black anodized finish
- Aluminium alloy
- Suitable for microscope objectives / assemblies with RMS thread (Lens tube / fiber holder etc...)

Clamping Fiber Adapter



This fiber adapter is for fixing bare optical fiber rigidly and safely in an optical system.

- Suitable for bare fiber
- Magnetic clamps
- Aluminium alloy

Model No.	Fiber Type
TC-CFA-S	Bare Fiber
TC-CFA-L	Bare Fiber

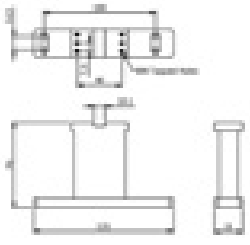


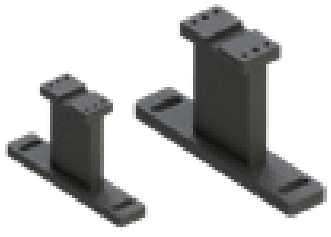


Rigid Support

These rigid supports have M4 tapped holes on top and M6 C' bored holes on bottom.

Model No.
TC-RS-76

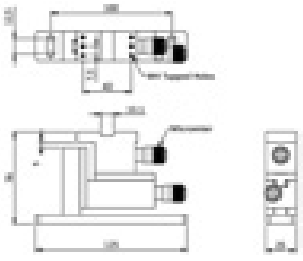




10 mm grooved top plate
Ø6.5 slots for M6 screws
76 mm height
Aluminium alloy
Black anodized finish

XZ Positioner

XZ fiber positioner consists of precision, compact XZ stage with fiber clamping provision through the center of the Z-axis stage. The stages make use of preloaded rolling contact ball bearing guide ways for frictionless and stick-slip free positioning. The positioner is equiped with a fiber chuck and chuck holder to clamp fibers up to1 mm diameter.



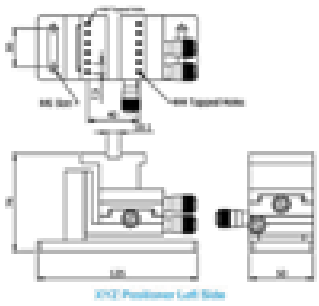
10.1 mm grooved top plate
6.5 mm dia slots for mountings
76 mm height
X Travel 5 mm / 2.5 mm
Z Travel 5 mm / 2.5 mm
Aluminium alloy
Black anodized finish



Drive	
Type 1	Type 2
Micrometer	Micrometer
Resolution 10 Micron	Resolution 5 Micron
Positioning Accuracy 5 Micron	

Model No.	Drive	Travel
TC XZ-Mμ 10	Micrometer 10μ	5 mm
TC XZ-Mμ 5	Micrometer 5μ	2.5 mm

XYZ Positioner





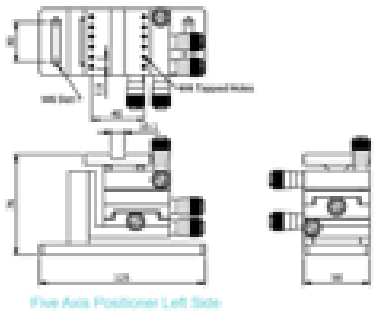
XYZ fiber positioner consists of compact XYZ stage with fiber clamping provision through the center of the Z-axis stage. The stage makes use of preloaded rolling contact ball bearing guide ways for frictionless and stick-slip free positioning. The positioner is equiped with a fiber chuck and chuck holder to clamp fibers up to1 mm diameter.

10.1 mm grooved top plate
6.5 mm dia slots for mountings
76 mm height
X Travel 5 mm / 2.5 mm
Y Travel 5 mm / 2.5 mm
Z Travel 5 mm / 2.5 mm
Aluminium alloy
Black anodized finish

Drive	
Type 1	Type 2
Micrometer	Micrometer
Resolution 10 Micron	Resolution 5 Micron
Positioning Accuracy 5 Micron	

Model No.	Drive	Micrometer	Travel
TC-XYZ-R-Mμ10	Micrometer 10μ	Right	5 mm
TC-XYZ-R-Mμ 5	Micrometer 5μ	Right	2.5 mm
TC-XYZ-L-Mμ10	Micrometer 10μ	Left	5 mm
TC-XYZ-L-Mμ 5	Micrometer 5μ	Left	2.5 mm

Five Axis Positioner





Five axis fiber positioner consists of compact 5 axis stage with fiber clamping provision through the center of the Z-axis stage. The stage makes use of preloaded rolling contact ball bearing guide ways for frictionless and stick-slip free positioning. The positioner is equipped with a fiber chuck and chuck holder to clamp fibers up to1 mm diameter.

Drive	
Type 1	Type 2
Micrometer	Micrometer
Resolution 10 Micron	Resolution 5 Micro
Positioning Accuracy 5 Micron	

Top plate having 10.1 mm groove
6.5mm dia slots for mountings
76mm height
X Travel 5 mm / 2.5 mm
Y Travel 5 mm / 2.5 mm
Z Travel 5 mm / 2.5 mm
Aluminium black anodized finish
ø 1 Tilting range ± 2°
ø 2 Tilting range ± 2°

Model No.	Drive	Micrometer	Travel
TC-5AR-Mu 10	Micrometer 10μ	Right	5 mm
TC-5AR-Mu 5	Micrometer 5μ	Right	2.5 mm
TC-5AL-Mu 10	Micrometer 10μ	Left	5 mm
TC-5AL-Mu 5	Micrometer 5μ	Left	2.5 mm

Optical Chopper

Model No: HO-IAD-OC-01

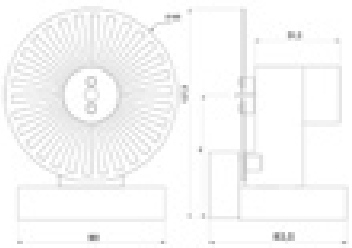
An optical chopper is a mechanical device which physically chops a light beam into discrete light pulses. It is widely used in various optical experiments. It modulates different light sources with given frequency for their subsequent analysis.



The chopping discs come in a variety of slot apertures and can be replaced with ease.

Holmarc's optical chopper is a stable device through out the frequency range. The basic system consists of control unit, rotating head and a set of four chopper discs. A DC motor drives the rotating head in closed loop control. Chopping discs are replaceable by the user with ease. A heavy base to which the rotating assembly is fixed provides stability during operation. Optical axis height is approximately 100 mm. The required disc depending on the frequency can be fixed to the rotating head. This system provide wide range of frequencies (10Hz - 3.7kHz.) A wide selection of additional discs and accessories are available to extend the frequency range and to satisfy individual requirements. Frequency is displayed directly on the digital display of the control unit. Easy-to-interchange blades are made of corrosion protected material for durability.

Frequency	
Two Slot	10 Hz to 200 Hz
Six Slot	100 Hz to 600 Hz
Thirty slot	200 Hz to 4000 Hz
Duty Cycle	50 %
Stability	+/- 1 Hz
Chopper Wheel Diameter	105 mm
Frequency Read Out	16 x 2 Lines LCD
Reference Pick-Up	IR LED and Photo Transistor Pair
Motor Cable Length	1.5 m
Operating Temperature	10°C - 50°C
Power input	230V, 50Hz



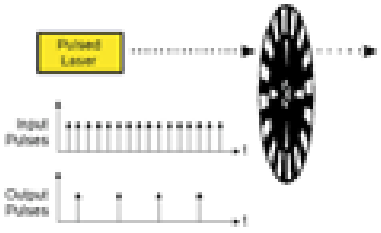
Delay Generator

The delay generator accepts a TTL pulse train having a frequency between 10 Hz to 4 kHz, and provides a delayed version of the same signal. The amount of time delay can be set using the front panel buttons and the LCD display. It can delay the signal by 10 microseconds minimum to 60 milliseconds maximum. This device can be used for triggering a measurement device or camera when used with an optical chopper. The reference signal from the optical chopper may not be in phase with the chopped laser output. Adding a user specified delay to the reference signal will make it in phase with the laser and bring the triggering in sync with the laser pulsations.

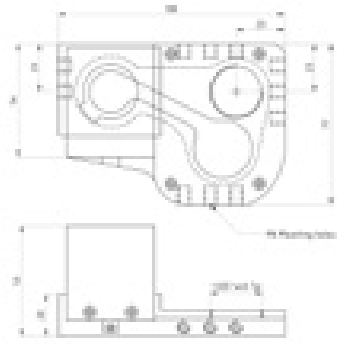


Specifications

Input signal	TTL (5V) pulses
Input signal frequency range	10 Hz to 4000 Hz
Minimum delay	10 microsecond
Maximum delay	60 millisecond
Delay resolution	1 microsecond
User interface	Alphanumeric LCD and buttons
Input & Output connectors	BNC
Power input	90 - 260V / 50 - 60Hz



Motorised Shutter

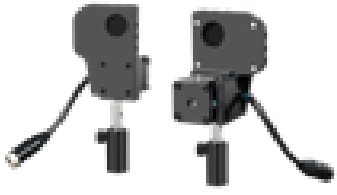


Model No: HO-MS-25

Precision and Efficiency for Your Optical Systems

Holmarc's HO-MS-25 Motorized Shutter is designed to provide precise and reliable control in your optical systems. With a 25mm aperture and rapid opening and closing speed, this shutter is ideal for a variety of applications requiring accurate light control. Constructed with high-quality aluminium, it ensures durability and lightweight handling. The remote operation and stepper motor movement add to its convenience and precision.

Aperture Size	25 mm
Opening and Closing Speed	1 second
Material Construction	High-quality Aluminium
Mounting Options	M6 mounting holes for versatile post mounting and height adjustments
Extended Brass Connector	Ensures reliable and stable connections
Remote Operated	Convenient control from a distance
Stepper Motor Movement	Smooth and precise shutter operation
Controller	Holmarc Stepper Motor Controller
Software	PC-based programmable software for easy operation
External Trigger Ports	For advanced control of the shutter



25 mm aperture
Precise shutter operation

Accessories

Holmarc Stepper Motor Controller : Advanced controller for smooth operation.
PC-Based Programmable Software : User-friendly software for customized programming.
Extended Brass Connector : For enhanced connectivity and stability.
Mounting Posts and Hardware : Various options for flexible and secure mounting.

Check our Controller & Software for more details

Applications

- Optical Experiments : Ideal for precise control of light exposure in laboratory settings.
- Photography : Useful in controlled lighting conditions for capturing high-quality images.
- Laser Systems : Ensures accurate control of laser exposure times in various applications.
- Industrial Automation : Enhances control in automated systems requiring precise timing.

Post Mounting Systems



8 mm Post System

Model No: HO-MS-25

Precision and Efficiency for Your Optical Systems

Holmarc's HO-MS-25 Motorized Shutter is designed to provide precise and reliable control in your optical systems. With a 25mm aperture and rapid opening and closing speed, this shutter is ideal for a variety of applications requiring accurate light control. Constructed with high-quality aluminium, it ensures durability and lightweight handling. The remote operation and stepper motor movement add to its convenience and precision.

8 mm diameter Post

P8 series posts are of 8 mm diameter with precision ground finish. Both ends are provided with M4 or 8-32 tapped holes. P8 series posts are compatible with PH8 series post holders.

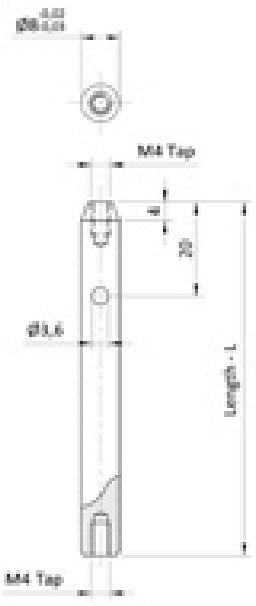
8 mm diameter posts
Length up to 150 mm
M4 or 8-32 tapped holes at both ends
Non magnetic Stainless steel construction
Ground finish

M4 tapped holes at both ends

P8 - 20	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 20 mm
P8 - 25	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 25 mm
P8 - 30	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 30 mm
P8 - 40	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 40 mm
P8 - 50	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 50 mm
P8 - 75	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 75 mm
P8 - 100	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 100 mm
P8 - 150	8 mm dia, non magnetic stainelss steel post ,M4 tap both end, length 150 mm

8 - 32 tapped holes at both ends

Model No	Description
PT8 - 20	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 20 mm
PT8 - 25	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 25 mm
PT8 - 30	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 30 mm
PT8 - 40	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 40 mm
PT8 - 50	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 50 mm
PT8 - 75	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 75 mm
PT8 - 100	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 100 mm
PT8 - 125	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 125 mm
PT8 - 150	8 mm dia, non magnetic stainelss steel post, 8-32 tap both end, length 150 mm





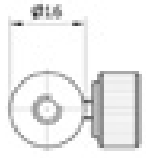
Non magnetic Stainless steel

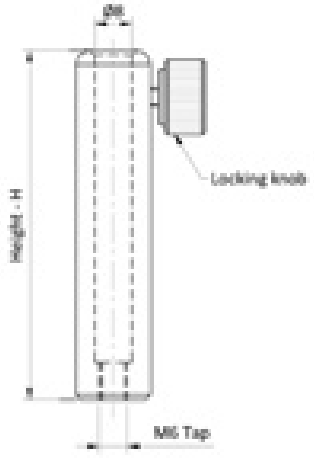
Length ranges from 20 to 150mm

PH Series Post Holders

These post holders have square relief cut for stable three point line contact with post and post holder. Spring loaded plunger knob is provided with every post holder for smooth up and down movement and stable tightening at desired position.

We can fix post holder to an optical table , base plate or a pedestal adapter using M6 mounting hole provided at the bottom of the post holder.





Aluminium alloy construction
Black anodized finish
Length up to 100 mm
8 mm inner diameter
16 mm outer diameter
Suitable for 8 mm diameter post

M6 Mounting hole

Model No	Description
PH8 - 20	8 mm inner & 16 mm outer dia, aluminium black anodised, length 20 mm with M6 Mounting hole
PH8 - 30	8 mm inner & 16 mm outer dia, aluminium black anodised, length 30 mm with M6 Mounting hole
PH8 - 40	8 mm inner & 16 mm outer dia, aluminium black anodised, length 40 mm with M6 Mounting hole
PH8 - 50	8 mm inner & 16 mm outer dia, aluminium black anodised, length 50 mm with M6 Mounting hole
PH8 - 75	8 mm inner & 16 mm outer dia, aluminium black anodised, length 75 mm with M6 Mounting hole
PH8 - 100	8 mm inner & 16 mm outer dia, aluminium black anodised, length 100 mm with M6 Mounting hole



1/4 - 20 Mounting hole

Model No	Description
PHT8 - 20	8 mm inner & 16 mm outer dia, aluminium black anodised, length 20 mm with 1/4-20 Mounting hole
PHT8 - 30	8 mm inner & 16 mm outer dia, aluminium black anodised, length 30 mm with 1/4-20 Mounting hole
PHT8 - 40	8 mm inner & 16 mm outer dia, aluminium black anodised, length 40 mm with 1/4-20 Mounting hole
PHT8 - 50	8 mm inner & 16 mm outer dia, aluminium black anodised, length 50 mm with 1/4-20 Mounting hole
PHT8 - 75	8 mm inner & 16 mm outer dia, aluminium black anodised, length 75 mm with 1/4-20 Mounting hole
PHT8 - 10	8 mm inner & 16 mm outer dia, aluminium black anodised, length 100 mm with 1/4-20 Mounting hole

Suitable for 8mm diameter post
A variety of post heights Available

Plunger knobe
Model : PGK-20

Plunger knobeis a brass plunger, loaded with a suitable spring, inside M6 stud. This plunger knob prevents posts from sudden falling while loosening the knob for removing the post or adjusting height in an optical set up. Only one hand is required for any operation using post and post holder.
one set contains 10 nos.



12mm Post System

Post mounting system is a convenient device for holding various optical mounts in a breadboard based experimental setup. Height and angular position of mounted optics can be easily adjusted. The post system includes post, post holder, post holder base and post collar.

P Series Post
Ø12 mm

P series stainless steel posts have 12mm diameter with precision ground finish. One end of the post is turned suitable for M4 screw and other end is for M6 screw. A 3.6 mm diameter hole is provided on the surface of the post for providing extra torque while tightening components on it. A 3.5 mm allen key or a screwdriver with less than 3.6 mm diameter can be used for tightening. For post holders suitable for 12 mm diameter posts refer to PH series post holders



Specifications
Stainless steel
Ground finish
One end chamfered for easy access
M4 & M6 threaded for mounting

P20	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 20 mm
P25	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 25 mm
P30	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 30 mm
P40	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 40 mm
P50	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 50 mm
P75	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 75 mm

P100	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 100 mm
P125	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 125 mm
P150	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 150 mm
P200	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 200 mm
P250	12 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 250 mm

12 mm Post with Imperial standard mounting holes

PT20	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 20 mm
PT25	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 25 mm
PT30	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 30 mm
PT40	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 40 mm
PT50	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 50 mm
PT75	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 75 mm
PT100	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 100 mm
PT125	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 125 mm
PT150	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 150 mm
PT200	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 200 mm
PT250	12 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 250 mm

12 mm Aluminium anodised post with mertic standard mounting holes

Model No	Length (mm)
AP30	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 30 mm
AP40	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 40 mm
AP50	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 50 mm
AP75	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 75 mm
AP100	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 100 mm
AP125	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 125 mm
AP150	12 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 150 mm

12 mm Aluminium anodised post with Imperial standard mounting holes

Model No	Length (mm)
APT30	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 30 mm
APT40	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 40 mm
APT50	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 50 mm
APT75	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 75 mm
APT100	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 100 mm
APT125	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 125 mm
APT150	12 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 150 mm

P-LE Series Post

P - LE series stainless steel posts have precise laser engraved scale reference from M4 screw side. Engravings are provided at 1 mm division along their length.

Specifications

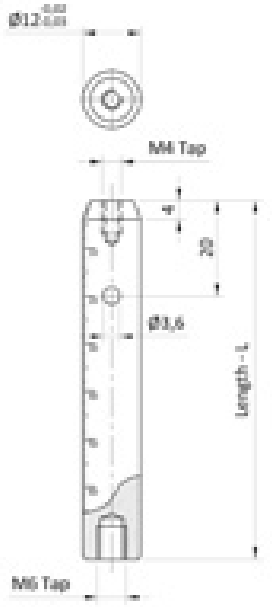
Stainless steel
Ground finish
One end chamfered for easy access
One end M4 threaded and other end M6 threaded
Laser engraved scale

Model No	Length (mm)
P - LE 50	50
P - LE 75	75
P - LE 100	100
P - LE 125	125
P - LE 150	150
P - LE 200	200

Accessories For Post

Item	Model No	Type of Thread	Thread Length (mm)	Minimum Order Qty.
Set - Screw	G M412	M4	12	25 Nos.
	G M612	M6	12	25 Nos.
Thread Adapter		M4 - M6	6 + 6	25 Nos.

Set Screw Sold Seperatly
Thread Adapter Sold Separately





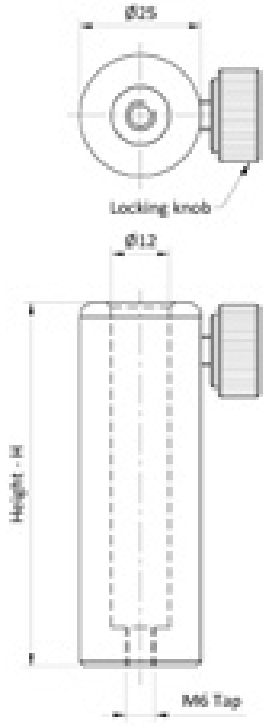
Resolution of 1mm in scale
Engraved Scale for Accurate Height Adjustments

PH Series Post

PH series post holders have a square relief cut for stable three point line contact with post and post holder. Spring loaded plunger knob is provided with every post holder for smooth up and down movement and stable tightening at desired position.

We can fix post holder to an optical table , base plate or a pedestal adapter by using M6 mounting hole provided at the bottom of the post holder.

Aluminium alloy construction
Black anodized finish
M6 mounting hole
Suitable for 12mm diameter post





A variety of post heights Available

Suitable for 12mm diameter post

12 mm post holder Metric mounting hole

PH20	12 mm inner & 20 mm outer dia, aluminium black anodised, length 20 mm with M6 tap
PH30	12 mm inner & 25 mm outer dia, aluminium black anodised, length 30 mm with M6 tap
PH40	12 mm inner & 25 mm outer dia, aluminium black anodised, length 40 mm with M6 tap
PH50	12 mm inner & 25 mm outer dia, aluminium black anodised, length 50 mm with M6 tap
PH75	12 mm inner & 25 mm outer dia, aluminium black anodised, length 75 mm with M6 tap
PH100	12 mm inner & 25 mm outer dia, aluminium black anodised, length 100 mm with M6 tap
PH150	12 mm inner & 25 mm outer dia, aluminium black anodised, length 150 mm with M6 tap

12 mm post holder Imperial mounting hole

Model No	Length (mm)
PHT20	12 mm inner & 25 mm outer dia, aluminium black anodised, length 20 mm with 1/4-20 tap
PHT30	12 mm inner & 25 mm outer dia, aluminium black anodised, length 30 mm with 1/4-20 tap
PHT40	12 mm inner & 25 mm outer dia, aluminium black anodised, length 40 mm with 1/4-20 tap
PHT50	12 mm inner & 25 mm outer dia, aluminium black anodised, length 50 mm with 1/4-20 tap
PHT75	12 mm inner & 25 mm outer dia, aluminium black anodised, length 75 mm with 1/4-20 tap
PHT100	12 mm inner & 25 mm outer dia, aluminium black anodised, length 100 mm with 1/4-20 tap
PHT150	12 mm inner & 25 mm outer dia, aluminium black anodised, length 150 mm with 1/4-20 tap

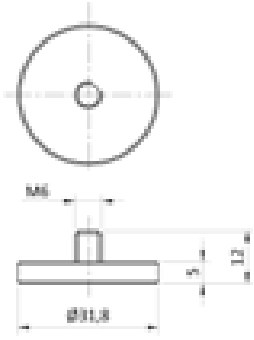
Pedestal Adapter

Pedestal Adapter Model : PPA PG 12D is used to convert PH series post holder to a pedestal post holder system. This can be used to position an optical system away from the line of mounting holes array by using a pedestal fork.

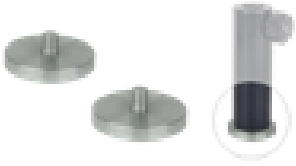
Specifications

- Stainless steel construction
- Turned finish
- M6 stud for mounting
- Disc thickness 5mm
- Suitable for STD fork

Model No
PPA-PG-12D
For 1 set., contains 5 nos.



Turned finish
Suitable for STD fork



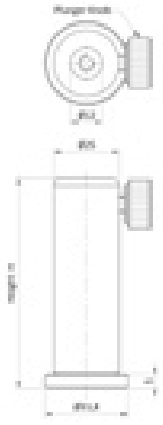
Pedestal Post Holder
PPH Series

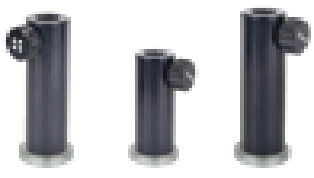
PPedestal Post holders have stainless steel pedestal foot of thickness 5mm.The posts will sit down to minimum height compared to our regular post holders. A square relief cut is also provided for better clamping. One spring loaded plunger knob model: PGK-20 is fixed with every pedestal post holder. Pedestal post holders are made in aluminium alloy with black anodized finish.

- Aluminium alloy construction
- Pedestal foot made of SS
- Black anodized finish
- Through bore
- Suitable for standard fork Model : PF-25

Pedestal post holder of 12 mm inner & 25 mm outer dia, aluminium black anodised

Model No	Length (mm)
PPH-30	30 mm
PPH-40	40 mm
PPH-50	50 mm
PPH-75	75mm
PPH-100	100 mm
PPH-150	150 mm





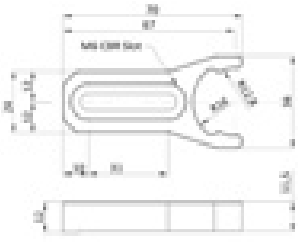
Black anodized finish
Compatible with Model: PF-25
STD fork

PF Series Pedestal Fork

Pedestal Fork , PF-25 is constructed in stainless steel. These forks can be used to fix pedestal post holder. Post holder with suitable pedestal adapter or pedestal post to a breadboard or optical table.

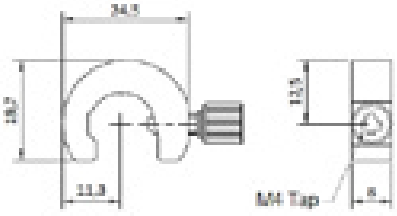
- Stainless Steel Construction
- 12mm Thick
- M6 CBR Slot
- Suitable for STD Pedestals
- Machined finish

Model No
PF - 25





Post Collar



PC - 12 Post collars are slip on type collars with M4 soft metal tipped knob. PC - 12 collars are made of aluminium B51S alloy metal with black anodized finish. PC - 12 post collars are suitable for our 12 mm diameter posts. They can be easily inserted or removed by using suitable access slots provided.

Aluminium B51S alloy
Black anodized matte finish
Open-ring design

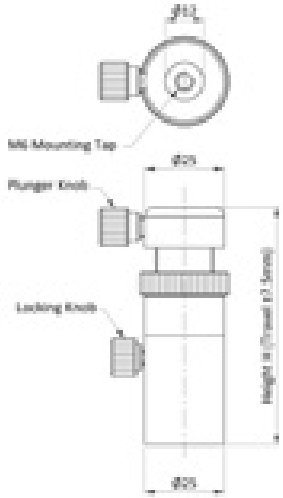


Model No
PC - 12

Translating Post Holder
Ø12 mm

Translating Post Holders provide non rotating height adjustment by a knurled rotating thimble. Post holders accept 12mm diameter posts. Plunger Knob (model: PGK-20) is fixed with every Translating Post Holders. Translating post holders are made in aluminium alloy and given black anodized finish.

We can fix these given post holders to an optical table, base plate or a pedestal adapter by using M6 mounting hole provided at the bottom of the post holder.



Specifications

Height adjustment range: 15 mm
Holds 12 mm diameter standard posts
Aluminium alloy
Black anodized finish

Translating post holder with metric mounting hole

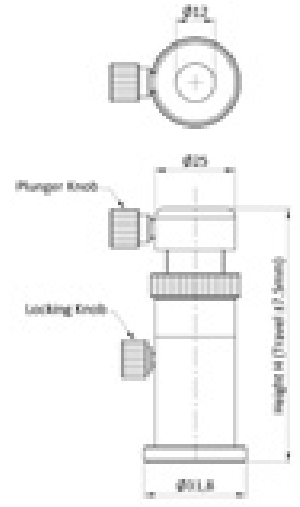
Model No	Length (mm)
TPH-75	Aluminium black anodised translating post holder for 12 mm dia post, Travel 15 mm & length 75 mm with M6 tap
TPH-100	Aluminium black anodised translating post holder for 12 mm dia post, Travel 15 mm & length 100 mm with M6 tap
TPH-150	Aluminium black anodised translating post holder for 12 mm dia post, Travel 15 mm & length 150 mm with M6 tap



Translating post holder with imperial mounting hole

Model No	Length (mm)
TPH-75T	Aluminium black anodised translating post holder for 12 mm dia post, Travel 15 mm & length 75 mm with 1/4-20 tap
TPH-100T	Aluminium black anodised translating post holder for 12 mm dia post, Travel 15 mm & length 100 mm with 1/4-20 tap
TPH-150T	Aluminium black anodised translating post holder for 12 mm dia post, Travel 15 mm & length 150 mm with 1/4-20 tap

Translating Pedestal Post Holder
Ø12 mm



TPPH series Translating Pedestal Post holders have a stainless steel pedestal foot of 5 mm thickness. One spring loaded plunger knob (model: PGK-20) is fixed with every Translating Pedestal post holder. Translating Pedestal post holders are made in aluminium alloy and given black anodized finish.

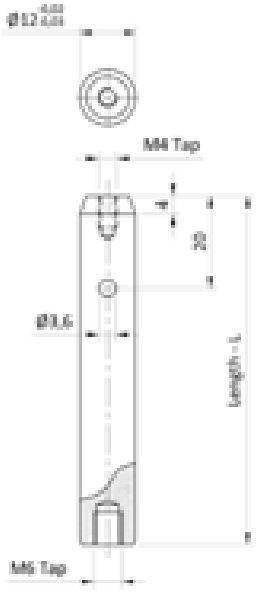
Pedestal Base thickness of 5mm
Compatible with 12mm P series posts

- Height adjustment range : 15 mm
- Holds 12 mm diameter standard posts
- Aluminium alloy
- Black anodized finish

Model No	Length (mm)
TPPH-75	Aluminium black anodised translating pedestal post holder for 12 mm dia post , travel 15 mm & length 75 mm
TPPH-100	Aluminium black anodised translating pedestal post holder for 12 mm dia post , travel 15 mm & length 100 mm
TPPH-150	Aluminium black anodised translating pedestal post holder for 12 mm dia post , travel 15 mm & length 150 mm



12.7mm Post System



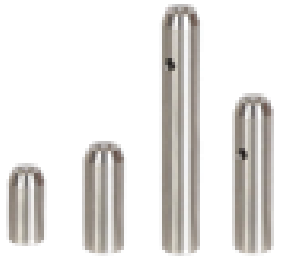
Post mounting system is a convenient device for holding various optical mounts in a breadboard based experimental setup. Height and angular position of mounted optics can be easily adjusted. The post system includes post, post holder, post holder base and post collar.

P Series Post
Ø12.7 mm

P series stainless steel posts have 12.7mm diameter with precision ground finish. One end of the post is turned suitable for M4 screw and other end is for M6 screw. A 3.6 mm diameter hole is provided on the surface of the post for providing extra torque while tightening components on it. A 3.5 mm allen key or a screwdriver with less than 3.6 mm diameter can be used for tightening. For post holders suitable for 12.7 mm diameter posts refer to PH series post holders.

Stainless steel
Ground finish
One end chamfered for easy access
M4 & M6 threaded for mounting

Translating post holder with metric mounting hole



Model No	Length (mm)
PN20	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 20 mm
PN25	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 25 mm
PN30	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 30 mm
PN40	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 40 mm

Model No	Length (mm)
PN50	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 50 mm
PN75	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 75 mm
PN100	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 100 mm
PN125	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 125 mm
PN150	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 150 mm
PN200	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 200 mm
PN250	12.7 mm dia, non magnetic stainelss steel post, M4 tap at one end - M6 tap at other end, length 250 mm

12.7 mm or 0.5 inch Aluminium anodised Post with metric standard mounting holes

Model No	Length (mm)
APN30	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 30 mm
APN40	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 40 mm
APN50	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 50 mm
APN75	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 75 mm
APN100	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 100 mm
APN125	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 125 mm
APN150	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 150 mm

12.7 mm or 0.5 inch Aluminium anodised Post with metric standard mounting holes

Model No	Length (mm)
APNT30	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 30 mm
APNT40	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 40 mm
APNT50	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 50 mm
APNT75	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 75 mm
APNT100	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 100 mm
APNT125	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 125 mm
APNT150	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 150 mm
PNT200	12.7 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 200 mm
PNT250	12.7 mm dia, non magnetic stainelss steel post, 8-32 tap at one end & 1/4-20 tap at other end, length 250 mm

12.7 mm or 0.5 inch Aluminium anodised Post with metric standard mounting holes

Model No	Length (mm)
APN30	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 30 mm
APN40	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 40 mm
APN50	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 50 mm
APN75	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 75 mm
APN100	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 100 mm
APN125	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 125 mm
APN150	12.7 mm dia, Aluminium anodised post, M4 tap at one end - M6 tap at other end, length 150 mm

12.7 mm or 0.5 inch Aluminium anodised Post with Imperial standard mounting holes

Model No	Length (mm)
APNT30	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 30 mm
APNT40	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 40 mm
APNT50	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 50 mm
APNT75	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 75 mm
APNT100	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 100 mm
APNT125	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 125 mm
APNT150	12.7 mm dia, Aluminium anodised post, 8-32 tap at one end & 1/4-20 tap at other end, length 150 mm

PH Series Post Holders

Ø12.7 mm

PH series post holders have a square relief cut for stable three point line contact with post and post holder. Spring loaded plunger knob is provided with every post holder for smooth up and down movement and stable tightening at desired position.

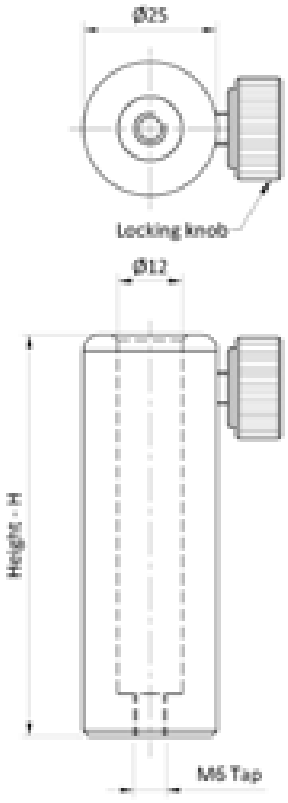
We can fix post holder to an optical table , base plate or a pedestal adapter by using M6 mounting hole provided at the bottom of the post holder.



Aluminium alloy construction
Black anodized finish
M6 mounting hole
Suitable for 12mm diameter post

12.7 mm post holder Metric mounting hole

Model No	Length (mm)
PHN20	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 20 mm with M6 tap
PHN30	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 30 mm with M6 tap
PHN40	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 40 mm with M6 tap
PHN50	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 50 mm with M6 tap
PHN75	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 75 mm with M6 tap
PHN100	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 100 mm with M6 tap
PHN150	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 150 mm with M6 tap



12.7 mm post holder Imperial mounting hole

Model No	Length (mm)
PHNT20	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 20 mm with 1/4-20 tap
PHNT30	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 30 mm with 1/4-20 tap
PHNT40	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 40 mm with 1/4-20 tap
PHNT50	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 50 mm with 1/4-20 tap
PHNT75	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 75 mm with 1/4-20 tap
PHNT100	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 100 mm with 1/4-20 tap
PHNT150	12.7 mm inner & 25 mm outer dia, aluminium black anodised, length 150 mm with 1/4-20 tap

Plunger knobe
Model : PGK-20



Plunger knobeis a brass plunger, loaded with a suitable spring, inside M6 stud. This plunger knob prevents posts from sudden falling while loosening the knob for removing the post or adjusting height in an optical set up. Only one hand is required for any operation using post and post holder.
one set contains 10 nos.

Pedestal Post Holder

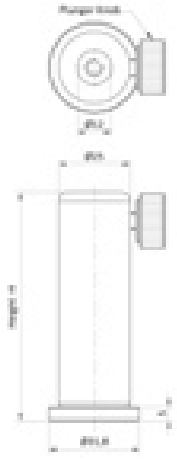
PPH Series



PPedestal Post holders have stainless steel pedestal foot of thickness 5mm.The posts will sit down to minimum height compared to our regular post holders. A square relief cut is also provided for better clamping. One spring loaded plunger knob model: PGK-20 is fixed with every pedestal post holder. Pedestal post holders are made in aluminium alloy with black anodized finish.

Aluminium alloy construction
Pedestal foot made of SS
Black anodized finish
Through bore
Suitable for standard fork Model : PF-25

Model No	Length (mm)
PPHN-30	Pedestal post holder of 12.7 mm inner dia & 25 mm outer dia, Aluminium black anodised, Length 30 mm
PPHN-40	Pedestal post holder of 12.7 mm inner dia & 25 mm outer dia, Aluminium black anodised, Length 40 mm
PPHN-50	Pedestal post holder of 12.7 mm inner dia & 25 mm outer dia, Aluminium black anodised, Length 50 mm
PPHN-75	Pedestal post holder of 12.7 mm inner dia & 25 mm outer dia, Aluminium black anodised, Length 75 mm
PPHN-100	Pedestal post holder of 12.7 mm inner dia & 25 mm outer dia, Aluminium black anodised, Length 100 mm
PPHN-150	Pedestal post holder of 12.7 mm inner dia & 25 mm outer dia, Aluminium black anodised, Length 150 mm

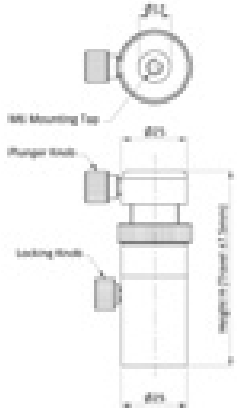


Translating Post Holder Ø12.7 mm

Translating Post Holders provide non rotating height adjustment by a knurled rotating thimble. Post holders accept 12.7mm diameter posts. Plunger Knob (model: PGK-20) is fixed with every Translating Post Holders. Translating post holders are made in aluminium alloy and given black anodized finish.

We can fix these given post holders to an optical table, base plate or a pedestal adapter by using M6 mounting hole provided at the bottom of the post holder.

Height adjustment range: 15 mm
Spring loaded plunger knob for fine adjustments
Holds 12.7 mm diameter standard posts
Aluminium alloy
Black anodized finish



12.7 mm Translating post holder with metric mounting hole

Model No	Length (mm)
TPH-75N	Aluminium black anodised translating post holder for 12.7 mm dia post, Travel 15mm & Length 75mm with M6 tap
TPH-100N	Aluminium black anodised translating post holder for 12.7 mm dia post, Travel 15mm & Length 100mm with M6 tap
TPH-150N	Aluminium black anodised translating post holder for 12.7 mm dia post, Travel 15mm & Length 150mm with M6 tap



Black anodized finish
Compatible with Model: PF-25 STD fork

12.7 mm Translating post holder with imperial mounting hole

Model No	Length (mm)
TPH-75NT	Aluminium black anodised translating post holder for 12.7 mm dia post, Travel 15mm & Length 75mm with 1/4-20 tap
TPH-100NT	Aluminium black anodised translating post holder for 12.7 mm dia post, Travel 15mm & Length 100mm with 1/4-20 tap
TPH-150NT	Aluminium black anodised translating post holder for 12.7 mm dia post, Travel 15mm & Length 150mm with 1/4-20 tap

Plunger knobe
Model : PGK-20

Plunger knobeis a brass plunger, loaded with a suitable spring, inside M6 stud. This plunger knob prevents posts from sudden falling while loosening the knob for removing the post or adjusting height in an optical set up. Only one hand is required for any operation using post and post holder.
one set contains 10 nos.



Translating Pedestal Post Holder Ø12.7 mm

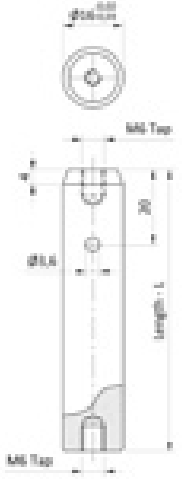


TPPHN series Translating Pedestal Post holders have a stainless steel pedestal foot of 5 mm thickness. One spring loaded plunger knob (model: PGK-20) is fixed with every Translating Pedestal post holder. Translating Pedestal post holders are made in aluminium alloy and given black anodized finish.

Height adjustment range : 15 mm
Holds 12.7 mm diameter standard posts
Aluminium alloy
Black anodized finish

Model No	Length (mm)
TPPHN-75	Aluminium black anodised translating pedestal post holder for 12.7 mm dia post , travel 15 mm & length 75 mm
TPPHN-100	Aluminium black anodised translating pedestal post holder for 12.7 mm dia post , travel 15 mm & length 100 mm
TPPHN-150	Aluminium black anodised translating pedestal post holder for 12.7 mm dia post , travel 15 mm & length 150 mm

16 mm Post System



Post mounting system is a convenient device for holding various optical mounts in a breadboard based experimental setup. Height and angular position of mounted optics can be easily adjusted. The post system includes post, post holder, post holder base and post collar.

P16D Series Posts

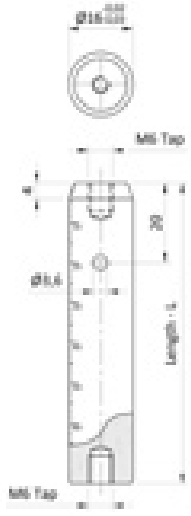
16mm diameter posts are made in stainless steel and given precision ground finish. Both ends of the posts are provided with M6 tapped holes for mounting. A hole of 3.6 mm diameter is provided on the surface of the post for providing extra torque while tightening components on it. A 3.5 mm Allen key or a screwdriver less than 3.6 mm diameter can be used for tightening. For post holders to be used with P - 16 D series posts, please refer to PH 16D series post holders.



Stainless steel
Ground finish
One end chamfered for easy access
M6 threaded on both sides for mounting
Length ranges from 30 to 300mm

Model No	Length (mm)
P16D - 30	30
P16D - 50	50
P16D - 75	75
P16D - 100	100
P16D - 125	125
P16D - 150	150
P16D - 200	200
P16D - 250	250
P16D - 300	300

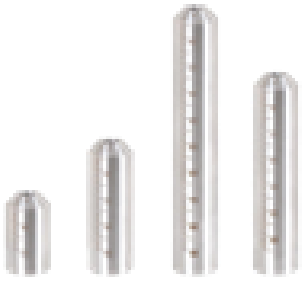
P16D-LE Series Posts



P16D - LE series stainless steel posts have precisely laser engraved scale in 1 mm division along their length.

Resolution of 1mm in scale
Engraved Scale for Accurate Height Adjustments
Stainless steel
Ground finish
One end chamfered for easy access
M6 threaded on both sides for mounting
Laser engraved scale

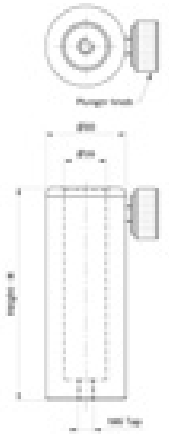
Model No	Length (mm)
P16D - 30	30
P16D - LE 50	50
P16D - LE 75	75
P16D - LE 100	100
P16D - LE 125	125
P16D - LE 150	150
P16D - LE 200	200
P16D - LE 250	250



Item	Model No	Type of Thread	Thread Length (mm)	Minimum Order Qty.
Set - Screw	G M412	M4	12	25 Nos.
	G M612	M6	12	25 Nos.
Thread Adapter		M4 - M6	6+6	25 Nos.

Set Screw Sold Seperatly
Thread Adapter Sold Separately

PH-16D Series Post Holder



PH series post holders have a square relief cut for stable three point line contact with post and post holder. Spring loaded plunger knob is provided with every post holder for smooth up and down movement and stable tightening at desired position.

We can fix post holder to an optical table , base plate or a pedestal adapter by using M6 mounting hole provided at the bottom of the post holder.

Suitable for 16mm diameter post
A variety of post heights Available
Aluminium alloy construction
Black anodized finish
M6 mounting hole
Suitable for 16 mm diameter post
Through bore

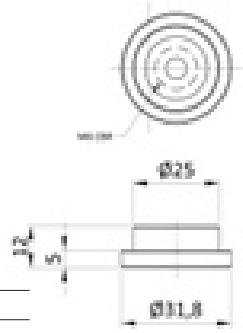
Model No	Length (mm)
PH - 16D - 30	30
PH - 16D - 40	40
PH - 16D - 50	50
PH - 16D - 75	75
PH - 16D - 100	100
PH - 16D - 150	150
PH - 16D - 200	200
PH - 16D - 250	250



Pedestal Adapter

Pedestal Adapter Model : PPA-PG-16D is used to convert our standard PH 16D series post holder to a pedestal post holder.

Stainless steel construction
Turned finish
M6 stud for mounting
Disc thickness 5 mm
Suitable for STD fork





Model No	PPA-PG-16D
	# For 1 set., contains 5 nos

PPH Series Pedestal Post Holder

PPH - 16D series Post holders have a stainless steel pedestal foot of thickness 5 mm. The posts will sit down to minimum height compared to our regular PH - 16D series Post holders. A square relief cut is also provided for better clamping. One spring loaded plunger knob model : PGK-20 is fixed with every pedestal post holder. Pedestal post holders are made in aluminium alloy material with black anodized finish. Bottom of pedestal post holders is provided with a through bore of 16 mm diameter



Square relief cut
Through bore
5 mm thick pedestal foot
Plunger knob
Aluminium alloy construction
Black anodized finish
Suits P16D posts
Compatible with PF - 25 pedestal fork



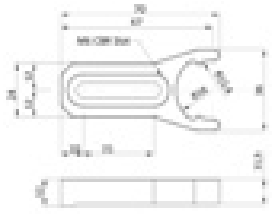
Model No	Length (mm)
PPH-16D-30	30
PPH-16D-40	40
PPH-16D-50	50
PPH-16D-75	75
PPH-16D-100	100
PPH-16D-150	150
PPH-16D-200	100
PPH-16D-250	150



Plunger knobe
Model : PGK-20

PF Series Pedestal Fork

Pedestal Fork , PF-25 is constructed in stainless steel. These forks can be used to fix pedestal post holder. Post holder with suitable pedestal adapter or pedestal post to a breadboard or optical table.



Open-slotted bases
Stainless Steel Construction
12mm Thick
M6 CBR Slot
Suitable for STD Pedestals
Machined finish



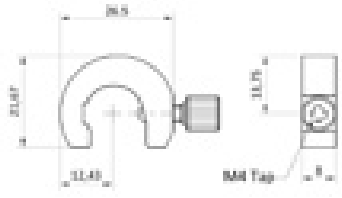
Model No	Length (mm)
PF - 25	30

PF Series Pedestal Fork



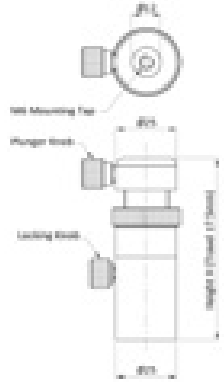
PC - 16 Post collars are slip on type collars with M4 soft metal tipped knob. These are made of aluminium B51S alloy with black anodized finish. PC - 16 post collars are suitable for our 16 mm diameter posts. This can be inserted or removed easily by using access slots provided.

Open-ring design
Aluminium B51S alloy
Black anodized matte finish



Model No
PC - 16

Translating Post Holder
Ø16 mm



TPH-16D series Translating Post Holders provide non rotating height adjustment by a knurled rotating thimble. Translating post holders accept 16mm diameter posts. Plunger Knob (model:PGK-20) is fixed with every translating post holder. These are made in aluminium alloy and given black anodized finish.
These post holders can be fixed to an optical table, base plate or a pedestal adapter using M6 mounting hole provided at the bottom of the post holder.

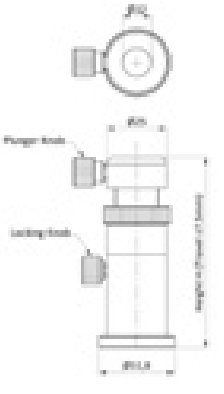
Spring loaded plunger knob for fine adjustments
Height adjustment range: 15 mm
Holds 16 mm diameter standard posts
Aluminium alloy
Black anodized finish



Model No	Length (mm)
TPH-16D-75	75
TPH-16D-100	100
TPH-16D-150	150
TPH-16D-200	200
TPH-16D-250	250

Plunger knobe
Model : PGK-20

Translating Pedestal Post Holder
Ø16 mm



TPPH series Translating Pedestal Post holders have a stainless steel pedestal foot of 5mm thickness. One spring loaded plunger knob (model: PGK-20) is fixed with every Translating Pedestal post holder. Translating Pedestal post holders are made in aluminum alloy and given black anodized finish.

Height adjustment range : 15 mm
Holds 16 mm diameter standard posts
Aluminium alloy
Black anodized finish



Model No	Length (mm)
TPPH-16D-75	75
TPPH-16D-100	100
TPPH-16D-150	150
TPPH-16D-200	200

Plunger knobe Model : PGK-20

Post Bases

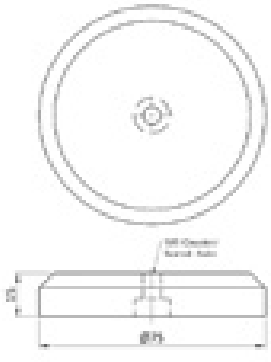
Post bases are used to mount post holders anywhere on the breadboard irrespective of the position of tapped holes. These are available in various sizes compatible with standard post holders of 12mm and 16mm diameters.

Post base is used to mount a post holder anywhere on a breadboard irrespective of the position of tapped holes. These are made of aluminium alloy..

Aluminium alloy
Black matte finish
9mm thickness
M6 clearance slot
Button magnet (in Magnetized Post Bases)

Model No	Type	Suitable Post Series	Size (mm)
PB - 1850	C - Shaped	8 mm	18 x 50 x 9
PB - 1865	H - Shaped	8 mm	18 x 65 x 9
PB - 6525	U -Type	12 mm	65 x 25 x 9
PB - 7530	U -Type	12 & 16 mm	75 x 30 x 9
PB - 7525	H -Type	12 mm	75 x 25 x 9
PB - 9030	H -Type	12 & 16 mm	90 x 30 x 9
PB - 6550	Square-Type	12 & 16 mm	65 x 50 x 9

Pedestal Bases



Pedestal Bases are of diameter 75mm, with standard M6 mounting hole at center for fixing posts or post holders. The thickness of the base is 15mm. Magnetic pedestal base (Model : IDBM-75) is having NdfeB permanent magnets while IDB75 model is without magnets.

Base thickness of 15 mm
Magnetic & Non Magnetic Version Available

IIDB - 75
Non Magnetic Stainless Steel
M6 CBR Mounting Hole

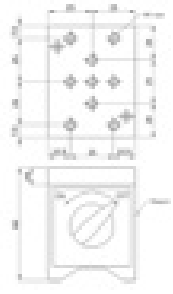
IDBM - 75
Aluminium Alloy
NdFeB Magnets
M6 CBR Mounting Hole



Model No	Size (mm)	Type
IDB - 75	Dia - 75 x 15	Without magnets
IDBM - 75	Dia - 75 x 15	NdfeB permanent magnets

Switchable Magnetic Post Bases

These bases come with a switchable magnet for ease of positioning of optical components. To ensure stability, bottom mounting surface is given ground finish.
On / Off hand switch
Ideal for mounting optics on Breadboards / Tabletops

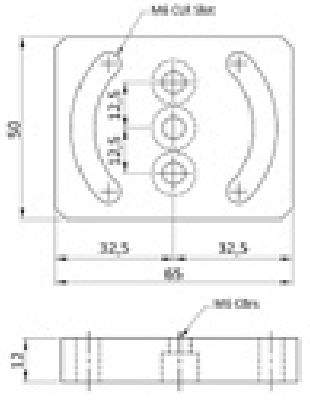




- Aluminium platform
- 10 kgs. of magnetic clamping force
- Machined finish
- M6 tapped holes on 25 mm grid
- 65 x 50 mm mounting area

Model No
MB - 50

Radial Slotted Base Plate



Radial slotted post base helps to fix a post or a post holder at a convenient horizontal angle on the breadboard. It is compatible with our standard 12mm and 16mm series post holders.

Magnetized base plates have NdfeB magnetic buttons at the base. Specifications are the same as that of normal non magnetic model.

Rotational Adjustments
Magnetic & Non Magnetic Version Available

- Aluminium alloy
- Black anodized matte finish
- M6 clearance slots
- M6 C'bored holes
- Button magnet (in Magnetized Radial Slotted Base Plate)



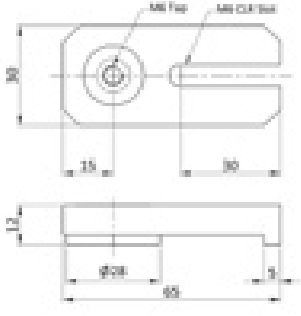


Model No	Type	Suitable Post Series	Size (mm)
PBS - 6525	Square	12 mm	65 x 50 x 9
MPBS - 6565	Square (Magnitized)	12 & 16 mm	65 x 50 x 9

Swivel Post Base

This is a 360 degree rotatable post base compatible with our standard12mm and 16mm diameter post holders. Swivel post base is suitable for spatially restricted optical setups. We can directly mount post, post holder or a pillar post by M6 x 12mm SHC screw on this swivel post base

360° rotation about an axis
Easy mounting on Breadboards / Tabletops

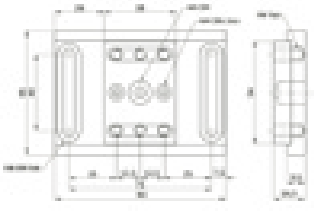




- Aluminium alloy
- Black anodized finish
- 12 mm thickness
- 360 degree rotatable
- M6 clearance slot
- M6 C'bored hole

Model No
PB - SW - 30

XY Post Base

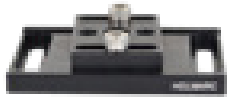


XY Post bases are suitable for our standard 12mm and 16mm diameter post systems. These post bases can be adjusted through 25mm in XY direction. We can easily fix post holder using an M6 x 12 SHC screw.

XY post base with magnetic button to position on optical tables/ breadbords are also available.

Aluminium alloy
Black anodized finish
16.5mm thickness
M6 clearance slot
M6 & M4 C'bored hole
Button magnet (in Magnetic XY Post Base)





Model No	Size (mm)
PB - XY - 50	90 x 65
MPB - XY - 50	90 x 65

Post Clamps



Holmarc offers a variety of designs of post clamps which are compatible with standard 8mm, 12mm and 16mm posts. These clamps provide a wide array of applications such as mounting of posts to each other, or directly to optical mounts, at various angles. It comprises locking knobs/ screws which securely attach the clamp to the posts.

Versatile Design Clamps
Compatible with PH, PH-8D & PH-16D series post holders

Right Angle Post Clamp



This is a 360° rotatable post clamp compatible with our posts. It is suitable for spatially restricted optical setup.

Versatile Design Clamps
Compatible with PH, PH-8D & PH-16D series post holders

- Aluminium alloy
- Black anodized finish
- M6 locking knobs

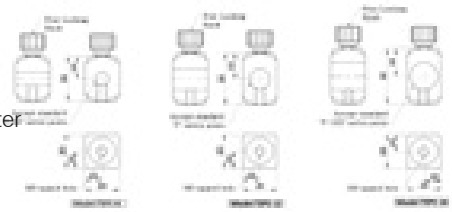
Right angle post clamp

Model No	Diameter of post
RAC - 8	8
RAC - 12	12
RAC - 16	16

Right angle reducer clamp

Model No	Diameter of post
RACR16 - 12	16 to 12

Top End Right Angle Post Clamp



Top end post clamp can be used for clamping 8 mm, 12 mm or 16 mm diameter posts at right angle to each other to achieve 'T' joint.

Aluminium alloy
Black anodized finish
M6 tapped hole at bottom
M6 locking knobs



Model No	Diameter of post
TEPC - 8	8
TEPC - 12	12
TEPC - 16	16

Swivel Post Clamp

Swivel post clamps can be used to achieve three degrees of freedom for post mounted components. There are models suitable for 8mm, 12 mm & 16mm diameter standard posts.

Aluminium alloy
Black anodized finish
M6 tapped hole at bottom
M6 locking knobs



Model No	Diameter of post
SWPC - 8	8
SWPC - 12	12
SWPC - 16	16

Ball and Socket Clamp

This clamp provides 360° rotation about its axis and swings 90° to the side. The device can be locked at any desired position. Optical mounts, posts, post holders etc. can be mounted on it.

Stainless steel
Machined finish
M6 tapped hole at bottom
Single lock screws

Model No	Type
BSPC - 12	Dual ball design
FAPC-12	Single ball design

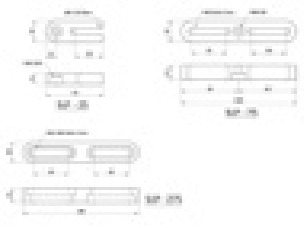


Slotted Plates

SLP-25 model slotted plate is suitable for standard optic mounts with M6 mounting holes. They have M6 CBR slots from bottom.

SLP-75 model slotted plate has two M6 slots and one M6 C'bored hole suitable for our standard post with M6 mounting hole. This slotted plate helps to arrange a twin mirror set up or a custom small optical bench within a restricted space.

SLP-275 model comes with two M6 CBR slots opposite to each other. We can use this when the optical path is far from the mounting holes.



3 Varieties of mounting slots
Easy mounting on Breadboards / Tabletops

- Aluminium alloy
- Black anodized finish
- M6 CBR hole for mounting



Model No	Size (mm)	Type
SLP - 25	50 x 18 x 9	Single M6 slot with M6 CBR hole
SLP - 75	100 x 18 x 12	Two M6 slots with M6 CBR hole
SLP - 275	100 x 18 x 12	Two M6 CBR slots

Opto Mechanical Kit

12mm Post System



OMK-01 Kit contains all commonly used posts, post bases, post collars, post clamps, table clamps etc. OMK-01 contains 185 components. This kit provides more flexibility while you are setting up an optical set up due to the variety of components in a single package.

Model No	Description	Qty
P - 30	12 mm dia post - 30 mm long	10
P - 40	12 mm dia post - 40 mm long	10
P - 50	12 mm dia post - 50 mm long	10
P - 75	12 mm dia post - 75 mm long	10
P - 100	12 mm dia post - 100 mm long	10
P - 150	12 mm dia post - 150 mm long	5
PH - 30	Post holder for 12 mm dia post - 30 mm long	10
PH - 50	Post holder for 12 mm dia post - 50 mm long	10
PH - 75	Post holder for 12 mm dia post - 75 mm long	10
PH - 100	Post holder for 12 mm dia post - 100 mm long	10
PH - 150	Post holder for 12 mm dia post - 150 mm long	5
PB - 6525	Post base	10
PB - 7525	Post base	10
PB - 6550	Post base	10
RAC - 12	Right Angle Post Clamp	10
SWPC - 12	Swivel Type Post Clamp	5
L - TC - 50	L Shaped Table Clamp	10
PC - 12	Post collar	15
PPA - PG - 12D	Pedestal Adapter for PH Series Post holder	5
PF - 25	Pedestal fork for PKG 20 Pedestal Adapter	10

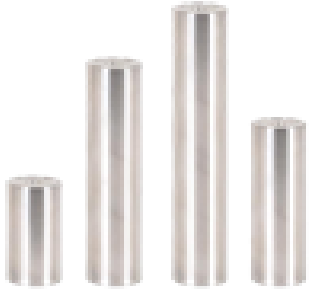
Heavy Duty Post System

Damped Heavy Duty Post



Damped heavy duty posts are used for building elevated structures & elevated platforms to fix optomechanical mounts, tube lasers with suitable laser mounts etc. Most of the opto-mechanical mounts are provided with mounting holes for fixing it to the clamps of this post system. The diameter of the post is 37.5mm and tolerances are kept within 0.1mm. Damped heavy duty posts are made from machined and ground stainless steel pipes filled with semi-solid epoxy. This design makes them light weight, still rigid and sturdy. Epoxy filling damps vibrations. M6 tapped holes are provided for mounting purpose.

Stainless steel
Ground finish at ends
M6 tapped holes



Model No	Description
HDP - 150	150
HDP - 200	200
HDP - 250	250
HDP - 300	300
HDP - 350	350
HDP - 400	400
HDP - 500	500
HDP - 600	600

Post Spacer

Post spacers are designed to act as shims / spacers while assembling heavy duty posts to adjust height with resolution of 0.1 mm. These spacers are made in stainless steel with ground finish at ends. M6 tapped holes are provided for HDPS - 20, HDPS - 25 and HDPS - 50 while other models are drilled with 6.5mm clear hole for M6 set-screw.



Provides Stable mounting
Ideal to increment heights for Heavy Duty Posts

- Stainless steel
- Ground finish at ends
- M6 tapped holes

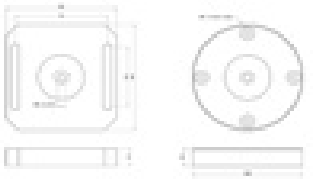


Model No	Height	Min. Order Qty	Diameter (D)
HDPS - 0.1	0.1	100	6.5 mm
HDPS - 0.2	0.2	100	6.5 mm
HDPS - 0.5	0.5	25	6.5 mm
HDPS - 1	1	15	6.5 mm
HDPS - 1.5	1.5	15	6.5 mm
HDPS - 2	2	15	6.5 mm
HDPS - 5	5	5	6.5 mm
HDPS - 10	10	1	6.5 mm
HDPS - 20	20	1	M6 tap Both Ends Depth - 6 mm
HDPS - 25	25	1	
HDPS - 50	50	50	



Heavy Duty Post Base

Heavy duty post bases are made of aluminium with black anodized finish.These are suitable for fixing heavy duty posts to a metric breadboard.
Easy mounting on Breadboards / Tabletops
Different Types Available – Magnetic, Square & Circular



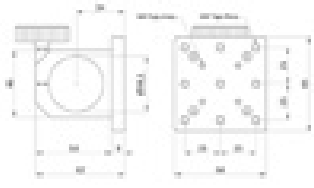
- 15 mm height
- M6 clearance slots
- M6 C'bored hole



Model No	Size	Type
MB - 50	65 x 50 mm	Magnetic
HD - SQ	65 x 65 mm	Square - Small
HD - R	Dia - 65 mm	Circular - Small
HD - SQ90	90 x 90 mm	Square - Big
HD - R90	Dia - 90 mm	Circular - Big

Mounting Clamp

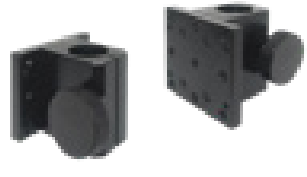
Model : C-HDP
These are used along with heavy duty posts for achieving a vertical mounting surface. For model C-HDP mounting surface is 65 x 65 mm. M6 and M4 tapped holes are provided on 25 mm grid on surface.



Aluminum alloy
Black anodized finish
Suitable for Heavy duty posts

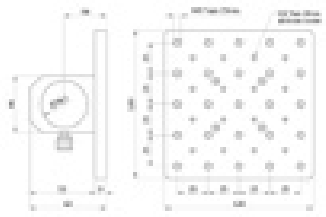
Accessories
Right Angle Bracket

Model No
ABC-65



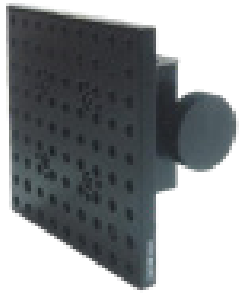
Large Mounting Clamp

Model : EL-HDP-C



These are used when a large mounting surface is required on heavy duty posts. Size of large mount clamp is 120 x 120mm. M6 mounting holes are provided on the surface. Construction material is aluminium with black anodized finish.

Aluminum alloy
Black anodized finish
Suitable for Heavy duty posts



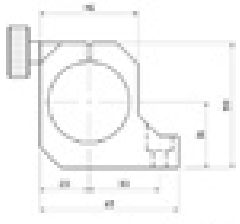
Accessories
Right Angle Bracket

Model No
ABC-120

This is suitable for mounting components in horizontal direction. Construction material is aluminium with black anodized finish.

Compact Post Clamp

This post clamp is usefull to attach an optical mount (mirror mount or laser mount) to a heavyduty post. The optical mount can be fixed at various angles using knurled clamping knob.





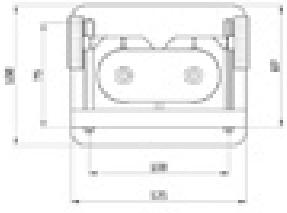


Includes Locking Knob for Easy mounting
Securely Attach the optics Mounts to Heavy duty Post

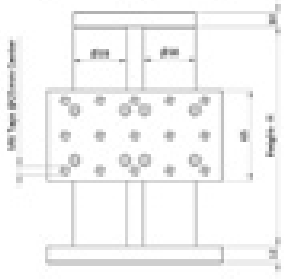
Aluminum alloy
Black anodized finish
M6 mounting holes

Model No
CT - HDPC

Dual Rod System



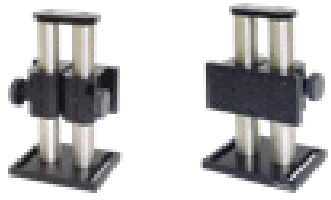
This post clamp is useful to attach an optical mount (mirror mount or laser mount) to a heavyduty post. The optical mount can be fixed at various angles using knurled clamping knob.



Mounting Plate with Dual Locks
Up and down orientations for Mounting Plate

Aluminum alloy
Black anodized finish
M6 mounting holes

Model No	Description	Height (mm)	Load Capacity
DRS - 300	Dual rod system with single sliding clamp	325	25 Kg
DRS - 500		525	25 Kg
DRS - 800		825	25 Kg
DRS - 1000		1025	25 Kg
C-DRS	Additional Clamp	65 x 125	
LC-DRS	Large Clamp	125 x 125	
AB-DRS	Horizontal Platform	125 x 125	

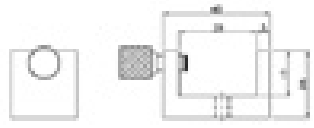


C & V type clamps

C - Type Clamps

C - Type clamps can be used for holding rectangular or cylindrical objects rigidly. The objects are held in position by adjustable screws.
Specifications

Hold objects rigidly
Easy mounting on Breadboards / Tabletops

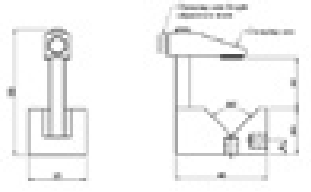




Model No	D	L	W	H
C - TC - 12	12 mm	25 mm	19 mm	17 mm
C - TC - 25	26 mm	40 mm	25 mm	25 mm
C - TC - 50	51 mm	70 mm	50 mm	33 mm

V - Type Clamps

V-Type clamps can be used for holding rectangular or cylindrical objects rigidly. There are three basic models to suit various object sizes.



Model No	D	L	W	H
V - TC - 12	12 mm	25 mm	19 mm	17 mm
V - TC - 25	26 mm	40 mm	25 mm	25 mm
V - TC - 50	51 mm	70 mm	50 mm	33 mm

Table Clamps

Compatible with Post Bases
Varieties of mounting slots

Aluminium alloy
Black anodized finish
M6 mounting holes

We can relaunch a base mounted system on an optical set up using a set of table clamps. Stages or components without mounting holes can as well be fixed using these table clamps.







Model No	Size (mm)	Type
TC - 35	35 x 15 x 6	Small Type
TC - 50	50 x 15 x 9	Slotted
TC - 75	75 x 15 x 9	Slotted
L - TC - 50	50 x 15 x 16	L Shaped

Tools & Accessories

Adapters are used to connect different types of threads together. Holmarc range of thread adapters offers several options for connecting between M4, M6, 8-32, and 1/4"-20 thread sizes. Made from stainless steel they are strong and convenient for use in mounts, posts and post holders. They are available in sets of 10 each. They provide conversion between English and Metric standards.

Metric - English Thread Adapters

M6 Male 1/4-20 Male

Model No
META6M25



M6 Male 8-32 Male

Model No
META6M15



Model No
META4M15



M6 Male 8-32 Male

Model No
META4M15



M4 Male 8-32 Female

Model No
META4F15



1/4-20 Female

Model No
META4F25



M6 Male 8-32 Female

Model No
META6F15

English - Metric Thread Adapters

(One set contains 10 numbers.)

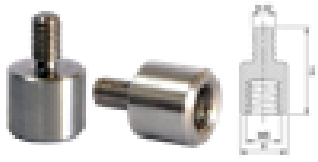
1/4-20 Male M6 Female

Model No
EMTA25F6



8-32 Male M6 Female

Model No
EMTA15F6



1/4-20 Male M4 Female

Model No
EMTA25F4



8-32 Male M4 Female

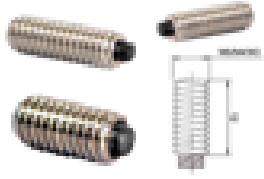
Model No
EMTA15F4



Set Screws

These are used to safely clamp components and optics without damaging the clamping area.

Nylon tipped set-screws

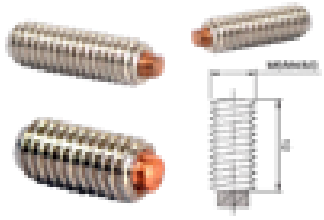


Metric Set - Screws (One set contains 10 numbers.)

Model No	Length
SM3L8	8 mm
SM3L12	12 mm
SM3L14	14 mm
SM3L18	18 mm
SM3L22	22 mm
SM3L27	27 mm
SM3L32	32 mm
SM4L8	8 mm
SM4L12	12 mm
SM4L14	14 mm
SM4L18	18 mm
SM4L22	22 mm
SM4L27	27 mm
SM4L32	32 mm
SM6L8	8 mm
SM6L12	12 mm
SM6L14	14 mm
SM6L18	18 mm
SM6L22	22 mm
SM6L27	27 mm
SM6L32	32 mm

Copper tipped set-screws

Metric Set - Screws (One set contains 10 numbers.)



Model No	Length
BSM3L6	6 mm
BSM3L8	8 mm
BSM3L12	12 mm
BSM3L14	14 mm
BSM3L18	18 mm
BSM3L22	22 mm
BSM3L27	27 mm

BSM4L6	6 mm
BSM4L8	8 mm
BSM4L12	12 mm
BSM4L14	14 mm
BSM4L18	18 mm
BSM4L22	22 mm
BSM4L27	27 mm

BSM6L8	8 mm
BSM6L12	12 mm
BSM6L14	14 mm
BSM6L18	18 mm
BSM6L22	22 mm
BSM6L27	27 mm

Thumb Screws

Nylon tipped thumb screws are used in Optics; mirrors, lens, prisms etc. and Copper tipped thumb screws are used to safely clamp components made in stainless steel or steel. Both tip is used to ensure firm clamping without damage.

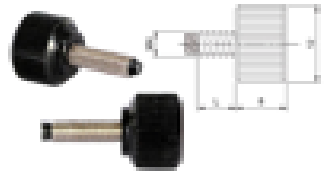
Nylon tipped thumb screws

Metric Thread Adapters (One set contains 10 numbers.)

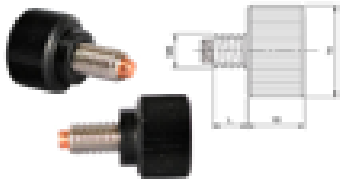


Model No	Length
TM3L6	6 mm
TM3L8	8 mm
TM3L12	12 mm
TM3L14	14 mm
TM3L18	18 mm
TM3L22	22 mm

Model No	Length
TM4L6	6 mm
TM4L8	8 mm
TM4L12	12 mm
TM4L14	14 mm
TM4L18	18 mm
TM4L22	22 mm



Model No	Length
TM6L6	6 mm
TM6L8	8 mm
TM6L12	12 mm
TM6L14	14 mm
TM6L18	18 mm
TM6L22	22 mm
BTM6L27	18 mm



SHC Screws

Metric Socket Cap Screws

(One set contains 25 numbers.)

Model No	Length
M3SHC6	6 mm
M3SHC10	10 mm
M3SHC12	12 mm
M3SHC16	16 mm
M3SHC20	20 mm
M3SHC25	25 mm



Model No	Length
M4SHC6	6 mm
M4SHC10	10 mm
M4SHC12	12 mm
M4SHC16	16 mm
M4SHC20	20 mm
M4SHC25	25 mm

Model No	Length
M6SHC6	6 mm
M6SHC10	10 mm
M6SHC12	12 mm
M6SHC16	16 mm
M6SHC20	20 mm
M6SHC25	25 mm



Allen key for M6, M4, M3, MCS, SCH screws. (One set contains 1 no each)

Metric Set Screws

(One set contains 25 numbers.)

Model No	Length
M3SCGB6	6 mm
M3SCGB10	10 mm
M3SCGB12	12 mm
M3SCGB16	16 mm
M3SCGB20	20 mm

Model No	Length
M4SCGB6	6 mm
M4SCGB10	10 mm
M4SCGB12	12 mm
M4SCGB16	16 mm
M4SCGB20	20 mm

Model No	Length
M6SCGB6	6 mm
M6SCGB10	10 mm
M6SCGB12	12 mm
M6SCGB16	16 mm
M6SCGB20	20 mm

Metric Allen Key, Washers & Nut

It ems	Metric Allen Key	Washers	Nuts
M6	MAKF2	M6W	M6N
M4	MAKF2	M4W	M4N
M3	MAKF2	M3W	M3N



All in One Screw kit

Items	Description	
M6 SHC	Length 6, 10, 12, 16, 20, 25	(25 Numbers)
M4 SHC	Length 6, 10, 12, 16, 20, 25	(25 Numbers)
M3 SHC	Length 6, 10, 12, 16, 20, 25	(25 Numbers)
M6 Set Screw	Length 6, 10, 12, 16, 20, 25	(25 Numbers)
M4 Set Screw	Length 6, 10, 12, 16, 20, 25	(25 Numbers)
M3 Set Screw	Length 6, 10, 12, 16, 20, 25	(25 Numbers)
M6 Nut	25 Numbers	
M6 Washer	25 Numbers	
M4 Nut	25 Numbers	
M4 Washer	25 Numbers	
M3 Nut	25 Numbers	
M3 Washer	25 Numbers	
Allen Key Set	1 No.	



Lab Jacks

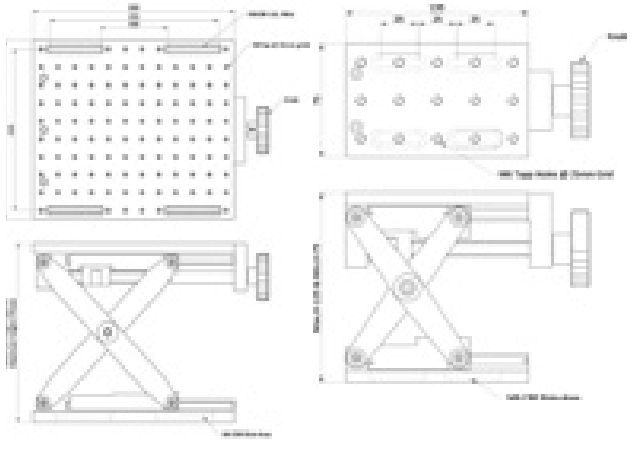


Manual Labjack

LJ SERIES

This is a labjack that offers excellent rigidity and positioning accuracy. These labjacks can be used to lift assemblies like Lasers, Stages etc. This model uses scissors type design.





MODEL LJSS300-250 MODEL LJ120-75

Specifications

Vertical height adjustment by 1 mm pitch lead screw
Parallelism : 0.1mm for the entire travel
M6 tapped holes on the top at 25 mm grid.
M6 tapped holes on the top at 25 mm grid.
Aluminium alloy & stainless steel construction
Black anodized
Smooth and stable vertical adjustment
Scissors type design

Model No	L (mm)	B (mm)	H (min, max) (mm)	Load Capacity
LJ120 - 75	120	75	75, 125	5
LJ150 - 100	150	100	75, 150	10
LJ180 - 100	180	100	75, 150	15
LJSS250 - 150	250	150	100, 200	10
LJSS250 - 200	250	200	100, 200	10
LJSS250 - 250	250	200	100, 200	12
LJSS300 - 150	300	150	100, 270	25
LJSS300 - 250	300	250	100, 270	30
LJSS300 - 300	300	300	100, 270	30
LJSS300 - 350	350	300	100, 270	30

Vacuum Compatible Labjack



Smooth and stable vertical adjustment

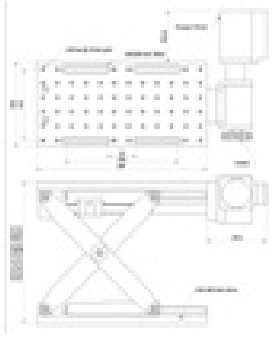
Scissors type design

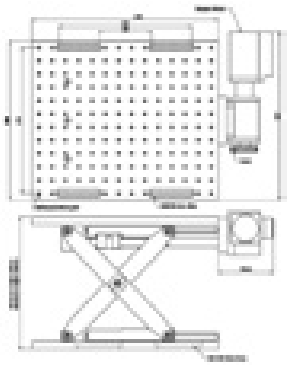
Vacuum compatible lab jacks are used in applications where the height adjustment is required inside vacuum environment. The gear ratio is made in 8:1 which ensures smooth movement. The gear materials are made in bronze which itself is lubricating and require very little grease. There is also an option to move the stage manually using a knob provided in the motor. High vacuum grade cables and motors are used in this series. We have also provided an option to adopt the vacuum series in manual lab jacks also. To select the required model, please add 'V' on the model while choosing. For eg: For opting vacuum compatibility in the manual model labjack : LJSS 300-150, the model number will be V-LJSS 300-150.

Motorized Labjack

MLJ SERIES







MODEL MLJ300 - 150

Labjacks combine precision height adjustment in a stable design with high load capacity. These Motorized Labjacks provide a rugged height adjustable platform ideal for mounting optomechanical sub assemblies requiring height adjustments. It can be controlled remotely by using a PC or a hand held unit.

The upper and lower mounting plates have M6 tapped holes and clearance slots respectively for general mounting requirements.

Excellent rigidity and positioning accuracy

Geared stepper motor driven Actuator

Specifications

- Load capacity : Up to 20 kg
- Vertical height adjustment by lead screw.
- Precision roller linear guide way
- Actuator : Geared stepper motor
- Actuator : Geared stepper motor
- Parallelism : 0.1mm for entire travel
- M6 tapped holes on the top at 25 mm grid.
- M6 clearance slots at the base
- Aluminium alloy
- Black Anodized

Model No	L (mm)	B (mm)	H (min, max) (mm)	Load Capacity
MLJ300 - 150	300	150	105, 270	20
MLJ300 - 250	300	250	105, 270	20
MLJ300 - 300	300	300	105, 270	20
MLJ350 - 250	350	250	105, 270	20
MLJ350 - 300	350	300	105, 270	20
MLJ350 - 350	350	350	105, 270	20

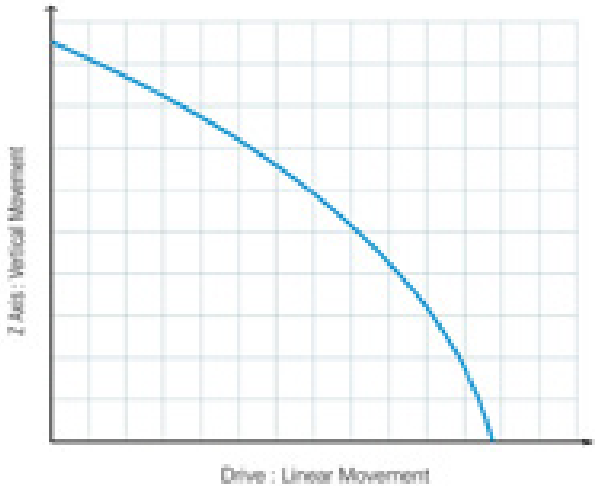


Fig. Motorized Lab Jack Movement Graph
MLJ Series lab jacks offer excellent rigidity and positioning accuracy with high load capacity. It can be used to lift larger assemblies like lasers, microscopes etc. This model uses scissors type design

Vacuum Compatible Labjack

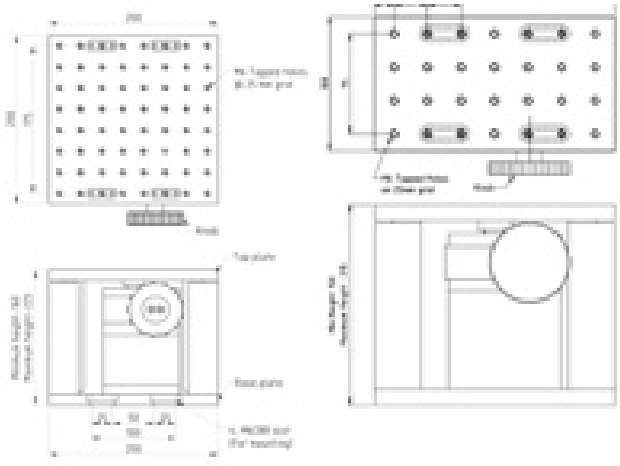
We have also provided an option to adopt the vacuum series in manual lab jacks also.To select the required model, please add 'V' on the model while choosing. For eg: For opting vacuum compatibility in the motorized model labjack : MLJ 300-150, the model number will be V-MLJ 300-150.



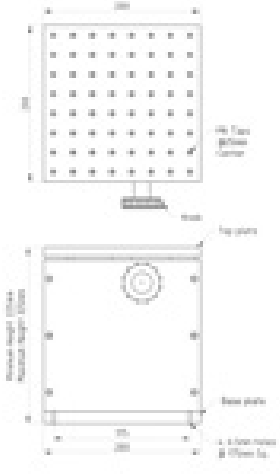
Heavy Duty Labjack

HDLJ SERIES

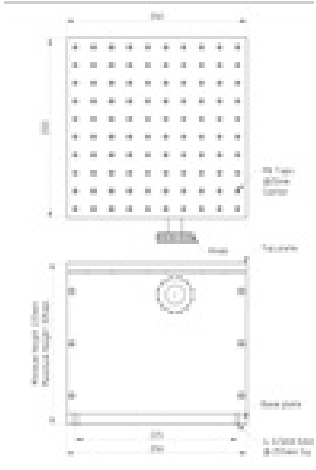




MODEL HD LJ200-200



MODEL HD LJ200-200-A



MODEL HD LJ250-250-A

A geared screw jack design help our jack lift weight up to 50 - 75kg, lifting platform size various fro 180 x 100 and 200 x 200mm and can raise up to 50 mm from its minimum height, precision roller slides are used to guide the heavy duty labjack in position.

Specifications

Vertical height adjustment by 4 mm pitch lead screw with Gear Box
Parallelism: 0.1 mm for entire travel
Load Capacity : 50 to 75 kg
Travel Range : 50 mm
M6 tapped holes at the top at 25 mm grid
M6 clearance slots at bottom
Aluminium alloy
Black anodized

Model No	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load Capacity
HD LJ180-100	180	100	150, 215	65	65 Kg
HD LJ200-200	200	200	160, 225	65	75 Kg
HD LJ250-250	250	250	200, 250	50	75 Kg
HD LJ200-200-A	200	200	225, 325	100	50 Kg
HD LJ250-250-A	250	250	225, 325	100	50 Kg
HD LJ300-300-A	300	300	225, 325	100	75 Kg
HD LJ300-300-B	300	300	250, 375	125	75 Kg

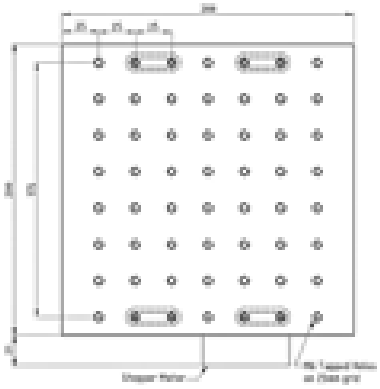
High load capacity up to 100 Kg

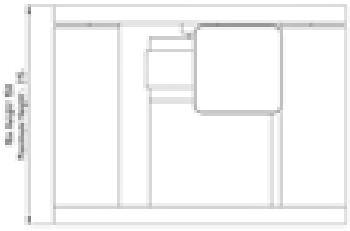
4 mm pitch lead screw drive

Vacuum Compatible Labjack

Vacuum compatibility in the Heavy duty Labjack : HDLJ 300-250, the model number will be V - HDLJ 300-250.

Motorized Heavy Duty Labjack





A geared screw jack design help our jack lift weight up to 50 - 55kg with help of a stepper motor , lifting platform size various fro 180 x 100 and 200 x 200mm and can raise up to 50 mm from its minimum height, precision roller slides are used to guide the heavy duty labjack in position.

Specifications

Vertical height adjustment by 4mm pitch lead screw with Gear Box
Parallelism: 0.1 mm for entire travel
Positioning Accuracy : 0.1 mm
Load Capacity : 50 to 55 kg
Travel Range : 50 mm
M6 tapped holes at the top at 25 mm grid.
M6 clearance slots at bottom
Aluminium Alloy & Stainless Steel Construction
Black Anodized

Model No	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load capacity
MHD LJ180-100	180	100	150, 215	65	50 Kg
MHD LJ200-200	200	200	160, 225	65	55 Kg
MHD LJ250-250	250	250	200, 250	50	50 Kg
MHD LJ200-200-A	200	200	225, 325	100	50 Kg
MHD LJ250-250-A	250	250	225, 325	100	50 Kg
MHD LJ300-300-A	300	300	225, 325	100	75 Kg
MHD LJ300-300-B	300	300	250, 375	125	75 Kg
MHD LJ350-250	350	250	200, 220	20	50 Kg



Controller for Motorized Lab jack

Model No : HO-MPC-1HL

Price : $ 900.00

This is a simple electronic device which provides up and down motion control to the motorized lab jacks. Holding down the up and down key will move the platform up or down correspondingly and releasing the key will stop the movement.

The speed can be varied using a control knob provided in the box. The LCD display provided in the control box will display the distance travelled. The Box will be separated from the Lab jack using a cable of length 3 meters. The power input can be 120V or 220V AC depending on requirement.

Vacuum Compatible Labjack

Controller for Motorized Lab jack

MODEL NO : HO-MPC-1H



Features

- In built motor drives
- PWM current control
- 1 A to 5A Stepper drive
- Up to 1 / 256 micro step
- Microprocessor controlled
- Power down mode
- Position & speed control
- Acceleration / deceleration
- Trigger I / O
- In-built power supply
- Software for PC based operation
- Serial port (RS232C) connectivity
- Optional USB to serial converter
- Optional wireless connectivity (Bluetooth
- Customized Motion Control and Data Acquisition Systems
- Handheld Motion Control System
- Software (Micro-Motion)
- Manual Mode . Programmable mode

This is a simple electronic device which provides up and down motion control to the motorized lab jacks. Holding down the up and down key will move the platform up or down correspondingly and releasing the key will stop the movement.

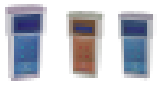
The speed can be varied using a control knob provided in the box. The LCD display provided in the control box will display the distance travelled. The Box will be separated from the Lab jack using a cable of length 3 meters. The power input can be 120V or 220V AC depending on requirement

Micro Motion

Model No:	Number of axis	Motor Type	Motor Torque (kg cm)	Control	Typical Pay load (kg)	Option
MPC-1-ST-OL	1	Stepper	1.5	Open Loop	20	None
MPC-2-SV-OL	2	Servo	7	Closed Loop	35	None
MPC-3-ST-OL	3	Stepper	10	Open Loop	50	None
MPC-4-SV-OL	4	Servo	15	Closed Loop	60	None
MPC-6-ST-OL	6	Stepper	31	Open Loop	80	None
MPC-4-ST-CL-H	4	Stepper	7	Closed Loop	35	Hand Held Unit



Software (Micro-Motion)
Manual Mode/ Programmable mode



Handheld Motion Control System

MODEL NO : HO-MPC-1H

Controller for Motorized Lab jack



Holmarc offers a wide range of high-precision micro positioning devices and systems. Micro-Motion along with a combination of one or more of the MTS, LTMS or MTTS series motorized stages make a high accuracy positioning system for research and industrial applications. The option for selecting any of the various models of motorized translation stages makes it easy to develop a complete position control system involving any or all of the three linear or rotational axes.

Holmarc stepper motor controller has microstep drives offering microstepping down to 16 microsteps per step. Usually stepper motor has 200 steps per revolution. We can increase step per revolution by using drives which can divide a single step in to 16 microstep. This allows much higher resolution up to 3200 micro steps per revolution.

Micro-Motion unit also supports encoder feedback. A built in algorithm counts the incoming pulses from the encoder and compares it with the commanded number of steps to verify the accuracy of movement



Multi Axis Positioning

Holmarc provides positioning controllers up to 6 axes for all motion applications, individually programmable for stepper motor driven stages. Multi axis position controller is recommended for a wide variety of both simple and complex motion applications.

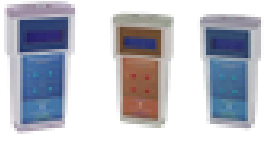
Microstep Configuration	Micro steps per revolution
1 / 2	400
1 / 4	800
1 / 16	3200

Customized Motion Control and Data Acquisition Systems

Holmarc also provides custom motion controllers with graphics LCD and micro switch keyboard which facilitates stand alone operation with a wide range of functions, without interfacing to a PC. The user interface in these systems can be developed according to specific application. Hence, the user is freed from meddling with unwanted features. The short learning curve also allows the user to dedicate more time on actual task. We will help you to develop a complete system for your motion control and data acquisition application using Holmarc's wide range of standard and custom products. Any third party instruments which have commonly used hardware or software interfaces like RS232, GPIB, DCOM etc can be use with the system.

Handheld Motion Control System

Hand-held stepper motor controller-driver offers up to 4 axes control for actuators, linear stages and rotation stages. The hand held unit features 16X micro stepping ratio for smooth, high resolution positioning. Two primary control modes are available, manual control and computer control.



To drive the stage using a PC, a command set will be provided to communicate with the controller using LabVIEW or any other programming language through RS 232 port.

Motorized Vertical Translation Stages

MVTS SERIES

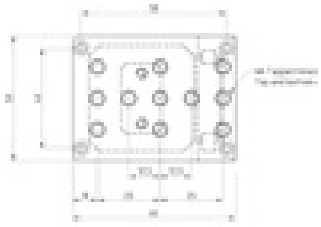
Holmarc's motorized actuator can be used to replace micrometers in translation stages or lead screws in kinematic mounts for making the positioning automated with appropriate control electronics. Drive is achieved by a stepper motor coupled to a precision lead screw–nut mechanism.

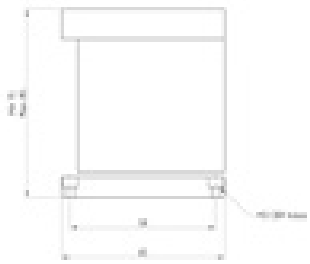
The spindle of the actuator which moves forward and backward when the motor rotates is made non-rotating to bring in extra precision. Construction material is stainless steel . Our standard position controllers can be used to drive these actuators without any customization. Holmarc can supply kinematic mounts and stages fitted with these actuators for custom applications. You are welcome to discuss your needs with our sales engineers.

Travel	10 - 50 mm
Absolute positioning accuracy	0.625 micron (1/16 microstep) *
Resolution	0.625 micron (1/16 microstep) *
Repeatability	5 micron *
Straight line accuracy	10 micron *
Parallelism	5 micron (total travel)
Assembly	10 micron
Full travel	5 micron
Maximum Speed	8 mm / sec *
Minimum continuous speed	12.5 micron / sec *
Feedback	Nil
Linear Guide way	Pre-loaded roller bearing
Material Construction	
Main body	Aluminum 6061
Lead screw	Steel hardened
Nut	Brass / Bronze
Load Capacity	10 - 15 kg
Motor	Stepper Motor
Lead screw	
Lead screw pitch	2 mm (can be modify on request)
Lead screw type	Precision ground lead screw
Coupling	Directing coupling (coupling not included)
Bearings	SKF or Equivalent
Lubricants	Grease
Finish	Black Anodized
Mounting holes	
Top Plate	M6 Mounting holes on 25mm grid
Bottom plate	M6 Clear Holes
Operating temperature	5 - 80 degree centigrade
Accessories	Nil
Electrical connector	9 pin brass connector
Limit switches	Optical limit switch
Controller	Single axis controller
Hand held controller	Optional handheld controller on request









0.5mm Pitch Lead Screw

Model No	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load Capacity
MVTS-5065-10	65	50	75 - 85	10	2 Kg
MVTS-5065-25	65	50	90 - 115	25	2 Kg
MVTS-65-10	65	65	90 - 100	10	5 Kg
MVTS-65-25	65	65	100 - 12	25	5 Kg

1 mm Pitch Lead Screw

Model No	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load Capacity
MVTS-75-10	75	75	75 - 85	10	5 Kg
MVTS-75-25	75	75	90 - 100	25	5 Kg
MVTS-90-10	90	90	90 - 100	10	5 Kg
MVTS-90-25	90	90	100 - 125	25	5 Kg

2 mm Pitch Lead Screw

Model No	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load Capacity
MVTS-125-10	125	125	100 - 120	10	15 Kg
MVTS-125-25	125	125	125 - 150	25	15 Kg
MVTS-125-50	125	125	150 - 200	50	10 Kg
MVTS-125180-10	125	180	100 - 110	10	15 Kg
MVTS-125180-25	125	180	125 - 150	25	15 Kg
MVTS-125180-50	125	180	150 - 200	50	10 Kg
MVTS-200200-10	200	200	100 - 110	10	12 Kg
MVTS-200200-25	200	200	125 - 150	25	10 Kg
MVTS-200200-50	200	200	150 - 200	50	8 Kg

11

OPTICS

598 OPTICS
600 Lenses
600 Spherical Singlets
600 Plano - Convex Lenses
601 Bi - Convex Lenses
602 Plano - Concave Lenses
603 Bi - Concave Lenses
604 Meniscus Lenses
605 Cylindrical Lenses
605 Plano Convex and Plano
605 Concave Cylindrical Lenses
606 Cylindrical Achromatic Lenses
606 Achromatic Lenses
606 Positive and Negative Achromatic Lenses
607 Cylindrical Achromatic Lenses
608 Axicons
610 Prisms
610 Prisms
610 Right Angle Prisms
611 Dove Prisms
612 Penta Prisms
612 Equilateral Prisms
612 Schmidt Prisms
612 Material - BK7
612 Bevel : 0.2mm x 45degree
613 Wedge Prisms
614 Pellin Broca Prisms
614 Littrow Prisms
614 Coated prism divert the incident beam by 60°
614 Uncoated prism ideal for dispersion of white light into spectrum
614 Rhomboid Prisms
615 Amici Roof Prisms
615 Schmidt Prisms
616 Windows
616 Rectangular and Square Windows
617 Circular Windows
618 Beamsplitters
618 Plate Beamsplitters
619 Metallic Cube Beamsplitters
620 Variable Beamsplitters (Mounted)
621 Beamsplitters
622 Mirrors
622 Plano Aluminium Mirrors
623 Plano Silver Mirror
623 Concave Mirror
624 Broadband Metallic Mirror
624 Cone Mirror
625 45° Rod Mirrors
625 Parabolic Concave Mirrors
626 Diffusers & Polarizing Optics
626 Diffusers
627 Polarizing Optics
627 Polarizers
627 Linear Film Polarizers
627 Lyot Depolarizer
628 Wave Plates / Retarders
628 Multiple-Order Wave Plates
629 Zero - Order Wave Plates
630 Fresnel Rhomb Retarders
631 Soleil - Babinet Compensator Fresnel Rhomb Retarders
632 Optical systems
632 10X Eye Loupe
632 Tube Lens - Infinity corrected
633 Beam Expanders
634 Variable Beam Expanders
634 Cylindrical Beam Expander Tube
635 Condensers
635 Fiber Collimator / Focusers
636 Microscope Objectives
Microscope Objectives 632

Lenses

Holmarc offers wide collection of lenses for UV, Visible and NIR applications. Our collection of lenses includes, convex and concave lenses, cylindrical lenses, achromatic lenses, cylindrical achromatic lenses, axicons etc. All the lenses are available in uncoated or Anti-Reflection coated options. In addition to the standard items custom lenses as are also available.



Spherical Singlets

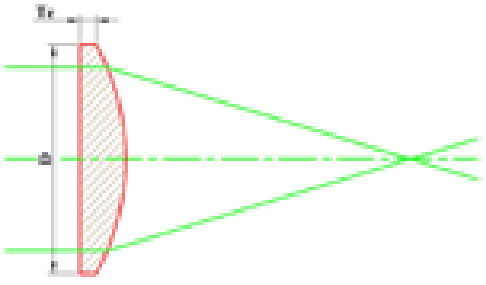
Plano - Convex Lenses

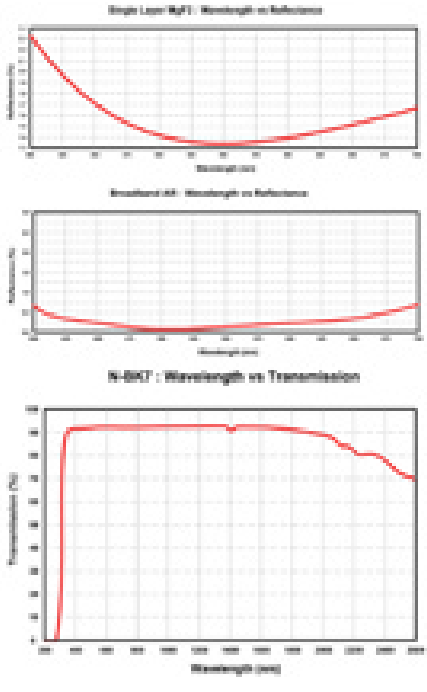
Plano - convex lenses are positive spherical lenses having convex surface on one side and flat surface on the other. These lenses find applications in collecting, focusing and collimating light

Focal length ranges from 15 to 1000 mmn
Available Uncoated or with Single layer MgF2 / Broadband AR coating

Material	BK7 or equivalent
Effective Focal Length Tolerance	± 1%
Diameter Tolerance	+ 0.0, - 0.2 mm
Centering Tolerance	≤ 3 arc min
Surface Quality	40 - 20 (scratch-dig)
Clear Aperture	> 90% of Diameter
Design Wavelength	587.6 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR

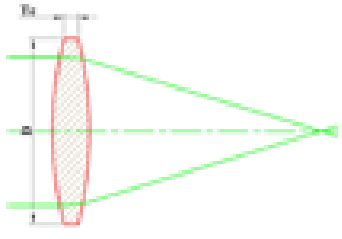
These lenses are available in uncoated, single layer MgF2 coated and Broadband AR coated options.





Model No Uncoated	Single Layer MgF2	Broadband AR	Diameter D (mm)	Focal Length F (mm)	Edge Thickness Te (mm)
HO-PXL12.5-1.2	HO-PXL12.5-1.2C	HO-PXL12.5-1.2B	12.5	15	2
HO-PXL12.5-1.6	HO-PXL12.5-1.6C	HO-PXL12.5-1.6B	12.5	20	2
HO-PXL12.5-02	HO-PXL12.5-02C	HO-PXL12.5-02B	12.5	25	2
HO-PXL12.5-2.4	HO-PXL12.5-2.4C	HO-PXL12.5-2.4B	12.5	30	2
HO-PXL12.5-3.2	HO-PXL12.5-3.2C	HO-PXL12.5-3.2B	12.5	40	2
HO-PXL12.5-04	HO-PXL12.5-04C	HO-PXL12.5-04B	12.5	50	2
HO-PXL12.5-08	HO-PXL12.5-08C	HO-PXL12.5-08B	12.5	100	2
HO-PXL25-01	HO-PXL25-01C	HO-PXL25-01B	25	25	2
HO-PXL25-1.6	HO-PXL25-1.6C	HO-PXL25-1.6B	25	40	2
HO-PXL25-02	HO-PXL25-02C	HO-PXL25-02B	25	50	2
HO-PXL25-3.2	HO-PXL25-3.2C	HO-PXL25-3.2B	25	80	2
HO-PXL25-04	HO-PXL25-04C	HO-PXL25-04B	25	100	2
HO-PXL25-06	HO-PXL25-06C	HO-PXL25-06B	25	150	2
HO-PXL25-08	HO-PXL25-08C	HO-PXL25-08B	25	200	2
HO-PXL25-12	HO-PXL25-12C	HO-PXL25-12B	25	300	2
HO-PXL25-20	HO-PXL25-20C	HO-PXL25-20B	25	500	2
HO-PXL25-40	HO-PXL25-40C	HO-PXL25-40B	25	1000	2
HO-PXL30-1.3	HO-PXL30-1.3C	HO-PXL30-1.3B	30	40	2.5
HO-PXL30-1.6	HO-PXL30-1.6C	HO-PXL30-1.6B	30	50	2.5
HO-PXL30-2.5	HO-PXL30-2.5C	HO-PXL30-2.5B	30	75	2.5
HO-PXL30-3.3	HO-PXL30-3.3C	HO-PXL30-3.3B	30	100	2.5
HO-PXL30-05	HO-PXL30-05C	HO-PXL30-05B	30	150	2
HO-PXL30-6.6	HO-PXL30-6.6C	HO-PXL30-6.6B	30	200	2
HO-PXL30-8.3	HO-PXL30-8.3C	HO-PXL30-8.3B	30	250	2
HO-PXL30-10	HO-PXL30-10C	HO-PXL30-10B	30	300	2
HO-PXL30-16.6	HO-PXL30-16.6C	HO-PXL30-16.6B	30	500	2
HO-PXL50-1.6	HO-PXL50-1.6C	HO-PXL50-1.6B	50	80	3
HO-PXL50-02	HO-PXL50-02C	HO-PXL50-02B	50	100	3
HO-PXL50-03	HO-PXL50-03C	HO-PXL50-03B	50	150	3
HO-PXL50-04	HO-PXL50-04C	HO-PXL50-04B	50	200	3
HO-PXL50-06	HO-PXL50-06C	HO-PXL50-06B	50	300	3
HO-PXL50-08	HO-PXL50-08C	HO-PXL50-08B	50	400	3
HO-PXL50-10	HO-PXL50-10C	HO-PXL50-10B	50	500	3
HO-PXL50-20	HO-PXL50-20C	HO-PXL50-20B	50	1000	3

Bi - Convex Lenses



Bi-convex lenses are positive spherical lenses having convex surfaces on both sides. Holmarc manufactures bi-convex lenses with equal radii on both sides as standard stock optics. Our bi-convex lenses are available in three options; uncoated, single layer MgF2 and broadband AR coated.

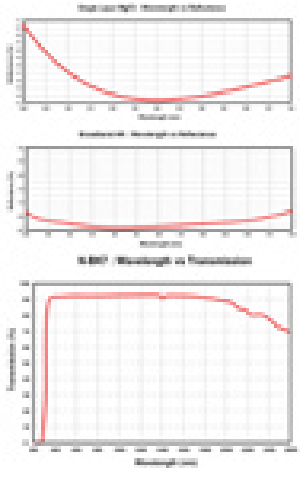
Focal length ranges from 15 to 1000 mm
Available Uncoated or with Single layer MgF2 / Broadband AR coating

Material	BK7 or equivalent
Effective Focal Length Tolerance	± 1%
Diameter Tolerance	+ 0.0, - 0.2 mm
Centering Tolerance	≤ 3 arc min
Surface Quality	40 - 20 (scratch-dig)
Clear Aperture	> 90% of Diameter
Design Wavelength	587.6 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR

These lenses are available in uncoated, single layer MgF2 coated and Broadband AR coated options

Model No Uncoated	Single Layer MgF2	Broadband AR	Diameter D (mm)	Focal Length F (mm)	Edge Thickness Te (mm)
HO-BXL12.5-1.2	HO-BXL12.5-1.2C	HO-BXL12.5-1.2B	12.5	15	2
HO-BXL12.5-1.6	HO-BXL12.5-1.6C	HO-BXL12.5-1.6B	12.5	20	2
HO-BXL12.5-02	HO-BXL12.5-02C	HO-BXL12.5-02B	12.5	25	2
HO-BXL12.5-2.4	HO-BXL12.5-2.4C	HO-BXL12.5-2.4B	12.5	30	2
HO-BXL12.5-3.2	HO-BXL12.5-3.2C	HO-BXL12.5-3.2B	12.5	40	2
HO-BXL12.5-04	HO-BXL12.5-04C	HO-BXL12.5-04B	12.5	50	2
HO-BXL12.5-08	HO-BXL12.5-08C	HO-BXL12.5-08B	12.5	100	2
HO-BXL25-01	HO-BXL25-01C	HO-BXL25-01B	25	25	2
HO-BXL25-1.6	HO-BXL25-1.6C	HO-BXL25-1.6B	25	40	2
HO-BXL25-02	HO-BXL25-02C	HO-BXL25-02B	25	50	2
HO-BXL25-3.2	HO-BXL25-3.2C	HO-BXL25-3.2B	25	80	2
HO-BXL25-04	HO-BXL25-04C	HO-BXL25-04B	25	100	2
HO-BXL25-06	HO-BXL25-06C	HO-BXL25-06B	25	150	2
HO-BXL25-08	HO-BXL25-08C	HO-BXL25-08B	25	200	2
HO-BXL25-12	HO-BXL25-12C	HO-BXL25-12B	25	300	2
HO-BXL25-20	HO-BXL25-20C	HO-BXL25-20B	25	500	2
HO-BXL25-40	HO-BXL25-40C	HO-BXL25-40B	25	1000	2
HO-BXL50-1.6	HO-BXL50-1.6C	HO-BXL50-1.6B	50	80	3
HO-BXL50-02	HO-BXL50-02C	HO-BXL50-02B	50	100	3
HO-BXL50-03	HO-BXL50-03C	HO-BXL50-03B	50	150	3
HO-BXL50-04	HO-BXL50-04C	HO-BXL50-04B	50	200	3
HO-BXL50-06	HO-BXL50-06C	HO-BXL50-06B	50	300	3
HO-BXL50-10	HO-BXL50-10C	HO-BXL50-10B	50	500	3
HO-BXL50-20	HO-BXL50-20C	HO-BXL50-20B	50	1000	3





Plano - Concave Lenses

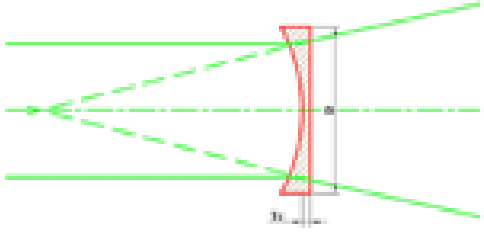


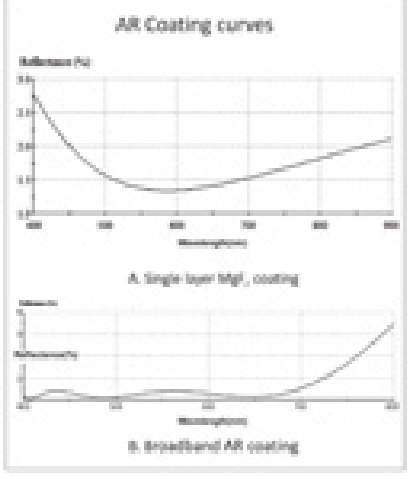
Plano - concave lenses are negative spherical lenses with one concave surface and one flat surface. These lenses can be used to diverge light or to increase the focal length of an optical system.

Plano-concave lenses are available as uncoated, single layer MgF2 coated and broadband AR coated.

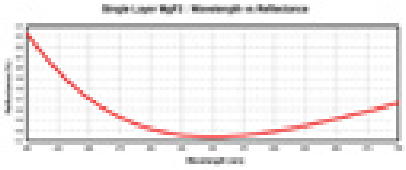
Focal length ranges from -25 to -1000 mm
Available Uncoated or with Single layer MgF2 / Broadband AR coating

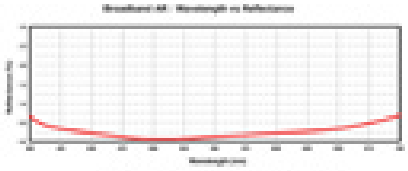
Material	BK7 or equivalent
Effective Focal Length Tolerance	± 1%
Diameter Tolerance	+ 0.0, - 0.2 mm
Centering Tolerance	≤ 3 arc min
Surface Quality	40 - 20 (scratch-dig)
Clear Aperture	> 90% of Diameter
Design Wavelength	587.6 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR
Center thickness, tc	2.5 mm

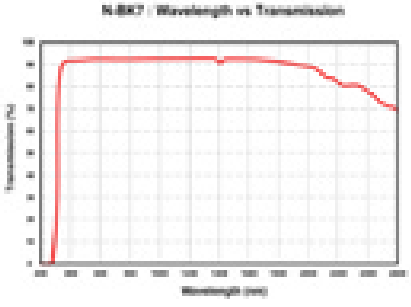




Uncoated	Single Layer MgF2	Broadband AR	Diameter D (mm)	Focal Length F (mm)
HO-PVL12.5-02	HO-PVL12.5-02C	HO-PVL12.5-02B	12.5	-25
HO-PVL12.5-2.4	HO-PVL12.5-2.4C	HO-PVL12.5-2.4B	12.5	-30
HO-PVL12.5-04	HO-PVL12.5-04C	HO-PVL12.5-04B	12.5	-50
HO-PVL25-1.2	HO-PVL25-1.2C	HO-PVL25-1.2B	25	-30
HO-PVL25-1.6	HO-PVL25-1.6C	HO-PVL25-1.6B	25	-40
HO-PVL25-02	HO-PVL25-02C	HO-PVL25-02B	25	-50
HO-PVL25-3.2	HO-PVL25-3.2C	HO-PVL25-3.2B	25	-80
HO-PVL25-04	HO-PVL25-04C	HO-PVL25-04B	25	-100
HO-PVL25-06	HO-PVL25-06C	HO-PVL25-06B	25	-150
HO-PVL25-08	HO-PVL25-08C	HO-PVL25-08B	25	-200
HO-PVL25-12	HO-PVL25-12C	HO-PVL25-12B	25	-300
HO-PVL25-20	HO-PVL25-20C	HO-PVL25-20B	25	-500
HO-PVL25-40	HO-PVL25-40C	HO-PVL25-40B	25	-1000
HO-PVL50-1.6	HO-PVL50-1.6C	HO-PVL50-1.6B	50	-80
HO-PVL50-02	HO-PVL50-02C	HO-PVL50-02B	50	-100
HO-PVL50-03	HO-PVL50-03C	HO-PVL50-03B	50	-150
HO-PVL50-04	HO-PVL50-04C	HO-PVL50-04B	50	-200
HO-PVL50-06	HO-PVL50-06C	HO-PVL50-06B	50	-300
HO-PVL50-10	HO-PVL50-10C	HO-PVL50-10B	50	-500
HO-PVL50-20	HO-PVL50-20C	HO-PVL50-20B	50	-1000







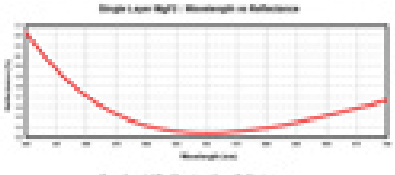
Bi - Concave Lenses

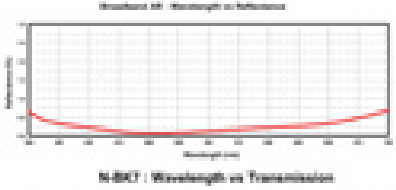
These lenses have spherical concave surfaces on both sides. Holmarc manufactures many of these lenses as standard products. These lenses find applications in diverging light or in increasing focal length of an optical system. Our bi-concave lenses are available in three options; uncoated, single layer MgF2 and broadband AR coated.

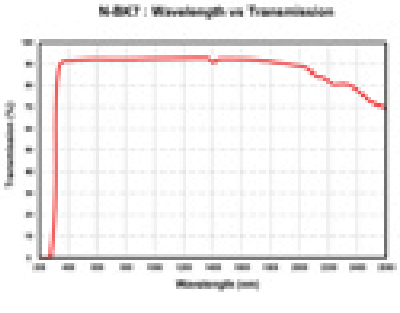
Focal length ranges from -30 to -1000 mm
Available Uncoated or with Single layer MgF2 / Broadband AR coating

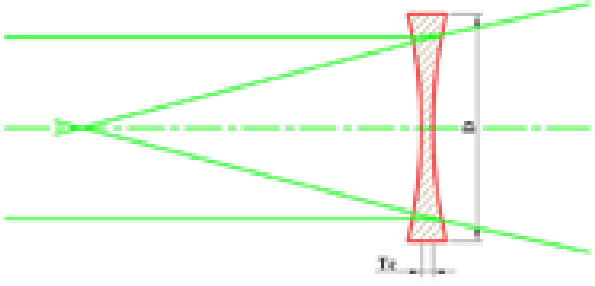


Material	BK7 or equivalent
Effective Focal Length Tolerance	± 1%
Diameter Tolerance	+ 0.0, - 0.2 mm
Centering Tolerance	≤ 3 arc min
Surface Quality	40 - 20 (scratch-dig)
Clear Aperture	> 90% of Diameter
Design Wavelength	587.6 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR
Center thickness, tc	2.5 mm



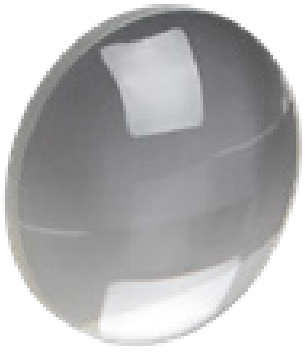






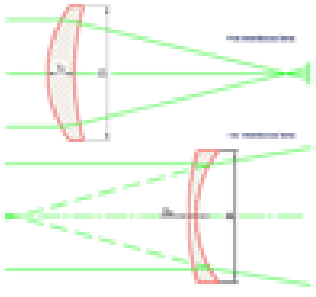
Uncoated	Single Layer MgF_2	Broadband AR	Diameter D (mm)	Focal Length F (mm)
HO-BVL25-1.2	HO-BVL25-1.2C	HO-BVL25-1.2B	25	-30
HO-BVL25-1.6	HO-BVL25-1.6C	HO-BVL25-1.6B	25	-40
HO-BVL25-02	HO-BVL25-02C	HO-BVL25-02B	25	-50
HO-BVL25-3.2	HO-BVL25-3.2C	HO-BVL25-3.2B	25	-80
HO-BVL25-04	HO-BVL25-04C	HO-BVL25-04B	25	-100
HO-BVL25-06	HO-BVL25-06C	HO-BVL25-06B	25	-150
HO-BVL25-08	HO-BVL25-08C	HO-BVL25-08B	25	-200
HO-BVL25-12	HO-BVL25-12C	HO-BVL25-12B	25	-300
HO-BVL25-20	HO-BVL25-20C	HO-BVL25-20B	25	-500
HO-BVL25-40	HO-BVL25-40C	HO-BVL25-40B	25	-1000
HO-BVL50-1.6	HO-BVL50-1.6C	HO-BVL50-1.6B	50	-80
HO-BVL50-02	HO-BVL50-02C	HO-BVL50-02B	50	-100
HO-BVL50-03	HO-BVL50-03C	HO-BVL50-03B	50	-150
HO-BVL50-04	HO-BVL50-04C	HO-BVL50-04B	50	-200
HO-BVL50-06	HO-BVL50-06C	HO-BVL50-06B	50	-300
HO-BVL50-10	HO-BVL50-10C	HO-BVL50-10B	50	-500
HO-BVL50-20	HO-BVL50-20C	HO-BVL50-20B	50	-1000

Meniscus Lenses



Positive meniscus lens is a convex-concave lens thicker at the center than at the edges. It is used to minimize spherical aberration. When used in combination with another lens, it will shorten the focal length, and increase the NA of system.
Negative meniscus lens is a convex-concave lens thinner at the center than edges. It increases the divergence of the beam without introducing any significant spherical aberration. When used in combination with another lens, it will increase the focal length and decrease the NA of the system.

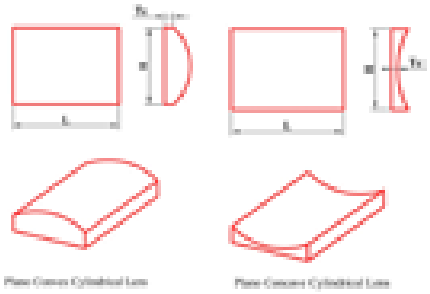
Minimize spherical aberrations
Positive or Negative configurations Available



Material	BK7 or equivalent
Effective Focal Length Tolerance	± 1%
Diameter Tolerance	+ 0.0, -0.2 mm
Centering Tolerance	≤ 3 arc min
Surface Quality	40 - 20 (scratch-dig)
Clear Aperture	> 90% of Diameter
Design Wavelength	587.6 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR
Center thickness, tc	3 mm for negative & 4 mm for Positive

Uncoated	Single Layer MgF_2	Broadband AR	Diameter D (mm)	Focal Length F (mm)	Focal Length F (mm)
HO-PML25-04	HO-PML25-04C	HO-PML25-04B	Positive	25	100
HO-PML25-05	HO-PML25-05C	HO-PML25-05B	Positive	25	125
HO-PML25-06	HO-PML25-06C	HO-PML25-06B	Positive	25	150
HO-PML25-08	HO-PML25-08C	HO-PML25-08B	Positive	25	200
HO-PML25-10	HO-PML25-10C	HO-PML25-10B	Positive	25	250
HO-PML25-12	HO-PML25-12C	HO-PML25-12B	Positive	25	300
HO-PML25-20	HO-PML25-20C	HO-PML25-20B	Positive	25	500
HO-NML25-04	HO-NML25-04C	HO-NML25-04B	Negative	25	-100
HO-NML25-05	HO-NML25-05C	HO-NML25-05B	Negative	25	-125
HO-NML25-06	HO-NML25-06C	HO-NML25-06B	Negative	25	-150
HO-NML25-08	HO-NML25-08C	HO-NML25-08B	Negative	25	-200
HO-NML25-10	HO-NML25-10C	HO-NML25-10B	Negative	25	-250
HO-NML25-12	HO-NML25-12C	HO-NML25-12B	Negative	25	-300
HO-NML25-20	HO-NML25-20C	HO-NML25-20B	Negative	25	-500

Cylindrical Lenses

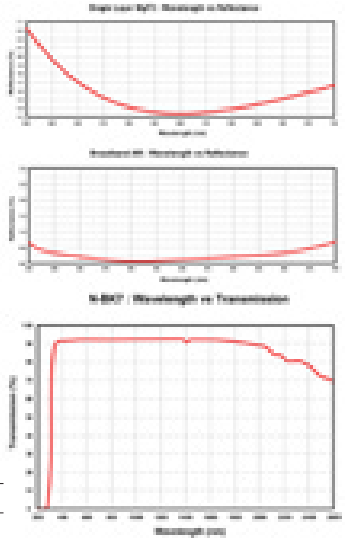


Plano Convex and Plano Concave Cylindrical Lenses

Cylindrical Lenses are well suited for applications which require magnification in one dimension only. Cylindrical lenses are available in either plano-concave or plano-convex configurations. Plano-concave lenses have a negative focal length and are used for image reduction or to spread light. Plano-convex lenses have a positive focal length, which makes them ideal for collecting and focusing light for many imaging applications.

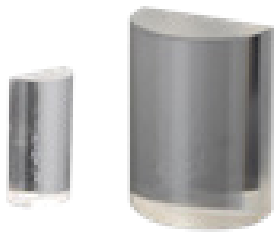
Plano-concave or Plano-convex configurations
Available Uncoated or with Single layer MgF2 / Broadband AR coating

Material	BK7 or equivalent
Effective Focal Length Tolerance	± 2%
Length Tolerance	+0.0, -0.2 mm
Height Tolerance	+0.0, -0.2 mm
Centering Tolerance	≤ 3 arc min.
Surface quality	40 - 20 (scratch-dig)
Clear aperture	> 90 % of surface dimensions
Design wavelength	587.6 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR

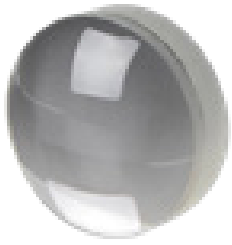


Plano Convex Cylindrical Lens

Model No.						
Uncoated	Single Layer MgF2	Broadband AR	Focal Length F (mm)	Length L (mm)	Height H (mm)	Edge Thick-ness Te (mm)
HO-PXCL10-10	HO-PXCL10-10C	HO-PXCL10-10B	10	10	10	2
HO-PXCL12-10	HO-PXCL12-10C	HO-PXCL12-10B	10	12	10	2
HO-PXCL12-15	HO-PXCL12-15C	HO-PXCL12-15B	15	12	10	
HO-PXCL20-15	HO-PXCL20-15C	HO-PXCL20-15B	15	20	10	
HO-PXCL10-20	HO-PXCL10-20C	HO-PXCL10-20B	20	10	10	
HO-PXCL20-20	HO-PXCL20-20C	HO-PXCL20-20B	20	20	10	
HO-PXCL10-25	HO-PXCL10-25C	HO-PXCL10-25B	25	10	10	
HO-PXCL20-25	HO-PXCL20-25C	HO-PXCL20-25B	25	20	10	
HO-PXCL10-30	HO-PXCL10-30C	HO-PXCL10-30B	30	10	10	
HO-PXCL20-30	HO-PXCL20-30C	HO-PXCL20-30B	30	20	10	
HO-PXCL25-30	HO-PXCL25-30C	HO-PXCL25-30B	30	25	15	
HO-PXCL15-40	HO-PXCL15-40C	HO-PXCL15-40B	40	15	10	
HO-PXCL20-40	HO-PXCL20-40C	HO-PXCL20-40B	40	20	15	
HO-PXCL30-40	HO-PXCL30-40C	HO-PXCL30-40B	40	30	20	
HO-PXCL20-50	HO-PXCL20-50C	HO-PXCL20-50B	50	20	20	
HO-PXCL30-50	HO-PXCL30-50C	HO-PXCL30-50B	50	30	20	
HO-PXCL30-60	HO-PXCL30-60C	HO-PXCL30-60B	60	30	25	3
HO-PXCL40-75	HO-PXCL40-75C	HO-PXCL40-75B	75	40	25	3
HO-PXCL50-100	HO-PXCL50-100C	HO-PXCL50-100B	100	50	20	
HO-PXCL70-100	HO-PXCL70-100C	HO-PXCL70-100B	100	70	30	
HO-PXCL50-150	HO-PXCL50-150C	HO-PXCL50-150B	150	50	30	
HO-PXCL75-150	HO-PXCL75-150C	HO-PXCL75-150B	150	75	30	
HO-PXCL50-250	HO-PXCL50-250C	HO-PXCL50-250B	250	50	30	3
HO-PXCL75-250	HO-PXCL75-250C	HO-PXCL75-250B	250	75	30	3
HO-PXCL50-500	HO-PXCL50-500C	HO-PXCL50-500B	500	50	30	3
HO-PXCL75-500	HO-PXCL75-500C	HO-PXCL75-500B	500	75	30	3

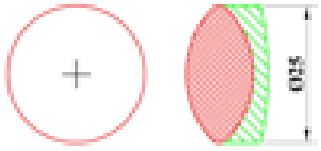


Cylindrical Achromatic Lenses

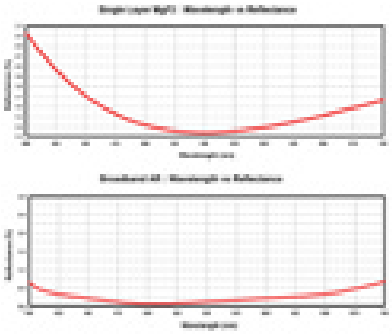


Holmarc's cylindrical achromatic lenses are used to focus polychromatic light in one dimension with reduced spherical and chromatic aberrations. Holmarc's cylindrical achromatic lenses are available either as uncoated or coated (single layer MgF2 or broadband AR). When used with monochromatic light source, these lenses produce smaller spot size than standard cylindrical lenses.

Focuses light in one dimension
Focal length ranges from 50 to 250 mm



Material	BK7, SF1 & F2 (or equivalent)
Effective Focal Length Tolerance	± 1%
Diameter tolerance	+ 0.0, -0.2 mm
Centering Tolerance	≤ 5 arc min.
Surface quality	40 - 20 (scratch-dig)
Clear aperture	> 90 % of dimensions
Design wavelengths	486.1 nm, 587.6 nm, & 656.3 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR (Ravg = < 0.5% @ 400-700 nm)



Uncoated	Model No.			
	Single Layer MgF2	Broadband AR	Diameter D (mm)	Focal Length F (mm)
HO-CAL25-02	HO-CAL25-02C	HO-CAL25-02B	25	50
HO-CAL25-03	HO-CAL25-03C	HO-CAL25-03B	25	75
HO-CAL25-04	HO-CAL25-04C	HO-CAL25-04B	25	100
HO-CAL25-06	HO-CAL25-06C	HO-CAL25-06B	25	150
HO-CAL25-08	HO-CAL25-08C	HO-CAL25-08B	25	200
HO-CAL25-10	HO-CAL25-10C	HO-CAL25-10B	25	250

Achromatic Lenses

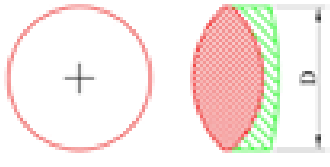
Positive and Negative Achromatic Lenses



Achromatic lenses can be used as collimators, focusing lenses or light collectors. They are designed to eliminate chromatic and spherical aberrations and perform well for all paraxial imaging tasks. These lenses are available as uncoated, single Layer MgF2 coated and broadband AR coated types.

These days Achromatic lenses are widely used in achromatic telescopes, microscopes and photographic lens.

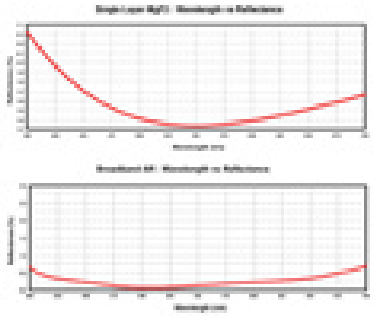
Reduces chromatic & spherical aberrations
Positive or Negative configurations Available



Material	BK7, N - SF1 & F2 (or equivalent)
Effective Focal Length Tolerance	± 1%
Diameter tolerance	+ 0.0, -0.2 mm
Centering Tolerance	≤ 3 arc min.
Surface quality	40 - 20 (scratch-dig)
Clear aperture	> 90 % of dimensions
Design wavelengths	486.1 nm, 587.6 nm, & 656.3 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR (Ravg = < 0.5% @ 400-700 nm)

Positive Achromatic Lens

Uncoated	Model No	Broadband AR	Diameter D (mm)	Focal Length F (mm)
	Single Layer MgF2			
HO-PAL12.5-02	HO-PAL12.5-02C	HO-PAL12.5-02B	12.5	25
HO-PAL12.5-04	HO-PAL12.5-04C	HO-PAL12.5-04B	12.5	50
HO-PAL12.5-06	HO-PAL12.5-06C	HO-PAL12.5-06B	12.5	75
HO-PAL25-1.6	HO-PAL25-1.6C	HO-PAL25-1.6B	25	40
HO-PAL25-02	HO-PAL25-02C	HO-PAL25-02B	25	50
HO-PAL25-03	HO-PAL25-03C	HO-PAL25-03B	25	75
HO-PAL25-04	HO-PAL25-04C	HO-PAL25-04B	25	100
HO-PAL25-06	HO-PAL25-06C	HO-PAL25-06B	25	150
HO-PAL25-08	HO-PAL25-08C	HO-PAL25-08B	25	200
HO-PAL25-10	HO-PAL25-10C	HO-PAL25-10B	25	250
HO-PAL25-12	HO-PAL25-12C	HO-PAL25-12B	25	300
HO-PAL25-16	HO-PAL25-16C	HO-PAL25-16B	25	400
HO-PAL25-20	HO-PAL25-20C	HO-PAL25-20B	25	500
HO-PAL50-02	HO-PAL50-02C	HO-PAL50-02B	50	100
HO-PAL50-03	HO-PAL50-03C	HO-PAL50-03B	50	150
HO-PAL50-04	HO-PAL50-04C	HO-PAL50-04B	50	200
HO-PAL50-05	HO-PAL50-05C	HO-PAL50-05B	50	250
HO-PAL50-06	HO-PAL50-06C	HO-PAL50-06B	50	300
HO-PAL50-08	HO-PAL50-08C	HO-PAL50-08B	50	400
HO-PAL50-10	HO-PAL50-10C	HO-PAL50-10B	50	500
HO-PAL50-15	HO-PAL50-15C	HO-PAL50-15B	50	750
HO-PAL50-20	HO-PAL50-20C	HO-PAL50-20B	50	1000

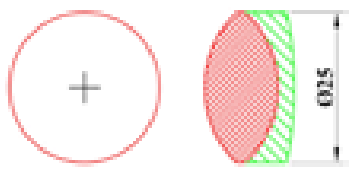


Negative Achromatic Lens

Uncoated	Model No	Broadband AR	Diameter D (mm)	Focal Length F (mm)
	Single Layer MgF2			
HO-NAL12.5-02	HO-NAL12.5-02C	HO-NAL12.5-02B	12.5	-25
HO-NAL12.5-04	HO-NAL12.5-04C	HO-NAL12.5-04B	12.5	-50
HO-NAL25-02	HO-NAL25-02C	HO-NAL25-02B	25	-50
HO-NAL25-2.8	HO-NAL25-2.8C	HO-NAL25-2.8B	25	-70
HO-NAL25-04	HO-NAL25-04C	HO-NAL25-04B	25	-100
HO-NAL25-06	HO-NAL25-06C	HO-NAL25-06B	25	-150
HO-NAL50-03	HO-NAL50-03C	HO-NAL50-03B	50	-150

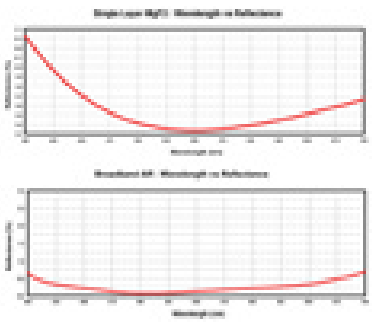
Cylindrical Achromatic Lenses

Holmarc's cylindrical achromatic lenses are used to focus polychromatic light in one dimension with reduced spherical and chromatic aberrations. Holmarc's cylindrical achromatic lenses are available either as uncoated or coated (single layer MgF2 or broadband AR). When used with monochromatic light source, these lenses produce smaller spot size than standard cylindrical lenses

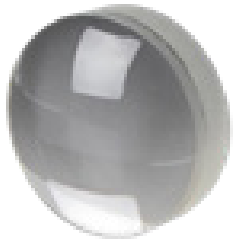


Focuses light in one dimension
Focal length ranges from 50 to 250 mm

Material	BK7, N - SF1 & F2 (or equivalent)
Effective Focal Length Tolerance	± 1%
Diameter tolerance	+ 0.0, -0.2 mm
Centering Tolerance	≤ 5 arc min.
Surface quality	40 - 20 (scratch-dig)
Clear aperture	> 90 % of dimensions
Design wavelengths	486.1 nm, 587.6 nm, & 656.3 nm
Coating	Uncoated / Single layer MgF2 / Broadband AR (Ravg = < 0.5% @ 400-700 nm)

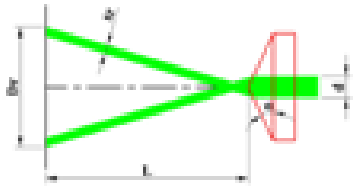


Uncoated	Model No	Broadband AR	Diameter D (mm)	Focal Length F (mm)
HO-CAL25-02	HO-CAL25-02C	HO-CAL25-02B	25	50
HO-CAL25-03	HO-CAL25-03C	HO-CAL25-03B	25	75
HO-CAL25-04	HO-CAL25-04C	HO-CAL25-04B	25	100
HO-CAL25-06	HO-CAL25-06C	HO-CAL25-06B	25	150
HO-CAL25-08	HO-CAL25-08C	HO-CAL25-08B	25	200
HO-CAL25-10	HO-CAL25-10C	HO-CAL25-10B	25	250

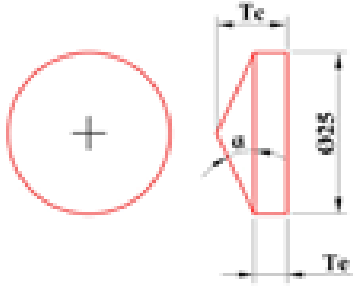


Axicons

Holmarc's cylindrical achromatic lenses are used to focus polychromatic light in one dimension with reduced spherical and chromatic aberrations. Holmarc's cylindrical achromatic lenses are available either as uncoated or coated (single layer MgF2 or broadband AR). When used with monochromatic light source, these lenses produce smaller spot size than standard cylindrical lenses



Axicons are optical components which can be used to convert a collimated laser beam into a ring shaped non-diffractive Bessel beam. Holmarc's axicons are made from UV grade fused silica substrate and are available as uncoated and broadband AR coated.



The ring thickness of the Bessel beam can be calculated from the following formula;

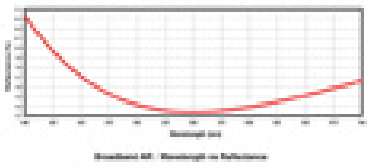
tr = 0.5 * d ..... where d is the diameter of the input collimated beam.

The diameter of the ring at a particular distance can be calculated from the following equation;

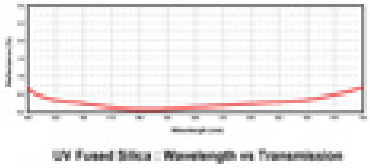
Dr = 2 L tan [(n - 1) α]



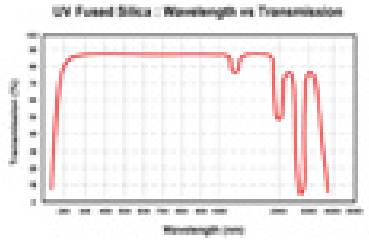
where D is the diameter of the ring at a distance L from the lens, n is the r refractive index of the lens material and α is the axicon angle.



25 mm diameter with a variety of axicon angles
Available Uncoated or with Broadband AR coating



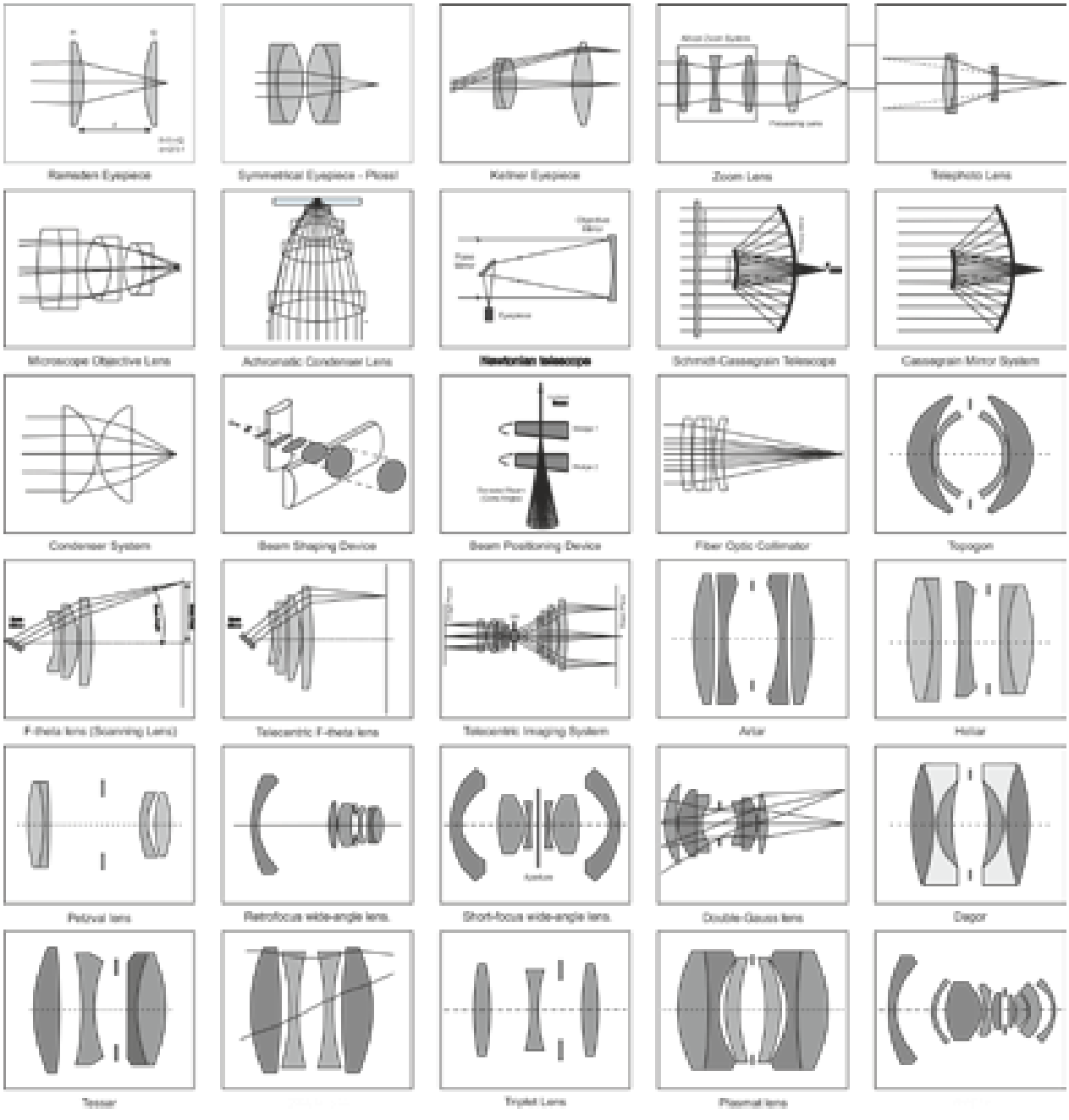
Material	UV fused silica
Diameter	25 mm
Diameter tolerance	+ 0.0, -0.2 mm
Edge thickness, te	5 mm
Center thickness tolerance	0.1 mm
Angular tolerance	± 0.01 %
Surface quality	40 - 20 (scratch-dig)
Clear aperture	> 90 % of dimensions
Surface flatness	λ / 4 @ 632.8 nm
Design wavelengths	486.1 nm, 587.6 nm, & 656.3 nm
Coating	Uncoated / Broadband AR coated (Ravg = < 0.5% @ 400 - 700 nm)

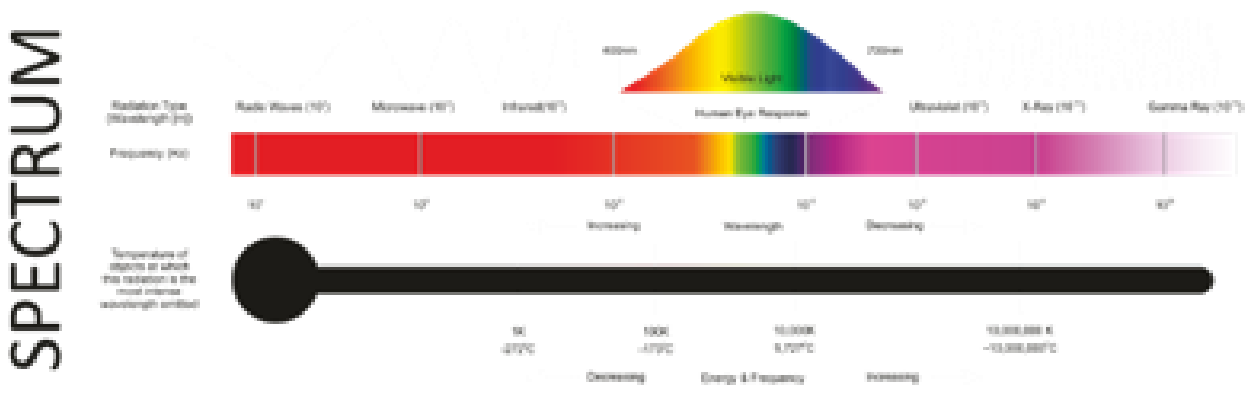


Model No AX-25-10.0



OPTIC DESIGN FUNDAMENTAL CHART AVAILABLE ON REQUEST

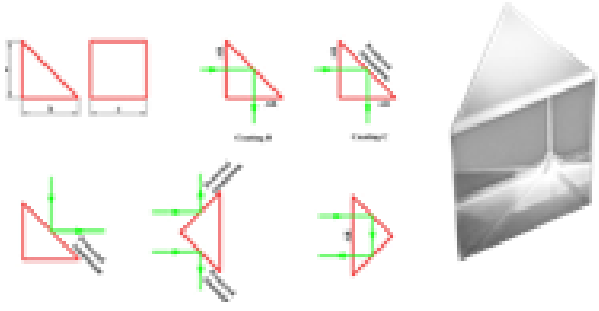




Prisms

Prisms

Holmarc offers different types of Reflective and Dispersive prisms. Dispersive prisms are used to separate the light into its constituent spectral colors, while reflective prisms are used to reflect, invert, rotate, deviate, or displace the light beam. Our prisms are available in different high quality substrates for UV, Visible, and NIR spectral regions. Custom specified prisms are also available.



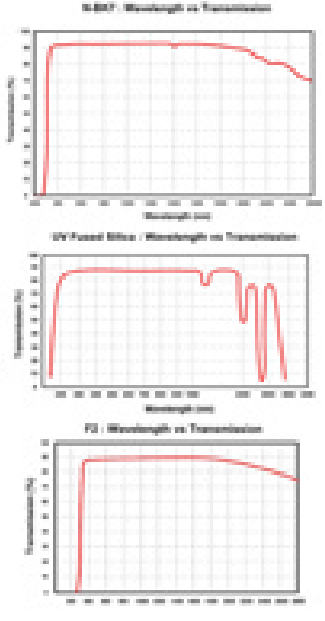
Right Angle Prisms

Right Angle Prisms are used to re-direct a beam of light at 90 degrees from the incident direction or used as 180° beam retroreflector. We offer these prisms uncoated or with five different coating options, namely;

Different coating options possible
Used as 180° beam retroreflector

Single layer anti-reflection coating on legs.
Protected aluminum on hypotenuse and single layer anti-reflection on legs.
Protected aluminum on hypotenuse.
Protected aluminum on legs
Single layer anti-reflection coating on hypotenuse.

Material	BK7 or equivalent, F2 & fused silica
Effective aperture	90 %
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Angle tolerance	+/- 3 arc min
Surface flatness	λ / 4 @ 632.8 nm
Perpendicularity	+/- 3 arc min
Protective chamfer	0.2 mm x 45°
Coating	Optional



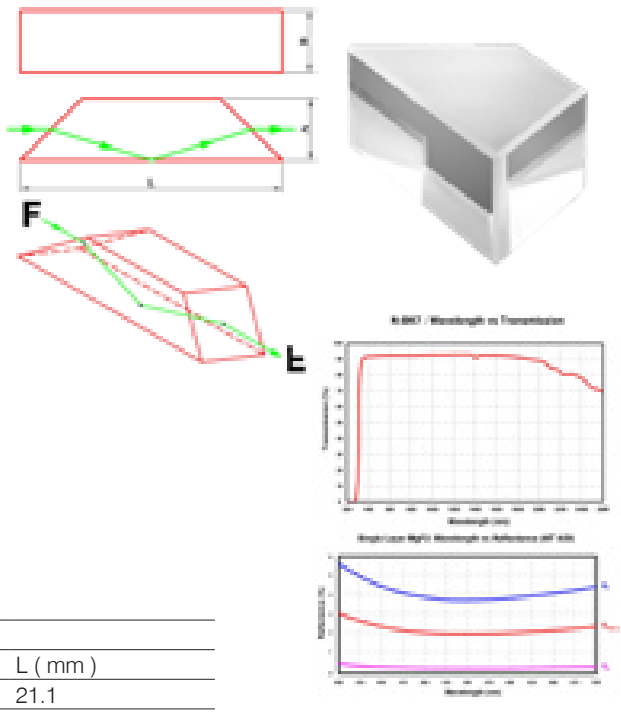
Model No.							
A*	B*	C*	D*	E*	E*	a = b = c (mm)	Material)
HO-RPB-A-5	HO-RPB-B-5	HO-RPB-C-5	HO-RPB-D-5	HO-RPB-E-5	HO-RPB-F-5	5	
HO-RPB-A-10	HO-RPB-B-10	HO-RPB-C-10	HO-RPB-D-10	HO-RPB-E-10	HO-RPB-F-10	10	
HO-RPB-A-20	HO-RPB-B-20	HO-RPB-C-20	HO-RPB-D-20	HO-RPB-E-20	HO-RPB-F-20	20	
HO-RPB-A-25	HO-RPB-B-25	HO-RPB-C-25	HO-RPB-D-25	HO-RPB-E-25	HO-RPB-F-25	25	
HO-RPB-A-38	HO-RPB-B-38	HO-RPB-C-38	HO-RPB-D-38	HO-RPB-E-38	HO-RPB-F-38	38	
HO-RPB-A-50	HO-RPB-B-50	HO-RPB-C-50	HO-RPB-D-50	HO-RPB-E-50	HO-RPB-F-50	50	Fused Silica
HO-RPS-A-5	HO-RPS-B-5	HO-RPS-C-5	HO-RPS-D-5	HO-RPS-E-5	HO-RPS-F-5	5	
HO-RPS-A-10	HO-RPS-B-10	HO-RPS-C-10	HO-RPS-D-10	HO-RPS-E-10	HO-RPS-F-10	10	
HO-RPS-A-20	HO-RPS-B-20	HO-RPS-C-20	HO-RPS-D-20	HO-RPS-E-20	HO-RPS-F-20	20	
HO-RPS-A-25	HO-RPS-B-25	HO-RPS-C-25	HO-RPS-D-25	HO-RPS-E-25	HO-RPS-F-25	25	
HO-RPS-A-38	HO-RPS-B-38	HO-RPS-C-38	HO-RPS-D-38	HO-RPS-E-38	HO-RPS-F-38	38	
HO-RPS-A-50	HO-RPS-B-50	HO-RPS-C-50	HO-RPS-D-50	HO-RPS-E-50	HO-RPS-F-50	50	
HO-RPF-A-5	HO-RPF-B-5	HO-RPF-C-5	HO-RPF-D-5	HO-RPF-E-5	HO-RPF-F-5	5	F2
HO-RPF-A-10	HO-RPF-B-10	HO-RPF-C-10	HO-RPF-D-10	HO-RPF-E-10	HO-RPF-F-10	10	F2
HO-RPF-A-20	HO-RPF-B-20	HO-RPF-C-20	HO-RPF-D-20	HO-RPF-E-20	HO-RPF-F-20	20	F2
HO-RPF-A-25	HO-RPF-B-25	HO-RPF-C-25	HO-RPF-D-25	HO-RPF-E-25	HO-RPF-F-25	25	F2
HO-RPF-A-38	HO-RPF-B-38	HO-RPF-C-38	HO-RPF-D-38	HO-RPF-E-38	HO-RPF-F-38	38	F2
HO-RPF-A-50	HO-RPF-B-50	HO-RPF-C-50	HO-RPF-D-50	HO-RPF-E-50	HO-RPF-F-50	50	F2

* A = Uncoated, B = Single layer anti-reflection coating on legs, C = Protected aluminum on hypotenuse and single layer antireflection on legs, D = Protected aluminum on hypotenuse, E = Protected aluminum on legs, F = Single layer anti-reflection coating on hypotenuse

Dove Prisms

Dove Prisms rotate an image without deviating the beam in such a way that the image rotates at twice the angular rate of the prism. Holmarc offers Dove prisms with single layer anti-reflection coating on end faces. The hypotenuse face has total internal reflection, hence does not require AR coating.

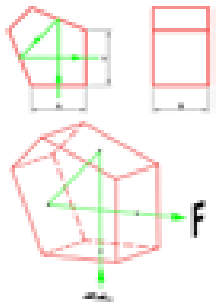
Uncoated prisms are also available. Broadband multi-layer AR coating on faces can be done on custom basis.

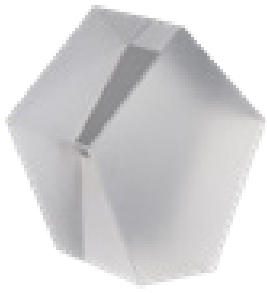


Material	BK7 or equivalent
Effective aperture	90 %
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Angle tolerance	+/- 3 arc min
Surface flatness	λ / 4 @ 632.8 nm
Perpendicularity	+/- 3 arc min
Protective chamfer	0.2 mm x 45°
Coating	Optional

Model No.			
Uncoated	Single Layer MgF2	A = B (mm)	L (mm)
HO-DP-5	HO-DPC-5	5	21.1
HO-DP-10	HO-DPC-10	10	42.2
HO-DP-15	HO-DPC-15	15	63.3
HO-DP-20	HO-DPC-20	20	84.4
HO-DP-25	HO-DPC-25	25	105.5

Penta Prisms

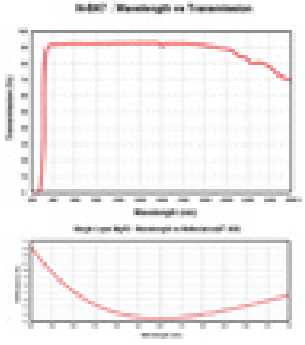




Penta Prisms deviate an input beam by precisely 90°.In imaging applications Penta Prism will neither invert nor reverse the image. These prisms deviate a beam through same angle regardless of its orientation to the beam. The reflecting surfaces of our Penta Prisms are coated with protective aluminium. The entrance and exit surfaces are single layer anti-reflection coated in HO-PPC series.

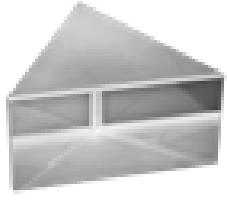
90° Deviation of input beam
Does not invert or reverse the image

Material	BK7 or equivalent
Effective aperture	85 %
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Angle tolerance	+/- 3 arc min
Surface flatness	λ / 4 @ 632.8 nm
Protective chamfer	0.2 mm x 45°



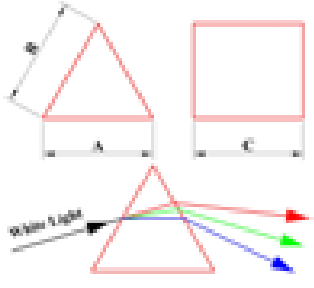
Model No.		
Uncoated	Single Layer MgF2	A = B = C (mm)
HO-PP-5	HO-PPC-5	5
HO-PP-10	HO-PPC-10	10
HO-PP-20	HO-PPC-20	20
HO-PP-25	HO-PPC-25	25
HO-PP-38	HO-PPC-38	38
HO-PP-40	HO-PPC-40	40

Equilateral Prisms



Applications of equilateral prisms are to disperse or break light into its spectral components. These prisms are available from Holmarc either uncoated or with single layer anti-reflection coating on the faces. AR coating helps to reduce polarization at the surface by increasing total transmittance. Broadband multi-layer anti-reflection coated prisms can be provided on special requests.

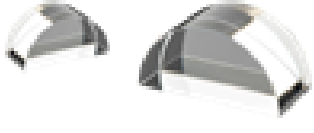
Specially for light dispersion
Sizes Ranging from 5 - 50 mm



Material	BK7 or equivalent & F2
Effective aperture	85 %
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Angle tolerance	+/- 3 arc mi
Surface flatness	λ / 4 @ 632.8 nm
Protective chamfer	0.2 mm x 45°
AR coating	Optional, on faces

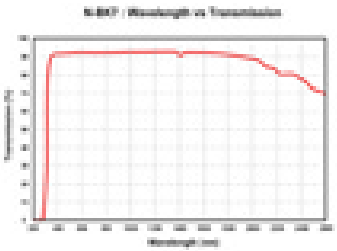
Schmidt Prisms

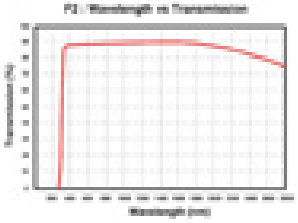
Material - BK7
Bevel : 0.2mm x 45degree

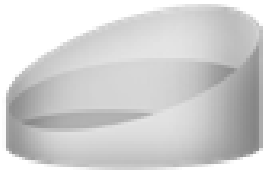


Model No.	HO-SCP-B50	HO-SCP-B20
Material	BK7	BK7
Diameter	50 mm	20 mm
Thickness	25 mm	5 mm
Polish	All side polished (top, bottom and edges)	
Bevel	0.2 mm x 45 degree	

Model No.			
Uncoated	Single Layer MgF2	A = B = C (mm)	Material
HO-EPB-5	HO-EPBC-5	5	BK7 or equivalent
HO-EPB-10	HO-EPBC-10	10	
HO-EPB-20	HO-EPBC-20	20	
HO-EPB-25	HO-EPBC-25	25	
HO-EPB-38	HO-EPBC-38	38	
HO-EPB-50	HO-EPBC-50	50	
HO-EPF-5	HO-EPFC-5	5	F2
HO-EPF-10	HO-EPFC-10	10	
HO-EPF-20	HO-EPFC-20	20	
HO-EPF-25	HO-EPFC-25	25	
HO-EPF-38	HO-EPFC-3	38	
HO-EPF-50	HO-EPFC-50	50	
HO-EPF-5	HO-EPFC-5	5	
HO-EPF-10	HO-EPFC-10	10	
HO-EPF-20	HO-EPFC-20	20	
HO-EPF-25	HO-EPFC-25	25	
HO-EPF-38	HO-EPFC-38	38	
HO-EPF-50	HO-EPFC-50	50	





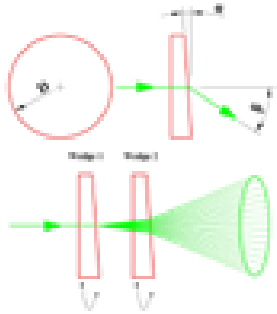


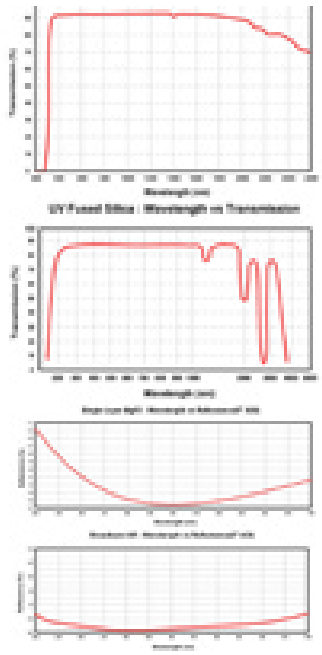
Wedge Prisms

Wedge prisms find applications in steering light beams. Two wedge prisms of equal power, used together can steer input light beams within a narrow cone. Wedge prism produces a small deviation to the light beam which doesn't allow the light return to the source. Holmarc offers wedge prisms in three options; uncoated, single layer MgF2 coated, and broadband AR coated.

Applicable for Beam Steering
Different coating options possible

Material	BK7 or equivalent & F2
Effective aperture	85 %
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Angle tolerance	+/- 3 arc min
Surface flatness	λ / 4 @ 632.8 nm
Thin edge thickness	3 mm
Bevel	0.2 mm x 45°
AR coating	Optional

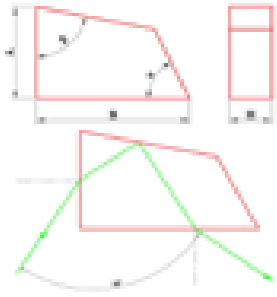




Model No.						
Uncoated	Single Layer MgF2	Broadband AR	Diameter D (mm)	Beam Deviation (β)	Wedge Angle (α)	Material
HO-WPB-1	HO-WPBC-1	HO-WPBB-1	25	1°	1°57'	BK7 or equivalent
HO-WPB-2	HO-WPBC-2	HO-WPBB-2	25	2°	3°53'	
HO-WPB-4	HO-WPBC-4	HO-WPBB-4	25	4°	7°41'	
HO-WPB-6	HO-WPBC-6	HO-WPBB-6	25	6°	11°22'	
HO-WPB-8	HO-WPBC-8	HO-WPBB-8	25	8°	14°52'	
HO-WPB-10	HO-WPBC-10	HO-WPBB-10	25	10°	18°09'	Fused Silica
HO-WPS-1	HO-WPSC-1	HO-WPSB-1	25	1°	2°40	
HO-WPS-2	HO-WPSC-2	HO-WPSB-2	25	2°	4°70'	
HO-WPS-4	HO-WPSC-4	HO-WPSB-4	25	4°	8°14'	
HO-WPS-6	HO-WPSC-6	HO-WPSB-6	25	6°	12°21'	

By combining two wedge prisms each of which can be rotated independently, it is possible to direct the beam anywhere within the cone angle defined by 4x the specified angular deviation of one wedge.

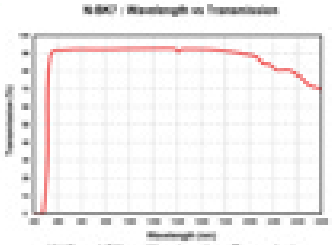
Pellin Broca Prisms

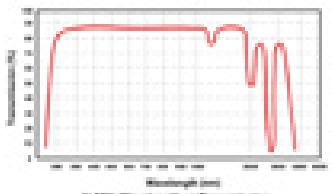


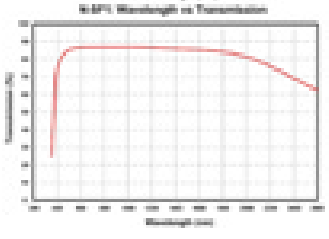


Pellin Broca prism is a constant (90°) deviation dispersive prism. These prisms separate light beam of multiple wavelengths to single wavelength. Pellin Broca prism's incidence angle is Brewster's angle, which minimizes the reflection losses in P-polarized light. Hence, these are known as Brewster's angle prisms as well. Holmarc offers Pellin Broca Prisms in three different substrate materials.

Deviate light wavelength by 90°
Separate light beam of multiple wavelengths to single wavelengths





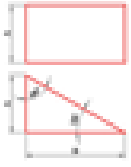


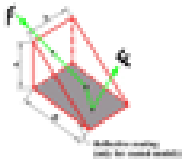
Material	BK7 or equivalent, N-SF1 & UV fused sllica
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Surface flatness	λ / 4 @ 632.8 nm
Clear aperture	80 %
Angle tolerance	α = 60° ± 1°, β = 79.5° ± 0.5°

Model No.	Clear Aperture (mm)	A (mm)	B (mm)	H (mm)	Material
HO-PBB-5	5	11	20	6.4	BK7 or equivalent
HO-PBB-10	10	23.5	40	12.7	
HO-PBS-5	5	11	20	6.4	Fused Silica
HO-PBS-10	10	23.5	40	12.7	
HO-PBF-5	5	11	20	6.4	
HO-PBF-10	10	23.5	40	12.7	N - SF1

Material other than BK7, NSF1 and Fused silica are available on special request.

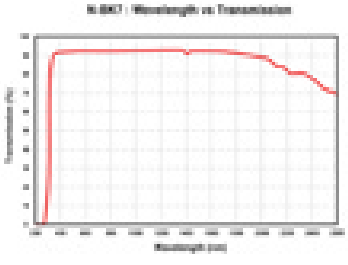
Littrow Prisms







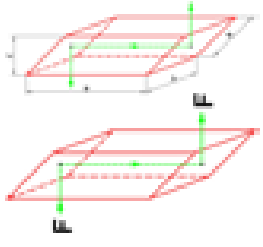
Holmarc's Littrow prisms are 30° - 60° - 90° prisms made from N-BK7 material. The uncoated littrow prisms are used to disperse white light into its spectrum. Coated littrow prisms are used to divert the incident beam at 60°.
Coated prism divert the incident beam by 60°
Uncoated prism ideal for dispersion of white light into spectrum

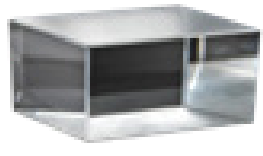


Material	BK7 or equivalent
Angle tolerance	± 3 arc min
Surface Quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Surface flatness	λ / 4 @ 632.8 nm
Coating	Al + SiO @ face opposite to 60° angle (optional)

Model No			
Uncoated	Coated	A (mm)	B (mm)
HO-LP-12.5	HO-LPC-12.5	12.5	21.65
HO-LP-25	HO-LPC-25	25	43.30

Rhomboid Prisms

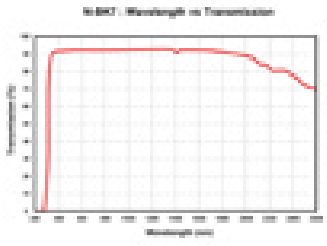




Rhomboid prism is used to displace the incident beam without affecting the image orientation. This prism can be used to displace the optical center line and the displacement is equal to the length of the prism. Rhomboid prisms are available uncoated.

Material	BK7 or equivalent
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Angles tolerance	± 5 arc sec
Beam deviation	± 30 arc sec
Surface flatness	λ / 4 @ 632.8 nm

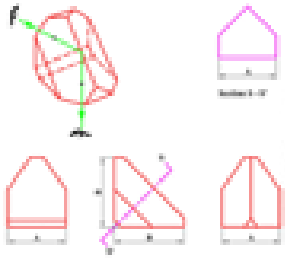
Model No.	A (mm)	B (mm)	C (mm)	D (mm)
HO-RHB-10	10	10	7.1	14.1
HO-RHB-20	20	20	14.2	28.3
HO-RHB-25	25	25	17.7	35.4
HO-RHB-50	50	50	35.4	70.7

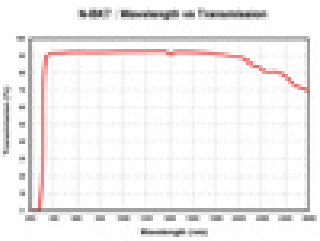


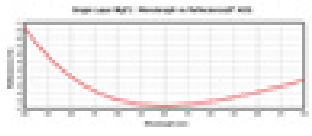
Beam deviation +/-30 arc sec
Displace the incident beam without affecting the image orientation

Amici Roof Prisms

Amici roof prisms are also known as roof prisms. It consists of a right angle prism whose hypotenuse has been replaced by a 90° TIR roof. The Amici roof prism will revert and invert the image and at the same time, will deviate the line of sight through an angle of 90°. Holmarc's amici roof prisms are available either uncoated or single layer AR coated on entrance and exit faces. Broadband AR coating (R < 0.5 % @ 400 - 700 nm) can be done on avg custom basis.

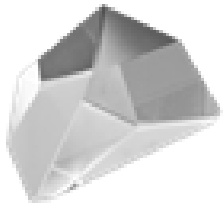






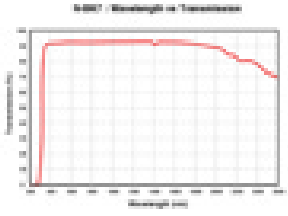
Material	BK7 or equivalent
Angle tolerance	± 3 arc min
Roof angle tolerance	± 5 arc sec
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+ 0.0, -0.2 mm
Surface flatness	λ / 4 @ 632.8 nm
Coating	Single layer MgF2 on entrance & exit faces

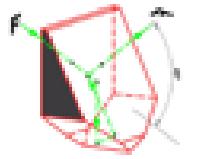
Model No.				
Uncoated	Coated	Clear Aperture (mm)	A (mm)	B (mm)
HO-ARP-10	HO-ARPC-10	10	13	18
HO-ARP-15	HO-ARPC-15	15	18	23
HO-ARP-20	HO-ARPC-20	20	25	30
HO-ARP-25	HO-ARPC-25	25	32	37

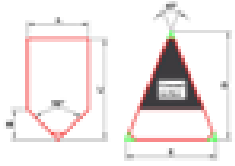


Schmidt Prisms

Holmarc's Schmidt prisms are used to invert and revert the image while deviating the line of sight by 45 degrees. The aluminized roof surfaces enhance the overall efficiency of the prism and the high accuracy roof angle tolerance increases the prism resolution.
45° deviation of beam
5 arc min angle tolerance

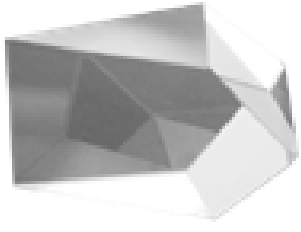




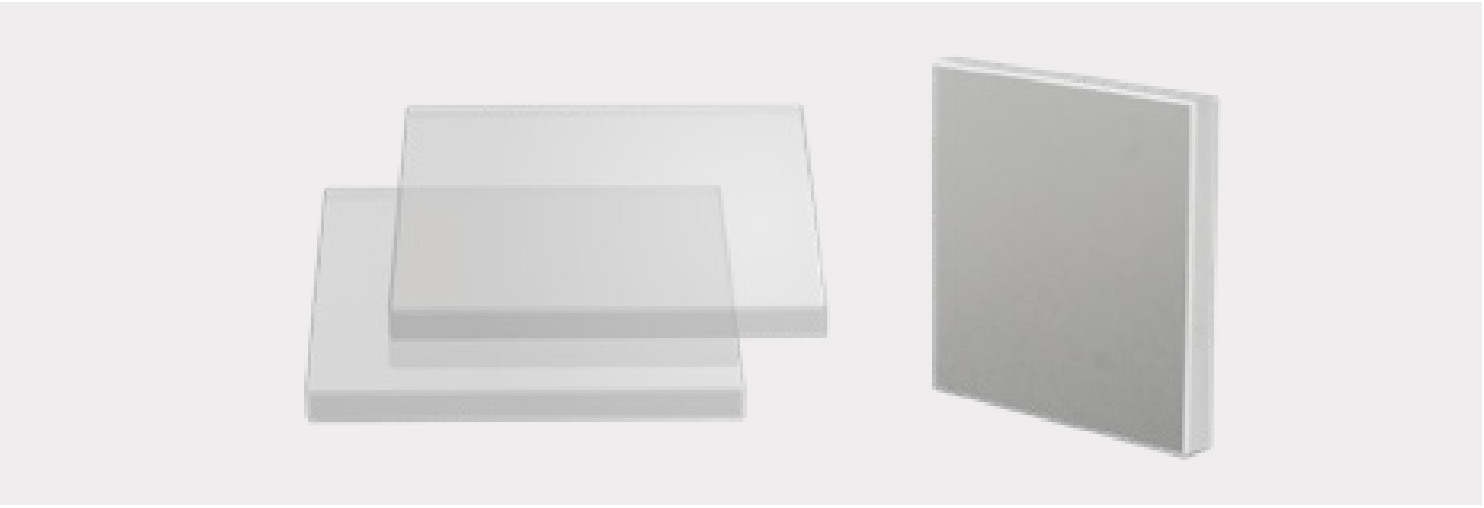


Material	BK7 or equivalent
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	± 0.1mm
Surface flatness	λ / 4 @ 632.8 nm
Angle tolerance	5 arc seconds
Coating	Entrance & exit faces = uncoated Roof = protected aluminium overcoated with Inconel

Model No.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HO-SP-10	10	5	16.5	17.74	14.7
HO-SP-25	25	12.5	41.3	44.4	36.78



Windows



Holmarc provides high precision optical windows with BK7 and UV fused silica substrates. Our optical windows are available in circular, square, or rectangular shapes with or without Anti-reflection coatings. Windows with custom sizes and shapes can be supplied to order. Anti-reflection coatings for custom wavelength regions are also available.



Rectangular and Square Windows

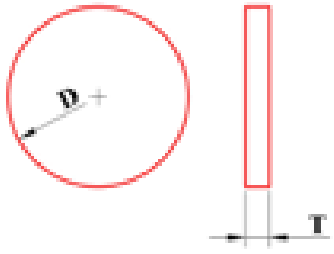
Optical Windows allow light beam to pass from one medium to another without changing the wavelength distribution or the transmitted wave front of the beam. Ideally, optical windows do not scatter light out of the beam. Holmarc offers windows in two different materials; N-BK7 & Fused Silica. Holmarc's windows are available in uncoated, single layer MgF2 coated, and broadband AR coated options.



Material	BK7 or equivalent
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+0.0, -0.2mm
Thickness tolerance	+0.0, -0.2mm
Surface flatness	λ / 4 @ 632.8 nm
Bevel	0.2 mm x 45°
Parallelism	≤ 1 arc min or 3 arc min
Coating (Optional)	1. Uncoated 2. Single layer MgF2 3. Broadband AR (Ravg < 0.5% @ 400-700 nm)

Uncoated	Single Layer MgF2	Broadband AR	Dimensions A x B (mm)	Thickness T (mm)	Parallelism (arc min)	Material
HO-WRB-10-1	HO-WRBC-10-1	HO-WRBB-10-1	10 x 20	5	1	BK7 or equivalent
HO-WRB-10-3	HO-WRBC-10-3	HO-WRBB-10-3	10 x 20	5	3	BK7 or equivalent
HO-WRB-15-1	HO-WRBC-15-1	HO-WRBB-15-1	15 x 30	5	1	
HO-WRB-15-3	HO-WRBC-15-3	HO-WRBB-15-3	15 x 30	5	3	
HO-WRB-20-1	HO-WRBC-20-1	HO-WRBB-20-1	20 x 35	5	1	BK7 or equivalent
HO-WRB-20-3	HO-WRBC-20-3	HO-WRBB-20-3	20 x 35	5	3	BK7 or equivalent
HO-WSB-25-1	HO-WSBC-25-1	HO-WSBB-25-1	25 x 25	6	1	BK7 or equivalent
HO-WSB-25-3	HO-WSBC-25-3	HO-WSBB-25-3	25 x 25	6	3	BK7 or equivalent
HO-WRB-30-1	HO-WRBC-30-1	HO-WRBB-30-1	30 x 50	8	1	BK7 or equivalent
HO-WRB-30-3	HO-WRBC-30-3	HO-WRBB-30-3	30 x 50	8	3	BK7 or equivalent
HO-WSB-50-1	HO-WSBC-50-1	HO-WSBB-50-1	50 x 50	8	1	BK7 or equivalent
HO-WSB-50-3	HO-WSBC-50-	HO-WSBB-50-3	50 x 50	8	3	BK7 or equivalent

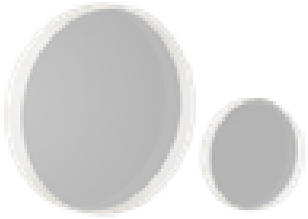
Circular Windows



These optical windows are precision manufactured using BK7 or equivalent and Fused silica. We can also work with substrates furnished by the customer.

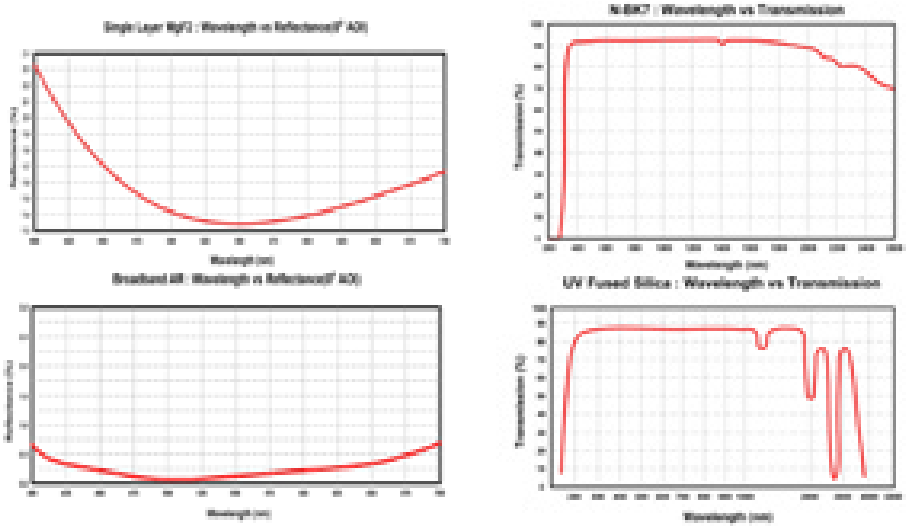
Windows are designed to be used in optical systems to separate two environments while passing a particular spectral range between them. Applications include laser set-ups, emitter/detector protection devices, and imaging systems involving ultraviolet wavelengths.

Diameter changes from 10 - 50 mm
Different coating options : Uncoated, Single layer MgF2, Broadband AR

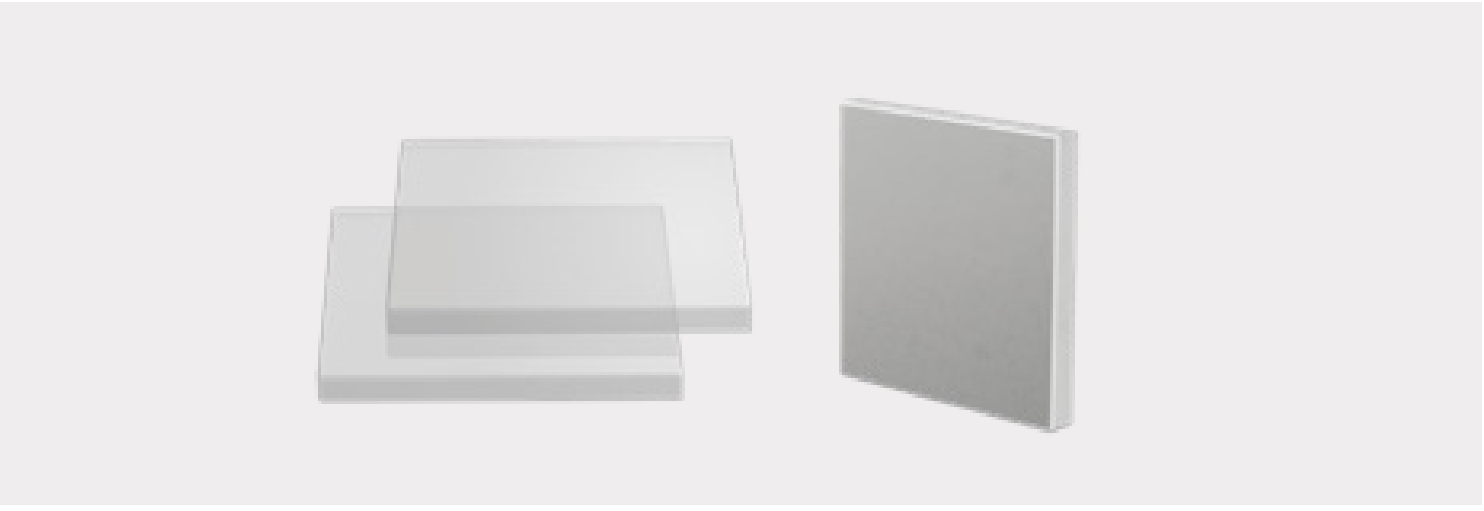


Material	BK7 or equivalent & fused silica
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+0.0, -0.2mm
Thickness tolerance	+0.0, -0.2mm
Surface flatness	λ / 4 @ 632.8 nm
Bevel	0.2mm x 45°
Parallelism	≤ 1 arc min or 3 arc min
Coating	(Optional) 1. Uncoated 2. Single layer MgF2 3. Broadband AR (Ravg < 0.5% @ 400-700 nm

Uncoated	Single Layer MgF2	Broadband AR	Diameter D (mm)	Thickness T (mm)	Parallelism (arc min)	Material
HO-WCB-10-1	HO-WCBC-10-1	HO-WCBB-10-1	10	5	1	BK7 or equivalent
HO-WCB-10-3	HO-WCBC-10-3	HO-WCBB-10-3	10	5	3	BK7 or equivalent
HO-WCB-15-1	HO-WCBC-15-1	HO-WCBB-15-1	15	5	1	BK7 or equivalent
HO-WCB-15-3	HO-WCBC-15-3	HO-WCBB-15-3	15	5	3	BK7 or equivalent
HO-WCB-20-1	HO-WCBC-20-1	HO-WCBB-20-1	20	5	1	BK7 or equivalent
HO-WCB-20-3	HO-WCBC-20-3	HO-WCBB-20-3	20	5	3	BK7 or equivalent
HO-WCB-20-3	HO-WCBC-20-3	HO-WCBB-20-3	20	5	3	BK7 or equivalent
HO-WCB-25-1	HO-WCBC-25-1	HO-WCBB-25-1	25	6	1	BK7 or equivalent
HO-WCB-25-3	HO-WCBC-25-3	HO-WCBB-25-3	25	6	3	BK7 or equivalent
HO-WCB-30-1	HO-WCBC-30-1	HO-WCBB-30-1	30	8	1	
HO-WCB-30-3	HO-WCBC-30-3	HO-WCBB-30-3	30	8	3	
HO-WCB-40-1	HO-WCBC-40-1	HO-WCBB-40-1	40	8	1	BK7 or equivalent
HO-WCB-40-3	HO-WCBC-40-3	HO-WCBB-40-3	40	8	3	BK7 or equivalent
HO-WCB-50-1	HO-WCBC-50-1	HO-WCBB-50-1	50	8	1	BK7 or equivalent
HO-WCB-50-3	HO-WCBC-50-3	HO-WCBB-50-3	50	8	3	BK7 or equivalent



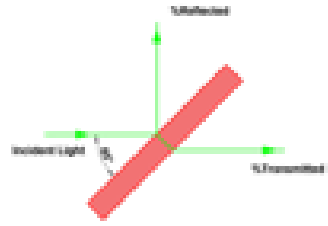
Beamsplitters

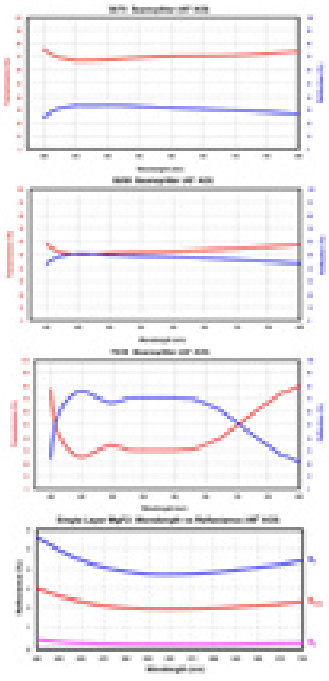


Holmarc provides three types of beamspliiters; Plate Beamsplitters, Cube Beamsplitters, and Variable Beamsplitters. Plate beamspliiters and cube beamsplitters are available with 30 / 70, 50 / 50, or 70 / 30 R/T ratios, while variable beamsplitters provide continuous R/T ratio from 10 / 90 to 90 / 10. In addition to the beamsplitters, Holmarc provides beam samplers to take off a sample of light by Fresnel reflection. All the beamsplitters are coated with Anti-reflection coating to reduce the back reflection. Beamsplitters with custom split ratios and sizes can be supplied to order.

Plate Beamsplitters

Plate beamsplitters find applications in splitting or re-combining a light beam. The front surface of our beamsplitter is coated with metallic or dielectric thin film and the back surface is AR coated. The antireflection coating on the back surface minimizes unwanted secondary reflection. Holmarc offers beamsplitters in three R/ T ratios; 30/70, 50/50 and 70/30. Custom R/T ratios and sizes are also available. Though our standard plate beamsplitters are designed for visible region between 400 nm and 700 nm, we can provide these optics for ultraviolet and Infra-red spectral regions.





Material	BK7 or equivalent
Clear aperture	90%
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+0.0, -0.2 nm
Thickness tolerance	±0.2 mm
Surface flatness	λ / 4 @ 632.8 nm
Parallelism	≤ 1 arc min
Coating (45° both side)	Front - metallic or dielectric Back - anti-reflection
Transmittance tolerance	± 5%
Reflectance tolerance	± 5%

Metallic Plate Beamsplitters - Square Aperture

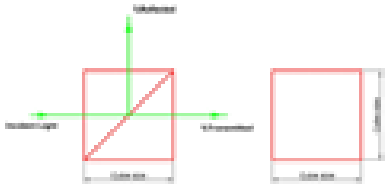
Model No.	size	Thickness	R % / T %
HO-MPSBS-25A	25 mm	6 mm	30 / 70
HO-MPSBS-25B	25 mm	6 mm	50 / 50
HO-MPSBS-25C	25 mm	6 mm	70 / 30
HO-MPSBS-50A	50 mm	6 mm	30 / 70
HO-MPSBS-50B	50 mm	6 mm	50 / 50
HO-MPSBS-50C	50 mm	6 mm	70 / 30

Metallic Plate Beamsplitters - Circular Aperture

Model No.	size	Thickness	R % / T %
HO-MPCBS-25A	25 mm	6 mm	30 / 70
HO-MPCBS-25B	25 mm	6 mm	50 / 50
HO-MPCBS-25C	25 mm	6 mm	70 / 30
HO-MPCBS-50A	50 mm	6 mm	30 / 70
HO-MPCBS-50B	50 mm	6 mm	50 / 50
HO-MPCBS-50C	50 mm	6 mm	70 / 30



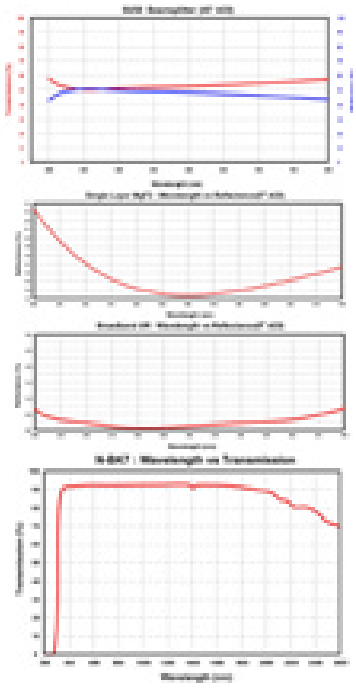
Metallic Cube Beamsplitters



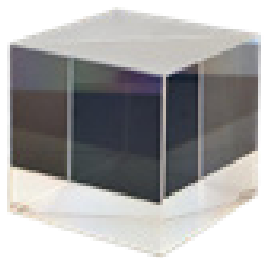
Holmarc's Metallic cube beamsplitters consists of two right angle prisms cemented together. The hypotenuse of the one prism has a combination of metallic-dielectric thin film coating. These are Lowpolarizing beamsplitters; the transmission and reflection for S - and P - polarization components are within ±10%. The cube faces of our beamsplitters have anti-reflection coatings for getting maximum transmittance. Beamsplitters with uncoated cube faces are also available. Custom sizes, coatings and split ratios are available as well.

Cube size ranges from 10-50 mm
Beamsplitter Coating for 400 - 700 nm

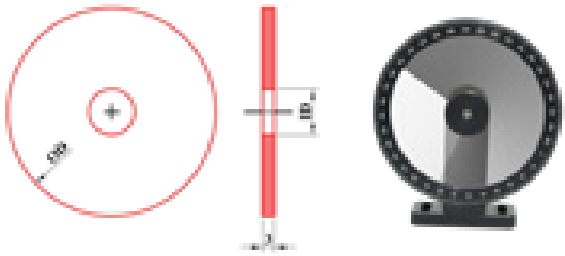
Material	BK7 or equivalent
Clear aperture	90%
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+0.0, -0.2 nm
Surface flatness	λ / 4 @ 632.8 nm
Angle folerance	± 5 arc min
Coating	Hypotenuse :- metallic + dielectric
	cube faces :
	1. Uncoated
	2. Single layer MgF2
	3. Broadband AR, Ravg < 0.5% (400 -700 nm)
Split ratio (R% / T%)	50 / 50 ± 10%
Absorption	< 10%
Polarization	< 10%



Model No.				
Uncoated	Single Layer MgF2	Broadband AR	Cube size (mm)	Wavelength (mm)
HO-MCBS-10	HO-MCBS-C-10	HO-MCBS-B-10	10	400 - 700
HO-MCBS-15	HO-MCBS-C-15	HO-MCBS-B-15	15	400 - 700
HO-MCBS-20	HO-MCBS-C-20	HO-MCBS-B-20	20	400 - 700
HO-MCBS-25	HO-MCBS-C-25	HO-MCBS-B-25	25	400 - 700
HO-MCBS-50	HO-MCBS-C-50	HO-MCBS-B-50	50	400 - 700
Note: Low-polarizing beamsplitters for custom wavelength regions are available.				

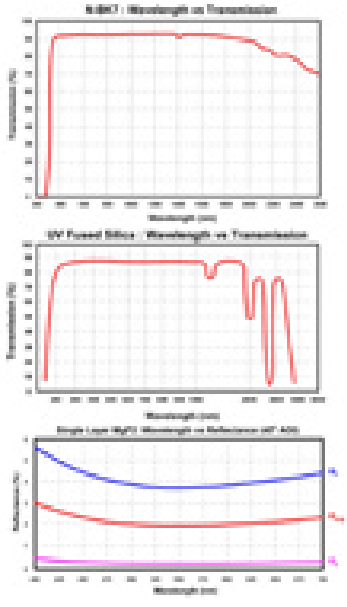


Variable Beamsplitters (Mounted)



Our Circular Variable Beamsplitters (Mounted) find applications in splitting an incident beam into a transmitted and a reflected beam. The intensity ratio of transmitted and reflected beams can be controlled over a wide range. The front surface of the variable beamsplitter has protected aluminium coating and the back surface has anti-reflection coating to reduce secondary images.

BK7 and Fused silica material of thickness 3 mm
Splits incident beam into a transmitted and a reflected beam

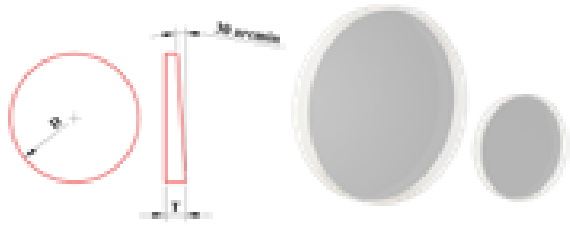


Material	BK7 or equivalent
Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+0.00, -0.2 nm
Thickness	3 ± 0.2 mm
Surface flatness	λ / 4 @ 632.8 nm
Parallelism	± 1 arc min
Coating	Front surface = protective aluminium Back surface = anti-reflection coating

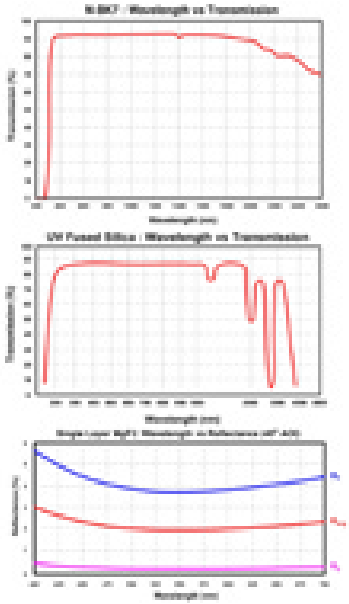
Model No.	OD(mm)	ID (mm)	Material
HO-VBS-N50	50	13	BK7 or equivalent
HO-VBS-F50	50	13	Fused Silica
HO-VBS-N75	75	25	BK7 or equivalent
HO-VBS-F75	75	25	Fused Silica
HO-VBS-N100	100	25	BK7 or equivalent
HO-VBS-F100	100	25	Fused Silica

Beamsplitters

Beam Samplers are used to pick off the sample of a light beam by using the Fresnel reflection from uncoated surfaces. Beam samplers are used for monitoring applications where disturbance of the transmitted beam must be kept minimum. The back surface is wedged to avoid internal fringes and is anti-reflection coated to remove ghost images. Custom Sizes and anti-reflection coatings are available on special request.



AR coating for 400 - 700 nm
Available in different diameters of different thickness



Surface quality	40 - 20 (scratch-dig)
Dimensional Tolerance	+0.00, -0.2 nm
Thickness	± 0.2 mm
Clear aperture	90 %
Surface flatness	λ / 4 @ 632.8 nm
Reflectance, Ravg	5% @ 45°
Wedge	30 ± 10 arc min
Coating	Front surface :- uncoated Back surface :- anti-reflection @ 400 - 700nm

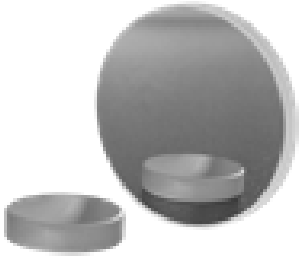
Model No.	Diameter (mm)	Thickness (mm)	Material
HO-BS-N-12.5	12.5	3	BK7 or equivalent
HO-BS-F-12.5	12.5	3	Fused Silica
HO-BS-N-25	25	5	BK7 or equivalent
HO-BS-F-25	25	5	Fused Silica
HO-BS-N-50	50	8	BK7 or equivalent
HO-BS-F-50	50	8	Fused Silica

Mirrors



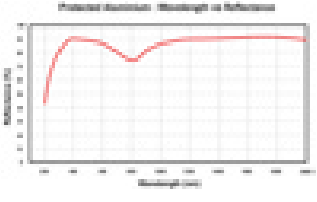
Holmarc offers different types of metallic coated mirrors for different applications in UV to IR wavelength range. Our high quality mirrors includes; Plano Aluminium Mirror, Plano Silver Mirror, Broadband Metallic Mirrors, Concave Mirrors, Cone Mirrors and 45° Rod Mirrors. Telescopic Primary Spherical and Parabolic mirrors are also available and can be supplied to order. Mirrors with custom sizes and shapes are also available.

Plano Aluminium Mirrors



Aluminium Mirrors offer high reflection throughout ultraviolet, visible and NIR region. The mirror coating consists of an Aluminium layer and a very thin protective coating. Custom sizes and flatness are available other than standard models.

Coating : Protected Aluminum
Circular & square mirrors are available as standard models

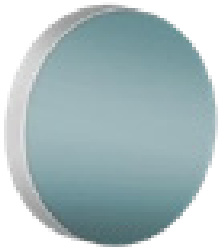


Material	Borofloat (schott)
Thickness Tolerance	± 0.2 mm
Dimensional Tolerance	+0.00, -0.2 nm
Clear aperture	90 % of diameter
Surface quality	40 - 20 (scratch-dig)
Surface flatness	λ / 4 @ 632.8 nm
Parallelism	≤ 3 arc min
Coating	Protected aluminium
Reflectivity R_{avg}	> 88% @ 450nm-2μm, > 93% @2μm - 20μm
Damage threshold	< 200 mJ / cm2 (@ 532 nm CW laser)
Bevel	0.2 mm x 45°

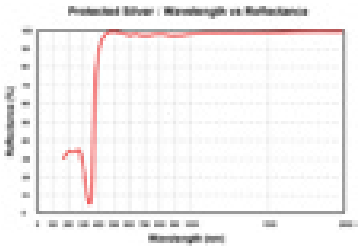
Model No.	Diameter (mm)	Thickness (mm)
HO-PCMA-10	ø 10	4
HO-PSMA-10	10 x 10	4
HO-PCMA-12.5	ø 12.5	6
HO-PSMA-12.5	12.5 x 12.5	6
HO-PCMA-25	ø 25	6
HO-PSMA-25	25 x 25	6
HO-PCMA-50	ø 50	6
HO-PSMA-50	50 x 50	6
HO-PCMA-75	ø 75	10
HO-PCMA-100	ø 100	10

Plano Silver Mirror

Holmarc's silver coated mirror exhibits high reflectance compared to aluminium coated mirrors. Custom sizes and flatness are available other than standard models.
Coating: Protected Silver
Circular & square mirrors are available as standard models



Material	Borofloat (schott)
Thickness Tolerance	± 0.2 mm
Dimensional Tolerance	+0.00, -0.2 nm
Clear aperture	90 % of diameter
Surface quality	40 - 20 (scratch-dig)
Surface flatness	λ / 4 @ 632.8 nm
Parallelism	≤ 3 arc min
Coating	Protected silver
Reflectivity Ravg	> 96% @ 450 nm - 2 μm, > 95% @2 μm - 20 μm
Damage threshold	< 200 mJ / cm2 (@ 532 nm CW laser)
Bevel	0.2 mm x 45°



Plano silver mirrors of custom sizes are available. Variety of cells and mounts are available from Holmarc. For custom designs, contact at mail@holmarc.com

Model No.	Size (mm)	Thickness (mm)
HO-PCMS-10	ø 10	4
HO-PSMS-10	10 x 10	4
HO-PCMS-12.5	ø 12.5	6
HO-PSMS-12.5	12.5 x 12.5	6
HO-PCMS-25	ø 25	6
HO-PSMS-25	25 x 25	6
HO-PCMS-50	ø 50	6
HO-PSMS-50	50 x 50	6
HO-PCMS-75	ø 75	10
HO-PCMS-100	ø 100	10

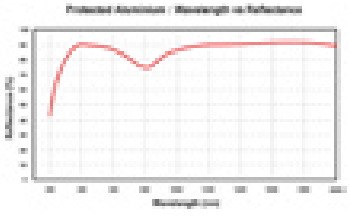
Concave Mirror

A concave mirror is a spherical mirror with reflective surface curved inwards. Concave mirrors produce real and virtual images. These mirrors find applications in laser beam concentration and quality imaging. Holmarc's concave mirrors have protected aluminium coating and offer high reflection throughout UV, visible and NIR region. Custom sizes and focal lengths are available as well.

Custom Coating Options Available
Focal length ranges from 25 to 1500 mm



Material	Borofloat (schott)
Thickness Tolerance	± 0.2 mm
Dimensional Tolerance	+0.00, -0.2 nm
Clear aperture	90 % of diameter
Surface quality	40 - 20 (scratch-dig)
Surface flatness	λ / 4 @ 632.8 nm
Parallelism	≤ 3 arc min
Coating	Protected aluminium
Reflectivity R_{avg}	> 88% @ 450 nm - 2 μm, > 93% @2 μm - 20 μm
Damage threshold	< 200 mJ / cm2 (@ 532 nm CW laser)



Concave mirrors with protected silver and protected gold coating are available on special requests.

Model No.	Size (mm)	Thickness (mm)
HO-CCMA-12.5-02	12.5	25
HO-CCMA-12.5-04	12.5	50
HO-CCMA-25-01	25	25
HO-CCMA-25-02	25	50
HO-CCMA-25-03	25	75
HO-CCMA-50-01	50	50
HO-CCMA-50-02	50	100
HO-CCMA-50-03	50	150
HO-CCMA-50-04	50	200
HO-CCMA-75-01	75	75
HO-CCMA-75-02	75	150
HO-CCMA-75-2.6	75	200
HO-CCMA-100-05	100	500
HO-CCMA-100-10	100	1000
HO-CCMA-100-15	100	1500
HO-CCMA-150-6.6	150	1000
HO-CCMA-150-10	150	1500

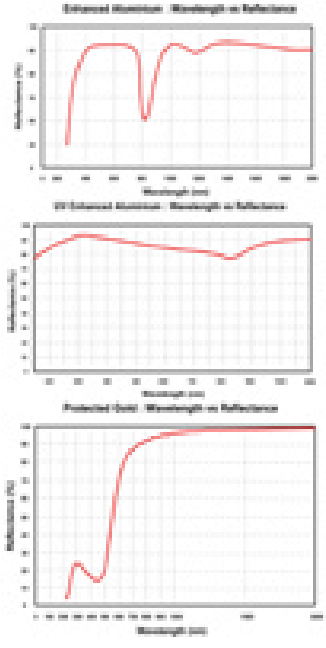
Broadband Metallic Mirror



Broadband metallic mirrors provide high reflectance for a particular wavelength region. Holmarc's broadband metallic mirrors make use of dielectric layers along with metallic coating to increase the reflectance for the required wavelength range.

We provide mirrors with enhanced aluminium, enhanced silver and protected gold coatings. Custom sizes and flatness are available as well.

Material	Borofloat (schott)
Thickness	6 mm
Thickness Tolerance	± 0.2 mm
Dimensional Tolerance	+ 0.00, - 0.2 nm
Clear aperture	90 % of diameter
Surface quality	40 - 20 (scratch-dig)
Surface flatness	λ / 4 @ 632.8 nm
Coating	UV enhanced aluminium / Enhanced aluminium / Enhanced silver / protected gold
Damage threshold	< 200 mJ / cm2 (@ 532 nm CW laser)

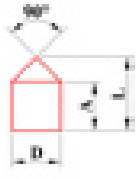


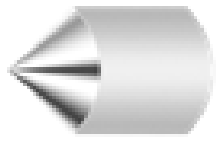
Model No.	Diameter D (mm)	Type	Reflectance	Wavelength Range (nm)
HO-BMM-UEA12.5	12.5	UV Enhanced Aluminium	> 85%	250 - 400
HO-BMM-UEA25	25	UV Enhanced Aluminium	> 85%	250 - 400
HO-BMM-UEA50	50	UV Enhanced Aluminium	> 85%	250 - 400
HO-BMM-EA12.5	12.5	Enhanced Aluminium	> 94%	400 - 700
HO-BMM-EA25	25	Enhanced Aluminium	> 94%	400 - 700
HO-BMM-EA50	50	Enhanced Aluminium	> 94%	400 - 700
HO-BMM-ES12.5	12.5	Enhanced Silver	> 96%	400 - 2000
HO-BMM-ES25	25	Enhanced Silver	> 96%	400 - 2000
HO-BMM-ES50	50	Enhanced Silver	> 96%	400 - 2000
HO-BMM-PG12.5	12.5	Protected Gold	> 96%	650 - IR
HO-BMM-PG25	25	Protected Gold	> 96%	650 - IR
HO-BMM-PG50	50	Protected Gold	> 96%	650 - IR

High reflectance
Variety of Sizes and Coating Options Available

Cone Mirror

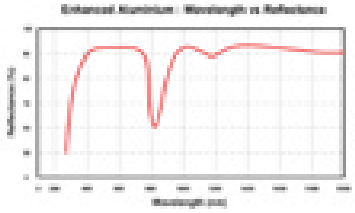
Holmarc's Cone Mirrors are made from BK7 or equivalent optical glass and are used for 360 degree illumination applications. The cone surface is coated with protective aluminium.





Material	BK7 or equivalent
Clear aperture	90 %
Dimensional Tolerance	+0.00, -0.2 mm
Thickness Tolerance	± 0.2 mm
Length Tolerance	± 0.1 mm, ± 6 arcmin Angle Tolerance
Surface quality	40 - 20 (scratch-dig), Protected aluminum coating
Bevel	0.2 mm x 45°

Model No.	Diameter D (mm)	A (mm)	Length L (mm)
HO-CM-2	2	2	3
HO-CM-3	3	3	4.5
HO-CM-5	5	5	7.5
HO-CM-10	10	10	15



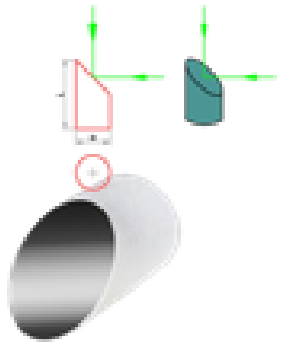
360° illumination applications
Cone surface with Protective Aluminum Coating

45° Rod Mirrors

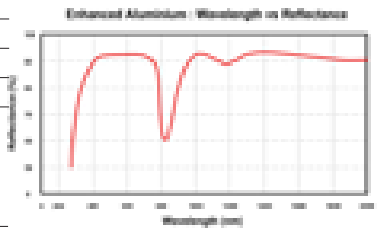
Holmarc's 45° Rod mirrors are made from BK7 or equivalent material and are used to bend laser or image path by 90°. Custom mirrors are available on special request. The elliptical surface of the rod mirrors are coated with protected aluminium.

Material	BK7 or equivalent
Clear aperture	90 %
Dimensional Tolerance	+0.00, -0.2 nm
Length Tolerance	± 0.1 mm , ± 10 arcmin Angle Tolerance
Surface quality	40 - 20 (scratch - dig)
Coating	Protected aluminum on elliptical surface
Bevel	0.2 mm x 45°

Model No.	Diameter D (mm)	Length L (mm)
HO-RM45-03	3	6
HO-RM45-04	4	8
HO-RM45-05	5	10
HO-RM45-06	6	12
HO-RM45-08	8	16
HO-RM45-10	10	20
HO-RM45-12	12	24
HO-RM45-15	15	30



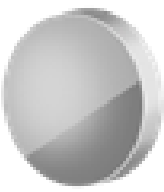
Bend laser or image path by 90°
Protected Aluminium on elliptical surface

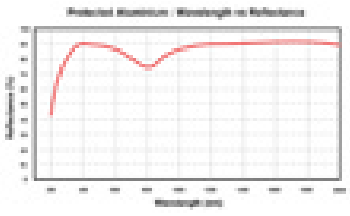


Parabolic Concave Mirrors

Material	Borofloat (schott), Protected aluminium coating
Reflectivity Ravg	> 88% @ 450 - 2000 nm
Dimensional tolerance	+/- 0.5 mm
Focal length tolerance	+/- 1%
Surface quality	40 - 20 (Scratch - dig)
Clear aperture	> 90% of diameter
Edge thickness	24.5 +/-0.5 mm

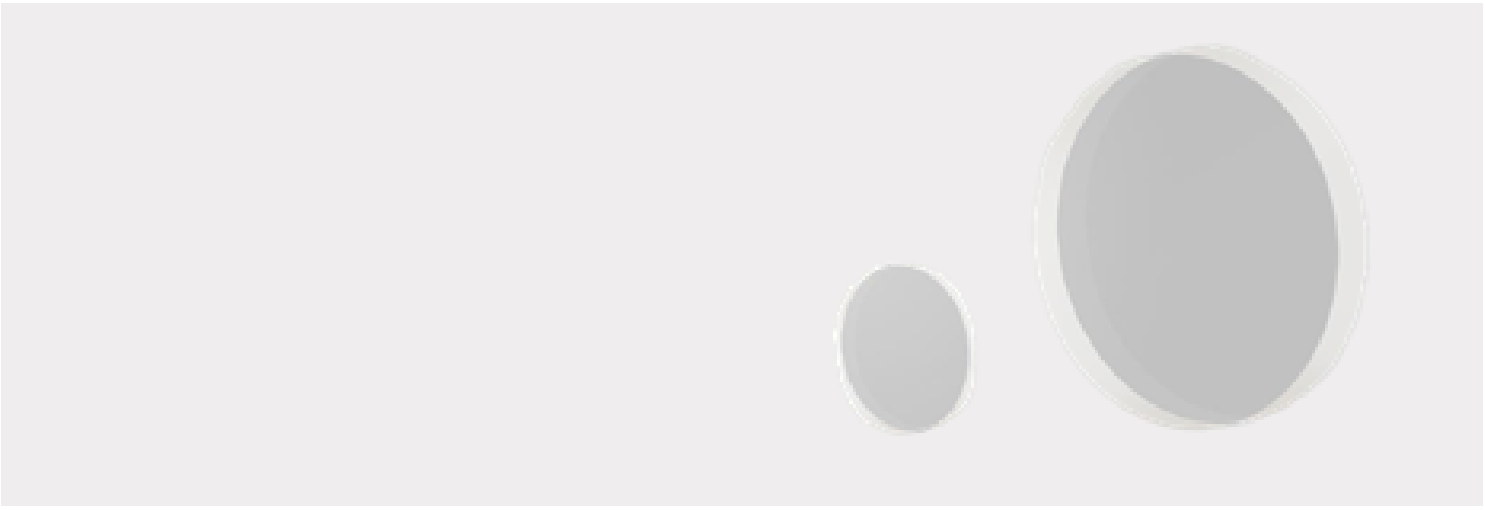
Model No.	Diameter (mm)	Focal Length (mm)
HO-PCCM-150-08	150	1200
HO-PCCM-150-10	150	1500
HO-PCCM-200-06	200	1200
HO-PCCM-200-7.5	200	1500
HO-PCCM-250-4.8	250	1200
HO-PCCM-250-06	250	1500
HO-PCCM-300-05	300	1500
HO-PCCM-300-6.7	300	2000
HO-PCCM-360-8.3	360	3000
HO-PCCM-400-10	400	4000
HO-PCCM-400-12.5	400	5000





Protected aluminium coating
Borofloat (Schott) Material

Diffusers & Polarizing Optics



Diffusers

Our diffuser spreads out or scatters light to give soft light. Holmarc's ground glass diffusers are available in fine, medium and coarse grade. Typical applications are in screens and illumination. Fused silica ground glass diffusers are also available, size up to 50 mm in diameter, ideal for UV illuminated diffusion.

Material	Float glass
Dimensional Tolerance	± 0.20 mm (dia.)
Thickness	2 ± 0.20 mm
Parallelism	≤ 3 arc min

Ground glass diffusers are available in custom size. Call or email for a quote. sales@holmarc.com, optics@holmarc.com

Model No.	Diameter (mm)	Grade (μm)
HO-DF-25-32	25	32
HO-DF-25-22	25	22
HO-DF-25-15	25	15
HO-DF-50-32	50	32
HO-DF-50-22	50	22
HO-DF-50-15	50	15
HO-DF-100-32	100	32
HO-DF-100-22	100	22
HO-DF-100-15	100	15

Model No.	Size (mm)	Grade (μm)
HO-DF-50S-32	50 x 50	32
HO-DF-50S-22	50 x 50	22
HO-DF-50S-15	50 x 50	15
HO-DF-100S-32	100 x 100	32
HO-DF-100S-22	100 x 100	22
HO-DF-100S-15	100 x 100	15
HO-DF-150S-32	150 x 150	32
HO-DF-150S-22	150 x 150	22
HO-DF-150S-15	150 x 150	15
HO-DF-200S-32	200 x 200	32
HO-DF-200S-22	200 x 200	22
HO-DF-200S-15	200 x 200	15

Polarizing Optics

Our diffuser spreads out or scatters light to give soft light. Holmarc's ground glass diffusers are available in fine, medium and coarse grade. Typical applications are in screens and illumination.

Polarizers

Linear Film Polarizers



Commercial-quality film polarizers are available. These linear polarizers have 25% transmittance for unpolarized light. Two crossed sheets have an average transmission of 0.04%. The sheets are neutral gray in color. It can be used as a variable attenuator.

Linear film polarizers are available in custom sizes.

Sandwiched type linear film polarizers are also available. In this models, a linear film polarizer is sandwiched between two polished BK7 glass discs and mounted on a black anodized aluminium threaded mount. The mounts are made with standard threads so that it can be mounted to any opto- mechanical mount which has similar thread.



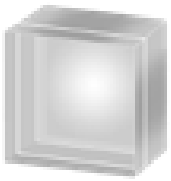
Optical type	Transmissive
Colour	Neutral gray
Polarization	Linear
Polarizing efficiency	99 %
Polarizer sheet Thickness	0.18 mm
Spectral range	400 - 700 nm
Extinction ratio	≥ 500 : 1



Model No.	Type	Diameter (mm)	Clear Aperture (mm)	Mount
HO-LFP-12.5	Sheet	12.5	-	Unmounted
HO-LFP-25	Sheet	25		Unmounted
HO-LFP-50	Sheet	50		Unmounted
HO-LFPS-12.5	Sandwiched	12.5	10	SM05
HO-LFPS-25	Sandwiched	25	22	SM1
HO-LFPS-50	Sandwiched	50	46	SM2

Lyot Depolarizer

Model : HO-LDP-10



These depolarizers are not suitable for Monochromatic light. These are designed for polychromatic light. A bandwidth of more than 100 nm is required for complete depolarization.

Quartz crystal material
Designed for polychromatic light

Size	10 mm x 10 mm x 6 mm
Dimensional tolerance	± 0.2 mm
Material	Quartz crystal
Wavelength range	200 - 2200 nm
Surface quality	40 - 20 (S-D)
Surface flatness	λ/4 @ 633 nm
Parallelism	< 3 arc minutes

Wave Plates / Retarders

Multiple-Order Wave Plates

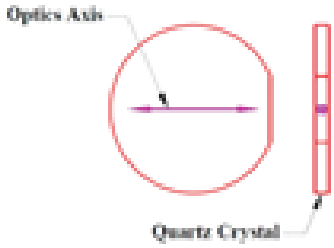


Holmarc's Multiple-Order Wave Plates are made from laser grade quartz crystal. These are designed to give retardance of several full waves, plus the required fraction. These wave plates are available as mounted or unmounted and provide either half-wave or quarter-wave retardation at chosen wavelengths. All wave plates are AR coated to increase transmission at design wavelength. The retardance of multiple-order wave plate depends on temperature, wavelength, angle of incidence and degree of collimation.

Half-wave plates are used to rotate plane of polarization of linearly polarized light through any angle, while quarter - wave plates are used to convert linearly polarized light into circularly polarized light and viceversa.

Available in Mounted or Unmounted versions
Half-wave or quarter-wave retardation options

Material	Quartz crystal
Diameter tolerance	± 0.2 mm
Surface quality	20 - 10 (scratch - dig)
Surface flatness	λ / 4 @ 632.8 nm
AR coating	Multilayer, R < 0.5% @ design wavelength
Beam deviation	< 10 arc sec
Retardance accuracy	< λ / 200



Model No.	Diameter (mm)	Retardation
HO-WMH-12.5	12.5 mm	λ/2
HO-WMH-25	25 mm	λ/2
HO-WMQ-12.5	12.5 mm	λ/4
HO-WMQ-25	25 mm	λ/4

Mounted Model No.	Mount Diameter	Clear Aperture	Retardation
HO-WMH-12.5M	25 mm	10 mm	λ/2
HO-WMH-25M	30 mm	22 mm	λ/2
HO-WMQ-12.5M	25 mm	10 mm	λ/4
HO-WMQ-25M	30 mm	22 mm	λ/4

Multiple - Order Half - Wave Plates

Unmounted	Mounted	Wavelength (nm)
HO-WMH-12.5-405	HO-WMH-12.5M-405	405
HO-WMH-12.5-488	HO-WMH-12.5M-488	488
HO-WMH-12.5-514	HO-WMH-12.5M-514	514
HO-WMH-12.5-532	HO-WMH-12.5M-532	532
HO-WMH-12.5-633	HO-WMH-12.5M-633	633
HO-WMH-12.5-670	HO-WMH-12.5M-670	670
HO-WMH-12.5-780	HO-WMH-12.5M-780	780
HO-WMH-12.5-808	HO-WMH-12.5M-808	808
HO-WMH-25-405	HO-WMH-25M-405	405
HO-WMH-25-488	HO-WMH-25M-488	488
HO-WMH-25-514	HO-WMH-25M-514	514
HO-WMH-25-532	HO-WMH-25M-532	532
HO-WMH-25-633	HO-WMH-25M-633	633
HO-WMH-25-670	HO-WMH-25M-670	670
HO-WMH-25-780	HO-WMH-25M-780	780
HO-WMH-25-808	HO-WMH-25M-808	808

Multiple - Order Quarter - Wave Plates

Unmounted	Mounted	Wavelength (nm)
HO-WMQ-12.5-405	HO-WMQ-12.5M-405	405
HO-WMQ-12.5-488	HO-WMQ-12.5M-488	488
HO-WMQ-12.5-514	HO-WMQ-12.5M-514	514
HO-WMQ-12.5-532	HO-WMQ-12.5M-532	532
HO-WMQ-12.5-633	HO-WMQ-12.5M-633	633
HO-WMQ-12.5-670	HO-WMQ-12.5M-670	670
HO-WMQ-12.5-780	HO-WMQ-12.5M-780	780
HO-WMQ-12.5-808	HO-WMQ-12.5M-808	808
HO-WMQ-25-405	HO-WMQ-25M-40	405
HO-WMQ-25-488	HO-WMQ-25M-488	488
HO-WMQ-25-514	HO-WMQ-25M-514	514
HO-WMQ-25-532	HO-WMQ-25M-532	532
HO-WMQ-25-633	HO-WMQ-25M-633	633
HO-WMQ-25-670	HO-WMQ-25M-670	670
HO-WMQ-25-780	HO-WMQ-25M-780	780
HO-WMQ-25-808	HO-WMQ-25M-808	808

Zero - Order Wave Plates

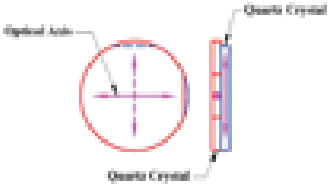
Zero order wave plates are made by combining two multiple-order wave plates with their optical axis aligned perpendicular to each other. The effect of the first plate is cancelled by the second, except for the residual difference between them. Holmarc's mounted zero-order wave plates provide either half-wave or quarter-wave retardation at their design wavelengths and are made by air-spaced design for high damage threshold. Zero order wave plates are much less sensitive to wavelength and temperature changes. All plates are AR coated to increase transmission at their design wavelength.



Material	Quartz crystal
Diameter tolerance	± 0.2 mm
Surface quality	20 - 10 (scratch - dig)
Wavefront distortion	λ / 4 @ 632.8 nm
AR coating	Multilayer, R < 0.5% @ design wavelength
Retardance accuracy	< λ / 300

Zero - Order Half - Wave Plates

Model No.	Wavelength (nm)
HO-WZH-10M	405
HO-WZH-10M-488	488
HO-WZH-10M-514	514
HO-WZH-10M-532	532
HO-WZH-10M-633	633
HO-WZH-10M-670	670
HO-WZH-10M-780	780
HO-WZH-10M-808	808
HO-WZH-22M-405	405
HO-WZH-22M-488	488
HO-WZH-22M-514	514
HO-WZH-22M-532	532
HO-WZH-22M-633	633
HO-WZH-22M-670	670
HO-WZH-22M-780	780
HO-WZH-22M-808	808



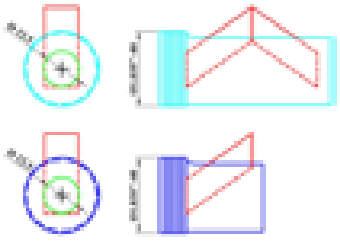
Zero - Order Quarter - Wave Plates

Model No.	Wavelength (nm)
HO-WZQ-10M-405	405
HO-WZQ-10M-488	488
HO-WZQ-10M-514	514
HO-WZQ-10M-532	532
HO-WZQ-10M-633	633
HO-WZQ-10M-670	670
HO-WZQ-10M-780	780
HO-WZQ-10M-808	808
HO-WZQ-22M-405	405
HO-WZQ-22M-488	488
HO-WZQ-22M-514	514
HO-WZQ-22M-532	532
HO-WZQ-22M-633	633
HO-WZQ-22M-670	670
HO-WZQ-22M-780	780
HO-WZQ-22M-808	808

Fresnel Rhomb Retarders



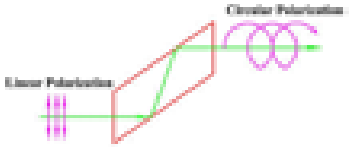
Fresnel Rhomb retarders give half-wave or quarter-wave retardation nearly independent of wavelengths. Holmarc's Fresnel rhombs are designed in such a way that a 22.5° or 45° phase shift occurs at each internal reflection creating a total half-wave or quarter-wave retardance. Holmarc's mounted Fresnel rhombs are manufactured in BK7 or equivalent substrate and are available in 3 different types.
Available in 3 different types
Wavelength ranges from 400 to 900 nm



Material	BK7 or equivalent
Surface quality	20 - 10 (scratch - dig)
Clear aperture	10 mm, + 0.00, - 0.2 mm
Retardance variation	2 %
Wavelength range	400 - 900 nm

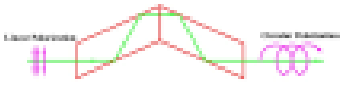
Single Fresnel Rhomb Quarter-wave retarder

A single Fresnel rhomb quarter wave retarder produces a phase shift of 90 (λ/4) due to internal reflections at two surfaces. This rhomb gives an output parallel to the input, but laterally displaced



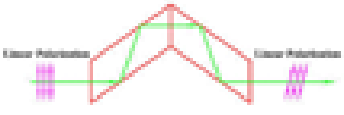
Double Fresnel Rhomb Quarter-Wave Retarder

A Double Fresnel rhomb quarter wave retarder produces a phase shift of 90 (λ/4) by the internal reflections at four surfaces. This rhomb has co-axial input and output.



Double Fresnel Rhomb Half-wave retarder

A Double Fresnel rhomb Half-wave retarder produces a phase shift of 180 (λ) by the internal reflections at four surfaces. This rhomb has co-axial input and output.



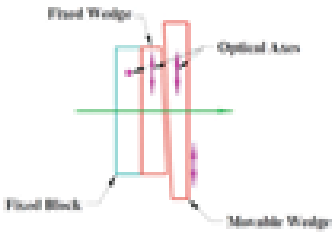
Model No.	Type	Retardation	Mount Diameter (mm)
HO-SFRQ-10	Single Fresnel Rhomb Quarter-wave Retarder	λ/4	25
HO-DFRQ-10	Double Fresnel Rhomb Quarter-wave Retard	λ/4	25
HO-DFRH-10	Double Fresnel Rhomb Half-wave Retarder	λ/2	25

Soleil - Babinet Compensator Fresnel Rhomb Retarders



Soleil - Babinet Compensators are zero order wave plates with variable retardation over a wide range of wavelengths. These are used to measure state of polarization or to produce certain retardation for different wavelengths. It consists of a birefringent wedge which is movable and another birefringent wedge which is fixed to a compensator plate. The retardance is adjusted by moving the position of the movable wedge relative to the fixed wedge. Holmarc's Soleil - Babinet compensators are equipped with precision digital micrometer and are made by laser grade quartz crystals. The wedges are AR coated to reduce reflection losses.

Clear Aperture of 10 mm
Available Uncoated or with Broadband AR coating



Material	Quartz crystal
Surface quality	40 - 20 (scratch-dig)
Retardance adjustment	0 - 2π (full wave)
Rotation	360° continuous
Detent Index stops	Every 45 degree
Digital readout resolution	1 microns
Transmitted wavefront error	λ / 4
AR coating	Uncoated Broadband AR (Ravg $\leq$ 0.5%)

Mounted Model No.	Mount Diameter	Clear Aperture	Retardation
HO-SBC-10	Uncoated	10 mm	400 - 700 nm
HO-SBC-10B	Broadband AR	10 mm	400 - 700 nm

Optical systems

10X Eye Loupe

Model No: HO-EL-10X

Soleil - Babinet Compensators are zero order wave plates with variable retardation over a wide range of wavelengths. These are used to measure state of polariza

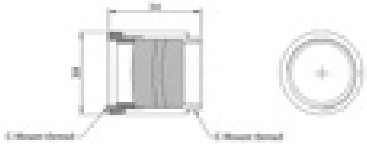


Magnification	10 X
Field of view	20 mm
Surface quality	40 - 20 (S-D)
AR coating	Broadband AR @ 400 - 700 nm
Working distance	17 mm
Eye relief	11.5 mm

Tube Lens - Infinity corrected

Model No: HO-TBL-200

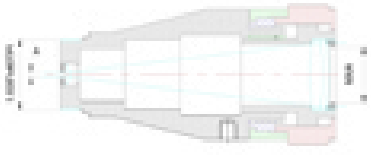
Holmarc's HO-TBL-200 has 200 mm focal length and is designed use with infinity corrected microscope objectives. These objectives are compatible for all type of Nikon and Leica microscopes. Internal and external C-mount threading are provided for mounting. Broadband AR coating provided for high transmission @ 400 - 700 nm.



Focal length	200 mm
Clear aperture	22 mm
Design	Triplet design
Coating	Broadband AR coated
Wavelength	400 - 700 nm
Field size at image place	Φ 20 mm
Working distance	178 mm
Thread	C-mount thread



Beam Expanders



Holmarc beam expanders provide accurate, unobstructed and achromatic expansion of any collimated input source and are easy to use. The most common type of beam expander is derived from the Galilean telescope which usually has one negative input lens and one positive output lens. The main advantage of Galilean design is that its overall length is smaller compared to a similar power Keplerian design.

Following Beam expanders are of the Galilean type and comes with M6 mounting holes. These are esay to mount and align using our standard posts and mounts.



Galilean type of Beam expansion
Ideal for laser processing application

Highlights

- Galilean type
- Ideal for laser processing application
- Custom beam expansion ratios available
- User specified AR coating
- Various type of mounting options
- Black anodized aluminium as housing material

Wavefront distortion	< λ / 4
Transmission	> 96%
Wavelength range	400 - 700nm
Damage threshold	> 500 mW / cm2
Surface quality	40 - 20 (Scratch-dig)
AR coating, ravg	< 0.5% @ 400-700 nm

Model No	Maqnification (M)	Aperture (A)
HO - BE2X - A3	2 X	3 mm
HO - BE2X - A5	2 X	5 mm
HO - BE2X - A10	2 X	10 mm
HO - BE2X - A15	2 X	15 mm
HO - BE5X - A2	5 X	2 mm
HO - BE5X - A3	5 X	3 mm
HO - BE5X - A5	5 X	5 mm
HO - BE5X - A10	5 X	10 mm
HO - BE10X - A2	10 X	2 mm
HO - BE10X - A3	10 X	3 mm
HO - BE10X - A4	10 X	10 X
HO - BE10X - A5	5 X	5 mm
HO - BE5X - A10	5 X	10 mm
HO - BE10X - A2	10 X	2 mm
HO - BE10X - A3	10 X	3 mm
HO - BE10X - A4	10 X	4 mm
HO - BE10X - A5	10 X	5 mm
HO - BE15X - A2	15 X	2 mm
HO - BE15X - A3	15 X	3 mm



Custom Beam Expanders

For automated applications, motorized beam expanders are available. With motorized systems, both expansion ratio and focus can be controlled independently from a remote location using control electronics and software. We also offer custom designed beam expanders for specific requirements. For further information on custom laser beam expanders, please contact us at sales@holmarc.com
Galilean type consists of a positive and a negative focal length lens.

Variable Beam Expanders

Holmarc's variable beam expanders are based on Galilean design. This 5-element diffraction limited design allows continuous beam expansion within the specified range. The expansion ratio can be adjusted by rotating the zoom control. Holmarc's variable beam expanders are equipped with broadband AR coated lenses and aluminium casings.



Galilean type of Beam expansion
Wavelength ranges from 400 to 700 nm

Wavefront distortion	< λ / 4
Transmission	> 96%
Wavelength range	400 - 700nm
Damage threshold	> 500 mW / cm2
Surface quality	40 - 20 (Scratch-dig)
AR coating, ravg	< 0.5% @ 400-700 nm

Variable beam expanders with custom expansion ranges are available upon special requests.

Model No	Expansion Range	Max. Input Beam Diameter (1/e2
HO-VBE-01	1x - 3x	5 mm
HO-VBE-02	1x - 6x	5 mm
HO-VBE-03	2x - 5x	4 mm
HO-VBE-04	5x - 10x	4 mm

Cylindrical Beam Expander Tube

Model No: HO-CBE10X-A10

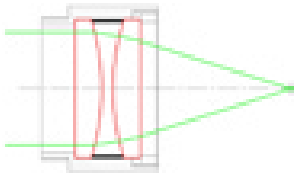
Holmarc's Cylindrical beam expander is used to create parallel light sheet. The length and width of the parallel light sheet is depends on the input collimated beam diameter. All the lenses are AR coated to reduce back reflection losses.

Expansion factor	10 X
Input beam diameter	10 mm (collimated)
Collimated sheet size	~ 100 mm x 10 mm
Collimated output beam length	~ 100 mm (depends on input beam diameter)
Collimated output beam width	~ 10 mm (depends on input beam diameter)
Input lens	Negative cylindrical lens
Output lens	Positive cylindrical lens
Collimation	Manually adjustable
AR coated	Broadband AR coated @ 400-700nm





Condensers



Condenser is a combination of lenses with short focal lengths used for concentrating a light source onto a small area. The lenses are mounted in a black anodized aluminium casing. Condensers with custom sizes and focal lengths are available.

Condenser Lenses concentrate light into a projected beam. They are usually mounted in pairs in projectors, enlargers, spotlights and photo cell systems. We make condenser systems of different focal lengths and apertures.

Two element air spaced design
Ideal for projection illuminator



- Two element air spaced design
- Ideal for projection illuminator
- Black anodized aluminium as housing material
- User specified AR coating
- Various type of mounting options

Model No.	Diameter (mm)	Focal Length (mm)
HO - CS25 - 0.8	25	20
HO - CS25 - 1.6	25	40
HO - CS25 - 2.4	25	60
HO - CS50 - 0.6	50	30
HO - CS50 - 0.8	50	40
HO - CS50 - 1.2	50	60

Fiber Collimator / Focusers

Our Fiber collimators / focusers are designed for laser applications which require pure Gaussian beam. Holmarc Fiber Collimators are available from 5 mm to 40 mm aperture size. The output is very clean with no diffraction patterns or beam distortions. Output stays as Gaussian at any distance. Collimators are provided with FC / SMA connectors. Output is adjustable so that it can be tuned for best collimation at the wavelength and then can be locked down. Broadband anti-reflection coating is provided for visible region.



Gaussian beam at any distance
5 mm, 10 mm, 20 mm and 40 mm apertures

- For single mode fibers
- Gaussian beam at any distance
- 5 mm, 10 mm, 20 mm, and 40 mm apertures
- Adjustable focus / collimation

Model No.	HO-FO-FC5	HO-FO-FC10	HO-FO-FC20	HO-FO-FC40	HO-FO-SMA5	HO-FO-SMA10	HO-FO-SMA20	HO-FO-SMA40
Clear aperture	5 mm	10 mm	20 mm	40 mm	5 mm	10 mm	20 mm	40 mm
Beam Divergence	< 0.5 mrad	< 0.25 mrad	< 0.1 mrad	< 0.05 mrad	< 0.5 mrad	< 0.25 mrad	< 0.1 mrad	< 0.25 mrad
Collimation	Adjustable and lockable							
Wavefront Error	< λ/4 @ 632.8 nm							
Connector	FC	FC	FC	FC	SMA	SMA	SMA	SMA
N A	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
AR Coating	Broadband AR for visible region							
Housing	Aluminium							

Microscope Objectives



Holmarc offers different types of infinity corrected objectives for high quality imaging and focusing applications. These objectives can also be used in fiber coupling, spatial filtering, and microscopy applications. Plan achromatic objectives are best suited for Brightfield observation with transmitted illumination, while plan achromatic metallurgical objectives and Long working distance plan apochromatic objectives and suitable for both epi-scopic(reflected light) and transmitted illumination applications.

Plan Infinity corrected achromatic objectives
Coated with broadband multilayer AR for visible regions

1. Plan Achromatic Objectives - Infinity corrected

Model No.	HO-PA-MO4X	HO-PA-MO10X	HO-PA-MO20X	HO-PA-MO40X	HO-PA-MO60X	HO-PA-MO100X
Magnification	4 X	10 X	20 X	40 X	60 X	100 X (oil)
Numerical Aperture (NA)	0.10	0.25	0.40	0.65	0.85	1.25
Field Number (FN)	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Effective Focal Length (EFL)	45 mm	18 mm	9 mm	4.5 mm	3 mm	1.8 mm
Working Distance(WD)	19.3 mm	6.8 mm	1.0 mm	0.67 mm	0.49 mm	0.25 mm
Cover Glass	0.17 mm	0.17 mm	0.17 mm	0.17 mm	0.17 mm	0.17 mm
Wavelength Range	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm
Threading						

2. Plan Apochromatic Long Working Distance objectives - Infinity corrected

Model No.	HO-PAPO-LWD2X	HO-PAPO-LWD5X	HO-PAPO-LWD10X	HO-PAPO-LWD20X	HO-PAPO-LWD50X
Magnification	2 X	5 X	10 X	20 X	50 X
Numerical Aperture (NA)	0.06	0.15	0.30	0.35	0.50
Effective Focal Length (EFL)	100 mm	40 mm	20 mm	10 mm	4 mm
Compatible Tube lens focal length	200 mm	200 mm	200 mm	200 mm	200 mm
Working Distance(WD)	34 mm	44 mm	34 mm	29 mm	17 mm
Wavelength Range	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm
Mounting Thread	M26 x 0.706	M26 x 0.706	M26 x 0.706	M26 x 0.706	M26 x 0.706
Parfocal distance	95 nm	95 nm	95 nm	95 nm	95 nm

3. Plan Achromatic Metallurgical objectives - Infinity corrected

Model No.	HO-PA-EPI 5X	HO-PA-EPI 10X	HO-PA-EPI 20X	HO-PA-EPI 40X	HO-PA-EPI 60X	HO-PA-EPI 80X	HO-PA-EPI 100x
Magnification	5 X	10 X	20 X	40 X	60 X	80 X	100 X
Numerical Aperture (NA)	0.12	0.25	0.40	0.60	0.75	0.8	0.85
Effective Focal Length (EFL)	40 mm	20 mm	109 mm	5 mm	3.3 mm	2.5 mm	2 mm
Compatible Tube lens focal length	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm
Working Distance(WD)	26.4 mm	20.2 mm	8.8 mm	3.98 mm	1.22 mm	1.25 mm	0.45 mm
Wavelength Range	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm	400 - 700 nm
Mounting Thread	0.8” x 36 TPI	0.8” x 36 TPI	0.8” x 36 TPI	0.8” x 36 TPI	0.8” x 36 TPI	0.8” x 36 TPI	0.8” x 36 TPI
Parfocal distance	45 nm	45 nm	45 nm	45 nm	45 nm	45 nm	45 nm

12

LINEAR AND ROTATION TRANSLATION STAGES

638 LINEAR AND ROTATION TRANSLATION STAGES
640 Linear Translation Stage
640 TS-35 Translation Stage
642 TS-50 Translation Stage
644 TS-65 Translation Stage
646 TS-90 Translation Stage
648 TSQ-90 Translation Stage
650 TS 120 Translation Stage
652 TSQ 120 Translation Stage
654 Precision Translation Stage
654 TSV - 35 Translation Stage
656 LTSV-35 Translation Stage :
656 Side Drive
658 TSV-50 Translation Stage
660 LTSV-50 Translation Stage : Side Drive
662 TSV-65 Translation Stage
664 LTSV-65 Translation Stage :
664 Side Drive
666 TSV-90 Translation Stage
668 LTSV-90 Translation Stage
668 Side Drive
670 Vertical Translation Stage
671 VTS Series
672 Multi Axis Translation Stages
672 Manual XY Theta Stage
672 XYZ Compact Translation Stage
673 XYZ Compact Translation Stage
673 XYZ Compact Translation Stage
673 XYZ Compact Translation Stage
674 XYZ Compact Translation Stage
674 XYZ Compact Translation Stage
675 XYZ Compact Translation Stage
675 XYZ Positioner
676 4 Axis Stages
676 Five Axis Positioner
677 XYZ Heavy Duty Translation Stages
678 Heavy Duty Stage
678 Heavy Duty XZ Stage
678 XZTS 300-300
679 Heavy Duty TS
679 XYZTS Series
680 XY Moving Platform
680 XYTSM Series
681 XYTSWM Series XY Moving Platform
682 Heavy Duty XY Moving Platform
683 XYTSWM Series XY Heavy Duty Moving Platform
684 XYTS Series XY Moving Platform
685 XYTSW Series XY moving Stage
686 Long Travel Translation Stage
687 Translation Stage with Vernier readout
688 MLS Series Translation Stages
689 LTTS 50 Series
690 LTTS 75 Series
691 LTTS 125 Series
692 LTTS 150 Series
694 LTTS 200 Series
695 LTTS 250 Series
696 Cryostat Positioner
696 Cryostat Positioner
697 Cryostat Positioner
697 Cryostat Positioner
698 Goniometer- Worm Gear Drive
698 GSM Series Goniometer
698 Single Axis
700 Heavy Duty Goniometer
702 Rotation Stage
702 Heavy Duty Goniometers
702 Single & Dual Axis
704 Rotation Stages -
704 Continuous Rotation - 360°
705 WRSC series Rotation Stages
705 WRS series Rotation Stages

Linear Translation Stage

TS-35 Translation Stage

These are miniature stages for space restricted applications. Pre loaded ball bearing guide ways ensure friction free and play-less movement. The stages are modular in design so that these can be assembled in XY and XYZ configurations

Available in multi axis configurations

Micrometer with resolution of 5 micron or 10 micron



XY Axis

X Axis



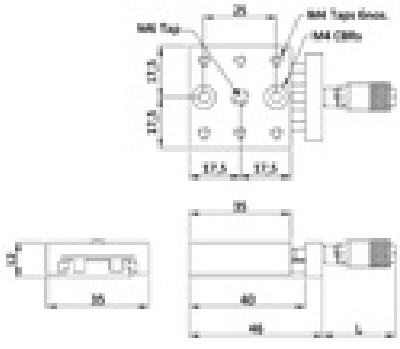
Z



XYZ



XZ





Specifications	
Straight line accuracy	5 μm
Micrometer linear resolution	5 μm or 10 μm
Guide way	Precision ball bearing guide way
Construction	Aluminum alloy B51S
Finish	Black anodized
Mounting holes	M4 tapped holes on carriage
	M6 tapped hole on top and bottom
	M4 CBR hole for mounting the stage to base Plate
Mounting options	Post mountable by using M6 thread
	Breadboard mounting by using base plate
Design	Modular design for multi axis configurations
Travel	6 mm
Carriage Size	35 mm x 35 mm
Load Capacity	3 kg vertical on X axis
Drive	Option-1) 10μ Micrometer Option-2) 5μ Micrometer

Micrometer Drive 5µ resolution







Model No.	TS35-Mu05-01	TS35-Mu05-02	TS35-Mu05-03	TS35-Mu05-04	TS35-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	3	3	0.5	0.5	0.5

Micrometer Drive 10µ resolution

Model No.	TS35-Mu05-01	TS35-Mu05-02	TS35-Mu05-03	TS35-Mu05-04	TS35-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	3	3	0.5	0.5	0.5

Accessories





Model No.	APTS - 35 Adapter Plate	BPTS - 35 Base Plate	ABTS - 35 Angle Bracket	ABZTS - 35



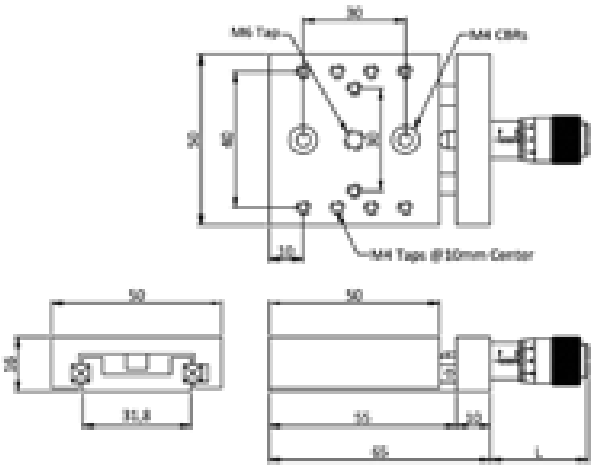

Model	M56	Model	M106
Micrometer	5µ	Micrometer	10µ
Length L	23 +/- 3 mm	Length L	23 +/- 3 mm
Lead screw pitch	0.25 mm	Lead screw pitch	0.5 mm

TS-50 Translation Stage

These stages have pre-loaded rolling contact guide ways to ensure friction free movement and precise positioning. XY and XYZ configurations are possible with the help of angle brackets and adapter plates.



Available in multi axis configurations



X Configuration



XY Configuration



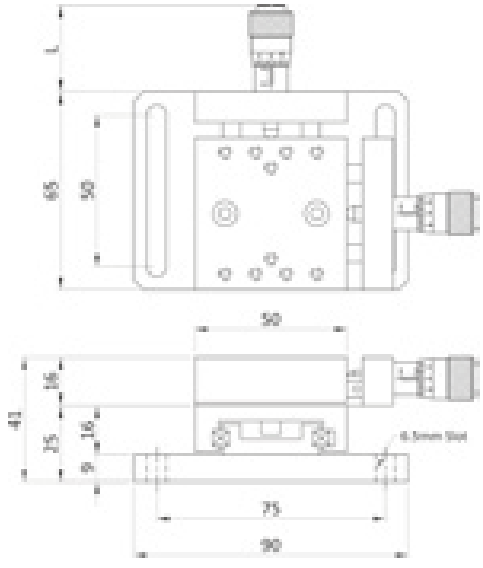
XYZ Configuration



Z Configuration



XZ Configuration



XY Configuration

Specifications

Straight line accuracy	7.5 μm
Micrometer linear resolution	10 μm
Guide way	Precision ball bearing guide way
Construction	Aluminum alloy B51S
Finish	Black anodized
Mounting holes	M4 tapped holes on carriage
	M6 tapped hole on top and bottom
	M4 CBR hole for mounting the stage to base Plate
Mounting options	Post mountable by using M6 thread
	Breadboard mounting by using base plate
Design	Modular design for multi axis configurations
Travel	10 mm
Carriage Size	50 mm x 50 mm
Load Capacity	5 kg vertical on X axis
Drive	Micrometer

Micrometer Drive 5µ resolution



Model No.	TS50-Mu05-01	TS50-Mu05-02	TS50-Mu05-03	TS50-Mu05-04	TS50-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			1	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	5	5	2	2	2

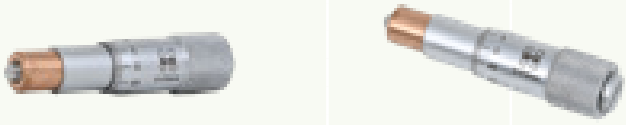
Micrometer Drive 10µ resolution

Model No.	TS50-Mu10-01	TS50-Mu10-02	TS50-Mu10-03	TS50-Mu10-04	TS50-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	5	5	2	2	2

Accessories



Model No	APTS - 50	BPTS - 50	ABTS - 50		
	Adapter Plate	Base Plate	Angle Bracket		

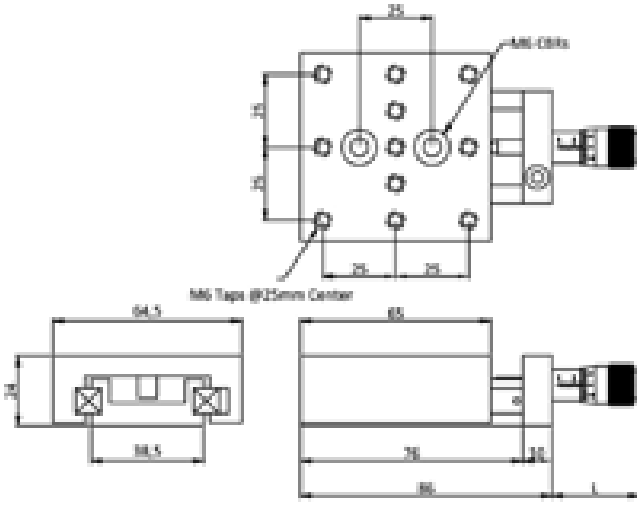


Model	M510	Model	M1010
Micrometer	5µ	Micrometer	10µ
Length L	23 +/- 3 mm	Length L	23 +/- 3 mm
Lead screw pitch	0.25 mm	Lead screw pitch	0.5 mm

TS-65 Translation Stage

These stages have guide ways using crossed rollers for enhanced load capacity and rigidity. Pre- loading ensures play-less and precision movement.





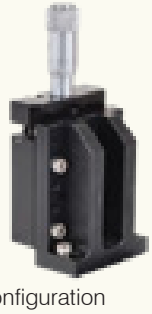
TS65-Mu05-01



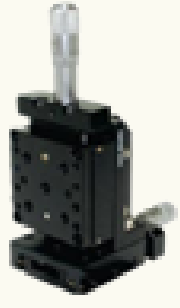
XY Configuration



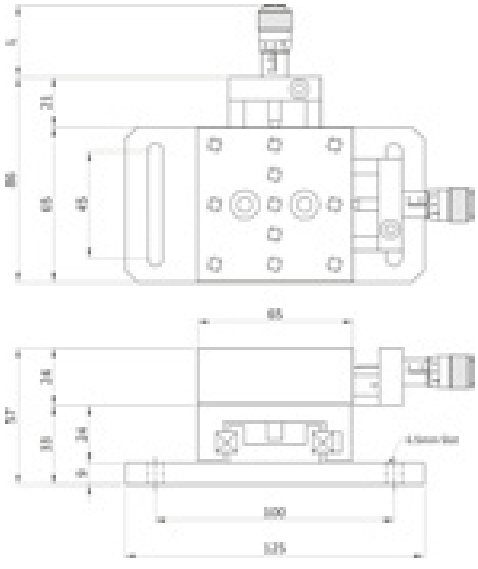
XYZ Configuration



Z Configuration



XZ Configuration



TS65-Mu05-02

Specifications

Straight line accuracy	7.5 μm
Micrometer linear resolution	10 μm
Guide way	Precision ball bearing guide way
Construction	Aluminum alloy B51S
Finish	Black anodized
Mounting holes	M6 tapped holes on carriage
	M6 CBR hole for mounting the stage to base plate or breadboard
Mounting options	Can be mounted to breadboard directly or by using Base Plate
Design	Modular design for multi axis configurations
Travel	15 mm
Carriage Size	65 mm x 65 mm
Load Capacity	20 kg vertical on X axis
Drive	Micrometer / digital micrometer

Micrometer Drive 5µ resolution








Model No.	TS65-Mu05-01	TS65-Mu05-02	TS65-Mu05-03	TS65-Mu05-04	TS65-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Micrometer Drive 10µ resolution

Model No.	TS65-Mu10-01	TS65-Mu10-02	TS65-Mu10-03	TS65-Mu10-04	TS65-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Digital Micrometer Drive

Model No.	TS65-DMu10-01	TS65-DMu10-02	TS65-DMu10-03	TS65-DMu10-04	TS65-DMu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Accessories



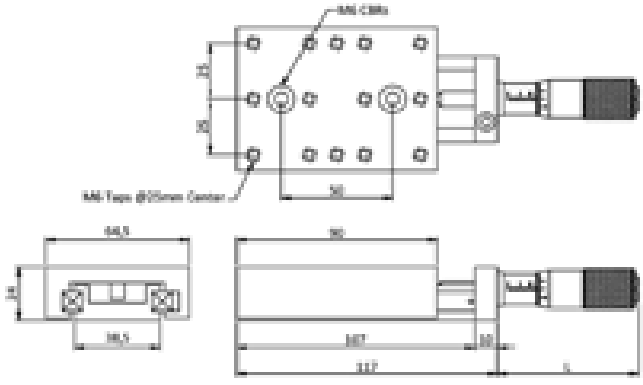


Model No.	APTS - 65	BPTS - 65	ABTS - 65	ABZTS-65	
Configuration	Adapter Plate	Base Plate	Angle Bracket		

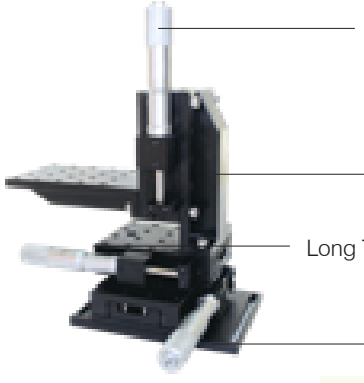
Micrometer					
Model	M515	M1015	DM115		
Micrometer	5µ	10µ	Digital		

TS-90 Translation Stage





These stages have pre-loaded rolling contact guide ways using crossed rollers. The use cross rollers ensures high load capacity along with rigidity and stability.





XY Configuration



Z Configuration



XZ Configuration



XYZ Configuration

Carriage Size : 90 mm x 65 mm

Comes in Micrometer & Digital Micrometer Drive

Specifications

Straight line accuracy	7.5 μm
Micrometer linear resolution	10 μm
Guide way	Precision ball bearing guide way
Construction	Aluminum alloy B51S
Finish	Black anodized
Mounting holes	M6 tapped holes on carriage
	M6 CBR hole for mounting the stage to base plate or breadboard
Mounting options	Can be mounted to breadboard directly or by using Base Plate
Design	Modular design for multi axis configurations
Travel	25 mm
Carriage Size	90 mm x 65 mm
Load Capacity	20 kg vertical on X axis
Drive	Micrometer / digital micrometer

Micrometer Drive 5µ resolution








Model No.	TS90-Mu05-01	TS90-Mu05-02	TS90-Mu05-03	TS90-Mu05-04	TS90-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Micrometer Drive 10µ resolution

Model No.	TS90-Mu10-01	TS90-Mu10-02	TS90-Mu10-03	TS90-Mu10-04	TS90-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Digital Micrometer Drive

Model No.	TS90-DMu10-01	TS90-DMu10-02	TS90-DMu10-03	TS90-DMu10-04	TS90-DMu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Accessories





Model No.	APTS - 65	BPTS - 65	ABTS - 65	ABZTS-65	
Configuration	Adapter Plate	Base Plate	Angle Bracket		

Micrometer

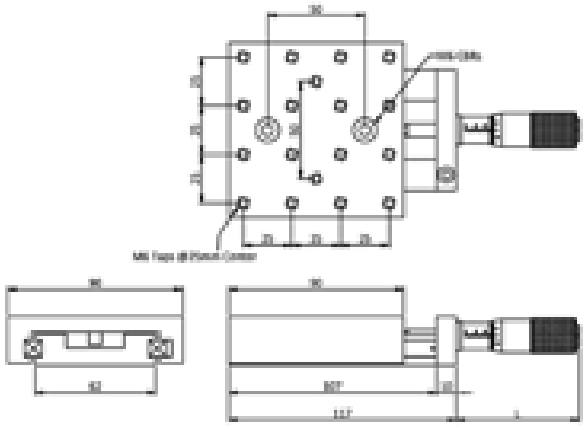
Model	M525	M1025	DM125		
Micrometer	5µ	10µ	Digital		

TSQ-90 Translation Stage

TSQ-90 stages have square shape having length and width 90mm. These stages too have rolling contact guide ways using crossed rollers. The increased width ensures highly stable positioning.

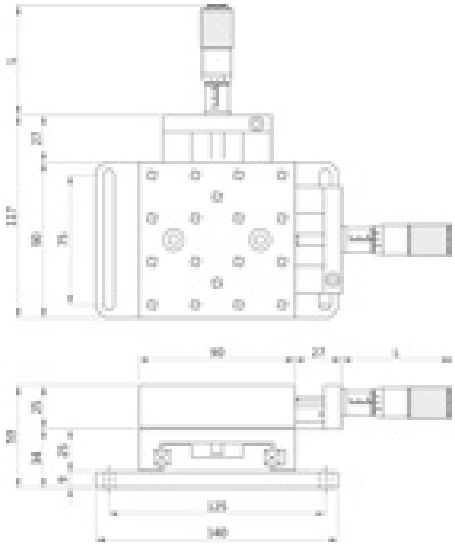
Carriage Size: 90 mm x 90 mm

Modular design for multi axis configurations



TSQ90-Mu5-01





TSQ90-Mu5-02
X Configuration

Specifications

Straight line accuracy	10 μm
Micrometer linear resolution	10 μm
Guide way	Precision ball bearing guide way
Construction	Aluminum alloy B51S
Finish	Black anodized
Mounting holes	M6 tapped holes on carriage
	M6 CBR hole for mounting the stage to base plate or breadboard
Mounting options	Can be mounted to breadboard directly or by using Base Plate
Design	Modular design for multi axis configurations
Travel	25 mm
Carriage Size	90 mm x 90 mm
Load Capacity	20 kg vertical on X axis
Drive	Micrometer / digital micrometer

Micrometer Drive 5µ resolution







Model No.	TSQ90-Mu5-01	TSQ90-Mu5-02	TSQ90-Mu5-03	TSQ90-Mu5-04	TSQ90-Mu5-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Micrometer Drive 10µ resolution

Model No.	TS90-Mu10-01	TS90-Mu10-02	TS90-Mu10-03	TS90-Mu10-04	TS90-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Digital Micrometer Drive

Model No.	TS90-DMu10-01	TS90-DMu10-02	TS90-DMu10-03	TS90-DMu10-04	TS90-DMu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Accessories





Model No.	APTSQ - 90	BPTSQ - 90	ABTSQ - 90	ABZTSQ - 90	
Configuration	Adapter Plate	Base Plate	Angle Bracket		

Micrometer

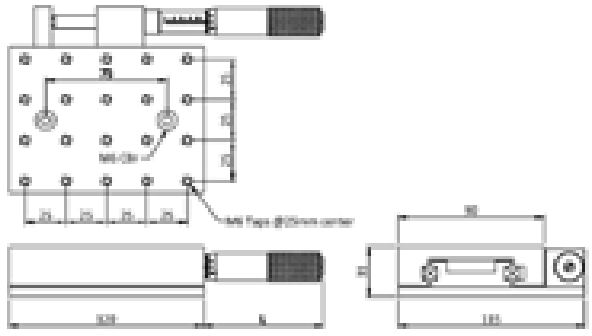
Model	M525	M1025	DM125		
Micrometer	5µ	10µ	Digital		

TS 120 Translation Stage

TS-120 translation stage has 50mm traverse with micrometer drive. These stages have rolling contact guide ways for friction free and playless positioning. Top surface has M6 mounting holes on 25 mm grid.

Carriage Size : 120 mm x 90 mm

Modular design for multi axis configurations

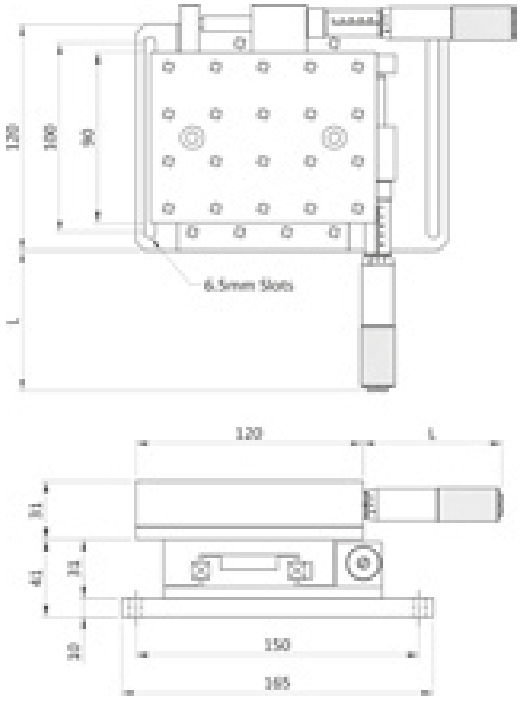


X Configuration



X Configuration





XY Configuration

Specifications

Straight line accuracy	± 10 μm for total travel length
Guide way	Precision ball guide way
Drive	Micrometer
Construction	Aluminum alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M6 tapped holes on 25 mm grid
Mounting Holes on the base plate	M6 tapped holes
Bread Board Mounting	With base plate /direct
Design	Modular Design for Multi Axis Configurations
Travel	50 mm
Carriage Size	120 mm x 90 mm
Load Capacity	20 kg vertical on X axis

Micrometer Drive 5µ resolution

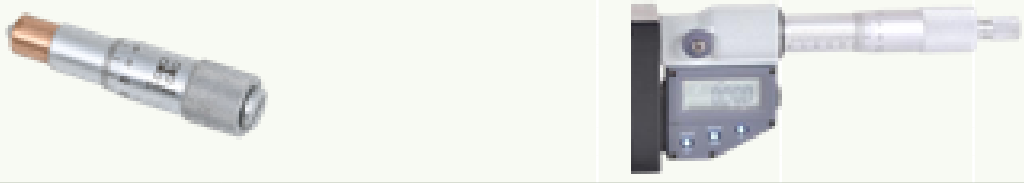


Model No.	TS120-Mu05-01	TS120-Mu05-02	TS120-Mu05-03	TS120-Mu05-04	TS120-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	8	8	8

Micrometer Drive 10µ resolution

Model No.	TS120-Mu10-01	TS120-Mu10-02	TS120-Mu10-03	TS120-Mu10-04	TS120-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	8	8	8

Micrometer Drive



Model	M250	Model	M1050
Micrometer	10μ	Digital Micrometer	1μ
Lead screw pitch	50 mm	Travel Range	50 mm
Lead screw pitch	0.25 mm	Lead Screw Pitch	0.5 mm

Accessories

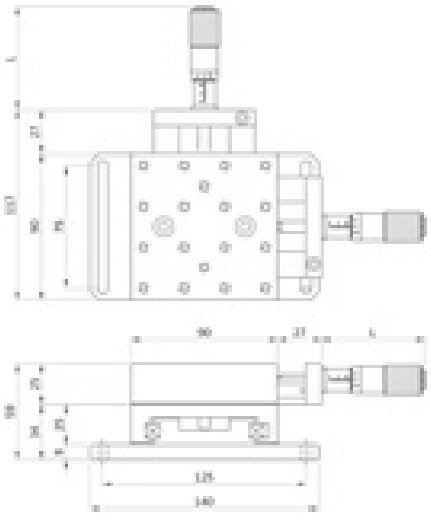


Model No.	APTS - 120	BPTS - 120	ABTS - 120	ABZTS - 120
Configuration	Adapter Plate	Base Plate	Angle Bracket	

TSQ 120 Translation Stage

TSQ-120 stages have square shape having length and width 120mm. These stages too have rolling contact guide ways using crossed rollers. The increased width ensures highly stable positioning.





Carriage Size: 120 mm x 120 mm

Modular design for multi axis configurations

Custom XYZ Configurations



XY Configuration



X Configuration

Specifications

Straight line accuracy	± 10 μm for total travel length
Guide way	Precision ball guide way
Drive	Micrometer
Construction	Aluminum alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M6 tapped holes on 25 mm grid
Mounting Holes on the base plate	M6 tapped holes
Bread Board Mounting	With base plate /direct
Design	Modular Design for Multi Axis Configurations
Travel	50 mm
Carriage Size	120 mm x 120 mm
Load Capacity	20 kg vertical on X axis

Micrometer Drive 5µ resolution



Model No.	TSQ120-Mu5-01	TSQ120-Mu5-02	TSQ120-Mu5-03	TSQ120-Mu5-04	TSQ120-Mu5-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	8	8	8

Micrometer Drive 10µ resolution

Model No.	TS120-Mu10-01	TS120-Mu10-02	TS120-Mu10-03	TS120-Mu10-04	TS120-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	•	•	•		•
Quantity	1	1	1		1
Adapter Plate			•	•	•
Quantity			1	1	1
Angle Bracket			•	•	•
Quantity			2	1	1
Z Axis Angle Bracket With Base Plate				•	
Quantity				1	
Load Capacity (kg)	20	20	6	6	6

Micrometer Drive





Model	M250	Model	M1050
Micrometer	5µ	Micrometer	10µ
Length L	110 +/- 25	Length L	110 +/- 25
Lead screw pitch	50 mm	Lead screw pitch	50 mm
Lead screw pitch	0.5 mm	Lead screw pitch	0.5 mm

Accessories



Model No.	APTSV-35	BPTSV-35	ABTSV-35
Configuration	Adapter Plate	Base Plate	Angle Bracket

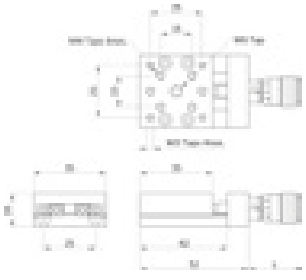
Precision Translation Stage

TSV - 35 Translation Stage

Travel	5 mm
Carriage Size	35 mm x 35 mm
Load Capacity	3 kg vertical on X axis
Drive (option1)	Micrometer 10μm Resolution
Drive (option2)	Micrometer 5μm Resolution

Available in multi axis configurations

Comes in 10µm & 5µm Micrometer Drive





X Configuration



XY Configuration



XZ Configuration



XYZ Configuration



Z Configuration

Specifications

Straight line accuracy	± 10 μm for total travel length
Micrometer Linear Resolution	(Option 1) : 10 μm, (Option 2) : 5 μm
Guide way	Precision V Grooved GuideWay
Drive	Micrometer
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized (aluminium), Ground Finish for SS
Mounting Holes	M3 and M4 Tapped Holes on Carriage
	M3 CBR Hole for Mounting the Stage to Base Plate or breadboard
Mounting Options	Post Mountable by Using M6 Thread
	Breadboard Mounting by Using Base Plate
Design	Modular Design for Multi Axis Configurations

Micrometer Drive 5µ resolution - Aluminium Alloy






Model No.	TSV35-Mu05-01	TSV35-Mu05-02	TSV35-Mu05-03	TSV35-Mu05-04	TSV35-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	TSV35-Mu10-01	TSV35-Mu10-02	TSV35-Mu10-03	TSV35-Mu10-04	TSV35-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

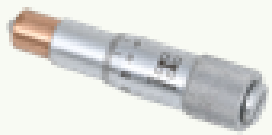
Micrometer Drive 5µ resolution - Stainless Steel

Model No.	SSTSV35-Mu05-01	SSTSV35-Mu05-02	SSTSV35-Mu05-03	SSTSV35-Mu05-04	SSTSV35-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	SSTSV35-Mu10-01	SSTSV35-Mu10-02	SSTSV35-Mu10-03	SSTSV35-Mu10-04	SSTSV35-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive



Model	
Micrometer	5µ
Length L	L
Lead screw pitch	0.5 mm

Accessories





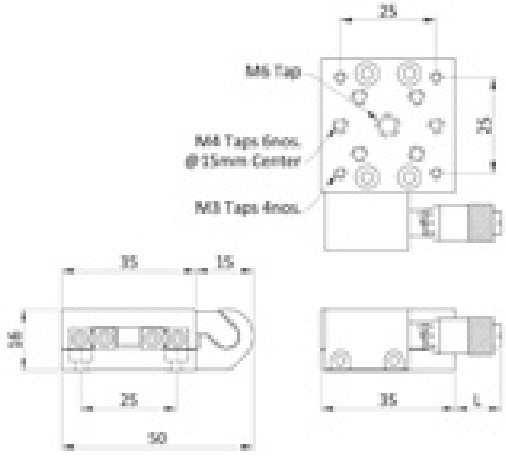
Model No.	APTSQ - 120	BPTSQ - 120	ABTSQ - 120	ABZTSQ - 120
Configuration	Adapter Plate	Base Plate	Angle Bracket	

LTSV-35 Translation Stage : Side Drive

Available in multi axis configurations

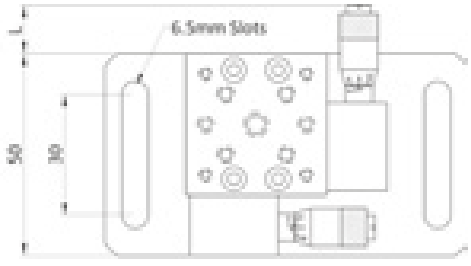
Comes in 10µm & 5µm Micrometer Drive

Travel	5 mm
Carriage Size	35 mm x 35 mm
Load Capacity	3 kg vertical on X axis
Drive (option1)	Micrometer 10μm Resolution
Drive (option2)	Micrometer 5μm Resolution

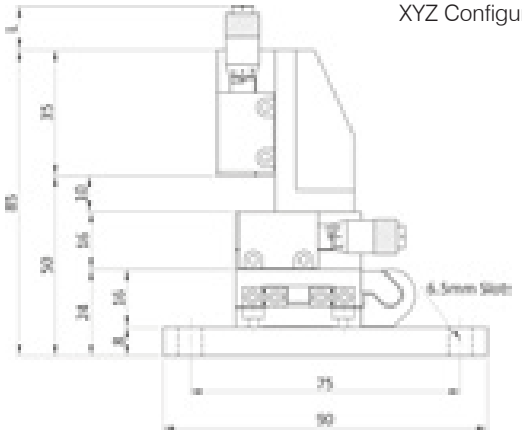


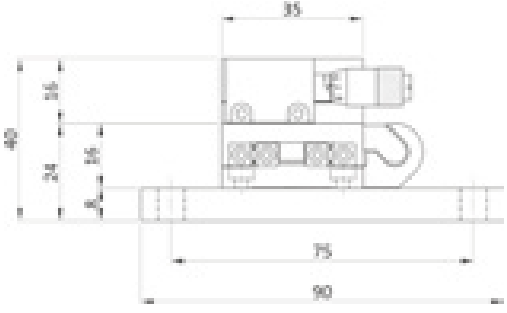
X Configuration





XYZ Configuration





XY Configuration

Specifications

Straight line accuracy	± 2 μm
Micrometer Linear Resolution (Option 1)	10 μm
Micrometer Linear Resolution (Option 2)	5 μm
Guide way	Precision V Grooved GuideWay
Drive	Micrometer
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized (aluminium), Ground Finish for SS
Mounting Holes	M3 and M4 Tapped Holes on Carriage
	M3 CBR Hole for Mounting the Stage to Base Plate or breadboard
Mounting Options	Post Mountable by Using M6 Thread
	Breadboard Mounting by Using Base Plate
Design	Modular Design for Multi Axis Configurations

Micrometer Drive 5µ resolution - Aluminium Alloy







Model No.	LTSV35-Mu05-01	LTSV35-Mu05-02	LTSV35-Mu05-03	LTSV35-Mu05-04	LTSV35-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	LTSV35-Mu10-01	LTSV35-Mu10-02	LTSV35-Mu10-03	LTSV35-Mu10-04	LTSV35-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive 5µ resolution - Stainless Steel

Model No.	SSLTSV35-Mu05-01	SSLTSV35-Mu05-02	SSLTSV35-Mu05-03	SSLTSV35-Mu05-04	SSLTSV35-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	SSLTSV35-Mu10-01	SSLTSV35-Mu10-02	SSLTSV35-Mu10-03	SSLTSV35-Mu10-04	SSLTSV35-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive




Model	M56	Model	M106
Micrometer	5µ	Micrometer	5µ
Lead screw	0.25 mm pitch	Lead screw pitch	0.5 mm

Accessories





Model No.	APTSV-35	BPTSV-35	ABTSV-35
Configuration	Adapter Plate	Base Plate	Angle Bracket

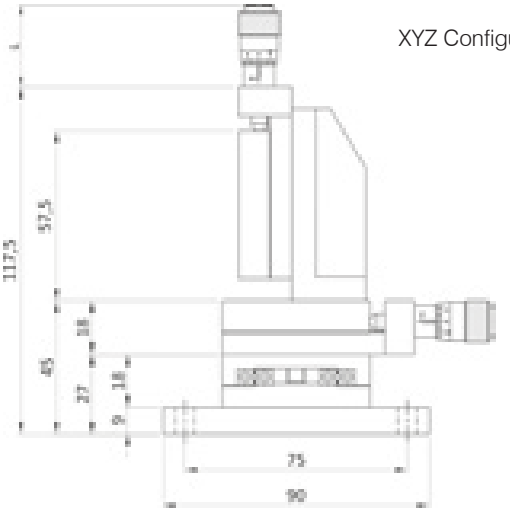
TSV-50 Translation Stage

Available in multi axis configurations

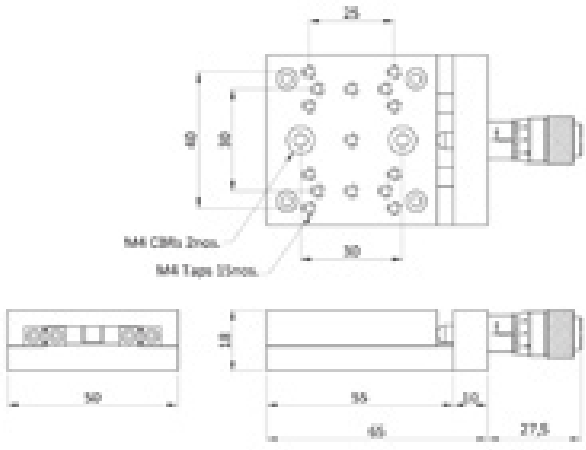
Comes in 10µm & 5µm Micrometer Drive

Travel	10 mm
Carriage Size	50 mm x 50 mm
Load Capacity	6 kg vertical on X axis
Drive (option1)	Micrometer 10μm Resolution
Drive (option2)	Micrometer 5μm Resolution

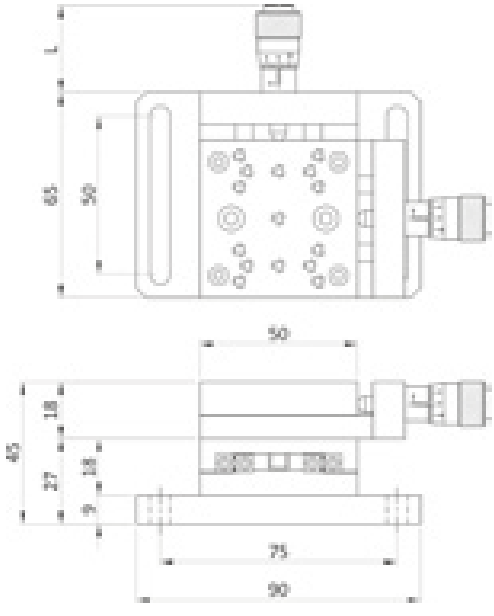




XYZ Configuration



X Configuration



XY Configuration

Specifications

Straight line accuracy	± 2 μm
Micrometer Linear Resolution	(Option 1) : 10 μm, (Option 2) : 5 μm
Guide way	Precision V Grooved GuideWay
Drive	Micrometer
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized (aluminium), Ground Finish for SS
Mounting Holes	M4 Tapped Holes on Carriage
	M4 CBR Hole for Mounting the Stage to Base Plate or Breadboard
Mounting Options	Post Mountable by Using M6 Thread
	Breadboard Mounting by Using Base Plate
Design	Modular Design for Multi Axis Configurations

Micrometer Drive 5µ resolution - Aluminium Alloy






Model No.	TSV50-Mu05-01	TSV50-Mu05-02	TSV50-Mu05-03	TSV50-Mu05-04	TSV50-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	6	6	2	2	2
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	TSV50-Mu10-01	TSV50-Mu10-02	TSV50-Mu10-03	TSV50-Mu10-04	TSV50-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	6	6	2	2	2
Material	Alluminum Alloy				

Micrometer Drive 5µ resolution - Stainless Steel

Model No.	SSTSV50-Mu05-01	SSTSV50-Mu05-02	SSTSV50-Mu05-03	SSTSV50-Mu05-04	SSTSV50-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	6	6	2	2	2
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	SSTSV50-Mu10-01	SSTSV50-Mu10-02	SSTSV50-Mu10-03	SSTSV50-Mu10-04	SSTSV50-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive




Model	M510	Model	M1050
Micrometer	5µ	Micrometer	5µ
Lead screw pitch	0.25 mm	Lead screw pitch	0.5 mm

Accessories





Model No.	APTSV-35	BPTSV-35	ABTSV-35
Configuration	Adapter Plate	Base Plate	Angle Bracket

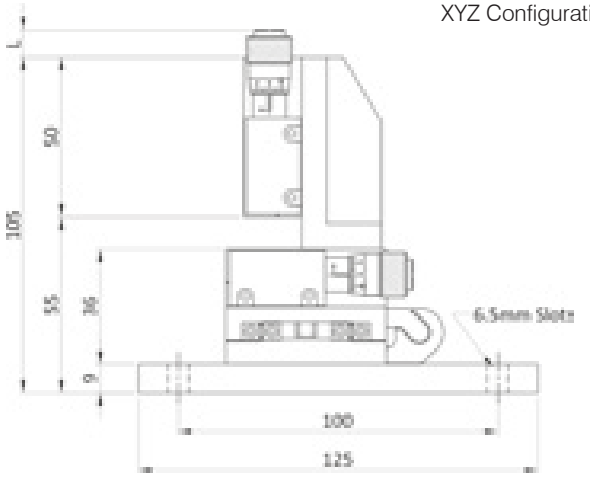
LTSV-50 Translation Stage : Side Drive

Available in multi axis configurations

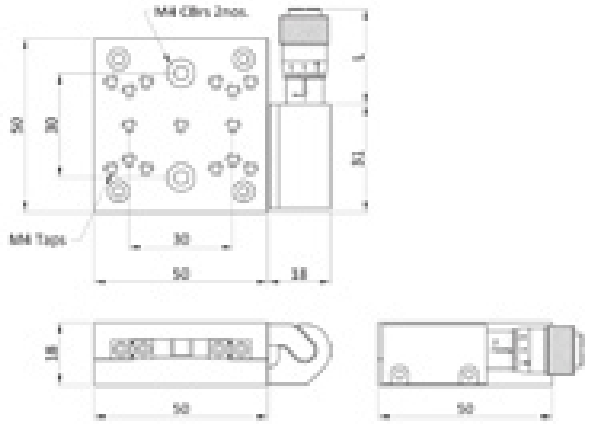
Comes in 10µm & 5µm Micrometer Drive

Travel	10 mm
Carriage Size	50 mm x 50 mm
Load Capacity	6 kg vertical on X axis
Drive (option1)	Micrometer 10μm Resolution
Drive (option2)	Micrometer 5μm Resolution

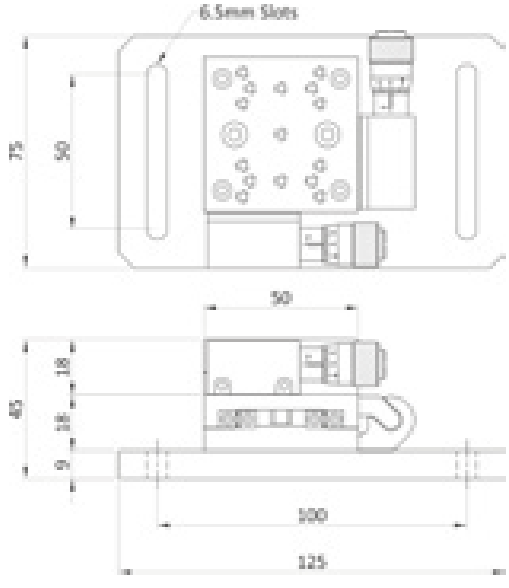




XYZ Configuration



X Configuration



XY Configuration

Specifications

Straight line accuracy	± 2 μm
Micrometer Linear Resolution	(Option 1) : 10 μm, (Option 2) : 5 μm
Guide way	Precision V Grooved GuideWay
Drive	Micrometer
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized (aluminium), Ground Finish for SS
Mounting Holes	M4 Tapped Holes on Carriage
	M4 CBR Hole for Mounting the Stage to Base Plate or Breadboard
Mounting Options	Post Mountable by Using M6 Thread
	Breadboard Mounting by Using Base Plate
Design	Modular Design for Multi Axis Configurations

Micrometer Drive 5µ resolution - Aluminium Alloy








Model No.	LTSV50-Mu05-01	LTSV50-Mu05-02	LTSV50-Mu05-03	LTSV50-Mu05-04	LTSV50-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	6	6	2	2	2
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	LTSV50-Mu10-01	LTSV50-Mu10-02	LTSV50-Mu10-03	LTSV50-Mu10-04	LTSV50-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	6	6	2	2	2
Material	Alluminum Alloy				

Micrometer Drive 5µ resolution - Stainless Steel

Model No.	SSLTSV50-Mu05-01	SSLTSV50-Mu05-02	SSLTSV50-Mu05-03	SSLTSV50-Mu05-04	SSLTSV50-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	6	6	2	2	2
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

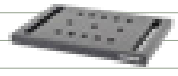
Model No.	SSLTSV50-Mu10-01	SSLTSV50-Mu10-02	SSLTSV50-Mu10-03	SSLTSV50-Mu10-04	SSLTSV50-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	3	3	0.5	0.5	0.5
Material	Alluminum Alloy				

Micrometer Drive




Model		Model	
Micrometer	5µ	Micrometer	5µ
Length L	L	Length L	L
Lead screw pitch	0.5 mm	Lead screw pitch	0.5 mm

Accessories


Model No.	APTSV-35	BPTSV-35	ABTSV-35
Configuration	Adapter Plate	Base Plate	Angle Bracket

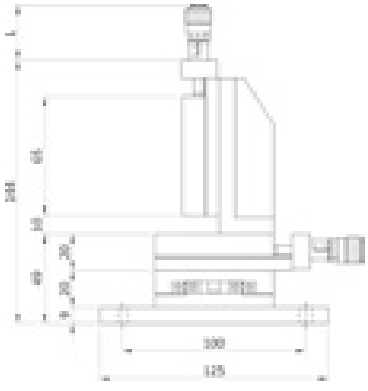
TSV-65 Translation Stage

Available in multi axis configurations

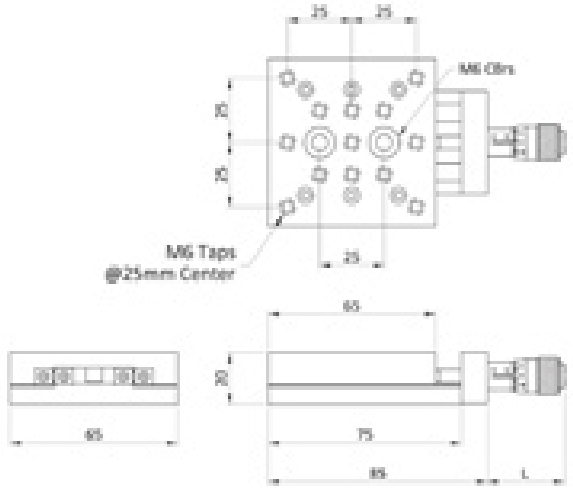
Comes in 1µm & 10µm Micrometer Drive

These stages have V grooved guide ways for precise positioning as well as for better straight line accuracy of movement compared to TS-65 stages.

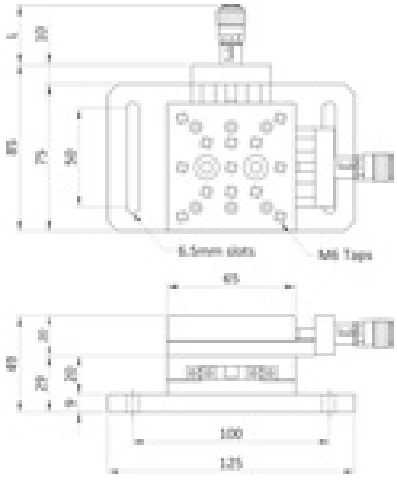




XYZ Configuration



X Configuration



XY Configuration

Specifications

Straight line accuracy	±2 µm for total travel length
Positioning accuracy	(Option 1) : Micrometer linear resolution : 1 µm,
	(Option 2) : Micrometer linear resolution : 10 µm
Guide way	Precision V Grooved GuideWay
Drive	Option-1) Micrometer 1µm Resolution (Digital)
	Option-2) Micrometer 5µm Resolution
	Option-3) Micrometer 10µm Resolution
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized for aluminium and ground finish for SS
Mounting Holes	M6Tapped holes on carriage
	M6 CBR hole for mounting stage to base plate or breadboard
Mounting Options	Directly mount to breadboard by using M6 screws or using base plate
Design	Modular Design for Multi Axis Configurations
Travel	15 mm
Carriage Size	65 mm x 65 mm
Load Capacity	20 kg vertical on X Axis

NOTE: TS-65 stages make use of flattened rods as guide ways where as TSV-65 stages use V grooved guide ways. V grooved guide ways offer better stability and straight line accuracy.

Micrometer Drive 1µ resolution - Aluminium Alloy





Model No.	TSV65-DMu01-01	TSV65-DMu01-02	TSV65-DMu01-03	TSV65-DMu01-04	TSV65-DMu01-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	20	20	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	TSV65-Mu10-01	TSV65-Mu10-02	TSV65-Mu10-03	TSV65-Mu10-04	TSV65-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	20	20	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 5µ resolution - Stainless Steel

Model No.	SSTSV65-DMu01-01	SSTSV65-DMu01-02	SSTSV65-DMu01-03	SSTSV65-DMu01-04	SSTSV65-DMu01-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	20	20	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

Model No.	SSTSV65-Mu10-01				
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	20	20	6	6	6
Material	Alluminum Alloy				

Micrometer Drive





Model	M515	Model	M1015	Model	DM115
Micrometer	5µ	Micrometer	5µ	Micrometer	
Lead screw pitch	0.25 mm	Lead screw pitch	0.5 mm		

Accessories





Model No.	APTSV - 65	BPTSV - 65	ABTSV - 65	ABZTSV - 65
Configuration	Adapter Plate	Base Plate	Angle Bracket	

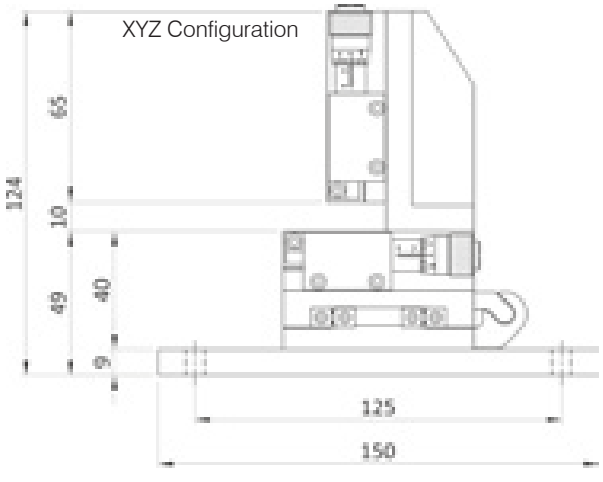
LTSV-65 Translation Stage : Side Drive

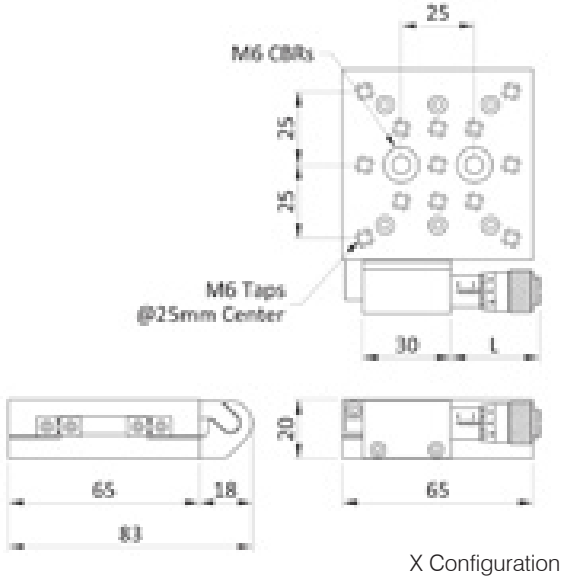
These stages have micrometer fixed by the side of the stage. This reduces the overall length of the stage. As in the case of TSV stages these models use V grooved guide ways for better straight line accuracy as well as stable positioning.

Available in multi axis configurations

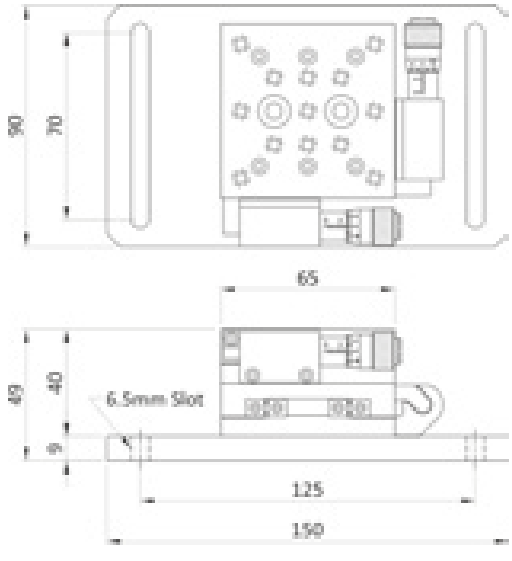
Comes in 10µm & 5µm Micrometer Drive







X Configuration



XY Configuration

Specifications

Straight line accuracy	±2 µm for total travel length
Positioning accuracy	(Option 1) : Micrometer linear resolution : 5 µm,
	(Option 2) : Micrometer linear resolution : 10 µm
Guide way	Precision V Grooved GuideWay
Drive	Option-1) Micrometer 5µm Resolution
	Option-2) Micrometer 10µm Resolution
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized for aluminium and ground finish for SS
Mounting Holes	M6Tapped holes on carriage
	M6 CBR hole for mounting stage to base plate or breadboard
Mounting Options	Directly mount to breadboard by using M6 screws or using base plate
Design	Modular Design for Multi Axis Configurations
Travel	15 mm
Carriage Size	65 mm x 65 mm
Load Capacity	20 kg vertical on X Axis

Micrometer Drive 1µ resolution - Aluminium Alloy





Model No.	LTSV65-Mu05-01	LTSV65-Mu05-02	LTSV65-Mu05-03	LTSV65-Mu05-04	LTSV65-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	20	20	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 10µ resolution

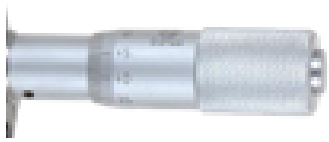
Model No.	LTSV65-Mu10-01	LTSV65-Mu10-02	LTSV65-Mu10-03	LTSV65-Mu10-04	LTSV65-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	20	20	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 5µ resolution - Stainless Steel 304

Model No.	SSLTSV65-Mu05-01	SSLTSV65-Mu05-02	SSLTSV65-Mu05-03	SSLTSV65-Mu05-04	SSLTSV65-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	20	20	6	6	6
Material	Stainless Steel 304				

Micrometer Drive 10µ resolution Stainless Steel 304

Model No.	SSLTSV65-Mu10-01	SSLTSV65-Mu10-02	SSLTSV65-Mu10-03	SSLTSV65-Mu10-04	SSLTSV65-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	20	20	6	6	6
Material	Stainless Steel 304				

Model	M515	M1015		
Micrometer	5µ	Micrometer	5µ	Digital Micrometer
Length L	L	Length L	L	NA
Lead screw pitch	0.5 mm	Lead screw pitch	0.5 mm	

Accessories





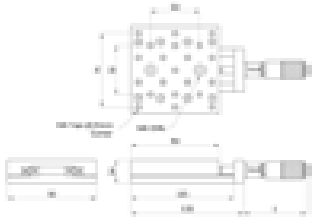
Model No.	APTSV - 65	BPTSV - 65	ABTSV - 65	ABZTSV - 65
Configuration	Adapter Plate	Base Plate	Angle Bracket	

TSV-90 Translation Stage

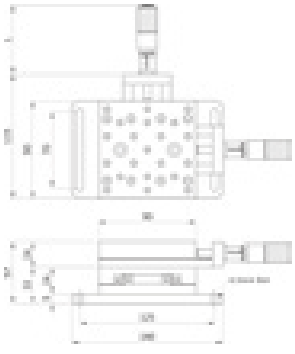
TSV-90 stages use V grooved guide ways with pre-loaded crossed rollers. V grooved guides ensures straight line accuracy and stable positioning.

Available in multi axis configurations

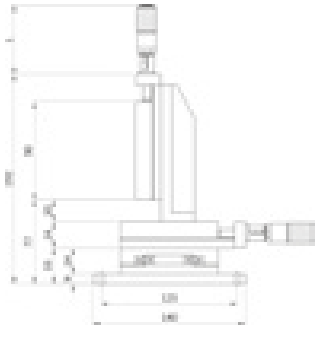
Comes in 1µm, 5µm & 10µm Micrometer Drive



X Configuration



XY Configuration



XYZ Configuration

Specifications

Straight line accuracy	± 3.5 μm for total travel length
Positioning accuracy	(Option 1) : Micrometer linear resolution : 1 μm,
	(Option 2) : Micrometer linear resolution : 5 μm
Guide way	Precision V Grooved GuideWay
Drive	Option-1) Micrometer 1μm Resolution (Digital)
	Option-2) Micrometer 5μm Resolution
	Option-3) Micrometer 10μm Resolution
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized for aluminium and ground finish for SS
Mounting Holes	M6Tapped holes on carriage
	M6 CBR hole for mounting stage to base plate or breadboard
Mounting Options	Directly mount to breadboard by using M6 screws or using base plate
Design	Modular Design for Multi Axis Configurations
Travel	25 mm
Carriage Size	90 mm x 90 mm
Load Capacity	25 kg vertical on X Axis
NOTE: TS - 90 stages make use of flattened rods as guide ways where as TSV - 90 stages use V grooved guide ways. V grooved guide ways offer better stability and straight line accuracy.	



Micrometer Drive 1µ resolution - Aluminium Alloy





Model No.	TSV90-DMu01-01	TSV90-DMu01-02	TSV90-DMu01-03	TSV90-DMu01-04	TSV90-DMu01-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	22	22	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 10µ - Aluminium Alloy

Model No.	TSV90-Mu10-01	TSV90-Mu10-02	TSV90-Mu10-03	TSV90-Mu10-04	TSV90-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	22	22	6	6	6
Material	Alluminum Alloy				

Digital Micrometer Drive 1µ - Stainless Steel 304

Model No.	SSTSV90-DMu01-01	SSTSV90-DMu01-02	SSTSV90-DMu01-03	SSTSV90-DMu01-04	SSTSV90-DMu01-0
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	22	22	6	6	6
Material	Stainless Steel 304				

Micrometer Drive 5µ Stainless Steel 304

Model No.	SSTSV90-Mu05-01	SSTSV90-Mu05-02	SSTSV90-Mu05-03	SSTSV90-Mu05-04	SSTSV90-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	22	22	6	6	6
Material	Stainless Steel 304				

Micrometer Drive 10µ Stainless Steel 304

Configuration	SSTSV90-Mu10-01	SSTSV90-Mu10-02	SSTSV90-Mu10-03	SSTSV90-Mu10-04	SSTSV90-Mu10-05
Base Plate	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Material	22	22	6	6	6

Micrometer Drive




Model	M525	Model	M1025	
Micrometer	5µ	Micrometer		5µ
Length L	L	Length L		L
Lead screw pitch	0.5 mm	Lead screw pitch		0.5 mm

Accessories

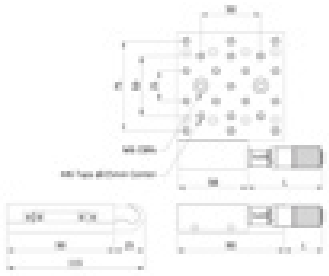




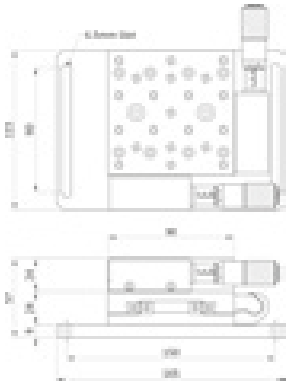
Model No.	APTSV - 90	BPTSV - 90	ABTSV - 90	ABZTSV - 90
Configuration	Adapter Plate	Base Plate	Angle Bracket	

LTSV-90 Translation Stage
Side Drive

LTSV-90 stages have side drive micrometers to make stage as compact as possible. These stages use V grooved guide ways with pre-loaded crossed rollers for improved straight line accuracy as well as stable positioning.



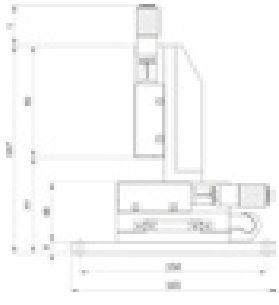
X Configuration



XYZConfiguration

Available in multi axis configurations

Comes in 10µm & 5µm Micrometer Drive



XY Configuration

Specifications

Straight line accuracy	± 3.5 μm for total travel length
Positioning accuracy	(Option 1) : Micrometer linear resolution : 5 μm,
	(Option 2) : Micrometer linear resolution : 10 μm
Guide way	Precision V Grooved GuideWay
Drive	Option-1) Micrometer 5 μm Resolution
	Option-2) Micrometer 10 μm Resolution
Construction	Aluminium Alloy B51S or Stainless Steel
Finish	Black anodized for aluminium and ground finish for SS
Mounting Holes	M6 Tapped holes on carriage
	M6 CBR hole for mounting stage to base plate or breadboard
	Directly mount to breadboard by using M6 screws or using base plate
Design	Modular Design for Multi Axis Configurations
Travel	25 mm
Carriage Size	90 mm x 90 mm
Load Capacity	22 kg vertical on X Axis



Micrometer Drive 1µ resolution - Aluminium Alloy





Model No.	LTSV90-Mu05-01	LTSV90-Mu05-02	LTSV90-Mu05-03	LTSV90-Mu05-04	LTSV90-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Load Capacity (kg)	22	22	6	6	6
Material	Alluminum Alloy				

Micrometer Drive 10µ - Aluminium Alloy

Model No.	LTSV90-Mu10-01	LTSV90-Mu10-02	LTSV90-Mu10-03	LTSV90-Mu10-04	LTSV90-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	22	22	6	6	6
Material	Alluminum Alloy				

Digital Micrometer Drive 5µ - Stainless Steel 304

Model No.	SSLTSV90-Mu05-01	SSLTSV90-Mu05-02	SSLTSV90-Mu05-03	SSLTSV90-Mu05-04	SSLTSV90-Mu05-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	22	22	6	6	6
Material	Stainless Steel 304				

Micrometer Drive 10µ Stainless Steel 304

Model No.	SSLTSV90-Mu10-01	SSLTSV90-Mu10-02	SSLTSV90-Mu10-03	SSLTSV90-Mu10-04	SSLTSV90-Mu10-05
Configuration	X Axis	XY Axis	XYZ Axis	Z Axis	XZ Axis
Base Plate	22	22	6	6	6
Material	Stainless Steel 304				

Micrometer Drive




Model	M525		M1025
Micrometer	5µ	Micrometer	5µ
Length L	L	Length L	L
Lead screw pitch	0.5 mm	Lead screw pitch	0.5 mm

Accessories



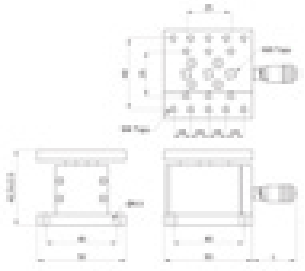


Model No.	APTSV - 90	BPTSV - 90	ABTSV - 90
Config.	Adapter Plate	Base Plate	Angle Bracket

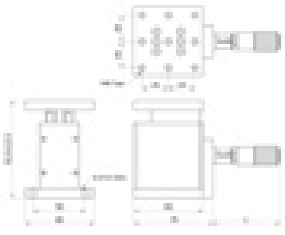
Vertical Translation Stage

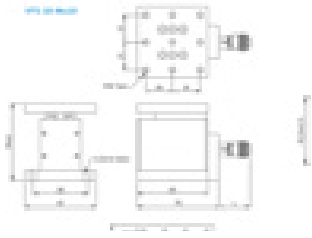


Vertical movement is obtained by activating a spring-loaded cam by micrometer head. Rolling contact guide ways using crossed rollers are employed for friction and stick-slip free translation. These guide ways are factory preloaded to eliminate play and wobble. There are tapped holes at the top and clearance slots at the base for mounting purpose. The stage is constructed in aluminium alloy and finished by black anodizing. Holmarc manufactures vertical stages in three models for 25 mm, 10 mm and 5 mm travel.

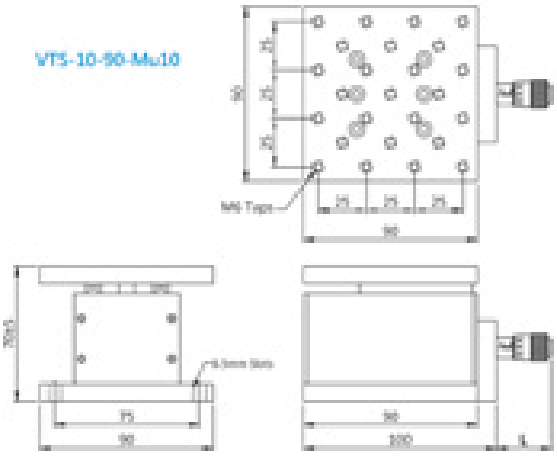


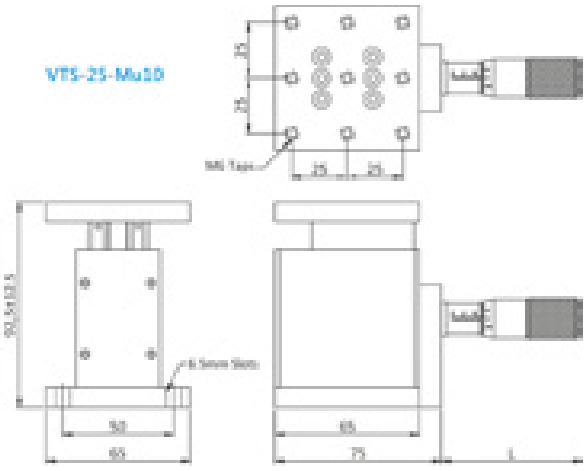






VTS Series





Specifications

Straight line accuracy	± 10 μm
Positioning accuracy	10 μm
Guide way	Precision ball slide
Drive	Precision lead screw / micrometer
Construction	Aluminium Alloy B51S
Finish	Black anodized (aluminium)
Mounting Holes	M4 / M6 tapped holes on carriage
	M4 / M6 CBR hole for mounting the stage to base plate or breadboard
Mounting Options	Post mountable by using M6 thread (VTS5 only)
	Directly mount to breadboard by using M6 screws or using base plate
Design	Modular type design for multi axis configurations

Micrometer Drive 10µ LC:0.01

Model No.	Travel (mm)	Load Capacity (kg)	Platform size (mm)	Height Min & Max	Micrometer length (L) max
VTS-5-Mu10	5	2	50 x 50	Min-40, Max-45	35
VTS-5-10-Mu10	10	2	50 x 50	Min-50, Max-60	40
VTS-10-Mu10	10	5	65 x 65	Min-65, Max-75	50
VTS-10-90-Mu10	10	5	90 x 90	Min-65, Max-75	50
VTS-25-Mu10	25	6	65 x 65	Min-80, Max-105	85
VTS-25-90-Mu10	25	6	90 x 90	Min-80, Max-105	85

Digital Micrometer LC:0.001 mm

Model No.	Travel (mm)	Load Capacity (kg)	Platform size (mm)	Height Min & Max	Micrometer length (L) max
VTS-10-DMu	10	5	65x65	Min-65, Max-75	135
VTS-10-90-DMu	10	5	90x90	Min-65, Max-75	135
VTS-25-DMu	25	6	65x65	Min-80, Max-105	145
VTS-25-90-DMu	25	6	90x90	Min-80, Max-105	145

Micrometer Drives

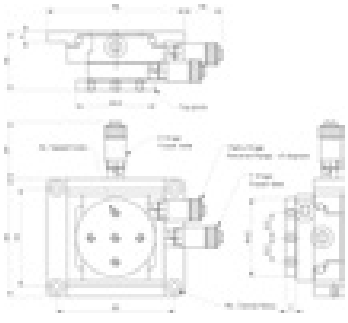
Micrometer	LC : 0.01 mm	LC : 0.001 mm

Multi Axis Translation Stages



Manual XY Theta Stage

Model : XYA-40



M4 tapped holes

Rotation : +/- 5 degree

Specifications

6 mm travel for X axis
6 mm travel for Y axis
Rotation : +/- 5 degree
M4 tapped holes on top of theta stage
M4 C'bored holes at 4 corners
Aluminium alloy contruction
Black anodized finsh

XYZ Compact Translation Stage

VTS series

This stage is designed and constructed to be compact and to be suitable for space restricted applications. Unlike our TS series modular stages, these stages are factory assembled as a three axes positioner. Micrometers or lead screws can be used for driving the stage. All the driving adjustment lead screws/micrometers are fixed on one side for ergonomical positioning control. M6 tapped holes are provided on top and bottom for mounting purpose. A base plate need to be used for mounting on to breadboards and optical tables.



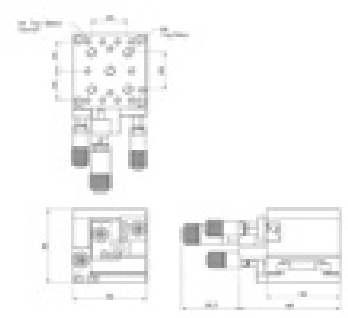
Specifications

Single side control	Precision micrometer driven
10 mm travel for X axis	M6 / M4 mounting holes
5 mm travel for YZ axis	Base mountable
50 x 50 mm top size	
50 mm minimum height	
3 kg load capacity	
Straight line accuracy	0.010 mm



XYZ Compact Translation Stage

Model : XYZCTS50-SU



This stage is designed and constructed to be compact and to be suitable for space restricted applications. Unlike our TS series modular stages, these stages are factory assembled as a three axes positioner. Micrometers or lead screws can be used for driving the stage. All the driving adjustment lead screws/micrometers are fixed on one side for ergonomical positioning control. M6 tapped holes are provided on top and bottom for mounting purpose. A base plate need to be used for mounting on to breadboards and optical tables

Specifications

Single side control	3 kg load capacity
10 mm travel for X axis	Precision micrometer driven
5 mm travel for YZ axis	M6 / M4 mounting holes
50 x 50 mm top size	Base mountable
50 mm minimum height	Straight line accuracy : 0.010 mm



XYZ Compact Translation Stage

Model : XYZCTS50-10



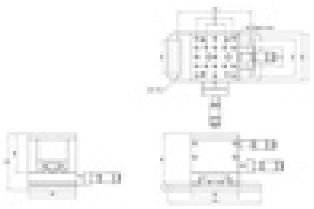
This stage is designed and constructed to be compact and to be suitable for space restricted applications. Unlike our TS series modular stages, these stages are factory assembled as a three axes positioner. Micrometers or lead screws can be used for driving the stage. All the driving adjustment lead screws/micrometers are fixed on one side for ergonomical positioning control. M6 tapped holes are provided on top and bottom for mounting purpose. A base plate need to be used for mounting on to breadboards and optical tables.

Specifications

Single side drive and unidirectional micrometer for each axis	
50 x 50 mm top size	60 mm minimum height
3 kg load capacity	Straight line accuracy : 0.010 mm
10 mm travel for X Y Z axis	
	Precision micrometer driven
Base mountable	M6 / M4 mounting holes

XYZ Compact Translation Stage

Model : XYZCTS65



This stage is designed and constructed to be compact and to be suitable for space restricted applications. Unlike our TS series modular stages, these stages are factory assembled as a three axes positioner. Micrometers or lead screws can be used for driving the stage. All drive micrometers are arranged along adjacent sides for ergonomical use. M6 tapped holes are provided on top and bottom for mounting purpose. A base plate need to be used for mounting on to breadboards and optical tables.

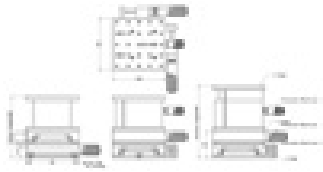
Specifications

15 mm travel for XY axis	3 kg load capacity
15 mm travel for Z axis	Straight line accuracy : 0.010 mm
65 x 65 mm top size	Precision micrometer driven
75 mm minimum height, 90mm maximum height	M6 mounting holes, Base mountable



XYZ Compact Translation Stage

Model : XYZCTS65



This stage is designed and constructed to be compact and to be suitable for space restricted applications. Unlike our TS series modular stages, these stages are factory assembled as a three axes positioner. Micrometers or lead screws can be used for driving the stage. All drive micrometers are arranged along adjacent sides for ergonomical use. M6 tapped holes are provided on top and bottom for mounting purpose. A base plate need to be used for mounting on to breadboards and optical tables.

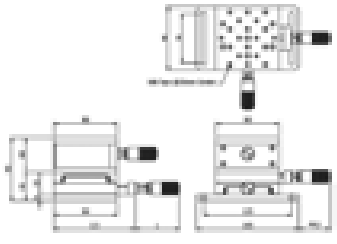


Specifications

50 mm travel for X and Y axis
10 mm travel for Z axis
120 x 120 mm top size
145 mm minimum height
6 kg load capacity
Straight line accuracy : 0.010 mm
Precision micrometer driven
M6 mounting holes
Base mountable

XYZ Compact Translation Stage

Model : XYZCTS90



This stage is designed and constructed to be compact and to be suitable for space restricted applications. Unlike our TS series modular stages, these stages are factory assembled as a three axes positioner. Micrometers or lead screws can be used for driving the stage. All drive micrometers are arranged along adjacent sides for ergonomical use. M6 tapped holes are provided on top and bottom for mounting purpose. A base plate need to be used for mounting on to breadboards and optical tables.

25 mm travel for X axis	Straight line accuracy : 0.010 mm
10 mm travel for YZ axis	Precision micrometer driven
90 x 90 mm top size	M6 mounting holes
90mm minimum height	Base mountable
5 kg load capacity	



Model : XYZCTS90-DMu01

Specifications

25 mm travel for X axis
10 mm travel for YZ axis
90 x 90 mm top size
90mm minimum height
5 kg load capacity
Straight line accuracy : 0.010 mm
Precision digital micrometer driven
M6 mounting holes
Base mountable



XYZ Compact Translation Stage



In these stages, the mounting surface is vertical as shown in the picture. All the three axes have pre-loaded rolling contact guides for play less and friction free movement. Drive is by 80 tpi leadscrew. Top surface of the stage has M6 tapped holes for component mounting. A base plate with M6 counter bored slot is fixed at the bottom for convenient fixing of this stage to breadboards and tables.

Specifications

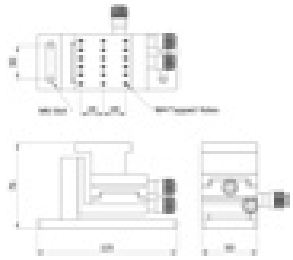
XYZ, Linear Travel - 10 & 15 mm
Drive : Leadscrew
Resolution : 0.1 mm
Load Capacity : 1 kg
Straight Line Accuracy : 0.01 mm
M6 / M3 Mounting Holes

Model No.	Drive	Travel
XYZCTS 35-35	Lead Screw	10 mm
XYZCTS 60-60	Lead Screw	15 mm
XYZCTS 50-50	Lead Screw	10 mm

1 Kg load capacity

80 TPI leadscrew drive

XYZ Positioner



In these stages, mounting surface is horizontal as obvious from the photograph. All drive micrometers are arranged along adjacent sides for ergonomical use.

Specifications

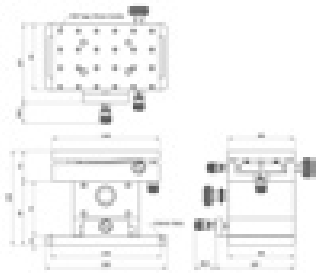
XYZ, Linear Travel - 10 & 15 mm
Drive : Leadscrew
Resolution : 0.1 mm
Load Capacity : 1 kg
Straight Line Accuracy : 0.01 mm
M6 / M3 Mounting Holes

Model No.	Drive	Travel
XYZCTS 35-35	Lead Screw	10 mm
XYZCTS 60-60	Lead Screw	15 mm
XYZCTS 50-50	Lead Screw	10 mm



Micrometer Drive
2 Kg load capacity

4 Axis Stages



Model : XYZ4A

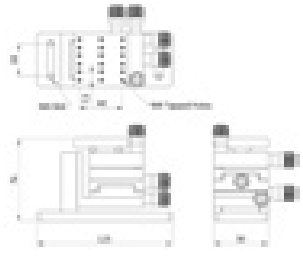
Four axes stages from holmarc are best suited for positioning lasers or optical imaging devices like CCD cameras. The stage has two linear movements (Y, Z) and two tilt adjustments (theta, phi). All four axes are driven by standard micrometer heads. Y and Z axes have rolling contact guides with crossed rollers for frictionless precise positioning. 'Phi' axis uses a spring loaded kinematic one where as 'theta' axis uses pre-loaded rotary bearings for stable positioning. Construction material is aluminium alloy and finish is black anodized.



Specifications

YZ, Linear Travel - 10 mm
Theta, phi travel : +/- 2.5 degree
Drive : Micrometer
Resolution : 10microns
Straight line accuracy : 0.01 mm
Load capacity : 10kg
M6 Mounting Holes

Five Axis Positioner



The stage has three linear movements and two tilt adjustments. All the five axes have adjustment micrometers for precise positioning. Linear stages have rolling contact guides using balls as rolling elements

Specifications

76 mm height
X Travel 5 mm
Y Travel 5 mm
Z Travel 5 mm
Aluminium Alloy
Black anodized finish
ø1 Tilting Range ± 2°
ø2 Tilting Range ± 2°

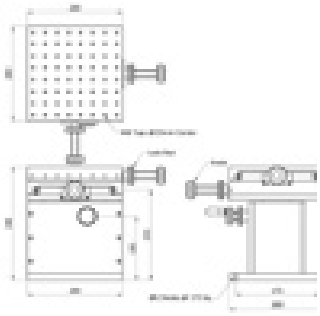
Model No.	Drive	Travel	Travel
CTS-5AR-Mμ05	Micrometer 5μ	Right	5 mm
CTS-5AL-Mμ05	Micrometer 5μ	Left	5 mm



Tilting Range ± 2°

3 linear movements & 2 tilt adjustments

XYZ Heavy Duty Translation Stages



These translation stages are designed for positioning heavy loads in X, Y and Z directions precisely without play and wobble. Pre-loaded roller bearing guides are used for all the three axes for friction free and play less movement. Even with heavy loads, movement is smooth and effortless. Worm gear drive is used in Z axis where as lead screw drive is used for X and Y axes. Top surface of the stage is provided with M6 tapped holes at 25 mm grid. Linear scale with vernier is provided for repeatable positioning with measurements. The stage is constructed in aluminium alloy and given black anodized finish. These stages can be made available in various sizes, travel ranges, heights and load capacity.

If the travel requirement is below 50 mm, X and Y axes can be driven by micrometers with 0.01 mm resolution. In this case, more precise positioning is possible compared to lead screw drive and vernier reading. Another feature of this stage is locking facility after positioning. Lock is normally provided by the side of the stage with appropriately sized hand knobs. Lock prevents accidental movements of the stage from its fixed position. Holmarc manufactures custom stages as well in this configuration.



Load capacity of 50 Kg

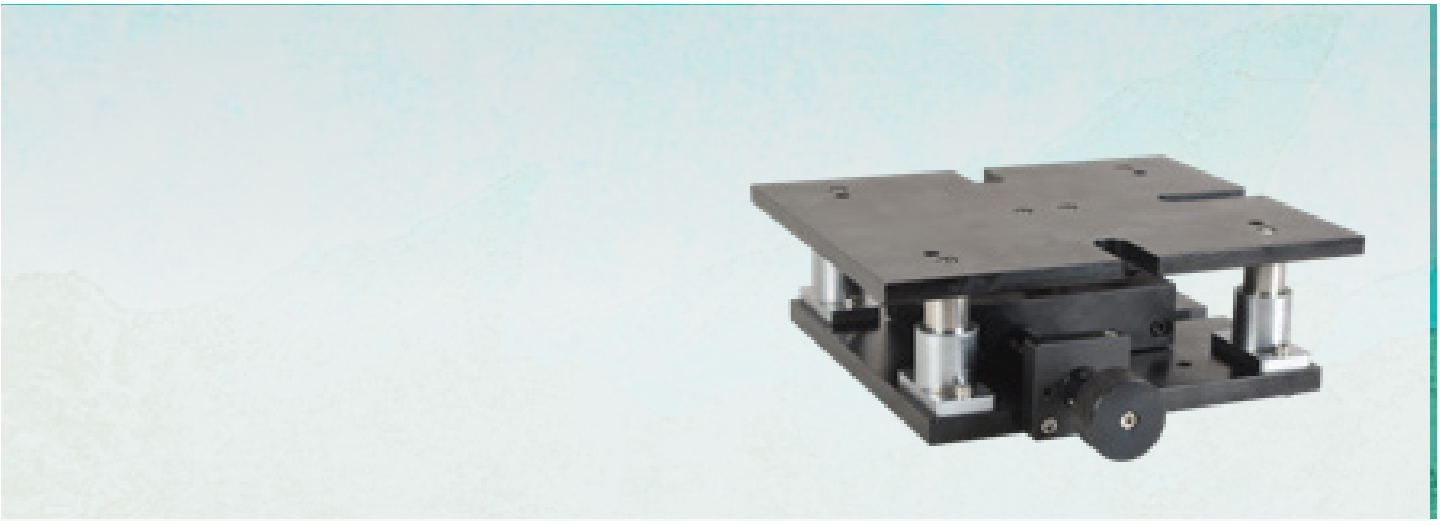
Locking facility after positioning

Specifications

Travel	100 mm XY & 75 mm for Z axis
Load capacity	50 kg
Drive	Lead screw
Straight line accuracy	10 microns
Read out	0.1 mm (Vernier scale)
Guide way	Precision ball bearing guide way
Construction Material	Aluminum alloy B51S
Finish	Black anodized (Aluminium)
Mounting	M6 tapped holes on carriage
	M6 CLR slot for mounting the stage to breadboard

Model No.	Travel	Size (L X B X H)	Space occupied (foot print)	Load Capacity	Weight
XYZTS-150150-3	X-50, Y-50, Z-50	210 x 150 x 150 mm	150 x 150 mm	25 kg	
XYZTS-200200-3	X-100, Y-100, Z-75	200 x 200 x 240 mm	200 x 200 mm	50 kg	10 kg approx.
XYZTS-250200-3	X-100, Y-100, Z-75	250 x 200 x 240 mm	250 x 200 mm	50 kg	14 kg approx

Heavy Duty Stage



Heavy Duty XZ Stage

XZTS 300-300

Specifications

Minimum height	155 mm
Maximum height	165 mm
Z Travel	10 mm
X travel	10 mm
Load capacity	200 Kg
Top plate size	300 x 300 mm
Base size	410 x 355 mm
Finish	Black anodized (Aluminium)



10 mm Travel

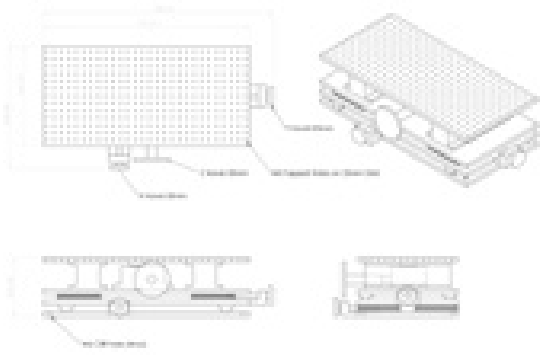
Load capacity of 200 Kg

Heavy Duty TS

XYZTS Series

Specifications

XYZTS 500-350		XYZTS 625-525	XYZTS 700-340
X Y Travel	50 mm	50 mm	50 mm
Z Travel	100 mm	100 mm	50 mm
Load capacity	150 kg	200 kg	200 kg
Drive	Leadscrew	Leadscrew	Leadscrew
Readout	0.1 mm (Vernier scale)	0.1 mm (Vernier scale)	0.1 mm (Vernier scale)
Positioning accuracy	100 micron	100 micron	100 micron
Carriage size	625 x 525 mm	625 x 525 mm	700 x 340 mm
Minimum height	380 mm	380 mm	200 mm
Maximum height	480 mm (maximum travel)	480 mm (maximum travel)	250 mm (maximum travel)

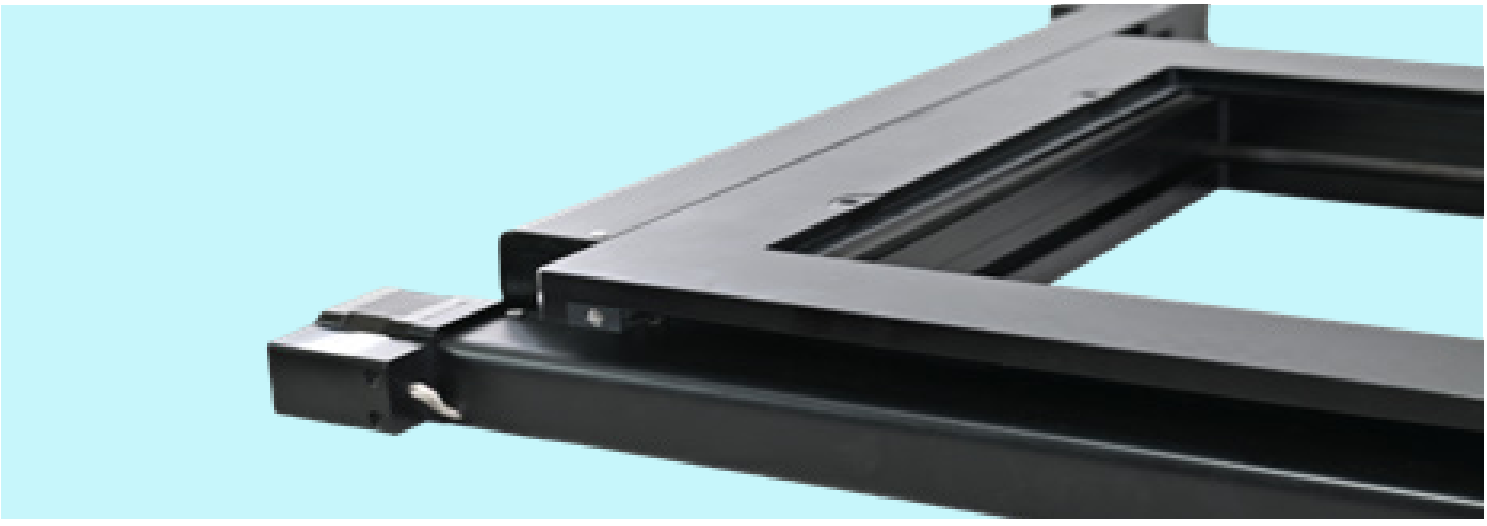




Leadscrew Drive

100 micron accuracy

XY Moving Platform



XYTSM Series

These are factory assembled XY stages for general purpose positioning applications. The stages employ rolling contact linear guide ways using crossed rollers. Friction, stick-slip and play are absent for all practical designs. They are available with lead screw drives as well as micrometer drives. Carriage (moving top) remains spring loaded by a tension spring against the micrometer spindle. This feature eliminates back-lash. In standard models, construction material is aluminium alloy. We manufacture these products in mild steel and stainless steel as well.

0.010 mm accuracy

X - Y orientations available

Specifications

Micrometer drive
Upto 30 kg load capacity
Upto 30 kg load capacity
M6 mounting holes
Base mountable

Model No.	Drive	Size	Resolution	Travel	Load Capacity
XYTSM-25-Mu-10	Micrometer	120x120	0.01 mm	25 mm	25 kg
XYTSM-50-Mu-10	Micrometer	150x150	0.01 mm	50 mm	30 kg
XYTSM25-DMu	Digital Micrometer	120x120	0.01 mm	25 mm	25 kg
XYTSM50-DMu	Digital Micrometer	150x150	0.01 mm	50 mm	30 kg

Motion Control Systems

Since 1993, we at HOLMARC have been manufacturing hundreds of motion control and positioning systems for our customers. We are supplying motion control products to industry and research institutions around the world.

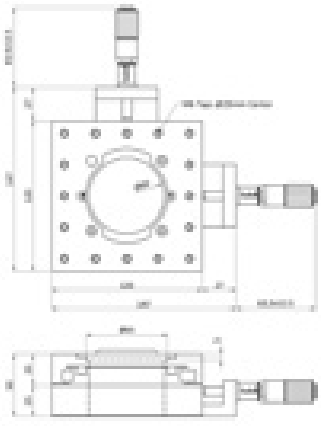
Our precision motion control products provide critical performance required for today's demanding applications in markets such as life science, photonics, laser processing, nano technology and others.

Our product line in motion control includes automated high-speed gantries, linear stages, rotary stages, tilt stages, single and multi-axis motion controllers, goniometers, gimbal mounts, etc. This wide range of products makes us unique among motion control manufacturers.





XYTSWM Series XY Moving Platform



These stages have through holes at the center with a step on the top of the stage for placing a transparent glass disc if required. Optical instruments like profile projectors, microscopes, etc. require illumination from underneath the sample. Stages under this series are suitable for such applications. The center hole can also act as an access hole for fixing components like gauges, sensors etc. to the fixed base.
All other features remain the same as that of our standard stages. Precision crossed roller based rolling contact guides are used for achieving perfect linear motion. Co-efficient of friction is maintained below 0.002. Play and wobble are eliminated for all practical purpose. The stage is constructed out of aluminium alloy and finished by black anodizing.

Specifications

Micrometer drive		
Straight line accuracy	:	0.010 mm
M6 mounting holes		
Base mountable		



Aperture platform

Aluminium alloy Finish

Applications

Tool makers microscope	Profile projector
Compound microscope	Pathology microscope

Model No.	Drive	Size	Resolution	Travel	Load Capacity
XYTSWM-25-Mu-10	Micrometer	120x120	0.01 mm	25 mm	25 kg
XYTSWM-50-Mu-10	Micrometer	150x150	0.01 mm	50 mm	30 kg
XYTSWM25-DMu	Digital Micrometer	120x120	0.01 mm	25 mm	25 kg
XYTSWM-50-DMu	Digital Micrometer	150x150	0.01 mm	50 mm	30 kg

Holmarc manufactures these stages with custom specifications. In many cases, we manufacture stages with rectangular or square access holes at the center instead of circular holes. Various drive options as well as sizes are also available. Contact us at sales@holmarc.com

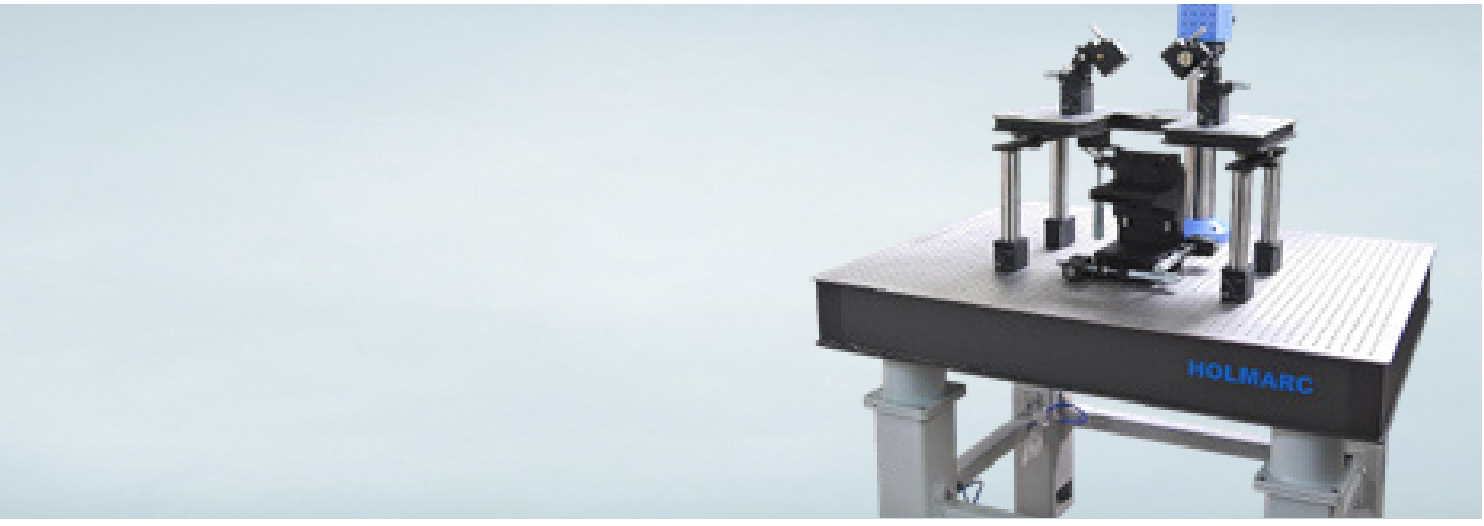
Glass Plate for XYTSWM series

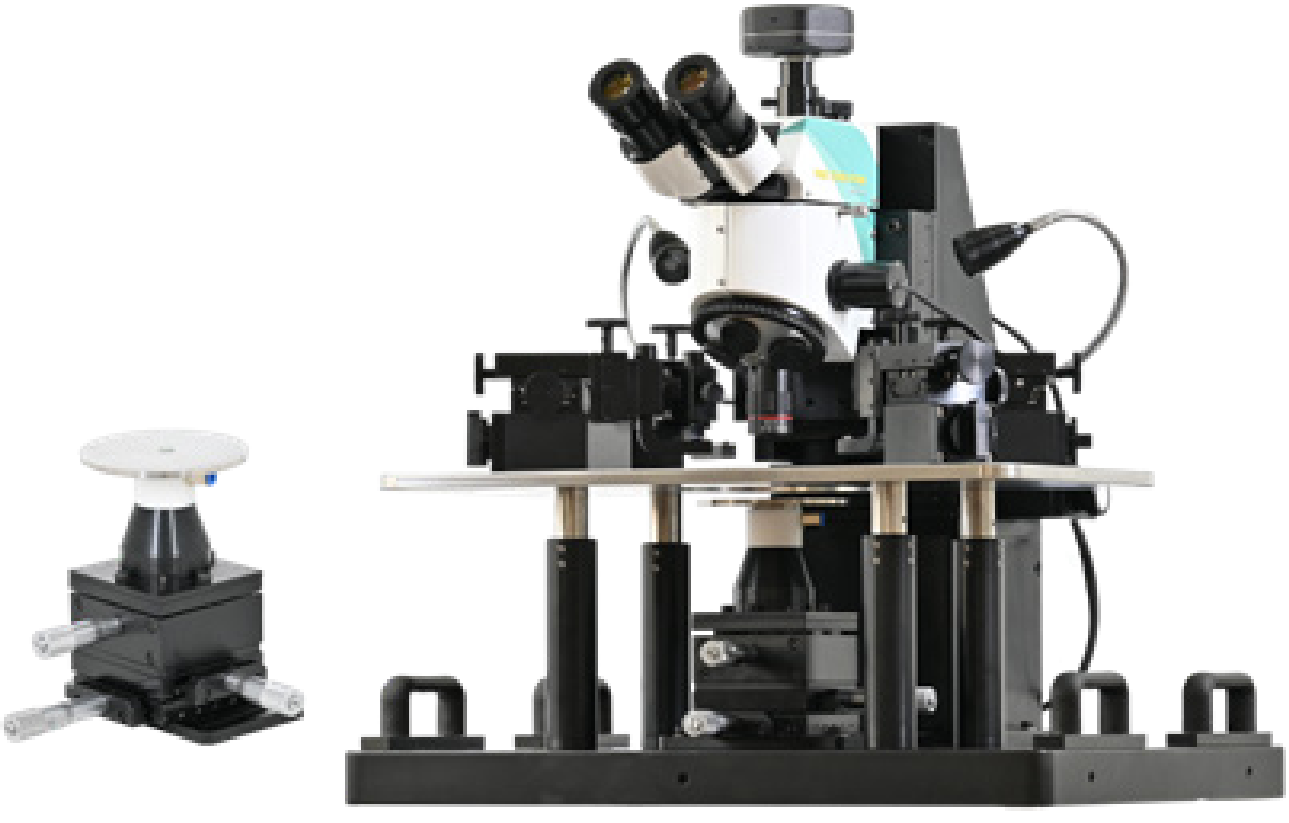
Glass plates are available for XYTSWM series XY translation stages

Model No.	Compatible Model No.
GXYTSWM25	XYTSWM25
GXYTSWM50	XYTSWM50



Heavy Duty XY Moving Platform





XYTSWM Series XY Heavy Duty Moving Platform

These are heavy duty XY stages capable of supporting comparative heavy loads. These stages find applications in positioning heavy loads. For example, a microscope can be placed on the stage and positioned precisely. Standard stages have slots for M6 screws on the base for fixing rigidly to any platform. The drive can be either by lead screw or micrometer. Crossed roller based linear guides are used for achieving precision linear motion.

The guide ways are factory preloaded to eliminate play and wobble. Coefficient of friction is less than 0.003. Standard stages are constructed in aluminium alloy and finished by black anodizing.



Alluminum alloy or SS made

High load capacity upto 50 Kg

Specifications

Micrometer drive
Upto 30 kg load capacity
Upto 30 kg load capacity
M6 mounting holes
Base mountable

Aluminium Alloy - Micrometer Drive

Model No.	Travel	Carriage Size	Height	Load Capacity (Vertical) Kg	Straightness
XYTSWM-150-S	25 mm	150 mm x 150 mm	48 mm	25 kg	4 microns
XYTSWM-150-C	25 mm	150 mm x 150 mm	48 mm	25 kg	3 microns
XYTSWM-200-S	25 mm	200 mm x 200 mm	56 mm	35 kg	4 microns
XYTSWM-200-C	25 mm	200 mm x 200 mm	56 mm	35 kg	3 microns
XYTSWM-250-S	50 mm	250 mm x 250 mm	60 mm	50 kg	5 microns
XYTSWM-250-C	50 mm	250 mm x 250 mm	60 mm	50 kg	4 microns

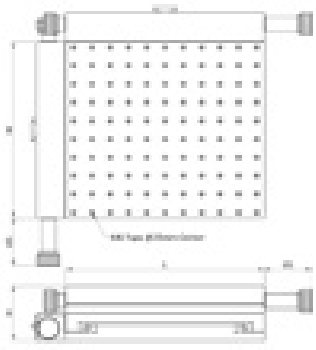
S = Side Drive C = Center Drive

Stainless Steel 304 - Micrometer Drive

Model No.	Travel	Carriage Size	Height	Load Capacity (Vertical) Kg	Straightness
SS XYTSWM-150-S	25 mm	150 mm x 150 mm	48 mm	35 kg	4 microns
SS XYTSWM-150-C	25 mm	150 mm x 150 mm	48 mm	35 kg	3 microns
SS XYTSWM-200-S	25 mm	200 mm x 200 mm	56 mm	45 kg	4 microns
SS XYTSWM-200-C	25 mm	200 mm x 200 mm	56 mm	45 kg	3 microns
SS XYTSWM-250-S	50 mm	250 mm x 250 mm	60 mm	65 kg	5 microns
SS XYTSWM-250-C	50 mm	250 mm x 250 mm	60 mm	65 kg	4 microns

S = Side Drive C = Center Drive

XYTS Series XY Moving Platform



These are heavy duty XY positioning stages driven by lead screw nut mechanism fixed by the side of the stage. The side drive design reduces overall footprint of the stage, especially, total length. There are side locks for both X and Y stages to keep the stage rigid after positioning. Top and bottom surfaces of the stage have M6 mounting holes at 50 mm grid. Crossed roller based linear guides are used for achieving precision linear motion. The guide ways are factory preloaded to eliminate play and wobble. Coefficient of friction is less than 0.003. Standard stages are constructed in aluminium alloy and finished by black anodizing. XYTS Series XY Moving Platform is an ideal precision stage with 0.01mm accuracy for Inspection and Measuring microscopes. It can be configured to provide high-performance positioning XY moving platforms. It is a compatible base for Induction hardening process and Hardness testing.

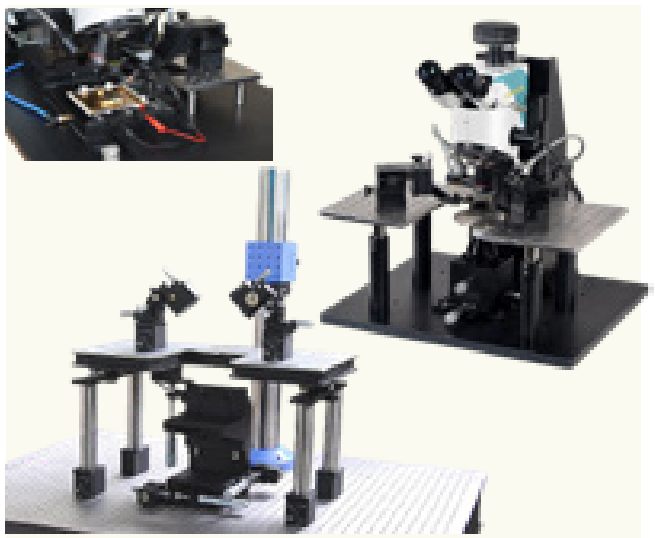
Specifications

Upto 25kg load capacity	
Straight line accuracy	0.010mm
Precision leadscrew	
M6 mounting holes	
Base mountable	



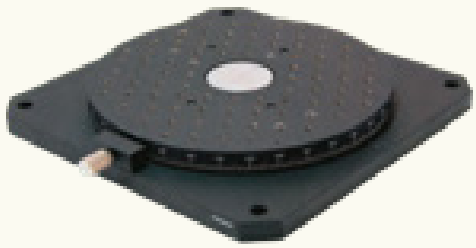
XY Adjustable with locking knob
Available in different carrier sizes & travel

Model No.	Carriage Size	Travel (mm)	Height	L	W
XYTS150150	150 mm x 150 mm	50, 50	65 mm	150 mm	150 mm
XYTS170170	170 mm x 170 mm	100, 100	65 mm	170 mm	170 mm
XYTS270170	270 mm x 170 mm	200, 100	75 mm	270 mm	170 mm
XYTS270240	270 mm x 240 mm	200, 170	75 mm	270 mm	240 mm
XYTS370240	370 mm x 240 mm	300, 170	75 mm	370 mm	240 mm



XYTS Series stages help to position heavy object up to 25kg. These stages are ideal choice for microscope probe station interfacing. Platforms are available upto 370x240mm size. Custom mounting hole patterns are available for easy integration with other system components

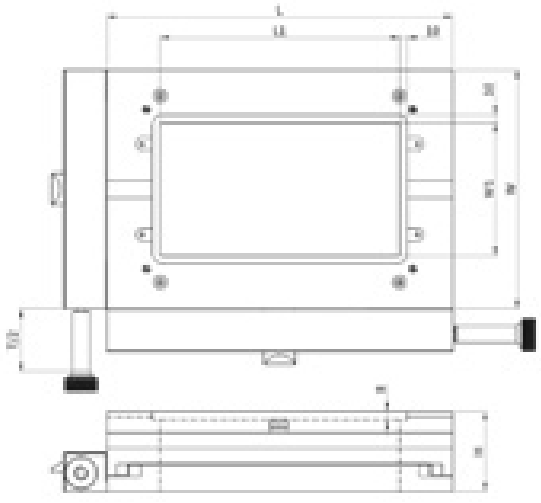
ROTATIONAL MOTION FOR XYTS SERIES MOVING PLATFORM



This rotation stage can be used with XYTS series XY moving platform. The stage has C' bored holes around the corner and can easily be attached to the XY stage using M6 screws. An angular scale along the outer edge of the mounting surface allows the user to set the angular orientation of the stage, which can then be fixed using locking setscrew.

XYTSW Series XY moving Stage





Finds applications in optical Instruments

Available in different carrier & aperture sizes

These stages have rectangular through holes at the center, primarily meant for back illumination. The top surface has stepped under cut on the periphery of the central hole for keeping a glass plate of suitable size. Lead screw-nut mechanism provides the linear drive, fixed by the side of the stage. These stages are best suited for Optical Measuring Instruments like profile projectors and custom microscopes.

Crossed roller based linear guides are used for achieving precision linear motion. The guide ways are factory preloaded to eliminate play and wobble. Coefficient of friction is less than 0.003. Standard stages are constructed in aluminium alloy and finished by black anodizing. XYTSW Series XY moving Stages are most suitable for Optical Measuring Instruments like profile Projectors and Inspection microscopes. It also finds applications in volumetric analysis and can be used for two axis positioning of bottler for dispensing nozzle.

Model No.	Carriage Size	Aparture Size	Travel	H	L	W	L1	W1
XYTSW175175	175 x 175	75 x 75	50, 50	65	175	175	75	75
XYTSW225225	225 x 225	125 x 125	100, 100	65	225	225	125	125
XYTSW325225	325 x 225	225 x 125	200, 100	75	325	225	225	125
XYTSW325295	325 x 295	225 x 195	200, 170	75	325	295	195	175
XYTSW425295	425 x 295	325 x 195	300, 170	75	425	295	195	175

* All dimensions are in mm





Custom stages : Platforms are available up to 500 x 500mm size, Materials other than aluminium are also available on request

Model No.	L	W
GI7575	95 x 95	XYTSW175175
GI125125	145 x 145	XYTSW225225
GI225125	245 x 145	XYTSW325225
GI225195	245 x 215	XYTSW325295
GI325195	345 x 215	XYTSW425295

XYTSW Series manual stages can be used with profile projector, microscope etc. For automated application please see the MXYTSW Series stages.
Linear encoder is available on special request for digital readout application. Contact us at sales@holmarc.com

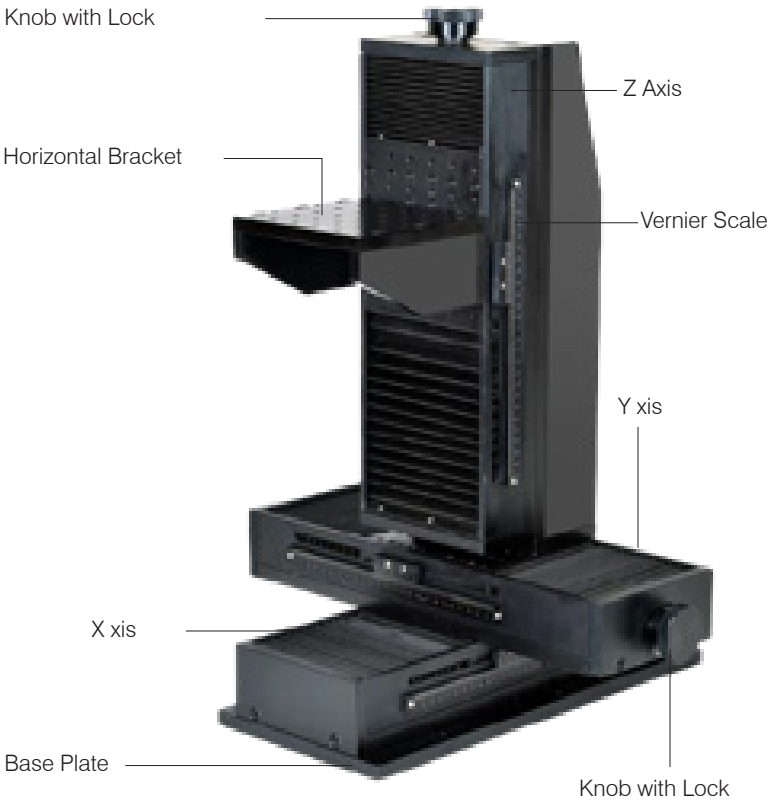
Long Travel Translation Stage



LTTS series manual translation stages provide maximum travel with minimum overall footprint. Re-circulating type ball bearing guide ways are used in all models. Drive is given by either ball screws or lead screws fixed by the side of the stage.

Travel can range from 50 mm to 500 mm. Tapped holes are provided on top and counter bored holes are provided on base for mounting purpose. For all the standard products, construction is in aluminium alloy. Circular graduations are there on driving knob. There are linear graduations by the side of the stage.



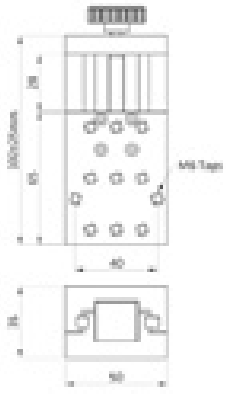






Translation Stage with Vernier readout

These stages are suitable for manual coarse positioning applications. A graduated scale with vernier readout is fixed to one side of the stage for repeated positioning. There are two choices for drive lead screws, 1 mm pitch & 9 mm pitch.





30 to 90 mm linear travel

0.1mm precision vernier read out

Specifications

Straight line accuracy	± 10 μm for total travel length
Vernier Readout	0.1 mm
Guide way	Precision ball slide
Drive	Precision lead screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M6 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Travel	30 to 90 mm
Carriage width	50 mm
Load Capacity	6 kg vertical
Leadscrew	1 mm pitch / 9 mm pitch

Accessories

Vertical Bracket	Horizontal Brackett	Base Plate
VAB-TSC5030		BP-TSC5030
VAB-TSC5050		BP-TSC5050
VAB-TSC5075	HAB-TSC-5050	BP-TSC5075
VAB-TSC5090	Size : 50 x 50 mm	BP-TSC5090
	With M6 tapped holes	



Base plates can be used for mounting translation stages to breadboards and tables conveniently.



Angle bracket can be used for assembling Z-axis stages. Horizontally fixed height platforms can be constructed by combining two angle brackets.

Drive Details

Pitch	1 mm	9 mm
Lead Screw Type	Ground	Rolled
Linear Resolution	1 mm / rotation	9 mm / rotation
Positioning Accuracy	0.1 mm	0.5 mm
Readout	0.1 mm precision vernier	0.1 mm precision vernier
Feature	Fine Movement	Course Movement



1 mm Pitch Lead Screw

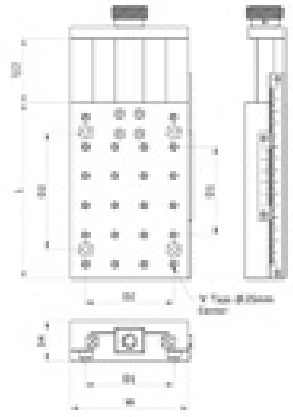
Model No:	Speed / Rotation	Positioning Accuracy	Travel range
TSC-1-5030	1 mm	0.02 mm	30 mm
TSC-1-5050	1 mm	0.02 mm	50 mm
TSC-1-5075	1 mm	0.02 mm	75 mm
TSC-1-5090	1 mm	0.02 mm	90 mm

9 mm Pitch Lead Screw

Model No:	Speed / Rotation	Positioning Accuracy	Travel range
TSC-9-5030	9 mm	0.5 mm	30 mm
TSC-9-5050	9 mm	0.5 mm	50 mm
TSC-9-5075	9 mm	0.5 mm	75 mm
TSC-9-5090	9 mm	0.5 mm	90 mm

MLS Series Translation Stages

MLS series stages are available in various sizes. The width ranges from 65 mm to 200 mm. The stage can be locked anywhere after positioning by making use of a locking nut which is provided along with the drive knob.





Locking nut facility
Fine & Precise Movement

Specifications

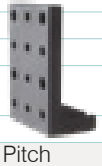
Straight line accuracy	± 10 μm for total travel length
Vernier Readout	0.1 mm
Guide way	Precision ball slide
Drive	Precision lead screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M6 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis
Travel	25 to 150 mm
Carriage width	65 mm to 200 mm
Load Capacity	5 - 35 kg vertical
Leadscrew	1 mm pitch
Lock	Can be locked at desired position

Drive Details

Drive Details	1 mm Pitch lead screw
Pitch	1 mm
Lead Screw Type	Ground
Linear Resolution	1 mm / rotation
Positioning Accuracy	10 μm
Repeatability	100 μm
Readout	0.1 mm precision vernier
Feature	Fine Movement



Angle Bracket :



Angle bracket can be used for assembling Z-axis stages. Horizontally fixed height platforms can be constructed by combining two angle brackets.

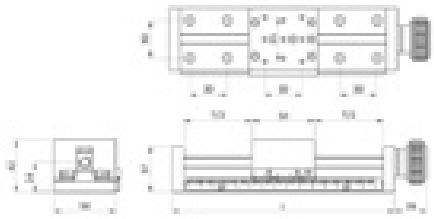
Base plates :



Base plates can be used for mounting translation stages to breadboards and tables conveniently.

1 mm Pitch Lead Screw	Load Capacity Vertical (X Axis)	Travel	Dimensions			
Model No:	Kg	T	W	L	T / 2	X
MLS-6565-1	6	25	65	65	12.5	M4
MLS-7575-1	8	35	75	75	17.5	M4
MLS-75100-1	15	50	75	100	25	M4
MLS-75150-1	25	100	75	150	50	M4
MLS-75200-1	28	150	75	200	75	M4
MLS-100100-1	20	50	100	100	25	M6
MLS-100150-1	25	100	100	150	50	M6
MLS-100200-1	28	150	100	200	75	M6
MLS-150150-1	25	100	150	150	50	M6
MLS-150200-1	35	150	150	200	75	M6
MLS-200200-1	35	150	200	200	75	M6

LTTS 50 Series



These stages used re-circulating type rolling contact guide ways. Drive knobs have rotary graduations in addition to the linear scale fixed to the side of the stage. Engraved vernier scales are provided for selected LTTS series translation stages

Specifications

Straight line accuracy	± 20 μm over 150mm travel
Vernier Readout	0.1 mm
Guide way	Precision re-circulating Guide way
Drive	Precision lead screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M4 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis Configuration
Travel	50 to 150 mm
Carriage Size	50 mm x 50 mm
Load Capacity	2kg vertical on X Axis
Leadscrew	1 mm pitch / 9 mm pitch



50 to 150 mm Travel

Carriage Size : 50 mm x 50 mm

Accessories

Vertical Bracket	Horizonta Bracket	Angle Bracket	Base Plate
VAB-LTTS50-50		It is used to transform horizontal translators to vertical ones. Horizontally fixed height platforms can be constructed by combining two angle brackets.	BP-LTTS50-50
VAB-LTTS50-75			BP-LTTS50-75
VAB-LTTS50-100			BP-LTTS50-100
VAB-LTTS50-150			BP-LTTS50-150
	HAB-LTTS-50		
	Size : 50 x 50 mm		



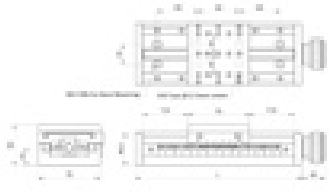
Drive Details

	1mm Pitch Lead screw with spring loaded nut mechanism	9mm Pitch Lead screw and resin nut
Pitch	1 mm	9 mm
Lead Screw Type	Ground	Rolled
Linear Resolution	1 mm / rotation	9 mm / rotation
Positioning Accuracy	0.1 mm	0.5 mm
Readout	0.1 mm precision vernier	0.1 mm precision vernier
Feature	Fine Movement	Course Movement



1 mm Pitch Lead Screw				
Model No:	Load Capacity Vertical (X Axis)	Load Capacity Vertical (Z Axis)	Travel (T)	Length (L)
LTTS50-50	2 Kg	1 Kg	50 mm	155 mm
LTTS50-75	2 Kg	1 Kg	75 mm	180 mm
LTTS50-100	2 Kg	1 Kg	100 mm	205 mm
LTTS50-150	2 Kg	1 Kg	150 mm	280 mm
9 mm Pitch Lead Screw				
LTTS50-50Z	2 Kg	1 Kg	50 mm	155 mm
LTTS50-75Z	2 Kg	1 Kg	75 mm	180 mm
LTTS50-100Z	2 Kg	1 Kg	100 mm	205 mm
LTTS50-150Z	2 Kg	1 Kg	150 mm	280 mm

LTTS 75 Series



These stages are similar to LTTS-50, except that width is 75mm instead of 50mm. A linear scale is fixed to the side for positioning references. For precise measurements, vernier scale is also available as an optional feature.



50 to 250 mm Travel

Carriage Size : 75 mm x 75 mm

Specifications

Straight line accuracy	± 20 μm over 200mm travel
Vernier Readout	0.1 mm
Guide way	Precision re-circulating Guide way
Drive	Precision lead screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M4 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis Configuration
Travel	50 to 250 mm
Carriage Size	75 mm x 75 mm
Load Capacity	5kg vertical on X Axis
Leadscrew	1 mm pitch / 9 mm pitch

Accessories

Vertical Bracket	Horizonta Bracket	Angle Bracket	Base Plate
VAB-LTTS75-50		It is used to transform horizontal translators to vertical ones. Horizontally fixed height platforms can be constructed by combining two angle brackets.	BP-LTTS75-50
VAB-LTTS75-75			BP-LTTS75-75
VAB-LTTS75-100			BP-LTTS75-100
VAB-LTTS75-150			BP-LTTS75-150
VAB-LTTS75-200			BP-LTTS75-200
VAB-LTTS75-250	HAB-LTTS-50		BP-LTTS75-250
	Size : 50 x 50 mm		



Drive Details

	1mm Pitch Lead screw with spring loaded nut mechanism	9mm Pitch Lead screw and resin nut
Pitch	1 mm	9 mm
Lead Screw Type	Ground	Rolled
Linear Resolution	1 mm / rotation	9 mm / rotation
Positioning Accuracy	0.1 mm	0.5 mm
Readout	0.1 mm precision vernier	0.1 mm precision vernier
Feature	Fine Movement	Course Movement



1 mm Pitch Lead Screw

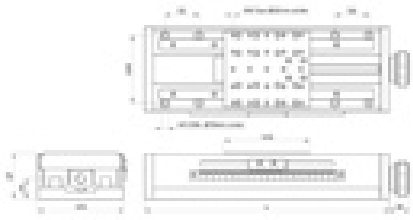
Model No:	Load Capacity Vertical (X Axis)	Load Capacity Vertical (Z Axis)	Travel (T)	Length (L)
LTTS75-50	5 Kg	1 Kg	50 mm	155 mm
LTTS75-75	5 Kg	1 Kg	75 mm	205 mm
LTTS75-100	5 Kg	1 Kg	100 mm	280 mm
LTTS75-150	5 Kg	1 Kg	150 mm	280 mm
LTTS75-250	5 Kg	1 Kg	250 mm	280 mm

9 mm Pitch Lead Screw

LTTS75-50Z	5 Kg	1 Kg	50 mm	155 mm
LTTS75-75Z	5 Kg	1 Kg	75 mm	205 mm
LTTS75-100Z	5 Kg	1 Kg	100 mm	280 mm
LTTS75-150Z	5 Kg	1 Kg	150 mm	280 mm
LTTS75-250Z	5 Kg	1 Kg	250 mm	280 mm

LTTS 125 Series

These stages feature carriages having 125mm width. Recirculating type ball bearing guide ways makes the linear motion play-less and friction free. Standard stages feature linear scale for position reference. Vernier with 0.1mm resolution is also available as an optional feature.



Specifications

Straight line accuracy	± 20 μm over 300mm travel
Vernier Readout	0.1 mm
Guide way	Precision re-circulating Guide way
Drive	Precision ball screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M6 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis Configuration
Travel	100 to 500 mm
Carriage Size	125 mm x 125 mm
Load Capacity	45 - 50 kg vertical on X axis
Ball Screw	4 mm pitch





100 to 500 mm Travel

Carriage Size : 125 mm x 125 mm

Accessories

Vertical Bracket	Horizonta Bracket	Angle Bracket	Base Plate
VAB-LTTS125-100		It is used to transform horizontal translators to vertical ones. Horizontally fixed height platforms can be constructed by combining two angle brackets.	BP-LTTS125-100
VAB-LTTS125-150			BP-LTTS125-150
VAB-LTTS125-200			BP-LTTS125-200
VAB-LTTS125-350			BP-LTTS125-350
VAB-LTTS125-500			BP-LTTS125-500
	HAB-LTTS-125 Size : 125 x 125 mm		



Drive Details

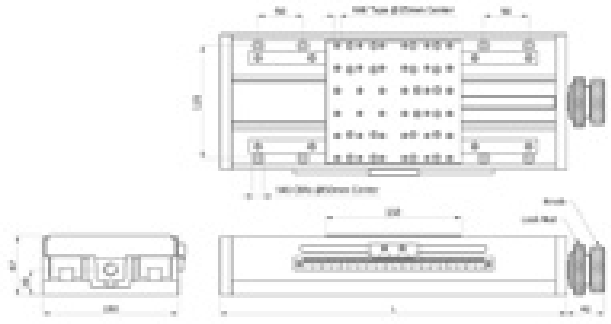
	4mm Pitch ball screw with lock
Pitch	4 mm
Lead Screw Type	Rolled
Linear Resolution	4 mm / rotation
Positioning Accuracy	0.1 mm
Readout	0.1 mm precision vernier
Feature	Precision movement



Model No:	Load Capacity Vertical (X Axis)	Load Capacity Vertical (Z Axis)	Travel (T)	Length (L)
LTTS125-100	50 Kg	10 Kg	100 mm	340 mm
LTTS125-150	50 Kg	10 Kg	200 mm	390 mm
LTTS125-200	50 Kg	10 Kg	200 mm	440 mm
LTTS125-300	45 Kg	10 Kg	300 mm	540 mm
LTTS125-500	45 Kg	10 Kg	500 mm	740 mm

LTTS 150 Series

These stages have 150mm width carriages for mounting heavy loads. Re-circulating type ball bearing guide-ways ensure stability under heavy loads.



Specifications

Straight line accuracy	± 20 μm over 300mm travel
Vernier Readout	0.1 mm
Guide way	Precision re-circulating Guide way
Drive	Precision ball screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M6 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis Configuration
Travel	100 to 750 mm
Carriage Size	150 mm x 150 mm
Load Capacity	45 - 75 kg vertical on X axis
Ball Screw	4 mm pitch

Accessories

Vertical Bracket	Horizonta Bracket	Angle Bracket	Base Plate
VAB-LTTS150-100		It is used to transform horizontal translators to vertical ones. Horizontally fixed height platforms can be constructed by combining two angle brackets.	BP-LTTS150-100
VAB-LTTS150-150			BP-LTTS150-150
VAB-LTTS150-200			BP-LTTS150-200
VAB-LTTS150-300			BP-LTTS150-300
VAB-LTTS150-500			BP-LTTS150-500
VAB-LTTS150-750	HAB-LTTS-150		BP-LTTS150-750
	Size : 150 x 150 mm		



Drive Details

	4mm Pitch ball screw with lock
Pitch	4 mm
Lead Screw Type	Rolled
Linear Resolution	4 mm / rotation
Positioning Accuracy	0.1 mm
Readout	0.1 mm precision vernier
Feature	Precision movement



Model No:	Load Capacity Vertical (X Axis)	Load Capacity Vertical (Z Axis)	Travel (T)	Length (L)
LTTS150-100	75 Kg	50 Kg	100 mm	335 mm
LTTS150-150	75 Kg	50 Kg	150 mm	385 mm
LTTS150-200	75 Kg	50 Kg	200 mm	435 mm
LTTS150-300	75 Kg	50 Kg	300 mm	535 mm
LTTS150-500	75 Kg	50 Kg	500 mm	735 mm
LTTS150-750	75 Kg	50 Kg	750 mm	985 mm
LTTS150-800	75 Kg	50 Kg	750 mm	

Load Capacity

45 - 75 kg vertical on X axis

Ball Screw

4mm Pitch

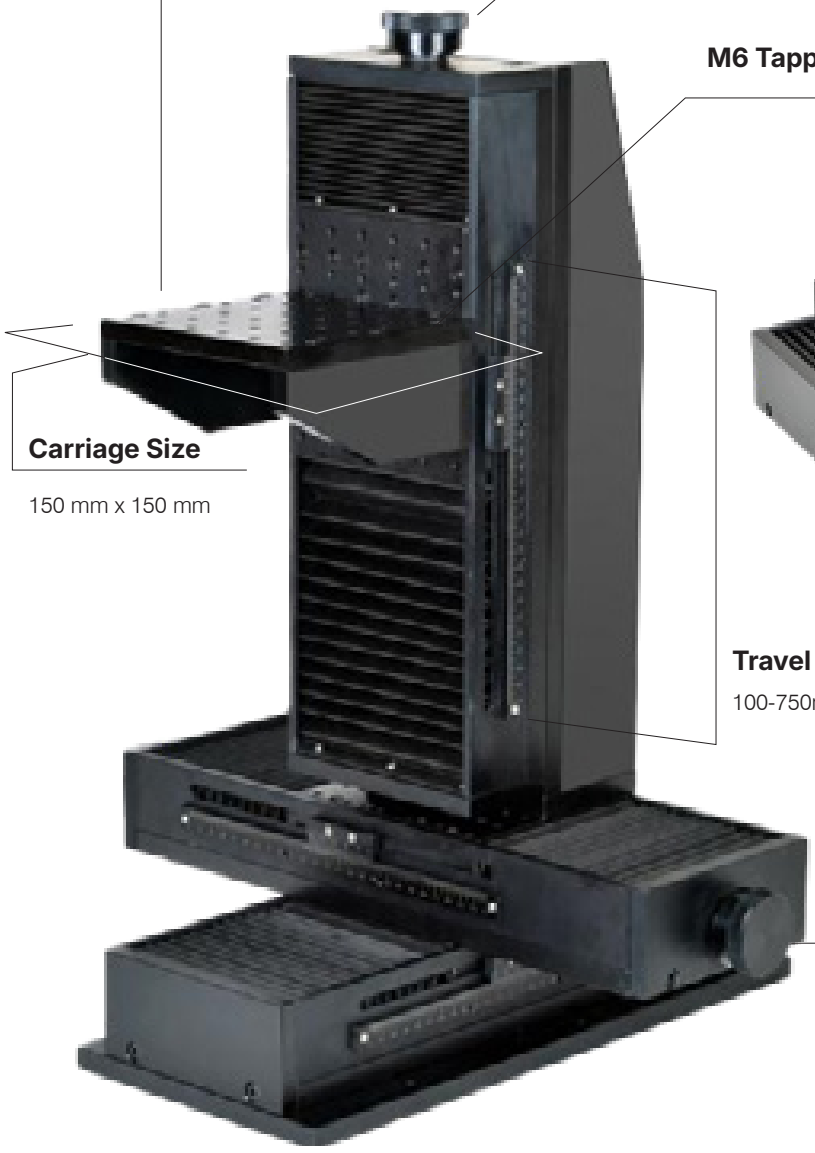
M6 Tapped Holes

Multi Axis



Carriage Size

150 mm x 150 mm



Travel

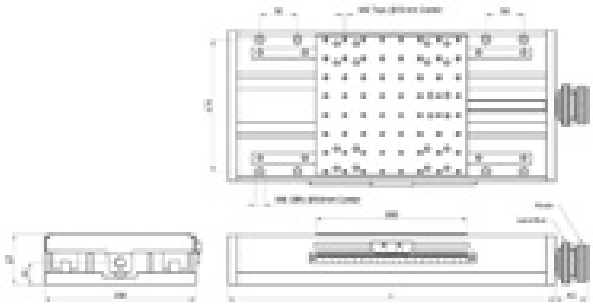
100-750mm

Drive

Precision ball screw
Straight line accuracy ± 20 μm over 300mm travel with 0.1 mm Vernier Readout



LTTS 200 Series



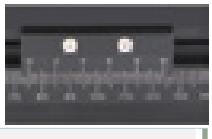
These stages can be loaded upto 90 kg vertically. Recirculating type ball bearing guide ways are used to ensure stability under load conditions.

Specifications

Straight line accuracy	± 20 μm over 300mm travel
Vernier Readout	0.1 mm
Guide way	Precision re-circulating Guide way
Drive	Precision ball screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M6 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis Configuration
Travel	100 to 750 mm
Carriage Size	150 mm x 150 mm
Load Capacity	45 - 75 kg vertical on X axis
Ball Screw	4 mm pitch



100 to 750 mm Travel
Carriage Size : 200 mm x 200 mm



Accessories

Vertical Bracket	Horizonta Bracket	Base plates	Base Plate
VAB-LTTS150-100		Base plates can be used for mounting translation stages to breadboards and tables conveniently.	BP-LTTS150-100
VAB-LTTS150-150			BP-LTTS150-150
VAB-LTTS150-200			BP-LTTS150-200
VAB-LTTS150-300			BP-LTTS150-300
VAB-LTTS150-500			BP-LTTS150-500
VAB-LTTS150-750	HAB-LTTS-150		BP-LTTS150-750
	Size : 150 x 150 mm		



Drive Details

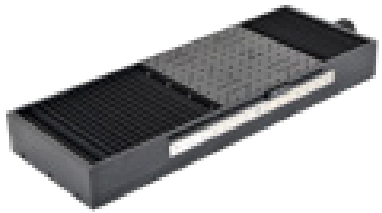
	4mm Pitch ball screw with lock	10mm Pitch ball screw with lock
Pitch	4 mm	10 mm
Lead Screw Type	Rolled	Rolled
Linear Resolution	4 mm / rotation	10 mm / rotation
Positioning Accuracy	0.1 mm	0.5 mm
Readout	0.1 mm precision vernier	0.1 mm precision vernier
Feature	Precision movement	Precision movement



4 mm Pitch ball Screw				
Model No:	Load Capacity Vertical (X Axis)	Load Capacity Vertical (Z Axis)	Travel (T)	Length (L)
LTTS200-100	90 Kg	50 Kg	100 mm	335 mm
LTTS200-150	90 Kg	50 Kg	150 mm	385 mm
LTTS200-200	90 Kg	50 Kg	200 mm	435 mm
LTTS200-300	90 Kg	50 Kg	300 mm	535 mm
LTTS200-500	85 Kg	50 Kg	500 mm	735 mm
LTTS200-750	70 Kg	50 Kg	750 mm	985 mm
10 mm Pitch ball Screw				
LTTS200-100-10P	90 Kg	50 Kg	100 mm	335 mm
LTTS200-150-10P	90 Kg	50 Kg	150 mm	385 mm
LTTS200-200-10P	90 Kg	50 Kg	200 mm	435 mm
LTTS200-300-10P	90 Kg	50 Kg	300 mm	535 mm
LTTS200-500-10P	85 Kg	50 Kg	500 mm	735 mm
LTTS200-750-10P	70 Kg	50 Kg	750 mm	985 mm

LTTS 250 Series

These are designed for carrying heavy loads. Size of the mounting platform is made 250 x 250 mm to accommodate loads upto a size of 300 x 30 mm (length x width). Re - circulating type ball bearing guide ways are used to ensure play less and friction free movement with heavy loads.



Specifications

Straight line accuracy	± 20 μm over 300mm travel
Vernier Readout	0.1 mm
Guide way	Precision re-circulating Guide way
Drive	Precision ball screw
Construction	Aluminium alloy B51S
Finish	Black anodized
Tapped Holes on Carrriage	M6 tapped holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular type
Configuration	Multi Axis Configuration
Travel	100 to 750 mm
Carriage Size	150 mm x 150 mm
Load Capacity	45 - 75 kg vertical on X axis
Ball Screw	4 mm pitch

100 to 1000 mm Travel

Carriage Size : 250 mm x 250 mm



Accessories

Vertical Bracket	Horizonta Bracket	Base plates	Base Plate
VAB-LTTS250-100		Base plates can be used for mounting translation stages to breadboards and tables conveniently.	BP-LTTS250-100
VAB-LTTS250-150			BP-LTTS250-150
VAB-LTTS250-200			BP-LTTS250-200
VAB-LTTS250-300			BP-LTTS250-300
VAB-LTTS250-500			BP-LTTS250-500
VAB-LTTS250-750	HAB-LTTS-250		BP-LTTS250-750
VAB-LTTS250-1000	Size :250 x 250 mm		BP-LTTS250-1000



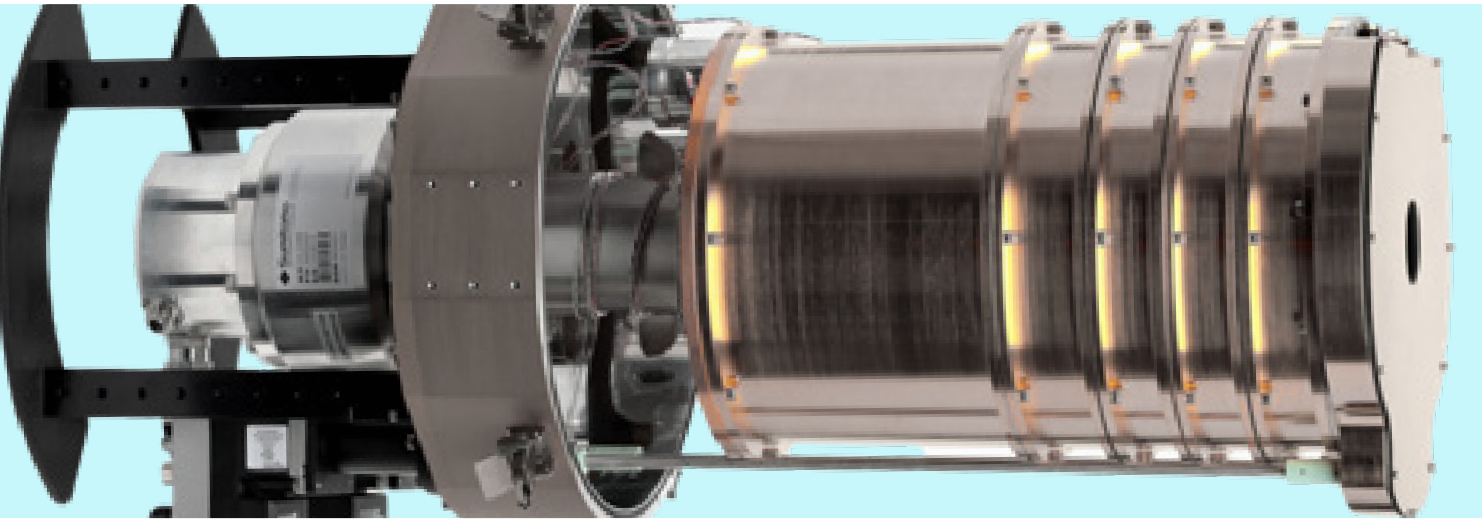
Drive Details

	4mm Pitch ball screw with lock	10 mm Pitch ball screw with lock
Pitch	4 mm	10 mm
Lead Screw Type	Rolled	Rolled
Linear Resolution	4 mm / rotation	10 mm / rotation
Positioning Accuracy	0.1 mm	0.5 mm
Readout	0.1 mm precision vernier	0.1 mm precision vernie
Feature	Precision movement	Precision movement



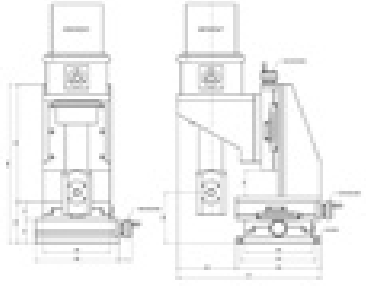
Model No:	Load Capacity Vertical (X Axis)	Load Capacity Vertical (Z Axis)	Travel (T)	Length (L)
4 mm Pitch ball Screw				
LTTS250-100	120 Kg	65 Kg	100 mm	440 mm
LTTS250-150	120 Kg	65 Kg	150 mm	490 mm
LTTS250-200	120 Kg	65 Kg	200 mm	540 mm
LTTS250-300	120 Kg	65 Kg	300 mm	640 mm
LTTS250-500	105 Kg	65 Kg	500 mm	840 mm
LTTS250-750	100 Kg	65 Kg	750 mm	1090 mm
LTTS250-1000	100 Kg	65 Kg	1000 mm	1340 mm
10 mm Pitch ball Screw				
LTTS250-100-10P	120 Kg	65 Kg	100 mm	440 mm
LTTS250-150-10P	120 Kg	65 Kg	150 mm	490 mm
LTTS250-200-10P	120 Kg	65 Kg	200 mm	540 mm
LTTS250-300-10P	120 Kg	65 Kg	300 mm	640 mm
LTTS250-500-10P	105 Kg	65 Kg	500 mm	840 mm
LTTS250-750-10P	100 Kg	65 Kg	750 mm	1090 mm
LTTS250-1000-10P	100 Kg	65 Kg	1000 mm	1340 mm

Cryostat Positioner



Model No : HO-CRYO-50

When cryostats with optical windows need to be mounted and positioned, Holmarc's cryostat positioners can be considered. These XYZ three axis positioners are made for smooth and precise movements with heavy loads. Rolling contact bearings are used for all the three axis for play less and wobble free movements and positioning with rigidity and stability. A bracket having mounting holes for cryostat can be fixed to the Z axis as shown in the figure. Z-axis is driven by worm gear assembly for effortless vertical positioning. These positioners are available in motorized and manual versions.





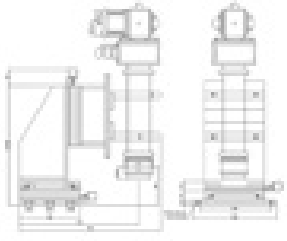
Specifications

X travel	50 mm
Y travel	50 mm
Z travel	50 mm
Positioning accuracy	0.01 mm

Cryostat Positioner

Model No : HO-CRYO-50

When cryostats with optical windows need to be mounted and positioned, Holmarc's cryostat positioners can be considered. These XYZ three axis positioners are made for smooth and precise movements with heavy loads. Rolling contact bearings are used for all the three axis for play less and wobble free movements and positioning with rigidity and stability. A bracket having mounting holes for cryostat can be fixed to the Z axis as shown in the figure. Z-axis is driven by worm gear assembly for effortless vertical positioning. These positioners are available in motorized and manual versions.



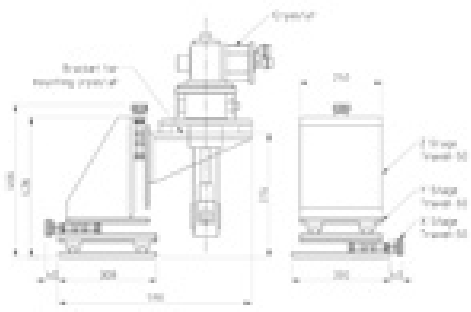


Specifications

X travel	50 mm
Y travel	50 mm
Z travel	50 mm
Positioning accuracy	0.01 mm

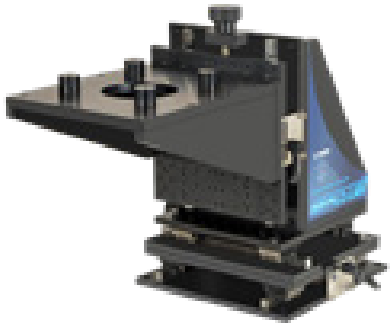
Cryostat Positioner

Model No : HO-CRYO-50HA



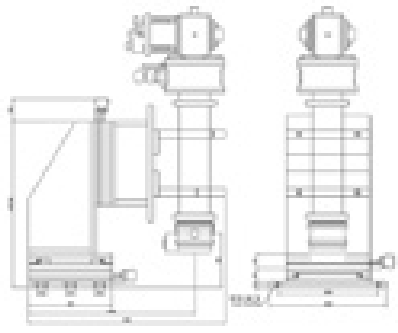
Specifications

X travel	50 mm
Y travel	50 mm
Z travel	50 mm
Positioning accuracy	0.01 mm



Cryostat Positioner

Model No : HO-CRYO-50S



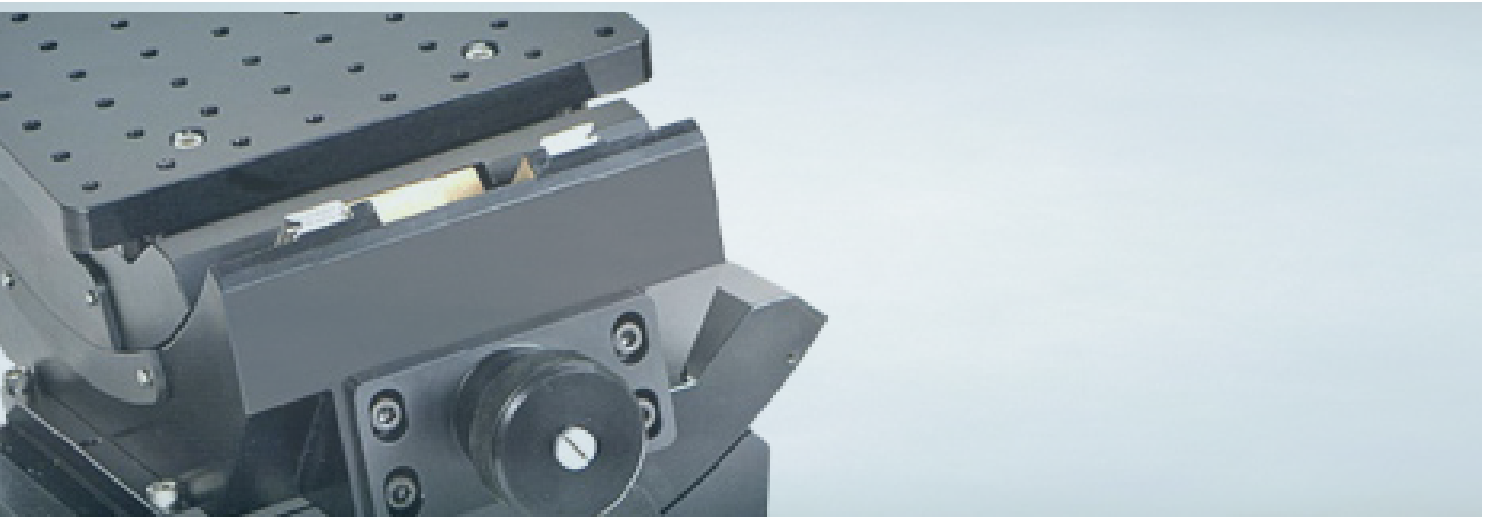
When cryostats with optical windows need to be mounted and positioned, Holmarc's cryostat positioners can be considered. These XYZ three axis positioners are made for smooth and precise movements with heavy loads. Rolling contact bearings are used for all the three axis for play less and wobble free movements and positioning with rigidity and stability. A bracket having mounting holes for cryostat can be fixed to the Z axis as shown in the figure. Z-axis is driven by worm gear assembly for effortless vertical positioning. These positioners are available in motorized and manual versions.

Specifications

X travel	50 mm
Y travel	50 mm
Z travel	50 mm
Positioning accuracy	0.01 mm

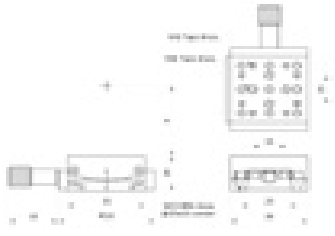


Goniometer- Worm Gear Drive



GSM Series Goniometer

Single Axis



Goniometers are used to rotate an object or sample about a point in space. Holmarc's GM series goniometer allows adjustment of ±10° around a defined optical axis by means of a precision worm gear drive and V grooved guide ways. These GM series goniometers are modular for building multi axis configurations.

Travel	± 10°. Readout 1°
Guide way	Precision ball guide way
Construction	Aluminium alloy B51S / SS
Finish	Black anodized (aluminium)
Tapped holes on carriage	M3 / M4 / M6 tapped holes
Mounting holes on base	M3 / M4 / M6 CBR
Design	Modular type, Multi axis configurable
Carriage Sizes	35 x 35 mm, 50 x 50 mm & 65 x 65 mm
Load Capacity	1 - 5 kg vertical on X axis
Drive	Precision worm gear

Alluminum alloy or SS made

Engraved Scale for Accurate Adjustments



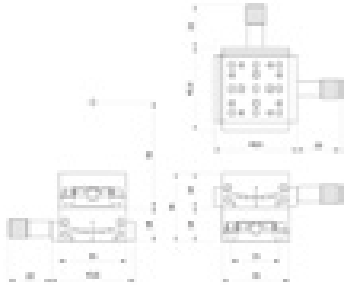
Material : Aluminium

Model No.	Center Height	Load Capacity
GM-35-37	37 mm	1 Kg
GM-35-55	55 mm	1 Kg
GM-50-43	43 mm	1 Kg
GM-50-63	63 mm	2 Kg
GM-65-50	50 mm	6 Kg
GM-65-75	75 mm	6 Kg

Material : Stainless Steel

Model No.	Travel	Carriage Size
SSGM-35-37	37 mm	1 Kg
SSGM-35-55	55 mm	1 Kg
SSGM-50-43	43 mm	1 Kg
SSGM-50-63	63 mm	2 Kg
SSGM-65-50	50 mm	6 Kg
SSGM-65-75	75 mm	6 Kg

Combi Goniometer - Worm Gear Drive
GM Series Goniometers - Dual Axis



The CGM series Combi-Goniometer is a two axis positioner. It enables precise positioning along pitch and roll direction with the help of a precision worm gear drive and V grooved guide ways. It has ± 10° positioning range around a defined optical point as it provides adjustment around an axis with defined optical height.



Specifications

Travel	± 10°
Readout	1°
Guide way	Precision ball guide way
Construction	Aluminium alloy B51S / SS
Finish	Black anodized (aluminium)
Tapped holes on carriage	M3 / M4 / M6 tapped holes
Mounting holes on the base	M3 / M4 / M6 CBR
Design	Modular type
Configuration	Multi axis configurable
Feature	Common axial point in XY configuration
Carriage Sizes	35 x 35 mm, 50 x 50 mm & 65 x 65 mm
Load Capacity	1 - 5 kg vertical on X axis
Drive	Precision worm gear

Material : Aluminium

Model No.	Center Height	Load Capacity
CGM-35-37	37 mm	1 Kg
CGM-50-43	43 mm	1 Kg
CGM-65-50	50 mm	6 Kg

Material : Stainless Steel

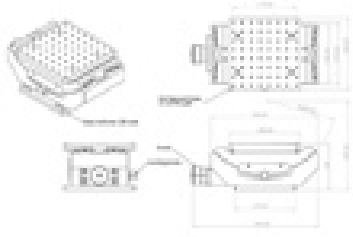
Model No.	Travel	Carriage Size
SSCGM-35-37	37 mm	1 Kg
SSCGM-50-43	43 mm	1 Kg
SSCGM-65-50	50 mm	6 Kg

Heavy Duty Goniometer



Heavy Duty Goniometers
Single & Dual Axis

This goniometer system features two axes for angular movement, providing flexibility in positioning and alignment of objects or components. With a carriage size of 200 x 200 mm, it offers ample space for accommodating various payloads. The manual worm gear drive mechanism allows for precise control over angular adjustments. Additionally, it boasts a robust load capacity of up to 100 kg, making it suitable for handling heavy loads. The presence of M6 mounting holes ensures compatibility with standard mounting configurations, facilitating easy integration into existing setups or equipment.



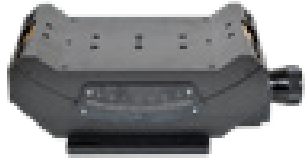
Specifications

Travel	Up to ± 15°
Readout	1°
Guide way	Precision ball guide way
Construction	Aluminium alloy B51S / SS
Finish	Black anodized (aluminium)
Tapped holes on carriage	M3 / M4 / M6 tapped holes
Mounting holes on the base	M3 / M4 / M6 CBR
Design	Modular type
Configuration	Multi axis configurable
Feature	Common axial point in XY configuration
Load Capacity	Up 100 Kg vertical on X axis
Drive	Precision worm gear



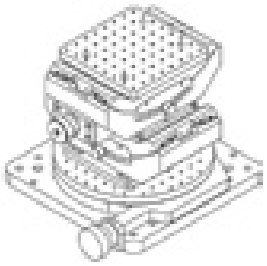


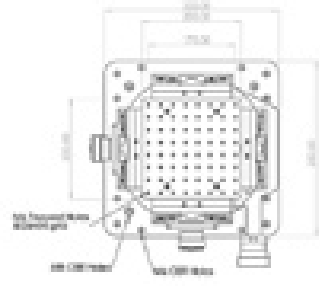
Model No	Carriage size	Configu ration	Tilting range	Load Capacity
GM-200	200 x 200 mm	Single axis	± 15°	100 Kg
CGM-200	200 x 200 mm	Dual axis	± 15°	100 Kg

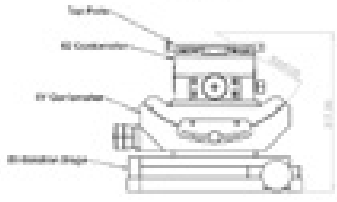


Heavy Duty Goniometer
Rx Ry Rz

Model : CGMRZ-300-200



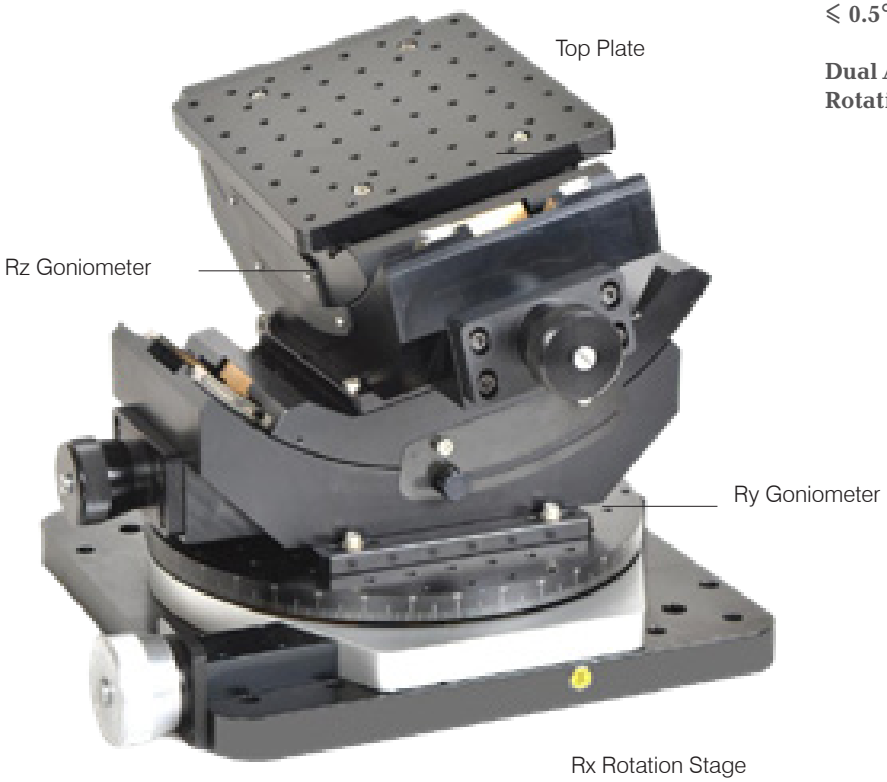




This goniometer system offers precise angular positioning and manipulation along three axes (Rx, Ry and Rz), providing versatility and control over object orientation in laboratory or experimental setups. With its sturdy construction and high load carrying capacity, it is suitable for a wide range of applications requiring accurate angular adjustments and stability. The inclusion of locking knobs ensures secure positioning once the desired orientation is achieved. Its compact size and manual drive mechanism make it convenient for use in various research and industrial environments.

Specifications

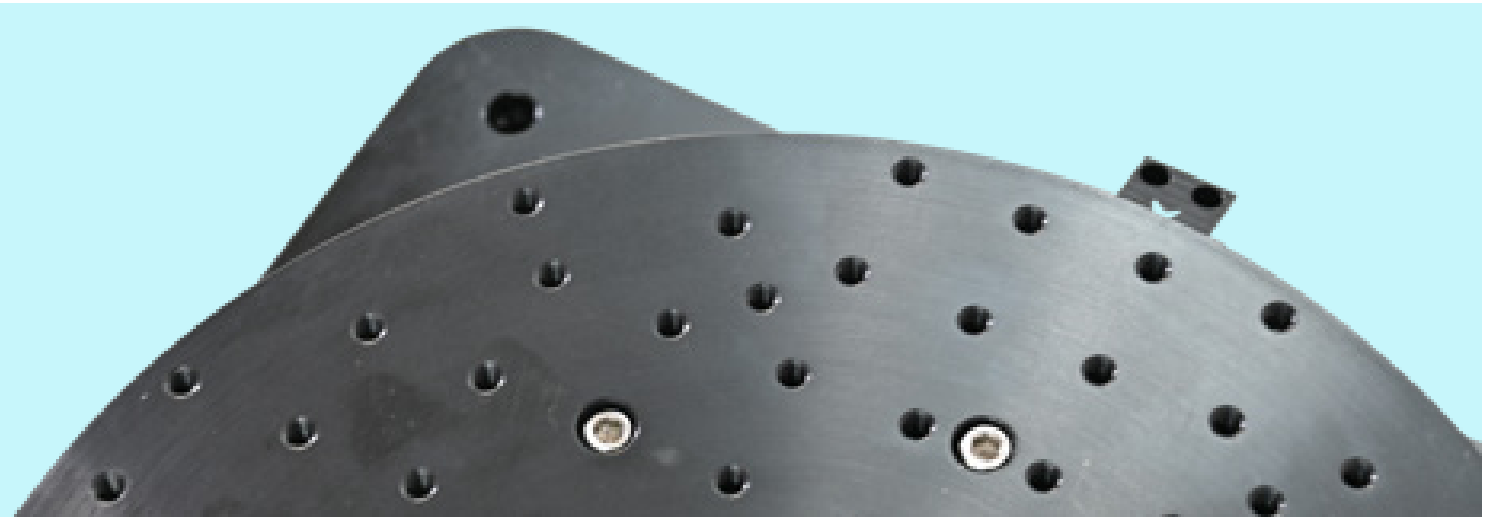
Top Platform Size	200 x 200 mm ^2
Angular Travel	Rx : > = ± 15 degrees, Ry : > = ± 15 degrees, Rz : 360 degrees
Locking Mechanism	Provided with locking knobs
Load Carrying Capacity	Up to 100 Kg
Tapped Holes for Payload Mounting	M6 tapped
Mounting Holes on Base	M6 counterbore
Position Accuracy	≤ 0.5 degrees
Drive Mechanism	Manual
Overall Size	350 mm x 350 mm x 278 mm
Overall Weight	Approximately 65 kg
Material	Aluminium black anodised



⩽ 0.5° Position Accuracy

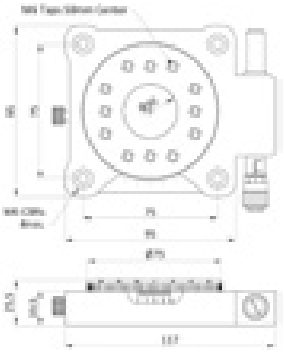
Dual Axis goniometer with Rotation Stage

Rotation Stage



Heavy Duty Goniometers

Single & Dual Axis



This RS Series precision rotary stage allows unlimited coarse movement and a limited +/- 4 degree azimuth at resolutions of 0.1 degree. It is suitable for horizontal and vertical rotary axes. Pre-loaded rolling contact bearings are used to minimize friction and to eliminate play. M6 clearance holes are provided at four corners to mount the stage directly to breadboards. For mounting to linear stages and other systems, adapter plates with sufficient tapped holes and C bored holes are used.

Specifications

Readout	0.1°
Construction	Aluminium Alloy B51S / Stainless Steel
Finish	Black anodized (Al) / Ground finish (SS)
Tapped holes on top disc	M4 / M6 tapped holes
Mounting holes on the base	M4 / M6 CBR
Design	Modular
Coarse travel	360°
Fine travel	± 4°
Top disc size	Diameter 25 mm - 150 mm
Load capacity	45 kg vertical
Drive	Micrometer



Aperture platform

Engraved Scale for Accurate Adjustments

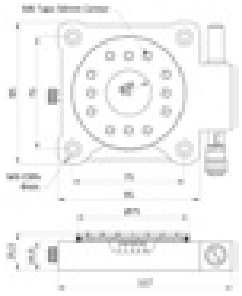
Material : Aluminium

Model No.	Load Capacity
RS-25	1 Kg
RS-35	1 Kg
RS-50	3 Kg
RS-75	8 Kg
RS-100	15 Kg
RS-125	35 Kg
RS-150	45 Kg

Material : Stainless Steel

Model No.	Load Capacity
SS-RS-25	1 Kg
SS-RS-35	1 Kg
SS-RS-50	3 Kg
SS-RS-75	8 Kg
SS-RS-100	15 Kg
SS-RS-125	35 Kg
SS-RS- 150	45 Kg

Rotation Stage with through hole at the center
RSC Series Rotation Stages



This RSC Series precision rotary stage allows unlimited coarse movement and limited +/- 4 degree azimuth at resolutions of 0.1 degree. It is suitable for horizontal and vertical rotary axes. Preloaded rolling contact bearings are used to minimize friction and to eliminate play. M6 clearance holes are provided at four corners to mount the stage directly to breadboards. For mounting to linear stages and other systems, adapter plates with sufficient M6 tapped holes and C'bored holes can be used. The stage is constructed out of aluminium alloy with black anodized finish.



Through-hole or M16x1 threaded hole in the center allows the stage to be used in an imaging application that requires illumination from underneath the sample. Holmarc provides custom mounting pattern as well possible for easy integration with other devices.

Specifications

Readout	0.1°
Construction	Aluminium Alloy B51S / Stainless Steel
Finish	Black anodized (Al) / Ground finish (SS)
Tapped holes on top disc	M4 / M6 tapped holes
Mounting holes on the base	M4 / M6 CBR
Design	Modular
Fine travel	± 4°
Bore Type	M16 x 1 thread or 25 - 100 mm through Bore
Top Disc Sizes	50 mm - 150 mm Dia.
Load Capacity	25 kg vertical
Drive	Micrometer

Material : Aluminium

Model No.	Load Capacity	Bore Type
RSC-50	2 Kg	Dia - 25 mm
RSC-50T	2 Kg	M16 x 1 thread
RSC-75	5 Kg	Dia - 30 mm
RSC-75T	5 Kg	M16 x 1 thread
RSC-100	8 Kg	Dia - 50 mm
RSC-125	25 Kg	Dia - 75 mm
RSC-150	25 Kg	Dia - 100 mm

Material : Stainless Steel

Model No.	Load Capacity	
SS-RSC-50	2 Kg	Dia - 25 mm
SS-RSC-50T	2 Kg	M16 x 1 thread
SS-RSC-75	5 Kg	Dia - 30 mm
SS-RSC-75T	5 Kg	M16 x 1 thread
M16 x 1 thread	8 Kg	Dia - 50 mm
SS-RSC-125	25 Kg	Dia - 75 mm
SS-RSC-150	25 Kg	Dia - 100 mm

Rotation Stage with through hole at the center
RSC Series Rotation Stages



Holmarc's Angle display unit (Angular Rotary stage with Led display) Model : HO-ADU-01 is a rotary stage which denotes precise angle which indicates in display unit. It's a vital unit in monochromatic design; which grating mounted on the angle rotary unit. The encoder attached to the rotary unit which helps the customer to note the exact position of the goniometric stage; thereby one can easily arrange monochromatic design & calibrate the monochromator / spectrophotometer. Micrometer attached to the stage is provided for fine alignment in the rotary stage. It's a flexible model which students get better understanding of the working principles of monochromatic / spectrometer design. All functions are deliberately made open and easy to understand. Students gain better advantage by calibrate the devices by their own.

Model No.	HO-ADU-01	HO-ADU-02
Angular resolution	0.009 degree resolution	0.001125 degree resolution
Fine Movement	Micrometer controlled	Micrometer controlled
Resolution of micrometer	10 micron	10 micron
Display	LED display	LED display
Mounting table size	Options for different grating size mounting	Options for different grating size mountings

Angular grating mount with display unit
Micrometer controlled fine movement
Fine Fixing Knobs
Fine Tilting long rod

Rotation Stages - Continuous Rotation - 360°

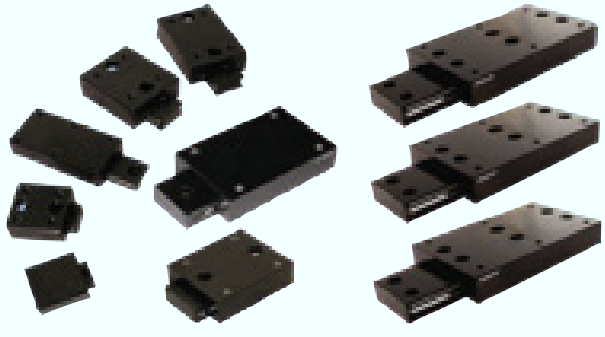


HOLMARC

LINEAR MOTION SLIDES

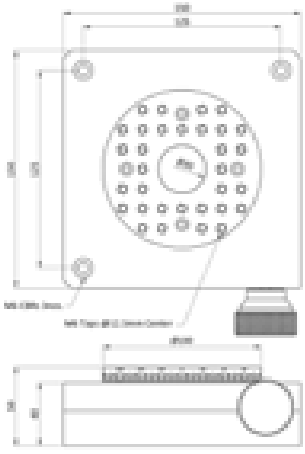
Linear motion Slides are ready to fit and cost-effective bearing assemblies for achieving straight-line movements in a mechanism. Essentially, the linear motion slide consists of two parts, a fixed base and a moving carriage Rolling elements, balls or rollers provide the interface between base and carriage and perfectly rolls on four surfaces arranged at 90 degree, called guide ways. In the case of slides from holmarc, hardened and ground rods act as guide ways. Wear and tear is negligible even after long use as there is a perfect rolling contact between rolling elements and guide ways. Friction is very less and in most cases, co-efficient of friction is less than 0.002. The slides can support heavy loads without compromising performance accuracies. Factory pre loading of the slides during assembly practically eliminate play and wobble.
The use of these readily available slide units saves time during design as well as for manufacturing. Compared to other options for linear motion, slide assemblies are cost effective, maintenance free and durable. Linear slides find a variety of applications in the following areas,

Industrial automation
Robotics
Metrology and measuring equipments
Medical equipments
Product packing
Textile industries
Electronic manufacturing
Machine tool equipments
Manufacturing processes like welding, drilling, wood industries etc:



Holmarc offers wide range of linear slides assemblies to choose from. There are four major categories namely, Miniature ball slides, Spring loaded slides, Ball slides and Roller slides. Dozens of models depending upon footprint and travel range are available in each category.

WRSC series Rotation Stages



In these rotation stages, a through hole is provided at the center . This through hole can be utilized for mounting components or taking out cables through the center. These stages are available in aluminium alloy and stainless steel. Please refer to table describing models for details.

Aperture platform
Engraved Scale for Accurate Adjustments

Material : Aluminium

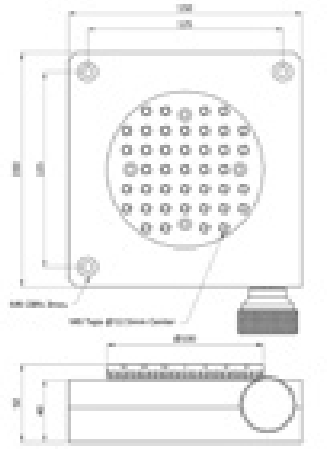
Model No.	Load Capacity
WRSC-100	30 Kg
WRSC-150	80 Kg
WRSC-200	150 Kg
WRSC-300	300 Kg

Material : Stainless Steel

Model No.	Load Capacity
SS-WRSC-50	
SS-WRSC-75	
SS-WRSC-100	30 Kg
SS-WRSC-150	80 Kg
SS-WRSC-200	150 Kg
SS-WRSC-300	300 Kg



WRS series Rotation Stages



In these stages, top rotating surface is plain without any center through hole. There are tapped holes provided on this top surface for mounting components and devices. These stages are also available either in aluminium alloy or stainless steel.

M6 tapped holes
Precision worm gear drive
Minimum back lash
Angular resolution - 0.1°
360° continous motion
Black anodized finish

Material : Aluminium

Model No.	Load Capacity
WRS-50	12 Kg
WRS-75	25 Kg
WRS-100	80 Kg
WRS-150	125 Kg
WRS-200	150 Kg
WRS-300	180 Kg

Material : Stainless Steel

Model No.	Load Capacity
SS-WRS-50	12 Kg
SS-WRS-75	25 Kg
SS-WRS-100	80 Kg
SS-WRS-150	125 Kg
SS-WRS-200	150 Kg
SS-WRS-300	180 Kg

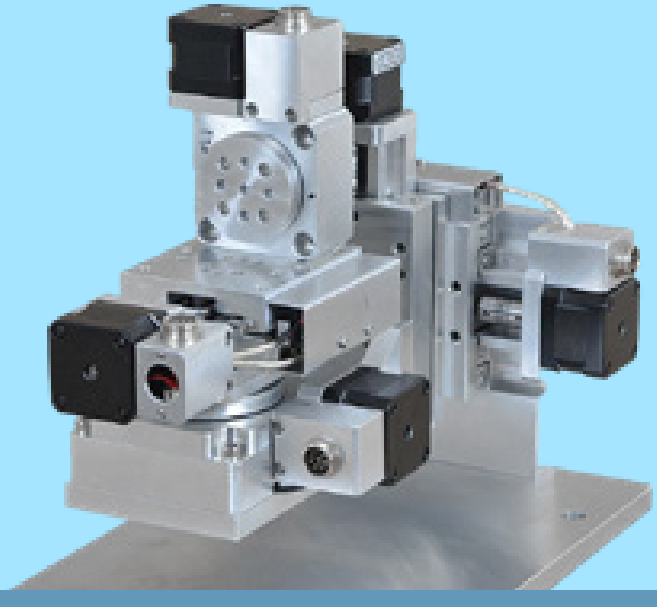


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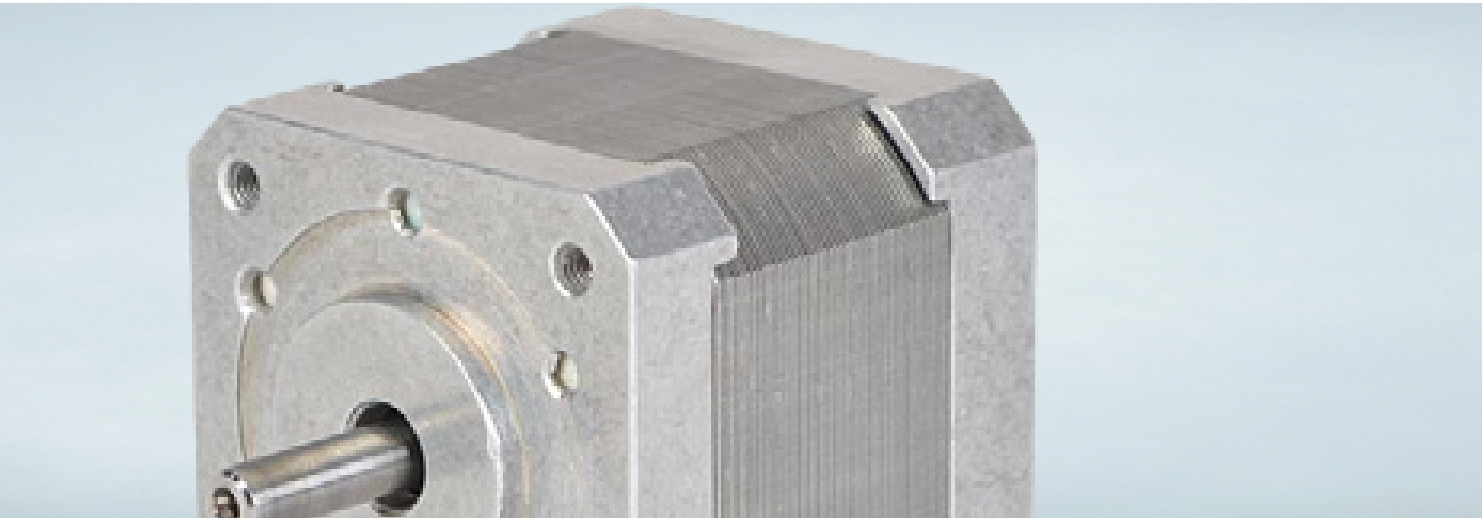
MOTORIZED ROTATION TRANSLATION STAGES

706 MOTORIZED ROTATION TRANSLATION STAGES
708 Stepper Motors
708 Nema 23 High Vacuum
708 Compatible Stepper Motor
710 Control Electronics & Software
712 Custom Micro Motion Controls
714 Motorized Actuators
715 HO-MA Series
715 Heavy Duty
715 HO-HMA-Series
716 Motorized Linear Stage
717 Motorized Translation Stages MTS-M35 series
718 Motorized Translation Stages MTS-M series
720 Motorized Translation Stages MTS series
722 Motorized Translation Stages LMS series
724 Motorized Precision
724 Long Travel Translation stages MLTS series (Linear and XY)
725 Belt Driven High Speed Translation Stage (Linear)
726 Belt Driven High Speed Translation Stage (XY)
727 Motorized Translation Stages RCMTS-35 Series
728 RCMTS Series Motorized Stages
729 Motorized Translation Stages
729 RCMTS-50 Series
731 Motorized Translation Stages
731 RCMTS-125 Series
732 Motorized Translation Stages
732 RCMTS-150 Series
734 Motorized Translation Stages
734 RCMTS-200 Series
736 Motorized Translation Stages
736 RCMTS-250 Series
738 Motorized XY Moving Platform
738 XY Moving Platform
738 MXYTS Series
740 Motorized Vertical Translation Stages
742 Motorized Two Axes Gimbal Stage
744 Motorized Goniometer
746 Motorized Rotation Stage
746 Sine Drive Angular Stage
746 Sin216R Series
748 Motorized Rotation Stage
748 MRSC Series
750 Motorized Heavy Duty
750 Rotation Stages MRSH Series
752 Rotation stage with IP65 rating
754 Motorized Multi Axis Stage
756 XY Theta Stage
758 XYZ Stage
760 5 axis Stage
762 Vacuum Compatible
762 Motorized 5 Axis Stage
764 Design Stage
766 Gantry Design Stage GTNDT Series
768 Radiography Multi Axis Manipulator
770 Positioner
770 Pitch & Yaw Positioning Mechanism for Subsonic Wind Tunnel
772 Antenna Positioner
774 Dual Axis Antenna Positioner with Azimuth and Elevation Control

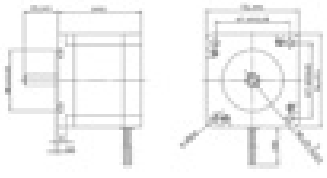


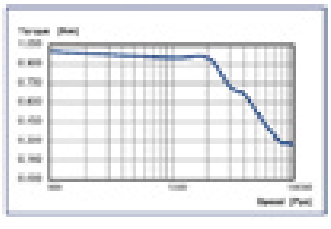


Stepper Motors



Nema 23 High Vacuum Compatible Stepper Motor





Aperture platform

Engraved Scale for Accurate Adjustments

Specifications

Vacuum compatibility	Ultra high vacuum compatible Stepper Moto
Vacuum rang	≤ 1 x 10-7mbar
Bake able temperature	150°C
Core material	Stainless steel , Grade - SS430
Shaft material	Stainless steel - 304
Bearings	Stainless steel - 304
Side plates	Aluminium - 6061
Winding	Class heavy film Polyester over coated with polyamide-imide enameled copper wire, 150°C thermal class
Plastic parts	Teflon
Size of motor	56 x 56 x 64 mm

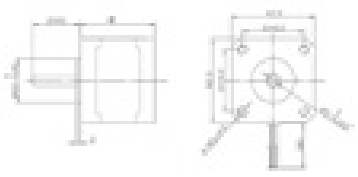
Model No.	57ST51-4A-V
Rated Voltage V	2.3
Current / Phase A	2.8
Resistance / Phase Ω	0.83
Inductance / Phase MH	2.2
Holding Torque NM	0.45
Rotor Inertia G-CM2	275
Weight KG	0.65
Number of Leads N°	4

Nema 17 High Vacuum Compatible Stepper Motor



Specifications

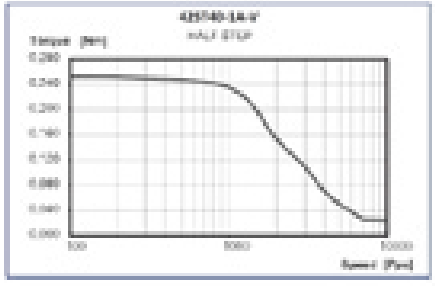
Vacuum compatibility	Ultra high vacuum compatible Stepper Motor
Vacuum range	≤ 1 x 10-7 mbar
Bake able temperature	200°C
Core material	Stainless steel , Grade - SS430
Shaft material	Stainless steel - 304
Bearings	Stainless steel - 304
Side plates	Aluminium - 6061
Winding	Class heavy film Polyester over coated with polyamide-imide enameled copper wire, 150°C thermal class
Plastic parts	Teflon
Size of motor	42 x 42 x 40 mm



1. Rotor, stator, bearings and shaft are made in Stainless steel

2. Windings and insulations can support a maximum temperature of 150°C

3. Winding coil extended outside without soldering for external connections.



Model No.	42ST40-1A-V
Rated Voltage V	4
Current / Phase A	1
Resistance / Phase Ω	3.3
Inductance / Phase MH	3.4
Holding Torque NM	0.259
Rotor Inertia G-CM2	54
Weight KG	0.28
Number of Leads N°	4

Control Electronics & Software



Micro-Motion

Holmarc offers a wide range of high-precision micro positioning devices and systems. Micro-Motion along with a combination of one or more of the MTS, LTMS or MTTS series motorized stages make a high accuracy positioning system for research and industrial applications. The option for selecting any of the various models of motorized translation stages makes it easy to develop a complete position control system involving any or all of the three linear or rotational axes.

Holmarc stepper motor controller has microstep drives offering microstepping down to 16 microsteps per step. Usually stepper motor has 200 steps per revolution. We can increase step per revolution by using drives which can divide a single step in to 16 microstep. This allows much higher resolution up to 3200 micro steps per revolution.

Micro-Motion unit also supports encoder feedback. A built in algorithm counts the incoming pulses from the encoder and compares it with the commanded number of steps to verify the accuracy of movement.

Multi Axis Positioning

Holmarc provides positioning controllers up to 6 axes for all motion applications, individually programmable for stepper motor driven stages. Multi axis position controller is recommended for a wide variety of both simple and complex motion applications.

- In built motor drives
- PWM current control
- 1 A to 5A Stepper drive
- Up to 1 / 256 micro step
- Microprocessor controlled
- Software for PC based operation
- Serial port (RS232C) connectivity
- Optional USB to serial converter
- Optional wireless connectivity (Bluetooth)
- Power down mode
- Position & speed control
- Acceleration / deceleration
- Trigger I / O
- In-built power supply

Handheld Motion Control System



PC based position control

User programmable motion profile

Microstep Configuration	Micro steps per revolution
1 / 2	400
1 / 4	800
1 / 16	3200

Hand-held stepper motor controller-driver offers up to 4 axes control for actuators, linear stages and rotation stages. The hand held unit features 16X micro stepping ratio for smooth, high resolution positioning. Two primary control modes are available, manual control and computer control.

To drive the stage using a PC, a command set will be provided to communicate with the controller using LabVIEW or any other programming language through RS 232 port.

Software (Micro-Motion)



Micro-Motion, a software developed by Holmarc is an easy to use package to drive all Holmarc made positioning stages. It allows the user to operate the system in two modes, namely Manual and Programmable.

The Micro-Motion software has a very short learning curve. According to the application requirements, the stages can be operated at different speeds and motion profiles.It incorporates facility to provide delay in between the movements to perform other tasks, trigger external devices or circuits and get itself triggered by an external trigger source. The software enables the user to program each movement of the stage in the form of the following commands executed sequentially.

>>
Commands
- Home
- Move
- Speed
- Wait
- Loop
- Goto

Reset
Trigger in
Trigger out

Manual Mode

There are 4 buttons in the Manual mode region of the dialog window, the functions of which are explained below.

>	Move the stage one step towards far-end.
<	Move the stage one step towards home
>>	Move the stage continuously towards far-end. Click again to stop the movement.
<<	Move the stage continuously towards home. Click again to stop the movement
Home	Move the stage towards home. Click again to stop the movement
Reset	Click this button to reset the position display to zero.

Model No:	No. of axis	Motor Type	Motor Torque (kg cm)	Control	Typical Pay load (kg)*
MPC-1-ST-OL	1	Stepper	1.5	Open Loop	20
MPC-2-SV-OL	2	Servo	7	Closed Loop	35
MPC-3-ST-OL	3	Stepper	10	Open Loop	50
MPC-4-SV-OL	4	Servo	15	Closed Loop	60
MPC-6-ST-OL	6	Stepper	31	Open Loop	80
MPC-4-ST-CL-H	4	Stepper	7	Closed Loop	35

* Typical payload for a linear translation stage, mounted horizontally, driven by the specified model

Programmable mode

This mode enables the user to write a program, containing instructions to move different stages simultaneously, set the speed, incorporate delays and loop a set of instructions, execute that program and save it for later use.

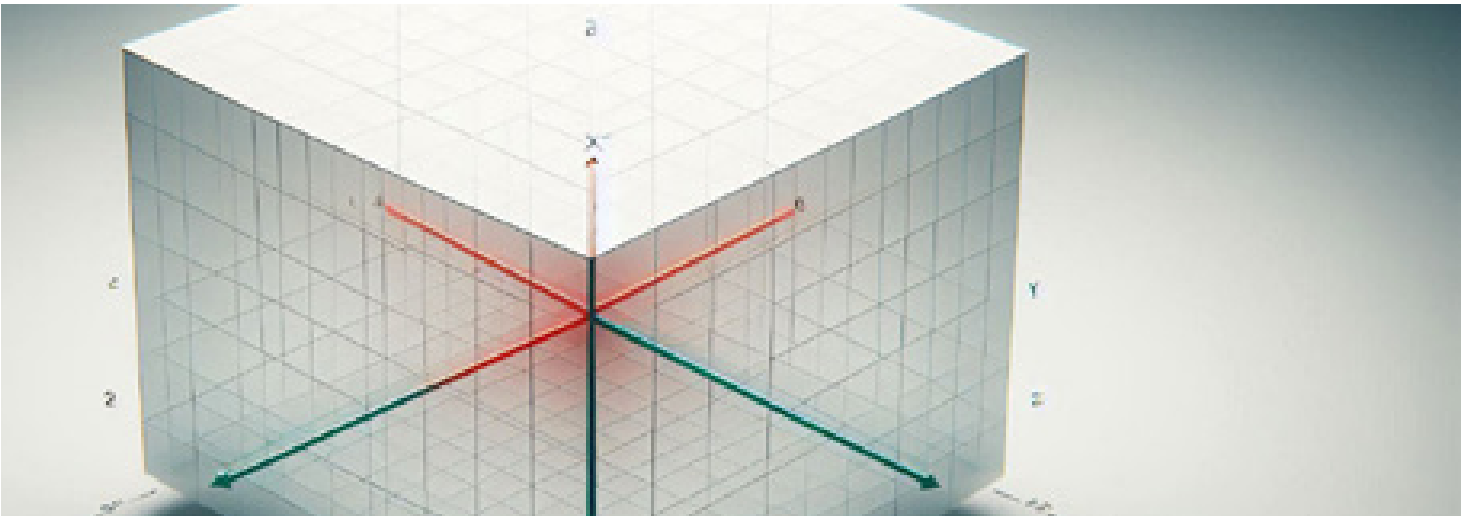
Home W	Moves the stage of the axis specified towards home.
Move [Displacement]	Moves the stage for the specified displacement. Wait Incorporates a delay.
Speed	Set the speed.
Trigger IN	The program waits for an external trigger which is a TTL pulse applied through the Trigger Input on the front panel of the controller.
Trigger OUT	The controller output a trigger which is a TTL pulse.
Loop [index, address]	The program loops index times from the address specified.
Goto address	The program jumps to the address specified.
Reset W	Resets the position display of the axis specified to zero.

Customized Motion Control and Data Acquisition Applications

Measurement of spatial distribution of
- Magnetic field strength of medium and large sized electromagnets.
- Microwave and RF signal intensity of antennae.
- Optical intensity of scattered, reflected or transmitted light in optical systems.

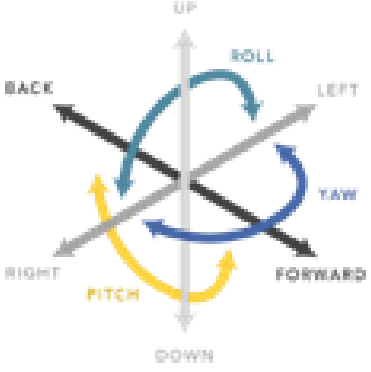
Multi-dimensional position control of the following
- Mirror mounts, polarizers and light sources in optical systems.
- Samples in nonlinear optics experiments.
- Sensors and other components inside vacuum chambers and glove boxes.
- High power laser head for laser cutting applications.
- Spindles for marking and engraving applications.
- Nanofiber Electrospinning targets for weaving of nanofibers.

Custom Micro Motion Controls

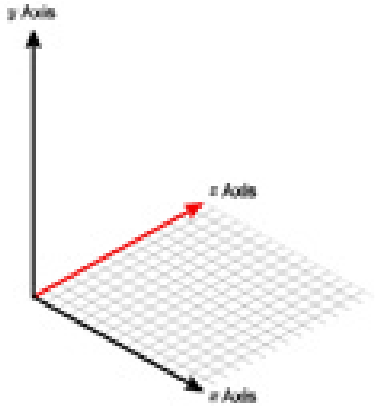


Motorized Translation Stage Ordering Information

Travel	.....	mm
Carriage Size	.....	LxW or diameter mm
Load Capacity	.....	Kg
Resolution	.....	micron or arc sec (rotary)
Accuracy	.....	micron or arc sec (rotary)
Speed	.....	mm/sec or degree/sec (rotary)
Configuration	.....	X, Y, Z(linear)
		A (Yaw) ,B (Pitch),C (Roll)
		Combination : It is possible to select different combinations like XY, XZ, XYZ, XYA, XZA, XYZA, XYZB, XYZC, XYZAB, XYZBC, XYZABC.
User Interface	.....	PC, hand held unit, both
Control	.....	Closed loop & open loop
		Closed loop control : Open loop control : It uses an encoder attached to stage or motor which gives feed back of motion of the stage or motor. It depends on accuracy of steps of the motor and does not have a feedback from encode



Rotary Motion



Linear Motion

Ready to use linear stages

from holmarc are cost effective solutions for linear positioning

Various designs to suit multitudes of applications in industry and research.



Holmarc manufactures motorized linear translation stages in ready to operate design for applications in research and manufacturing. We have categorized our standard stages in four different series, namely MTS, LMS and RCMTS based on their design. All these stages are modular in design and construction. Multi-axes configurations are possible by assembling single axis stages at user end. For standard stages, construction material is aluminum alloy. We make stages in stainless steel and mild steel as well for custom requirements.

Linear Guides
Pre-loaded rolling contact bearings are used as guide ways. Both nonre-circulating type and re-circulating type guides are used depending upon the design and use. For non-re-circulating type, rollers are used as rolling elements where as for re-circulating type, balls are used.



Drive
Either lead screws or ball screws are used as mechanical drive. For ground lead screw, nut is spring loaded to minimize play and back-lash.

Actuators
Stepper motors are used as electrical actuators. DC or AC servos can as well be used with our standard models on special request.

PITCH, STEP & RESOLUTION

Ball screw or lead screw pitch depends upon the speed and resolution requirements. Drive electronics of stepper motor decides both these parameters. In all our standard stages, 200 steps/revolution stepper motors are used. For ball screws, 4 mm is the standard pitch in our stages. For lead screws, pitch can be 0.5 mm, 1 mm, and 2 mm.

For any stages with lead screw/ ball screw pitch, resolution other than standard depends on the drive electronics. There are micro-step driver cards for the stepper motors having 1/8 to 1/256 micro steps.



Motorized Actuators



Piezo Nanopositioner & Controllers

HOLMARC'S Advanced Precision Motion Systems

Piezo actuator is an ideal choice when high precision nano scale positioning is required.
Holmarc Piezo Actuators are high-resolution nano positioning systems designed for a variety of applications in nano technology, bio technology etc. We offer Piezo Actuators and Translators for scientific and industrial applications. In addition to the standard products, we manufacture custom designs tailored for requirements.

HOLMARC NANO POSITIONING SYSTEMS

- Actuators
- Scanning Stages
- Microscope Stages
- Objective NanoPositioner for Microscopy
- Single Axis Stages
- Multiaxis Stages
- Compact X / XY / XYZ Systems
- Custom Piezo Stages & Systems



0.001 mm Resolution

0.01 mm Positioning Accuracy



Holmarc's motorized actuator can be used to replace micrometers in translation stages or lead screws in kinematic mounts for making the positioning automated with appropriate control electronics. Drive is achieved by a stepper motor coupled to a precision lead screw–nut mechanism.

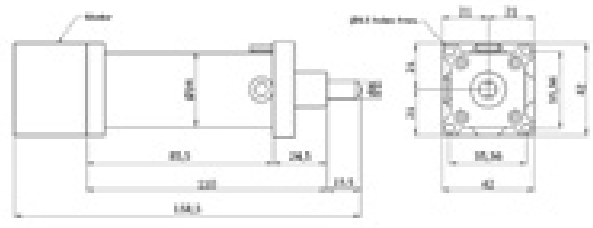
Accuracy 10 micron

Load Capacity 100 Kg

HO-MA Series

Holmarc's motorized actuator can be used to replace micrometers in translation stages or lead screws in kinematic mounts for making the positioning automated with appropriate control electronics. Drive is achieved by a stepper motor coupled to a precision lead screw–nut mechanism.

The spindle of the actuator which moves forward and backward when the motor rotates is made non-rotating to bring in extra precision. Construction material is stainless steel . Our standard position controllers can be used to drive these actuators without any customization. Holmarc can supply kinematic mounts and stages fitted with these actuators for custom applications. You are welcome to discuss your needs with our sales engineers.



Specifications

Travel	Up to 25mm
Positioning Accuracy	0.01 mm
Resolution	0.001 mm
Construction	Stainless steel / Aluminium

Model No.	Travel	Resolution
HO-MA-15	15 mm	0.001 mm
HO-MA-25	25 mm	0.001 mm

Heavy Duty
HO-HMA-Series

The spindle of the actuator which moves forward and backward when the motor rotates is made non-rotating to bring in extra precision. Construction material is Aluminium, Stainless steel and brass. Our standard position controllers can be used to drive these actuators without any customization. Holmarc can supply stages fitted with these actuators for custom applications. You are welcome to discuss your needs with our sales engineers.



Model No.	Travel	Load capacity Axial load	Motor
HO-HMA-25	25 mm	100 Kg	Ac Servo
HO-HMA-50	50 mm	100 Kg	Ac Servo

Acessories	
Base plate	Suitable Model
BP-HO-HMA-25	HO-HMA-25
BP-HO-HMA-50	HO-HMA-50

Specifications

Travel	HO-HMA-25 : 25 mm
	HO-HMA-50 : 50 mm
Absolute positioning accuracy	10 micron *
Resolution	0.1 micron (1 / 10000 microstep) *
Repeatability	5 micron *
Straight line accuracy	10 micron *
Maximum Speed	20 mm / sec *
Minimum continuous speed	2 micron / sec *
Feedback	Rotary encoder attached with motor
Material Construction	
Main body	Aluminum 6061 (main body)
Lead screw	Steel hardened
Shaft	Brass / Bronze
Load Capacity	100 kg (axial load)
Motor	Servo motor
Lead screw pitch	1 mm
Lead screw type	Precision ground lead screw
Coupling	Flexible GS coupling
Bearings	SKF or Equivalent
Lubricants	Grease
Finish	Black Anodized
Mounting provisions	M6 Mounting holes on main body
	M35 x 1 (Clamp nut)
	M10 Std (Spindle)
Operating temperature	5 - 80 degree centigrade
Accessories	Base plate (sold separately)
Limit switches	Optical limit switch
Controller	Single axis controller
Hand held controller	Optional handheld controller on request

* These values achievable using Holmarc controller

Single axis controller and software sold separately

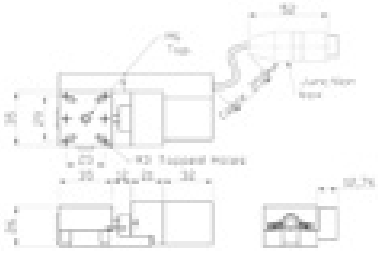
Motorized Linear Stage





Holmarc manufactures motorized linear translation stages in ready to operate design for applications in research and manufacturing. We have categorized our standard stages in four different series, namely MTS, LMS and RCMTS based on their design. All these stages are modular in design and construction. Multi-axes configurations are possible by assembling single axis stages at user end. For standard stages, construction material is aluminum alloy. We make stages in stainless steel and mild steel as well for custom requirements.

Motorized Translation Stages
MTS-M35 series



MTSM series stages are compact and modular motorized positioners for short travel applications (up to 5 mm travel range). Stepper motor is used as electrical actuator. It has V grooved precision guide ways using crossed rollers. Construction material for standard stage is aluminium alloy.

These stages are X, XY, XYZ, XZ & Z axis configurable with the help of angle bracket and base plates

Specifications

Travel	5 mm
Straight Line Accuracy	3 Micron
Positioning accuracy	5 micron *
Resolution	1 micron *
Drive	Precision Lead screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M3 Tapped Holes & M6 Tap
Mounting Holes on the base	M3 Tap and M6 tap
Design	Assembled
Carriage Size	35 mm x 35 mm
Load Capacity	2 Kg vertical on X Axis
Lead screw	0.5 mm pitch
Limit switch	Optical limit switch
Motor	Stepper motor

* when using Holmarc's controller



Accuracy 10 micron

Load Capacity 100 Kg

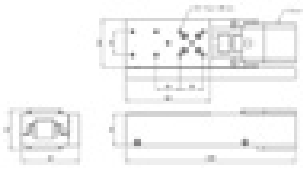
Model No.	Load Capacity	Accessories	Configurations
MTS-M3535-1-01	0.5 Kg	Angle Bracket	X Axis
MTS-M3535-1-02	0.5 Kg	Model : AB-MTS	XY Axis
MTS-M3535-1-03	0.5 Kg	3535	XYZ Axis
MTS-M3535-1-04	0.5 Kg	Base Plate	Z Axis
MTS-M3535-1-05	0.5 Kg	Model : BP-MTS-3535	XZ Axis







Motorized Translation Stages MTS-M series



Holmarc's MTS-M series motorized stages are miniature in size with a footprint as small as 35 x 35 mm. Drive motor is stepper with 28 mm frame size. The stage features precision V grooved guides with balls and precision leadscrew drive having 1 mm / 0.4 mm pitch. Standard stages are constructed in aluminium alloy though stainless steel stages can also be manufactured on request. There are four footprint sizes to choose from as described in the drawing.

These stages are available in five factory assembled configurations (X, XY, XYZ, Z and XZ). Please see the chart below for details

controller sold separately

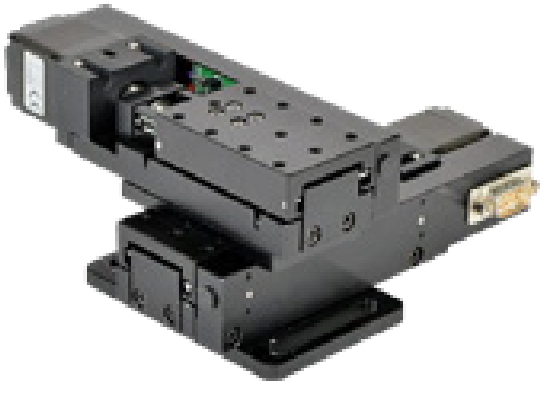
Specifications

Straight Line Accuracy	5 Micron
Guide way	Precision V grooved guide way
Drive	Precision lead screw
Construction	Aluminum alloy B51S
Finish	Black anodized
Tapped Holes on Moving Plate	M4 tapped holes
Mounting Holes	M3 tapped holes









4mm Pitch Lead Screw






Model No.	MTSM-5050-HC	MTSM-5065-HC	MTSM-5075-HC	MTSM-5090-HC	
Travel					
Load Capacity X Axis					
Load Capacity Z Axis					

1mm Pitch Lead Screw

Model No:	MTSM-3760	MTSM-5050-H	MTSM-5065-H	MTSM-5075-H	MTSM-5090-H
Travel	50 mm	15 mm	25 mm	50 mm	75 mm
Load Capacity X Axis	1 kg	2 kg	5 kg	5 kg	5 kg
Load Capacity Z Axis	0.4 kg	0.7 kg	1 kg	1 kg	1 kg

0.4mm Pitch Lead Screw

Model No:	MTSM-3760F	MTSM-5050-F	MTSM-5065-HF	MTSM-5075-HF	MTSM-5090-HF
Travel	50 mm	15 mm	25 mm	50 mm	75 mm
Load Capacity X Axis	1 kg	2 kg	5 kg	5 kg	5 kg
Load Capacity Z Axis	0.4 kg	0.7 kg	1 kg	1 kg	1 kg

Micrometer Drive

Drive Details	4 mm Pitch Lead Screw	1 mm Pitch Lead Screw		0.4 mm Pitch Precision Lead screw
Positioning Accuracy	0.1 mm	0.01 mm		0.002 mm
Repeatability	0.2 mm	0.01 mm		0.002 mm
Resolution	0.01 mm	0.0003125 (Micro Step Mode)		0.000125 (Micro Step Mode)
Speed	16 mm / Sec. (4 rps)	4 mm / Sec. (4 rps		1.2 mm / Sec. (4 rps)

Accessories

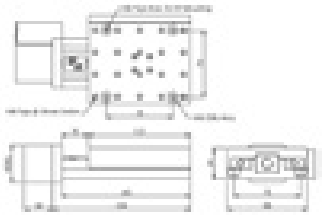


Base plates can be used for mounting translation stages to breadboards and tables conveniently




Base Plate	Vertical Bracket	Horizontal Bracket
BP-MTSM-3535	VB-MTSM-3535	HB-MTSM-3760
BP-MTSM-3550	VB-MTSM-3550	HB-MTSM-5050H
BP-MTSM-3760	VB-MTSM-3760	HB-MTSM-5065H
BP-MTSM-5050H	VB-MTSM-5050H	HB-MTSM-5075H
BP-MTSM-5065H	VB-MTSM-5065H	HB-MTSM-5090H
BP-MTSM-5075H	VB-MTSM-5075H	
BP-MTSM-5090H	VB-MTSM-5090H	

Motorized Translation Stages MTS series



MTS series stages are compact and modular motorized positioners for short travel applications. (up to 50 mm travel range). Stepper motor is used as electrical actuator. It has V grooved precision guide ways using crossed rollers. Construction material for standard stage is aluminium alloy. Linear drive is by a precision lead screwnut combination. There are two limit switches built in to the system, one for home and other for far end. Electrical junction box with suitable 9 pin connector is also a standard feature.

These stages are X, XY, XYZ, XZ & Z axis configurable with the help of angle bracket and base plates.

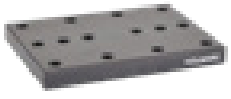
controller sold separately



Specifications

Straight Line Accuracy	5 Micron
Guide way	Precision V grooved guide way
Drive	Precision lead screw
Construction	Aluminum alloy B51S
Finish	Black anodized
Tapped Holes on Moving Plate	M6 tapped holes
Mounting Holes	M3 / M6 C'bored holes
Motor	Nema 17 motor

We have provided suitable mounting holes for assembling multi-axes configurations







Micrometer Drive

Drive Details	1 mm Pitch Lead Screw	0.4 mm Pitch Precision Lead screw
Positioning Accuracy	0.01 mm	0.001 mm
Repeatability	0.01 mm	0.001 mm
Speed	4 mm / Sec. (4 rps)	1.2 mm / Sec. (4 rps)



0.4mm pitch Lead screw

Model No.	MTS-6565-1-01	MTS-6565-1-02	MTS-6565-1-03	MTS-6565-1-04	MTS-6565-1-05
Load Capacity	10 Kg	10 Kg	2 Kg	2 Kg	2 Kg
Accessories	Angle Bracket Model : AB-MTS 6565, Base Plate Model : BP-MTS-6565				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

1mm pitch Lead screw

Model No:	MTS-6565-2-01	MTS-6565-2-02	MTS-6565-2-03	MTS-6565-2-04	MTS-6565-2-05
Load Capacity	10 Kg	10 Kg	2 Kg	2 Kg	2 Kg
Accessories	Angle Bracket Model : AB-MTS 6565 , Base Plate Model : BP-MTS-6565				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

0.4mm pitch Lead screw MTS-7575 Series,Travel - 25 mm

Model No:	MTS-7575-1-01	MTS-7575-1-02	MTS-7575-1-03	MTS-7575-1-04	MTS-7575-1-05
Load Capacity	10 Kg	10 Kg	2 Kg	2 Kg	2 Kg
Accessories	Angle Bracket Model : AB-MTS 7575, Base Plate Model : BP-MTS-7575				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

1mm pitch Lead screw

Model No:	MTS-7575-2-01	MTS-7575-2-02	MTS-7575-2-03	MTS-7575-2-04	MTS-7575-2-05
Load Capacity	10 Kg	10 Kg	2 Kg	2 Kg	2 Kg
Accessories	Angle Bracket Model : AB-MTS 7575 , Base Plate Model : BP-MTS-7575				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

0.4mm pitch Lead screwMTS-9090 Series,Travel - 25 mm

Model No	MTS-9090-1-01	MTS-9090-1-02	MTS-9090-1-03	MTS-9090-1-04	MTS-9090-1-05
Load Capacity	14 Kg	14 Kg	3 Kg	3 Kg	3 Kg
Accessories	Angle Bracket Model : AB-MTS 9090, Base Plate Model : BP-MTS-9090				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

1mm pitch Lead screw

Model No	MTS-9090-2-01	MTS-9090-2-02	MTS-9090-2-03	MTS-9090-2-0	MTS-9090-2-05
Load Capacity	15 Kg	15 Kg	5 Kg	5 Kg	5 Kg
Accessories	Angle Bracket Model : AB-MTS 9090, Base Plate Model : BP-MTS-9090				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

0.4mm pitch Lead screwMTS-90115 Series,Travel - 50 mm

Model No	MTS-90115-1-01	MTS-90115-1-02	MTS-90115-1-03	MTS-90115-1-04	MTS-90115-1-05
Load Capacity	14 Kg	14 Kg	3 Kg	3 Kg	3 Kg
Accessories	Angle Bracket Model : AB-MTS 90115, Base Plate Model : BP-MTS-90115				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

1mm pitch Lead screw

Model No	MTS-90115-2-01	MTS-90115-2-02	MTS-90115-2-03	MTS-90115-2-04	MTS-90115-2-05
Load Capacity	15 Kg	15 Kg	5 Kg	5 Kg	5 Kg
Accessories	Angle Bracket Model : AB-MTS 90115, Base Plate Model : BP-MTS-90115				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

0.4mm pitch Lead screwMTS-90150 Series,Travel - 100 mm

Model No:	MTS-90150-1-01	MTS-90150-1-02	MTS-90150-1-03	MTS-90150-1-04	MTS-90150-1-05
Load Capacity	14 Kg	14 Kg	5 Kg	5 Kg	5 Kg
Accessories	Angle Bracket Model : AB-MTS 90150, Base Plate Model : BP-MTS-90150				
Configurations					

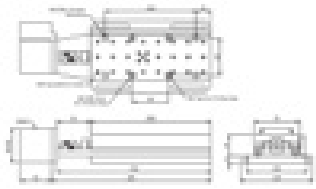
1mm pitch Lead screw

Model No:	MTS-90150-2-01	MTS-90150-2-02	MTS-90150-2-03	MTS-90150-2-04	MTS-90150-2-05
Load Capacity	15 Kg	15 Kg	6 Kg	6 Kg	6 Kg
Accessories	Angle Bracket Model : AB-MTS 90150, Base Plate Model : BP-MTS-90150				
Configurations	X Axis	XY Axis	XYZ Axis	Z Axis	XZAxis

Accessories

Angle Bracket	AB-MTS 6565	AB-MTS 9090	AB-MTS 90115	AB-MTS 90150
Base Plate	BP-MTS 6565	BP-MTS 9090	BP-MTS 90115	BP-MTS 90150

Motorized Translation Stages LMS series



LMS series motorized stages provide travel up to 150 mm. Drive mechanism comprises of precision ground lead screw and preloaded nut. Stepper motor used is of 56 mm frame size and 10 kg-cm torque. There are limit switches for home and far end. Electrical junction box with 9 pin connector is also a standard feature. Linear guide ways using V grooved guides and crossed rollers are used for playless and stick-slip free precision positioning. Standard stages are constructed in aluminium alloy and finished by black anodizing. Tapped holes are provided on top and bottom surfaces for mounting. XY and XYZ configurations can be assembled from single axis stages along with accessories like base plates and angle brackets.

controller sold separately

Specifications

Straight Line Accuracy	2 Micron
Guide way	Precision V grooved guide way
Drive	Precision lead screw
Construction	Aluminum alloy B51S
Finish	Black anodized
Tapped Holes on Moving Plate	M6 tapped holes
Mounting Holes	M6 tapped holes

We have provided suitable mounting holes for assembling multi-axes configurations

Aluminum alloy B51S

Precision V grooved guide way





0.4mm pitch Lead screw



Model No.	LMS 75100 - 3	LMS 100100 - 3			
Travel	50 mm	50 mm			
Load Capacity	8 Kg	8 Kg			
Size L X B	100 x 75 mm	100 x 100 mm			

1mm pitch Lead screw

Model No:	LMS 75100 - 2	LMS 75150 - 2	LMS 75200 - 2	LMS 100100 - 2	LMS 100150 - 2
Travel	50 mm	100 mm	150 mm	50 mm	100 mm
Load Capacity	10 Kg	11 Kg	14 Kg	15 Kg	17 Kg
Size L X B	100 x 75 mm	150 x 75 mm	200 x 75 mm	100 x 100 mm	150 x 100 mm

Model No:	LMS 100200 - 2	LMS 150150 - 2	LMS 150200 - 2	LMS 200200 - 2	LMS 250250 - 2
Travel	150 mm	100 mm	150 mm	150 mm	150 mm
Load Capacity	19 Kg	18 Kg	25 Kg	35 Kg	30 Kg
Size L X B	200 x 100 mm	150 x 150 mm	200 x 150 mm	200 x 200 mm	200 x 200 mm

2 mm pitch Lead screw

Model No:	LMS 75100 - 1	LMS 75150 - 1	LMS 75200 - 1	LMS 100100 - 1	LMS 100150 - 1
Travel	50 mm	100 mm	150 mm	50 mm	100 mm
Load Capacity	8 Kg	9 Kg	11 Kg	16 Kg	15 Kg
Size L X B	100 x 75 mm	150 x 75 mm	200 x 75 mm	100 x 100 mm	150 x 100 mm

Model No:	LMS 100200 - 1	LMS 150150 - 1	LMS 150200 - 1	LMS 200200 - 1	LMS 250250 - 1
Travel	150 mm	100 mm	150 mm	150 mm	200 mm
Load Capacity	17 Kg	16 Kg	22 Kg	30 Kg	30 Kg
Size L X B	200 x 100 mm	150 x 150 mm	200 x 150 mm	200 x 200 mm	250 x 250 mm

Micrometer Drive



Drive Details	0.4 mm Pitch Lead screw	1 mm Pitch Precision Lead screw	2 mm Pitch Precision Lead screw
Positioning Accuracy	0.001 mm	0.0025 mm	0.005 mm
Repeatability	0.001 mm	0.0025 mm	0.005 mm
Resolution	0.000125 (Micro Step Mode)	0.003125 (Micro Step Mode)	0.000625 (Micro Step Mode)
Speed	1.6 mm / sec	4 mm / sec	8 mm / sec

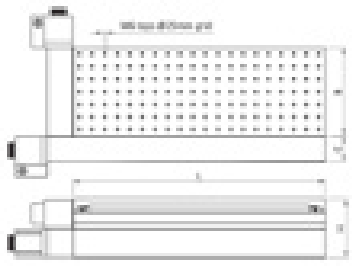
Accessories



Angle Bracket	AB - LMS 75100	AB - LMS 75150	AB - LMS 75200	AB - LMS 100100	AB - LMS 100150
	AB - LMS 100200	AB - LMS 150150	AB - LMS 150200	AB - LMS 200200	
Base Plate	BP - LMS 75100	BP - LMS 75150	BP - LMS 75200	BP - LMS 100100	BP - LMS 100150
	BP - LMS 100200	BP - LMS 150150	BP - LMS 150200	BP - LMS 200200	

Motorized Precision

Long Travel Translation stages MLTS series (Linear and XY)



These stages are based on linear guide ways using V grooved guides and crossed rollers are used for play-less and stick-slip free precision positioning. Stages are constructed in aluminium alloy and finished by black anodizing. Tapped holes are provided on top and bottom surfaces for mounting.

controller sold separately



Travel : 100 - 200 mm

Load capacity up to 75 Kg

Specifications

Precision roller slides
100 - 200 mm travel
1 - 5 micron straight line accuracy
5 micron positioning accuracy
0.625 micron resolution
2 mm pitch backlash free lead screw and nut
4 mm pitch ball screw and nut
8 - 16 mm Maximum speed
Up to 75 kg load capacity
Stepper motor for computer control movement
Optional Servo motor control
Controller with software for computer controlling
Additional handheld unit or joysticks available as per request

Linear

Model No.	Travel Range X	Load Capacity (vertical)	Resolution (mm)	Max .Speed	Carriage Size W x L (mm)
MLTS-100-250	125 mm	15 kg	0.000625	8 mm / se	100 x 150
MLTS-100-350	225 mm	15 kg	0.000625	8 mm / se	100 x 350
MLTS-100-500	350 mm	25 kg	0.00125	16 mm / sec	100 x 500
MLTS-175-175	50 mm	15 kg	0.000625	8 mm / se	175 x 175
MLTS-175-350	225 mm	25 kg	0.00125	16 mm / sec	175 x 350
MLTS-175-500	375 mm	25 kg	0.00125	16 mm / sec	175 x 500
MLTS-250-250	125 mm	50 kg	0.00125	16 mm / sec	250 x 250
MLTS-250-400	250 mm	60 kg	0.00125	16 mm / sec	250 x 400
MLTS-250-600	450 mm	75 kg	0.00125	16 mm / sec	250 x 60

X & Y

Model No:	Travel Range X & Y	Load Capacity (vertical)	Resolution (mm)	Max .Speed	Carriage Size W x L (mm)
MLTS-175-175-XY	50 mm	15 kg	0.000625	8 mm / sec	175 x 175
MLTS-175-275-XY	50 & 125 mm	25 kg	0.00125	16 mm / sec	175 x 275
MLTS-175-500-XY	50 & 350 mm	25 kg	0.00125	16 mm / sec	175 x 500
MLTS-250-250-XY	125 mm	50 kg	0.00125	16 mm / sec	250 x 250
MLTS-250-400-X	125 & 250 mm	60 kg	0.00125	16 mm / sec	250 x 400
MLTS-250-600-X	125 & 450 mm	75 kg	0.00125	16 mm / sec	250 x 6

Belt Driven High Speed Translation Stage (Linear)



Belt-driven stages are ideal for applications requiring long distances and high speeds. Speeds as high as 600mm per second can be achieved. The belt drive's high efficiency make it an ideal choice for moving light loads at high speed and for continuous duty applications. They are not recommended for vertical applications because of the risk of load free-fall in the event of belt failure.



controller sold separately



Precision re circulating slide

Travel up to 1500mm



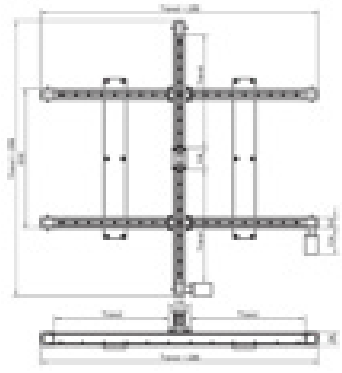
Specifications

Suitable for faster movements and positioning
Precision re circulating slide
100 - 1500 mm Travel
600mm / sec maximum speed
2mm / sec minimum speed
100 micron straight line accuracy
500 micron positioning accuracy
100 x 65 mm carriage size
Timing belt and pully mechanism
Up to 5 kg load capacity
Shaft extension for connecting rod free slide (XY) ***
Stepper motor for computer control movement
Controller with software for computer controlling
Additional handheld unit or joysticks available as per request



Model No:	Travel Range	Positioning Accuracy	Min. Speed	Max. Speed	Length
HS-LTS-100	100 mm	0.5 mm	2 mm / sec	600 mm / sec	388 mm
HS-LTS-200	200 mm	0.5 mm	2 mm / sec	600 mm / sec	488 mm
HS-LTS-300	300 mm	0.5 mm	2 mm / sec	600 mm / sec	588 mm
HS-LTS-500	500 mm	0.5 mm	2 mm / sec	600 mm / sec	788 mm
HS-LTS-600	600 mm	0.5 mm	2 mm / sec	600 mm / sec	888 mm
HS-LTS-750	750 mm	0.5 mm	2 mm / sec	600 mm / sec	1038 mm
HS-LTS-1000	1000 mm	0.5 mm	2 mm / sec	600 mm / sec	1288 mm
HS-LTS-1250	1250 mm	0.5 mm	2 mm / sec	600 mm / sec	1538 mm
HS-LTS-1500	1500 mm	0.5 mm	2 mm / sec	600 mm / sec	1788 mm
HS-LTS-X***	Specify trave				X + 288 mm
# How to order custom travel					
HS-LTS-1750	X = 1750 mm	0.5 mm	2 mm / sec	600 mm / sec	1750 + 288 mm

Belt Driven High Speed Translation Stage (XY)



Belt-driven stages are ideal for applications requiring long distances and high speeds. Speeds as high as 600mm per second can be achieved. The belt drive's high efficiency make it an ideal choice for moving light loads at high speed and for continuous duty applications. They are not recommended for vertical applications because of the risk of load free-fall in the event of belt failure.

controller sold separately

Specifications

Suitable for faster movements and positioning
Precision re circulating slide
100 - 1500 mm Travel
600mm / sec maximum speed
2mm / sec minimum speed
100 micron straight line accuracy
500 micron positioning accuracy
100 x 65 mm carriage size
Timing belt and pully mechanism
Up to 5 kg load capacity
Shaft extension for connecting rod free slide (XY) ***
Stepper motor for computer control movement
Controller with software for computer controlling
Additional handheld unit or joysticks available as per request



Model No:	Travel Range	Positioning Accuracy	Min. Speed	Max. Speed	Length
HS-XYLTS-100-100	100 mm	0.5 mm	2 mm / sec	600 mm / sec	388 mm
HS-XYLTS-200-200	200 mm	0.5 mm	2 mm / sec	600 mm / sec	488 mm
HS-XYLTS-300-300	300 mm	0.5 mm	2 mm / sec	600 mm / sec	588 mm
HS-XYLTS-500-500	500 mm	0.5 mm	2 mm / sec	600 mm / sec	788 mm
HS-XYLTS-600-600	600 mm	0.5 mm	2 mm / sec	600 mm / sec	888 mm
HS-XYLTS-750-750	750 mm	0.5 mm	2 mm / sec	600 mm / sec	1038 mm
HS-XYLTS-1000-1000	1000 mm	0.5 mm	2 mm / sec	600 mm / sec	1288 mm
HS-XYLTS-1250-1250	1250 mm	0.5 mm	2 mm / sec	600 mm / sec	1538 mm
HS-XYLTS-1500-150	1500 mm	0.5 mm	2 mm / sec	600 mm / se	1788 mm
HS-XYLTS-X-Y***	Specify X travel				X + 288 mm
					Y + 288 mm
# How to order custom travel	200mm X travel				200 + 288 mm
HS-LTS-1750	1800mm Y travel	0.5 mm	2 mm / sec	600 mm / sec	1800 + 288 mm

Motorized Translation Stages RCMTS-35 Series

These stages use re-circulating type ball bearing guideways along with leadscrews positioned above the guideways as shown in the drawing. This configuration helps to keep the footprint as minimum as possible. In this case, width of the stage could be reduced to 35mm. Construction is in aluminum alloy with black anodized finish.

There are two options for leadscrew pitch, 1mm and 2mm. For those applications where greater speed is required, 9 mm pitch leadscrew can be considered.

controller sold separately



Specifications

Straight Line Accuracy	+/- 20 Micron over 200 mm travel
Drive	Precision Lead screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M4 Tapped Holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular Type
Configuration	Multi axis
Travel	50 to 150 mm
Carriage Size	35 mm x 35 mm
Load Capacity	2 kg vertical on X Axis
Lead screw	Lead screw
Motor	Stepper motor (42mm size)

1.25 mm Pitch Leadscrew

Model No:	Travel	Load Capacity X - Axis	Load Capacity Z - Axis
RCMTS35-50-1	50 mm	2 kg	500 gm
RCMTS35-75-1	75 mm	2 kg	500 gm
RCMTS35-100-1	100 mm	2 kg	500 gm
RCMTS35-150-1	150 mm	2 kg	500 gm

Micrometer Drive

Drive Details	1.25 mm Pitch Precision Lead Screw
Positioning Accuracy	3.125 micron
Repeatability	3.125 micron
Resolution	0.000390 (Micro Step Mode)
Speed	5 mm / Sec.

Accessories



Adapter Plate

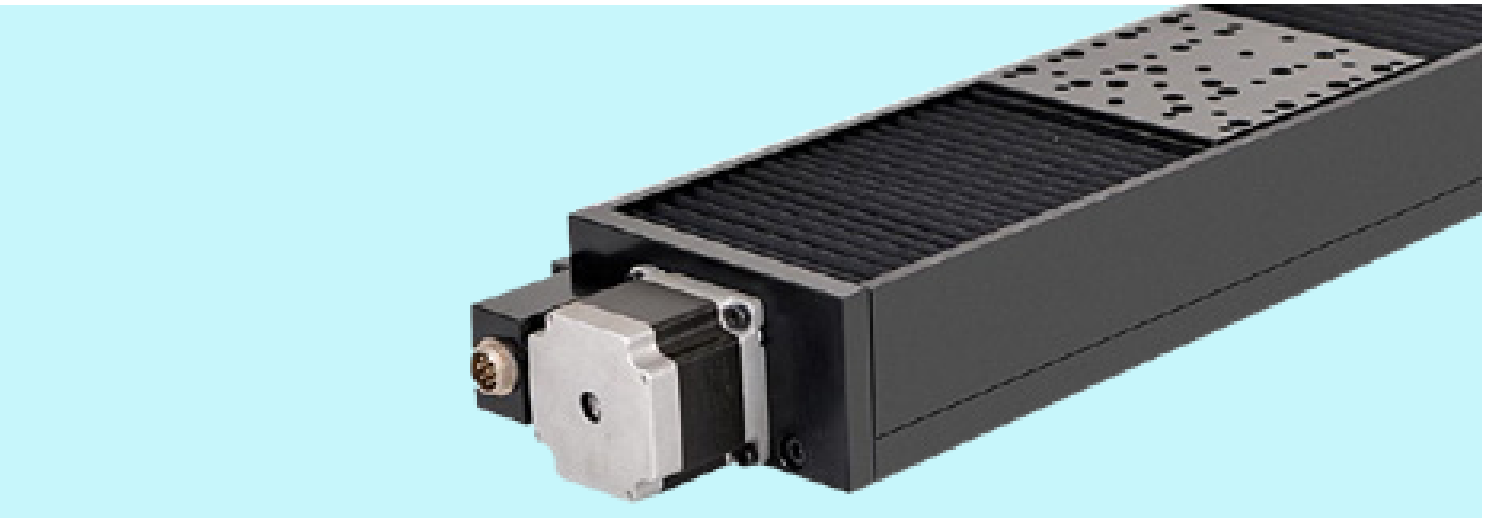


Base Plate

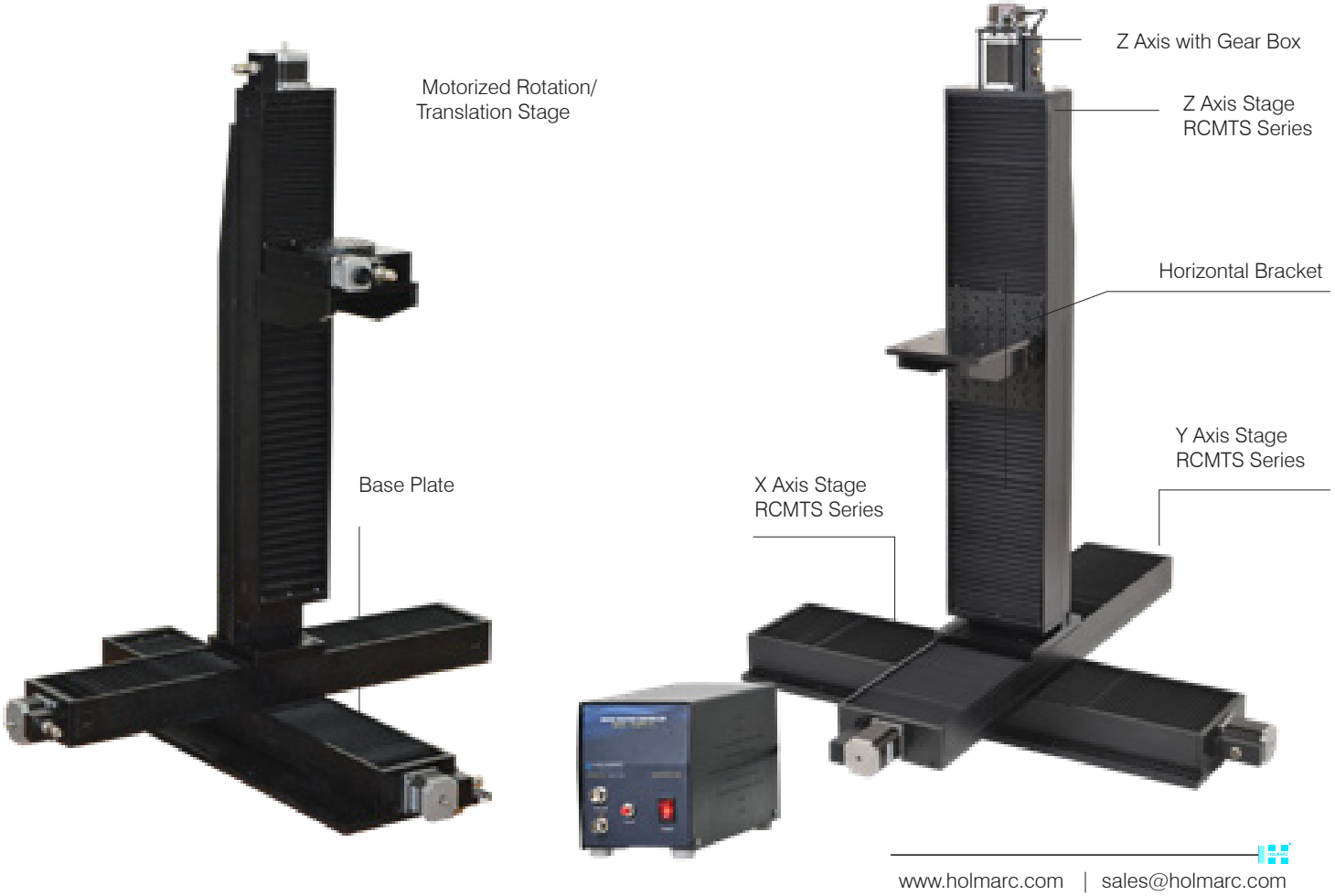


Angle Bracket

RCMTS Series Motorized Stages



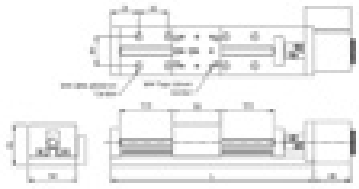
RCMTS series stages use re-circulating type linear bearings. Hence, the carriage (moving part) in this case will be smaller in length than the base. As in the case of our standard stages described in preceding pages, there are two drive options, precision lead screws and ball screws. Its design permits dust protection by the use of bellows. Holmarc manufacture these stages up to a travel of 500 mm in various carriage sizes and load bearing capacities. Apart from the standard stages described in this section, we also manufacture custom stages in aluminum, steel and stainless steel for variety of applications. Kindly contact our sales engineers for details.



Motorized Translation Stages

RCMTS-50 Series

These stages use re-circulating type ball bearing guideways along with leadscrews positioned above the guideways as shown in the drawing. This configuration helps to keep the footprint as minimum as possible. In this case, width of the stage could be reduced to 50mm. Construction is in aluminum alloy with black anodized finish. There are two options for leadscrew pitch, 1mm and 2mm. For those applications where greater speed is required, 9 mm pitch leadscrew can be considered.



Modular Type Design
Travel : 50 to 150 mm

Specifications

Straight Line Accuracy	+/- 20 Micron over 200 mm travel
Drive	Precision Lead screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M4 Tapped Holes
Mounting Holes on the base	M6 Tap and M4 CBR
M6 Tap and M4 CBR	Modular Type
Configuration	Multi axis
Travel	50 to 150 mm
Carriage Size	50 mm x 50 mm
Load Capacity	2 kg vertical on X Axis
Lead screw	1 mm pitch / 2 mm pitch
Footprint	50 x 255 mm (motor size extra)



controller sold separately

1 mm Pitch Lead Screw

Model No.	RCMTS50-50-1	RCMTS50-75-1	RCMTS50-100-1	RCMTS50-150-1
Travel	50 mm	75 mm	100 mm	150 mm
Length	155 mm	180 mm	205 mm	280 mm
Load Capacity X - Axis	2 kg	2 kg	2 kg	2 kg
Load Capacity Z - Axis	1 kg	1 kg	1 kg	1 kg

2mm pitch Lead screw

Model No:				
Travel	50 mm	155 mm	2 kg	1 kg
Length	75 mm	180 mm	2 kg	1 kg
Load Capacity X - Axis	100 mm	205 mm	2 kg	1 kg
Load Capacity Z - Axis	150 mm	280 mm	2 kg	1 kg

Micrometer Drive



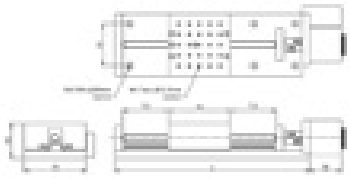
Drive Details	1 mm Pitch Lead screw	2 mm Pitch Precision Lead screw
Positioning Accuracy	0.0025 mm	0.005 mm
Repeatability	0.0025 mm	0.005 mm
Resolution	0.000125 (Micro Step Mode)	0.000125 (Micro Step Mode)
Speed	4 mm / Sec.	8 mm / Sec.

Accessories



Base Plate	BP-RCMTS50-50	BP-RCMTS50-75	BP-RCMTS50-100	BP-RCMTS50-150
Vertical Bracket	VAB-RCMTS50-50	VAB-RCMTS50-75	VAB-RCMTS50-100	VAB-RCMTS50-150
Horizontal Bracket	HAB-RCMTS-50	Size : 50 x 50 mm		

Motorized Translation Stages
RCMTS-75 Series



RCMTS-75 series are light duty stages with respect to load capacity. Point contact ball bearing guides are used in these stages to keep height of the stage at 42 mm which is height of the drive motor. Bellows are provided for the protection of the stage from dust as well as to protect the environment from the accidental contamination from grease used in the guideways and leadscrew drives. Standard stages are fixed with stepper motors. There are two models to choose from, stages with 1 mm pitch leadscrew (low speed) and stages with 9mm pitch leadscrew (high speed).

Specifications

Straight Line Accuracy	+/- 20 Micron over 200 mm travel
Drive	Precision Lead screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M4 Tapped Holes
Mounting Holes on the base	M6 Tap and M4 CBR
Design	Modular Type
Configuration	Multi axis
Travel	50 to 250 mm
Carriage Size	75 mm x 75 mm
Load Capacity	5 kg vertical on X Axis
Lead screw	1.25 mm pitch / 2 mm pitch
Lock	Can be Locked at desired position
Footprint	50 x 280 mm (motor size extra)



controller sold separately

1.25 mm Pitch Lead Screw

Model No.	RCMTS75-50-A	RCMTS75-100-A	RCMTS75-150-A	RCMTS75-200-A	RCMTS75-250-A
Travel	50 mm	100 mm	150 mm	200 mm	250 mm
Length	180 mm	230 mm	280 mm	330 mm	380 mm
Load Capacity X Axis	6 kg	6 kg	6 kg	6 kg	6 kg
Load Capacity Z Axis	3 kg	3 kg	3 kg	3 kg	3 kg

2mm pitch Lead screw

Model No:	RCMTS75-50-Z	RCMTS75-100-Z	RCMTS75-150-Z	RCMTS75-200-Z	RCMTS75-250-Z
Travel	50 mm	100 mm	150 mm	200 mm	250 mm
Length	180 mm	230 mm	280 mm	330 mm	380 mm
Load Capacity X Axis	8 kg	8 kg	8 kg	8 kg	8 kg
Load Capacity Z Axis	4 kg	4 kg	4 kg	4 kg	4 kg

Micrometer Drive





Drive Details	1.25 mm Pitch Lead screw	2 mm Pitch Precision Lead screw
Positioning Accuracy	0.003125 mm	0.005 mm
Repeatability	0.003125 mm	0.005 mm
Resolution	0.000390 (Micro Step Mode)	0.000125 (Micro Step Mode)
Speed	5 mm / Sec.	8 mm / Sec.

Accessories



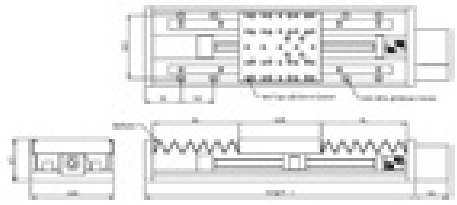




Base Plate	BP-RCMTS75-50	BP-RCMTS75-100	BP-RCMTS75-150	BP-RCMTS75-200	BP-RCMTS75-250
Vertical Bracket	VAB-RCMTS75-50	VAB-RCMTS75-100	VAB-RCMTS75-150	VAB-RCMTS75-200	VAB-RCMTS75-250
Horizontal Bracket					

Motorized Translation Stages

RCMTS-125 Series



RCMTS-125 series stages are designed to carry heavy loads, yet to move and position precisely. Recirculating type ball bearing linear ways are used as guides. Drive is provided by a combination of ball screw and stepper motor. Z-axis: In these stages in vertical configuration, if the load is more than 15 kgs, the carriage may come down under gravity when power to the motor is switched off. This is when ball screw is directly attached to the steppermotor. If the load to be lifted is more than 15 kgs, it is advisable to use our Z axis stages with a gear box (1:6 ratio) in between motor and ball screw. Though this reduces speed in Z axis, load capacity increases considerably.

Specifications

Straight Line Accuracy	+/- 20 Micron over 300 mm travel
Drive	Precision Lead ball screw
Construction	Aluminium Alloy B51
Finish	Black anodized
Tapped Holes on Carriage	M6 Tapped Holes
Mounting Holes on the base	M6 Tap and M6 CBR
Design	Modular Type
Configuration	Multi axis
Travel	100 to 500 mm
Carriage Size	125 mm x 125 mm
Load Capacity	Up to 90kg vertical



controller sold separately

4 mm Pitch ball Screw

Model No.	RCMTS125-100-2	RCMTS125-150-2	RCMTS125-200-2	RCMTS125-300-2	RCMTS125-500-2
Travel	100 mm	150 mm	200 mm	300 mm	500 mm
Length	310 mm	360 mm	410 mm	510 mm	750 mm
Load Capacity X Axis	50 kg	50 kg	50 kg	45 kg	45 kg
Load Capacity -Z Axis	15 kg	15 kg	15 kg	15 kg	15 kg

4mm pitch Pitch ball Screw with Magnetic brake

Model No:	RCMTS125-100-B	RCMTS125-150-B	RCMTS125-200-B	RCMTS125-300-B	RCMTS125-500-B
Travel	100 mm	150 mm	200 mm	300 mm	500 mm
Length	310 mm	360 mm	410 mm	510 mm	750 mm
Load Capacity X Axis	90 kg	90 kg	86 kg	85 kg	80 kg
Load Capacity Z Axis	70 kg	70 kg	62 kg	60 kg	55 kg

Micrometer Drive





Drive Details	4 mm Pitch Ball Screw	4 mm Pitch Ball Screw with Magnetic brake
Positioning Accuracy	0.02 mm	0.01 mm
Repeatability	0.01 mm	0.01 mm
Resolution	0.00125 (Micro Step Mode)	0.00125 (Micro Step Mode)
Speed	16 mm / sec (4RPS)	16 mm / sec (4RPS)

* Feature : Magnetic break helps stages carriage from sudden falling while loading heavy load in Z axis

Accessories



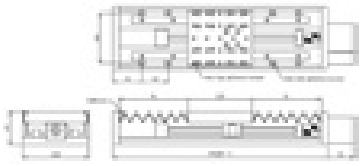




Base Plate	BP-RCMTS125-100	BP-RCMTS125-150	BP-RCMTS125-200	BP-RCMTS125-300	BP-RCMTS125-500
Vertical Bracket	VAB-RCMTS125-100	VAB-RCMTS125-150	VAB-RCMTS125-200	VAB-RCMTS125-300	VAB-RCMTS125-500
Horizontal Bracket					

Motorized Translation Stages

RCMTS-150 Series



RCMTS-150 series stages are available for travel upto 150 mm. Carriage size is 150 x 150 mm. Drive is by ball screw-stepper motor combination. There are bellows for dust protection. Re-circulating type linear ways are used as guides. Z-axis: In these stages, in vertical configuration, if the load is more than 15 kgs, the carriage may come down under gravity when power to the motor is switched off. This is when ball screw is directly attached to the stepper motor. If the load to be lifted is more than 15 kgs, it is advisable to use our Z axis stages with a gear box (1:6 ratio) in between motor and ball screw. Though this reduces speed in Z axis, load capacity increases considerably. Please see the tables and chart below for details.

luminum alloy B51S
Precision Lead ball screw

controller sold separately

Specifications

Straight Line Accuracy	+/- 30 Micron over 300 mm travel
Drive	Precision Lead ball screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M6 Tapped Holes
Mounting Holes on the base	M6 Tap and M6 CBR
Design	Modular Type
Configuration	Multi axis
Travel	100 to 750 mm
Carriage Size	150 mm x 150 mm
Load Capacity	Up to 90kg vertical



RCMTS-75 Series in XY Configuration

4 mm Pitch ball Screw



Model No.	RCMTS125-100-2	RCMTS125-150-2	RCMTS125-200-2	RCMTS125-300-2	RCMTS125-500-2
Travel	100 mm	150 mm	200 mm	300 mm	500 mm
Length	310 mm	360 mm	410 mm	510 mm	750 mm
Load Capacity X Axis	50 kg	50 kg	50 kg	45 kg	45 kg
Load Capacity -Z Axis	15 kg	15 kg	15 kg	15 kg	15 kg

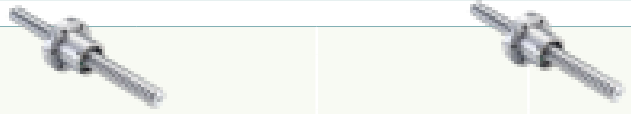
Model No.	RCMTS150-500-2	RCMTS150-750-2
Travel	500 mm	750 mm
Length	790 mm	1070 mm
Load Capacity X Axis	45 kg	45 kg
Load Capacity -Z Axis	15 kg	15 kg

4mm pitch Pitch ball Screw with Magnetic brake

Model No:	RCMTS150-100-B	RCMTS150-150-B	RCMTS150-200-B	RCMTS150-300-B	RCMTS150-500-B
Travel	100 mm	150 mm	200 mm	300 mm	500 mm
Length	330 mm	380 mm	430 mm	480 mm	790 mm
Load Capacity X Axis	90 kg	90 kg	86 kg	85 kg	80 kg
Load Capacity Z Axis	70 kg	70 kg	62 kg	60 kg	55 kg

Model No	RCMTS150-750-B
Travel	750 mm
Length	1070 mm
Load Capacity X Axis	80 kg
Load Capacity Z Axis	50 kg

Micrometer Drive



Drive Details	4 mm Pitch Ball Screw	4 mm Pitch Ball Screw with Magnetic brake
Positioning Accuracy	0.02 mm	0.01 mm
Repeatability	0.01 mm	0.01 mm
Resolution	0.00125 (Micro Step Mode)	0.00125 (Micro Step Mode)
Speed	16 mm / sec (4RPS)	16 mm / sec (4RPS)

* Feature : Magnetic break helps stages carriage from sudden falling while loading heavy load in Z axis

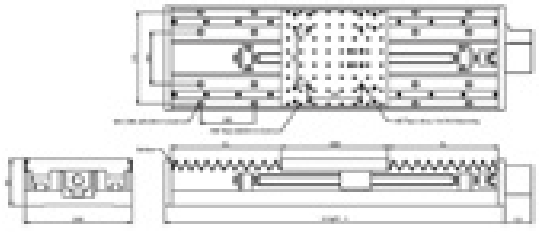
Accessories



Base Plate	BP-RCMTS150-100	BP-RCMTS150-150	BP-RCMTS150-200	BP-RCMTS150-300	BP-RCMTS150-500
	BP-RCMTS150-750				
Vertical Bracket	VAB-RCMTS150-100	VAB-RCMTS150-150	VAB-RCMTS150-200	VAB-RCMTS150-300	VAB-RCMTS150-500
	VAB-RCMTS150-500				
Horizontal Bracket	HAB-RCMTS-150	Size : 150 x 150 mm			

Motorized Translation Stages

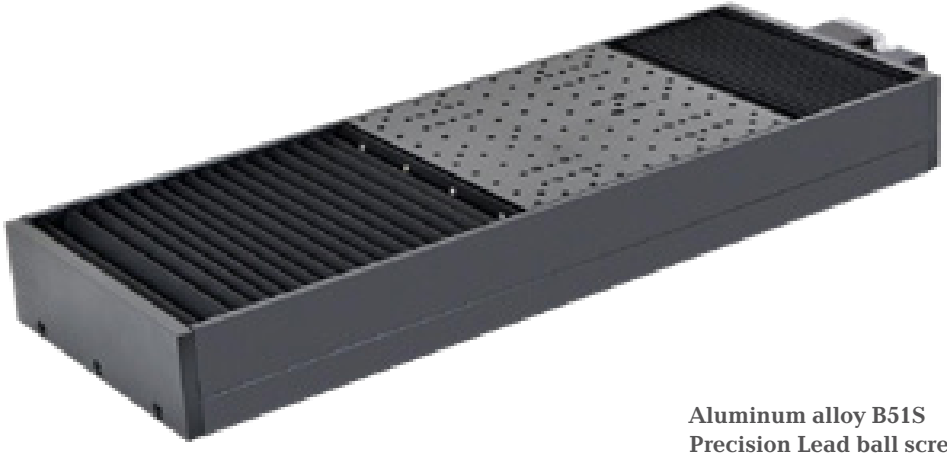
RCMTS-200 Series



RCMTS-200 series stages have 200 mm width and carriages (load bearing moving surfaces) have 200 mm x 200 mm size. Drive is by ball screw-stepper motor combination. Re-circulating type linear ways are used as guides (two linear ways per stage). These stages are available up to travel of 750 mm as standard products. For more traverse, please contact us. Z-axis: In these stages, in vertical configuration, if the load is more than 15 kgs, the carriage may come down under gravity when power to the motor is switched off. This is when ball screw is directly attached to the stepper motor. If the load to be lifted is more than 15 kgs, it is advisable to use our Z axis stages with a gear box (1:6 ratio) in between motor and ball screw. Though this reduces speed in Z axis, load capacity increases considerably. Please see the tables and chart below for details. # controller sold separately

Specifications

Straight Line Accuracy	+/- 30 Micron over 300 mm travel
Drive	Precision Lead ball screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M6 Tapped Holes
Mounting Holes on the base	M6 Tap and M6 CBR
Design	Modular Type
Configuration	Multi axis
Travel	100 to 750 mm
Carriage Size	200 mm x 200 mm
Load Capacity	Up to 150kg vertical



Aluminum alloy B51S
Precision Lead ball screw

4 mm Pitch ball Screw



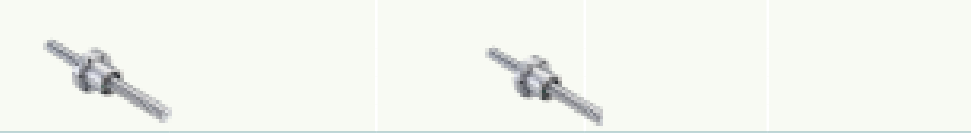
Model No.	RCMTS200-100-2	RCMTS200-200-2	RCMTS200-300-2	RCMTS200-500-2	RCMTS200-750-2
Travel	100 mm	200 mm	300 mm	500 mm	750 mm
Length	390 mm	490 mm	590 mm	670 mm	1120 mm
Load Capacity X Axis	100 kg	100 kg	100 kg	100 kg	100 kg
Load Capacity Z Axis	15 kg	15 kg	15 kg	15 kg	15 kg

* (maximum holding kg weight at off condition)

4 mm Pitch ball Screw with Magnetic brake

Model No:	RCMTS200-100-B	RCMTS200-200-B	RCMTS200-300-B	RCMTS200-500-B	RCMTS200-750-B
Travel	100 mm	200 mm	300 mm	500 mm	750 mm
Length	390 mm	490 mm	590 mm	670 mm	1120 mm
Load Capacity X Axis	150 kg	150 kg	150 kg	150 kg	150 kg
Load Capacity Z Axis	70 kg	70 kg	70 kg	65 kg	65 kg

Drive Details



Drive Details	4 mm Pitch Ball Screw	4 mm Pitch Ball Screw with Magnetic brake
Positioning Accuracy	0.02 mm	0.01 mm
Repeatability	0.01 mm	0.01 mm
Resolution	0.00125 (Micro Step Mode)	0.00125 (Micro Step Mode)
Speed	16 mm / sec (4RPS)	16 mm / sec (4RPS)

* Feature : Magnetic break helps stages carriage from sudden falling while loading heavy load in Z axis

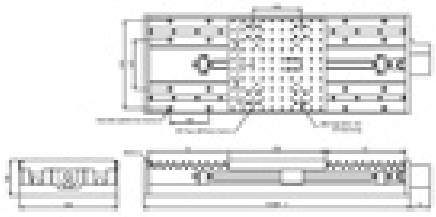
Accessories



Base Plate	BP-RCMTS200-100	BP-RCMTS200-200	BP-RCMTS200-300	BP-RCMTS200-500	BP-RCMTS200-750
Vertical Bracket	VAB-RCMTS200-100	VAB-RCMTS200-200	VAB-RCMTS200-300	VAB-RCMTS200-500	VAB-RCMTS200-750
Horizontal Bracket	HAB-RCMTS-200	Size : 200 x 200 mm			

Motorized Translation Stages

RCMTS-250 Series



Carriages (load bearing surface of the stage which moves) of RCMTS-250 stages have 250 mm x 250 mm size. Standard models are available for up to 750 mm traverse. There are two linear guideways for each axis and these are re-circulating type with balls. Drive is by ball screw-stepper motor combination. Servo motors can also be made available for specific applications where speed requirements are not possible with steppers.

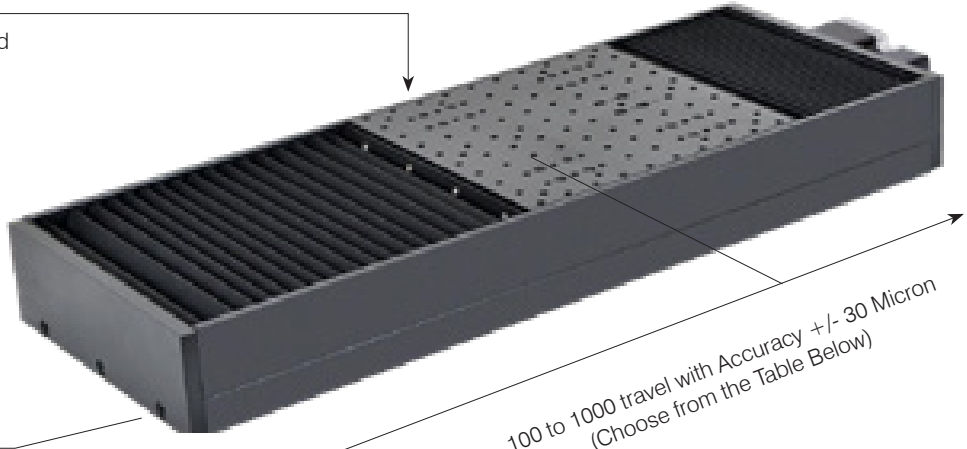
Z-axis: In these stages, in vertical configuration, if the load is more than 15 kgs, the carriage may come down under gravity when power to the motor is switched off. This is when ball screw is directly attached to the stepper motor. If the load to be lifted is more than 15 kgs, it is advisable to use our Z axis stages with a gear box (1:6 ratio) in between motor and ball screw. Though this reduce speed in Z axis, load capacity increases considerably. Please see the tables and chart below for details.

Specifications

Straight Line Accuracy	+/- 30 Micron over 300 mm travel
Drive	Precision Lead ball screw
Construction	Aluminium Alloy B51S
Finish	Black anodized
Tapped Holes on Carriage	M6 Tapped Holes
Mounting Holes on the base	M6 Tap and M6 CBR
Design	Modular Type
Configuration	Multi axis
Travel	100 to 1000 mm
Carriage Size	250 mm x 250 mm
Load Capacity	Up to 150kg vertical

Pay-load

95 to 150 Kg Vertical Load
(Models Listed in Table)



Build Quality

Aluminum alloy B51S
Precision Lead ball screw

4 mm Pitch ball Screw



Model No.	RCMTS250-100-2	RCMTS250-200-2	RCMTS250-250-2	RCMTS250-300-2	RCMTS250-500-2
Travel	100 mm	200 mm	250 mm	300 mm	500 mm
Length	410 mm	510 mm	560 mm	610 mm	920 mm
Load Capacity X Axis	100 kg	100 kg	100 kg	100 kg	95 kg
Load Capacity Z Axis	15 kg	15 kg	15 kg	15 kg	15 kg

Model No	RCMTS250-750-2	RCMTS250-1000-2
Travel	750 mm	1000 mm
Length	1170 mm	1420 mm
Load Capacity X Axis	90 kg	90 kg
Load Capacity Z Axis	15 kg	15 kg

* (maximum holding kg weight at off condition)

4 mm Pitch ball Screw with Magnetic brake

Model No:	RCMTS250-100-B	RCMTS250-200-B	RCMTS250-250-B	RCMTS250-300-B	RCMTS250-500-B
Travel	100 mm	200 mm	250 mm	300 mm	500 mm
Length	410 mm	510 mm	560 mm	610 mm	920 mm
Load Capacity X Axis	150 kg	150 kg	150 kg	150 kg	140 kg
Load Capacity Z Axis	120 kg	120 kg	120 kg	115 kg	90 kg

Model No	RCMTS250-750-B	RCMTS250-1000-B
Travel	750 mm	1000 mm
Length	1170 mm	1420 mm
Load Capacity X Axis	135 kg	135 kg
Load Capacity Z Axis	90 kg	85 kg

Drive Details



Drive Details	4 mm Pitch Ball Screw	4 mm Pitch Ball Screw with Magnetic brake
Positioning Accuracy	0.02 mm	0.01 mm
Repeatability	0.01 mm	0.01 mm
Resolution	0.00125 (Micro Step Mode)	0.00125 (Micro Step Mode)
Speed	16 mm / sec (4RPS)	16 mm / sec (4RPS)

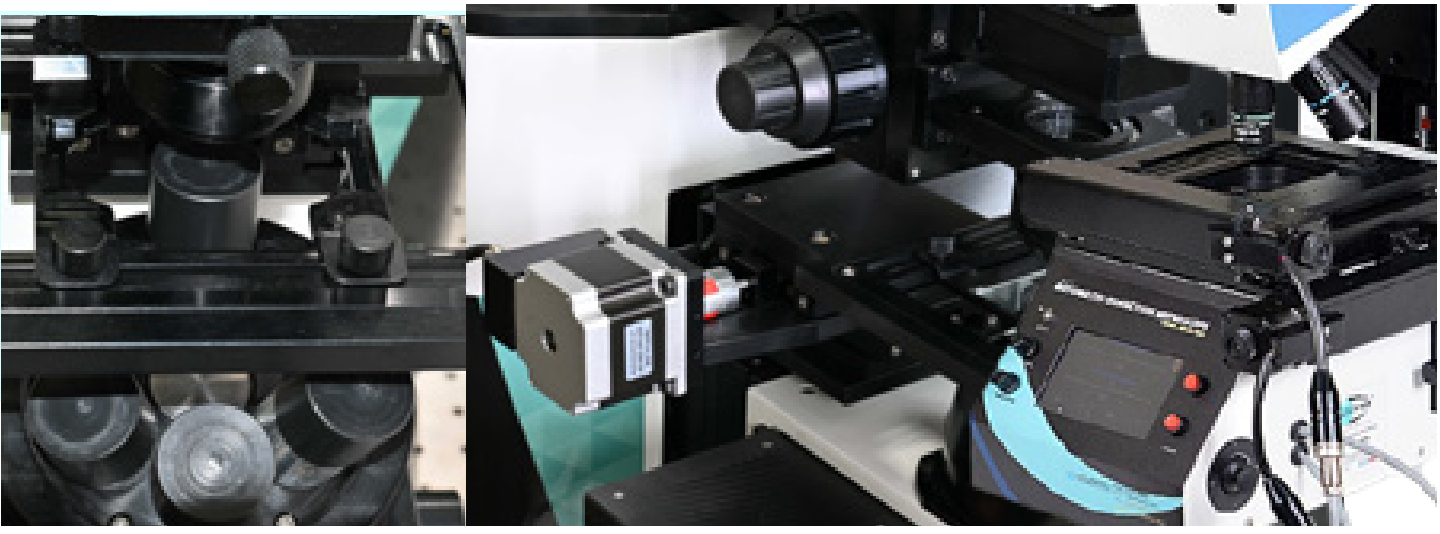
* Feature : Magnetic break helps stages carriage from sudden falling while loading heavy load in Z axis

Accessories



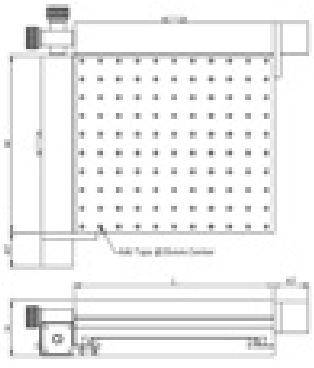
Base Plate	BP-RCMTS250-100	BP-RCMTS-250-200	BP-RCMTS250-250	BP-RCMTS250-300	BP-RCMTS250-500
	BP-RCMTS250-750	BP-RCMTS250-1000			
Vertical Bracket	VAB-RCMTS250-100	VAB-RCMTS250-250	VAB-RCMTS250-250	VAB-RCMTS250-300	VAB-RCMTS250-500
	VAB-RCMTS250-750	VAB-RCMTS250-1000			
Horizontal Bracket	HAB-RCMTS-250 Size : 250 x 250 mm				

Motorized XY Moving Platform



XY Moving Platform

MXYTS Series



MXYTS series motorized stages are manufactured in five different sizes for general purpose positioning and measurement applications. The stages are supplied with or without mounting holes as per requirement. The stages are supplied with or without mounting holes as per requirement. Drive leadscrew along with motor is mounted by the side of the stage. One end of the lead screw is attached to a rotary knob for manual adjustments, whenever required. Limit switches are fixed at both extremes for home and far end location. Crossed roller based linear guides are used for achieving precision linear motion. The guide ways are factory pre-loaded to eliminate play and wobble. Coefficient of friction is less than 0.003. Standard stages are constructed in aluminium alloy and finished by black anodizing.

controller sold separately

- XY moving platforms
- XY dispensing units
  Inspection microscopes
- Hardness testing
- Induction hardening
- Measuring microscope

Precision lead screw 0.010 mm Straight line accuracy

Specifications

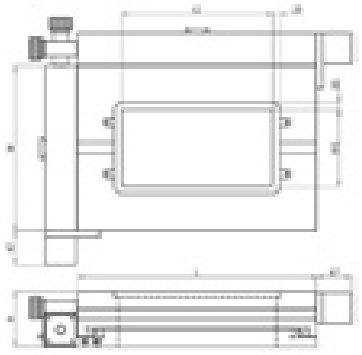
Straight line accuracy	0.010 mm
Positioning accuracy	0.005 mm
Repatability (unidirectional)	0.002 mm
Backlash	0.02mm (Max)
Resolution	0.625 micron (1/16 microstep
Drive	Precision lead screw
Mounting holes	M6 mounting holes
Load Capacity	20 Kg
Base mountable	

Model No.	Carriage size	Travel X & Y	Height	L	W
MXYTS150150	150 x 150	50, 50	65	150	150
MXYTS170170	170 x 170	100, 100	65	170	170
MXYTS270170	270 x 170	200, 100	75	270	170
MXYTS270240	270 x 240	200, 170	75	270	240
MXYTS270270	270 x 270	200, 170	75	270	270
MXYTS370240	370 x 240	200, 170	75	370	240
MXYTS370370	370 x 370	300, 300	75	370	370

All dimensions are in “mm”



XY Moving Platform
MXYTSW Series



MXYTSW Series stages are provided with a rectangular through hole at the center. This holes can either be used as access hole for keeping other instruments or for illuminating objects from underneath. Drive lead screw along with motor is mounted by the side of the stage. One end of the lead screw is attached to a rotary knob for manual adjustments, whenever required. Limit switches are fixed at both extremes for home and far end location.

Crossed roller based linear guides are used for achieving precision linear motion. The guide ways are factory pre-loaded to eliminate play and wobble. Coefficient of friction is less than 0.003. Standard stages are constructed in aluminium alloy with black anodized finish.

controller sold separately



Straight line accuracy	0.010 mm
Repeatability	0.002 mm
Drive	Precision lead screw
Mounting holes	M6 mounting holes
Finish	Black anodized
Stepper Motor Driven	

Glass Plate

Model	Size	Compatible Stage
GI7575	95 x 95	XYTSW175175
GI125125	145 x 145	XYTSW225225
GI225125	245 x 145	XYTSW325225
GI225195	245 x 215	XYTSW325295
GI325195	345 x 215	XYTSW425295

Application Areas

One of the application of MXYTSW Series motorized stage is automated pipetting system in which sample tray is connected to the motorized stage. These XY stages are fitted with a drive mechanism that provides controlled, precise positioning along X and Y axis. Pre programmed position control unit allows accurate positioning of sample compartment below the pipetting system.



Profile projector
Measuring microscope
Inspection microscope
Dispensing unit
Automated pipetting system

Model No.	Carriage size	Aperture Size	Travel X & Y	H	L	W	L1	W1
MXYTSW175175	175 x 175	75 x 75	50, 50	65	175	175	75	75
MXYTSW225175	225 x 175		100, 50		225	175		
MXYTSW225225	225 x 225	125 x 125	100, 100	65	225	225	125	125
MXYTSW325225	325 x 225	225 x 125	200, 100	75	325	225	225	125
MXYTSW325295	325 x 295	225 x 195	200, 170	75	325	225	225	195
MXYTSW425295	425 x 295	325 x 195	300, 170	75	425	225	325	195

All dimensions are in “mm”

Long Travel Motorised XY Stage

Model: MLXYTS-550



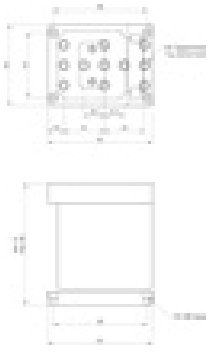
* Without encoder # controller sold separately

Platform flatness	within 40 microns
Travel range	400 x 400 mm
Carriage size	550 x 550 mm
Ball screw pitch	4 mm
Straight line accuracy	0.010 mm
Positioning accuracy	0.02 mm*
Repeatability (unidirectional)	0.02 mm*
Backlash	0.02 mm (Max)
Resolution	0.00125 mm (1/16 microstep)
Maximum speed	16mm / sec (4 RPS)
Mounting holes	M6 mounting holes
Load Capacity	10 Kg
Motor	56 mm frame stepper motor

Motorized Vertical Translation Stages



Holmarc's motorized actuator can be used to replace micrometers in translation stages or lead screws in kinematic mounts for making the positioning automated with appropriate control electronics. Drive is achieved by a stepper motor coupled to a precision lead screw–nut mechanism. The spindle of the actuator which moves forward and backward when the motor rotates is made non-rotating to bring in extra precision. Construction material is stainless steel . Our standard position controllers can be used to drive these actuators without any customization. Holmarc can supply kinematic mounts and stages fitted with these actuators for custom applications. You are welcome to discuss your needs with our sales engineers.



controller sold separately

0.5 mm Pitch Lead Screw

Model No.	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm	Load capacity
MVTS-5065-10	65	50	75 - 85	10	2 Kg
MVTS-5065-25	65	50	90 - 115	25	2 Kg
MVTS-65-10	65	65	90 - 100	10	5 Kg
MVTS-65-25	65	65	100 - 125	25	5 Kg

1 mm Pitch Lead Screw

Model No:	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load capacity
MVTS-75-10	75	75	75 - 85	10	5 Kg
MVTS-75-25	75	75	90 - 100	25	5 Kg
MVTS-90-10	90	90	90 - 100	10	5 Kg
MVTS-90-25	90	90	100 - 125	25	5 Kg

2 mm Pitch Lead Screw

Model No:	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm)	Load capacity
MVTS-125-10	125	125	100 - 120	10	15 Kg
MVTS-125-25	125	125	125 - 150	25	15 Kg
MVTS-125-50	125	125	150 - 200	50	10 Kg
MVTS-125180-10	125	180	100 - 110	10	15 Kg
MVTS-125180-25	125	180	125 - 150	25	15 Kg
MVTS-125180-50	125	180	150 - 200	50	10 Kg
MVTS-200200-10	200	200	100 - 110	10	12 Kg
MVTS-200200-25	200	200	125 - 150	25	10 Kg
MVTS-200200-50	200	200	150 - 200	50	8 Kg

Specifications

Travel	10 - 50 mm
Absolute positioning accuracy	5 micron *
Resolution	0.625 micron (1/16 microstep) *
Repeatability	5 micron *
Straight line accuracy	10 micron *
Parallelism	5 micron (total travel)
Assembly	10 micron
Full travel	5 micron
Maximum Speed	8 mm / sec *
Minimum continuous speed	12.5 micron / sec *
Feedback	Nil
Linear Guide way	Pre-loaded roller bearing
Material Construction	Aluminum 6061
Main body	Aluminum 606
Lead screw	Steel hardened
Nut	Brass / Bronze
Load Capacity	10 - 15 kg
Motor	Stepper Motor
Lead screw	
Lead screw pitch	2 mm (can be modify on request)
Lead screw type	Precision ground lead screw
Coupling	Directing coupling (coupling not included)
Bearings	SKF or Equivalent
Lubricants	Grease
Finish	Black Anodized
Mounting holes	
Top Plate	M6 Mounting holes on 25mm grid
Bottom plate	M6 Clear Holes
Operating temperature	5 - 80 degree centigrade
Accessories	Nil
Electrical connector	9 pin brass connector
Limit switches	Optical limit switch
Controller	Single axis controller
Hand held controller	Optional handheld controller on request



Vacuum Compatible Motorized Vertical Translation Stage HVC-MVTS Series s

Model No.	L (mm)	B (mm)	H (min, max) (mm)	Travel (mm	Load capacity
HVC-MVTS-125-10	125	125	100 - 120	10	15 Kg
HVC-MVTS-125-25	125	125	120 - 145	25	15 Kg
HVC-MVTS-125-50	125	125	150 - 200	50	10 Kg
HVC-MVTS-125180-10	125	180	100 - 110	10	15 Kg
HVC-MVTS-125180-25	125	180	120 - 145	25	15 Kg
HVC-MVTS-125180-50	125	180	150 - 200	50	10 Kg
HVC-MVTS-200200-10	200	200	100 - 110	10	12 Kg
HVC-MVTS-200200-25	200	200	120 - 145	25	10 Kg
HVC-MVTS-200200-50	200	200	150 - 200	50	8 Kg

Stepper Motor

Brand	M-tork , manufactured by Holmarc
Vacuum compatibility	Ultra high vacuum compatible Stepper Motor
Vacuum range	≤ 1x10-7 mbar
Bake able temperature	200°C
Core material	Stainless steel, Grade - SS430
Shaft material	Stainless steel - 304
Bearings	Stainless steel - 304
Side plates	Aluminium - 6061
Winding	Class heavy film Polyester over coated with plyamideimide enameled copper wire, 200°C thermal cla
Plastic parts	Teflon
Size of motor	56 x 56 x 52 mm

0.001 mm Resolution
0.01 mm Positioning Accuracy

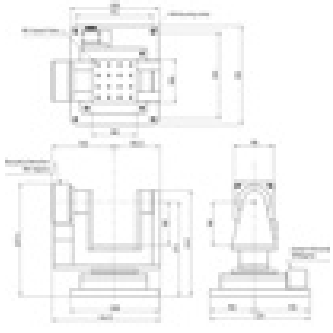




Motorized Two Axes Gimbal Stage



HO-MGS Series



Specifications

Number of Axes	Two (Azimuth and Elevation)
Travel	360 Degree Continuous
Minimum mounting platform size	100 mm x 100 mm
Maximum mounting platform size	200 mm x 200 mm
Platform type	Option - 1 : Off axis gimbal platform
	Option - 2 : On axis gimbal platform
Load capacity	0.5 to 4 Kg
Positioning accuracy	0.1 degree
Backlash	0.1 degree
Home positioning accuracy	0.01 degree

On Axis Platform

MGS-100OA

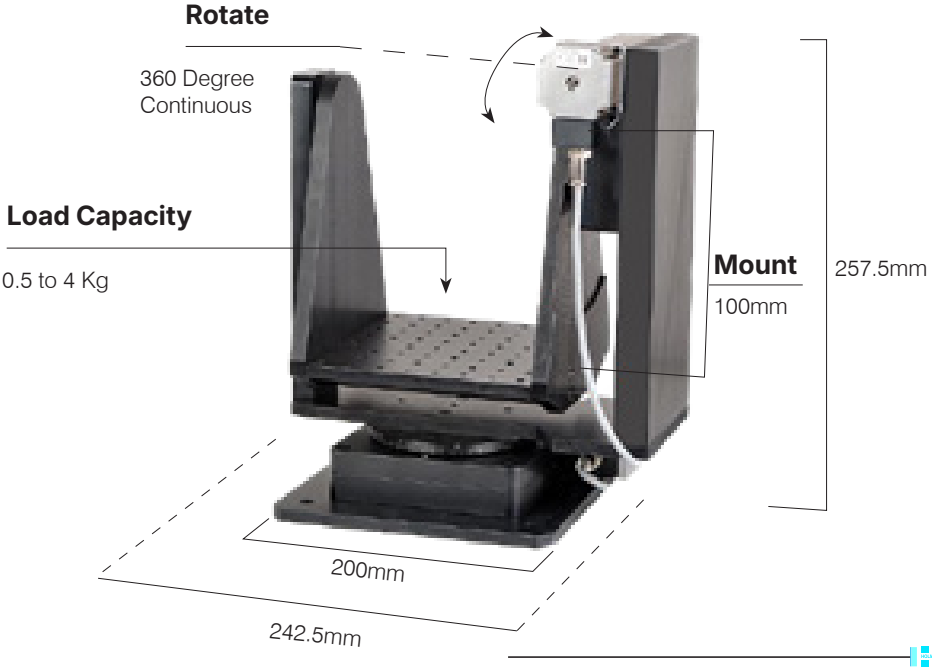


Off Axis Platform

MGS-200OA



360º Continuous Travel
Load capacity up to 4Kg







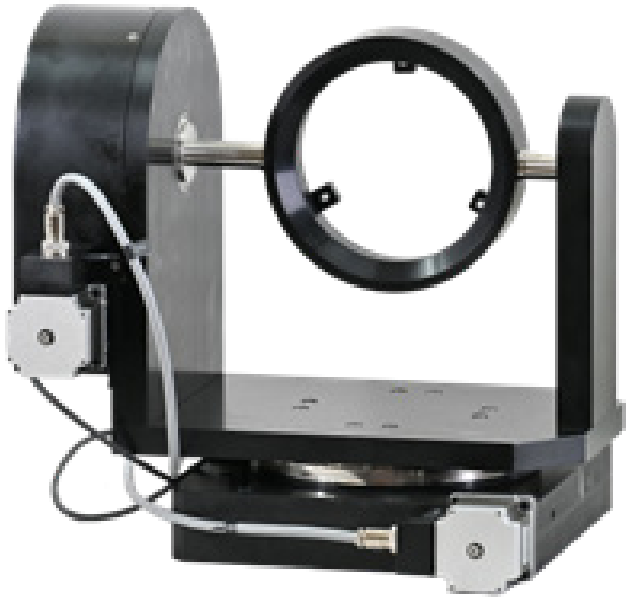

Model No.		MGS-100A	MGS-100-OA	MGS-200A	MGS-200-OA
Type		On axis platform	Off axis platform	On axis platform	Off axis platform
Platform Size		100x100mm	100x100mm	200x200mm	200x200mm
Depth of platform form axis		0	100	0	200
Load Capacity		1 Kg	1 Kg	3 Kg	3 Kg
Gear Ratio	Azimuth	180:1	180:1	240:1	240:1
	Elevation	90:1	90:1	180:1	180:1
Degree / 1 full rotation of motor	Azimuth	2°	2°	1.5°	1.5
	Elevation	4°	4°	2°	2°
Maximum speed *	Azimuth	8°	8°	6°	6°
	Elevation	16°	16°	8°	8°
Positioning accuracy		0.01°	0.01°	0.01°	0.01°

Custom motorized Gimbal (Including controller and software)

Specifications

Clear Aperture Diameter	140 mm
Accuracy	±24 μrad (±5 arc sec)
Repeatability	5 arc sec
Resolution	0.50 μrad
Max Pay load (kg)	2.5 kg
Max Speed	60 rpm
Move profile	60° Continuous, AZ/E





Motorized Goniometer

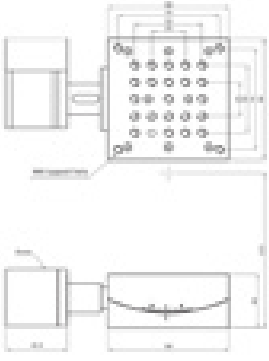


MGM Series

Holmarc's goniometers use rolling contact guides with balls rolling on precision curved 'V' grooves for friction less and stick-slip free movements. Pre-loading of the ball guides ensure play less positioning and long term stability. Drive is achieved by a worm and gear mechanism. Graduations are marked on one side of the stage for measurements and repeatable positioning. Construction material of the goniometer is chosen as aluminium alloy for keeping the self weight of the device as minimum as possible. Black anodized finish is given to make the goniometer optics lab compatible.

Holmarc makes goniometers for custom applications as well. Please contact our sales engineers for more details.

controller sold separately







Model No.	MGM-35-55	MGM-50-63	MGM-65-75	MGM 90-100
Travel	+/- 5°	+/- 7.5°	+/- 10°	+/- 15°
Central Height	55 mm	63 mm	75 mm	100 mm
Load Capacity	1 Kg	2 Kg	6 Kg	10 Kg

Base Plate



Model No.	BP-MGM-35	BP-MGM-63	BP-MGM75	BP-MGM-90

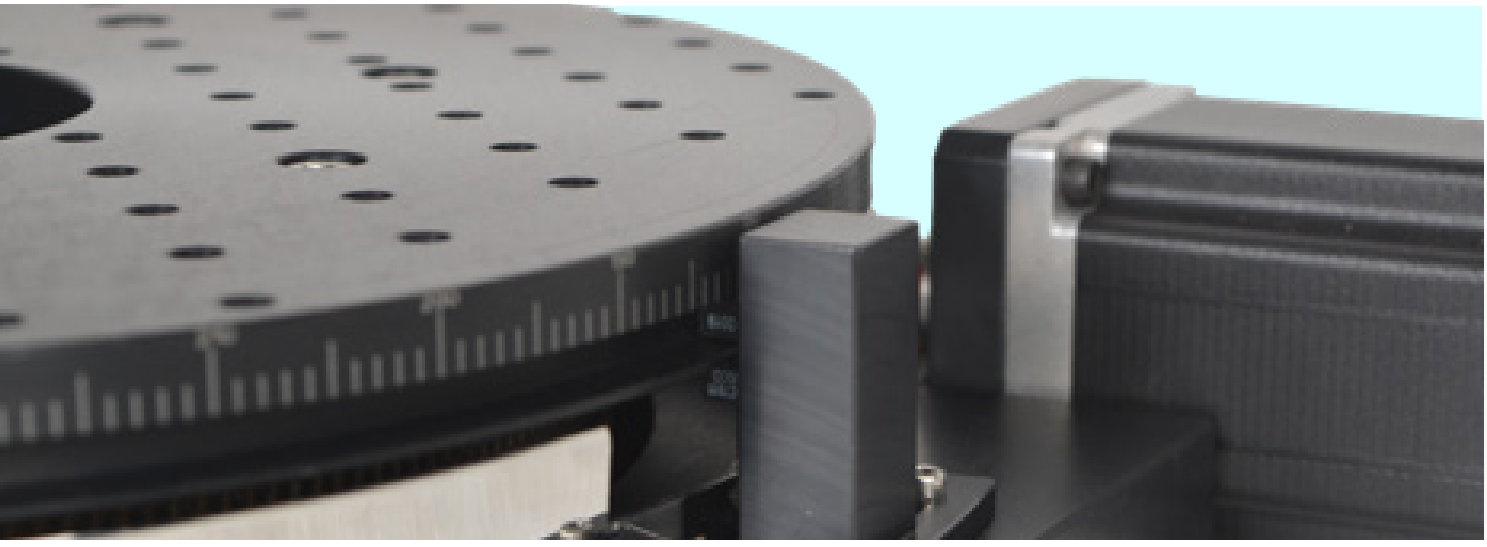
Specifications

Model	MGM-65-75
Travel	+/- 10°
Positioning Accuracy	0.1 degree
Readout (dial)	1 degree
Resolution	0.00046875 degree (microstep)
Drive mechanism	Worm gear and worm shaft
Gear ratio	240:1
Construction	Aluminium
Coupling	Flexible coupling
Guideway	Radial 'v' grooved
Drive	Stepper motor
Load capacity	6 Kg

Specifications 2

Model	MGM-90-100
Travel	+/- 15°
Pay-Load	Axial 10 Kg
Gear Ratio	180 : 1 (reduction)
Rotation of top disc / rotation of worm shaft	2 degree
Absolute positioning accuracy	0.1 degree
Repeatability	0.06 degree
Resolution	0.005 degree (Half step)
	0.000625 degree (micro step - 1/16)
Maximum speed	8 degree / sec (4 rps)
Feedback	Optional (on request)
Top plate size	90 mm x 90mm
Mounting holes	M6 Tapped holes
Construction	Aluminum alloy
Finish	Black anodized
Guide way system	Radial V grooved ball guide way
Drive	Precision worm gear and shaft assembly
Actuator	Stepper motor
Limit switch	Optical limit switch
Connector	Brass connector with junction box

Motorized Rotation Stage



Sine Drive Angular Stage

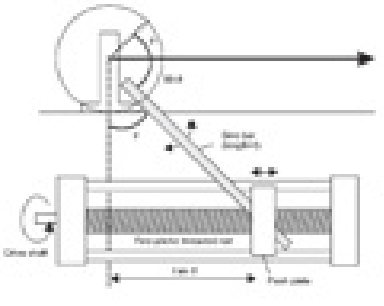
Sin216R Series

The Sin216R series are ultra-precision computer controlled angular stages developed for accurate positioning applications. Sine-bar mechanism is employed in this device for higher resolution angular positioning. A precision linear translation stage with a high resolution optical encoder is used in the mechanism for achieving angular tilt of the sine bar. The absolute encoder allows instant initialization at the time of power up and eliminates the need for a home cycle. The stepper motor turns the drive lead screw which moves the drive block which in turn pushes the sine bar to rotate the platform, providing stable and excellent performances in angular positioning.

The principle of sine drive mechanism is shown schematically in Fig. When a lever of length L is rotated through an angle θ about one end, the other end moves through a distance $X = L \sin \theta$ perpendicular to the initial position of the lever. Standard metric M4 mounting holes patterns are provided on the top plate of these stages. Top plate can be used to position manually large optical and other components through with accuracy of 1°. Custom mounting patterns can be provided for easy integration with other systems / components. The Sin216R series stages are perfect for rotary positioner testing, laser pointing, optical calibration systems and metrology systems. Other specific applications include optical encoder accuracy testing, missile seeker testing, photonic component alignment and precision wafer inspection.

- Angle Calibration
- Laser Nano Scanning
- X-Ray Mirror Deflection
- Nano Probe Positioning

0.000069 Degree Accuracy
Precision High-Performance





controller sold separately
Sine drive rotation stages are also offered in high vacuum and ultra high vacuum configurations. Please contact us for details.

Model No.	HO-Sin216R	HO-Sin216R8	HO-Sin216R4
Angular Measurement System	Sin bar	Sin bar	Sin bar
Travel Range	16° (± 8°)	8° (± 4°)	4° (± 2°)
Platform Size	150 mm Dia	150 mm Dia	150 mm Dia
Rotation Axis Height	80 mm	80 mm	80 mm
Speed max. (Degree / sec.)	2	2	2
Stepper Resolution	0.125 Arc Sec (0.00003477 Degree)	0.0625 Arc Sec (0.0000174 Degree)	0.0625 Arc Sec (0.0000087 Degree)
Accuracy	Arc Sec (0.0002778 Degree)	0.5 Arc Sec (0.000138 Degree)	0.25 Arc Sec (0.000069 Degree)
Repeatability	1 Arc Sec (0.0002778 Degree)	0.5 Arc Sec (0.000138 Degree)	0.25 Arc Sec (0.000069 Degree)
Tapped Holes on Carriage M6	M4	M4	M4
Interface	USB 2.0 & RS 232	USB 2.0 & RS 232	USB 2.0 & RS 232
Size (L x W x H)	310 x 250 x 80 mm	520 x 250 x 85 mm	750 x 250 x 90 mm

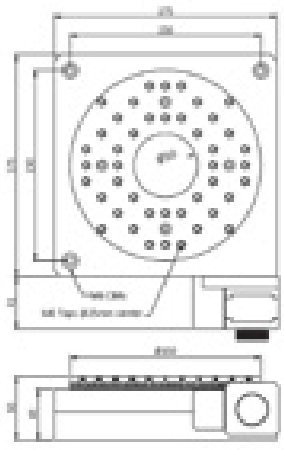
Motorized Rotation Stage

MRSC Series

These stages are suitable for applications where positioning needs to be automated. The drive mechanism consists of worm and gear assembly perfectly matched to minimize play and backlash. There is an access hole through the center of the stage for illumination from underneath or for similar purposes.

Radial play is eliminated by the use of preloaded thrust bearings. Stepper motor is used as the electrical actuator and is connected to the worm. Shaft of the stepper motor is connected to a rotating knob for manual adjustments, whenever required. Top surface of the stage is provided with tapped holes and base with counter bored holes for mounting. Standard stages are manufactured in aluminium alloy and finished by black anodizing. The stage can be manufactured in stainless steel and mild steel with the required finish.

controller sold separately



MRSC-150



Model No.	MRSC 40	MRSC 50	MRSC 75	MRSC 100	MRSC 150
Top Disc Dia.	40 mm	50 mm	75 mm	100 mm	150 mm
Through Hole Dia.	12 mm	12 mm	12 mm	30 mm	50 mm
Load Capacity	2 Kg	5 Kg	8 Kg	50 Kg	100 Kg
Gear Ratio	60 : 1	72 : 1	90 : 1	180 : 1	240 : 1
Maximum speed	24 deg / sec	20 deg / sec	16 deg / sec	8 deg / sec	6 deg / sec
Half Step Resolution	0.015 deg	0.0125 deg	0.01 deg	0.005 deg	0.0035 deg

Model No.	MRSC 200	MRSC 300	MRSC 400	MRSC 500
Top Disc Dia.	200 mm	300 mm	400 mm	460 mm
Through Hole Dia.	65 mm	65 mm	65 mm	65 mm
Load Capacity	150 Kg	200 Kg	300 Kg	500 Kg
Gear Ratio	225 : 1	225 : 1	150 : 1	180 : 1
Maximum speed *	6.4 deg / sec	6.4 deg / sec	9.6 deg / sec	8 deg / sec
Half Step Resolution	0.004 deg	0.004 deg	0.006 deg	0.005 deg

- Pre loaded rolling contact bearings are used to minimize friction and to eliminate play
- Driven by precision worm gear assembly
- Graduated rotary scales are provided for visual reference of positions
- Can be fitted to our motorized linear stages for multi axis configurations
- Custom stages can be constructed out of aluminium, steel and SS depending on the application
- Custom mounting patterns are available for easy integration with other devices

MRSC Series Motorized Rotation Stage with XY Positioner
Application Idea :
MRSC series rotation stage can be assembled along with XY stage. It can be used to position the rotation stage precisely in X and Y directions. Feel free to contact our engineers,
E-mail : sales@holmarc.com

Model : MRSC 40



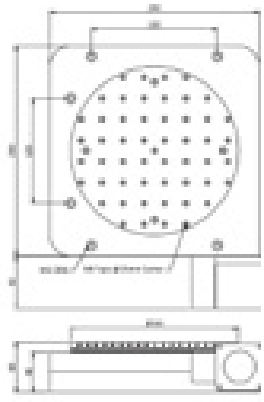
Model : MRSC 40



Double bearing design
Precision worm gears



MRS Series



Model No.	D (mm)	W (mm)	H (mm)	Load Capacity	Gear Ratio	Maximum speed *	Half Step Resolution
MRS 50	50	65	45	5 Kg	72 : 1	20 deg / sec	0.0125 deg
MRS 75	75	90	45	8 Kg	90 : 1	16 deg / sec	0.01 deg
MRS 100	100	150	50	50 Kg	180 : 1	8 deg / sec	0.005 deg
MRS 150	150	175	50	100 Kg	240 : 1	6 deg / sec	0.0035 deg
MRS 200	200	250	65	150 Kg	180 : 1	8 deg / se	0.005 deg

* (4 RPS of motor)

MRS series motorized rotation stages are designed and manufactured for automated positioning applications. Since perfectly matched worm gear assembly is used as drive mechanism, play and back-lash is minimal in these stages. The top rotating part which is plane in this case, is provided with rotary graduations on the periphery throughout 360 degree.

Radial play is eliminated by the use of preloaded thrust bearings with balls as rolling elements. Stepper motor is used as the electrical actuator and is connected to the worm. Shaft of the stepper motor is connected to a rotating knob as well for manual adjustments, whenever required. Top surface of the stage is provided with tapped holes and base with counter bored holes for mounting. Standard stages are manufactured in aluminium alloy and finished by black anodizing. The stage can be manufactured in stainless steel and mild steel as well with required finish.

controller sold separately

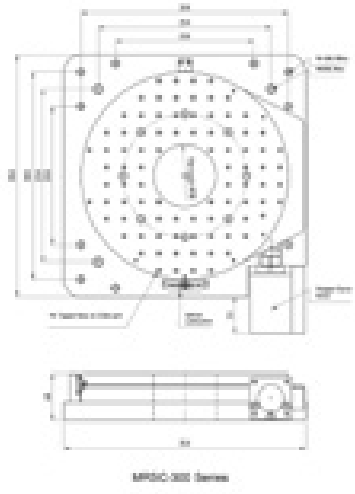


- Pre loaded rolling contact bearings are used to minimize friction and to eliminate play
- Driven by precision worm gear assembly
- Graduated rotary scales are provided for visual reference of positions
- Can be fitted to our motorized linear stages for multi axis configurations
- Custom stages can be constructed out of aluminium, steel and SS depending on the application
- Holmarc can provide custom mounting pattern on request



Model No.	MRS-100	MRS-150
Pay-Load	Axial 50 kg Radial : 5 kg	Axial 100 kg Radial : 12 kg
Travel	360 degree continues	360 degree continues
Gear Ratio (reduction)	180:1	240:1
Rotation of top disc / rotation of worm shaft	2 degree	1.5 degree
Absolute positioning accuracy	0.1 degree	0.1 degree
Repeatability	0.05 degree	0.05 degree
Resolution	0.005 degree (Half step) 0.000625 degree (micro step -1/16)	0.0035 degree (Half step) 0.00047 degree (micro step -1/16)
Maximum speed	+-8 degree / sec (4 rps)	-6 degree / sec (4 rps)
Feedback	Optional (on request)	Optional (on request)
Rotating disc diameter	100mm	150 mm
Mounting holes	M6 Tapped holes	M6 Tapped holes
Through diameter	MRSC-100 : Dia-30mm MRS-100 : Flat surface M6 mounting holes	MRSC-150 : Dia-50mm MRS-150 : Flat surface M6 mounting holes
Construction	Aluminum alloy	Aluminum alloy
Finish	Black anodized	Black anodized
Rotary stage bearing system	Double bearing system including preloaded roller thrust bearing	Double bearing system including preloaded roller thrust bearing
Drive	Precision worm gear and shaft assembly	Precision worm gear and shaft assembly
Actuator	Stepper motor	Stepper motor
Limit switch	Optical home sensing limit switch	Optical home sensing limit switch
Connector	Brass connector with junction box	Brass connector with junction box

Motorized Heavy Duty Rotation Stages MRSH Series



These are heavy duty stages which can take axial loads beyond 400 kg's. Perfectly matched worm and gear assembly to minimize play and back-lash. The top rotating part which is plane in this case, is provided with rotary graduations on the periphery throughout 360 degree.

Radial play is eliminated by the use of preloaded thrust bearings using balls as rolling elements. Stepper motor which is connected to the worm is used as a electrical actuator. Shaft of the stepper motor or servo motor is connected to the rotating knob as well for manual adjustments, when ever required. Top surface of the stage is provided with tapped holes and base with counter bored holes for mounting. Standard stages are manufactured in aluminium alloy with black anodizing finish. The stage can be manufactured in stainless steel and mild steel as well with the required finish.

To meet the most critical positioning demands, rotary encoder is used. It converts the angular position of a shaft to digital code, making it an angle transducer.

controller sold separately

Specifications

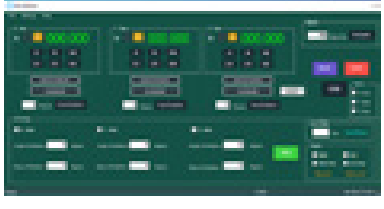
Material	Aluminium / SS
Turn table dimension	up to 500 X 500mm
Load Capacity	up to 400 Kg
Maximum Speed	10 degree / sec
Traverse	360 º
Actuator	Stepper motor
Control Type	Closed loop using rotary encoder
Encoder resolution	200 ppr

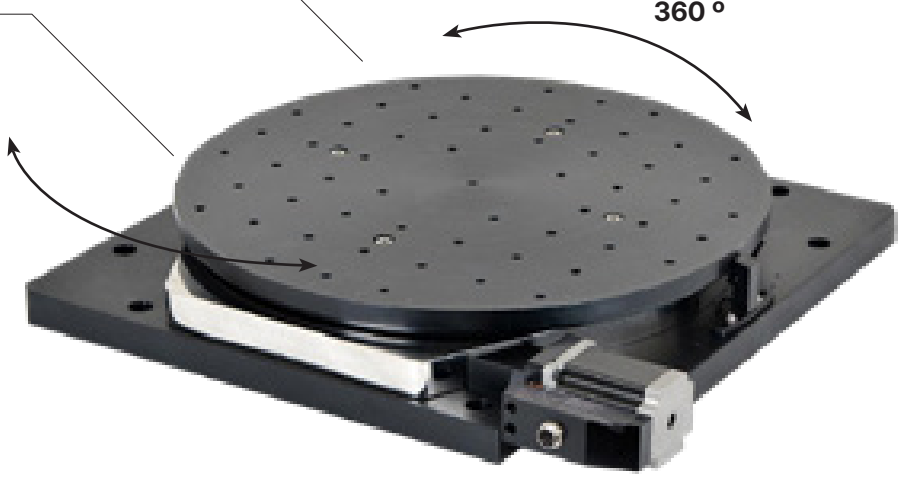
- Pre loaded rolling contact bearings are used to minimize friction and to eliminate play
- Driven by precision worm gear assembly
- Graduated rotary scales are provided for visual reference of positions
- Can be fitted to our motorized linear stages for multi axis configurations
- The stages can be constructed out of aluminium, steel or SS depending on the application

Pay-Load

300 - 400 Kg
(Choose from Table

Control Software





360 º Traverse

Stepper motor Actuator

Stepper motor drive Rotation stages

Model No.	MRSH 300	MRSH 400	MRSH 500
Foot print (length x width)	300 x 350	400x 450	500x500
Rotating Disc Dia	300	400	460
H (mm)	68	80	80
Load Capacity	300 Kg	350 Kg	400 Kg
Gear Ratio	225 : 1’	150 : 1’	180 : 1’
Degree/1 full rotation of motor	1.6^{o}	2.4^{o}	2^{o}
Maximum speed *	6.4^{o}	9.6^{o}	8^{o}
Positioning accuracy	0.1^{o}	0.1^{o}	0.1^{o}
Half Step Resolution	0.004^{o}	0.006^{o}	0.02
# Available micro stepping 1/8, 1/16, 1/256		* (4 RPS of motor)	

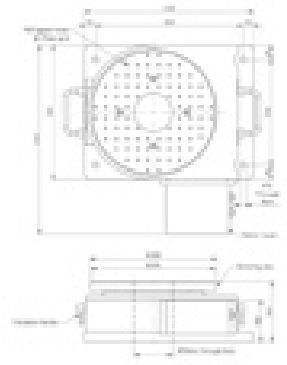
AC Servo motor drive Rotation stages

Model No:	MRSH 300-ACS	MRSH 400-ACS	MRSH 500-ACS
Foot print (length x width)	300x350	400x450	500x500
Rotating Disc Dia	300	400	460
H (mm)	68	80	82
Load Capacity	300 Kg	350 Kg	400 Kg
Gear Ratio	225 : 1’	150 : 1’	180 : 1’
Degree/1 full rotation of motor	1.6^{o}	2.4^{o}	2^{o}
Maximum speed *	32^{o}	48^{o}	40^{o}
Positioning accuracy	0.1^{o}	0.1^{o}	0.1^{o}
Half Step Resolution	0.00016^{o}	0.00024^{o}	0.0002^{o}
		* (20 RPS of motor)	

- 360^{o} rotatable
- Fine rotation 0.1 degree
- Up to 400 Kg load capacity
- Stepper motor or AC servo motor drive options
- Double bearing design
- Precision worm gears
- m6 / M8 mounting holes
- M6 / M8 / M12 C’bored holes
- Aluminium and SS construction
- Encoder on request only
- Controller sold separately



Rotation stage with IP65 rating



controller sold separately

Specifications

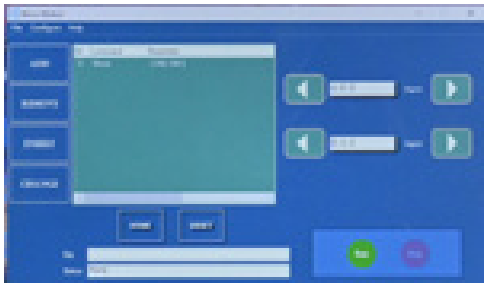
Water proof rating	IP65
Travel	360 degree (Continues)
Drive	Stepper motor or Servo motor
Load capacity	300 Kg
Gear mechanism	Precision worm gear mechanism
Center Hole	90 mm
Mounting holes	M6 Tapped holes on rotating disc, dia-10 holes on base
Material	Aluminium painted

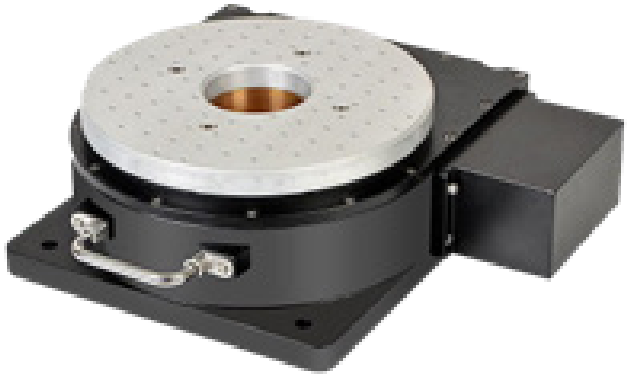
Stepper motor drive Rotation stages

Model No.	MRSH -IP65-300	MRSH -IP65-500
Foot print (length x width)	350x350	500x500
Rotating Disc Dia	300	460
H (mm)	145	195
Center bore	90 mm	90 mm
Load Capacity	300 Kg	400 Kg
Gear Ratio	225:1'	180:1'
Degree/1 full rotation of motor	1.6°	2°
Maximum speed *	6.4°	8°
Positioning accuracy	0.1°	0.1°
Half Step Resolution	0.004°	0.02°
# Available micro stepping 1/8, 1/16, 1/256		* (4 RPS of motor)

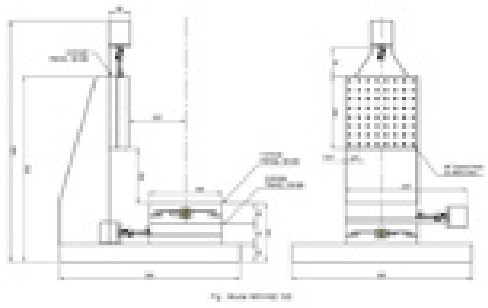
AC Servo motor drive Rotation stages

Model No:	MRSH -IP65-300-ACS	MRSH -IP65-500-ACS
Foot print (length x width)	350x350	500x500
Rotating Disc Dia	300	460
H (mm)	145	195
Center bore	90 mm	90 mm
Load Capacity	300 Kg	400 Kg
Gear Ratio	225:1'	180:1'
Degree/1 full rotation of motor	1.6°	2°
Maximum speed *	32°	40°
Positioning accuracy	0.1°	0.1°
Half Step Resolution	0.00016°	0.0002°
		* (20 RPS of motor)





3 Axis Precision Positioning System with Optional CNC Software (XY & Independent Z)



Motorized 3-Axis linear positioning system is a high precision positioning device can be used in industrial and scientific automated motion applications. The X, Y, and Z axis produce linear motion in three mutually orthogonal directions. Secondary linear axis & rotational axis can be provided optionally. A range of system configurations are possible and options including automated CNC operation. We also offer vacuum compatible and all steel construction motorized linear translation stages.

controller sold separately

Model No.	Travel Range X, Y, Z	Load Capacity X Y & Z	Resolution	Max. Speed	Work platform size
MXY-MZ-100	100 x 100 x 25mm	25 & 8 Kg	0.000625 mm	8 mm / sec	150 x 150 mm
MXY-MZ-100-A	100 x 100 x 50mm	20 & 10 Kg	0.000625 mm	8 mm / sec	150 x 150 mm
MXY-MZ-100-25	100 x 100 x 25mm	25 & 5 Kg	0.000625mm	8 mm / sec	150 x 150 mm
MXY-MZ-150	150 x 150 x 50mm	25 & 20 Kg	0.000625 mm	8 mm / sec	200 x 200 mm
MXY-MZ-150-A	150 x 100 x 50mm	25 & 8 Kg	0.000625 mm	8 mm / sec	200 x 150 mm
MXY-MZ-200	200 x 200 x 50mm	25 & 20 Kg	0.000625 mm	8 mm / sec	270 x 270 mm
MXY-MZ-200-A	200 x 150 x 50mm	25 & 20 Kg	0.000625 mm	8 mm / sec	270 x 170 mm
MXY-MZ-200-B	200 x 200 x 50mm	35 & 25 Kg	0.000625 mm	8 mm / sec	300 x 300 mm

0.625 micron resolution

5 micron positioning accuracy



- Suitable for Micromachining applications
- Precision roller slides
- 100 - 200 mm travel
- 5 micron positioning accuracy
- 0.625 micron resolution
- 2 mm pitch backlash free lead screw and nut
- Optional CNC software
- Up to 50 Kg load capacity
- Stepper motor for computer control movement
- Optional Servo motor control
- Controller with software for computer controlling
- Additional handheld unit or joysticks available as per request

Motorized Multi Axis Stage



(Linear & Rotary Configuration)

Most of the linear and rotary stages manufactured by Holmarc are modular in design that these can be assembled with suitable angle brackets and adapter plates to obtain multi-axes stages. Three of the linear and rotary combination stages are described in this section.

Compact XYZ Stage

Model: MXYZCTS-80

Specifications	
Top plate size	80 x 80 mm
X Travel	10 mm
Y Travel	5 mm
Z Travel	5 mm
Minimum Stage Height	52.5
Maximum stage height	57.5
Leadscrew pitch	0.4 mm
Resolution	0.125 micron (@ 1/16 microstep)
Maximum Speed	1.6 mm / sec (@ 4 RPS)
Minimum Continues Speed	2.5 micron / sec
Motor used	FL42STH38-1684AF
Load Capacity	3 Kg
Positioning Accuacy	20 micron



0.125 micron resolution
Load Capacity 3 Kg

controller sold separately

XYZ Theta Stage 500

Model: HO-MXYZR-500

In this model, theta stage is fixed to carriage of the Z stage with an bracket so that top surface of the theta stage is horizontal. As shown in the photograph, one side of the theta stage is obstructed by Z axis. All linear stages are given bellows protection.

controller sold separately

Absolute positioning accuracy	Linear stages (XYZ) : ± 0.025 mm or better
	Theta stage : 0.1 degree
Repeatability	Linear stage (XYZ) : ± 0.05 mm or better
	Theta stage : 0.1 degree
Straight line accuracy	Linear stage (XYZ) ± 5 μm / 25 mm or better
Construction	Aluminum alloy on any rust free
Finish	Black anodized
Travel	Linear stages (XYZ) : 500 mm
	Theta stage : 360 degree
Feedback	Nil
Resolution	Linear stages : 20 μm (full Step)
	Theta stage : 0.1 degree (full Step)
Linear guide and Rotary stage bearing system	Recirculation block and rail
	Double bearing system including preloaded roller thrust bearing
Drive	Linear stage (XY Stage) : Rolled ballscrew, pitch 4 mm
	Linear stage (Z Stage) : Rolled ballscrew with magnetic brake
	Rotation Stage : Precision worm gear and shaft assembly
Actuator	Stepper motor
Maximum speed	Linear stages (XY Stage) : 16mm / sec (4 rps)
	Linear stages (Z Stage) : 16 mm / sec (4 rps)
	Theta stage : 8 degree / sec (4 rps)
Limit switchs	Linear stages : Optical Limitswitch in both ends
	Theta stage : Optical home sensing limitswitch
Mounting Holes	Linear stages : M6 tapped holes
	Theta stage : M6 Tapped holes on top disc
Pay-Load	25 kg

Theta stage : 360 degree

Stepper Motor Actuator

XYZ Theta Stage 50
Model: HO-MXYZR-500

In this configuration, theta stage is fixed on top of Z stage with the help of an L bracket. This configuration helps to mount components on top of the theta stage without obstructions from any sides. All four axes are motorized with stepper.

Absolut e positioning accuracy	Linear stages (XYZ) : ± 5 μm
	Theta stage : 0.1 degree
Repeatability	Linear stage (XYZ) : ± 5 μm
	Theta stage : 0.1 degree
Straight line accuracy	Linear stage (XYZ) ± 5 μm / 25 mm or better
Construction	Aluminum alloy on any rust free
Finish	Black anodized
Travel	Linear stages (XYZ) : 50 mm
	Theta stage : 360 degree
Feedback	Nil
Resolution	Linear stages : 0.625 μm (micro step)
	Theta stage : 0.01 degree (micro Step)
Linear guide and Rotary stage bearing system Recirculation block and rail	
	Double bearing system including preloaded roller thrust bearing
Drive	Linear stage (XYZ Stage) : Leadscrew, pitch 2 mm
	Rotation Stage : Precision worm gear and shaft assembly
Actuator	Stepper motor
	Linear stages (XY Stage) : 8mm / sec (4 rps)
	Linear stages (Z Stage) : 8 mm / sec (4 rps)
	Theta stage : 12 degree / sec (4 rps)
Limit switchs	Linear stages : Optical Limit switch in both ends
	Theta stage : Optical home sensing limit switch
Mounting Holes	Linear stages : M6 tapped holes
	Theta stage : M6 Tapped holes on top disc
Pay-Load	25 kg



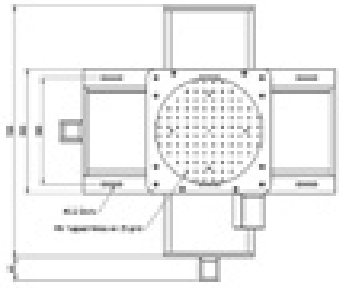


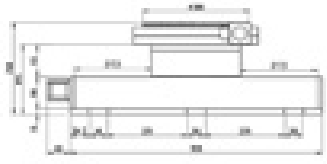
XY Theta Stage

Model: HO-MXYR-300

As evident from the photograph, theta stage is placed on top of X-Y stages. All three axes are motorized, still hand knobs are given behind each motor for manual adjustments if required. X and Y stages have bellows protection. Top surface of theta stage is provided with tapped holes for mounting.

controller sold separately





Controller and Software



M6 Tapped Holes

M6 tapped holes, Theta stage

Pay-Load 250 Kg

Aluminium alloy B51S Construction

Linear Stage

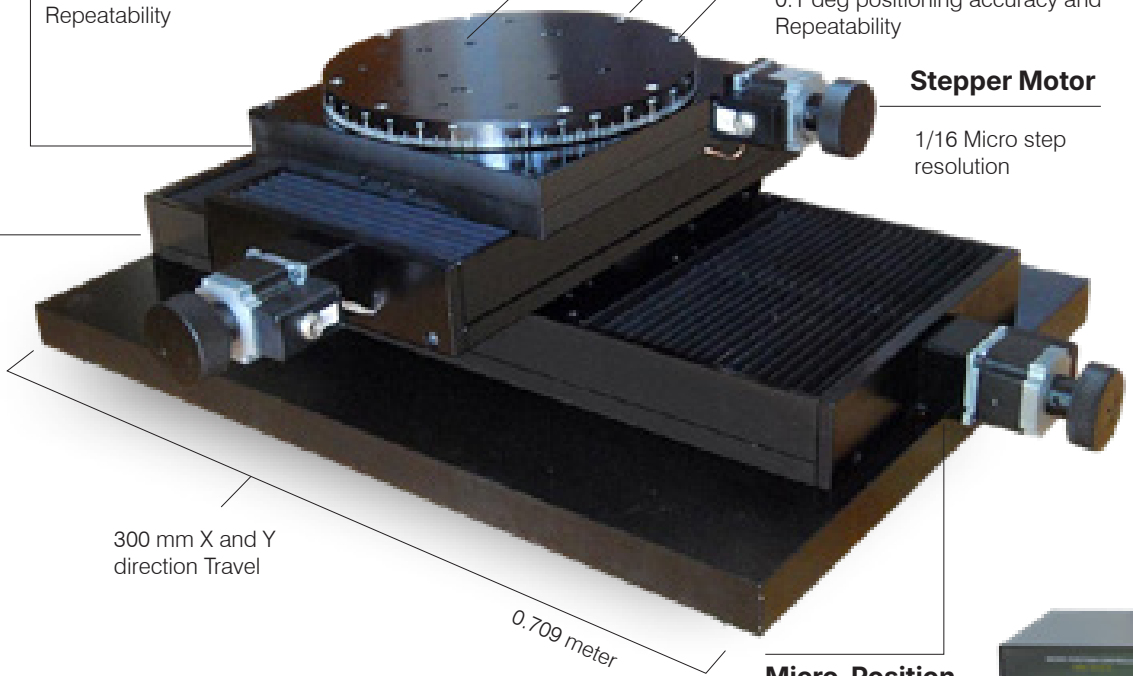
16mm / sec (4 rps) Maximum Speed
± 0.20 mm positioning accuracy with ± 0.20 Repeatability

Theta Stage

8 degree / sec (4 rps)
0.1 deg positioning accuracy and Repeatability

Stepper Motor

1/16 Micro step resolution



300 mm X and Y direction Travel

0.709 meter

Micro-Position Controller



Specifications

Absolute positioning accuracy	Linear stages (XY) : ± 0.20 mm or better
	Theta stage : 0.1 deg
Repeatability	Linear stage (XY) : ± 0.20 mm or better
	Theta stage : 0.1 deg
Straight line accuracy	Linear stage (XY) ± 25 μm
Construction	Aluminum alloy on any rust free
Finish	Black anodized
Travel	Linear stage X Axis : 300 mm
	Linear stage Y Axis : 300 mm
	Theta stage : 360 degree
Feedback	Linear stage : NIL
	Theta stage : NIL
Resolution	Linear stages : 10 μm (Half step)
	Theta stage : 0.1 degree (Full step)
Linear guide & Rotary stage bearing system	Recirculation block and rail
	Double bearing system including preloaded roller thrust bearing
Drive	Linear stage (XY Stage) : Rolled ballscrew, pitch 4 mm
	Theta Stage : Precision worm gear and shaft assembly
Actuator	Stepper motor
Maximum speed	Linear stages (XY Stage) : 16mm / sec (4 rps)
	Theta stage : 8 degree / sec (4 rps)
Limit switches	Linear stages : Optical Limit switch in both ends
	Theta stage : Optical home sensing limit switch
Pay-Load	250 kg
Mounting Holes	Linear stages : M6 tapped holes, Theta stage : M6 Tapped holes on top disc

Controller and Software specifications

Motor Type	Stepper
Drive	Bipolar stepper motor drive
	Micro step resolution : 1/16
Encoder Feedback	Optional

Micro-Position Controller

Type of processor	Micro-controller
Lab-View compatibility	Optional (A command set will be provided which can be used to communicate with the controller using Lab VIEW or any other programming language through RS232 port.)
PC interface	RS232 (USB / RS485) 5 meter cable
Power supply	Built-in SMPS (24 VDC)
Input voltage	230V AC / 50Hz

Micro-Motion (Software)

Independent motion	Every stage can be operated independently
Displacement	Command to move the stage to a specified distance in Microns (Deg.)
Speed	Command to Set the speed of motion of the stage
Trigger I / O	Command to make the Controller to wait for a trigger pulse from an external source
	Command to make the controller to generate a pulse used for triggering external devices
Delay	Command to make controller to wait a specified time in milli seconds without doing operation
Motion programs	Sets of commands can be saved as a single program and can be executed by a single click
Position indication	Position counter is updated after the completion of each movement

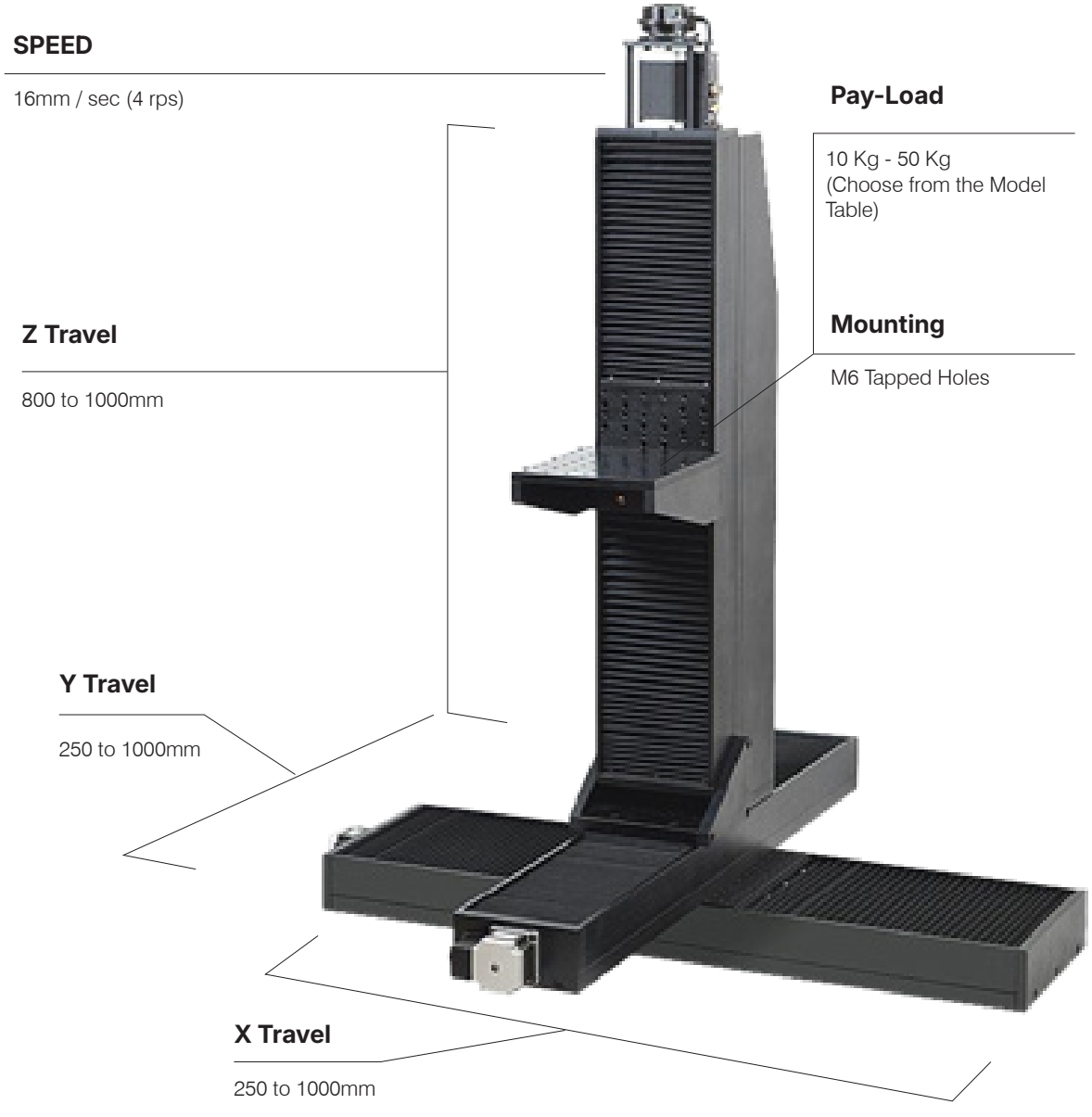
XYZ Stage

Model: HO-MXYZ-100

In this HO-MXYZ-100 design, a long travel Z stage is fixed on top of 250mm travel XY stage. 200 x 200mm area angle bracket is placed on the Z stage for mounting components. All three axes are motorized with stepper.

controller sold separately

Model No.	Travel X	Travel Y	Travel Z	Load Capacity	Construction	Finish
HO-MXYZ-100	250 mm	250 mm	800 mm	25 Kg	Aluminium alloy B51S	Black anodized
HO-MXYZ-100B	300 mm	300 mm	300 mm	50 Kg	Aluminium alloy B51S	Black anodized
HO-MXYZ-100C	500 mm	500 mm	500 mm	50 Kg	Aluminium alloy B51S	Black anodized
HO-MXYZ-100D	200 mm	200 mm	500 mm	30 Kg	Aluminium alloy B51S	Black anodized
HO-MXYZ-100E	750 mm	250 mm	750 mm	75 Kg	Aluminium alloy B51S	Black anodized
HO-MXYZ-10F	1000 mm	1000mm	1000mm	10 - 50 Kg	Aluminium alloy B51S	Black anodized
HO-MXYZ-100F-ACS	1000 mm	1000 mm	1000 mm	10 - 50 Kg	Aluminium alloy B51S	Black anodized

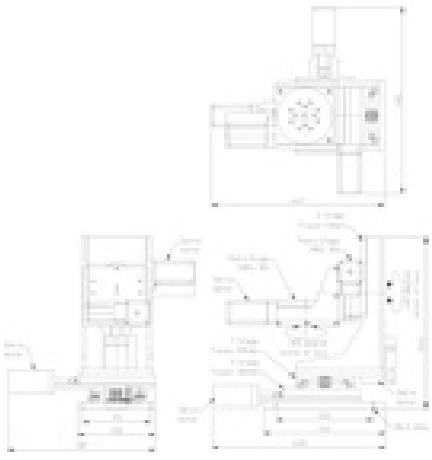


Specifications	HO-MXYZ-100B	HO-MXYZ-100C
		
Absolute positioning accuracy	Linear stages (XYZ) : ± 0.025 mm or bette	Linear stages (XYZ) : ± 0.05 mm or better
Repeatability	Linear stage (XYZ) : ± 0.05 mm or better	Linear stage (XYZ) : ± 0.05 mm or better
Straight line accuracy	Linear stage (XYZ) : ± 5 μm / 25 mm or better	Linear stage (XYZ) : ± 5 μm / 25 mm or better
Construction	Aluminum alloy on any rust free	Aluminum alloy on any rust free
Finish	Black anodized	Black anodized
Travel	Linear stages (XYZ) : 300 mm	Linear stages (XYZ) : 500 mm
Feedback	Nil	Nil
Resolution	Linear stages : 20 μm (full Step)	Linear stages : 20 μm (full Step)
Linear guide	Recirculation block and rail	Recirculation block and rail
	Linear stage (XY Stage) : Rolled ballscrew, pitch 4 mm	Linear stage (XY Stage) : Rolled ballscrew, pitch 4 mm
Drive	Linear stage (Z Stage) : Rolled ballscrew with magnetic brake	Linear stage (Z Stage) : Rolled ballscrew with magnetic brake
Actuator	Stepper motor	Stepper motor
Maximum speed	Linear stages (XY Stage) : 16mm / sec (4 rps)	Linear stages (XY Stage) : 16mm / sec (4 rps)
	Linear stages (Z Stage) : 16 mm / sec (4 rps)	Linear stages (Z Stage) : 16 mm / sec (4 rps)
Limit switch	Linear stages : Optical Limitswitch in both ends	Linear stages : Optical Limitswitch in both ends
	Theta stage : Optical home sensing limit switch	Theta stage : Optical home sensing limit switch
Mounting Holes	Linear stages : M6 tapped holes	Linear stages : M6 tapped holes
Pay-Load	25 Kg	50 Kg
Mounting carriage size		200 x 200mm

Specifications	HO-MXYZ-100F	HO-MXYZ-100F-ACS
		
Travel - X	1000 mm	1000 mm
Travel - Y	1000 mm	1000 mm
Travel - Z	1000 mm	1000 mm
Positioning accuracy	50 microns	50 microns
Straight line accuracy	100 micron (over 500 mm)	100 micron (over 500 mm)
Minimum incremental motion	1.25 micron	0.4 micron
Maximum speed	16mm / sec (4 RPS)	80mm / sec (20 RPS)
Drive	Stepper motor	Servo motor
Load capacity	10 - 50 Kg	10 - 50 Kg
Moving platform size	200 x 200 mm	200 x 200 mm
Footprint	1600 x 1600 mm	1600 x 1600 mm

5 axis Stage

Model: HO-XYZCA-100



Rotary stage giving C movement will be mounted on the rotary stage giving A movement. Rotary stage (giving A movement) will be mounted on Z stage. Z stage will be mounted perpendicularly on Y-stage and Y stage will be further mounted on X stage. Therefore, all the stages should be able to carry the total weight of the work stations which are mounted above it along with a working load of 5 Kg (max). These stages are modular in design and construction.

controller sold separately



360° Continuous rotation

Pay-Load 5 kg

Specifications	HO-XYZCA-100-ZZ	HO-XYZCA-100-SM
Drive	AC servo motor	Stepper motor
Absolute positioning accuracy		
Linear stages (XYZ)	10 μm	10 μm
Theta stage	Theta stage	Theta stage
Repeatability		
Linear stage (XYZ)	5 μm	5 μm
Theta stage	0.05 degree	0.05 degree
Straight line accuracy	Linear stage (XYZ) 10 μm	Linear stage (XYZ) 10 μm
Construction	Aluminum alloy on any rust free	Aluminum alloy on any rust free
Finish	Black anodized	Black anodized
Travel		
Linear stage X Axis	100 mm	100 mm
Linear stage Y Axis	100 mm	100 mm
Linear stage Z Axis	50 mm	
Theta stage C axis	+/- 60 degree	+/- 60 degree
Theta stage A axis	360 degree	360 degree
Feedback		
Linear stage	Optional fitting on request	Optional fitting on request
Theta stage	Optional fitting on request	Optional fitting on request
Resolution		
Linear stages	0.2 μm (1/10000 step)	0.3125 μm (1/10000 step)
Theta stage	0.01 degree (1/10000 step)	0.01 degree (1/10000 step)
Linear guide and Rotary stage bearing system	Precision V guidway and roller	Precision V guidway and roller
	Double bearing system including preloaded roller thrust bearing	Double bearing system including preloaded roller thrust bearing
Drive mechanism		
Linear stage (XY Stage)	Ground leadscrew , Pitch 2 mm	Ground leadscrew , Pitch 2 mm
Theta stage	Precision worm gear and shaft assembly	Precision worm gear and shaft assembly
Speed		
Minimum speed	Linear stages (XYZ Stage) : 300 micron / min	Linear stages (XYZ Stage) : 300 micron / min
	Theta stage : 8 degree / sec	Theta stage : 8 degree / sec
Maximum speed	Linear stages (XY Stage) : 1000 mm / min	Linear stages (XY Stage) : 480 mm / min
	Theta stage : 8 degree / sec	Theta stage : 8 degree / sec
Limit switchs		
Linear stages	Optical limit switch in both ends	Optical limit switch in both ends
Theta stage	Optical home sensing limit switch	Optical home sensing limit switch
Limit switchs		
Linear stages	Optical limit switch in both ends	Optical limit switch in both ends
Theta stage	Optical home sensing limit switch	Optical home sensing limit switch
Pay-Load	5 kg	5 kg
Mounting Holes	M6 Mounting holes	M6 Mounting holes

Vacuum Compatible

Motorized 5 Axis Stage

Model: HO-MXYZCA-50VC

controller sold separately

Vacuum Compatibility : ⩽1 x 10-6 mbar

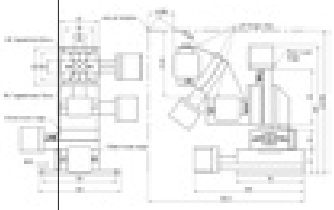
Aluminium alloy Construction

Parameters	Linear Stage	Rotational Stage
Vacuum Compatibility	≤1 x 10-6 mbar	≤1 x 10-6 mbar
Construction (Material)	Aluminum Alloy	Aluminum Alloy
Finish	Without Anodizing (Desirable for Vacuum)	Without Anodizing (Desirable for Vacuum)
Actuator	Stepper Motor	Stepper Motor
Absolute positioning accuracy	2.5 μm ± 0.25 μm	0.2 degree ± 0.02 degree
Repeatability	± 0.20 mm	± 0.1 degree
Straight line accuracy	± 25 μm	
Wobble	0.02 mm	
Travel	(X,Y & Z) : 50 mm	360 degree
Resolution	2.5 μm (Half Step)	0.01 degree (half step)
Drive	Ground leadscrew, pitch 1mm	Precision worm gear and shaft assembly
Maximum speed	Linear stages (XY Stage) : 4 mm / sec (4 rps)	4 rps
Limit switches	Optical Limit switch in both ends	Optical home sensing limit switch
Pay-Load	2 Kg	2 Kg

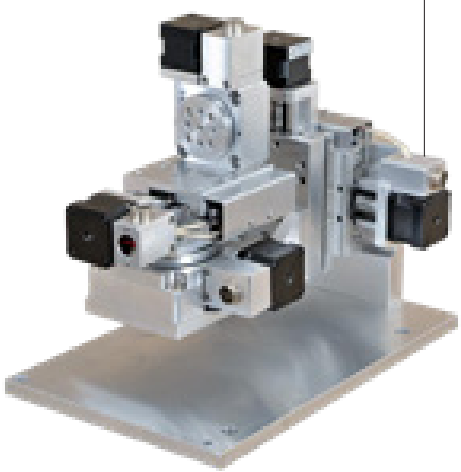


6 axis Stage

Model: HO-XYZ6A-65



Travel	
X, Y, Z axis	10 mm
Yaw	10 degree
Roll	10 degree
Pitch	10 degree
Resolution	
Linear stage	0.125 micron
Theta stage	0.001 degree
Positioning accuracy	
Linear stage	1 micron
Theta stage	0.1 degree
Speed	
Linear stage	1.6 mm / sec
Theta stage	5.6 degree / sec





Motorized Theta 2 Theta Stage

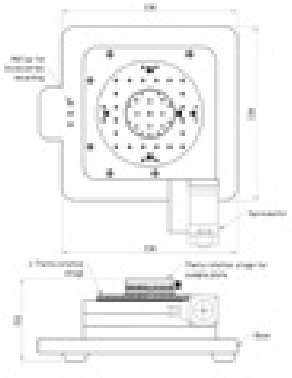
Model: MLXYTS-550

Holmarc's theta 2 theta stage consists of two rotation stages arranged in such a way that axis of rotation for both the stages are same. Both stages have preloaded ball bearing guides for wobble free rotation and positioning. 360° limitless movement is possible for inner and outer stages. Holmarc manufactures these stages with manual as well as motorized drive configurations. Rotary graduations are provided in 1°/ 2° with appropriate vernier graduations depending on the size of the stage. For motorized rotation stage, worm and gear is our standard drive mechanism. Surfaces of both stages are provided with M6 tapped holes for mounting components and subassemblies. Holmarc manufactures custom theta 2 theta stages to suit specific applications as well.

controller sold separately

360° limitless movement

Preloaded ball bearing guides

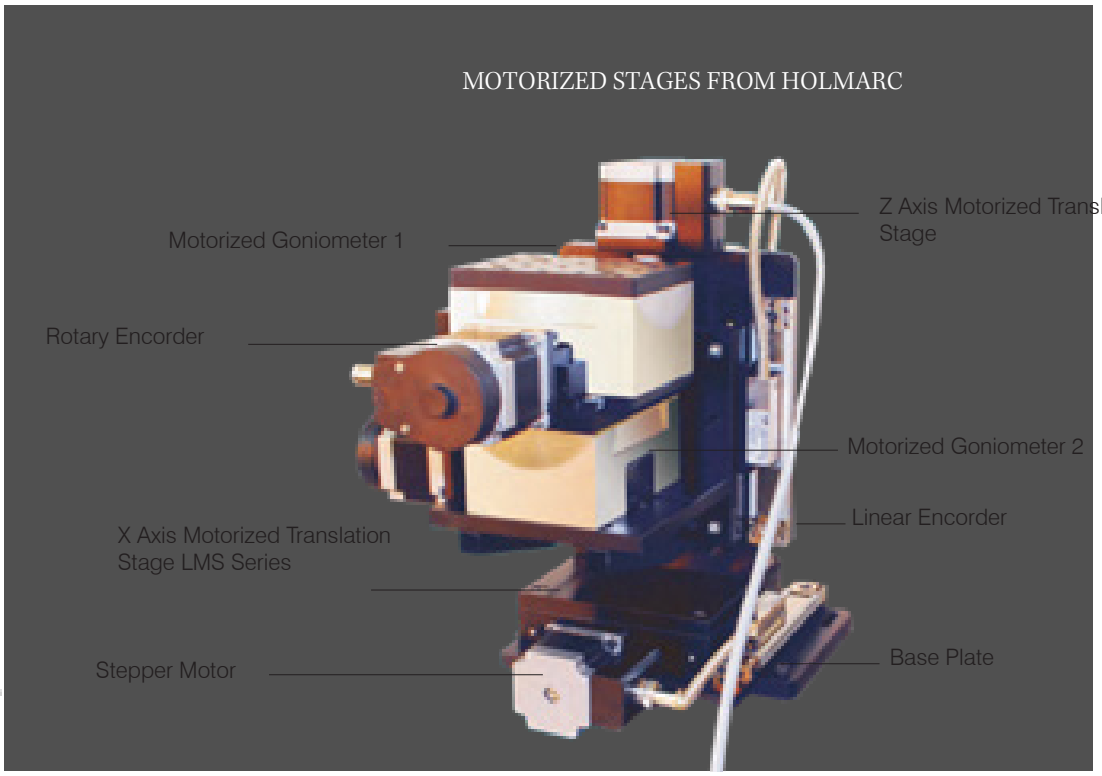


Specifications

Absolute positioning accuracy	Theta-1 : 0.05 degree
	Theta-2 : 0.05 degree
Repeatability	Theta-1 : 0.1 degree
	Theta-2 : 0.1 degree
Resolution	Theta-1 : 0.000625 degree
	Theta-2 : 0.000625 degree
Construction	Aluminum alloy on any rust free
Finish	Black anodized
Travel	Theta-1 : 360 degree continues
	Theta-2 : 300 degree
Feedback	Nil
Drive	Theta-1 : Stepper Motor
	Theta-2 : Stepper Motor
Maximum speed	Theta-1 : 8 degree / sec
	Theta-2 : 8 degree / sec
Limit switches	Theta-1 : Optical home sensing limit switch
	Theta-2 : Optical limit switches @ 300 degree apart
Mounting holes	Linear stages : M6 tapped holes
Pay-Load	Theta-1 : 5 Kg
Mounting holes	Theta-2 Arm : 8 kg
Finish	Fixed Arm : 5kg
Accessories	Accessories sold separately
Approximate Size	400 x 425 x 155 mm
Controller	2 axis stepper motor controller



Design Stage









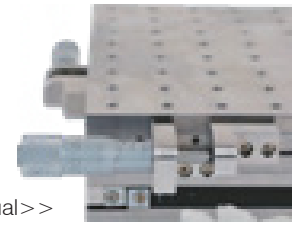
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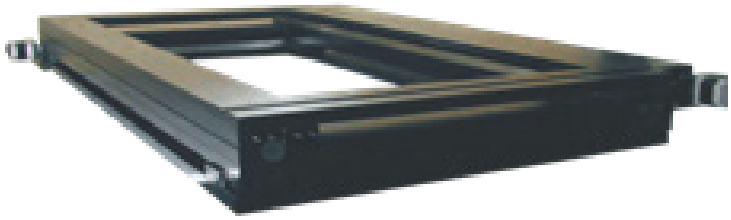
CUSTOM ENGINEERED
POSITIONING SYSTEMS

We know some applications
require uniquely engineered solutions..

Custom design and manufacturing of linear stages is a regular activity being carried out at Holmarc. Stages are designed for multitudes of applications in research and manufacturing. The standard stages described in the preceding pages of this brochure are in fact the result of years of experience in customization of linear positioning for our esteemed clients. Sourcing mechanics, electronics and software from a single manufacturer reduces hassles of integration. Our engineers at Holmarc will be happy to configure innovative as well as traditional design to suit your specific application

Large XY SS Platform Manual>>





>> 1000mm X750mm Motorized XY Stage

XY Motorized Target Holder >>



Holmarc has standardized an array of positioning stages. These include linear slides having traverse from 5 mm to 500 mm, stages driven by micrometer and lead screw, motorized stages in modular as well as standalone configurations, etc. Applications are diverse as well

In many cases, customization of our standard stage is done at a reasonable cost. All our esteemed customers are welcome to discuss application needs and unique requirements with our engineer

HOLMARC designs and manufactures wide range of linear
and rotary translation products to help you construct a flexible and stable motion syste. Send us your technical requirement at sales@holmarc.com

Long Travel Positioner >>

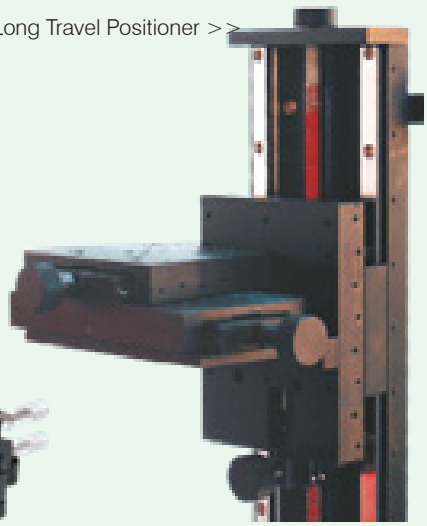


xyz Tilting Optical
Fiber Positioner
V
V

4 Axis He- Neon Laser
Positioner
V
V



Long Travel Positioner >>



Gantry Design Stage GTNDT Series

GTNDT Series

n gantry configuration, Z axis which is fixed to Y axis moves over a fixed platform / surface. Length and width of this platform covered by Z movement are limited to traverses in X and Y axes. Holmarc manufactures standard and custom stages in gantry configurations. Driver motors can be either stepper, BLDC or AC servo depending on the application. Holmarc provides control hardware and software for gantry stages with or without linear and circular interpolations. Standard stages are manufactured in aluminium alloy which is well suited for clean room environment. For rugged applications, construction material can be steel as well. Re-circulating ball bearing guides are used for X and Y axes. For Z axes, guideways can be either re-circulating or non-recirculating depending on the traverse and load conditions.

controller sold separately

Specially developed control software

Standard and customized designs are available

Stepper motor Drive

Model No.	X (mm)	Y (mm)	Z (mm)	Resolution	Load capacity Working surface	XYZ stage
GTNDT 100	100	100	25	0.625 μm	50 Kg	5 Kg
GTNDT 200	200	200	50	1.25 μm	50 Kg	5 Kg
GTNDT 300	300	300	75	1.25 μm	50 Kg	10 Kg
GTNDT 500	500	500	100	1.25 μm	75 Kg	20 Kg
GTNDT 500-1000	1000	500	200	3.125 μm	100 Kg	25 Kg
GTNDT 500-1200	1200	600	200	3.125 μm	100 Kg	30 Kg
GTNDT 800-1500	1500	750	200	3.125 μm	100 Kg	30 Kg

	Positioning accuracy			Maximum speed		
Model No:	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
GTNDT 100	5 μm	5 μm	5 μm	8 mm / sec	8 mm / sec	8 mm / sec
GTNDT 200	10 μm	10 μm	5 μm	16 mm / sec	16 mm / sec	8 mm / sec
GTNDT 300	20 μm	20 μm	5 μm	16 mm / sec	16 mm / sec	8 mm / sec
GTNDT 500	50 μm	50 μm	10 μm	16 mm / sec	16 mm / sec	16 mm / sec
GTNDT 500-1000	100 μm	50 μm	30 μm	20 mm / sec	20 mm / sec	16 mm / sec
GTNDT 500-1200	100 μm	50 μn	30 μm	20 mm / sec	20 mm / sec	16 mm / sec
GTNDT 800-1500	100 μm	50 μm	30 μm	20 mm / sec	20 mm / sec	16 mm / sec

Servo motor Drive

Model No:	X (mm)	Y (mm)	Z (mm)	Resolution	Load capacity Working surface	XYZ stage
GTNDT 200-ACS	200	200	50	1.25 μm	50 Kg	5 Kg
GTNDT 300-ACS	300	300	75	1.25 μm	50 Kg	10 Kg
GTNDT 500-ACS	500	500	100	1.25 μm	75 Kg	20 Kg
GTNDT 500-1000-ACS	1000	500	200	3.125 μm	100 Kg	25 Kg
GTNDT 500-1200-ACS	1200	600	200	3.125 μm	100 Kg	30 Kg
GTNDT 800-1500-ACS	1500	750	200	3.125 μm	100 Kg	30 Kg

	Positioning accuracy			Maximum speed		
Model No.	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
GTNDT 200-ACS	10 μm	10 μm	5 μm	40 mm / sec	40 mm / sec	20 mm / sec
GTNDT 300-ACS	20 μm	20 μm	5 μm	40 mm / sec	40 mm / sec	20 mm / sec
GTNDT 500-ACS	50 μm	50 μm	10 μm	40 mm / sec	40 mm / sec	20 mm / sec
GTNDT 500-1000-ACS	100 μm	50 μm	30 μm	100 mm / sec	100 mm / sec	40 mm / sec
GTNDT 500-1200-ACS	100 μm	50 μm	30 μm	100 mm / sec	100 mm / sec	40 mm / sec
GTNDT 800-1500-ACS	100 μm	50 μm	30 μm	100 mm / sec	100 mm / sec	40 mm / sec

Specifications



Model	GTNDT Series
Straight line accuracy	300 micron over 1000 mm
Drive	Stepper motor / AC-Servo motor
Leadscrew	Leadscrew or ballscrew
Material construction	Aluminium, Cast iron, MS, SS
Base surface flatness	0.3 mm over 300 x 300 mm
Base mounting	
Table top mounting for up to GTNDT-500 series	
Base structure with caster wheel and leveling bolt for GTNDT 500-1000-ACS, GTNDT 500-1200-ACS, GTNDT 800-1500-ACS	

Cartesian Design Stage SGTS Series

In Cartesian configuration, Y axis is fixed to the carriage of X axis and the Z axis is fixed to the carriage of Y axis. The stage is fixed to a suitable base structure depending on the application. As in the case of our standard motorized stages, drive motors can be stepper, BLDC or AC servo. Holmarc manufactures control electronics and software to go with these stages which can be standard as well as custom.

Customization with respect to size of the stages, traverse, load capacity, drive motor selection, ball screw pitch, speed, etc are offered by holmarc at the price of standard products. Our customers are welcome to discuss application needs with our engineers.

controller sold separately

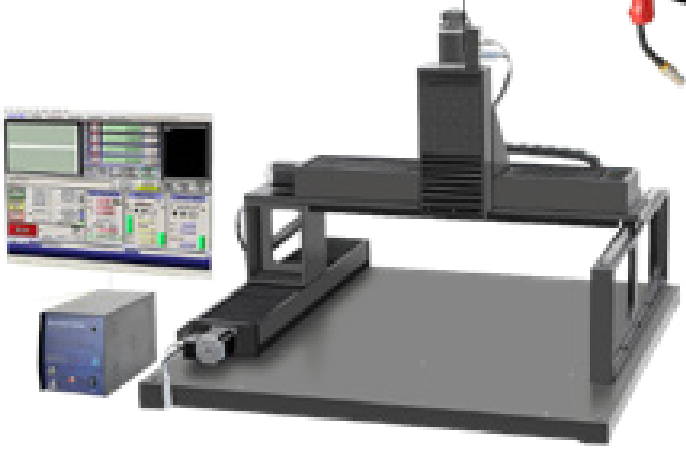
Model No.	X (mm)	Y (mm)	Z (mm)
SGTS 200	200	200	50
SGTS 300	300	300	50
SGTS 400	400	400	50
SGTS 500	500	500	50

Automated XYZ Transverse System

Specifications

X axis trave	1200 mm
Y axis travel	1200 mm
Z axis travel	1200 mm
Lead screw pitch	10 mm
Speed	40 mm per second approximately
Positioning accuracy	50 microns
Load capacity	35 Kg
Communication using RS232 as well as USB	
Traverse positioning using handheld remote as well as using computer	

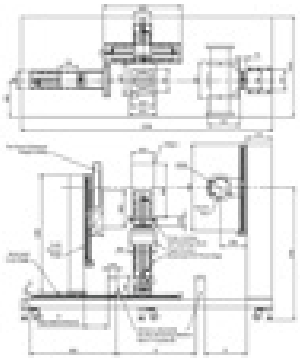






Radiography Multi Axis Manipulator

Conventional, Digital & CT
Model: HO-RGMAM-600R



Conventional and digital radiography techniques have been widely used by industries for routine and in-service inspection for non destructive testing (NDT).

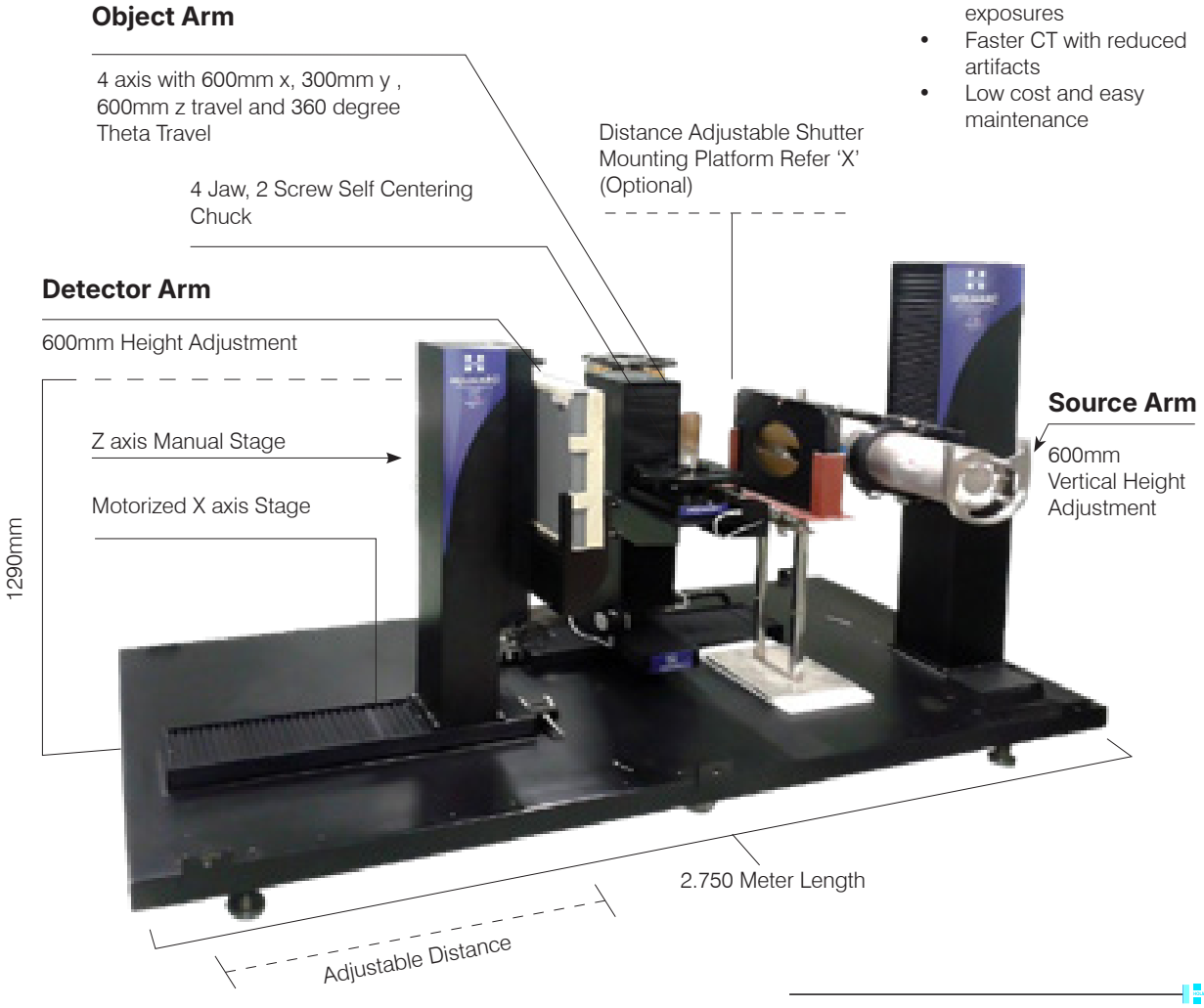
Automated positioning and movement systems (manipulators) enable quality radiography images with minimum number of exposures.

Holmarc manufactures six axis manipulators for X-ray & CT applications as standard products. The system is equipped with six motorized axis and two / three manual stages. On one of the arms, X-ray source (100 kgs approx.) can be mounted while flat panel with lead mask (200 kgs approx.) can be mounted on the other arm. Both these arms have X-Z-movement (300 mm) with accuracy of 50 micron and option to have two more additional motorized axis. At the center of these two arms, the sample stage is mounted with motorized X, Y, Z and (rotation) stages. The manipulator makes the alignment of the source, detector and sample easy and precise. The position (rotation) of sample and automatically acquired radiography images for each are used to create computed tomogram of objects.

Optional features such as motorized shutters, mounts for additional sources and detector etc. are available. We can tailor the system to our customers needs as well.

Features

- Remote operation of the X-ray or CT system with reduced operator intervention
- Fast, precise and efficient positioning of samples, source and detector.
- Easy alignment
- Quality X-ray images with minimum number of exposures
- Faster CT with reduced artifacts
- Low cost and easy maintenance



Model: HO-RGMAM-600R

Specifications	Source Arm	Detector Arm
Vertical height adjustment	600 mm	600 mm
Positioning Accuracy	1 mm	1 mm
Drive	Ball screw with manual gear box	Ball screw with manual gear box
Linear axis travel		600 mm
Positioning accuracy		0.05 mm

Specifications	Object Arm
Number of axis	4 (X,Y, Z, ϴ)
Positioning Accuracy	0.05 mm
X stage travel	600 mm
Y stage travel	300 mm
Z stage travel	600 mm
Theta stage travel	360 degree
Accuracy	0.1 degree
Drive	All axis motorized
Maximum object size	250 x 600 mm
Objects held by	Self centering chuck

Object Manipulator

Holmarc manufactures multi-axes linear and rotary stages for manipulating objects for NDT and other applications. Two standard models are described in this section. Both the models have four axes of freedom, three linear and one rotary. There are hand knobs fitted behind the motors for manual adjustments when ever required. Though fitted with stepper motors in standard models, brush less DC motors can as well be supplied along with rotary or linear encoder depending on the application needs.

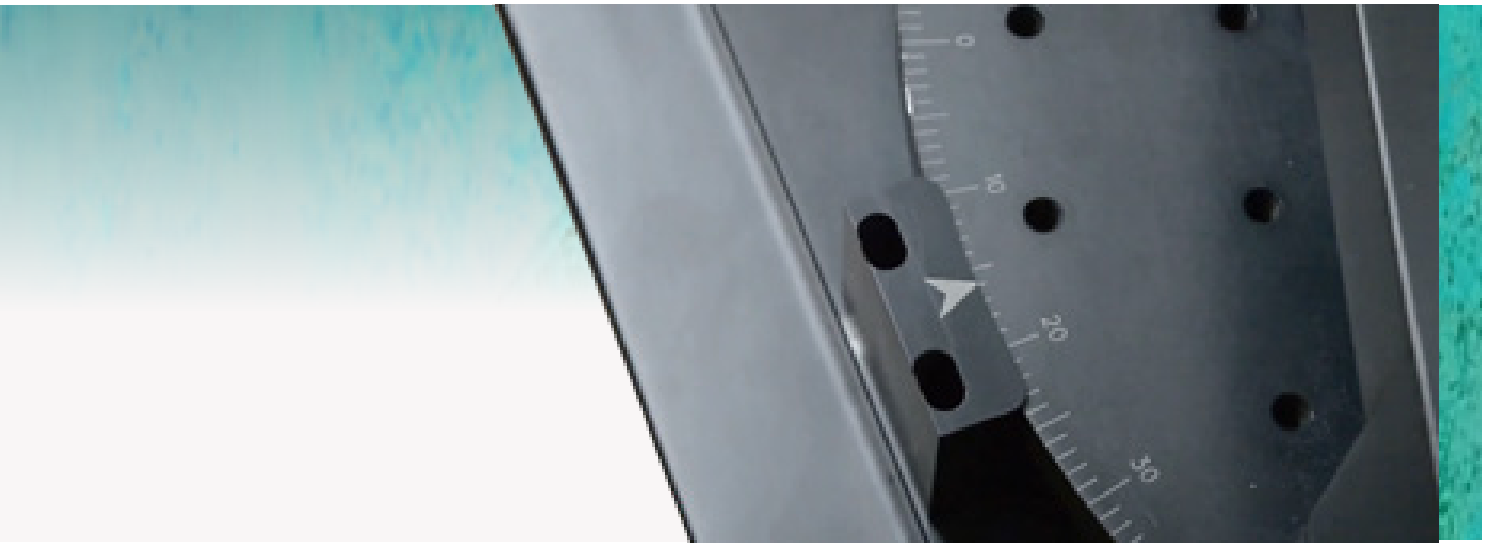
Motorized X, Y, Z & Θ Stage



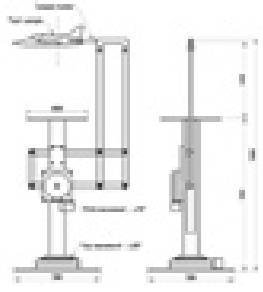


Model No.	HO-RGMAM-COM3AR	HO-RGMAM-OM3AR
X Travel	25 mm	25 mm
Y Travel	25 mm	25 mm
Z Travel	25 mm	25 mm
Theta Travel	360 °	360 °
Positioning accuracy	0.05 mm	0.05 mm
Maximum object size	100 x 100 x 100 mm	100 x 100 x 100 mm
Object Locking Mechanism	Self centering Jaw	Self centering Jaw

Positioner



Pitch & Yaw Positioning Mechanism for Subsonic Wind Tunnel



Model: HO-PY-WT01

Holmarc's Pitch & Yaw Positioning Mechanism for Subsonic Wind Tunnel. Test section size is 600 mm x 600 mm x 1200 mm. Maximum load due to the test model and instrumentations will not exceed 1.5 kgs during the test run. Blockage ratio will be less than 2% due to the mechanism.
controller sold separately

Specifications

Pitching Angle	0 to 75 degrees
Yaw Angle	+/- 20 degrees
Speed range	2 to 35 m/s
Electronic controller for pitching and yawing	



Pitch Movement

+/- 75 degrees

Yaw Movement

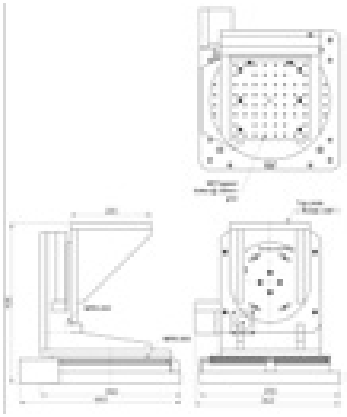
+/- 20 degrees



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Antenna Positioner

Model: APS 300 Series



Holmarc's azimuth antenna positioner consists of horizontal heavy duty rotation stage driven by stepper/servo motor mounted horizontally. Antenna can be positioned at 1 meter height from the surface of the positioner using antenna mast made in wood or plastic. We provide suitable antenna mast along with the system as per customer specifications. There are two standard models having 300 mm diameter (medium duty) and 500 mm diameter (heavy duty) mounting area. Construction material is aluminium alloy for medium duty positioner and steel for heavy duty positioner. Stepper motor or BLDC servo motor is used as actuator. Manual positioning facility is provided by a hand wheel fixed to worm shaft. Rotary graduations in degree with one degree resolution is marked on the rotating surface for visual reference.

controller sold separately

Antenna Positioner-Azimuth & Elevation



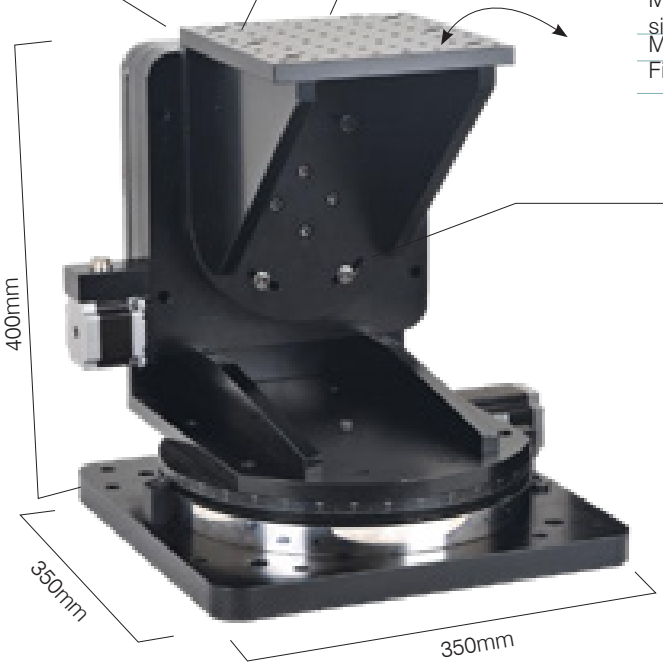
Model No.	HO-APS-300R2	HO-APS-300R2-ZZ
Payload	12 kg	12 kg
Drive	Stepper motor	AC servo motor
Travel range		
Azimuth	360° continuous	360° continuous
Elevation	+/- 90°	+/- 90°
Accuracy	0.1 Degree	0.1 Degree
Maximum Speed		
Azimuth	6.4 Degree / sec	80 Degree / sec
Elevation	8 Degree / sec	100 Degree / sec
Mounting platform size	200 x 200 mm	200 x 200 mm
Material	Aluminium	Aluminium
Finish	Black anodised	Black anodised

M6

Tapped Holes at 25mm grid

Top Plate

Rotate +/- 90 degrees



Rotate 90⁰

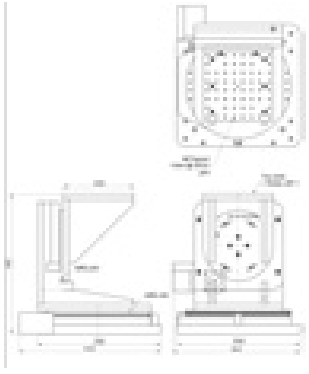


360° continuous travel range

Having medium and heavy duty applications

Antenna Positioner

Model: APS 500 Series



Holmarc's azimuth antenna positioner consists of horizontal heavy duty rotation stage driven by stepper/servo motor mounted horizontally. Antenna can be positioned at 1 meter height from the surface of the positioner using antenna mast made in wood or plastic. We provide suitable antenna mast along with the system as per customer specifications. There are two standard models having 300 mm diameter (medium duty) and 500 mm diameter (heavy duty) mounting area. Construction material is aluminium alloy for medium duty positioner and steel for heavy duty positioner. Stepper motor or BLDC servo motor is used as actuator. Manual positioning facility is provided by a hand wheel fixed to worm shaft. Rotary graduations in degree with one degree resolution is marked on the rotating surface for visual reference.

controller sold separately



360° continuous travel range

Having medium and heavy duty applications

Antenna Positioner-Azimuth & Elevation





Model No.	HO-APS-300R2	HO-APS-300R2-ZZ
Payload	350 kg (without antenna mast)	350 kg (without antenna mast)
Payload	30 kg (with antenna mast)	30 kg (with antenna mast)
Drive	Stepper motor	AC servo motor
Travel range	360° continuous	360° continuous
Accuracy	0.1 Degree	0.1 Degree
Speed	Maximum 8 Degree / sec	100 Degree / sec
Material	Aluminium	Aluminium
Finish	Black anodised	Black anodised

Accessories

Model	Antenna mast	Antenna Jaw adjustable clamp
Material	Wood	Delrin / Poly propylene
Height	1 meter	
Finish	Painted	
Model	Mounting frame with leveling foot and caster wheel :	
Material	MS	
Finish	black painted	

Antenna Positioner-Azimuth & Elevation





Model No	HO-APS-500R2	HO-APS-500R2-ZZ
Payload	12 kg (with antenna mast)	12 kg (with antenna mast)
Drive	Stepper motor	Stepper motor
Travel range		
Azimuth	360° continuous	360° continuous
Elevation	+/- 90°	+/- 90°
Accuracy	0.1 Degree	0.1 Degree
Maximum Speed		
Azimuth	8 Degree / sec	100 Degree / sec
Elevation	6 Degree / sec	75 Degree / sec
75 Degree / sec	200 x 200 mm	200 x 200 mm
Material	Aluminium	Aluminium
Finish	Black anodised	Black anodised
Antenna mast :		
Material	Wood	Wood
Finish	Painted	Painted

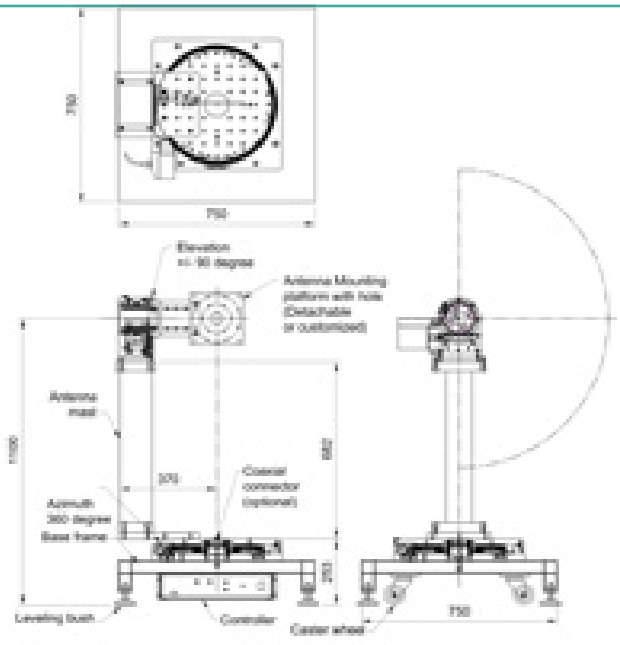
Accessories

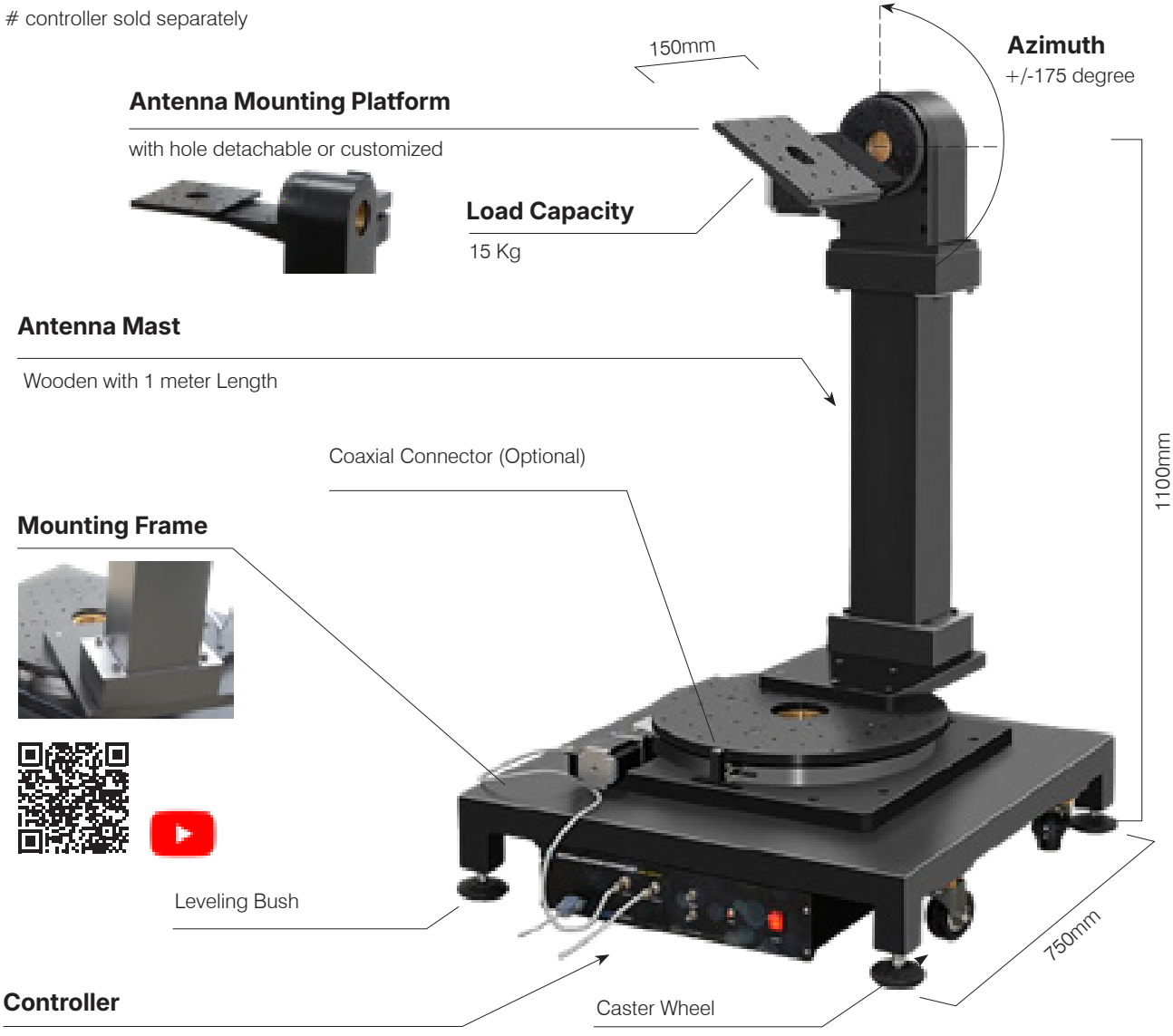
Model	Antenna clamp	Mounting frame
Type	Jaw adjustable	with leveling foot and caster wheel :
Material	Delrin / Poly propylene	MS
Finish		black painted

Dual Axis Antenna Positioner with Azimuth and Elevation Control

APS 500-D Series

Holmarc's azimuth antenna positioner consists of horizontal heavy duty rotation stage driven by stepper/servo motor mounted horizontally. Antenna can be positioned at 1 meter height from the surface of the positioner using antenna mast made in wood or plastic. We provide suitable antenna mast along with the system as per customer specifications. There are two standard models having 300 mm diameter (medium duty) and 500 mm diameter (heavy duty) mounting area. Construction material is aluminium alloy for medium duty positioner and steel for heavy duty positioner. Stepper motor or BLDC servo motor is used as actuator. Manual positioning facility is provided by a hand wheel fixed to worm shaft. Rotary graduations in degree with one degree resolution is marked on the rotating surface for visual reference.
controller sold separately





Specifications

Azimuth travel	+/-175 degree with limit sensors to prevent movement beyond travel range
Elevation travel	+/-90 degree (Zero position towards horizon, limit sensors to prevent movement beyond travel range)
Accuracy	0.1 degree (Azimuth & Elevation)
Maximum speed	8 degree/s (Azimuth), 12 degree/s (Elevation)
Load capacity	15 kg (At a distance of 20 cm from the elevation axis of rotation)
Actuators	Stepper motor
Mounting platform size	150 x 150 mm
Material	Aluminium Alloy
Surface finish	Black anodized
Foot print	750 x 750 mm

Antenna Mast

Length	1 meter
Material of construction	Wood
Surface finish	Painted

Antenna clamp

Detachable clamp with M6 tapped holes	
Material of construction	Aluminium Alloy

Mounting frame

With levelling foot and caster wheel	
Material of construction	Mild Steel
Surface finish	Painted
Foot print	750 x 750 mm

Dual axis position controller

Two stepper motor drives, controller card and power supply in a single enclosure	
Controls both the azimuth and elevation stages according to the user program	
Programmable motion profile using Windows software	
PC interface	RS232C or USB

1/16 microstepping stepper motor drives

Home and limit sensor interface	
Motor cables, RS232 cable and USB to serial converter included	
Power input	230V 50Hz
Power consumption	100W

776 PHYSICS LAB INSTRUMENTS
778 Spectroscopy
778 Spectrometer-Goniometer
779 Spectrometer - Goniometer
780 CCD Based Constant Deviation Spectrometer
781 Flame Spectrometer
783 Hydrogen Spectra - Balmer Series Apparatus
784 Photoluminescence Measurement Apparatus
785 Zeeman Effect Apparatus
786 Zeeman Effect Apparatus (Transverse & Longitudinal configuration)
788 Laser Raman Spectrometer (PMT Based)
789 Laser Raman Spectrometer (CCD Based)
790 Confocal Laser Raman Spectrometer
791 Educational spectrophotometer
792 Interferometry
794 Cornus Interference Apparatus
796 Michelson Interferometer (Standard Model)
798 Michelson Interferometer (Compact Model)
800 Magnetostriction with Michelson Interferometer
802 Michelson Interferometer (Sodium D'Lines)
804 Michelson Interferometer (Piezo Electric Effect)
806 Mach Zehnder Interferometer
808 Fabry - Perot Etalon
809 Fabry - Perot Interferometer (Projection Based)
810 Fabry - Perot Interferometer (CCD Based)
812 Fizeau Interferometer
814 Electronic Speckle Pattern Interferometer (ESPI)
816 Polarization
816 Brewster's Angle Apparatus
817 Malus Law Apparatus
818 Faraday Effect Apparatus
820 Faraday Effect Apparatus (Liquid Sample)
822 Faraday Effect Apparatus (Multi Wavelength)
824 Kerr Effect Apparatus

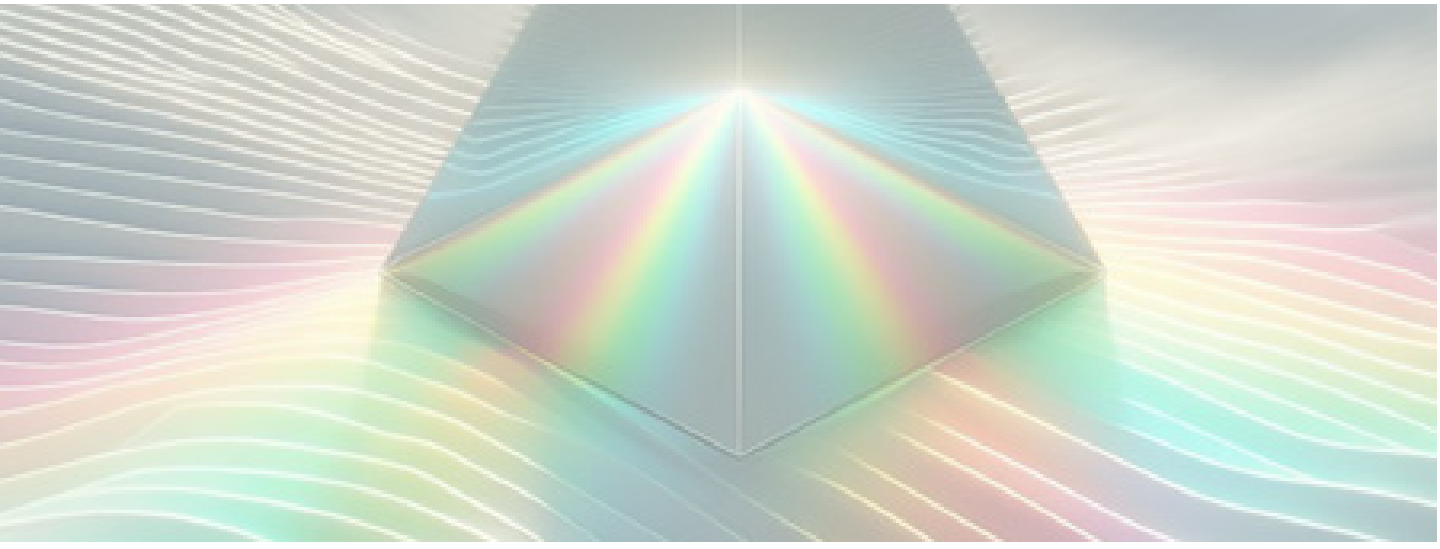
14

PHYSICS LAB INSTRUMENTS

826 Pockel Effect Apparatus
828 Apparatus for the Study of Polarisation by Waveplates
829 Babinet Compensator
832 Fiber Optics
836 Laser & Opto Electronics
836 Apparatus for Characteristic study of Diode Laser
841 Z-Scan system
843 Spectral characteristics of LED
844 Second Harmonic Generation
848 Led, Laser Diode & Photodiode Characterization Apparatus
850 Diffraction
850 Screen Based Apparatus for Diffraction Experiments
851 Detector Based Apparatus for Diffraction Experiments
852 Single Slit Diffraction and Heisenberg's uncertainty principle
853 Goniometer Based Apparatus for Diffraction
854 Apparatus for Studying Diffraction from Reflection Grating
855 Apparatus for Determination of Particle Size
856 Fresnel's Biprism Diffraction Apparatus
858 Optics
858 Liquid Lens Apparatus
859 Geometrical Optics Experiment Apparatus
861 Refractometer
862 Mechanics
862 Contact Angle Meter
865 Lee's Disc Apparatus
866 Electricity and Magnetism
866 Millikan's Oil Drop Apparatus
868 Apparatus for the Study of Photo Electric Effect (Plank's Constant)
869 e/m Experiment Apparatus (Thomson's method)
871 Apparatus for the study of Biot-Savart's Law
872 B-H Curve / Magnetic Hysteresis Curve Experiment
873 Hall effect Apparatus
874 Hall Effect Sample Holder for Electromagnet
875 Magnetic Susceptibility - Quincke's Method
876 Magnetic Susceptibility - Gouy's method
878 Acoustics
880 Screen Based Apparatus for Ultrasonic Diffraction
881 Kundt's Tube Apparatus
882 Ultrasonic Diffraction using Goniometer
884 Holography
884 Holographic Lab
886 Thin Film Characterization
886 Spectrophotometer
887 Variable Angle Laser Ellipsometer
888 Variable Angle Spectroscopic Ellipsometer
889 Thin film Spectroscopic Reflectometer
890 Theta 2 theta advanced Spectrophotometer
892 Solar Cell
892 Solar Cell Characterization Apparatus
894 Spectral Response Measurement Apparatus
895 Conductivity Cell Measurement Setup
896 Astro Physics
896 Solar Characteristics Measurement Set Up
899 Astronomy and Astrophysics Experiment Set up
900 Temperature determination of an artificial star by photometry
902 Sources and Detectors
902 Diode Laser
903 DPSS Laser



Spectroscopy



Spectrometer-Goniometer

Model: HO-SP-RE-01

Spectrometer-Goniometer, is a versatile instrument for studying the spectrum of different light sources as well as for characterization of components like prisms and gratings. Unlike common spectrometers, this model is designed in such a way that students get better understanding of the working principles of spectrometer. All modules are deliberately made open and easy to understand. Students gain hands on experience in the basics of spectroscopy.

This Goniometer is used for measuring optical data of prisms. It offers precise angle and refractive index measurements. The well designed mechanics of the Goniometer allows maintenance-free operation over many years. Conventionally, the measurement of refractive index is carried out with a dispersion prism made from the material to be tested. For the measurement of refractive index of fluids, a hollow prism, which is filled with the fluid is used. It can also be used as a spectroscope for qualitative examination and measurement of emission and absorption spectra.

Specifications

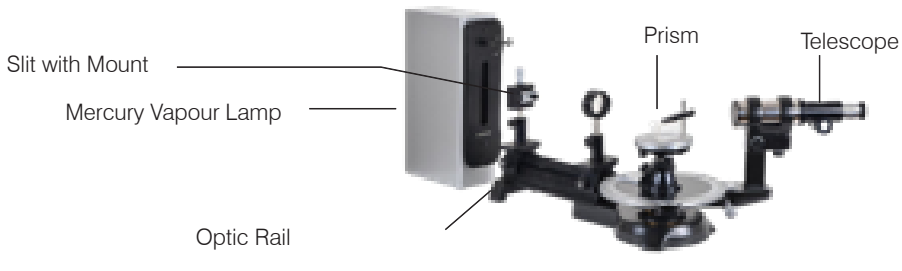
Inspection Telescope Magnification	:	10 x
Resolution of Prism Table	:	30 arc minute
Resolution of Stage	:	1 arc minute
Variable slit	:	Micrometer controlled, continuously variable 0 - 3mm
Construction Material	:	Aluminum
Finish	:	Black Anodized

Features

Modern and user friendly design
Mercury lamp is used as light source
Symmetrical precision slit
Height of prism table is adjustable
High-quality optics

Experiment Possible

- Determination of refractive index of the solid prism
- Dispersive power of the material of the prism
- Refractive index of various liquids using liquid prism
- Determine the grating constant of a diffraction grating



Scope of Supply

Goniometer
Model No. : HO-SP-RE-01-G
Resolution of Prism Table : 30 arc min
Resolution : 1 arc min
Quantity : 1 No.



Telescope
Model No. : HO-SP-RE-01-T
Magnification : 10X
Quantity : 1 No.



Slit with Mount
Model No : HO-SP-RE-01-SM
Controlling : Lead Screw
Slit Size : 0-3mm
Quantity : 1 No.



Collimating Lens with Mount
Model No. HO-SP-RE-01-CLM
Material N-BK7
Focal Length 202mm
Diameter : 50mm
Quantity : 1 No.



Accessories : User Manual



Optical Rail
Model No. : HO-SP-RE-01-OR
Length : 500mm
Material : Black Anodized Aluminum Alloy
Quantity : 1 No.



Hollow Prism
Model No. : HO-SP-RE-01-HP
Material : PMAA
Quantity : 1 No.



Equilateral Prism
Model No. : HO-SP-RE-01-EP
Material : N-SF1
Quantity : 1 No.



Holographic Grating
Model No. : HO-SP-RE-01-HG
Groove Spacing : 500 line per mm
Size : 50x50mm



Mercury Vapour Lamp
Model No. : HO-SP-RE-01-MLPS
Input : 230V, 50 Hz



Spectrometer - Goniometer

Model: HO-SP-RE-02

Holmarc's Spectrometer Goniometer (Model No: HO-ED-S-02) is designed as a versatile instrument suitable for precise determination of the optical parameters of prisms and gratings. It can also be used as a spectroscope, for qualitative examination and measurement of emission and absorption spectra. Holmarc's well designed mechanics of the Goniometer allows maintenance-free operation over many years. This system consists of a mercury lamp with power supply, prism with holder and transmission grating with holder. The collimator and the telescope have a focal length of 202 mm and a diameter of 32mm. The collimator tube has an adjustable slit.

Scope of Supply

Spectrometer Goniometer

Angular scale	:	0° to 360° with 0.5° divisions
Resolution	:	30 arc second
Focal length collimator	:	202 mm
Focal length Telescope		202 mm
Observation Tube	:	Infinity Variable
Ocular	:	Crosshair
Slit Tube	:	Symmetric Precession Slit
Variable slit	:	Micrometer variable 0 - 3mm
Eye piece Magnification	:	10x
Construction Material	:	Aluminum
Finish	:	Black Anodized

Prism
Material : NSF 1 (60°), BK7 1 each

Transmission Grating
Size (mm) : 38 x 50 mm
Lines / mm : 500 and 1000 lines / mm

Entrance Slit
Width of entrance slit : 0 – 3 mm

Features

- Prism table attached with vernier table
- 30 arc second resolution
- Covered Goniometer scale
- Classic design spectrometer Goniometer
- High-quality optics
- Symmetrical precision slit

Experiment Possible

- Determine the refractive index of a glass prism
- Demonstrate the relationship between refractive index and wavelength (dispersion curve)
- Calculate the resolving power of the glass prism from the slope of the dispersion curves
- Determine the wavelengths of the mercury spectral lines
- Determine the grating constant of a diffraction grating



based on the diffraction angle of the high intensity spectral lines of mercury
- Calculate the resolving power required to separate the different Hg-Lines

Scope of Supply

Goniometer
Model No. : HO-SP-RE-02-G
Resolution of prism table : 30 arc second
Resolution Stage : 30 arc second
Quantity : 1 No.



Mercury Vapour Lamp
Model No. : HO-SP-RE-02-MLPS
Input : 230V, 50 Hz
Quantity : 1 No.



Holographic Grating
Model No. : HO-SP-RE-02-HG
Groove Spacing : 500 &1000 lines/ mm
Size : 50x50mm
Quantity : 1 No.



Hollow Prism
Model No. : HO-SP-RE-02-HP
Material : PMAA

Quantity : 1 No.



Equilateral Prism
Model No. : HO-SP-RE-02-EP
Material : N-SF1
Quantity : 1 No.



Accessories
User Manual



For more product information , visit us at www.holmarc.com

CCD Based Constant Deviation Spectrometer

Model: HO-ED-S-0203

The apparatus uses CCD imaging instead of photographic silver halide films. It has become difficult to carry out silver halide film based spectroscopic experiments in class rooms due to the unavailability of consumables and hurdles in its processing. CCD imaging of the spectrum is a timely solution. Data acquisition is easy and fast. As most of the commercial spectroscopes are based on digital imaging, students get an exposure to the latest trends in spectroscopy.



Mercury is used as a standard element in most cases. Knowing the wavelength, corresponding to different spectral lines, elements can be judged. Hartmann's method is employed to determine the unknown wavelength.

If a transparent substance is placed between a continuous source and a spectrometer, the substance absorbs a certain part of the spectrum. Hence in the continuous spectrum of the source, a few dark lines or bands appear. This spectrum is called absorption spectrum of the substance.

This method is useful for manufacturing as well as for academic experiments. Constant Deviation Spectrometer (Model No: HO-ED-S-0203) can be used for the study of spectral series viz. emission spectra of elements, absorption spectra of compounds, quantitative spectrum analysis etc.

Features

- Modern, user friendly and precision design
- Emission and absorption spectra can be observed
- CCD imaging system
- High-quality optics produce sharp and clear spectra

Experiment Possible

- **To find wavelength of prominent lines of the emission spectra of copper, iron and brass**

The wave length of the corresponding lines of the arc spectrum can be calculated using the equation;

$\lambda = \lambda 0 + [C / (d0 - d)]$

When a substance is heated, electrons first absorb energy, go to a higher energy level and eventually fall to a lower level, by emitting photons. Every element emits a characteristic spectrum of its own. There are certain important and prominent spectral lines associated with each element. These lines are used to distinguish one element from another.

Specifications

Optical Platform	:	Constant Deviation Spectrometer
Prism	:	Pellin Broca
Effective Spectral Range	:	380 nm to 750 nm
Spectral Resolution	:	0.1 nm
Accuracy	:	0.5 nm
Slit Options	:	Micrometer Controlled Variable Slit (0-3mm)
Stray Light	:	< 0.06% @ 532 nm (< 0.1% overall)
Detector	:	Toshiba Linear CCD Array
Total Pixel Number	:	3648
Pixel Size	:	8 x 200 μm
Pixel Well Depth	:	100,000 electron
Signal-to-Noise Ratio	:	1,000: 1 (at full scale)
A/D Resolution	:	16 bit
Exposure Time	:	1.0 to 6,500 ms
Frame Rate	:	Upto 138 fps
Trigger Input	:	Yes (Optional)
PC Interface	:	USB 2.0
Software	:	Spectra QSR V2.26

- **To calculate it's Hartmann's constant and measure the wavelength of absorption bands of $KMnO_4$.**

The positions of spectral lines are usually measured in the direction of increasing wavelength. The constant d depends on scale setting, C on the range of spectrum and is a constant for the instrument. To determine these constant, we take three prominent lines of standard spectrum and equations are,

$A = (\lambda_2 - \lambda_1) / (\lambda_3 - \lambda_1)$
$B = (d_2 - d_1) / (d_3 - d_1)$
$C = [(\lambda_2 - \lambda_1)(d_0 - d_1)(d_0 - d_2)] / (d_2 - d_1)$
$d0 = (B\, d_3 - A\, d_2) / (B - A)$
$\lambda 0 = (A\lambda_3 - B\, \lambda_2) / (A - B)$

Where, A, B, C, λ_0, d_0 are called Hartmann's constants. Using these Hartmann's constants, we can calculate the absorption band wavelength as

$\lambda = \lambda_0 + [C / (d_0 - d)]$

Scope of Supply

Constant Deviation Spectrometer
Model No. : ED-S-03A-CDS
Sensor : CCD Linear array 3648pixels
Prism : Pellin Broca
Quantity : 1 No.



Metal Arc Stand
Model No. : HO-ED-S-0203-MAS
Arc Cavity : 0- 25 mm
Quantity : 1 No.



Halogen Lamp with Power Supply
Model No : HO-ED-S-0203-THLS
Input : 230V, 50Hz
Output : 20 Watts



Copper, Iron, Brass Rods
Model No. : ED-INT-06M-SR
Length : 185mm
Diameter : 6mm
Quantity : 1 Set



Metal Arc Power supply
Model No. : HO-ED-S-0203-MAPS
Input : 230V, 50 Hz
Output : 0 - 100V, 0 - 10A
Quantity : 1 No.



Accessories
User Manual

Flame Spectrometer

Model: HO-ED-S-03A

Flame spectrometer is an instrument used for the analysis of emission and absorption characteristics of different materials. Holmarc's Flame spectrometer (Model No: HO-ED-S-03A) is able to analyze the spectrum of samples repeatedly with high speed.

As we know, German Physicists Robert Bunsen and Gustav Kirchhoff discovered the spectral emission activity in the 18th century, which is modified here.We use sodium metal for the experiment, which is placed in crucible and heated with Bunsen burner. Light from sodium flame is coupled to an optical fiber and taken to input port of the spectrometer.

Features

- Both solid & liquid samples can be analyzed
- Computer controlled, user friendly interface
- Capable of automatic live recording of flame spectrum (customized version)

The output of the spectrometer produces standard D1 & D2 lines. In turn, in absorption spectroscopy, partially continuous spectrum of halogen lamp passes through the sodium flame. The cooler atoms in the centre of the flame absorbs certain region of halogen spectrum which produce D1 and D2 lines as absorbed dip lines. However, absorption or emission spectra will reveal the spectral characteristics of the material.

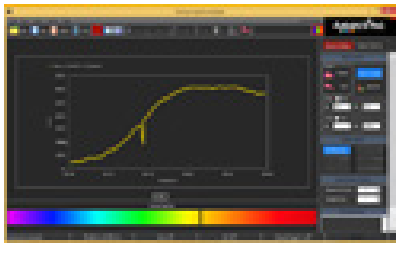
Holmarc's flame spectrometer is calibrated using mercury source which uses Hartmann's constants as calibration method. It can be upgraded for research purpose and can be used to analyze absolute transmittance or reflectance spectroscopy by small modifications. CCD linear array detector is used in prism spectrometer. It will support UV-VIS-Near IR regions.

A safety cage design is used in flame spectrometer as a security system for controlling sodium metal hyper reactions. Cage is made of float glass for safety and visibility. Gas tube attached to Bunsen burner is protected using metal cover. Metallic crucible in fine size allows safe melting of sodium. Safety goggles are provided with the equipment

Specifications

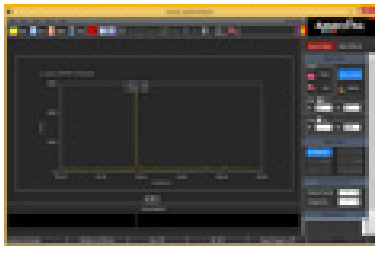
Optical Platform	:	Constant Deviation Spectrometer
Prism	:	Pellin Broca
Effective Spectral Range	:	380 nm to 750 nm
Spectral Resolution	:	0.1 nm
Accuracy	:	0.5 nm
Slit Options	:	Micrometer Controlled Variable Slit (0-3mm)
Stray Light	:	< 0.06% @ 532 nm (< 0.1% overall)
Detector	:	Toshiba Linear CCD Array
Total Pixel Number	:	3648
Pixel Size	:	8 x 200 μm
Pixel Well Depth	:	100,000 electron
Signal-to-Noise Ratio	:	1,000: 1 (at full scale)
A/D Resolution	:	16 bit
Exposure Time	:	1.0 to 6,500 ms
Frame Rate	:	Upto 138 fps
Trigger Input	:	Yes (Optional)
PC Interface	:	USB 2.0
Software	:	Spectra QSR V2.26





Absorption spectrum of sodium D lines

Flame produced by Na metal shows dip lines in a tungsten halogen continuous source. The cooler atoms in flames centre shows normal absorption lines d1 & d2 which is around 589 & 589.6nm.

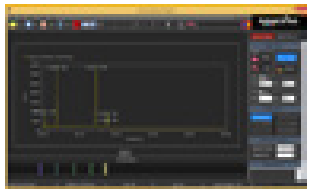


Emission spectrum of sodium metal

The contradictory emission spectrum shows the same d1 & d2 lines which reveals the characteristics of the element.

Experiment Possible

- **Calibration of Grating spectrometer using mercury source**



The positions of spectral lines are usually measured in the direction of increasing wavelength. The constant d depends on scale setting, C on the range of spectrum and is a constant for the instrument. To determine these constant, we take three prominent lines of standard spectrum and equations are,

$A = (\lambda 2 - \lambda 1) / (\lambda 3 - \lambda 1)$

$B = (d2 - d1) / (d3 - d1)$

$C = [(\lambda 2 - \lambda 1)(d0 - d1)(d0 - 2)] / (d2 - d1)$

$d0 = (B\,d3 - A\,d2) / (B - A)$

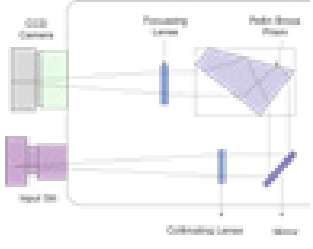
$\lambda 0 = (A\lambda 3 - B\,\lambda 2) / (A - B)$

Where, A, B, C, λ0, d0 are called Hartmann's constants.

Using these Hartmann's constants, we can calculate the absorption band wavelength as

$\lambda = \lambda 0 + [C / (d0 - d)]$

After calibrating the spectrometer. Put sodium metal in crucible in small proportion & kept above Flamed Bunsen burner. Adjust the fiber coupler attached lens arrangement to get a good emission spectrum of sodium d1 & d2 lines



Scope of Supply

Constant Deviation Spectrometer
Model No. : ED-S-03A-CDS
Sensor : CCD Linear array 3648pixels
Prism : Pellin Broca
Quantity : 1 No.



Multi mode fibre
Model No. : ED-S-03A-MMF
Type : Multi mode
Cladding : PMMA
Core : Fused silica



Goggles & sodium sample bottle(Not in Supply)
Model No. : ED-S-03A-GSSB
Quantity : 1 No.



Burner Cage
Model No. : ED-S-03A-BRC
Quantity : 1 No.



Tungsten Halogen Light source
Model No. : ED-S-03A-THLS
Output power : 20W
Quantity : 1No.



Low Pressure Mercury Light source
Model No. : ED-S-03A-LPMLS
Dimensions : 180x140x100 mm
Fiber optic
Quantity : 1 No.



Zoom lens with fiber SMA attached unit
Model No : ED-S-03A-ZLF
Quantity : 1 No.



Standard crucibles
Model No. : ED-S-03A-STC



Accessories
User Manual

Hydrogen Spectra - Balmer Series Apparatus

Model: HO-ED-S-03B

Holmarc introduces yet another product 'Hydrogen Spectra-Balmer Series Appartus' for the benefit of students in spectroscopy. It is specially designed for the determination of wavelengths of Balmer series from hydrogen emission spectra and to find the Rydberg constant. This apparatus comprises of high performance CCD Spectrometer, Mercury lamp with power supply and Hydrogen Spectrum Discharge Tube coupled with a High Voltage Transformer. Spectrometer utilizes Constant Deviation Pellin Broca Prism for spectral dispersion and is compatible with USB 2.0 interface. The better sensitivity of the CCD makes this spectrometer suitable for applications with lower light signals as well. The software developed for this instrument has facilities for capturing single or continuous spectra, custom wavelength calibration, dark subtraction and intensity comparison, simultaneous display of overlay multiple spectra, exporting data to Microsoft excel, automatically timed spectrum saving etc. Mercury lamp is used as the standard element to find the unknown wavelengths of hydrogen. Later using the hydrogen spectrum and the energy level quantum number; Rydberg constant can be determined. High Voltage Transformer is supplied with Hydrogen Spectrum Discharge Tube. The discharging action is controlled by a variable knob and can be adjusted to get optimum performance of Hydrogen

Features

- New compact & Ergonomic Design
- High luminance spectral tubes
- High Resolution Spectral Analysis
- Precision Micrometer driven slit
- USB 2.0 interface with extended dynamic range
- User friendly Software

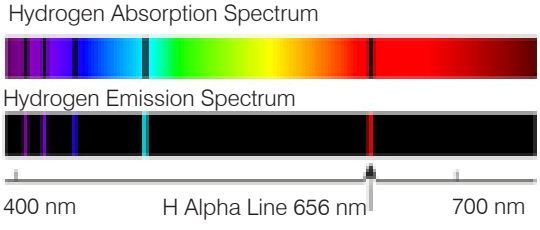
Experiment Possible

- Calibration of the spectrometer using mercury lines
- To calculate and verify Hartmann's constants
- To study the emission of light from a hydrogen discharge source

To learn the empirical formulas to characterize the pattern of spectral lines from hydrogen.

Specifications

Optical Platform	:	Constant Deviation Spectrometer
Prism	:	Pellin Broca
Effective Spectral Range	:	380 nm to 750 nm
Spectral Resolution	:	0.1 nm
Accuracy	:	0.5 nm
Slit Options	:	Micrometer Controlled Variable Slit (0-3mm)
Stray Light	:	< 0.06% @ 532 nm (< 0.1% overall)
Detector	:	Toshiba Linear CCD Array
Total Pixel Number	:	3648
Pixel Size	:	8 x 200 μm
Pixel Well Depth	:	100,000 electron
Signal-to-Noise Ratio	:	1,000: 1 (at full scale)
A/D Resolution	:	16 bit
Exposure Time	:	1.0 to 6,500 ms
Frame Rate	:	Upto 138 fps
Trigger Input	:	Yes (Optional)
Software	:	Spectra QSR V2.26



Scope of Supply

Constant Deviation Spectrometer

Model No.	:	HO-ED-S-03B-CDS
Effective Spectral Range	:	380 to 750 nm
Pixel Number	:	3648
Software	:	Spectra QSR V2.26





Variable High power AC source & Light source Holding stage

Output Voltage	:	0-4500V
Input Voltage	:	230V



Mercury &Hydrogen lamp

Type	:	Low Pressure

Photoluminescence Measurement Apparatus

Model: HO-ED-S-07(PMT) | Model No: HO-ED-S-07S(CCD)

Photoluminescence is one of the best scientific inventions ever in the field of material Science. The luminous efficiency of each fluresent material differentiate them. And this experimets provide you the ratio of emitted photons to absorbed photons which is called the quantum yield of the material.



Our HO- SP-SQR300FA is our spectra monochromator with a detector which can be used as a PL system, quantum yield spectrometer which makes use of photoluminiscence to measure the quantum yield of a material quickly and accurately.

Our system consists of an excitation source, a monochromator and a pohotomultiplier tube as the spectrometer detector. It has a Czerny-turner optical path configuration, a plane holographic grating is used to diffract the input light. Use of holographic grating minimize the stray light for high sensitivity and accuracy.

A stepper motor controlled sine drive positions the grating, which is mounted on a precision rotary table. The sine drive delivers a linear relationship between stepper motor motion and wave- length of interest. It can be controlled using a designed hand held controller. Also it includes a mechanism to change the wavelength selected by software and to record the resulting changes as a function of wavelength.

Features

- Laser Source
- Designed light collection set up
- Computer interface with specially developed software

Technical Characteristics

Spectra Quasar 300F Fully Automated Monochromator

Optical Design	:	Czerny-Turner
Input Port	:	Single
Output Port	:	Dual (One for Monochromatic Light and other for single / multi channel spectral application)
Port Selection	:	Integrated Flip Mirror based Mechanism
Aperture Ratio	:	f / 6 (with 50 x 50mm grating)
Excitation Laser	:	504 nm, 100mW
Dispersion Element	:	Holographic Diffraction Grating
Grating Size	:	50 x 50 mm
Wavelength Range	:	200 - 900 nm
Detector	:	PMT
Resolution	:	0.046 nm
Accuracy	:	0.05 nm (with 1200-g/mm grating)
Slit Width Range	:	0 - 3 mm
Software	:	Windows based software to control all spectrometer functions and detector readings (with Lab view interface support)

Zeeman Effect Apparatus

Model: HO-ED-S-04A

Holmarc's Zeeman Effect Apparatus is designed for the determination of e/m ratio, which requires knowledge in optics, mechanics, electromagnetism, modern physics and mathematics. Traditional Zeeman effect apparatus needs more skills in operation and measurement. With it's new and integrated design, this device is easier to setup and operate so that students can lay focus on understanding the principles and theories involved. A low-pressure mercury lamp is placed inside a variable current electromagnet. Light passes through a narrow-band interference filter, centered around the desired wavelength and enters the Fabry - Perot etalon. This device consists of two reflective parallel plates which serve to transmit strong incoming radiation at different orders of wavelength. Small tilting knobs allow precise and careful adjustments of the plate. The significant difference in our setup is in the imaging system used for viewing and recording the interference patterns. We use USB 2.0 camera, which can be directly connected to the PC to monitor the fringe pattern and save desired pictures. This makes the alignment of the optics much easier and eliminates the need for photographic processing. The Fabry-Perot etalon is the heart of the apparatus which allows us to detect small shifts in wavelengths of light emitted from the source.

- **High quality optics**
- **User friendly design**
- **Computer interface**
- **Dust protection cover included**

Gaussmeter Specifications

Range	:	0 - 20 KG
Resolution	:	10 gauss
Accuracy	:	+/- 0.5%
Display	:	3 ½ digit, 7 segment LED
Power	:	220V +/- 10%, 50Hz
Transduce	:	Hall probe - In As

Dichroic Green Filter Specification

Type	:	Additive
Color	:	Green
Dimensions	:	50 mm x 50 mm
Clear aperture (%)	:	≥ 85
Thickness (mm)	:	2 nominal
Surface quality	:	80 – 50
Angle of incidence (°)	:	0
Substrate	:	Borofloat



Experiment Examples

This experiment consist of two parts :

To perform qualitative observations of the Zeeman effect including :

Observing the line triplet for the transverse Zeeman Effect- The normal Zeeman Effect is characterized by a triplet splitting of the spectral line if it is observed transversally. The middle component remains at the position of the original line. The two others are shifted by the same range towards higher and lower wavelengths, respectively

To perform quantitative measurements on the Zeeman effect including

To find Spacing of the etalon

An etalon is an optical interferometer, for finding the spacing of the etalon we measure the radius of the circular fringes using Holmarc's image analysis software 'Image J'.

Spacing of the etalon $t = nD2\lambda / \chi n2$

Where, D = Distance between Etalon and the camera

n = is the order of rings

λ = wavelength of the light used

χn = difference in the radius of two consecutive rings

Verification of the magnetic moment constant Bohr magneton μ Bohr magneton

$\mu B = hc((\Delta\bar{\nu}) / 2) / B$

Where

$(\Delta\bar{\nu}) / 2$ is the difference in wave numbers of one of the σ-lines with respect to the central lines

h = Planck's constant

c = Speed of light

B = Magnetic flux density

Analysis of Planck's constant (h) and speed of light (c) using Zeeman Effect

Planck's constant, $h = (\mu B / c) . 2B / (\Delta\bar{\nu})$

Speed of light, $c = (\mu B / h) . 2B / (\Delta\bar{\nu})$

Calibration of the magnetic field

A gauss meter is used for the calibration of magnetic field.

Scope of Supply

Rail Based Platform
Model No. : ED-S-04A-RBP
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Green Filter with Mount
Model No : ED-S-04A-GFM
Dimension : 50 x 50 mm
Substrate : Borofloat
Quantity : 1 No.



Fabri-Perot Etalon with Mount
Model No. : ED-S-04A-FPEM
Aperture : 30 mm
Separation of plates : 3 - 4 mm
Quantity : 1 No.



Camera
Model No. : ED-S-04A-CCDC
Resolution : (320-1280 pixels)
Connectivity : USB 2.0
Quantity : 1 No.



Gauss Probe Holder with Mount
Model No. : ED-S-04A-GPHM
Height : 100 - 150 mm
Material : Anodized Aluminium Alloy.
Quantity : 1 No.



Dust Protecting Cover with magnetic locks
Model No. ED-S-04A-DCML
Material PMMA
Dimension : 450 x 150 x 165 mm
Quantity : 1 No.



Accessories : User Manual

IR Filter with Mount
Model No. : ED-S-04A-IRFM
Dimension : 50 x 50 mm
Substrate : Borofloat
Quantity : 1 No.



Polarizer with Variable Aperture
Model No. : ED-S-04A-PVA
Material : Sheet polarizer
Rotation : 360 degree
Quantity : 1 No.



Camera Lens Assembly
Model No. : ED-S-04A-CLA
Focal length : 85 mm
Quantity : 1 No.



Electromagnet
Model No. : ED-S-04A-EM
Max magnetic field : 1.7 Tesla @ 10mm
: 10 mm pole space
Quantity : 1 No.



Digital Gauss Meter
Model No. : ED-S-04A-DGM
Range : 0 - 20 Kg
Transducer : In As
Quantity : 1 No.



Mercury Vapor Lamp with Power Supply
Model No. : ED-S-04A-MVPS
Power supply : 230V 50 Hz
Output : 4 KV, 30 mA
Quantity : 1 No.



Electromagnet Power Supply
Model No. : ED-S-04A-EMPS
Output Power : 40 V DC , 0 - 3.5 A
Quantity : 1 No.



Zeeman Effect Apparatus
(Transverse & Longitudinal configuration)

Model: HO-ED-S-04B



Holmarc's Zeeman Effect model no: HO-ED-S-04B is designed for analyzing both transverse and longitudinal Zeeman splitting. Here more than the transverse triplet splitting we can observe normal longitudinal doublet splitting without central line as contrast to the transverse mode Zeeman Effect. The new & integrated design helps students to understand the classical behavior of atomic & molecular physics. We have already discussed the transverse zeeman effect before in model HO-ED-S-04. The source low pressure mercury lamp emits different prominent lines of frequencies. The light passes through one of the poles of electromagnet; in which the most prominent green line is filtered with hot mirror (Red filter) & green interference filter. The light corresponding to 546nm passes through Fabry-perot etalon & interfere each other, which in turn focused by zoom lens to CMOS camera. And can be monitored on a PC via USB 2.0 interface.
A polarizer is introduced in between filter & fabry perot unit to visualize normal & anomalous Zeeman Effect. Dedicated software which control & monitors the live fringe pattern which can capture for measurement analysis. In fabry perot etalon module one mirror is fixed & other made parallel using Allen key knobs fine turning arrangement. The mirrors are Aluminum coated & MgF protective coating 2 applied.

Experiment Examples

This experiment consist of two parts :

- To perform qualitative observations of the Zeeman effect including
- Observing the line triplet for the normal transverse Zeeman Effect.
- Observing Longitudinal Zeeman shifting.
- Observing the

Gaussmeter Specifications

Range	:	0 - 20 KG
Resolution	:	10 gauss
Accuracy	:	+/- 0.5%
Display	:	3 ½ digit, 7 segment LED
Power	:	220V +/- 10%, 50Hz
Transduce	:	Hall probe - In As

Dichroic Green Filter Specification

Type	:	Additive
Color	:	Green
Dimensions	:	50 mm x 50 mm
Clear aperture (%)	:	≥ 85
Thickness (mm)	:	2 nominal
Surface quality	:	80 – 50
Angle of incidence (°)	:	0
Substrate	:	Borofloat

polarization effects on Zeeman lines.

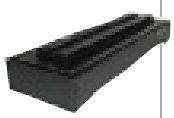
To perform quantitative measurements on the normal

- Zeeman effect including :
- To find Spacing of the etalon.
- Verification of the magnetic moment constant Bohr magneton (μ).
- Analysis of Planck's constant (h) and speed of light (c) using Zeeman Effect.
- Calibration of the magnetic field.

Scope of Supply

Rail Based Platform

Model No.	:	ED-S-04A-RBP
Length	:	500 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



IR Filter with Mount

Model No.	:	ED-S-04A-IRFM
Dimension	:	50 x 50 mm
Substrate	:	Borofloat
Quantity	:	1 No.



Green Filter with Mount

Model No.	:	ED-S-04A-GFM
Dimension	:	50 x 50 mm
Substrate	:	Borofloat
Quantity	:	1 No.



Polarizer with Variable Aperture

Model No.	:	ED-S-04A-PVA
Material	:	Sheet polarizer
Rotation	:	360 degree
Quantity	:	1 No.



Fabri-Perot Etalon with Mount

Model No.	:	ED-S-04A-FPEM
Aperture	:	30 mm
Separation of plates	:	3 - 4 mm
Quantity	:	1 No.



Camera Lens Assembly

Model No.	:	ED-S-04A-CLA
Focal length	:	85 mm
Quantity	:	1 No.



Dust Protecting Cover with magnetic locks

Model No.	:	ED-S-04A-GPHM
Material	:	PMMA
Dimension	:	450 x 150 x 165 mm
Quantity	:	1 No.



Camera

Model No.	:	ED-S-04A-CCD
Resolution	:	(320-1280 pixels)
Connectivity	:	USB 2.0
Quantity	:	1 No.



Electromagnet

Model No.	:	ED-S-04A-EM
Max magnetic field	:	1.7 Tesla @ 10 mm
Quantity	:	1 No.



Electromagnet Power Supply

Model No.	:	ED-S-04A-EMPS
Output Power	:	40 V DC , 0 - 3.5 A
Quantity	:	1 No.



Digital Gauss Meter

Model No.	:	ED-S-04A-DGM
Range	:	0 - 20 Kg
Transducer	:	In As
Quantity	:	1 No.



Gauss Probe Holder with Mount

Model No.	:	ED-S-04A-GPHM
Height	:	100 - 150 mm
	:	Anodized Aluminium Alloy
Quantity	:	1 No.



Mercury Vapor Lamp with Power Supply

Model No.	:	ED-S-04A-MVPS
Power supply	:	230V 50 Hz
Output	:	4 KV, 30 mA
Quantity	:	1 No.



Accessories

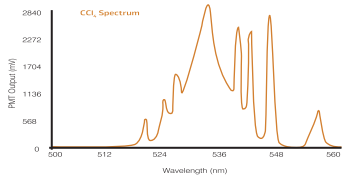
User Manual



For more product and its informations, visit our website: www.holmarc.com

Laser Raman Spectrometer (PMT Based)

Model: HO-ED-S-06



Laser Raman Spectrometer (Model no: HO-ED-S-06) is primarily meant for post graduate courses in Physics and Engineering. It can be used as a laboratory analyzing tool as well.

Monochromator

The monochromator is of Czerny-Turner design with 50 mm x 50mm size plane grating having 1200 lines per millimeter. A sine drive mechanism with classic design is employed for rotation of grating by using a stepper motor. Enhanced aluminium coated concave mirrors are used for collimating the signal light. The monochromator chamber is sealed air tight. No user adjustments required for normal use.



Detector

PMT is used as detector. It is kept near to exit slit in an enclosure. The high voltage power supply required for PMT is made integrated with the detector housing.

Control Electronics and Software

Electronics hardware is made integrated for monochromator, detector and laser source so that fully automatic operation is possible from an interfaced computer. The software developed is dedicated for Laser Raman spectrometer with all standard capabilities. Holmarc's engineers entertain customization of this software on request.

Sample Illumination and signal collection

Sample is illuminated by a laser. Though the instrument is supplied with 532 nm DPSS laser, it can be replaced by any laser of user's choice to suit application requirements. Laser mount and illumination chamber is made compatible for this purpose. Laser is guided to the sample by mirrors mounted on kinematic mounts. Sample can be either liquid or solid. Sample chamber is designed in such a way that liquid in a test tube or solid held on pin can be mounted for illumination. We customize the sample chamber at no extra cost as well. For efficient collection of signals, concave mirror and lenses are incorporated in the sample chamber.

Spectometer Specifications

Laser	:	532nm 40 mW DPSS laser
Wavelength range	:	200 ~ 800 nm (Monochromator)
Wavelength accuracy	:	≤ 0.4 nm
Wavelength repeatability	:	≤ 0.2 nm
Reciprocal of linear dispersion	:	2.7 mm
Resolution of the slit	:	0.01 mm
Notch filter wave length	:	532 nm
CWL tolerance (nm	:	+/- 5.3 nm
Half-width of spectral line	:	≤ 0.2nm @ 586nm

Monochromator Specifications

Relative aperture ratio	:	D / F 1 / 5.5
Optical grating	:	1200 l / mm

Features

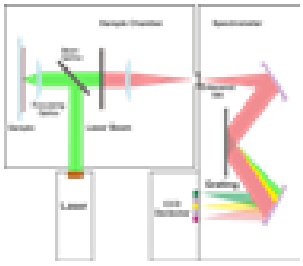
- Computer-controlled, user-friendly interface
- Capable of automatic recording of Raman spectra
- DPSS laser is used as light source
- Both solid and liquid samples can be analyzed
- High sensitive PMT is used as the detector
- PMT protection feature
- The system is assembled as a standalone unit with a footprint of 800 mm x 600mm

Experiment Examples

- To record the vibrational Raman spectrum of CCl_4 molecule
- To record the polarized Raman spectrum of CCl_4 molecule
- To calculate the depolarization ratio of CCl_4 molecule and to determine if the mode of vibration is symmetric or asymmetric vibrational Raman mode
- To record the Raman spectrum of diamond
- To record the Raman spectrum of acetone, Iso propanol etc or unknown chemicals

Laser Raman Spectrometer (CCD Based)

Model: HO-SP-LRS218



Holmarc's CCD Based Laser Raman Spectrometer apparatus (Model No: HO-ED-S-06A) is an apparatus designed for recording Raman spectra of both solids and liquid samples. Raman spectroscopy is a scattering technique. It is based on Raman Effect, i.e., frequency of a small fraction of scattered radiation is different from frequency of monochromatic incident radiation.

It is based on the inelastic scattering of incident radiation through its interaction with vibrating molecules. It probes the molecular vibrations. This will produce a different range of frequencies, namely intense stokes and anti stokes, which have higher frequency than the incident radiation along Rayleigh line. Rayleigh and Raman scattering can be explained both classically and quantum mechanically.



In CCD based Raman spectrometer, sample is kept in cuvette accompanied by the mechanical chamber with DPSS laser (532nm). The vibrational state of molecule while relaxing the high energy state re-emits the radiation in all directions.

Spectrometer is positioned in such a way that laser beam collide at the cuvette perpendicularly. Notch filter is used in front of the spectrometer to avoid Rayleigh scattering so that Raman radiations are measured efficiently.

Highly sensitive (0.1 -6500ms), low noise, cooled CCD is ideal as a detector for Raman spectrum studies. Czerny Turner design is applied in the spectrometer with precision holographic grating as dispersion element. The control electronic devices convert the optical dispersion to electronic pulses which is transmitted to computer via USB. The software used to interpret the data is user friendly. Regression / curve fit algorithms (Newton - Raphson numerical analysis, Levenberg Marquardt algorithms, etc) are used. Savitzky – Golay filtering / Box car smoothing purposes, etc are the features of the software. Material library is provided for customized versions.

Spectrometer Specifications

Design	:	Czerny Turner design
Type	:	Plane grating
Lines / mm	:	1200 l/m
Wavelength range	:	538 nm to 598 nm *
Raman Shift range	:	210 cm-1 - 2000 cm-1
Wavelength accuracy	:	< 0.4 nm
Wavelength repeatability	:	< 0.2 nm
Laser	:	532nm, 40mW DPSS laser
Notch filter wavelength	:	532 nm
CWL tolerance (nm)	:	+/- 5.3 nm
Calibration source used	:	Mercury lamp
Calibration type	:	Regression / curve fitting

* *(other wavelength ranges are available on request)*

CCD Specifications

CCD detector	:	High sensitive CCD detector 3648 element
Signal to noise ratio	:	500 : 1
A/D resolution	:	12 / 16 Bit
Exposure time	:	0.1 - 6500 ms

Features

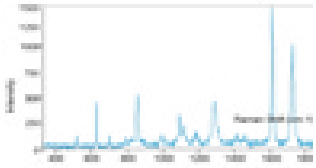
- Computer-controlled, user-friendly interface
- Automatic recording of Raman spectra
- DPSS laser is used as light source
- Both solid and liquid samples can be analyzed
- Compact System

Experiment Examples

Raman spectrum study of solid and liquid samples like TiO_2, CeO_2, Sulfur, Urea, Cyclohexane, CCl_4, etc

Confocal Laser Raman Spectrometer

Model: HO-SP-CRM215





Holmarc's Confocal Laser Raman Spectrometer couples a Raman spectrometer to a standard optical microscope, allowing highly magnified visualization of a sample and Raman analysis with a microscopic laser spot. In this equipment, sample is placed on the top of the microscope (Inverse confocal method)and is focused and then the measurement is taken. We can also analyze the sample output intensity vs. Raman shift spectrum which is connected via USB on a computer screen. Confocal means having the same focus. Unlike a normal microscope, where the whole sample is illuminated, the confocal microscope only measures the light from a small volume in the sample at any given time. Raman imaging, which combines Raman spectroscopy and imaging techniques, is an excellent method for obtaining information about the spatial distribution of molecular species. The principle on which Raman Imaging is based, is that the spatial distribution of a molecular species is obtained by isolating the Raman scattered photons from a Raman line of the specific molecular species. Raman Imaging is a 3-dimensional problem (1 spectral and 2 spatial dimensions). In Confocal microscopy we use series-imaging method in which, point illumination technique is used. A laser spot is scanned across the sample. At each resolved position, the light is collected, spectrally filtered and detected by a detector. Confocal Raman microscopy refers to the ability to spatially filter the analysis volume of the sample, in the XY (lateral) and Z (depth) axes.

CCD Specifications

CCD detector : High sensitive CCD detector 3648 element hermetically sealed vacuum cooled down to -30°C
Signal to noise ratio : 500 : 1
A/D resolution : 12 / 16 Bit
Exposure time : 0.1 - 6500 ms

Specifications

Microscope Type	:	Upright Infinity Research Grade (Inverted model on request)
Nosepiece	:	Revolving objective nosepiece
Objective	:	5X, 20X and 40X (User specified optional)
Long working distance objective	:	5X Plan apochromatic type 42mm Working distance
Tube Length	:	200 mm
Imaging Camera	:	3MP USB 3.0
Sensor	:	1/2.5" CMOS
Illumination	:	Top, Bottom and Co-Axial HB-LED Based
Illumination Control	:	Continuously Variable
Laser wavelength	:	532nm (785nm optional)
Type	:	Low noise variable power 100mW DPSS Laser
Shutter	:	Solenoid Type
Spectrometer	:	Czerny-Turner
Focal Length	:	200 mm
Focal Ration	:	f / 4
Spectral range	:	4000 ~ 100 cm-1 (Raman)
The spectral resolution	:	0.95 cm-1

Optional Accessories

1. Sample Heating Unit
Model A : Temperature Range : RT - 200 Degree C
Model B : Temperature Range : 200 - 482 Degree C
2. Specimen Holders
Multiwell Plate Holder
Petri Dish Holder
3. Motorized objective lens selection unit

Experiment Examples

- To record the Raman spectrum of Solid and liquid samples using spectrometer
- To visualize the live mode of molecule in action and its Studies

Educational spectrophotometer

HO-ED-S-08

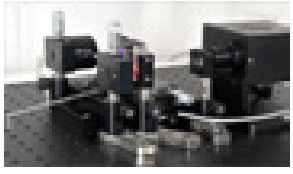
Holmarc's Educational spectrophotometer / Monochromator (Model no: HO-ED-S-08) is an educational instrument for analysis of transmittance / absorption spectroscopy studies. It characterizes the spectrum of different Monochromatic / polychromatic sources. It's a flexible model which students get better understanding of the working principles of spectrometer. All modules are deliberately made open and easy to understand. Students gain hands on experience in the basics of spectroscopy.

A pecisized angle based movement with display will help the students to create dedicated software in lab view / mat lab. For absorption studies $KMnO_4$ powder provide as a standard reference. Tungsten halogen lamp is provided as a standard source. Photo diode with multimeter is works as the detector. Diffuser screen is provided for direct observations.

Experiments Included

- Works as standard Monochromator at wavelength 400 - 1000 nm
- Works as a spectrophotometer for transmittance / Absorption measurements
- Absorption band spectra studies using $KMnO_4$ solution
- Students can work on lab view by controlling angle display unit encoder





Specifications HO-ED-S-08

Angle display unit	:	0.009 degree resolution
Variable slit	:	Micrometer controlled
Detector	:	Photo diode with multimeter
Grating	:	Holographic 1200 l / mm, 500 nm blazed
Source	:	Tungsten Halogen 20w
Reference sample	:	$KMnO_4$ solution

Specifications HO-ED-S-08A

(Advanced Version with more angle resolution)

Angle display unit	:	0.00125 degree resolution
Variable slit	:	Micrometer controlled
Detector	:	Photo diode with multimeter
Grating	:	Holographic 1200 l / mm, 500 nm blazed
Source	:	Tungsten Halogen 20w
Reference sample	:	$KMnO_4$ solution

Angle display unit
Model No. : HO-ED-S-08-ADU
Resolution : 0.009 degree resolution
Quantity : 1 No.



Halogen lamp with power supply (20w)
Model No. : HO-ED-S-08-HLPS
Power : 20 W



Cuvette holder with standard cuvettes
Model No : HO-ED-S-08-QH
Size : 10 mm path length cuvettes



Breadboard
Model No. : HO-ED-S-08-BB
Size : Custom
Material : Cast Iron
Quantity : 1 No.



Silicon Photodiode
Wave Length : 400-1100 nm



Grating with optics
Size : 30 * 30 mm

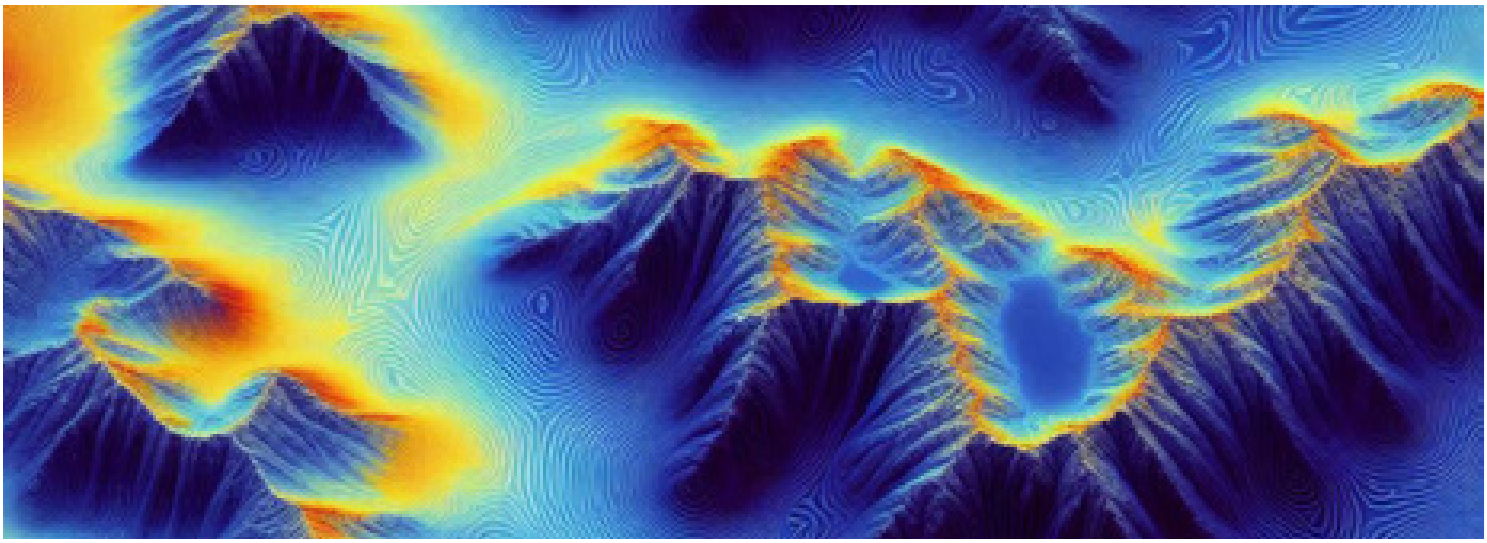
Micrometer controlled slits
Model No. : HO-ED-S-08-SL
Controlling : Lead Screw
Slit Size : 0-3mm
Quantity : 1 No.



Multimeter & Diffuser screen
Model No. : HO-ED-S-08-DSM
Material : Float
Size : 150x138x3mm



Interferometry



Newton's Rings Apparatus
Model: HO-ED-INT-01

In this apparatus, light from a sodium lamp falls on the glass plate, inclined at 45 degree to the horizontal, get reflected, and then falls normally on the convex lens placed over the glass plate. A system of bright and dark concentric circular rings are observed through a microscope, arranged vertically above the glass plate.

The microscope is properly focused so that alternate bright and dark concentric circular rings are observed more clearly. Measurements are taken from a micrometer driven traveling microscope, which is integrated with this apparatus.

The two interfering beams, derived from a monochromatic source satisfy the coherence condition for interference. Ring shaped fringes are produced by the air film existing between the convex surface of a long focus planoconvex lens and the plane of glass plate.

Specifications (Travelling Microscope)

- Magnification : 10 X
- Micrometer travel : 25 mm
- Least count : 0.01 mm



Features

- Sodium vapor lamp and spectral LED's are used as light sources
- Traveling microscope with precision micrometer is used for accurate measurements
- The optics used in this device are of research quality
- All materials used in this setup are of laboratory grade and are corrosion resistant

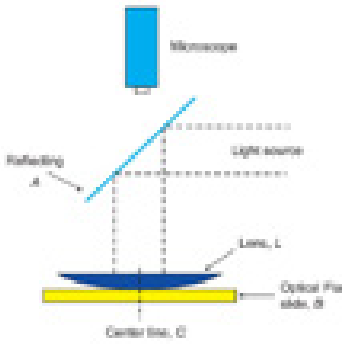
Experiment Possible

- **To determine the wavelength of Sodium light and LEDs (Red, Blue, Green, and Yellow)**

Let Dm and Dm+k be the diameters of the mth and (m+k)th dark ring respectively. Then,

$D_{2m} = 4\,mR\lambda$
$D2_{m+k} = 4\,(m+k)\,R\lambda$
$D2_{m+k} - D2_{m} = 4\,kR\lambda$
$\lambda = [D2_{m+k} - D2_{m}] / 4kR$

where λ is the wavelength used and R is the radius of curvature of the lens.



To find the refractive index of liquid

Refractive index of liquid,
$n = m\lambda R / r^2$

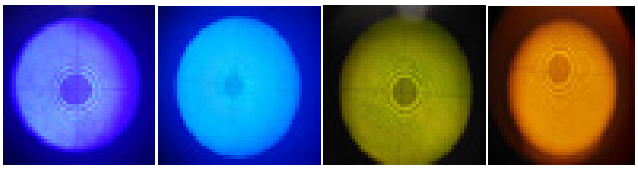
where, m order of the fringe, R Radius of curvature of the lens
λ wave length of light, r radius of the ring

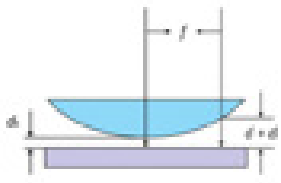
- **To find the diameter of thin wire or thickness of a thin strip of paper using air wedge method**

The diameter or thickness of the wire,
$d = l\lambda / 2\beta$

λ is the wavelength of the light
β is the bandwidth
l is the diameter of the wire or thickness of a thin strip of paper from the line of contact of the two plates of the air wedge.

Newton's ring fringe pattern using LED's





Scope of Supply

Travelling Microscope with Rigid Base

Model No.	:	ED-INT-01-TMRB
Magnification	:	10x
Micrometer Travel	:	25 mm
Least Count	:	0.01 mm
Quantity	:	1 No.



LED Mount with Rigid Base

Model No.	:	ED-INT-01-LEDM
Height	:	225 mm
Material	:	Anodized Aluminum Alloy & SS
Quantity	:	1 No.



Optical Flat

Model No.	:	ED-INT-01-OF
Material	:	Borofloat
Diameter	:	50 mm
Quantity	:	1 No.



Beamsplitter Plate

Model No.	:	ED-INT-01-BSP
Material	:	Borofloat
Diameter	:	45 x 45 mm
Quantity	:	1 No.



Accessories

Dust Protective cover
Instruction Manual



Lens Holder with Rigid Base

Model No.	:	ED-INT-01-LHRB
Height	:	180 mm
Materia	:	Anodized Aluminum Alloy & SS
Quantity	:	1 No.



Plano Convex Lens

Model No.	:	ED-INT-01-PCL1000
Material	:	Borofloat
Diameter	:	50 mm
Focal Length	:	1000 mm
Quantity	:	1 No.



Plano Convex Lens

Model No.	:	ED-INT-01-PCL750
Material	:	Borofloat
Diameter	:	50 mm
Focal Length	:	750 mm
Quantity	:	1 No.



Sodium vapor Lamp with Power supply

Model No.	:	ED-INT-01-SLPS
Output Power	:	35 W
Quantity	:	1 No.



LED's with Power supply

Model No.	:	ED-INT-01-LEDP
Colours	:	Red, Blue, Green, and Yellow
Output	:	5V, 800mA
Quantity	:	1 No. each



Cornus Interference Apparatus

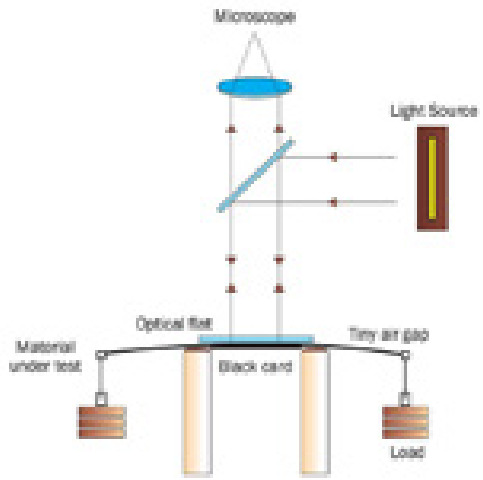
Model: HO-ED-INT-02

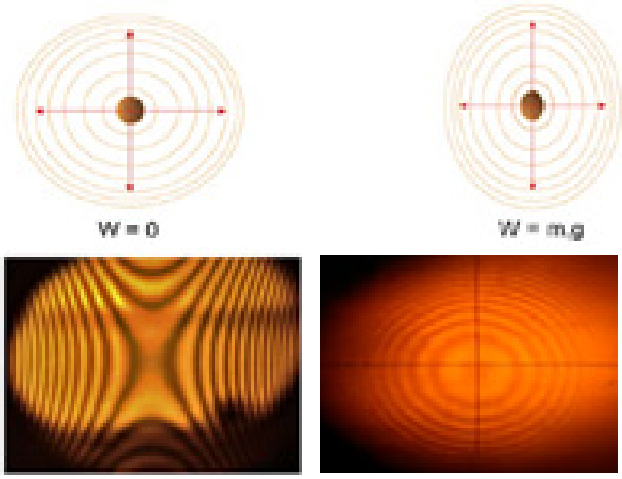
This device is similar to Newton's Rings apparatus, except that an arrangement for loading the test piece is provided for carrying out Cornus interference studies. The objective of this experiment is to determine Poisson's ratio and Young's Modulus for different materials (glass, Perspex etc) using interference method. Weights are positioned at both ends of the bar, causing it to bend longitudinally downward. A glass plate is placed on the bar to produce an interference pattern. By examining the interference pattern, extent of longitudinal and lateral bending can be determined. Thus, Poisson ratio and Young's modulus of the bar can be deduced.

When a plano-convex lens rests on a uniformly bent glass bar, an air film is formed between the two surfaces. Without adding any mass in the weight hanger we get circular rings. But as we uniformly add mass on the weight hangers, the beam bends and we get elliptical fringes.

Specifications (Travelling Microscope)

Magnification	: 10 X
Micrometer travel	: 25 mm
Least count	: 0.01 mm





Hyperbolic and Elliptical fringes observed through microscope

Features

- **In this apparatus, sodium vapor lamp and spectral LED's are used as light sources**
- **Traveling microscope with precision micrometer is used for accurate measurements**
- **High quality optics are used in order to get the clear fringe pattern**
- **All materials used in this setup are of laboratory grade and are corrosion resistant**

Experiment Possible

- **To study the elastic constants of glass by Cornus interference methods,**

i. Hyperbolic fringes

When a rectangular glass plate rests on a uniformly bent glass beam, an air film is formed between the two glass surfaces. On illuminating the air film with monochromatic light, two conjugate systems of hyperbolic fringes (longitudinal and transverse) around the point of contact of the glass plates are obtained. By measuring the longitudinal and transverse curvature, Young's modulus (Y) and Poisson's ratio (σ) can be determined.

ii. Elliptical fringes

When a plano-convex lens rests on a uniformly bent glass bar, an air film is formed between the two surfaces. On illuminating the air film with monochromatic light, a system of elliptical fringes (longitudinal and transverse) around the point of contact of the glass bar is obtained.
By measuring the longitudinal and transverse curvature, Young's modulus (Y) and Poisson's ratio (σ) can be determined.

Scope of Supply

Travelling Microscope with Rigid Base
Model No. : ED-INT-02-TMRB
Magnification : 10x
Micrometer
Travel : 25 mm
Least Count : 0.01 mm
Quantity : 1 No.



LED Mount with Rigid Base
Model No. : ED-INT-02-LEDM
Height : 225 mm
Material : Anodized Aluminum Alloy & SS
Quantity : 1 No.



Weight Hanger with Weight
Model No. : ED-INT-02-WHW
Material : Brass
Weights : 50 gm
Quantity : 1 Set



Optical Flat
Model No. : ED-INT-02-OF
Material : Borofloat
Diameter : 50 mm
Quantity : 1 No.



Beamsplitter Plate
Model No. : ED-INT-01-BSP
Material : Borofloat
Thickness : 2mm
Diameter : 45 x 45 mm
Quantity : 1 No



Test Samples :
Model No. : ED-INI-02-TS
Material : Borofloat Glass, PMMA
Dimension : 300x40x2 No
Quantity : 1 No. Each



Accessories : Instruction Manual

Knife edges with Rigid Base
Model No. : ED-INT-02-KERB
Height : 180 mm
Material : Anodized Aluminum Alloy & SS
Quantity : 1 No.



Weight Hanger clamp
Model No. : ED-INT-02-WHC
Length : 5 mm
Material : Anodized Aluminum Alloy
Quantity : 2 Nos.



Plano Convex Lens
Model No. : ED-INT-02-PCL1000
Material : Borofloat
Diameter : 50 mm
Focal Length : 1000 mm
Quantity : 1 No.



Plano Convex Lens
Model No. : ED-INT-02-PCL750
Material : Borofloat
Diameter : 50 mm
Focal Length : 750 mm
Quantity : 1 No.



Sodium vapor lamp with Power Supply
Model No. : ED-INT-02-SLPS
Output Power : 35 W
Quantity : 1 No.



LED's with Power supply
Model No. : ED-INT-02-LEDP
Colours : Red, Blue, Green, and Yellow
Output : 500V, 800mA
Quantity : 1 No. each





Michelson Interferometer (Standard Model)

Model: HO-ED-INT-06

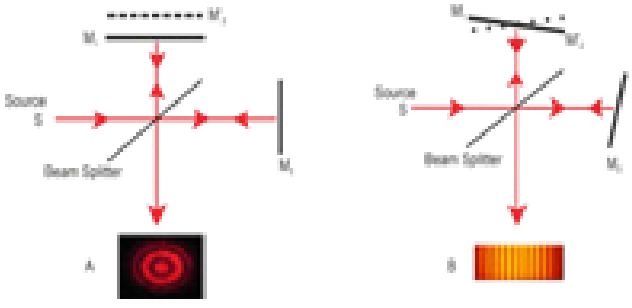
Michelson interferometer is a widely used instrument for measuring wavelength of light, refractive index of transparent materials etc. The interferometer (Model No. HO-ED-INT-06) is designed and constructed in modular fashion. The beam splitter is designed to reflect 50% of the incident light and transmit the other 50%.

The incident beam therefore is split into two beams; one beam is reflected towards mirror M1, the other is transmitted towards mirror M2. Half the light is transmitted through the beam splitter to M1 and the other half is reflected by beam splitter to M2.

The reflected beams from M1 and M2 superimpose at the beam splitter and the interference pattern can be observed on the screen

- **The instrument uses laser diode as light source**
- **Precision kinematic mounts for optical components**
- **The optics used in this device are of research quality**
- **The assembling and alignments are easy, can assemble individually**





Formation of fringes in a Michelson interferometer



Effective arrangement of Interferometer Circular Fringes

Experiment Possible

- **To determine wavelength of laser beam**

The wavelength of laser is calculated by ; $\lambda = (2d / N) \Delta$

where 'd' is the change in position that occurs for 'N' fringes to pass and Δ is the calibration constant of the micrometer

- **To find refractive index of a transparent material**

The light passes through a greater length of glass as the plate is rotated. The change in the path length of the light beam as the glass plate is rotated and relates the change in path length with the laser beam through air.

The refractive index of glass slide,

$N = (2t - N\lambda)(1 - \cos\theta) / 2t(1 - \cos\theta) - N\lambda$

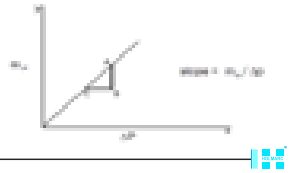
Where t is the thickness of the glass slide, N is the number of fringes counted, λ is the wave length of light used and θ is the angle turned for N fringes.

- **To study refractive index change in air under different pressures and determination of refractive index of air**

Let λ be the wavelength of light, n the refractive index of air at atmospheric pressure, d the length of the air cell, P_{atm} the current atmospheric pressure and ΔP the pressure change.

The relationship between the pressure change ΔP and the number of fringe shift $m_{\Delta P}$ is given by,

$m_{\Delta P} = (2d(n-1) / \lambda)(\Delta P / P_{atm})$



Scope of Supply

Optical Breadboard with Support
Model No. : ED-INT-06-BBS
Dimensions : 800mm x 600mm
Material : Stainless Steel
Quantity : 1 No.



Beamsplitter Mount
Model No. : ED-INT-06-BSM
Adjustment Range : 2 degrees
Material : Black anodized
: Aluminium alloy
Quantity : 1 No.



Mirror Mount with Precision Translation
Model No. : ED-INT-06-MMPT
Adjustment Range : +/-3 degrees
Material : Black anodized
Aluminium alloy
Least count : 0.01 mm
Quantity : 1 No.



Screen with Mount
Model No. : ED-INT-06-SM
Dimension : 75mm x 75mm
Quantity : 1 No.



Mirror with Cell
Model No. : ED-INT-06-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 2 Nos.



Glass Slide
Model No. : ED-INT-06-GS
Dimension : 75 mm x 25 mm
Thickness : 1 mm
Material : Float
Quantity : 5 Nos.



Diode Laser with Power supply (Green)
Model No. : ED-INT-06-DLPG
Wave length : 532 nm
Optical power : 5 mW
Quantity : 1 No.



Accessories
Thumb Screws, Dust Protective Cover
User Manual



Kinematic Laser Mount
Model No. : ED-INT-06-KLM
Material : Black anodized
Aluminum alloy
Adjustments : Using 80 tpi
lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Mirror Mount with Translation
Model No. : ED-INT-06-MMT
Adjustment Range : +/-3 degrees
Fine adjustments : Using 80
tpi lead screws
Material : Black anodized
: Aluminium alloy
Quantity : 1 No.



Rotation Stage
Model No. : ED-INT-06-RS
Resolution : 1° / division
Material : Black anodized
Aluminium alloy
Quantity : 1 No.



Pressure Cell
Model No. : ED-INT-06-PC
Length : 10 cm
Pressure Range : 0 - 300 mm Hg
Quantity : 1 No.



Beamsplitter
Model No. : ED-INT-06-BS
Dimension : 50 mm x 50 mm
Thickness : 6 mm
R / T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-INT-06-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.

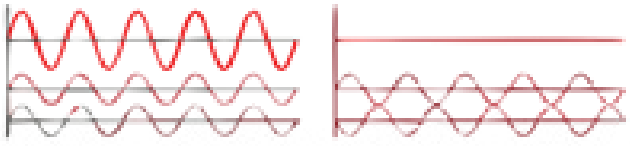


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Michelson Interferometer (Compact Model)

Model: HO-ED-INT-06C

Holmarc's Model No: HO-ED-INT-06C is a compact Michelson Interferometer. The beam splitter is designed to reflect 50% of the incident light and transmit the other 50%. The incident beam therefore is split into two beams; one beam is reflected towards mirror M1, the other is transmitted towards mirror M2. Half the light is transmitted through the beam splitter to M1 and the other half is reflected by beam splitter to M2. The reflected beams from M1 and M2 superimpose at the beam splitter and interference pattern can be observed on the screen.



Constructive Interference Destructive Interference

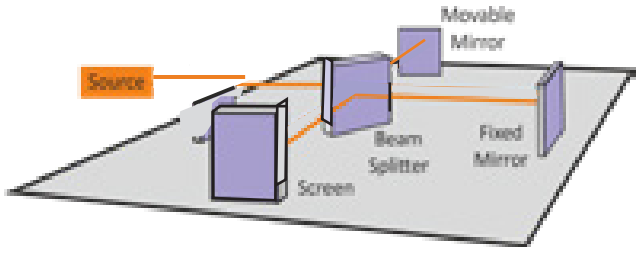


Fig. Path of Light in a Michelson interferometer



When glass plate is introduced in the optical path of Michelson interferometer, the fringes will be shifted & will become blurred. To make the fringes sharp again, move mirror mount to & fro using the knob till the clear set of fringes is achieved on the viewing screen/wall.

The Michelson Interferometer consists of a beam splitter, two mirrors and an instrument. It is reflective mirror which splits up the laser beam of light into two pathways. One path is called the reference path, while another is that of the test path. Both paths are reflected by mirrors, and they merge when they reach the beam splitter in which they conflict with one another.

Experiment Possible

- **To determine wavelength of laser beam**

The wavelength of laser is calculated by ;

$\lambda = (2d / N) \Delta$

where 'd' is the change in position that occurs for 'N' fringes to pass and Δ is the calibration constant of the micrometer

- **To find refractive index of a transparent material**

The light passes through a greater length of glass as the plate is rotated. The change in the path length of the light beam as the glass plate is rotated and relates the change in path length with the laser beam through air.

The refractive index of glass slide,

$N = (2t - N\lambda)(1 - \cos\theta) / 2t(1 - \cos\theta) - N\lambda$

Where ,

T is the thickness of the glass slide,
N is the number of fringes counted,
λ is the wave length of light used and
θ is the angle turned for N fringes.

The instrument uses laser diode as light source. Assembly and alignment are easy to understand. Laser, mirrors and beam splitter are mounted on precision kinematic mounts for fine tuning and alignment. The interference fringes are obtained on a screen and can be viewed with naked eye.

Scope of Supply

Optical Breadboard with Rigid base Platform



Model No.	:	ED-INT-06C-RBP
Dimensions	:	450 mm x 325 mm
Material	:	Cast Iron
Quantity	:	1 No.

Beamsplitter Mount



Model No.	:	ED-INT-06C-BSM
Adjustment Range	:	2 degrees
Material	:	Black anodized Aluminium alloy
Quantity	:	1 No.

Mirror Mount with Precision Translation



Model No.	:	ED-INT-06C-MMPT
Adjustment Range	:	+/-3 degrees
Material	:	Black anodized Aluminium alloy
Least count micrometer	:	0.01 mm
Quantity	:	1 No.

Mirror with Cell



Model No.	:	ED-INT-06C-MC
Diameter	:	25 mm
Thickness	:	6 mm
Material	:	Borofloat
Coating	:	Aluminium
Quantity	:	2 Nos.

Glass Slide



Model No.	:	ED-INT-06C-GS
Dimension	:	75 mm x 25 mm
Thickness	:	1 mm
Material	:	Float
Quantity	:	5 Nos.

Accessories

User Manual, Thumb Screws, Dust Protective Cover

Kinematic Laser Mount



Model No.	:	ED-INT-06C-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.

Mirror Mount with Translation



Model No.	:	ED-INT-06C-MMT
Adjustment Range	:	+/-3 degrees
Fine adjustments	:	Using 80 tpi lead screws
Material	:	Black anodized Aluminium alloy
Quantity	:	1 No.

Rotation Stage



Model No.	:	ED-INT-06C-RS
Resolution	:	1° / division
Material	:	Black anodized Aluminium alloy
Quantity	:	1 No.

Beamsplitter



Model No.		ED-INT-06C-BS
Dimension		50 mm x 50 mm
Thickness	:	6 mm
R / T ratio	:	50 / 50
Material	:	N-BK7
Coating	:	Aluminium
Quantity	:	1 No.

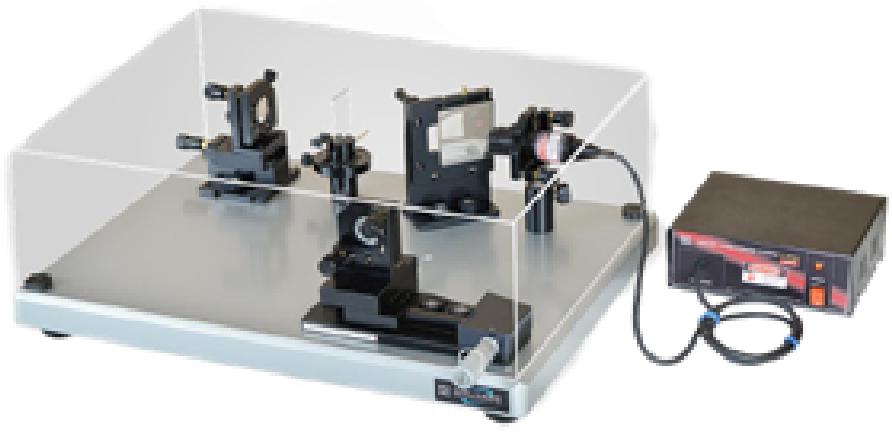
Diode Laser with Power supply (Red)



Model No.	:	ED-INT-06C-DLPR
Wave length	:	650 nm
Optical power	:	5 mW
Quantity	:	1 No.

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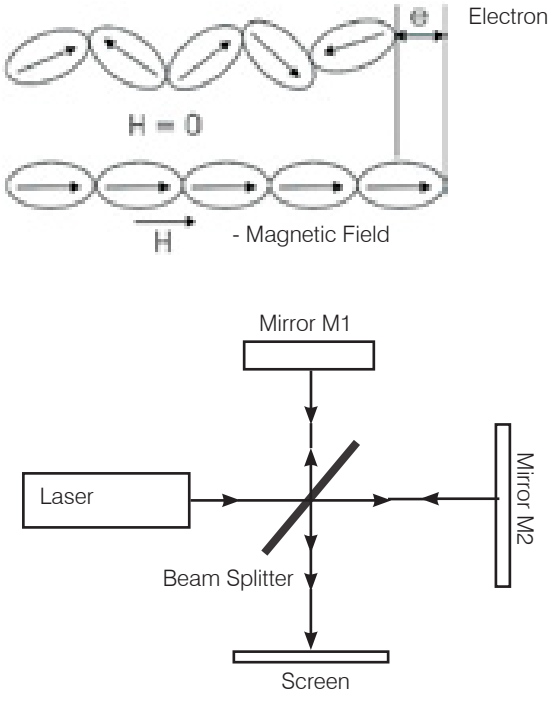
For more product information , visit us at www.holmarc.com



Magnetostriction with Michelson Interferometer

Model: HO-ED-INT-06M

Holmarc's Model No:HO-ED-INT-06M, Magnetostriction with Michelson Interferometer uses two mirrors in a Michelson arrangement to obtain the interference pattern. Due to the magnetostrictive effect, one of the mirrors is shifted by variation in the magnetic field applied to the sample, and the shift in interference pattern is observed.



Schematic Diagram for Experimental Setup of Michelson Interferometer

Ferromagnetic substances undergo so-called magnetic distortions, i.e, they exhibit lengthening or shortening parallel to the direction of magnetization. Such changes are termed positive or negative magnetostriction. In crystal anisotropy , magnetostriction is also ascribable to the spin-orbit mutual potential energy, as this is a function of direction of magnetization and the interatomic distances. Due to magnetostriction, which corresponds to a spontaneous distortion of the lattice, a Ferro magnet can reduce its total anisotropic and elastic energy.

Features

- **Longitudinal magneto–striction is considered**
- **Diode laser is used as light source**
- **All materials used in this setup are of laboratory grade and are corrosion resistant**

Experiment Possible

- **To study magnetostric-tive properties of various materials (iron, nickel and copper)**

Magnetostriction is a property of ferromagnetic materials that causes them to change their shape or dimensions during the process of magnetization.

The alteration in length Δl is obtained from the number of circular fringe changes

In the process the separation per circular fringe change alters by λ/2.

$\Delta l = n.\lambda / 2$

λ is the wavelength of laser used and
n is the number of circular fringes

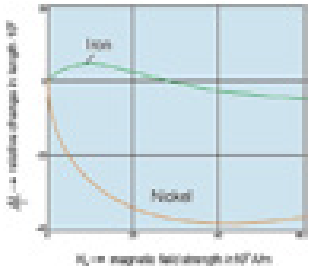


Fig. Material with their relative change in length Δl plotted against applied field strength Hm

Scope Of Supply

Optical Breadboard with Support
Model No. : ED-INT-06M-BBS
Dimensions : 800 mm x 600 mm
Material : Stainless Steel
Quantity : 1 No.



Beamsplitter Mount
Model No. : ED-INT-06M-BSM
Adjustment Range : 2 degrees
Material : Black anodized Aluminium alloy
Quantity : 1 No



Mirror Mount with Precision Translation
Model No. : ED-INT-06S-MMPT
Adjustment Range : +/- 3 degrees
Material : Black anodized Aluminium alloy
Least count of the micrometer : 0.01 mm
Quantity : 1 No.



Screen with Mount
Model No. : ED-INT-06M-SM
Dimension : 75mm x 75mm
Quantity : 1 No.



Mirror with Cell
Model No. : ED-INT-06M-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 2 Nos.



Diode Laser with Power supply (RED)
Model No. : ED-INT-06M-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.



Electromagnet Power supply
Model No. : ED-INT-06M-EP
Current : 0-4A
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-INT-06M-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 t pi lead screws
Adjustment Range : +/- 3 degrees
Quantity : 1 No.



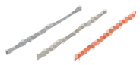
Mirror Mount with Translation
Model No. : ED-INT-06M-MMT
Adjustment Range : +/- 3 degrees
Fine adjustments : Using 80 tpi lead screws
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Electromagnet Coil with Mount
Model No. : ED-INT-06M-ECM
Winding material : Copper
No. of turns : 2508 nos.
Quantity : 1 No.



Specimen Rods (Iron, Nickel, Copper)
Model No. : ED-INT-06M-SR
Length : 185mm
Diameter : 6mm
Quantity : 1 No.



Beam splitter
Model No. : ED-INT-06M-BS
Dimension : 50 mm x 50 mm
Thickness : 6 mm
R / T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium



Accessories
User Manual, Thumb Screws
Dust Protective Cover



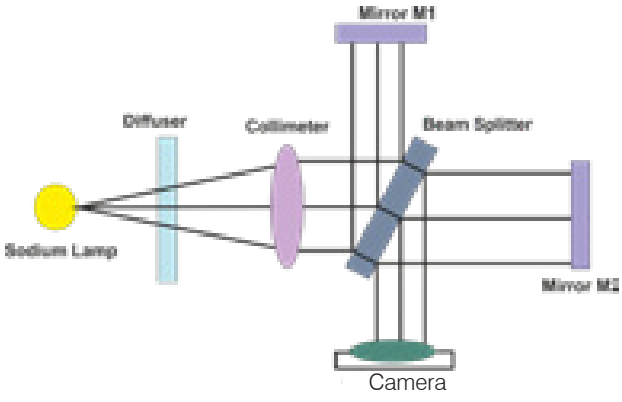
Gt In Touch with our technical experts and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service

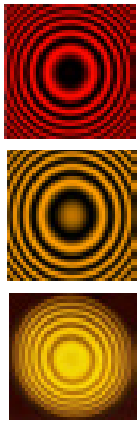


Michelson Interferometer (Sodium D'Lines)

Model: HO-ED-INT-06S

In this model of Michelson interferometer, sodium vapor lamp is used as light source. Sodium has two emission wavelengths that have extremely close values and without sensitive equipment, it cannot be distinguished. Measurement of these lines, designated as D1 and D2 Fraunhofer lines, the average wavelength as well as difference between the two emission lines of sodium can be determined. The purpose of this experiment is to measure the wavelength of Sodium D emission lines.





Schematic Diagram for Michelson Interferometer (Sodium D'Lines)

The two beams of a Michelson interferometer interfere constructively when the waves add in phase and destructively when they add out of phase, producing circular interference fringes as a result. From this we can calculate wavelength of sodium source. The interference pattern observed with the sodium lamp contains two sets of fringes which disappear when the bright bands of one set are superimposed on the dark bands of the other. The wavelength separation of the Na D-line doublet is easily determined by observing the successive coincidence and discordance of the two sets of fringe systems produced by the doublet of wavelengths (λ1 and λ2 with λ1 > λ2). As D is increased, the two systems gradually separate and the maximum discordance occurs when the rings of one system are set exactly halfway between those of the other system. The discordance positions are most clearly seen as minima in the contrast of the pattern.



Experiment Possible

- **To find out the difference in wavelength of D1 and D2 lines of sodium light**

The fringe pattern formed by the Michelson interferometer, using monochromatic light (sodium D lines).

Wavelength separation λ2/2D where λ is the average wavelength of the sodium and D is the change in position of the micrometer for two successive discordance / coincidence.

- **To determine the wavelength of monochromatic light**

The wavelength of laser is calculated by;

$\lambda = (2d / N)\,\Delta$

where 'd' is the change in position that occurs for 'N' fringes to pass and Δ is the calibration constant of the micrometer

- **To measure refractive index of transparent materials**

The light passes through a greater length of glass as the plate is rotated. The change in the path length of the light beam as the glass plate is rotated and relates the change in path length with the laser beam through air.

The refractive index of glass slide,

$N = (2t - N\lambda)(1 - \cos\theta) / 2t(1 - \cos\theta) - N\lambda$

Where t is the thickness of the glass slide,
N is the number of fringes counted,
λ is the wave length of light used and
θ is the angle turned for N fringes.

Scope of Supply

Optical Breadboard with Support
Model No: : ED-INT-06S-BBS
Dimensions : 800 mm x 600 mm
Material : Stainless Steel
Quantity : 1 No.



Beamsplitter Mount
Model No. ED-INT-06S-BSM
Adjustment Range : 2 degrees
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Mirror Mount with Precision Translation
Model No. : ED-INT-06S-MMPT
Material : Black anodized Aluminium alloy
Least count of the micrometer : 0.01 mm
Quantity : 1 No.



Camera lens Assembly Mount
Model No. : ED-INT-06S-CLAM
Diameter 50 mm
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Diffuser plate with Mount
Model No. : ED-INT-06S-DPM
Plate Diameter : 25 mm
Material : Borofloat
Quantity : 1 No.



Camera
Model No. : ED-INT-06S-CCDC
Resolution : 320-1280 Pixels



Mirror with Cell
Model No. : ED-INT-06S-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 2 Nos.



Diode Laser with Power supply (Red)
Model No. : ED-INT-06S-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.



Accessories User Manual, Thump Screws, Software

Kinematic Laser Mount
Model No. : ED-INT-06S-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/- 3 degrees
Quantity : 1 No.



Mirror Mount with Translation
Model No. : ED-INT-06S-MMT
Adjustment Range : +/- 3 degrees
Course movement : Micrometer controlled
Material Black anodized : Aluminium alloy
Least count : 0.01mm
Quantity : 1 No.



Rotation Stage
Model No. : ED-INT-06S-RS
Resolution : 1° / division
Material Black anodized : Aluminium alloy
Quantity : 1 No. each



Camera Lense Assembly
Model No. : ED-INT-06S-CLA
Focal Length : 85mm
Quantity : 1 No.



Beamsplitter
Model No. : ED-INT-06S-BS
Dimension : 50 mm x 50 mm
Thickness : 6 mm
R / T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium
Quantity : 1 No.



Glass Slide
Model No. : ED-INT-06-GS
Dimension : 75 mm x 25 mm
Thickness : 1 mm
Material : Float
Quantity : 5 Nos.



Sodium vapor lamp with Power Supply
Model No. : ED-INT-06S-SLPS
Output Power : 35W
Quantity : 1 No.



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Michelson Interferometer (Piezo Electric Effect)

Model: HO-ED-INT-06P

Michelson interferometer is a widely used instrument for measuring wavelength of light, refractive index of transparent materials etc. In Holmarc's Apparatus (Model No: HO-ED-INT-06P), Michelson Interferometer is used as 'Optical Ruler' to calculate the displacement factor of piezoelectric actuator in accordance with the Piezoelectric Effect. An applied voltage will cause a piezoelectric actuator to exhibit a tiny mechanical displacement(typically in nanometer).

The displacements are measured using the beam of light from a diode laser (650nm) in the Michelson Interferometer to calculate the minute motions. The applications of the Piezoelectric effect has reached almost every fields of science and technology, being utilized in advanced disciplines such as the atomic force microscopy, all forms of vibration suppression etc.ift

Holmarc's Michelson Interferometer-piezoelectric effect uses two mirrors in a Michelson arrangement to obtain the interference pattern. The interferometer is assembled with a Piezoelectric Actuator on a movable mirror. When the voltage across the Piezoelectric Actuator is increased from zero to maximum gradually, we can observe shift in the fringe pattern. One can determine the fringe shift and hence the displacement produced by the Piezoelectric Actuator can be calculated. The instrument uses laser diode as light source. Assembly and alignment are easy to understand. Laser, mirrors and beam splitter are mounted on precision kinematic mounts for fine tuning and alignment. The interference fringes are obtained on a screen and can be viewed with naked eye. Due to the Piezoelectric Effect, one of the mirrors is shifted by the variation in the voltage applied to the sample, and the change in interference pattern is observed. Students can assemble the interferometer out of individual modules by fixing them on the optical breadboard. All components required for such assembly, including screws and allen keys, are supplied with the package.

Piezoelectric Actuators

A piezoelectric actuator converts an electrical signal into a precisely controlled physical displacement (stroke). If displacement is prevented, a useable force (blocking force) will develop. The precise movement control afforded by piezoelectric actuators is used to finely adjust machining tools, lenses, mirrors, or other equipment. Piezoelectric actuators are also used to control hydraulic valves, acting as small-volume pumps or special-purpose motors and in other applications requiring movement or force. When an electric field is applied across the material, the polarized molecules will align themselves with the electric field, resulting in induced dipoles within the molecular or crystal structure of the material. This alignment of molecules will cause the material to change dimensions. This phenomenon is known as electrostriction. This can be utilized by engineers to develop instruments for measuring exact displacement factors. They can use this knowledge to apply exact voltages and produce nanometer displacements with an incredibly small margin of error. Knowing this is immensely important, especially in the ever growing field of nano-technology, where the smooth movement of a piezo electric actuator would be able to move minute parts and manufacture tiny materials.

Features of Piezo Electric Actuator

- Compact size, accurate positioning in nm, high speed response and large blocking force
- High energy conversion efficiency, low power consumption and absence of electromagnetic noise
- Easy to be controlled by voltage variations

Features

- **Research grade optical components**
- **Flexible, modern and user friendly design**
- **Precision kinematic mounts for fine tuning and alignment**

Experiment Possible'

- To observe the Piezo Electric Effect
- To obtain the displacement factor by counting the fringe sh

Scope of Supply

Optical Breadboard with Support
Model No. : ED-INT-06P-BBS
Dimensions : 800 mm x 600 mm
Material : Stainless Steel
Quantity : 1 No.



Beamsplitter Mount
Model No. : ED-INT-06P-BSM
Adjustment Range : 2 degrees
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Mirror mount with Piezo electric actuator
Model No. : ED-INT-06P-MMP
Drive : Piezo Electric Actuator
Material : Aluminium Alloy B51S
Quantity : 1 No.



White Screen
Model No. : ED-INT-06P-WS
Material : Acrylic
Quantity : 1 No.
Dimension : 300x200mm



Mirror with Cell
Model No. : ED-INT-06P-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 2 Nos.



Diode Laser with Power supply (Red)
Model No. : ED-INT-06P-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No



Kinematic Laser Mount
Model No. : ED-INT-06P-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/- 3 degrees
Quantity : 1 No.



Mirror Mount with Translation
Model No. : ED-INT-06P-MMT
Adjustment Range : +/- 3 degrees
Fine adjustments : Using 80 tpi lead screws
Least count of the Micrometer : 0.01mm
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Power Supply for Piezo electric actuator
Model No. : ED-INT-06P-PSP
Actuator : Piezo Electric Actuator
PC connectivity : Serial port (RS 232)
Quantity : 1 No.



Beam Splitter
Model No. : ED-INT-06P-BS
Dimension : 50 mm x 50 mm
Thickness : 6 mm
R / T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium
Quantity : 1 No.



Accessories
User Manual
Thump Screws





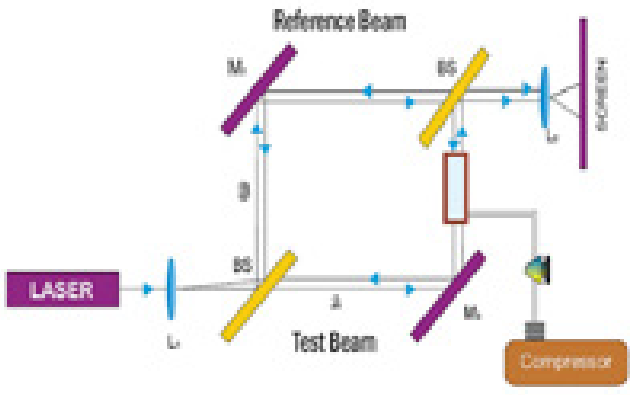
Mach Zehnder Interferometer

Model: HO-ED-INT-12

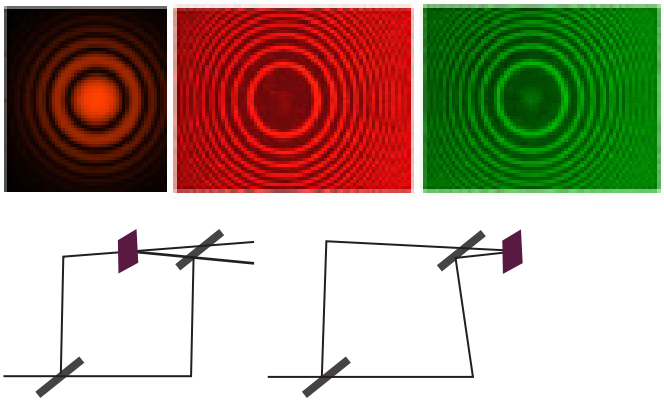
Interferometer is built by assembling the building blocks on a breadboard as per desired optical layout. Optics and laser head are held using kinematic mounts with two axis fine adjustment facility. Precision alignments for obtaining the interference fringes are done using kinematic mounts.

One of the simplest experiments using the interferometer is measurement of index of refraction of air with an airtight test cell placed in one of the optical arms of the interferometer. No other factor such as convective airflow, should be present, that can generate optical path differences.

The flexibility in fringe localization is one of the important advantages of the mach zehnder interferometer over other interferometers. Although many Mach-Zehnder interferometers use a rectangular arrangement, parallelogram arrangements are also possible. Vibration isolated supports for optical table is optional.



The Mach-Zehnder interferometer is a particularly simple device for demonstrating interference by division of amplitude. A light beam is first split into two parts by a beam splitter and then recombined by a second beam splitter. Depending on the relative phase acquired by the beam along the two paths the second beam splitter will reflect the beam with efficiency between 0 and 100%.



The Mach–Zehnder interferometer is a device used to determine the relative phase shift variations between two collimated beams derived by splitting light from a single source. The interferometer has been used, among other things, to measure phase shifts between the two beams caused by a sample or a change in length of one of the paths Localized fringes result when an extended source is used in a Mach–Zehnder interferometer. By appropriately adjusting the mirrors and beam splitters, the fringes can be localized in any desired plane

Experiment Possible

- **To determine wavelength of laser beam.**

The wavelength of laser is calculated by,

$\lambda = (2d / N) \Delta$

where 'd' is the change in position that occurs for 'N' fringes to pass and Δ is the calibration constant of the micrometer.

- **To find refractive index of a transparent material.**

The light passes through a greater length of glass as the plate is rotated. The change in the path length of the light beam as the glass plate is rotated and relates the change in path length with the laser beam through air.

The refractive index of glass slide,

$N = (2t - N\lambda) (1 - \cos\theta) / 2t (1 - \cos\theta) - N\lambda$

Where t is the thickness of the glass slide, N is the number of fringes counted, λ is the wave length of light used and θ is the angle turned for N fringes.

- **To study refractive index change in air under different pressures and determine refractive index of air.**

When a piece of material of thickness d is placed in one arm of the Michelson Interferometer, the change in optical path length is given by 2dn where n is the difference in refractive index between the sample and the material it replaced (usually air). In other words, 2d (nm-nair) / λ extra wavelengths are introduced if air is replaced by a sample of refractive index nm.

Scope of Supply

Optical Breadboard with Support
Model No. : ED-INT-12-BBS
Dimensions : 800 mm x 600 mm
Material : Stainless Steel
Quantity : 1 No.



Beamsplitter Mount
Model No. : ED-INT-12-BSM
Degrees of freedom : 2 degrees
Material : Black anodized Aluminium alloy
Quantity : 1 No



Mirror Mount with Precision Translation
Model No. : ED-INT-12-MMPT
Adjustment Range : +/- 3 degrees
Material : Black anodized Aluminium alloy
Least count of the micrometer : 0.01 mm
Quantity : 1 No.



Screen with Mount
Model No. : ED-INT-12-SM
Dimension : 75mm x 75mm
Quantity : 1 No.



Mirror with Cell
Model No. : ED-INT-12-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 2 Nos.



Glass Slide
Model No. : ED-INT-12-GS
Dimension : 75 mm x 25 mm
Thickness : 1 mm
Material : Float
Quantity : 5 Nos.



Diode Laser with Power supply (Green)
Model No. : ED-INT-06-DLPG
Wave length : 532 nm
Optical power : 5 mW
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-INT-12-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Mirror Mount with Translation
Model No. : ED-INT-12-MMT
Adjustment Range : +/- 3 degrees
Fine adjustments : Using 80 tpi lead screws
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Rotation Stage
Model No. : ED-INT-12-RS
Resolution : 2° / division
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Pressure Cell
Model No. : ED-INT-12-PC
Length : 10 cm
Pressure Range : 0 - 300 mm Hg
Quantity : 1 No.

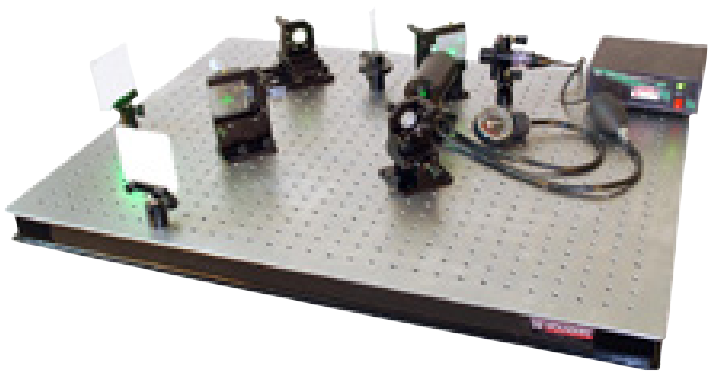


Beamsplitter
Model No. : ED-INT-12-BS
Dimension : 50 mm x 50 mm
Thickness : 6 mm
R / T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No : ED-INT-12-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.





Features

- Kinematic mounts are used for fine movement of optical components
- Diode laser is used as light source
- All materials used in this setup are of laboratory grade with corrosion resistance
- The optics used in this device are of research quality

Fabry - Perot Etalon

Model: HO-ED-INT-09

Holmarc's Fabry-Perot etalon is made of plate beamsplitters separated by 3mm distance. The beamsplitters are made by coating thin aluminum films on optically polished N-BK7 substrates. The reflecting surfaces are kept inside the assembly. The etalon has optical resonating properties similar to that of laser. A translucent screen is provided with vernier and needle to take the readings of the fringes directly. Etalons transmit light as a series of periodic frequencies and their narrow bandwidth makes them well-suited for wavelength selection, measurement and line-narrowing. The properties of an etalon are largely determined by its thickness, index of refraction and the reflectivity of it's surfaces. The finesse is a measure of the interferometer's ability to resolve closely spaced spectral lines. An etalon is an optical interferometer in which a beam of light undergoes multiple reflections between two reflecting surfaces and it's resulting optical transmission (or reflection) is periodic in wavelength. In other words, an etalon is a narrow band wavelength filter.

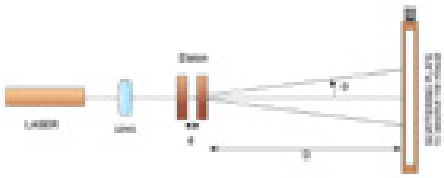




Fig. Schematic Diagram

When a ray of light from laser source incident on Etalon, it gets reflected and transmitted. The reflected ray continues to get reflected inside the parallel reflecting surface, and some of the rays will be transmitted. The transmitted lights are collected on a screen and rings are observed. It make use of multiple reflection which follows interference of thin films due to transmitted light







Fig. Fabry Perot etalon produces sharp interference peeks

The output of the interferometer will appear as a collection of bright, extremely narrow rings; a typical example is illustrated below An etalon is an optical interferometer that consists of two glass plates, separated by a small, fixed distance. If one of the mirrors is movable, it is called an interferometer, otherwise it is termed an etalon.

Experiment Examples

To find the Spacing of the Etalon

The Spacing of the Etalon is given by,

$t = nD2\lambda / \chi_{n2}$

where

n is the order of interference,

D is the distance between the etalon and the screen,

λ is the wavelength of light used.

$\chi n2 = \chi^{m+n2} - \chi^{m2}$

χ^{m+n2} is the square of the radius of (m+n)th ring and χ_m^2 that of m^{th} ring.

To find the Finesse and Free Spectral Range of the Etalon

The Free Spectral Range of the Etalon is given by,

$FSR = c / 2t$,

Where c is the speed of light in air and t is the spacing of the Etalon

The finesse is a measure of the interferometer's ability to resolve closely spaced spectral lines.

The finesse F is defined by the following equation.

$F = \pi \sqrt{R} / (1-R)$

Where, R is the reflectivity of surfaces

Scope of Supply

Optical Rail

Model No.	:	ED-INT-09-OR
Length	:	1000 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Kinematic Laser Mount

Model No.	:	ED-INT-09-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



Diode Laser with Power supply (Red)

Model No.	:	ED-INT-09-DLPR
Wave length	:	650 nm
Optical power	:	5 mW
Quantity	:	1 No.



Fabri-Perot Etalon

Model No.	:	ED-INT-09-FPE
Material	:	H-K9L
Diameter	:	32 mm
Coating	:	Aluminium
R / T	:	60 : 40
Spacing of plates	:	3 +/- 1 mm
Quantity	:	1 No.



Plano Convex Lens with Mount

Model No.	:	ED-INT-09-PCLM
Material	:	N-BK7
Diameter	:	20 mm
Effective Focal Length	:	26 mm
Quantity	:	1 No.



Diffuser Screen with Measurement unit

Model No.	:	ED-INT-09-DSM
Material	:	Float
Size	:	150x138x3mm
Quantity	:	1 No.

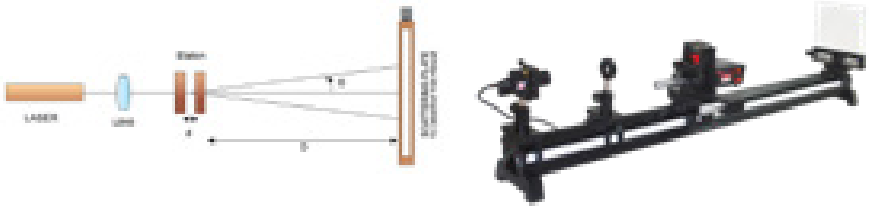


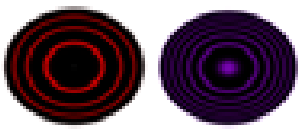
Fabry - Perot Interferometer (Projection Based)

Model: HO-ED-INT-10

In Fabry - Perot interferometer, the distance between the partially reflecting mirrors are varied by using coarse and finely adjustable translation stage driven by micro-meters. One beam splitter is fixed and the other is mounted on the translation stage through a kinematic mount. This two axis kinematic mount is used to correct the parallelism between beamsplitters. The Fabry - Perot design contains plane surfaces that are partially reflecting so that multiple rays of light are responsible for the creation of the observed interference patterns. For high resolution spectroscopy, where a resolution in the range of MHz to GHz is required, a Fabry - Perot interferometer (FP) is used. The FP consists of two plane mirrors mounted accurately parallel to each another, with an optical spacing of 'd' between them.

The enclosed air gap generally varies from several millimeters to centimeters, when the device is used interferometrically. If the gap can be mechanically varied by moving one of the beam splitters, then the device is referred to as an interferometer. It's transmission spectrum as a function of wavelength exhibits peaks of transmission corresponding to resonances of the etalon. Fabry - Perot interferometers are widely used in telecommunication, lasers and spectroscopy for controlling and measuring the wavelength of light.





Concentric circular ring pattern for monochromatic source of red light (700nm) and violet light (400 nm)

Experiment Possible

To find the wavelength of monochromatic light

The wavelength of laser
$\lambda = (2d / N) \Delta$
where 'd' is the change in position that occurs for 'N' fringes to pass and Δ is the calibration constant of the micrometer

To determine the spacing between the plates of fabry perot etalon from the fringe Pattern

The Spacing of the Etalon
$t = nD2\lambda / \chi n2$, where n is the order, 'D ' is the distance between the etalon and the screen, 'λ' is the wavelength of light used.
$\chi n2 = \chi^{m+n2} - \chi^{m2,}$ where χ^{m+n2} is the square of the radius of (m+n) th ring and χm2 that of mth ring.

To find the finesse and free spectral range (FSR) of etalon from the fringe calibration at different cavity thickness

The Free Spectral Range of the Etalon is given by,
$FSR = c / 2t$, Where c is the speed of light in air and t is the spacing of the Etalon
The finesse is a measure of the interferometer's ability to resolve closely spaced spectral lines.The finesse F
$F = \pi \sqrt{R} / (1-R)$
Where, R is the reflectivity of surfaces

Scope of Supply

Optical Rail

Model No.	:	ED-INT-10-OR
Length	:	1000 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Kinematic Laser Mount

Model No.	:	ED-INT-10-KLM
Material	:	Black anodized
Adjustments	:	Aluminum alloy Using 80 tpi lead screws
Adjustment Range	:	+/- 3 degrees
Quantity	:	1 No



Diode Laser with Power supply (Red)

Model No.	:	ED-INT-10-DLPR
Wave length	:	650 nm
Optical power	:	5 mW
Quantity	:	1 No.



Diode Laser with Power supply (Green)

Model No.	:	ED-INT-10-DLPG
Wave length	:	532 nm
Optical power	:	5 mW
Quantity	:	1 No.



Fabri-Perot Interferometer

Model No.	:	ED-INT-10-FPI
Material	:	H-K9L
Diameter	:	25 mm
Coating	:	Aluminium
R / T	:	60 : 40
Spacing of plates	:	2 - 8mm variable
Least count of the Micrometer	:	0.01mm
Quantity	:	1 No.



Plano Convex Lens with Mount supply

Model No.	:	ED-INT-10-PCLM
Material	:	H-K9L
Diameter	:	20 mm
Effective Focal Length	:	26 mm
Quantity	:	1 No.



Diffuser Screen with Measurement unit

Model No.	:	ED-INT-10-DSM
Material	:	Float
Size	:	150x138x3mm
Quantity	:	1 No.



Accessories

User Manual, Knobs

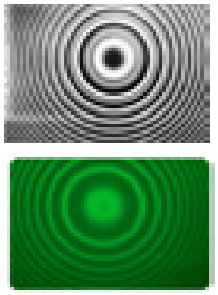
Fabry - Perot Interferometer (CCD Based)

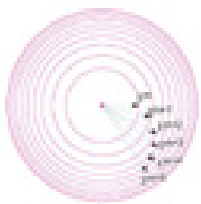
Model: HO-ED-INT-10A

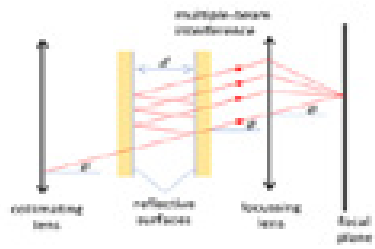
Computer interfaced Fabry-Perot interferometer (Model No:HO-ED-INT-10A) is similar to projection type (model no:HO-ED-INT-10), apart from the fact that in this case, the interference pattern is captured by a CCD sensor and displayed on a computer monitor. The advantage of computer interface is that the pattern can be saved for future analysis. In addition, measurements can be taken directly from the monitor by using the software module provided. In the etalon, distance between partially reflecting mirrors can be precisely varied in microns. One of the beam splitters can be kinematically adjusted for initial settings.

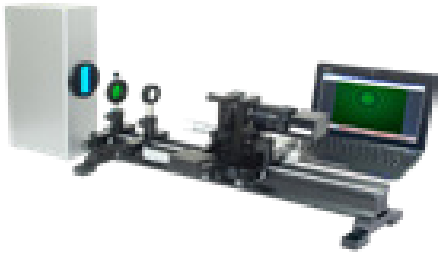
Specification of etalon

- Spacing of Etalon : 2 - 8mm
- Ratio R/T : 60/40
- Aperture : 25mm









In optics, a Fabry–Pérot interferometer (FPI) or etalon is an optical cavity made from two parallel reflecting surfaces (i.e.: thin mirrors). Optical waves can pass through the optical cavity only when they are in resonance with it.
Etalons are widely used in telecommunications, lasers and spectroscopy to control and measure the wavelengths of light. Recent advances in fabrication technique allow the creation of very precise tunable Fabry–Pérot interferometers. The device is technically an interferometer when the distance between the two surfaces can be changed, and an etalon when the distance is fixed (however, the two terms are often used interchangeably).

Features

- **Mercury vapor lamp is used as light source**
- **Compact design**
- **Fine tuning is possible in etalon**
- **High resolution CCD camera**

Experiment Possible

- **To find the wavelength of monochromatic light**

The wavelength of laser is calculated by,

$\lambda = (2d / N) \Delta$

where 'd' is the change in position that occurs for 'N' fringes to pass and Δ is the calibration constant of the micrometer

- **To determine the spacing between the plates of fabry perot etalon from the fringe Pattern**

The Spacing of the Etalon is given by,

$t = nD2\lambda / \chi n2$

where n is the order, 'D ' is the distance between the etalon and the screen, 'λ' is the wavelength of light used.
$\chi n2 = \chi m+n2 - \chi m2$

χ^{m+n2} is the square of the radius of (m+n)th ring and χ^{m2} that of mth ring.

- **To find the finesse and free spectral range (FSR) of etalon from the fringe calibration at different cavity thickness**

The Free Spectral Range of the Etalon is given by,

$FSR = c / 2t,$

Where c is the speed of light in air and t is the spacing of the Etalon
The finesse is a measure of the interferometer's ability to resolve closely spaced spectral lines.

The finesse F is defined by the following equation.

$F = \pi \sqrt{R} / (1-R)$
Where, R is the reflectivity of surfaces

Scope of Supply

Optical Rail
Model No. : ED-INT-10A-OR
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



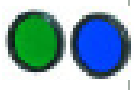
Kinematic Laser Mount
Model No. : ED-INT-10A-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Colour Filter Mount
Model No. : ED-INT-10A-CFM
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 Nos.



Colour Filters (Green, Blue)
Model No. : ED-INT-10A-CF
Diameter : 30 mm
Material : PMMA
Quantity : 1 No. Each



Diode Laser with Power supply (Red)
Model No. : ED-INT-10A-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.



Mercury Vapor Lamp
Model No. : ED-INT-10A-MVPS
Input : 230V, 50 Hz
Quantity : 1 No



Fabri-Perot Interferometer
Model No. : ED-INT-10A-FPI
Material : H-K9L
Diameter : 25 mm
Coating : Aluminium
R / T : 60 : 40
Spacing of plates : 2 - 8mm variable
Least count of the Micrometer : 0.01mm
Quantity : 1 No.



Plano Convex Lens with Mount supply
Model No. : ED-INT-10A-PCLM
Material : H-K9L
Diameter : 30 mm
Effective Focal Length : 26 mm
Quantity : 1 No.



Camera Lens Assembly with Mount
Model No. : ED-INT-10A-CLAM
Material : H-K9L
Focal Length 85 mm
Quantity : 1 No



CCD Camera
Model No. : ED-INT-10A-CCDC
Resolution : Selectable (320-1280 pixels)
Connectivity : USB 2.0
Quantity : 1 No.



Accessories
User Manual



Fizeau Interferometer

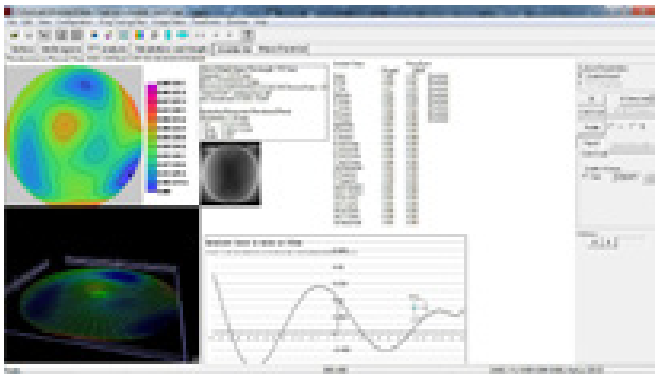
Model: HO-ED-INT-14

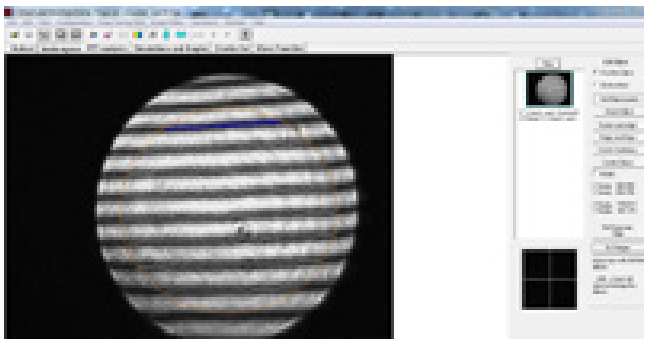
Fizeau Interferometer is one of the simplest and most versatile interferometers and is popular for routine measurements of both flat and spherical surfaces. It is used to measure optical components such as flats, prisms, lenses, or precision metal parts such as bearings, sealing surfaces or polished ceramics. Measurements can be made by using the static fringe analysis software.

The Holmarc Fizeau interferometer (model no:HO-ED-INT-14) basically comes with high optical quality (λ / 20) reference flat. The reflection from the test surface interferes with the reflection from reference flat, producing fringes. The shape and quality of the fringes depends on surface quality of the test flat. The fringes are digitalized using a high resolution CCD camera. By analyzing the fringes, we can obtain the P-V flatness, RMS flatness, 3D surface plot etc. The instrument is built upright to fix the test sample easily. The tip / tilt test base allows the test sample to align with the reference surface. High quality aberration corrected optical design enhances performance.

Specifications

Sample size	:	≤ 100 mm
Reference flat	:	λ/20 PV 100 mm diameter 25 mm thickness
Accuracy	:	≤ λ/20 PV
Laser source	:	DPSS 5.0 mW 532 nm
Alignment	:	By Tip / tilt sample base
Camera	:	CCD Res. 1280 x 1024
Analysis	:	Using fringe analysis software
Weight	:	Approx. 25 Kg
Power supply	:	220V, 50Hz





Experiment Possible

To measure the optical flatness of different surfaces

The refractive index of the solid prism using the formula,

$n = \sin((\alpha+\beta)/2) / \sin(\alpha/2)$

Where α is angle of the prism & β is angle of minimum deviation.



Scope of Supply

Fizeau Interferometer
Model No. : ED-INT-14-FI
Height : 1200 mm
Base : 400 mm x 300 mm
Quantity : 1 No.



Beamsplitter
Model No. : ED-INT-14-BS
Material : Borofloat
Size : 50 x 50 mm
R/T Ratio : 50 : 50
Quantity : 1 No.



Reference Flat with Mount
Model No. : ED-INT-14-RFM
Material : Fused Silica
Quantity : 1 No.



Camera Lens Assembly
Model No. : ED-INT-14-CLA
Focal length : 65 mm
Diameter : 100mm
Quantity : 1 No.



CCD Camera
Model No. : ED-INT-14-CCDC
Resolution : 1280 x 1024 pixels
Quantity : 1 No.



Spatial filter Assembly
Model No. : ED-INT-14-SPA
Magnification : 60 X
Pinhole Size : 5 micron
Quantity : 1 No.



Achromat Doublet with Mount
Model No. : ED-INT-14-ADM
Diameter : 100 mm
Focal length : 500 mm
Quantity : 1 No.



Test Flat with Mount
Model No. : ED-INT-14-TFM
Material : Fused Silica
Quantity : 1 No



DPSS Laser
Model No. : ED-INT-14-DPSL
wavelength : 532 nm
Output power : 5 mW
Quantity : 1 No.



Accessories
User Manual
Software CD



Electronic Speckle Pattern Interferometer (ESPI)

Model: HO-ED-INT-15

Electronic Speckle Pattern interferometry (ESPI) is a non-destructive optical method for studying surface deformations. It relies on the interference between diffusely reflected light from the test object and a reference beam.This is one of the most sensitive interferometric technique, so that we can measure sub-micron level displacements either in plane or out of plane. The images before and after deformation are recorded by a CCD camera and analysed using an image analysis software. Deformation causes variations in the fringe pattern.These variations can be analized with the help of the software provided to find the deformations. As this interferometer is highly sensitive to vibrational noises, Holmarc's ESPI comes with a Vibration isolation optical breadboard. A linearly polarized 632.8nm He-Ne laser with 5mW output power is used as the light source. A beam splitter splits the laser beam into two. The transmitted beam illuminates the test object uniformly via a spatial filter assembly while the reflected beam falls on a CCD as reference beam. The image of the illuminated test object is captured by zoom lens and CCD. Our ESPI system allows the user to perform the Electronic Speckle Shearographic interferometry in the same system without disturbing the optical set ups and alignments. Holmarc's camera application software helps to capture and analyze the images.

Features

- Measurement under visible light is possible
- Non contact and full field measurements
- Object contour and displacement measurements

Experiment Possible

To observe and study the deformation of objects with respect to mechanical and thermal loads using electronic speckle pattern interferometer (ESPI)

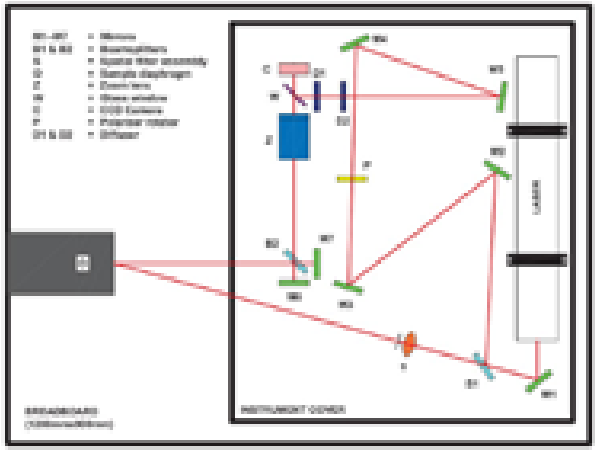
Specifications

Laser	:	He-Ne 5mW @ 632.8nm
Beam expander	:	20X microscope objective with pinhole.
Zoom lens	:	Nikon®
Camera	:	1/2.5" 5 MPC MOS Colo
Software	:	Holmarc camera application software & image analysis software.
Optical Breadboard	:	1200mm x 900 mm size with vibration isolation support.

Applications

Electronic speckle pattern interferometry also known as TV holography is a technique that uses laser light, together with video detection, recording and processing, to visualise static and dynamic displacements of components with optically rough surfaces. The visualisation is in the form of fringes on the image, where each fringe normally represents a displacement of half a wavelength of the light used.

ESPI can be used for stress and strain measurement, vibration mode analysis and nondestructive testing





Scope of Supply

Optical Breadboard with Vibration Isolation support
Model No. : ED-INT-15-BBVS
Material : Stainless Steel
Dimensions : 1200 mm x 900 mm
Quantity : 1 No.



Beamsplitter Mount
Model No. : ED-INT-15-BSM
Material : Black anodized Aluminum alloy
Adjustment Range : 50 mm
Quantity : 1 No.



Test Object Mechanical Loader
Model No. : ED-INT-15-TOML
Material : Black anodized Aluminium alloy
Loading : Linearly Micrometer controlled
Quantity : 1 No.



Diffuser Mount
Model No. : ED-INT-15-DM
Material : Black anodized Aluminium alloy
Slot width : 3 mm
Quantity : 1 No.



Camera Lens Assembly with Mount
Model No. : ED-INT-15-CLAM
Quantity : 1 No.



Mirror with Cell supply
Model No. : ED-INT-15-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 1 No.



Glass Plate
Model No. : ED-INT-15-GP
Dimension : 75 mm x 25 mm
Thickness : 1 mm
Material : Float
Quantity : 2 Nos.



Helium Neon Laser :
Model No. : ED-INT-15-HNL
Wave length : 632.8nm
Optical power : 5 mW
Quantity : 2 Nos.



Heater with Control Unit
Model No. : ED-INT-15-HCU
Output Power : 200 Watts
Quantity : 1 No.



Accessories
User Manual
Allen keys
Thumb Screws
Software CD



Spacial Filter Assembly
Model No. : ED-INT-15-SFA
Magnification : 60 X
Pinhole Size : 5 micron
Quantity : 1 No.



Mirror Mount
Model No. : ED-INT-15-MM
Material : Black anodized Aluminum alloy
Adjustment Range : +/-4 degrees
Diameter : 25 mm
Quantity : 1 No.



Glass plate Holder with Mount
Model No. : ED-INT-15-GHM
Material : Black anodized Aluminium alloy
Slot width : 2 mm
Quantity : 1 No
.



Polarizer Rotator with Mount
Model No. : ED-INT-15-PRM
Material : Sheet polarizer
Rotation : 360 degree
Resolution : 1 degree
Quantity : 1 No.



Beamsplitter
Model No. : ED-INT-15-BS
Dimension : 50 mm x 50 mm
Thickness : 6 mm
R/T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium
Quantity : 1 No.



Camera with Mount
Model No. : ED-INT-15-CCDM
Resolution : (320-1280 pixels)
Connectivity : USB 2.0
Quantity : 1 No.



Diffuser Plate
Model No. : ED-INT-15-DP
Dimension : 50 mm x 50 mm
Thickness : 2 mm
Material : Float
Quantity : 2 Nos.



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Polarization



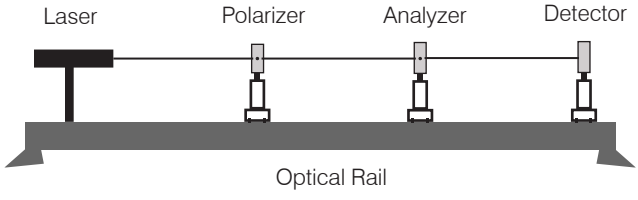
Brewster's Angle Apparatus

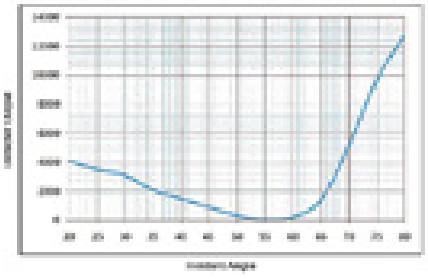
Model: HO-ED-P-01

Holmarc's Brewster's Angle Apparatus (Model No: HO-ED-P-01) is designed to study the Brewster's angle phenomenon and the polarization of reflected light. The essential elements of the apparatus consists of a goniometer, a laser light source capable of projecting a light beam that is linearly polarized in its plane of incidence, and a pinhole photo detector with output measurement unit for detecting and measuring the intensity of light reflected. The diode laser and polarizer rotator are mounted on an optical rail.

Intensities of reflected light polarized in the plane of incidence and perpendicular to the plane are obtained as a function of angle of incidence. The results should be consistent with Fresnel's laws of reflection.

A beam of light incident on a di-electric transparent material can be resolved into parallel (P) and orthogonal (S) components. These components have different reflection coefficients and Brewster discovered that at a particular angle of incidence θ_B (called Brewster angle), reflection co-efficient of P-component goes zero. At this angle, direction of reflected and transmitted beam are orthogonal to each other.





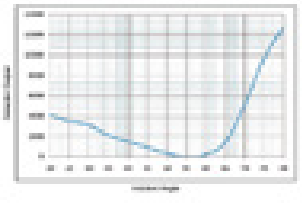


Experiment Possible

- **Verification of Malus law**

When completely plane polarized light is incident on the analyzer, the intensity I of the light transmitted by the analyzer is directly proportional to the square of the cosine of angle between the transmission axes of the analyzer and the polarizer ie,

$$I \propto \cos^2\theta$$



- **To study the polarization properties of light**
- **To measure the light intensity of plane polarized light as a function of the analyzer position**

Scope of Supply

Optical Rail
Model No. : ED-P-02-OR
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-P-01-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-P-02-DLPR
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



Accessories
User Manual



Kinematic Laser Mount
Model No. : ED-P-01-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Detector Mount
Model No. : ED-P-02-DM
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Detector Output Measurement Unit
Model No. : ED-P-02-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli / Micro amperes
Quantity : 1 No.

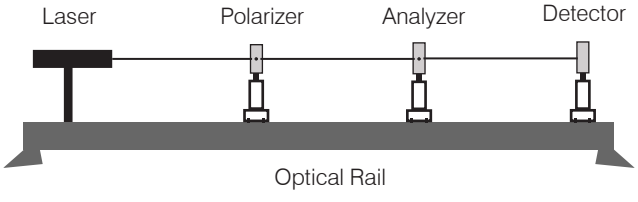


Malus Law Apparatus

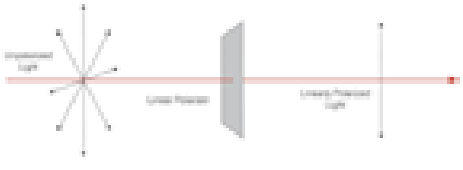
Model: HO-ED-P-02

Holmarc's Malus Law Apparatus (Model No: HO-ED-P-02) helps to understand polarization properties of light. It can also be used to study the light intensity relation of polarizer-analyzer. This apparatus comprises of a diode laser (as a light source), a polarizer, an analyzer assembly and a pinhole photo detector with output measurement unit.
In this experiment, Malus law of polarization is verified by showing that the intensity of light passed through two polarizers depend on the square of cosine value of the angle between the two polarizer axis. Laser light is used in this experiment because it's wavelength is almost completely extinguished by the crossed polarizers.

The laser beam travelling through a polarizer is observed as a function of the orientation of the polarizer. With a second polarizer (called analyzer) the relative orientation of the polarizers is determined. The transmitted light is measured by a photo detector and the Malus Law can be verified.



Holmarc's Commercial-quality Linear film polarizers are available. These linear polarizers have 25% transmittance for unpolarized light. Two crossed sheets have an average transmission of 0.04%. The sheets a



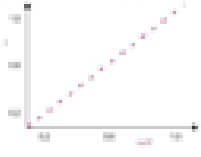


Experiment Possible

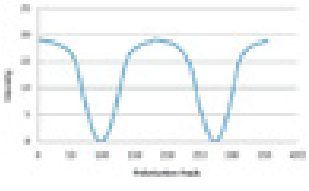
- **Verification of Malus law**

When completely plane polarized light is incident on the analyzer, the intensity I of the light transmitted by the analyzer is directly proportional to the square of the cosine of angle between the transmission axes of the analyzer and the polarizer ie,

$$I \propto \cos^2\theta$$



- To study the polarization properties of light
- To measure the light intensity of plane polarized light as a function of the analyzer position



Scope of Supply

Optical Rail

Model No.	:	ED-P-02-OR
Length	:	500 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Polarizer Rotator with Mount

Model No.	:	ED-P-01-PRM
Material	:	Sheet Polarizer
Rotation	:	360 degree
Resolution	:	2 degree
Quantity	:	1 No.



Diode Laser with Power supply (Red)

Model No.	:	ED-P-02-DLPR
Wave length	:	650 nm
Optical power	:	3 mW
Quantity	:	1 No.



Accessories

User Manual



Kinematic Laser Mount

Model No.	:	ED-P-01-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



Detector Mount

Model No.	:	ED-P-02-DM
Material	:	Black anodized Aluminum alloy
Diameter	:	30 mm
Quantity	:	1 No.



Detector Output Measurement Unit

Model No.	:	ED-P-02-DOMU
Sensor Type	:	Photo Transistor
Display	:	7 segment, 3 ½ digit
Range	:	0 - 199 milli / Micro amperes
Quantity	:	1 No.



Faraday Effect Apparatus

Model: HO-ED-P-04

Holmarc's Faraday Effect Apparatus (Model No: HO-ED-P-04) is designed for the determination of the Verdet constant of a material for a given wavelength of light. With its new and integrated design, this device is easier to setup and operate so that students can understand the principles and theories behind the experiment. Red and green diode lasers (λ = 650nm, 532 nm, respectively) are used for this experiment. This apparatus provides a rod of Schott SF-57 glass as a sample. A photo detector is placed at the end of the optical rail to measure the intensity as a function of the analyzer angle θ for a full rotation. This system also consists of a power supply for the laser, a magnetic solenoid and a power supply for the solenoid.

Faraday Effect is a magneto optical effect in which the plane of polarized light is rotated as it passes through a medium that is placed in a magnetic field. The amount of rotation is dependent on the amount of sample through which the light passes, strength of the magnetic field and a proportionality constant called Verdet's Constant.

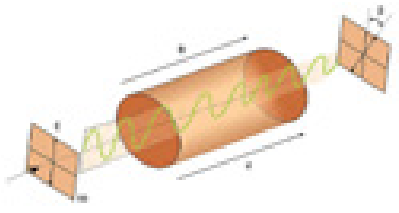
Optical isolators based on Faraday's effect have important applications in telecommunication. For example to prevent reflected signals on fiber optic cables from producing unwanted signals. Isolators are important when lasers are used because reflected light can cause havoc with the operation of the laser itself.

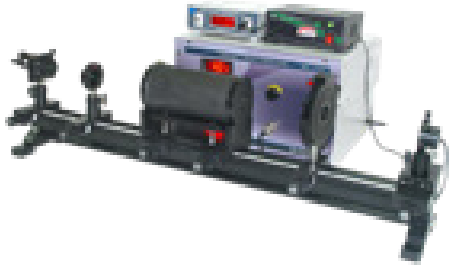
Experiment Possible

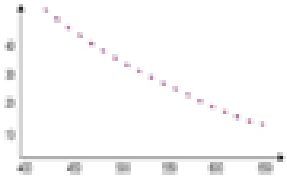
- **Determination of the Verdet constant of the material for a given wavelength of light (Magneto Optic Effect)**

Faraday Effect is a magneto optical effect in which the plane of polarized light is rotated as it passes through a medium that is placed in a magnetic field. The amount of rotation is dependent on the amount of sample through which the light passes strength of the magnetic field and proportionality constant called the Verdet Constant.

$$\theta = V I B$$







The Faraday effect or Faraday rotation, sometimes referred to as the magneto-optic Faraday effect is a physical magneto-optical phenomenon. The Faraday effect causes a polarization rotation which is proportional to the projection of the magnetic field along the direction of the light propagation. Formally, it is a special case of gyroelectromagnetism obtained when the dielectric permittivity tensor is diagonal This effect occurs in most optically transparent dielectric materials (including liquids) under the influence of magnetic fields.

The Faraday effect is caused by left and right circularly polarized waves propagating at slightly different speeds, a property known as circular birefringence. Since a linear polarization can be decomposed into the superposition of two equal-amplitude circularly polarized components of opposite handedness and different phase, the effect of a relative phase shift, induced by the Faraday effect, is to rotate the orientation of a wave's linear polarization. The Faraday effect has applications in measuring instruments. For instance, the Faraday effect has been used to measure optical rotatory power and for remote sensing of magnetic fields (such as fiber optic current sensors). The Faraday effect is used in spintronics research to study the polarization of electron spins in semiconductors. Faraday rotators can be used for amplitude modulation of light, and are the basis of optical isolators and optical circulators; such components are required in optical telecommunications and other laser applications.

Applications

Interstellar medium : The effect is imposed on light over the course of its propagation from its origin to the Earth, through the interstellar medium. The ionosphere : Radio waves passing through the Earth's ionosphere are likewise subject to the Faraday effect.

Semiconductor : Due to spin-orbit coupling, undoped GaAs single crystal exhibits much larger Faraday rotation than glass (SiO2).

In organic materials, Faraday rotation is typically small, with a Verdet constant in the visible wavelength region on the order of a few hundred degrees per Tesla per meter

Scope of Supply

Optical Rail
Model No. : ED-P-04-OR
Length : 1000 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-P-04-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 No.



Detector Mount with X - Translation
Model No. : ED-P-04-DMX
Material : Black anodized Aluminum alloy
Travel : Micrometer Controlled
Resolution : 0.01 mm
Diameter : 30 mm
Quantity : 1 No.



Glass Rod Specimen
Model No. : ED-P-04-GRS
Material : SF – 57
Length : 10 cm
Diameter : 6 mm
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-P-04-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 no.



Detector Output Measurement Unit
Model No. : ED-P-04-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli/ micro amperes
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-P-04-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Polarizer with Precision Rotation
Model No. : ED-P-04-PPR
Material : Sheet Polarizer
Rotation : 360 degree
Fine Rotation : 15 degree
Resolution : 0.1 degree
Quantity : 1 No



Electromagnet with Mount
Model No. : ED-P-04-EMM
Winding Material : Copper
Number of turns : 2508
Length of coil : 150 mm
Quantity : 1 No.



Constant Current Power supply
Model No. : ED-P-04-CCPS
Input : 230V 50Hz
Output Current : 0 - 4 Amps
Quantity : 1 No.



Diode Laser with Power supply (Green)
Model No. : ED-P-04-DLPG
Wave length : 532 nm
Optical power : 5 mW
Quantity : 1 No.



Accessories
User Manual



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Faraday Effect Apparatus (Liquid Sample)

Model: HO-ED-P-04A

Faraday Effect Apparatus Model: HO-ED-P-04A is designed for the determination of Verdet's constant of the liquid sample at 532nm and 650nm laser light.This experiment is suitable for a senior and graduate laboratory to measure the Verdet constant of several commonly available liquids as functions of two different wavelengths were measured. This experiment helps the student to learn how electric and magnetic fields can influence the optical properties of materials.

Faraday rotation is the rotation of the plane of polarization of light due to magnetic-field-induced circular birefringence in a material. In a nonabsorbing or weakly absorbing medium a linearly polarized monochromatic light beam passing through the material along the direction of the applied magnetic field experiences circular birefringence, which results in rotation of the plane of polarization of the incident light beam.

The materials used in this experiment are SF10, water, Ferric chloride solution, cinnamic acid etc. Cinnamic acid is also known as ethyl cinnamate, has a relatively high index of refraction in the visible, and also exhibits substantial dispersion.

Faraday rotation measurements are taken at two different wavelengths, the green diode laser at 532nm and the red diode laser at 650nm. Laser light transmitted through a column of test liquid contained in a glass tube.

The glass tube is coaxial with a solenoid coil. At the entrance end the light is plane polarized by a linear polarizer . At the exit end, the plane of polarization is determined by rotating a second polarizer called the analyzer to obtain extinction of the transmitted light. Precision polarizer rotator mount is used to take the measurement of angular rotation of the polarizer. Measure the angle of rotation for a series of coil currents.

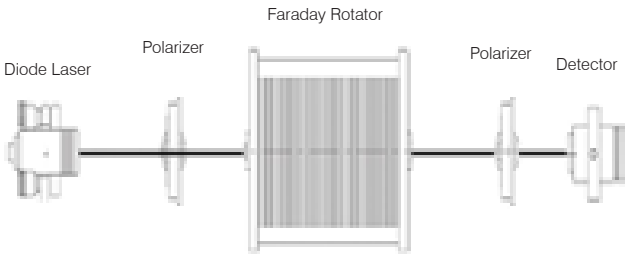
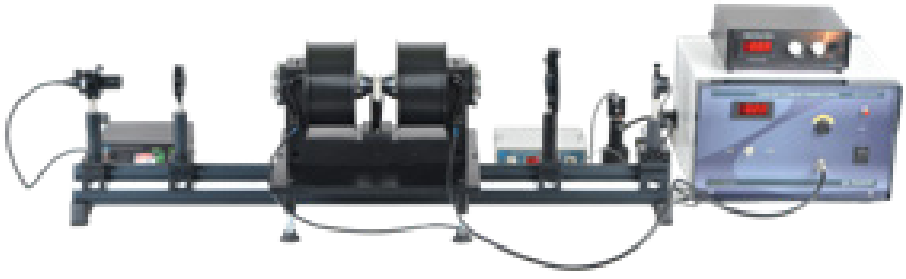


Fig. Schematic Diagram of Faraday Effect Apparatus



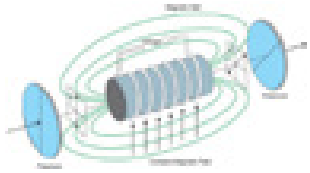
Experiment Possible

- **To determine the angle of rotation of liquid samples as a function of mean magnetic flux-density using two different wavelengths of light and to calculate the corresponding Verdet's constant in each case.**

Fill the liquid sample in a glass cell with flat optical ends such that no empty space exists. Now insert the glass cell so that the solenoid hole with the inserted liquid sample is aligned with the optical axis. The corresponding Verdet constant is calculated using the relation

$V = \theta / (B.L)$

Verdet constant is evaluated as a function of the wavelength.



We can setup this experiment in optical breadboard with dual pass configuration for more optical Rotation

Laser light is made to travel two times through the magneto optical element by using a beam splitter assembly, So that effective Faraday rotation will be twice as compared to the single pass. This helps to detect very small optical rotation.

HO-ED-P-04A Faraday effect electromagnet power supply has provision for direction switching. Rotation of polarization depends on the direction of the applied magnetic field, a current reversing switch on the power supply allows for easy reversal of the magnetic fie

Scope of Supply

Optical Rail
Model No. : ED-P-04A-OR
Length : 1000 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-P-04A-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 No.



Detector Mount with X - Translation
Model No. : ED-P-04A-DMX
Material : Black anodized Aluminum alloy
Travel : Micrometer Controlled
Resolution : 0.01 mm
Diameter : 30 mm
Quantity : 1 No.



Liquid Sample Cuvette
Model No. : ED-P-04A-LST
Material : Standard Glass : Cuvette
Internal Diameter : 8 mm
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-P-04A-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.



Detector Output Measurement Unit
Model No. : ED-P-04A-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli / micro amperes
Quantity : 1 No.



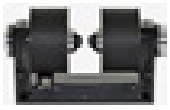
Kinematic Laser Mount
Model No. : ED-P-04A-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Polarizer with Precision Rotation
Model No. : ED-P-04A-PPR
Material : Sheet Polarizer
Rotation : 360 degree
Fine Rotation : 15 degree
Resolution : 0.1 degree
Quantity : 1 No.



Electromagnet with Mount
Model No. : ED-P-04A-EMM
Winding Material : Copper
Magnetic field : 5K Gauss at 20mm pole
Quantity : 1 No.



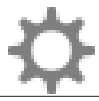
Constant Current Power supply
Model No. : ED-P-04A-CCPS
Input : 230V 50Hz
Output Current : 0 - 4 Amps
Quantity : 1 No.



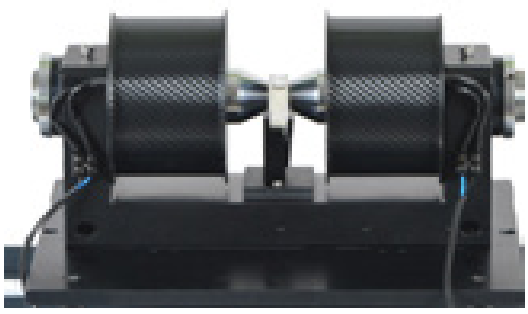
Diode Laser with Power supply (Green)
Model No. : ED-P-04A-DLPG
Wave length : 532 nm
Optical power : 5 mW
Quantity : 1 No.



Accessories
User Manual



For more product and its informations, visit our website: www.holmarc.com



Sample used in this experiment Carbon disulphide & Olive Oil

Due to spin-orbit coupling, undoped GaAs single crystal exhibits much larger Faraday rotation than glass (SiO2). Based on the large Faraday rotation, one might be able to use GaAs to calibrate the B field of the terahertz electromagnetic wave which requires very fast response time.

Applications

- measure optical rotatory power and for remote sensing of magnetic fields
- The faraday effect is used in spintronics research to study the polarization of electron spins in semiconductors
- Faraday rotators can be used for amplitude modulation of light,

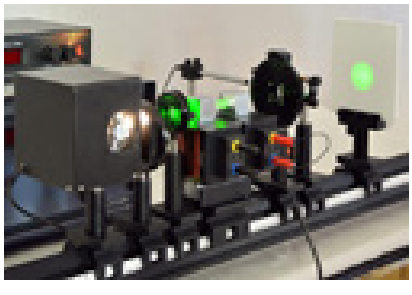
Faraday Effect Apparatus (Multi Wavelength)

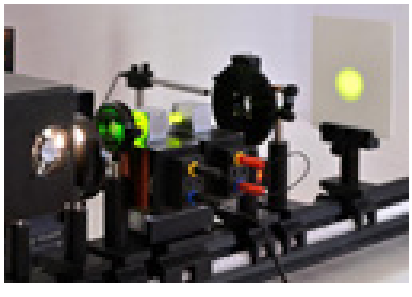
Model: HO-ED-P-04B

Holmarc's Faraday Effect Apparatus Model: HO-ED-P-05 is designed for the determination of Verdet's constant of a material for multiple wavelengths of light. With its new and integrated design, this device is easier to setup and operate so that students can easily understand its principles and theories.
A glass rod (NSF57) with high refractive index is located on a U shaped laminated variable current electromagnet. 50W Halogen lamp is used as light source.5 Filters 404, 450, 505, 546 & 578nm used in filter assembly as narrow band monochromatic light. The sample is placed in a hole drilled pole piece in electromagnet. Sample with electromagnetic unit kept between two linear polarizers and a power meter is used to measure the light intensity as a function of the analyzer angle θ for a full rotation. Faraday Effect is a magneto optic effect in which the plane of linear polarized light is rotated as it passes through a medium that is placed in a magnetic field

Specifications

Interference filters	:	404, 450, 505, 546, 578nm
Source	:	Tungsten Halogen 50W
Glass rod specimen	:	Schott NSF57, 30mm length, 10mm diameter
Electromagnet input voltage	:	40V DC, 0 - 4A
Analyzer precision	:	0.1 degree / division
Power meter	:	Photo diode sensor, 2 - 20mW & μW
Variable power supply	:	0 - 4A, 40V DC
Gauss meter	:	0 - 2 Tesla range







Features

- Modern & user friendly design
- 50W hg lamp as light source
- High quality Interference filters with filter wheel assembly provided
- U shaped laminated iron core copper winded electromagnet with DC socket
- High refractive index glass rod specimen
- Hollow mode electromagnet pole pieces
- Photo detector with Power meter unit for null detection from analyser

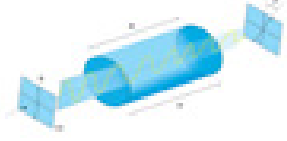
Experiment Possible

- **Plot wavelength versus verdet constant graph at a constant current**

θ = VB *l*, Where magnetic flux density B = μ0NI

For a given magnetic field and optical path length , Verdet constant will directly corresponds to optical rotation of plane of polarization of light. Verdet constant depends upon the medium its temperature and the frequency of light.

- **Plot Varying current versus angle of rotation Δθ for a constant wavelength.**



The angle of rotation depends upon the length of the sample, strength of the magnetic field & a proportionality constant called verdet costant

Scope of Supply

Optical Rail

Model No.	:	HO-ED-P-04B-OR
Length	:	1 meter
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Halogen Lamp with Power Supply

Model No.	:	HO-ED-P-04B-HLPS
Power	:	50W
Quantity	:	1 No.



Polarizer Rotator with Mount

Model No.	:	HO-ED-P-04B-PRM
Material	:	Sheet Polarizer
Rotation	:	360 degree
Resolution	:	2 degree
Quantity	:	1 No.



Electromagnet with mount

Model No.	:	HO-ED-P-04B-EMM
Winding material	:	Copper
Total number of turns	:	600
Core	:	Iron U Shaped Laminated
Quantity	:	1 No



Lens with Mount

Model No.	:	HO-ED-P-04B-LM
Focal Length	:	80 mm
Diameter	:	32 mm
Material	:	N-BK7
Quantity	:	2 No.



White Screen

Model No.	:	HO-ED-P-04B-WS
Colour	:	White
Material	:	Acrylic
Quantity	:	1 No.



Constant current Power supply

Model No.	:	HO-ED-P-04B-CCPS
Power input	:	230V - 50Hz
Output	:	40V DC / 0 - 4 A
Quantity	:	1



Digital Gauss Meter with Axial Gauss Probe

Model No.	:	HO-ED-P-04B-GMAP
Resolution	:	0.1 gauss at 200 G
Range	:	200 G, 2 kG, 20 kG and 40 kG
Accuracy	:	± 0.5%, ± ½ at 2 kG 20 kG and 40 kG range
Temperature	:	Up to 40°C
Display	:	3½ digits 7 segment LED DPM
Power	:	220 V ±10%, 50 Hz



Glass rod specimen

Model No.	:	HO-ED-P-04B-GRS
Material	:	SF 57
Length	:	30 mm
Diameter	:	10 mm
Quantity	:	1 No.



Filter Wheel with Interference Filters

Model No.	:	HO-ED-P-04B-FWF
No. of filters	:	5 nos
Filter change	:	Manual
Filter Type	:	Narrow band Interference Filters
Wavelengths	:	404 nm, 450 nm 505 nm, 546 nm, 578nm
Quantity	:	1 No.



Analyzer with Precision adjustment

Model No.	:	HO-ED-P-04B-APR
Type	:	Sheet Polarizer
Accuracy	:	1°/ division
Fine adjustment	:	up to 15 degrees



Optical Power Meter

Model No.	:	HO-ED-P-04B-01A
Sensor	:	Si photodiode (5.8 x 5.8 mm)
Wavelength range	:	400 nm to 1100 nm
Measuring ranges	:	20uW, 200uW 2mW & 20mW
Display	:	Graphic LCD
Sampling rate		2 times/sec
Power input	:	230 V / 50Hz
Quantity	:	1 No.



Kerr Effect Apparatus

Model: HO-ED-P-05A

Holmarc's Kerr effect apparatus (Model No: HO-ED-P-05A) is used to determine the Kerr constant of the Liquid (Nitro Benzene C6 H5 NO2). In this apparatus, Nitrobenzene is used as the Kerr agent because Nitrobenzene shows a large Kerr constant than other polar liquids. Multiple travel of laser beams through Kerr cell helps to make it compact. This apparatus helps students to acquire knowledge on the fundamental physical property, Kerr Effect.

The Kerr effect, also called the quadratic electro-optic effect (QEO effect), is a change in the refractive index of a material in response to an applied electric field. Filtration column for purifying Nitrobenzene will be supplied along with the equipment.

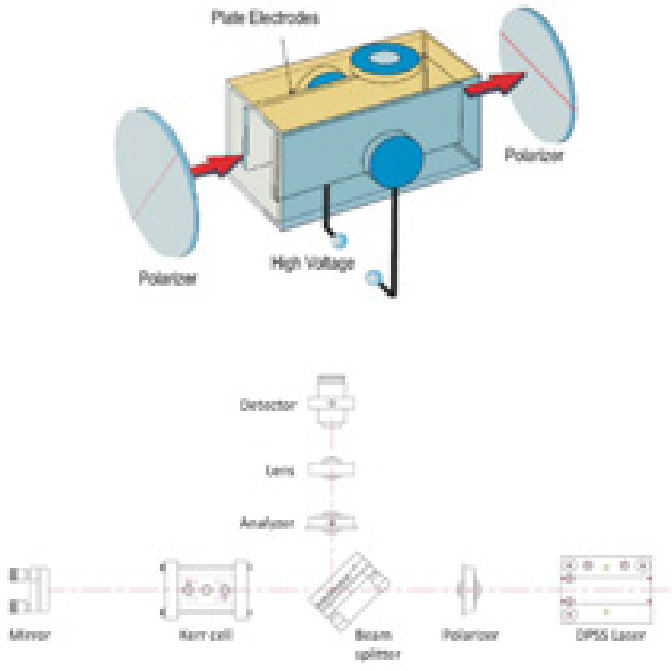


Fig. A Schematic Diagram of the Experimental Setup

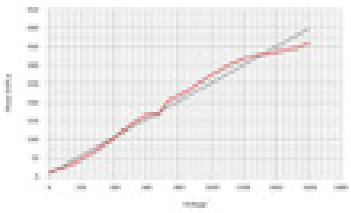
In this apparatus, polarized light from a DPSS laser is directed to pass through the space between the electrodes of the Kerr cell. The beam is reflected by a mirror from the other side of the Kerr cell and again it passes through the space between the electrodes. With the help of a beamsplitter and convex lens, the beam is directed to focus on a Si photo diode detector. Embodiments of Kerr effect apparatus provide a phase-shift between the normal and the extra-ordinary light beam and it can be recorded for different voltages applied to the Kerr cell for different electric field strengths.

Features

- Safe and convenient
- Rigid support for easy operation
- Advanced and well proven opto - mechanical designs coupled to high performance electronics

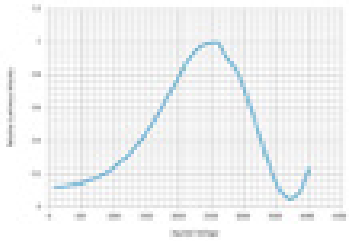
Experiment Possible

- **To plot a graph and study the birefringence with respect to applied voltage in an electro optic liquid (Nitrobenzene C6H5NO2)**



By plotting the square of the applied voltage versus the phase shift between normal and extraordinary beam it is to be shown that the relation between the two quantities is approximately linear. From the slope of the straight line the Kerr Constant is to be calculated.

- **Determination of half-wave voltage of the cell**



The phase-shift between the normal and the extra-ordinary light beam is to be recorded for different voltages applied to the Kerr cell respectively for different electric field strengths. The half wave voltage is to be determined.

Scope of Supply

Optical Breadboard with Support
Model No. : ED-P-05A-BBS
Dimensions : 800mm x 600mm
Material : Stainless Steel
Quantity : 1 No.



Beam Splitter Mount
Model No. : ED-P-05A-BSM
Degrees of freedom : 2 degrees
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Detector Mount
Model No. : ED-P-05A-DM
Diameter : 40 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Kerr Cell
Model No. : ED-P-05A-KC
Liquid filled : Nitrobenzene
Casing : Teflon
Electrode Cavity : 60 x 3 x 3 mm
Quantity : 1 No.



DPSS Laser Mount
Model No. : ED-P-05A-DPLM
Material : Black anodized Aluminum alloy
Tilting : Lead screw controlled
Quantity : 1 No.



Switched Mode Power Supply
Model No. : ED-P-05A-SMPS
Input : 230V 50 Hz
Output Voltage : 0 - 4KV
Quantity : 1 No.



Beam Splitter
Model No. : ED-P-05A-BS
Dimension : 50 mm x 50 mm
Thickness : 4 mm
R/T ratio : 50 / 50
Material : N-BK7
Coating : Aluminium
Quantity : 1 No.



Kinematic Mirror Mount
Model No. : ED-P-05A-KMM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-P-05A-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 2 Nos.



Plano Convex Lens with Mount
Model No. : ED-P-05A-PCLM
Material : Borofloat
Diameter : 25 mm
Quantity : 1 No.



DPSS Laser
Model No. : ED-P-05A-DPSL
wavelength : 532 nm
Output power : 5 mW
Quantity : 1 No.



Mirror with Cell
Model No. : ED-P-05A-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Aluminium
Quantity : 1 No.



Detector Output Measurement Unit
Model No. : ED-P-05A-DOMU
Sensor Type : Si Photo diode
Sensing Area : 5.8 x 5.8mm
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli / micro Amperes
Quantity : 1 No.

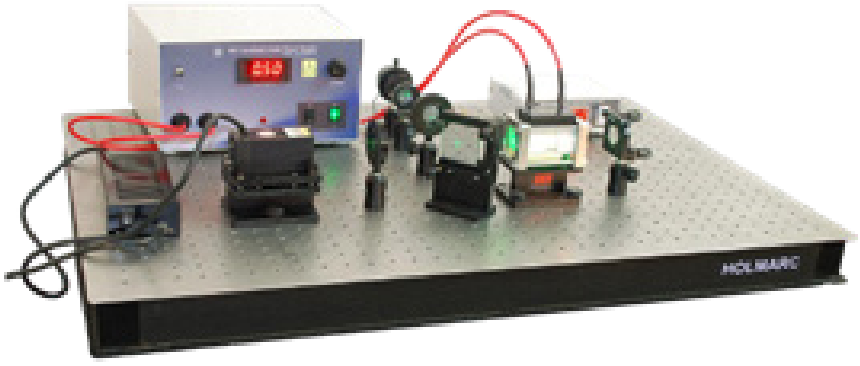


Kerr Cell Mount
Model No. : ED-P-05A-KCM
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Accessories : Filtration column, Allen Key, User Manual

For more product and its informations, visit our website: www.holmarc.com

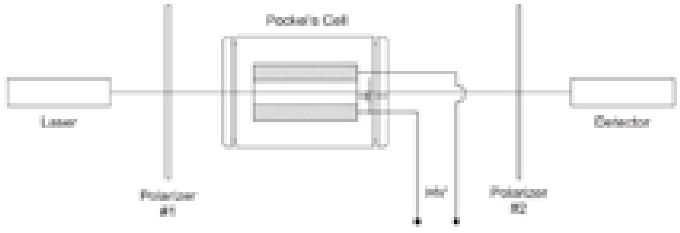


Pockel Effect Apparatus

Model: HO-ED-P-05A

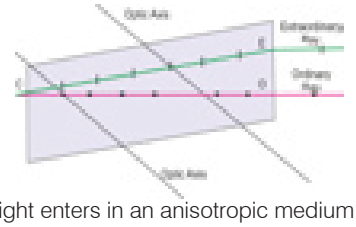
Many crystals exhibit birefringence naturally. There are certain crystals which are not birefringent naturally but become birefringent by application of an electric field. This electro-optic phenomenon is called Pockel Effect.

Holmarc manufactures laboratory instrument for studying Pockel effect for Physics and engineering courses as a standard product (Model No: HO-ED-P-05B). In this instrument, a diode laser provides collimated light for the experiment. Lithium niobate is the electro-optic crystal used in the Pockel cell which is arranged between two polarizers. Carriages on an optical rail hold all modules including laser and detector on a straight-line path for the experiment. The spacing between the electrodes can be varied in order to use crystals of different dimensions. The power supply module of the instrument can apply voltages up to 2 KV across the crystal. Experiment can be done by varying the applied voltage and recording the detector output reading at various voltage levels. The birefringence is increasing function of the applied voltage, so, transmission will be an oscillatory function of the applied voltage.



In optic
dependent linear variation in the refractive index of an optical medium that occurs in response to the application of an electric field. The non-linear counterpart, the Kerr effect, causes changes in the refractive index at a rate proportional to the square of the applied electric field. In optical media, the Pockels effect causes changes in birefringence that vary in proportion to the strength of the applied electric field. The Pockels effect occurs in crystals that lack inversion symmetry, such as monopotassium phosphate, potassium dideuterium phosphate, lithium niobate, beta-barium borate, barium titanate and in other non-centrosymmetric media such as electric-field poled polymers or glasses. The key component of a Pockels cell is a non-centrosymmetric single crystal with an optic axis whose refractive index is controlled by an external electric field.

Double Refraction



When light enters in an anisotropic medium the light gets diffracted into two rays each polarized with vibration directions oriented at right angles to each other and travelling at different velocities. This phenomenon is termed as Double refraction or birefringence.

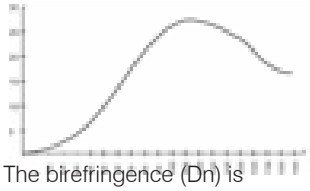
In our apparatus we are passing light through optic axis of an anisotropic crystal and we apply electric field to it to generate anisotropy of molecules, and thus birefringence.

Features

- Enhanced and integrated design with drive voltage 0-2 KV
- Precise measurements
- Clear process observation and can study electro-optic effect
- High sensitivity pin hole photo detector

Experiment Possible

To plot the graph and study the birefringence with respect to applied voltage in an electro optic crystal (Lithium niobate)



The birefringence (Dn) is increasing function of the applied voltage, so that the transmission will be an oscillatory function of the applied voltage.

$D_n = \lambda / \Pi L \sin^{-1} \sqrt{P (V) / P (V½)}$

D_n = Birefringence

P (V½) = Intensity at Half wave voltage

P(V) = Intensity at applied voltage

L = Length of the crystal

λ = Wavelength of Light

Scope of Supply

Optical Rail
Model No. : ED-P-05B-OR
Length : 1000mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-P-05B-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 No.



Detector Mount with X- Translation
Model No. : ED-P-05B-DMX
Material : Copper Black Anodized Aluminium Alloy
Travel : Micrometer control
Resolution : 0.01mm
Quantity : 1 No



Electro-Optic Crystal
Model No. : ED-P-05B-EOC
Material : Lithium Niobate (Li NbO3)
Dimension : 25 x 4 x 4 mm
Quantity : 1 No.

Diode Laser with Power supply (Red)
Model No. : ED-P-05B-DLPR
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



Accessories
User Manual

Kinematic Laser Mount
Model No. : ED-P-05B-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Polarizer with Precision Rotation
Model No. : ED-P-05B-PPR
Material : Sheet Polarizer
Rotation : 360 degree
Fine Rotation : 15 degree
Resolution : 0.1 degree
Quantity : 1 No.



Pockel Cell with Mount
Model No. : ED-P-05B-PCM
Electrode Material : Copper
Cavity width : 0-6mm Lead screw control
Cavity size : 30 x 5 x 5 mm
Quantity : 1 No.



Switched Mode Power Supply
Model No. : ED-P-05B-SMPS
Input : 230V 50 Hz
Voltage : 0 - 2 KV
Quantity : 1 No.

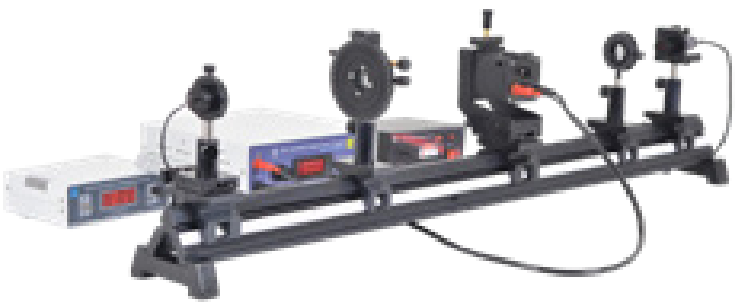


Detector Output Measurement Unit
Model No. : ED-P-05B-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3½ digit
Range : 0 - 199 milli / micro
Quantity : 1 No.



Get In Touch with our technical experts and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service

For more product informations, contact us : sales@holmarc.com



Applications

- Material Procesing : Enable precise laser control for metal cutting in manufacturing.
- Biomedical Imaging : Enhance microscopy resolution for detailed cellular analysis.
- Secure data transmission for photon polarization manipulation.
- Improve fiber optic data transmission efficiency
- Detect defects in semiconductor wafers with pockels cells for quality control.

Apparatus for the Study of Polarisation by Waveplates

Model: HO-ED-P-07



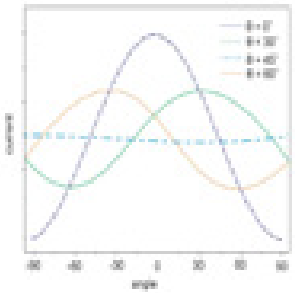
A wave plate or retarder is an optical device that alters the polarization state of a light beam travelling through it. A typical wave plate is simply a birefringent crystal like quartz ,calcite etc. with a particular thickness.

If a beam of parallel light passes perpendicularly through a wave plate, the light beam is split into two components due to its double refracting properties. The two components have planes of oscillation perpendicular to each other and slightly different phase velocities.

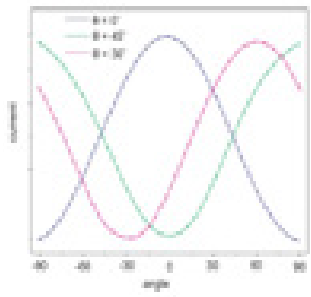
For a quarter-wave plate, the thickness of the quartz plate is chosen in such a manner that the light component whose electric field vector oscillates parallel to the rotation lever lags by a λ/4 behind other perpendicular oscillating light component. For a half-wave plate the thickness is chosen so that the created phase difference is λ/2.

Experiment Possible

- Intensity measurement as a function of analyzer angle
- Polarization study by quarter wave plate - elliptical and circular polarization.
- Polarization study by half wave plate - change of polarization axis.
- Verification of Malus' law



Quarter wave Plate



Half wave plate

In this experiment a laser beam passes through a polarizer, quarter-wave or half-wave plate, analyzer and finally falls on the detector. The polarization of the emergent light is investigated at different angles between the optic axis of the wave plates and the direction of the incident light.

Scope of Supply

Optical Rail

Model No.		ED-P-07-OR
Length		500mm
Material		Black anodized Aluminum alloy
Quantity		1 No.



Kinematic Laser Mount

Model No.	:	ED-P-07-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



Half wave & quarter wave plates with mount

Model No.	:	ED-P-07-WPM
Material	:	Quartz Crystal
Diameter of wave plate	:	25mm
Surface Quality	:	20 - 10 (Scratch-dig)
Surface Flatness	:	λ / 4 @ 632.8nm
Retardance Accuracy	:	< λ / 300
Quantity	:	1 No. each



Polarizer with mount

Model No.	:	ED-P-07-PRM
Material	:	Sheet Polarizer
Rotation	:	360 degree
Quantity	:	2 Nos



Detector with output measurement unit

Model No.	:	ED-P-07-DOMU
Sensor Type	:	Photo Transistor
Display	:	7 segment, 3½ digit
Range	:	0-199 milli amperes
Quantity	:	1 No.



Diode laser with power supply

Model No.	:	ED-P-07-DLPR
Wave length	:	650 nm
Output Power	:	3mW
Quantity	:	1 No.



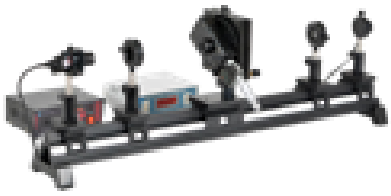
Detector Mount

Model No.	:	ED-P-07-DM
Material	:	Black anodized Aluminum alloy
Diameter	:	30 mm
Quantity	:	1 No.



Babinet Compensator

Model: HO-ED-P-08

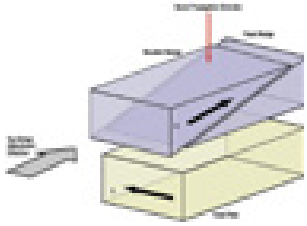


A Soleil-Babinet Compensator is a continuously variable zero-order retarder (wave plate) that can be used over a broad spectral range.The variable retardance is achieved by adjusting the position of a long birefringent wedge with respect to a short fixed birefringent wedge.The wedge angle and fast axis orientation is the same for both wedges so that the retardance is uniform across the entire clear aperture of the Soleil-Babinet compensator. A compensator plate is attached to the fixed wedge, with its fast axis orthogonal to both the fast axis of the wedges and the propagation direction of the light. When the long birefringent wedge is positioned such that the total thickness of the two stacked wedges is equal to the thickness of the compensator plate, the net retardance of light passing through the Soleil-Babinet compensator will be zero. The position of the long wedge can then be adjusted with a precision micrometer in order to create a retardance transmitted beam of light.

Wavelength range : 380- 650 nm
Retardation range : 2π radiance
Aperture : 10 mm
Rotation : 360°

Experiment Possible

- **To calibrate the Babinet compensator with monochromatic light.**
- **Measurement of the sample birefringence**



Calibration of the Babinet compensator with monochromatic light



A schematic diagram of the experimental setup

Experiment procedure

Determine precisely the Babinet compensator interfringe at the wavelength of the green line of mercury. This is about 2.4 mm. The polarizers are spaced apart with their polarization axis rotated 90° to each other so that no light is transmitted. At this point the polarizers are crossed. Insert compensator in between the two polarizers. Adjust the tip/tilt so that the compensator is perpendicular to the optical beam. Turn the Babinet compensator to find the extinction. Fringes of high contrast should appear. Using micrometer, record the reading between two null position of the fringe.

Measurement of the sample birefringence

Using Babinet compensator, ordinary and extra-ordinary rays of light are produced. These light rays interfere and the interference fringes are observed. By introducing the sample sheet in between the incident ray and Babinet compensator, shift in the fringe pattern is produced. The fringe shift is measured and the differences in the refractive indices of the ordinary and extraordinary rays are calculated.

Scope of Supply

Optical Rail
Model No. : ED-P-08-OR
Length : 500mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer with mount
Model No. : ED-P-08-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 1 degree
Quantity : 2 No.



Diode laser with power supply
Model No. ED-P-08-DLPR
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



Detector Mount
Model No. : ED-P-07-DM
Material : Black anodized Aluminum alloy
Diameter : 30 mm



Babinet compensator with mount
Model No. : ED-P-08-BCM
Material : Quartz Crystal
Surface Quality : 40 - 20 (Scratch-dig)
Retardance Adjust : 0 - 2π (full wave)
Rotation : 360° continuous
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-P-07-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi
: lead screws
Quantity : 1 No.



Detector with output measurement unit
Model No. ED-P-08-DOMU
Sensor Type : Photo Transistor
: 7 segment, 3 ½ digit
Display : 0 - 199 milli amperes
Quantity 1 No.



Accessories
User Manual



Surface Plasmon Resonance Apparatus

Model: HO-ED-P-10

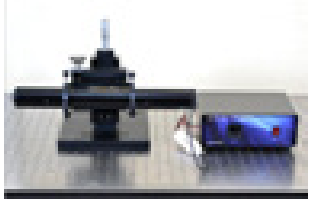
Holmarc's surface Plasmon resonance Apparatus Model: HO-ED-P-10 is designed for the creation of surface Plasmon wave at resonance angle. This model consists of gold coated prism with high refractive index & He-Ne 'p' polarized laser source with spatial filter assembly. This model is called as Kretschmann configuration model. With its new and integrated design, this device is easier to setup and operate so that students can easily understand its principles and theories.

In this apparatus Goniometer kept at 0-180 degree for easy of operation & reflection from prism points to the laser at 0/180 degree for zero degree reflection angle measurement. Spatial filter assembly with 45X objective is used for SPR setup. Lens assembly make parallel beam & refocus the laser at the backside of gold coated prism. The rectangular dark image in enlarged beam can be scanned with photo detector within a specific range of angles using Goniometer stage. The resolution of Goniometer is 1 arc min. A nonlinear curve with a dip in the curve noted for certain angular scanning with the help of pinhole photo detector. Half wave plate is used for change p & s polarized state of He-Ne laser. Thereby we can observe dark band disappear & then come again in an interval of 90 degrees.

Specifications

Laser	:	He-Ne p polarized, 632.8nm
Detector	:	Pinhole photo detector
Prism	:	Gold coated, NSF01 material
Goniometer	:	1arc min resolution
Optical Bread board:		Rectangular, SS material, Magnetic
Lens	:	Plano-vex lens, Focal length 200mm & 150mm
Polarizer	:	Half wave plate, Quartz material, 25mm diameter

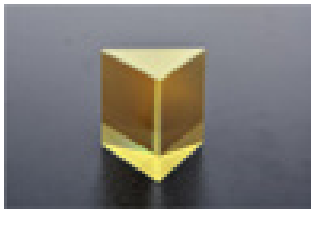
Components Included



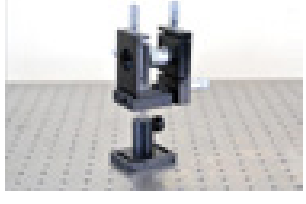
He-Ne laser



Goniometer stage



Gold coated Prism



Spatial Filter Assembly

Aim of the experiment

- **Demonstrate the experiment to see the dark band in the reflected beam from the gold coated prism.**

Note the angle of absorption occurred using photo detector. Study the change in polarization from p to s using half wave plate.

Theory

As we know gold metal consists of bulk of free electrons and they have electric field called as evascent wave or surface wave. These oscillating coherent wave moves in longitudinal direction with propagation k vector. In mean time the 632.8nm laser with p polarized state have its own electric field.

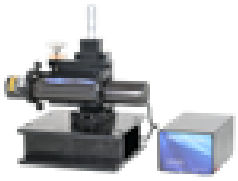
At an angle greater than critical angle for total internal reflection this electric field interlock or coupled with surface wave produced by gold metal at Au-Air (dielectric) interface. This is called resonance condition. At this resonance condition there is a loss of energy hw & loss of momentum hk occurs in the optical electric field which will lead to the loss / absorption in light. This will clearly see as rectangular dark band in enlarged view of reflection light from gold coated prism.

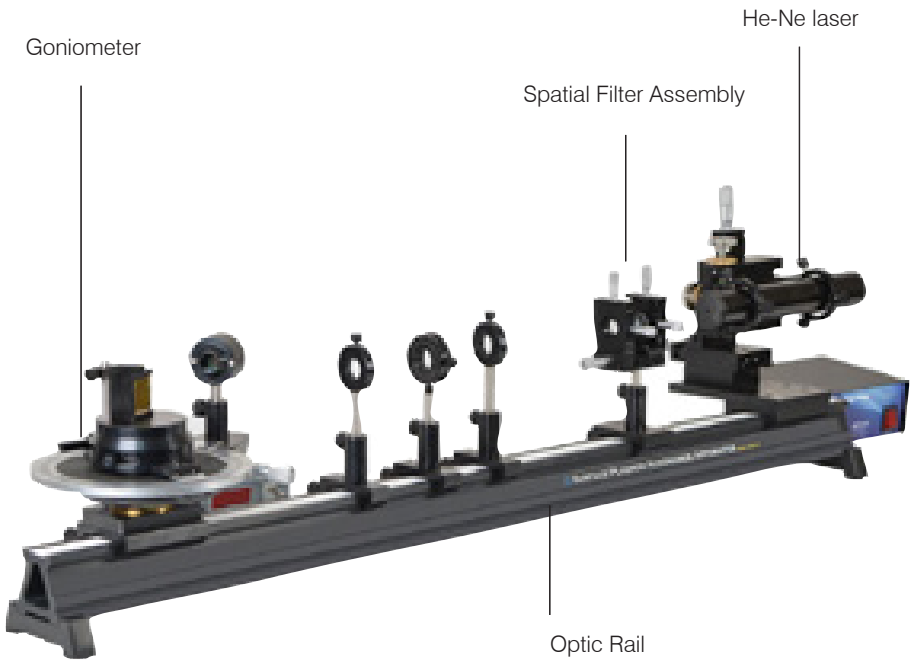
One of the important applications in SPR; is the analysis of change happened in a dielectric medium while it used on the top of the prism. As an example by using protein molecules, one can analysis the change in molecular binding energy level by analyzing shift in the absorption band.

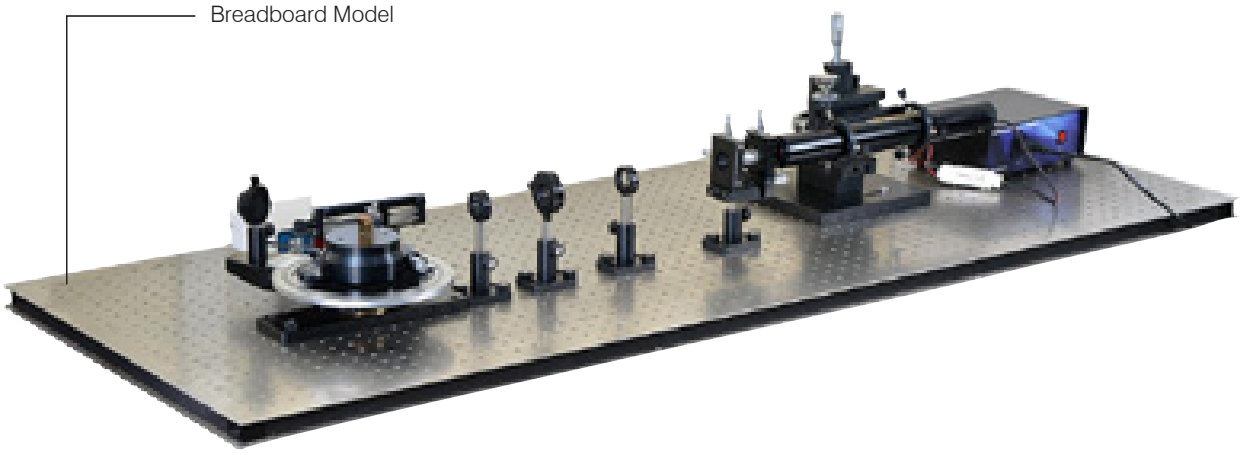
He-Ne Laser Mount Tilt And Rotation

Holmarc's gimbal laser mounts provide 360° coarse positioning in two axes in addition to fine adjustments. Laser is held in position by nylon tipped setscrews.

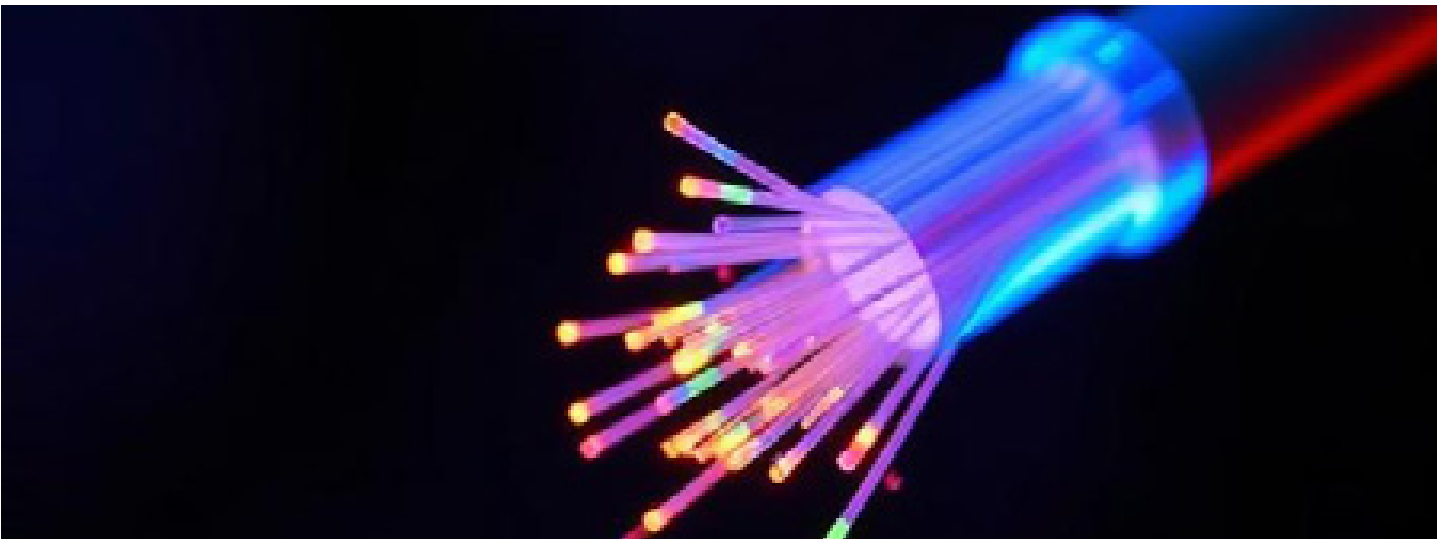
360° Rotation with ±2° Fine Adjustment
Provide fine centering adjustability







Fiber Optics



Optical Fiber Characterization Apparatus (Rail Based) Model: HO-ED-F-02

In this apparatus, both single mode and multi-mode fibers are used for the experiments. The apparatus makes use of rail and carriage system for mounting and adjusting the optical components required for experiments. Diode laser is used as light source. Laser fiber coupler is used to couple light from laser to fiber input end efficiently. There are mounts to hold input and output ends of the fiber firmly. Detector is placed on an XYZ stage. Distance between each component can be adjusted using the rail and carriage mechanism.

The experiment helps students to understand concepts of numerical aperture, bending loss, splice loss etc. The laser light is coupled to optical fiber with the use of an objective lens for maximum coupling efficiency. Numerical aperture is found out by scanning the far field of the optical fiber using a photo detector mounted on a translation stage. Corrosion resistant materials like stainless steel and aluminium alloys are used for the construction of all components used in this apparatus.

Features

Single mode and multi-mode fibers
Diode laser is used as light source
High precision Laser coupler
Highly sensitive photo detector

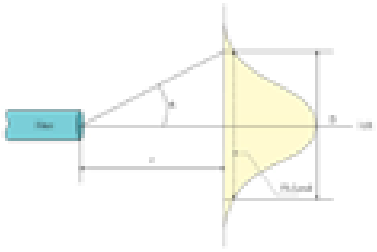


Experiment Possible

Numerical aperture measurement of multi-mode fiber
The Numerical Aperture is given by, NA = Sin θ_a, Where θ_a is the Acceptance angle

Measurement of bending loss in multi-mode fiber
The bend of a fiber causes loss in emittance and increase in attenuation as the angle of incidence decreases at the points where curveted radius is too small and the condition of total internal reflection is not fulfilled. In this experiment an apparatus of varying radii is used to study the bending losses involved. When a fiber is bend specified number of turns on various diameters, loss occurs in accordance with the diameter and it can be seen that, the loss will increase with respect to the decrease in diameter.

Relative measurement of splice loss in multi-mode fiber
Splice loss is caused by a number of factors. Loss is minimized when the two fiber cores are identical and perfectly aligned, splices are properly finished and no dirt is present. Only the light that is coupled into the receiving fiber's core will propagate, so all the rest of the light becomes splice loss



Intensity vs Micrometer Reading

Numerical aperture measurement of single mode fiber

The Numerical Aperture is given by,

NA = Sin θ_a, Where θ_a is the Acceptance angle

Calculation of normalized frequency or V-number of single mode fiber

In an optical fiber, the normalized frequency, the V number is given by

$V = (2\pi a / \lambda) \sqrt{} (n_1 - n_2)$

$V = (2\pi a / \lambda) NA$

Where a is the core radius, λ is the wavelength in vacuum, n_1 is the maximum refractive index of the core, n_2 is the refractive index of the homogeneous cladding, and applying the usual definition of the numerical aperture NA.

Calculation of mode field diameter of single mode fiber.

For a Gaussian power distribution (lasers used in communications have Gaussian power distribution) in a single mode optical fiber, the mode field diameter (MFD) is defined as the point at which the electric and magnetic field strengths are reduced to 1/ e^2 of their maximum values, i.e., the diameter at which power is reduced to $1/e^2$ (0.135) of the peak power (because the power is proportional to the square of the field strength). For single mode fibers, the peak power is at the center of the core.

Scope of Supply

Optical Rail

Model No.	:	ED-F-02-OR
Length	:	1000 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Detector Mount

Model No	:	ED-F-02-DM
Material	:	Black anodized Aluminum alloy
Diameter	:	30 mm
Quantity	:	1 No.



Laser Fiber Coupler with Mount

Model No.	:	ED-F-02-LFCM
Objective Magnification	:	10 X
Positioning	:	Lead screw
Quantity		1 No



Fiber Chuck Holder

Model No.	:	ED-F-02-FCH
Material	:	Black anodized
	:	Aluminum alloy
Quantity		1 No



Fiber Chuck

Model No.	:	ED-F-02-FC
Material	:	Black anodized Aluminum alloy
Diameter	:	30 mm
Quantity	:	1 No.



Multi Mode Optical Fiber

Model No.	:	ED-F-02-MMOF
Material	:	Plastic Fiber
Numerical Aperture	:	0.5
Core Dia	:	750, 250 microns
Length	:	5 meters
Quantity	:	1 No. each.



Detector with Output Measurement Unit

Model No.		ED-F-02-DOMU
Sensor Type		Photo Transistor
Display		7 segment, 3 ½ digit
Range		0 - 199 micro/milli A
Quantity		1 No



Kinematic Laser Mount

Model No.	:	ED-F-02-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment	:	+/-3 degrees
Quantity	:	1 No.



XYZ Translation stage with Mount

Model No.	:	ED-F-02-XYZT
Material	:	Black anodized Aluminum alloy
Travel	:	Micrometer controlled
Resolution	:	0.01 mm
Quantity	:	1 No



Fiber Holder with Angular Tilt

Model No.	:	ED-F-02-FHAT
Material	:	Black anodized Aluminum alloy
Resolution	:	2 degree
Quantity	:	1 No.



Bending Loss Apparatus

Model No.	:	ED-F-02-BLA
Chuck material	:	Nylon
Step diameter	:	35, 45, 55, 65 mm
Quantity	:	1 No.



Single Mode Optical Fiber

Model No.	:	ED-F-02-SMOF
Material	:	Glass fiber
Numerical Aperture	:	0.11
Core Dia	:	9 micron
Length	:	3 meters
Quantity	:	1 No.



Diode Laser with Power supply (Red)

Model No.	:	ED-F-02-DLPR
Wave length	:	650 nm
Optical power	:	5 mW
Quantity	:	1 No





Accessories

User Manual

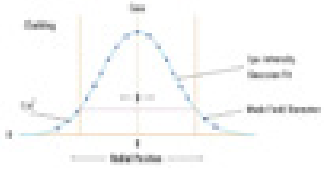
Optical Fiber Characterization Apparatus (Breadboard Based)

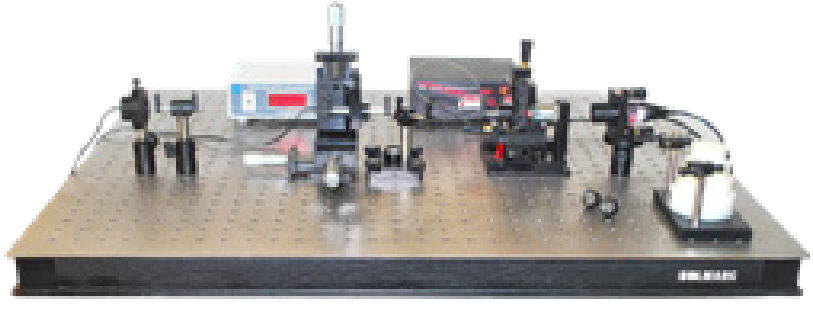
Model: HO-ED-F-03

In the model HO-ED-F-03, components are mounted on an optical breadboard (800 x 600mm) for performing the experiment. The use of optical breadboard makes the system flexible and helps to setup the experiments easily. In this model, various components can be arranged on the breadboard with desired configurations. There are M6 tap holes at 25mm grid throughout the breadboard to facilitate mounting. The characterization of single mode and multi mode fiber can be performed by this experiment setup. The coupling efficiency verify with pin hole detector detecting the light coming out from end of fiber. The output ends is hold by mount and detector hold on translation stage. This setup helps to understand concept of numerical aperture, coupling of light and etc. Numerical aperture can be calculated by output light of optical fiber using photo detector mounted on translation stage. All components of setup constructed by corrosion resistant material

Features

- Easy and flexible
- Experiments based on both single mode and multi–mode fibers
- Diode laser is used as light source
- High precision laser coupler
- Photo transistor type photo detector
- Corrosion free components





Experiment Possible

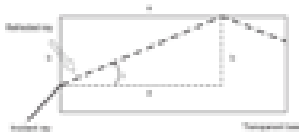
Numerical aperture measurement of multi-mode fiber
The Numerical Aperture is given by, NA = Sin θ_a, Where θ_a is the Acceptance angle

Relative measurement of splice loss in multi-mode fiber
Splice loss is caused by a number of factors. Loss is minimized when the two fiber cores are identical and perfectly aligned, splices are properly finished and no dirt is present. Only the light that is coupled into the receiving fiber's core will propagate, so all the rest of the light becomes splice loss

Calculation of normalized frequency or V-number of single mode fiber
In an optical fiber, the normalized frequency, the V number is given by
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$V = (2\pi a / \lambda) NA$
Where a is the core radius, λ is the wavelength in vacuum, n_1 is the maximum refractive index of the core, n_2 is the refractive index of the homogeneous cladding, and applying the usual definition of the numerical aperture NA.

Calculation of mode field diameter of single mode fiber.
For a Gaussian power distribution (lasers used in communications have Gaussian power distribution) in a single mode optical fiber, the mode field diameter (MFD) is defined as the point at which the electric and magnetic field strengths are reduced to $1/e^2$ of their maximum values, i.e., the diameter at which power is reduced to
$1/e^2$ (0.135) of the peak power (because the power is proportional to the square of the field strength). For single mode fibers, the peak power is at the center of the core.

Determination of refractive index of transparent solids



According to Snell's law,

$$V = \sin i / \sin r$$

Where, n is the refractive index of transparent medium, i is the angle at which light enters the medium and r is the angle at which it gets refracted

Scope of Supply

Optical Breadboard with Support
Model No. : ED-F-03-BBS
Dimensions : 800mm x 600mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Detector Mount
Model No. : ED-F-03-DM
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Laser Fiber Coupler with Mount
Model No. : ED-F-03-LFCM
Magnification of objective : 10 X
Positioning : Lead screw
Quantity : 1 No.



Fiber Chuck Holder
Model No. : ED-F-03-FCH
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Fiber Chuck
Model No. : ED-F-03-FC
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Multi Mode Optical Fiber
Model No. : ED-F-03-MMOF
Material : Plastic Fiber
Numerical Aperture : 0.5
Core Dia : 750,250 microns
Length : 5 meters
Quantity : 1 No. each.



Detector with Output Measurement Unit
Model No. : ED-F-03-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli amperes
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-F-03-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment : +/-3 degrees
Quantity : 1 No.



XYZ Translation stage with Mount
Model No. : ED-F-03-XYZT
Material : Black anodized Aluminum alloy
Travel : Micrometer controlled
Resolution : 0.01 mm
Quantity : 1 No.



Fiber Holder with Angular Tilt
Model No. : ED-F-03-FHAT
Material : Black anodized Aluminum alloy
Resolution : 2 degree
Quantity : 1 No.



Bending Loss Apparatus
Model No. : ED-F-03-BLA
Chuck material : Nylon
Step diameter : 35, 45, 55, 65 mm
Quantity : 1 No.



Single Mode Optical Fiber
Model No. : ED-F-03-SMOF
Material : Glass fiber
Numerical Aperture : 0.11
Core Dia : 9 micron
Length : 3 meters
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-F-03-DLPR
Wavelength : 650 nm
Optical Power : 5MW
Quantity : 1 No.



Accessories
User Manual



For more product informations, contact us : sales@holmarc.com

Laser & Opto Electronics



Apparatus for Characteristic study of Diode Laser

Model : HO-ED-LOE-01

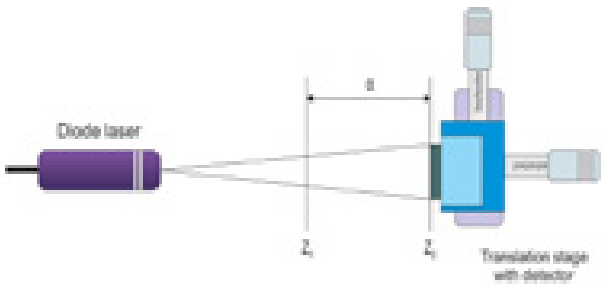
Holmarc's Apparatus for Characteristic Study of Diode Laser (Model No: HO-ED-LOE-01) is an important educational instrument for the study of beam profile with the detector mounted on XYZ translation stage and the diode laser. In this apparatus, the detector is scanned linearly using a translation stage along the cross section of laser beam noting down the intensity readings at close intervals.

A graph is plotted from the readings for finding out attributes like Gaussian nature, divergence etc. The laser diode is designed to produce a cone of divergent radiation with an elliptical cross-section and Gaussian intensity distribution.

For studying polarization nature of the laser beam, diverging laser output is made to pass through a polarizer which is fixed on a rotary mount with graduations. Using the detector and readout, intensity at various rotary positions of the polarizer is tabulated. The degree of polarization varies with the diode current.

Specifications

- Laser type : Diode laser (Red)
- Input : 230V AC / 50 Hz
- Output power : 3 mW
- Wavelength : 650 nm



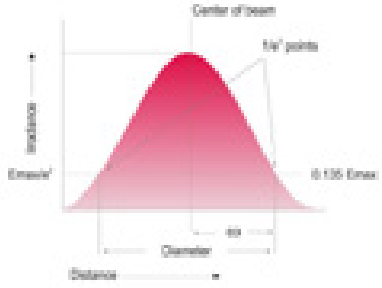
Experiment Possible

A. To study gaussian nature of the laser beam

Study the intensity distribution of laser in X and Y direction using the corresponding micrometer of XYZ stage. The beam is scanned linearly using the micrometer noting down the output current of the detector at close intervals. Plot the detector current Vs distance graph and can study the gaussian nature of the laser beam.

B. To find diameter (beam spot size) of the laser beam

The 'Beam Diameter' is defined as "The distance across the center of the beam for which the irradiance (E) equals (1 / e^2 = 0.135)". The 'Spot Size' (ω) of the beam is "The radial distance (radius) from the center point of maximum irradiance to the 1 / e^2 point". These definitions provide standard measures of laser beam size.



C. To determine divergence of the laser beam

Divergence angle θ is given by,

$\theta = \tan^{-1} (| \omega_2 - \omega_1 |)$

Where ω_1 and ω_2 are the beam spot sizes at two different positions say Z_1 and Z_2 respectively.

D. To study polarization nature of the laser beam

Plot a graph with polarizer angle and the output current from the detector and can study the polarization nature of the laser beam.



Features

- **Laser assures smooth switch on and long life**
- **Light sensor range 0–199 milli / micro amperes**
- **Linear travel of 25mm for XYZ axis**
- **Precision micrometer driven translation stage with resolution of 10 microns**

Scope of Supply

Optical Rail

Model No.	:	ED-LOE-01-OR
Length	:	500 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Polarizer Rotator with Mount

Model No.	:	ED-LOE-01-PRM
Material	:	Sheet Polarizer
Rotation	:	360 degree
Resolution	:	2 degree
Quantity	:	1 No.



Detector Output Measurement Unit

Model No.	:	ED-LOE-01-DOMU
Sensor Type	:	Photo Transistor
Display		7 segment, 3 ½ digit
Range	:	0 - 199 milli/micro amperes
Quantity	:	1 No.
Accessories	:	User Manual



Kinematic Laser Mount

Model No.	:	ED-LOE-01-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



XYZ Translation stage with Mount

Model No.	:	HD-LOE-01-XYZT
Material	:	Black anodized Aluminum alloy
Travel	:	Micrometer controlled
Resolution	:	0.01 mm
Quantity	:	1 No.



Diode Laser with Power supply (Red, without Lens)

Model No.	:	ED-LOE-01-DLPRW
Wave length	:	650 nm
Optical power	:	3 mW
Quantity	:	1 No.



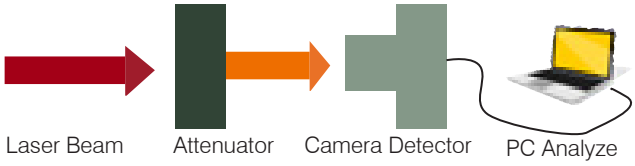
Connect with our engineers and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service:

Apparatus for Laser Beam Profile Analysis

Model : HO-ED-LOE-01A

The Laser beam profiler is a high precision, camera based (for VIS / NIR) device to be used with lasers having wavelengths between 340nm and 1100 nm. Coupled with software package, the device can be used for quick and accurate characterization of lasers. A laser beam profile is produced to identify spatial characteristics that predict the propagation, quality, and utility of a laser beam. These spatial characteristics include beam width, divergence and direction. Laser beam profiling is important for manufacturers of products that utilize lasers as the core technology.

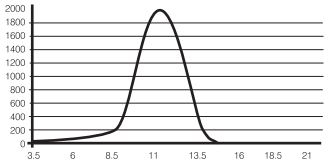
Holmarc Laser Beam Profiler enables quick and accurate measurement of laser beams as well as other spot light sources. There are two models, one for educational application (Model : HO-ED-LOE-01A) which is based on CMOS sensor and the other is intended for scientific application based on camera Model : HO-ED-LOE-01B. Both these laser beam profiler models include HOLMARC IMAGE Analysis Software.

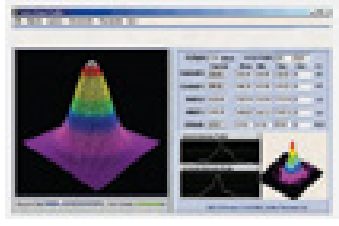


There are different ways to analyze the profile of a laser beam, Non-electronic methods as well as electronic methods.The best electronic method is making the laser beam to fall over a sensor and to image the beam profile on a computer screen. But it is necessary to attenuate the laser beam to some degree before it falls on a camera sensor. We make use of set of neutral density filters in the beam path to reduce the power to the level acceptable by the camera. Lasers usually emit beams with a Gaussian profile. A Gaussian beam is a beam of electromagnetic radiation whose transverse electric field and intensity (irradiance) distributions are described by Gaussian functions.Spot size is nothing but the radius of the beam itself. The distance across the center of the beam for which the irradiance (intensity) equals of the maximum irradiance ($1/e^2 = 0.135$) is defined as the beam diameter. The spot size (w) of the beam is defined as the radial distance (radius) from the center point of maximum irradiance to the $1/e^2$ point.

Experiment Possible

- To study the polarization nature of laser beam
- To measure the divergence of the laser beam
- To study the Gaussian nature of laser beam
- To measure the diameter (beam spot size) of the laser beam





Scope of Supply

Optical Rail
Model No. : ED-LOE-01A-OR
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-LOE-01A-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Accuracy : 2 degree
Quantity : 2 Nos.



Camera with mount and ND Filter
Model No. : LOE-01A-CMOS
Sensor Type : CMOS
Image Resolution : 2592 x 1944 (typical, max.)
ND Filter : OD 1.5 and 1.7
Quantity : 1 No.



Accessories : User Manual

Kinematic Laser Mount
Model No. : ED-LOE-01A-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Diode Laser with Power supply Green
Model No. : ED-LOE-01A-DLPG
Wave length : 532 nm
Optical power : 5 mW
Colour : Green
Input voltage : 230V / 50 Hz
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-LOE-01A-DLPR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.



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Apparatus for Opto -Electronics Characterization

Model : HO-ED-LOE-02

Holmarc's Apparatus Model HO-ED-LOE-02 is for the characterization of Optoelectronic components. Optoelectronics is the study and application of electronic devices that interacts with light. Optoelectronic devices are electrical to optical / optical to electrical transducers or instruments.

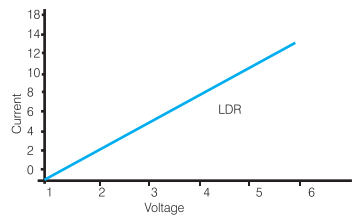
These introductory - level experiments reveal the basic concepts of opto-electronics and are useful in courses dealing with applied physics, fiber optics, electronic devices, etc. Opto-electronics is based on the quantum mechanical effects of light on electronic materials, especially semiconductors, sometimes in the presence of electric fields.

The apparatus consists of a diode laser and cell mount to which any of the opto - electronic components can be attached easily. Opto electronic components are fixed inside metallic casing for ease of mounting in an experimental setup. The terminals of the components are taken out through a cable which has a pair of stereo connector . Both source and the detector are placed on the optical rail using carriage system. Linearly variable light intensity is obtained by using polarizer with a rotary mount in front of the laser.

Experiment Possible

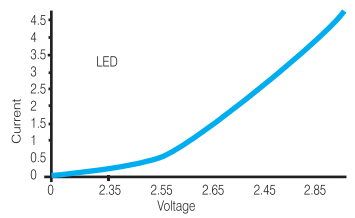
A.Characteristic study of Light Dependent Resistor (LDR)

A photoresistor or Light Dependent Resistor (LDR) is a resistor whose resistance decreases with increasing incident light intensity. Light detection operation depends on the fact that the resistance of certain materials like Cadmium Sulphide (CdS) varies with the intensity of light falling on the surface of the film.



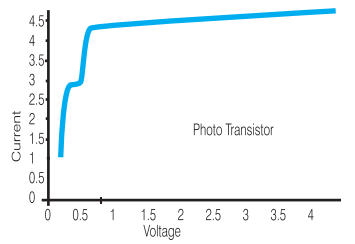
B.Characteristic study of Light Emitting Diode (LED)

A light-emitting diode (LED) is a semiconductor light source. When a light-emitting diode is forward biased, electrons are able to recombine with holes within the device, releasing energy in the form of photons. This effect is called electroluminescence and the color of the light is determined by the energy gap of the semiconductor. Here we are finding the relationship between the input voltage V and forward current I. The biasing voltage is increased from zero to V in suitable steps by varying the biasing supply. The corresponding reading in the ammeter connected to the LED is noted at each step. A graph plotted between V and I, which represents the V-I characteristics.



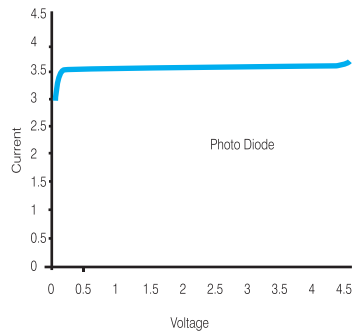
C.Characteristic study of Photo Transistor

In a phototransistor, the base region is enlarged and generally does not have a lead attached to it. The collector-base junction is sensitive to light falling on it. When light falls on the base junction, a base current proportional to light intensity is produced. This initiates a collector current proportional to the light intensity.



D.Characteristic study of Photo Diode

A photodiode is a type of photo detector capable of converting light into either current or voltage, depending upon the mode of operation. When a photon of sufficient energy strikes the diode, it excites an electron, thereby creating a free electron and a positively charged electron hole. If the absorption occurs in the junction's depletion region, or one diffusion length away from it, these carriers are swept from the junction by the built-in field of the depletion region. Thus holes move toward the anode, and electrons toward the cathode, and a photocurrent is produced. This photocurrent is the sum of both the dark current (without light) and the light current, so the dark current must be minimized to enhance the sensitivity of the device.

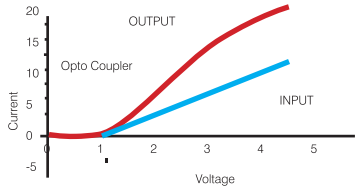


E.Characteristic study of Solar Cell

A solar cell is a semiconductor device, which generates an emf when illuminated by light. When light hits the surface of a solar cell near the p-n junction, the crystal is ionized and new electron hole pairs are generated. These electrons and holes created in the n and p-region diffuse towards the junction and if they have no time to recombine in the transit, they fall under the influence of the internal electric field existing in the junction. The electric field forces the electrons to move to n-region and holes to the p-region. This produces an excess of hole in the p-region and electrons in the n-region. These electrons and holes buildup charges in their respective regions and a potential difference called photo emf appear across the cell.

F.Characteristic study of Opto-Coupler

The opto-coupler or opt isolator is essentially a device that uses a short optical path to couple an electrical signal from one area to another. Typically the opto coupler is housed within a single small package, often around the size of a small integrated circuit, although sizes vary according to the application and the specification.



Scope of Supply

Optical Rail
Model No. : ED-LOE-02-OR
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-LOE-02-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 No.



Mounted Opto-Electronic Detectors
Model No. : ED-LOE-02-MOED
1. Light dependent resistor (LDR)
2. Light emitting diode (LED)
3. Photo Transistor
4. Photo Diode
5. Solar Cell
6. Opto-Coupler

Quantity : 1 No. each



Acessories

User Manual

Kinematic Laser Mount
Model No. : ED-LOE-02-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Detector Mount
Model No. : ED-LOE-02-DM
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Opto-Electronic Measurement Unit
Model No. : ED-LOE-OEMU
Output Voltage
Port 1 : 0 - 5 Volt Variable
Port 2 : 5 Volt fixed
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-LOE-02-DLPR
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



Z-Scan system

Model : HO-IAD-ZS-01A

The Z-Scan technique is a simple and popular experimental technique used to measure intensity dependent nonlinear susceptibilities of materials. Holmarc's Z-Scan System is a simple implementation of the z-scan technique that can be used to characterize optical materials.

In this method, the sample is translated along the axis of a focused Gaussian beam, and the far field intensity is measured as a function of the sample position. Analysis of the intensity versus sample position, Z-Scan curve, predicated on a local response, gives the real and imaginary parts of the third order susceptibility. In this technique, the optical effects can be measured by translating a sample in and out of the focal region of an incident laser beam.

Holmarc's Z-Scan System includes precision motorized stage for linear scanning, photo diode assembly along with mechanical mounts and control electronics for motion control and data acquisition. High power 532 nm CW DPSS Laser is used as the light source. Parameters like travel distance, data acquisition intervals etc. can be programmed using computer Interface.

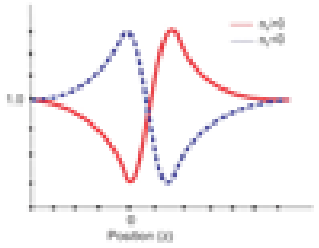
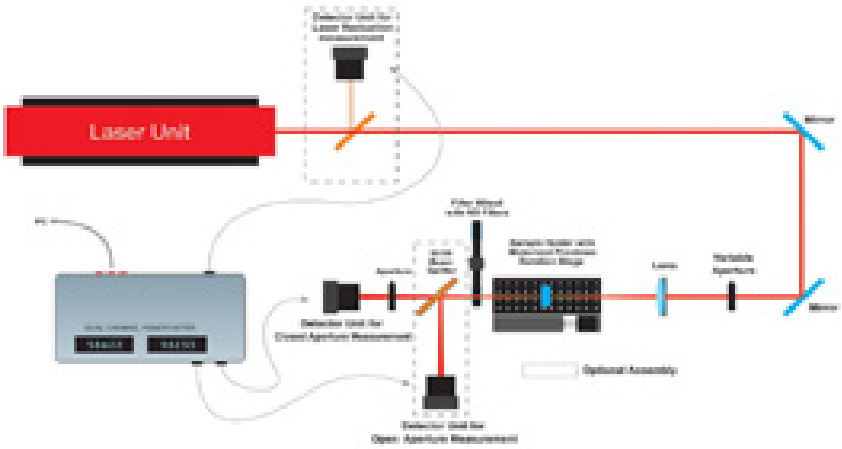


Fig- Z scan theoretical of Transmittance as function of Z





Scope of Supply

Optical Breadboard with Rigid Support



Model No.	:	HO-IAD-ZS-01A-BBRS
Dimensions	:	1200 x 800 mm
Material	:	5 mm thick magnetic SS top skin 410 Grade
Holes	:	M6 tapped holes at 25 mm grid
Quantity	:	1 No.

Motorized Linear Translation Stage



Model No.		HO-IAD-ZS-01A-MLTS
Actuator		Stepper motor
Drive Mechanism	:	Lead screw
Travel range	:	150 mm
Resolution	:	0.1 mm
PC connectivity	:	Serial port (RS 232)
Power input	:	230 V, 50 Hz
Quantity	:	1 No.

Dual Channel Control Unit



Model No.		HO-IAD-ZS-01A-DCCU
Drive		Bipolar stepper motor drive
Current Control	:	PWM current control
Step	:	1 / 16 micro step
Control	:	Microprocessor controlled
Detector Interface	:	Dual channel detector
Operation	:	PC based operation
Connectivity	:	Serial port (RS232C)
Quantity	:	1 No. each

Variable Beam Splitter with Mount



Model No.		HO-IAD-ZS-01A-VBSM
Diameter		75 mm
Thickness	:	3 mm
Material	:	H-K9L
Coating	:	S1Protective Aluminium
	:	S2Anti-reflection Coating
Surface Quality	:	40 - 20 (scratch-dig)
Surface Flatness		λ/4 @ 632.8 nm
Mount Material	:	Aluminium
Quantity	:	1 No.

ND Filter Wheel



Model No.		HO-IAD-ZS-01A-NDFW
Filters		6 nos
Type	:	Absorptive
Optical Density	:	1, 2, 2.3, 3, 3.3 & 4
Material	:	NG4 & Ng9
Surface Quality	:	40 - 20 (scratch-dig)
Clear Aperture	:	90 %
Surface Flatness	:	λ/4 @ 632.8nm
Quantity	:	1 No.

Aperture Wheel with Selectable Apertures

Model No.		HO-IAD-ZS-01A-AW
Material	:	Anodized Aluminium
Aperture Diameters	:	0.50 mm, 0.75 mm, 1.00 mm, 1.25 mm, 1.50 mm,1.75 mm, 2 mm
Quantity		1 No.

Accessories

User Manual

Laser Source with Mount



Model No.	:	HO-IAD-ZS-01A-DPSS
Type	:	DPSS Laser
Power	:	100 mW
Wavelength	:	532 nm
Power Stability	:	<5% (over 2 hours)
Beam Divergence	:	<1.5mrad
Beam Diameter	:	<1.2 mm
Warm-up time	:	< 15 min
Quantity	:	1 No.

Photo Detector with Mount



Model No.	:	HO-IAD-ZS-01A-PDM
Type	:	Si Photodiode
Active area	:	5.8 mm x 5.8 mm
Range	:	320 - 1100 nm
Quantity	:	2 Nos.

Kinematic Mirror Mount with Mirror



Model No.	:	HO-IAD-ZS-01A-KMM
Material	:	Borofloat (Schott)
Coating	:	Protected Aluminium
Diameter	:	25 mm
Thickness	:	6 mm
Tolerance	:	+/ -0.2 mm
Clear Aperture	:	90% of diameter
Surface Quality	:	40 - 20 (Scratch - dig)
Surface Flatness	:	λ/4 @ 632
Quantity	:	2 Nos.

Achromatic Lens with Mount



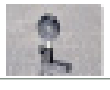
Model No.	:	HO-IAD-ZS-01A-ALM
Material	:	H-K9L
Design Wavelength	:	587.6 nm
Focal length	:	286 mm & 100 mm
Effective Focal Length Tolerance	:	± 1%
Surface Quality	:	40 - 20 (scratch-dig)
Clear Aperture	:	> 90% of Diameter
Quantity	:	1 No. each.

Cuvette with Holder



Model No.	:	HO-IAD-ZS-01A-CH
Material	:	UV Fused silica
Path length	:	1 mm
Outer dimension	:	44.5 x 20 x 3 mm
Inner dimension	:	35 x 10 x 1 mm
Volume	:	0.35 mL approx.
Holder Material	:	Aluminium
Dimensions	:	50 x 25 x 5 mm
Quantity	:	1 No.

Variable Aperture with Mount



Model No.	:	HO-IAD-ZS-01A-VAM
Material	:	Aluminium & Spring Steel
Max. Aperture	:	25 mm
Min. Aperture	:	2 mm
Quantity	:	1 No.

Connect with our engineers and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service:

Spectral characteristics of LED

Model : HO-ED-LOE-04

Holmarc's grating spectrometer consists of a holographic concave diffraction grating and a one-dimensional CCD detector array. It delivers excellent thermal stability with low stray light for wide range of research and OEM applications. The concave gratings accomplish the task of two optical elements in a single, easily integrated component. It has one micrometer controlled variable input slit with LED holder.

The spectral power distribution of the optical radiation emitted by LED differs in many ways from other radiation sources. It is neither monochromatic like a laser nor broadband like a Tungsten lamp but rather lies between these two extremes. The spectrum of LED has a specific peak wavelength depending on the manufacturing process where the FWHM is typically a couple of tens of nanometres. Holmarc's grating spectrometer gives fast and reliable LED spectral characterization.

Spectrometer interfaces with a computer via Type-B USB 2.0. The entire power requirement is drawn through the 2.0 type-B USB connector. Spectra QSR software gives the output plot of intensity versus wavelength.

Spectrometer Specification

Spectrometer F#	:	2.9
Dispersion Element	:	Concave Grating
Wavelength Range	:	350 - 1050 nm
Resolution	:	0.9 nm
Detector	:	Toshiba Linear CCD Array
Connectivity	:	USB 2.0
Software	:	Spectra QSR V2.26

Scope of Supply

Spectrometer

Model No.	:	HO-ED-LOE-04-S
Spectrometer F#	:	2.9
Wavelength Range	:	350 - 1050 nm
Software	:	Spectra QSR V2.26
Quantity	:	1 No.

LED with power supply

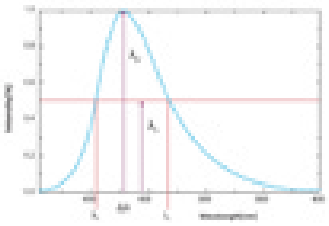
Model No.	:	HO-ED-LOE-04-LPS
Quantity	:	1 No.

Accessories	:	User Manual



Experiment Possible

- **To calculate the peak wavelength of LEDs**



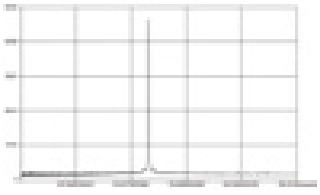
Peak wavelength λp:
Peak wavelength λp is the wavelength at the maximum intensity of the spectrum. The peak wavelength is easy to define and is therefore generally given in LED data sheets. owever, the peak wavelength has little significance for practical purposes since two LEDs may have the same peak wavelength but different colour perceptions.

- **To calculate the spectral bandwidth of LEDs - FWHM**

Spectral Band width FWHM:
The spectral bandwidth at half intensity, Δλ is calculated from the two wavelengths λ and λ on either side of λp

$$\Delta\lambda = \lambda 1 - \lambda 2$$

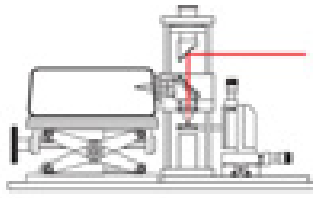
- **To analyze emission spectrum of laser and study the peak wavelength and FWHM**



Other parameters like Centre wavelength, Centroid wavelength, Dominant wavelength, etc can be studied.

Second Harmonic Generation

Model : HO-ED-LOE-05



The objective of this experiment is to observe non-linear effect, second harmonic generation in 2nd order non linear crystals. Second harmonic generation (also called frequency doubling or abbreviated SHG) is a nonlinear optical process, in which photons with the same frequency interacting with a nonlinear material are effectively "combined" to generate new photons with twice the energy, and therefore twice the frequency and half the wavelength of the initial photons. Due to nonlinear atomic polarization, crystals can emit a different frequency of light other than absorbed. In order to see the second order effect of atomic polarization, which causes doubling in frequency of the incident light, the incident light must be intense and coherent source, like a laser. Potassium Dihydrogen Phosphate (KDP), Urea etc. are the crystals that exhibit nonlinear polarization properties. When light hits a crystal, it excites the atomic dipoles. In classical optics, it is assumed that this polarization of atoms is linear to the magnitude of electrical field of the incident light. In reality, this polarization is a nonlinear phenomenon, but the nonlinear components are evident only for high intensity

Scope of supply

Raycus RFLP30Q Laser



Average output power	:	30W
Central wavelength	:	1064 nm
Output beam diameter	:	7±1mm
Pulse width (ns)	:	90 – 130
Power range %	:	10 – 100
Power supply	:	24V DC
Single pulse energy	:	0.5 mJ Maximum
Operating temperature	:	0 – 400C

Mechanical assembly to hold Laser sample and spectrometer







Wavelength range	:	320 – 900 nm
Resolution	:	0.9 nm
Optical platform	:	concave grating
Effective spectral range	:	200 – 1050 nm
Detector	:	Toshiba linear CCD
Pixel size	:	8 x 200 μm
Pixel number	:	3648
Software	:	Spectra Analyte V2.26
Pc Interface	:	USB 2.0

Fibre Laser control unit
Model No
To control the voltage to Laser



Experiment Possible

- **Potassium Dihydrogen Phosphate (KDP) crystal growth**
- **Second harmonic generation of light - frequency doubling in Urea and KDP crystals**
- **Comparison of SHG efficiency of urea and KDP crystals using a CCD spectrometer**

In order for the second harmonic light to be visible in the output beam from the crystal, the atomic dipoles must be radiating constructively. This means that the second harmonic light output must be in phase with the incident laser light. The phase of the field at ω needs to be matched with the phase at 2ω in second harmonic generation. This is critical so that they do not interfere destructively. The applied electric field is strong enough such that it produces the second order radiation but the first order radiation does not become the dominant one. Hence, it can be thought of as a superposition of signals at two frequencies which should be added and not cancelled out.

In this experiment, a non centro symmetric crystal is probed with infrared laser to produce visible light. This experiment shows that frequency doubling can be achieved in urea and lab grown KDP crystals. Using a high power infrared laser we can see frequency doubling in crystals. Efficiency of emission from each crystal is calculated using standard techniques. Feel free to contact our engineers for any assistance

Laser Optics Lab

Model : HO-ED-LOL-01

Holmarc's Model no: HO-ED-LOL-01 is designed for performing innovative experiments and carrying out optics related projects. It covers all the major topics such as Michelson interferometer, diffraction, opto-electronics, optical fiber, laser, polarization etc. Experimental setups can be easily assembled on the optical breadboard. Students get hands on experience and knowledge of the experiment. The laser optics lab consists of a honeycomb optical breadboard with rigid supports and various opto - mechanical and optical components. The components are fixed to the readboard by M6 socket head cap screws. Laser Optics Lab is designed to perform more than 30 experiments using diode laser. Instruction manual with complete information and diagrams is provided along with the apparatus.



Polarization

- Polarization of light and verification of Malus law

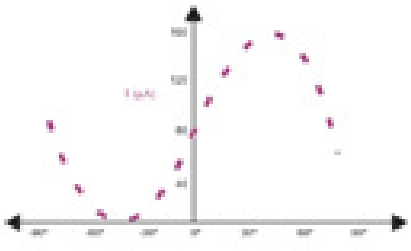


Fig. Photo detector current as a function of the angular position of polarization plane of the analyzer

- Determination of refractive index of transparent material by finding Brewster's angle

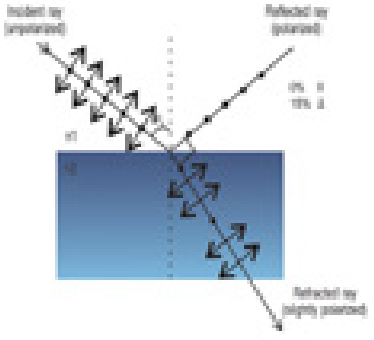




Fig. Brewster's Angle

Experiment Possible

Michelson Interferometer

- Determination of wavelength of laser light
- Determination of refractive index of transparent materials

Optical Fiber

- Numerical aperture measurements
- Determination of bending loss in multi-mode fibers

Diffraction

- Diffraction of light by single slit
- Diffraction of light by double slit
- Diffraction of light by transmission grating
- Diffraction of light by single wire
- Diffraction of light by cross wire
- Diffraction of light by fine wire mesh
- Diffraction of light by pinhole
- Particle size determination
- Use of meter scale ruling as reflection grating
- To find the groove spacing of a CD by using it as reflection grating

Laser

- Gaussian nature of the laser beam
- Beam spot measurements
- Divergence measurement
- Polarization nature of laser

Opto-Electronics

- Characteris
- tics of photo transistor
- Characteristics of photo diode
- Characteristics of light dependent resistor (LDR)
- Characteristics of solar cell
- Characteristics of light emitting diode (LED)
- Characteristics of opto - coupler

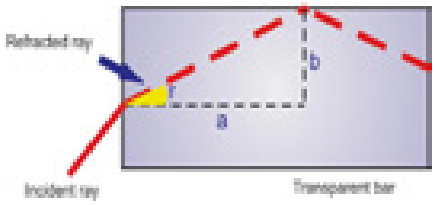


Fig. An Illustration of total internal reflection of light which is incident on a PMMA rod

Absorption

- Study of absorption of laser light in various filters

Total Internal Reflection

- Determination of refractive index of PMMA rod
- Determination of refractive index of liquids

Scope of Supply

Optical Breadboard with Rigid Support (800x600mm)
Model No. : ED-LOL-01-BBS
Dimensions : 800mm x 600mm
Material : Stainless Steel
Quantity : 1 No.



Beam Splitter Mount
Model No. : ED-LOL-01-BSM
Degrees of freedom : 2 degrees
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Mirror Mount with Precision Translation Stage
Model No. : ED-LOL-01-MMPT
Adjustment Range : +/-3 degrees
Material : Black anodized Aluminium alloy
Least count micrometer : 0.01 mm
Quantity : 1 No.



Screen with Mount
Model No. : ED-LOL-01-SM
Dimension : 75mm x 75mm
Quantity : 1 No.



Cell Mount
Model No. : ED-LOL-01-CM
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Laser Fiber Coupler
Model No. : ED-LOL-01-LFC
Magnification objective : 10 X
Positioning : Lead screw Controlled
Quantity : 1 No.



Fiber Chuck Holder
Model No. : ED-LOL-01-FCH
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-LOL-01-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Mirror Mount with Translation Stage
Model No. : ED-LOL-01-MMT
Adjustment Range : +/-3 degrees
Fine adjustments : Using 80 tpi lead screws
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Rotation Stage
Model No. : ED-LOL-01-RS
Resolution : 1° / division
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-LOL-01-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 Nos.



XYZ Translation Stage
Model No. : ED-LOL-01-XYZT
Material : Black anodized Aluminum alloy
Travel : Micrometer controlled
Resolution : 0.01 mm
Quantity : 1 No.



Meter Scale Mount
Model No. : ED-LOL-01-MSM
Material : Black anodized Aluminum alloy
Cavity Thickness : 3 mm
Quantity : 1 No.



PMMA Mount
Model No. : ED-LOL-01-PMM
Material : Black anodized Aluminum alloy
Quantity : 1 No.



PMMA Rod

Model No. : ED-LOL-01-PMR
Chuck material : Poly Methyl Meth Acrylate
Size : 200 x 25 x 25 mm
Quantity : 1 No.

Fiber Chuck

Model No. : ED-LOL-01-FC
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Mirror with Cell

Model No. : ED-LOL-01-MC
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Quantity : 2 Nos.
Coating : Aluminium



Plano Convex Lens with Cell

Model No. : ED-LOL-01-PCXL
Material : Borofloat
Diameter : 30 mm
Focal Length : 150 mm
Quantity : 1 No.



Colour Filter

Model No : ED-LOL-01-CF
Material : PMMA
Diameter : 30 mm
Colours : Red, Blue, Green & Yellow
Quantity : 4 Nos.



Glass Tank

Model No. : ED-LOL-01-GT
Material : PMMA
Dimension : 100 x 100 x 50 mm
Number of Cells : 2 nos.
Quantity : 1 No. each.



Opto-Electronic Measurement Unit(230VAC / 50Hz)

Model No. : ED-LOE-OEMU
Output Voltage
Port 1 : 0 - 5 Volt Variable
Port 2 : 5 Volt fixed
Quantity : 1 No.



Diode Laser with Power supply (Michelson Red)

Model No. : ED-LOL-01-DLPRM
Wave length : 650 nm
Optical power : 5 Mw
Quantity : 1 No.



Detector Output Measurement Unit

Model No. : ED-LOL-01-DOMU
Sensor Type : Photo Transistor
Display : 7 segment 3 ½ digit
Range : 0 - 199 milli / micro amperes
Quantity : 1 No.



Bending Loss Apparatus

Model No. : ED-LOL-01-BLA
Chuck material : Nylon
Step diameter : 35, 45, 55, 65 mm
Quantity : 1 No.



Multi Mode Optical Fiber

Model No. : ED-LOL-01-MMOF
Material : Plastic Fiber
Numerical Aperture : 0.5
Core Dia : 750,250 microns
Length : 5 meters
Quantity : 2 Nos.



Beam Splitter

Model No. : ED-LOL-01-BS
Thickness : 6 mm
R/T ratio : 50 / 50
Material : Aluminium
Coating : N-BK7
Quantity : 1 No.



Diffraction Cells

Model No. : ED-LOL-01-BS
Single Slit : 50 & 100 micron
Double slit : 100 & 200 micron
Transmission grating : 8 lines / mm
Single wire : 75 microns
Cross wire : 75 microns
Wire mesh : 65 microns (grove spacing)
Pinhole : 400 microns
Quantity : 7 Nos.



Mounted Opto-Electronic Detectors

Model No. : ED-LOL-01-MOED
Light depend resistor
Light emitting diode : 2 Nos.
Photo Transistor
Photo Diode
Solar Cell
Opto-Coupler
Quantity : 7 Nos.



Diode Laser with Power supply (Red)

Model No. : ED-LOL-01-DLPRR
Wave length : 650 nm
Optical power : 5 mW
Quantity : 1 No.



Diode Laser with Power supply (Red, without Lens)

Model No. : ED-LOL-01-DLPRW
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



Accessories

User Manual
Allen keys
Thumb Screws
Glass Slides
Sample Powder
Meter Scale
CD



Led, Laser Diode & Photodiode Characterization Apparatus

Model : HO-ED-LOE-06

Lasers and LEDs are interesting equipments in electronics. Light emitting diode is a semiconductor light source and a Laser diode is a device with an active medium of semiconductor itself.

HOLMARC provides a simple and an excellent experimental set up to find the characteristics of both LED and Laser diode. Using our set up you can find,

(1) V-I characteristics of Laser diode and LED

(2) P-I characteristics of Laser diode and LED

(3) V-I and response characteristics of photo diode

HOLMARC's apparatus HO-ED-LOE-06 consists of,

- An optoelectronic source and measurement unit - works as a power supply (0-5V variable), an ammeter (0-200mA) & voltmeter.
- An optical rail along with a Laser mount and a cell mount.
- A specially designed Power meter to find the Power of the Laser beam as well as LED light.
- A 3mW laser with power supply and a polarizer to find the characteristics of a photo diode

LEDs are connected in forward bias arrangement with the optoelectronic source and measurement unit and voltage applied across LED is varied and corresponding current is measured and plot the V-I characteristics of LED.

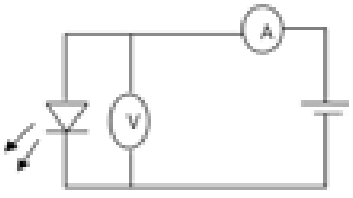
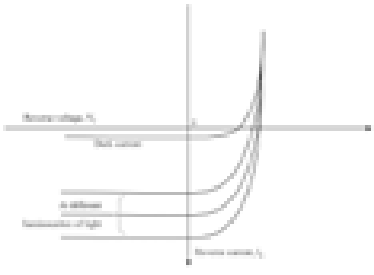
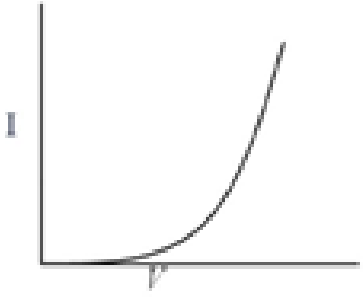


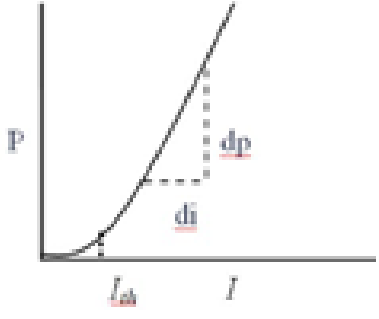
Figure (1)

Replace LED with Laser diode find the V-I characteristics. P-I characteristics of both Laser and LED can be found with the help of a power meter. External efficiency of the Laser diode depends on the slope dp / di.

To find the V-I characteristics of Photodiode, connect it in reverse bias, apply bias voltage and measure the corresponding current. Obtain Response characteristics of Photodiode by observing the variation of output current with respect to the polarizer angle. Experiment your electronic skills along with our apparatus...







Scope of Supply

Optical Rail
Model No. : ED-LOE-06-OR
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Polarizer Rotator with Mount
Model No. : ED-LOE-06-PRM
Material : Sheet Polarizer
Rotation : 360 degree
Resolution : 2 degree
Quantity : 1 No.



Mounted Opto-Electronic Detectors
Model No. : ED-LOE-06-MOED
1. Light emitting diode
2. Photo Diode
3. Laser Diode
Quantity : 2 Nos. Each



Diode Laser with Power supply (Red)
Model No. : ED-LOE-06-DLPR
Output Voltage
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-LOE-06-KLM
Material : Black anodized Aluminum Alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Detector Mount
Model No. : ED-LOE-06-DM
Material : Black anodized Aluminum alloy
Diameter : 30 mm
Quantity : 1 No.



Opto-Electronic Measurement Unit
Model No. : ED-LOE-OEMU
Output Voltage
Port 1 : 0 - 5 Volt Variable
Port 2 : 5 Volt fixed
Quantity : 1 No.



Optical Power Meter
Model No. HO-OPM-01A
Sensor Si photodiode
Wavelength range 400 nm to 1100 nm
Measuring ranges 20uW, 200uW 2mW & 20mW
Display Graphic LCD
Quantity 1 No.



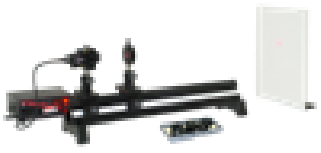


Diffraction



Screen Based Apparatus for Diffraction Experiments

Model: HO-ED-D-01



The apparatus Model No: HO-ED-D-01 is meant for studying diffraction when laser light passes through a diffracting element. The device consists of diode laser and diffracting element that can be conveniently fixed on carriages, which are mounted on the anodized aluminum rail. One carriage holds laser head and the other carriage holds a diffracting element like single slit, double slit, etc. which can be replaced as per requirement.
The laser mount is kinematic with two dimensional positioning freedoms. This helps to direct the laser beam to the required point on the diffracting element. All materials used for the construction of this apparatus are corrosion free. The diffraction pattern is projected on to a screen or wall for performing experiments. This elementary apparatus is simple, economical and is well suited for graduate level Physics courses. A diffraction element can be thought of as an optical component that has tiny grooves cut into it. The grooves are cut so small that their dimensions approach the wavelength of light.

Experiment Possible

- Diffraction of light by single slit
- Diffraction of light by double slit
- Diffraction of light by single wire
- Diffraction of light by cross wire
- Diffraction of light by wire mesh
- Diffraction of light by transmission grating
- Diffraction of light by circular aperture (Pinhole)

Optical Rail :

Model No.	:	ED-D-01-OR
Length	:	500 mm
Material	:	Aluminum alloy
Finish	:	Black anodized
Quantity	:	1 No.



Kinematic Laser Mount

Model No.	:	ED-D-01-KLM
Material	:	Aluminum alloy
Finish	:	Black anodized
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees



Cell Mount

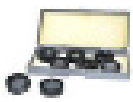
Model No.	:	ED-D-01-CM
Diameter	:	30mm

Diffraction Cells

Model No.	:	ED-D-01-DC
Single slit	:	100 & 200 micron
Double slit	:	50 & 100 micron Spacing between slits 250 micron

Diffraction Cells

Model No.	:	ED-D-01-DC
Single slit	:	100 & 200 micron
Double slit	:	50 & 100 micron Spacing between slits 250 micron
Transmission grating	:	8 lines / mm
Single wire	:	75 micron
Cross wire	:	75 micron
Wire mesh	:	15 lines / mm
Pinhole	:	400 micron



White Screen

Model No.	:	ED-D-01-WS
Material	:	Acrylic
Dimension	:	300x200mm
Quantity	:	1 No.

Diode Laser with Power Supply

Model No.	:	ED-D-01-DLPR
Wave length	:	655 nm
Optical	:	3 mW power
Quantity	:	1 No

Detector Based Apparatus for Diffraction Experiments

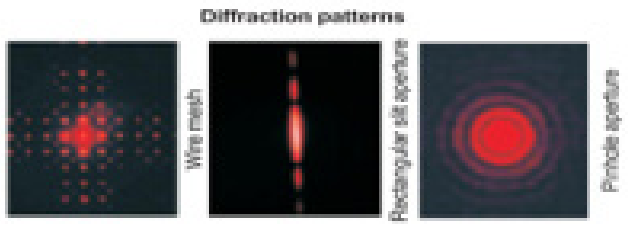
Model: HO-ED-D-02

This apparatus (Model No: HO-ED-D-02) is meant for graduate and post graduate level courses in physics. Here, the diffraction pattern is closely studied using a detector with translation stage. The device consists of 1.2 meter long optical rail along with carriages, optics and opto-mechanics. At one end of the rail, detector with translation stage is mounted and at the other end, laser is held on a kinematic mount. Linear scale attached to the rail makes length measurement easy and convenient. Both the laser head and detector stages are mounted on rail carriages with locks, which in turn can be mounted anywhere on the rail conveniently. This setup is for studying the diffraction pattern using detector. The device includes a diode laser of 650nm wavelength which provides a clean monochromatic light source. Diffraction pattern can be observed when a laser beam passes through various single and multiple slits. A number of diffraction slits and gratings are provided with this setup.

The intensity distribution of the diffraction pattern consists of a series of light and dark fringes with the intensity distribution symmetric along the central axis. The intensity pattern can be determined using a pin photo detector with fine adjustments. The complete set up is mounted on rail carriages with locks, which in turn can be mounted anywhere on the 1.2 meter long optical rail conveniently.

Features

- **High measurement accuracy, clear and sharp diffraction patterns**
- **Diffraction elements are fixed to metallic casing for ease of mounting**
- **Smooth switch on and long lifetime of light source**
- **Reliable and affordable**





Scope of Supply

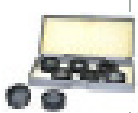
Optical Rail
Model No. : ED-D-02-OR
Length : 1200 mm
Material : Aluminum alloy
Finish : Black anodized
Quantity : 1 No.



Cell Mount
Model No. : ED-D-02-CM
Material : Aluminum alloy
Finish : Black anodized
Diameter : 30 mm
Quantity : 1 No.



Diffraction Cells
Model No. : ED-D-02-DC
Single slit : 100 & 200 Micron
Double Slit 50 & 100 micron
Space Between slits : 250micron
Transmission : 8 Lines per mm
Gratings
Single Wlre : 75 micron
Cross Wire : 75 Micron
Wire Mesh 15 Lines/mm
Pinhole : 400 micron



Accessories
User Manual

Kinematic Laser Mount
Model No. : ED-D-02-KLM
Material : Anodized Aluminum alloy
Adjustments : 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Detector Mount with linear translation stage
Model No. : ED-D-02-DMX
Material : Black anodized Aluminium alloy
Travel : Micrometer controlled
Resolution : 0.01 mm
Diamete : 30 mm
Quantity : 1 No.



Detector Output Measurement Unit
Model No. : ED-D-02-DOMU
Sensor Type : Photo Transistor
Display : 7 segment
Range : 3 ½ digit
0 - 199 milli/micro A



Diode Laser with Power supply (Red)
Model No. : ED-D-02-DLPR
Wave length : 655 nm
Optical power : 3 mW
Quantity : 1 No.



For more product informations, contact us : sales@holmarc.com

Single Slit Diffraction and Heisenberg's uncertainty principle

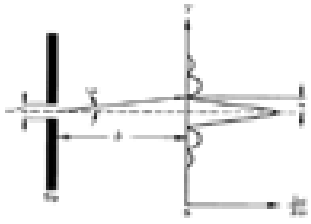
Model: HO-ED-D-02A

Holmarc's Apparatus Model HO-ED-D-02A is meant for the study of diffraction patterns of single slits and to confirm Heisenberg's uncertainty principle. Here, the diffraction pattern is closely studied using a detector mounted on a translation stage. The device consists of 1.2 meters long optical rail along with carriages and opto-mechanics. At one end of the rail, X-translation stage with detector is mounted and at the other end, laser is held on a kinematic mount. Linear scale attached to the rail makes length measurements easy and convenient. In this apparatus, diffraction experiments using single slits are carried out with a photo sensitive detector and diode laser is used as light source. The diffraction slit is placed at a certain distance from the detector and the pattern is allowed to fall on the detector stage. The micrometer driven stage is used to move the detector to extreme end of the diffraction pattern and the intensity is noted at close intervals by traversing the detector through the cross section of the spectrum. The intensity versus distance curve is plotted on a graph for calculations.



Experiment

- To observe the diffraction pattern and calculate the slit width



- To calculate the uncertainty of momentum from the diffraction patterns of single slits of differing widths and to confirm Heisenberg's uncertainty principle

Scope of Supply

Optical Rail
Model No. : ED-D-02A-OR
Length : 1200 mm
Material : Aluminum alloy
Finish : Black anodized
Quantity : 1 No.



Cell Mount
Model No. : ED-D-02A-CM
Material : Aluminum alloy
Finish : Black anodized
Diameter : 30 mm
Quantity : 1 No.



Diffraction Cells
Model No. : ED-D-02A-DC
Single slit : 50,100
150,200,250 Micron
Diameter : 30mm
Quantity : 1 No. each



Diode Laser with Power supply(Red)
Model No. ED-D-02A-DLPR
Wave length : 655 nm
Optical power : 3 mW
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-D-02A-KLM
Material : Anodized
Aluminum alloy
Adjustments : 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Detector Mount with linear translation stage
Model No. : ED-D-02A-DMX
Material : Black anodized
Aluminium alloy
Travel : Micrometer controlled
Resolution : 0.01 mm
Diamete : 30 mm
Quantity : 1 No.



Detector Output Measurement Unit
Model No. : ED-D-02A-DOMU
Sensor Type : Photo Transistor
Display : 7 segment
Range : 3 ½ digit, 0 - 199 milli / micro amperes
Quantity : 1 No.



Accessories : User Manual

Goniometer Based Apparatus for Diffraction

Model: HO-ED-D-02A

Goniometer Based Apparatus for diffraction experiments (Model No: HO-ED-D-03) is designed as a versatile instrument suitable for any optics laboratory. It is goniometer based construction allows the user to configure it for multitudes of applications. The apparatus can be used for studying both reflecting and transmitting type diffracting elements. Unlike conventional spectrometer goniometers, all modules in this device are open, simple and easy to assimilate. This feature gives student's better understanding. The apparatus can also be used for many other applications like measurement of prism angles, refraction angle etc., where spectrometer goniometers are generally used. All components are made from corrosion free laboratory grade materials. Optical components are made of research quality N-BK 7 optical glass. This apparatus consists of a goniometer for measuring diffraction angle directly and a precision adjustable slit through which light passes before falling on the diffracting element. The function of goniometer and positioning stage is to establish and control the geometric relationship between the incident beam, diffraction cell and telescope. The goniometer is also the supporting base to many components, such as the optics, diffraction cell stage, telescope and so on. The equipment is specifically suited for studying elements with considerably greater diffraction angles, like holographic gratings. As the readings are taken through an eyepiece with cross wire, precise results are achieved.

Experiment

- Diffraction of light by single slit. double slit, single wire, cross wire, wire mesh, Diffraction of light by grating



Scope of Supply

Goniometer
Model No. : ED-D-03-G
Resolution of prism table : 10 arc min
Quantity : 1 No.



Optical Rail
Model No. : ED-D-03-OR
Length : 500 mm
Material : Aluminum alloy
Finish : Black anodized
Quantity : 1 No.



Diffraction Cells
Model No. : ED-D-02A-DC
Single slit : 100 & 200 Micron
Double Slit : 50&100 micron
Space Between Slit : 250 micron
Transmission Grating : 8 Lines Per mm
Single Wire : 75 micron
Cross wire : 75 micron
Pin Hole : 400 micron



Cell Mount
Model No. : ED-D-03-CM
Material : Aluminium alloy
Finish : Black anodized
Diameter : 30 mm
Quantity : 1 No.



Slit with Mount
Model No. : ED-D-03-SM
Controlling : Lead screw
Slit Size : 0 - 3 mm
Quantity : 1 No.



Collimating Lens with Mount
Model No. : ED-D-03-CLM
Focal length : 202 mm
Diameter : 50 mm
Quantity : 1 No.



Telescope
Model No. : ED-D-03-T
Magnification : 10 X
Quantity : 1 No.



High Bright LED (Green) with Power Supply
Model No. : HO-LH-LG-01
LED power : 0-3W
Wavelength : 532nm
Quantity : 1 No.



Accessories
User Manual



Because of continuous product improvement, the various data listed are subjected to change without notice. Please confirm before ordering

Apparatus for Studying Diffraction from Reflection Grating

Model: HO-ED-D-04

This device is specifically designed for studying reflection gratings. It consists of a laser head mounted on a kinematic holder and a grating mount with angular adjustments. The grating can be fixed at appropriate angles using this mount. Fine adjustments in grazing or incident angle can be done using kinematic tuning of the laser mount.

Both the laser and grating mounts are fixed on rail carriers, which are held on a graduated solid aluminum rail. The diffraction pattern is projected on a screen or wall. When a meter scale is used as reflection grating, the pattern can be observed typically at two to three meters.
Compact Disc and the meter scale consists of a series of evenly spaced (reflective) grooves and ridges that act as a diffraction grating. The grooves in a compact disc are very close together. CD and the millimeter scale are reflective and therefore the diffraction pattern can be observed by looking at the reflected pattern. The spectrum of colors can be seen reflected from a compact disc. The closely-spaced tracks on the surface of the disc form a diffraction grating, and the individual wavelengths of white light are diffracted at different angles from it.

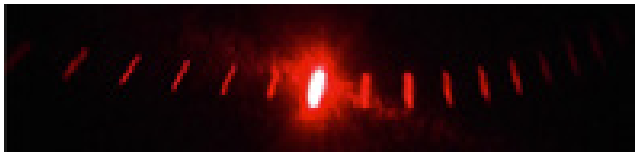


Fig. Intensity of Light Transmitted through Large number of Slits. Only the principal maxima remains very bright and very narrow lines

Application

- Spectroscopy: Analyzing materials based on their spectral signatures.
- Telecommunications : Multiplexing signals in fiber-optic systems.
- Laser Systems : Tuning and stabilizing laser wavelengths.
- Holography : Creating three-dimensional images.
- Biomedical Imaging: Analyzing light emitted or scattered from biological samples.
- Optical filters : Selectively transmitting or reflecting certain wavelengths or reflecting certain wavelengths of light.
- Solar Energy : Spectrum splitting and concentration for energy conversion.

Features

- **Sharp, clearly visible diffraction pattern**
- **Simple, economical and relatively compact**
- **Specimen holder provides angular and height adjustment**
- **Fine adjustments in grazing angle can be done using kinematic laser mount**

Experiment Examples

- **To measure the wavelength of laser light using a millimeter scale as grating**

Wavelength (λ) is given by
$\lambda = [(Y^2_m - Y^2_0)d]/2Z^2_0 m$
Where d is the spacing of the engraving on the scale

- **To find the groove spacing of CD**

The equation for the groove separation distance d is given by,
$d = n \lambda / \sin \theta$
Where n is the order of the bright spot in the pattern, λ is the wavelength of light used and θ is the angle of diffraction.

Scope of Supply

Optical Rail
Model No. : ED-D-04-OR
Length : 500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Specimen Holder with Mount
Model No. : ED-D-04-SHM
Cavity Thickness : 3 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Diode Laser with Power supply (Red)
Model No. : ED-D-04-DLPR
Wave length : 650 nm
Optical power : 3 Mw
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-D-04-KLM
Material : Black anodized Aluminum Alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Reflection Gratings
Model No. : ED-D-04-RG
Types : Meter Scale, CD
Quantity : 1 No. each.



Accessories
User Manual



Apparatus for Determination of Particle Size

Model: HO-ED-D-05

Holmarc's Apparatus for Determination of Particle size (Model No: HO-ED-D-05) is a simple instrument. When laser light passes through the particles, diffraction occurs and pattern is observed on a screen or wall at a distance. Kinematic adjustment of the laser head can be used to direct laser beam to the required spot on the glass slide with particle.

The device consists of a diode laser held on a kinematic mount and a glass slide fixed on the slide holder. The particles, of which diameters are to be determined are sprinkled on the glass slide.

Both the laser and slide holder are fixed on rail carriers which are held on a graduated solid aluminum rail. Particle size influences many properties of particulate materials and is a valuable indicator of quality and performance. The size and shape of powders influences its diffraction characteristics. The diffraction pattern of larger particles will have less distance between the first dark ring and the central maximum than that of smaller ones. There are several industrial and research applications where measurement of particle size is important.

The laser diffraction technique is based on the fact that the spatial distribution of scattered light is a function of the particle size of the sample

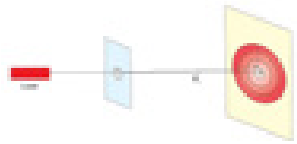
Experiment Possible

To determine particle size of lycopodium using laser beam diffraction

The diffraction equation is,

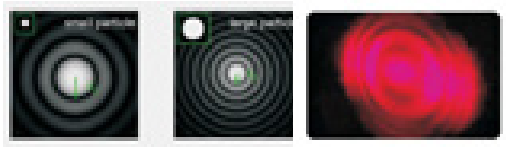
$D = 1.22 \, l \, \lambda \, / \, \text{Sin} \, \theta$

Where D is the size of the particle, l is the distance between the particle and the screen, λ is the wavelength of light used and θ is the angle of diffraction.



Diffraction Patterns of Small and Large Particles





Scope of Supply

Optical Rail

Model No.	:	ED-D-05-OR
Length	:	500 mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Specimen Holder with Mount

Model No.	:	ED-D-05-SHM
Cavity	:	3 mm Thickness
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Accessories

User Manual Sample powder

Kinematic Laser Mount

Model No.	:	ED-D-05-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



Glass Slide

Model No.	:	ED-D-05-GS
Material	:	Float
Quantity	:	5 Nos.



Diode Laser with Power supply (Red)

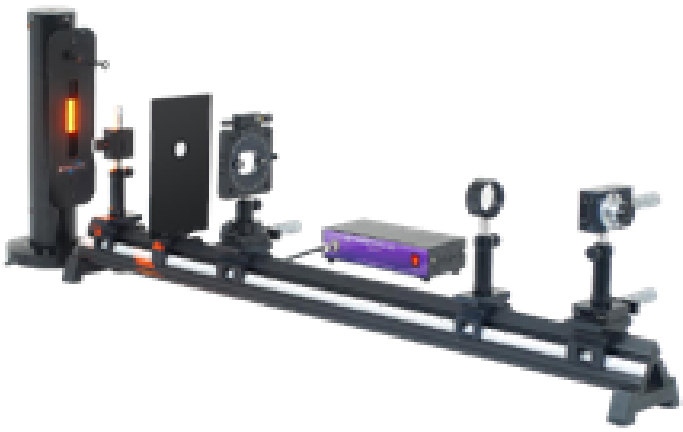
Model No.	:	ED-D-05-DLPR
Wave length	:	650 nm
Optical	:	3 mW power
Quantity	:	1 No.



Fresnel's Biprism Diffraction Apparatus

Model: HO-ED-D-07

Holmarc's Fresnel's biprism diffraction Apparatus (Model No: HO-ED-D-07) is an instrument that demonstrates how Fresnel's Bi prism can be used to obtain fringes due to interference and to calculate the wavelength of monochromatic light. Bi-prism produces interference pattern from a single source due to the creation of two virtual coherent sources as the light passes through the prism.
The apparatus consists of an optical rail on which components are mounted using posts, post holders and movable carriages. For setting up the experiment, the slit, eye piece and the biprism are adjusted so as to obtain well defined bright and dark fringes. Sodium vapour lamp is used as light source. All components are made out of anodized aluminum and stainless steel to avoid corrosion.
Fresnel's biprism consist of two prisms of very small angles joined base to base. In practice, a thin glass plate is taken and one of its faces is ground and polished till a prism is formed with an obtuse angle of about 179° and two side angles of the order 30 arc minutes. If a diverging beam of light strikes the edge of the biprism, two diverging coherent light beams are created which appear to emerge from two virtual slits and interfere on the far side of the biprism. Students gain knowledge of the general setup of the Fresnel experiment and the interference patterns. Research quality modules of the instrument can be used for project works as well.

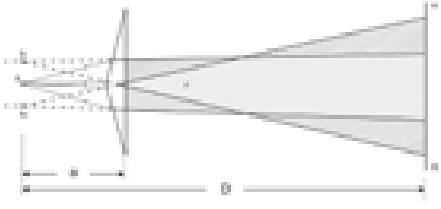


Features

- **Compact and integrated design**
- **Sodium vapor lamp as light source with light output port adjustable in length**
- **Precision lead screw driven slit provided with a maximum opening of 3mm**
- **Eyepiece with micrometer drive for achieving perfect linear motion**
- **Precision rotary coarse and fine adjustments with lead screw controller in biprism mount**
- **Achromatic lens is used for focusing image**

Experiment Examples

- **To find the wavelength of the sodium light using bi-prism diffraction experiment**



Wavelength is given by

$\lambda = \beta d/D$

where, d is the distance between the two virtual sources S1 and S2, D is the distance between slit and the screen and β is the fringe width.

Scope of Supply

Optical Rail
Model No. : ED-D-07-OR
Length : 1500 mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



Bi Prism Mount
Model No. : ED-D-07-BM
Controlling : Lead screw
Dial movement : 360 degree
Course : 10 degree
Fine
Quantity 1 No.



Eye Piece with Micrometer Drive
Model No. : ED-D-07-EPM
No. of Micrometers : 2
Least Count : 0.01 mm
Quantity 1 No.



Bi Prism :
Model No. : ED-D-07-BP
Material : Borofloat
Quantity 1 No.



Slit with Mount
Model No. : ED-D-07-SM
Controlling : Lead screw
Slit Size : 0 - 3mm
Quantity : 1 No.



Achromatic Lens with Mount
Model No. : ED-D-07-ALM
Focal length : 202 mm
Diameter : 40 mm
Quantity : 1 No.



Screen with Mount
Model No. : ED-D-07-SM
Material : Acrylic
Size : 200 x 150 mm
Quantity : 1 No.



Sodium vapor lamp with Power Supply
Model No. : ED-D-07-SLPS
Output : 35 W Power
Quantity : 1 No.



Accessories
User Manual,

Optics



Liquid Lens Apparatus

Model: HO-ED-O-01

Holmarc's Liquid Lens Apparatus (Model No: HO-ED-O-01) is designed for the determination of refractive index of a given liquid. With its new design and features, one can easily understand the principles and practices involved.

The theory behind the liquid lens is based on the properties of one or more liquids to create magnifications within a small amount of space. The focus of a liquid lens is controlled by the surface of the liquid. The surface profile of the liquid determines the focal length of liquid lens system and how the liquid lens focuses light rays.

This apparatus consists of graduated vertical post with rigid base along with a light source and required optics. A pointer illuminated with LED is mounted on the vertical post. The illumination helps to conduct the experiment even in low light conditions. The pointer is free to move along the axis of the vertical post and can be easily clamped at desired positions. The liquid lens arrangement is kept on a rigid base. The pointer is raised or lowered till the tip of its image coincides with the tip of the pointer without parallax. The distances of the pointer from the top and bottom of the lens are measured. The experimental setup includes three convex lenses of different focal lengths and a plane mirror. A petri dish carrying liquid is also included in this setup..

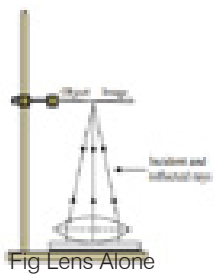


Fig Lens Alone

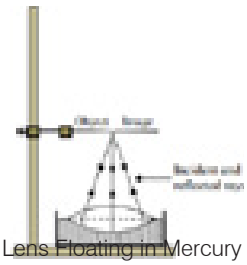


Fig Lens Floating in Mercury

Scope of Supply

Retort Stand with Rigid Base

Model No.	:	ED-O-01-RSRB
Material	:	Mild Steel Rod
Scale	:	0 - 500 mm Vertical
Quantity	:	1 No.



Petri Dish

Model No	:	ED-O-01-PD
Material	:	Teflon
Maximum Optics cavity	:	50 mm
Quantity	:	1 No.



Bi - Convex Lens

Model No.	:	ED-O-01-BCL
Material	:	N-BK7
Diameter	:	50 mm
Focal Length	:	100, 200, 300 mm
Quantity	:	1 No. each



Pointer Holder with Carriage

Model No.	:	ED-O-01-PHC
Pinter Material	:	MS Rod
Length	:	3 cm
Holder Material	:	Black anodized Aluminium alloy
Quantity	:	1 No.



Back Coated Plane Mirror

Model No.	:	ED-O-01-BCPM
Material	:	Float
Thickness	:	6 mm
Quantity	:	1 No.



LED with Power supply

Model No.	:	ED-O-01-LEDP
Quantity	:	1 No.



Mercury Sample Bottle

Density	:	13.6 g/cm^3
Quantity	:	1 No.

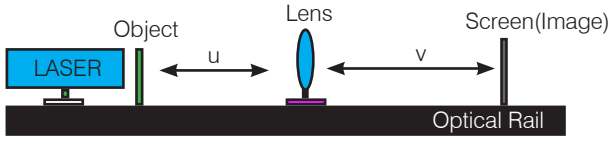
Geometrical Optics Experiment Apparatus

Model: HO-ED-O-02

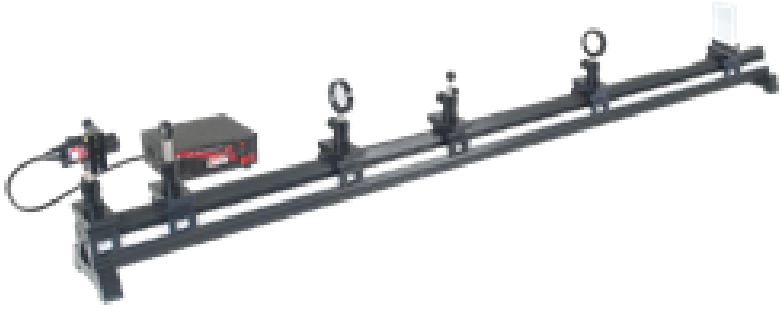
Holmarc's Geometrical Optics Experiment Apparatus (Model No. HO-ED-O-02) is developed for general physics education in universities and colleges. The compact and fully integrated design makes Holmarc's Geometrical Optics Experiment Apparatus an ultimate tool to study the basics of optics.

It includes 1500mm long graduated optical bench with carriers. The optical components such as lenses, mirrors, etc. are fixed to the carriers using suitable mounts so that these can be fixed anywhere on the rail.

Students can easily adjust positions of optical devices using the sliding carriers. All the accessories are easy to be mounted and adjusted. The apparatus includes set of lenses, concave and convex mirrors, light sources like laser, LED etc. The use of diode laser as light source makes the ray path visible and helps students to assimilate the basics easily.

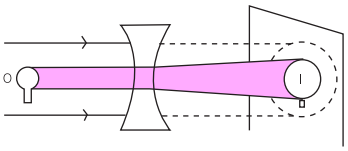


Focal length of a convex lens using parallel beam method

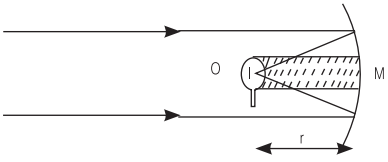


Experiment Possible

- **To measure the focal length of convex lens, concave lens, convex mirror and concave mirror.**

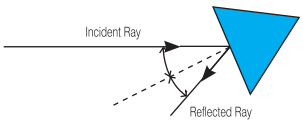


Focal length of a Concave Lens using parallel beam method

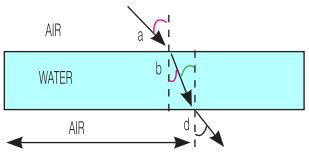


Focal length of a concave mirror using parallel beam method

- **To verify inverse square law.**
- **To verify law of reflection.**



- **To verify law of refraction and to find the refractive index of water.**



- **To construct laser beam expander.**
- **To construct collimator.**
- **To construct simple and compound microscopes.**

Scope of Supply

Goniometer with Detector Mount
Model No. : ED-O-02-GDM
Material : Aluminum alloy
Finish : Black anodized
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-O-02-KLM
Material : Anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Hollow Screen with Mount
Model No. : ED-O-02-HSM
Quantity : 1 No.



Microscope Assembly with Mount
Model No. : ED-O-02-MAM
Length : 10 X
Quantity : 1 No.



Divergence Lens with Mount
Model No. : ED-O-02-DLM
Material : Borofloat
Diameter : 15 mm
Focal length : 18 mm
Quantity : 1 No.



Plano Concave Lens with Mount
Model No. : ED-O-02-CCLM
Material : Borofloat
Diameter : 40 mm
Focal Length : 150 mm, 300 mm
Quantity : 1 No. each



Concave Mirror with Mount
Model No. : ED-O-02-CCMM
Material : Borofloat
Diameter : 40 mm
Focal Length : 150 mm, 300 mm
Quantity : 1 No. each



Detector Output Measurement Unit
Model No. : ED-O-02-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli amperes
Quantity : 1 No.



Diode Laser with Power supply
Model No. : ED-O-02-DLPR
Wave length : 650 nm
Optical power : 5 Mw
Colour : Red
Quantity : 1 No.



Optical Rail
Model No. : ED-O-02-OR
Length : 1500 mm
Material : Aluminum alloy
Finish : Black anodized
Quantity : 1 No.



White Screen with Mount
Model No. : ED-O-02-WSM
Quantity : 1 No.



Wire gauze with Mount
Model No. : ED-O-02-WGM
Quantity : 1 No.



Spatial Filter Assembly
Model No. : ED-O-02-SFA
Objective Magnification : 10 X
Positioning : Lead screw
Quantity : 1 No.



Obstacle with Mount
Model No. : ED-O-02-OM
Diameter : 10 mm
Quantity : 1 No.



Plano Convex Lens with Mount
Model No. : ED-O-02-CXLM
Material : Borofloat
Diameter : 40 mm
Focal Length : 150 mm, 300 mm
Quantity : 1 No. each



Convex Mirror with Mount
Model No. : ED-O-02-CXMM
Material : Borofloat
Diameter : 40 mm
Focal Length : 150 mm, 300 mm
Quantity : 1 No. each



Glass Tank
Model No. : ED-O-02-GT
Material : Acrylic
Dimension : 50 x 50 x 50 mm
Quantity : 1 No.



LED with Variable Power supply
Model No. : ED-O-02-LEDP
Output Power : 0 - 1 Watt (Variable)
Colour : White
Quantity : 1 No.



Accessories
Allen Key
User Manual



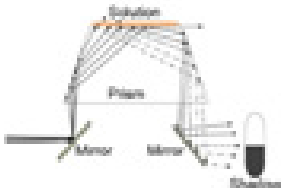
Connect with our engineers and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service:

Refractometer

Model: HO-ED-O-03

A refractometer device used for the measuring the refractive index of samples using the concepts of critical angle and total internal reflection. Holmarc's Refractometer (Model No: HO-ED-O-03) is an experimental model designed for understanding the basics of refractometry.





Bright LED light is used here. Fine adjustments in grazing or incident angle can be done using kinematic tuning of the LED mount. The lenses and dove prism are fixed on rail carriers which are held on graduated solid aluminum rail. All the mounts are made of anodized aluminum and can be mounted easily on the optical rail.

The figure illustrates the working principle of a refractometer: Light is directed to the interface between the prism and the solution. The light rays meet the interface at different angles. Some of these angles are larger than the critical angle of the interface so that the light is totally reflected. For angles of incidence smaller than the critical angle, light is partially transmitted (i.e. lost). Thus a shadow (less luminescence) is created on the screen. The position of the shadow indicates the magnitude of the critical angle.

Features

- **Refractive index measurement is easy**
- **Compact and precision design**
- **High performance LED light source of optical wavelength 589nm**
- **Precise optics minimize aberrations**
- **Can observe clear and sharp shadow line**
- **Mounts and rail with black anodized finish**

Experiment Possible

- To find the refractive index of an unknown solution.

Scope of Supply

Optical Rail

Model No.	:	ED-O-03-OR
Length	:	750 mm
Material	:	Anodized Aluminium
Quantity	:	1 No.



White Screen with Mount

Model No.	:	ED-O-03-WSM
Material	:	Acrylic
Size	:	100mmx75mmx3mm
Quantity	:	2 Nos.



Plano Convex Lens with Mount

Model No.	:	ED-O-03-PCLMP
Material	:	N-BK7
Diameter	:	25 mm
Focal Length	:	40 mm
Quantity	:	1 No.



Kinematic LED Mount

Model No.	:	ED-O-03-KLM
Material	:	Aluminum alloy
Finish	:	Black anodized
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



Accessories
User Manual

Dove Prism with Mount

Model No.	:	ED-O-03-DPM
Material	:	F2 or equivalent H-ZF3 or equivalent
Effective Aperture		90 %
Surface Quality	:	40 - 20 (scratch-dig)
Dimensional Tolerance	:	+ 0.0, -0.2 mm
Angle tolerance	:	+/- 3 arc min
Surface flatness	:	λ / 4 @ 632.8 nm
Perpendicularity	:	+/- 3 arc min
Quantity	:	1 No. each



Biconvex Convex Lens with Mount

Model No.	:	ED-O-03-BCLM
Material	:	N-BK7
Diameter	:	25 mm
Focal Length	:	100 mm
Quantity	:	1 No.



LED with Variable Power supply

Model No.	:	ED-O-03-LEDP
Power	:	0 - 3 W (Variable)
Wavelength	:	589 nm
Colour	:	White
Quantity		1 No.



Screen with circular aperture

Material	:	Acrylic
Size		30mm X17mm
Aperture size	:	20 mm
Quantity	:	1 No.



Mechanics



Contact Angle Meter

Model: HO-IAD-CAM-01



Holmarc's Contact Angle Meter (Model No: HO-ED-M-01) is a compact and cost effective CMOS based instrument for measuring contact angles of liquids over substrates. Contact angle is the angle formed by a liquid at the phase boundary where a liquid, gas and solid intersect. The shape of the drop is controlled by three forces of interfacial tension. The shape of a liquid droplet on a flat horizontal solid surface is determined by the Young-Laplace equation. Image Analysis software is used for measurement and further calculations.
The instrument makes use of a CMOS sensor to form the image of the droplet. The CMOS sensor inputs images and live video to a computer for further analysis. Manual dispensing syringe pump is used for liquid dispensing. The CMOS sensor and imaging optical assembly are mounted on a translation stage for fine adjustment of image position on the sensor. The dispensing system which consists of a syringe along with linear stage is held on a vertical translator for initial setting of the distance of the needle from the solid surface. Back light is provided by bright LED. The illumination intensity of the back light LED can be controlled.

Specifications

Measuring method	:	Sessile drop method
Analysis method	:	Dropsnake analysis which is based on B-spline snakes (active contours) to shape the drop. Software can be used for measuring contact angles of both symmetrical and asymmetrical drops.
Optics	:	High performance aberration corrected imaging lens with precise manual focus adjustment.
Video system	:	High performance CMOS Sensor. 3m shielded USB cable included.
Lighting	:	LED based diffused lighting mechanism. Light intensity can be varied.
Dispenser	:	Mechanical dispenser. 50,100 & 250 micro liter syringes provided with the system.
Dimension	:	500 x 400 x 498 mm
Power supply	:	230VAC, 50 Hz.
Other specifications	:	+/- 180 degree rotation provided for the sample holder. 75mm XY travel provided for the CMOS - optics assembly.

Experiment Possible

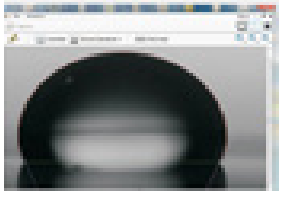
- **To measure the contact angle of liquids over various solids.**

If H represents the protruding height of droplet and D the diameter of the len, then the contact angle θ is defined by geometry as,

θ = 2 arc tan (2H / D)

This is the angle formed by a tangent to the droplet at the point the liquid surface meets the supporting block.





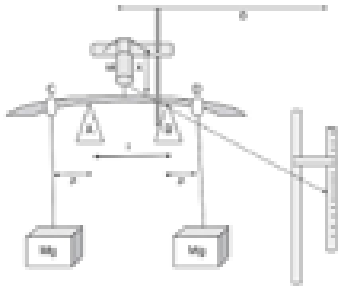
Young's Modulus Apparatus

Model: HO-ED-M-02

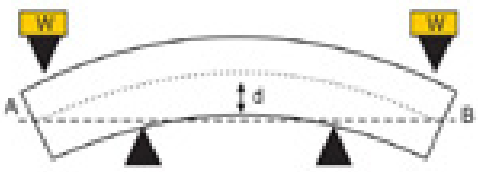
Holmarc's Young's modulus apparatus (Model No: HO-ED-M-02) is used to measure the Young's modulus of a bar. Young's modulus is a measure of stiffness of an elastic material and is a quantity used to characterize materials. It can vary considerably depending on the exact composition of the material. If the beam is loaded at its mid-point, the depression produced will not form an arc of a circle. This type of bending is called non-uniform bending. If the beam is loaded at both ends, the elevation produced will form an arc of a circle. This type of bending is called uniform bending. Two methods are used to measure Young's modulus of the bar in both uniform and non-uniform bending. They are Pin and Microscope method and Optic lever method.





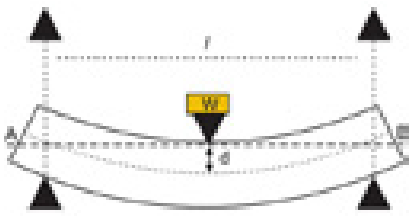


Uniform Bending



In uniform bending, the bar is placed symmetrically on two knife edges. Two weight hangers are suspended at equal distance from the knife edges. Weights are add one by one and corresponding readings are taken. From these readings, the mean elevation (e) of the midpoint of the bar for a given mass is determined.

Non uniform bending



In non uniform bending, the beam (meter scale) is supported symmetrically on two knife edges and loaded at its centre. The maximum depression is produced at its centre. Since the load is applied only at a point of the beam, this bending is not uniform through out the beam and the bending of the beam is called non-uniform bending.



Experiment Possible

- **To find the Young's modulus of the material of a bar by uniform and non uniform bending using,**

1. Pin and microscope method

1. Non uniform bending



Consider a bar of thickness d and breadth b is supported symmetrically between two knife edges at a distance l distance apart and loaded with a weight Mg at the center.

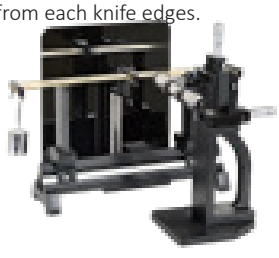
The depression at the midpoint is given by,
$Z = Mgl^3 / 48\ Y\ (bd^3 / 12)$

The Young's Modulus of the material of the bar
$Y = Mg\ (l^3 / z) / 4bd^3$

For a constant mass M, the quantity l^3/z is a constant from which Y can be calculated.

2. Uniform bending

Consider a bar of thickness d and breadth b is supported symmetrically between two knife edges at a distance l distance apart and loaded with equal weights Mg at the ends at equal distance p from each knife edges.





The elevation at the midpoint is given by,
$Z = Mgpl^2 / 8Y\ (bd^3 / 12)$

The Young's Modulus of the material of the bar

$Y = 3\ Mgpl^2 / 2bd^3z$

2. Optic Lever Method

1. Non uniform bending



According to the theory of non uniform bending, for a bar of thickness d and breadth b ; supported by two knife edges l distance apart, the depression at the midpoint due to a load M is given by,
$Z = Mgl^3 / 48\ Y\ (bd^3 / 12)$
The Young's Modulus of the material of the bar
$Y = Mg\ (l^3 / z) / 4bd^3$
If the optical lever, scale and laser arrangement are used for measuring the depression, the angle of twist of optic lever
$\Theta = z / x$
Where x is the perpendicular distance to the legs of the optical lever
If y to the shift on the scale arranged at a distance D from the laser of the optical lever then
$\Theta = y / 2D \quad Z = xy / 2D$
Thus, $Y = Mg / 2bd^3x\ (Dl^3 / y)$
For a mass M, the quantity Dl^3/y is a constant.

2. Uniform bending



Consider a bar of thickness d and breadth b is supported symmetrically between two knife edges at a distance l distance apart and loaded with equal weights Mg at the ends at equal distance p from each knife edges. The elevation at the midpoint is given by,
$Z = Mgpl^2 / 8Y\ (bd^3 / 12)$
The Young's Modulus of the material of the bar
$Y = 3Mg\ pl^2 / 2bd^3z$
If the optical lever, scale and laser arrangement are used for measuring the depression, the angle of twist of optic lever
$\Theta = z / x$, Where x is the perpendicular distance to the legs of the optical lever
If y to the shift on the scale arranged at a distance D from the laser of the optical lever then, $\Theta = y / 2D \quad Z = xy / 2D$
Thus, $Y = 3Mgpl^2 / bd^3xy$)

Scope of Supply

Young's Modulus Test Bench



Model No.	:	ED-M-02-YMTB
Material	:	Black Anodized Aluminum alloy
Quantity	:	1 No.

Weight Hangers with Weights



Model No.	:	ED-M-02-WHW
Material	:	Brass
Weights	:	100 gm & 50 gm
Quantity	:	1 Sets each

Laser Line Generator with Power supply



Model No.	:	ED-M-02-LLGP
Wave length	:	650 nm
Optical power	:	3 mW
Quantity	:	1 No.

Traveling Microscope



Model No.	:	ED-M-02-TM
Magnification	:	10 X
Micrometer travel	:	25 mm
Least Count	:	0.01 mm
Quantity	:	1 No.

Meter Scale with Rigid Base



Model No.	:	ED-M-02-MSRB
Length	:	1000 mm
Least Count	:	1 mm
Quantity	:	1 No.

Sample Test Plates



Model No.	:	ED-M-02-STP
Material	:	Brass, Aluminium Stainless steel, PMMA
Dimension	:	500 x 50 x 2 mm
Quantity	:	1 No. each

Lee's Disc Apparatus

Model: HO-AE-LD18

Holmarc's Lee's Disc Apparatus is designed for the measurement of thermal conductivity in bad conductors. Thermal conductivity is the property of a material that indicates its ability to conduct heat. Conduction takes place if there exists a temperature gradient in a solid (or stationary fluid) medium.

Lee's Disc Apparatus comprises of a brass disc resting on another slab of the same dimension with special heating coil. Both metallic discs have radial holes for inserting the sensitive thermistors. Material under test is placed in between two discs. The heater is turned on and the apparatus is left idle until the temperature gets stabilized. At this point the heat energy passing through the heat sample will be exactly equal to the heat flowing out of the lower block.

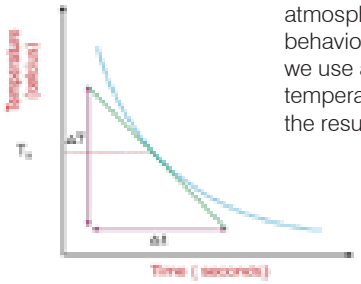
Maximum temperature the disc can achieve during the experiment is around 50 degree Celsius to make it safe for handling with even bare hands. Similarly, operating voltage for heating coil sandwiched between the discs is fixed as 50 V for safety. The temperature sensors used are highly sensitive and accurate with least count as low as 0.2 degree Celsius. Front panel is equipped with digital display and keyboard for user friendly operation. This instrument provides the facility for performing experiments using different kinds of sample materials. The front panel includes LCD display and keyboard for readouts and settings. Readings can be taken and controlling can be done directly from the LCD display at the front panel of the apparatus. There are three operation modes for this Equipment - Manual mode, Auto mode and PC mode. In manual mode, the user can calculate thermal conductivity using the acquired data manually. In auto mode, the user can retrieve result directly from the system once the temperature stabilized. In PC mode, one can monitor progress of the experiment through a computer and can calculate thermal conductivity with the help of Holmarc's software. This diversity of usage makes the equipment user friendly.

Thermal conductivity,

$k = (Mc\,dT/dt) / (\pi r^2 (T_2 - T_3)) \times (r + 2h)\,d / 2(r + h)$ W / mK^{-1}

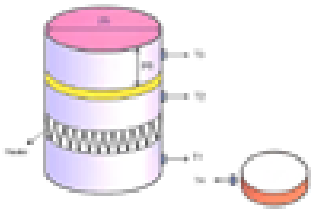
Where,

M = Mass of the metallic disc
c = Specific heat capacity of the metallic disc
h = Height of the metallic disc
r = Radius of the metallic disc
dT / dt = Rate of cooling of the metallic disc at T2
d = Thickness of the sample
$T_2 - T_3$ = Steady temperatures recorded at T_2 and T_3 respectively



Experiments Possible

- **To determine thermal conductivity of bad conductors (Glass, Nylon, Plywood, etc.) in the form of a disc using Lee's method.**



Experimental setup for Lee's Disc steady-state thermal conductivity measurement

Four discs are used in this apparatus for much more accurate results. D1 and D2 are heating discs. D3 is the Lee's disc and D4 is for measuring the brass atmospheric temperature behaviour. In Auto mode, we use all these 4 disc temperature data for finding the result.

Scope of Supply

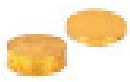
Lees Disc Control Unit

Model No.	:	HO-AE-LD18-LDCU
Input	:	230V 5Amp AC
Quantity	:	1 No.



Brass Disc

Model No.	:	HO-AE-LD18-BD
Material	:	Cartridge Brass
Diameter	:	76.2 mm
Height	:	23mm (Block, B1) 8 mm (Block B4)
Quantity	:	1 No. each



Accessories

RS 232 PC cable and connector,
Heat Sink Compound, User Manual, software CD

Heating Unit with Disc

Model No.	:	HO-AE-LD18-HUD
Operating Voltage	:	50 V
Quantity	:	1 No.



AC Power Cord

Model No.	:	HO-AE-LD18-APC
Type	:	3 core 3 Pin
Quantity	:	1 No.

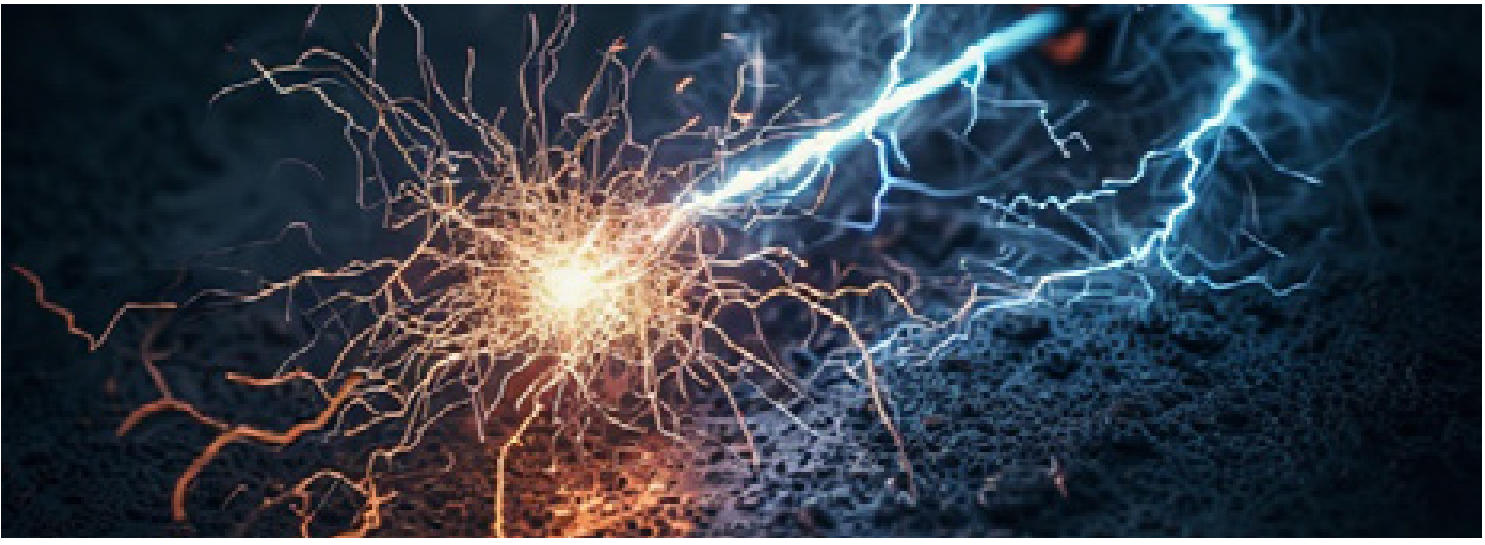


Test Samples

Model No.	:	HO-AE-LD18-TS
Material	:	Borofloat glass Teflon, Nylon
Quantity	:	1 No. each



Electricity and Magnetism



Millikan's Oil Drop Apparatus

Model: HO-ED-EM-01

Holmarc's Millikan oil drop apparatus (Model No: HO-ED-EM-01) is modernized version of classic set-up used to find out electron charge. The apparatus makes use of camera along with computer screen for convenient viewing of oil droplet. Measurements of the droplets are also taken from display screen using a software module. Control of high voltage power supply across the electrode is made easy by having a digital display on the front panel. The apparatus consists of two horizontal metal discs placed 10mm apart in a closed chamber. Non-volatile oils are used for the experiment. A bright LED is used for illuminating the droplets inside the chamber in order to get a clear view. The significant difference in our setup is in the imaging system used for the observation of droplet movement. We use USB 2.0 camera which can be directly connected to the PC to monitor the droplet movement and can measure the velocity of the droplet with the help of Holmarc's dedicated software. This makes the measurements much easier and eliminates the need for conventional telescope and stopwatch system. A variable power supply of 0-2KV is used for conducting the experiment. The temperature inside the drop viewing chamber can be monitored through the front panel display system.

Specification

Power supply	:	230V AC, 50 Hz
Operating voltage	:	0 - 2 KV
Video system	:	High performance Camera sensor
Camera lens magnification	:	30 X
Lighting	:	High bright LED lighting
Dimension	:	590 x 490 x 760 mm

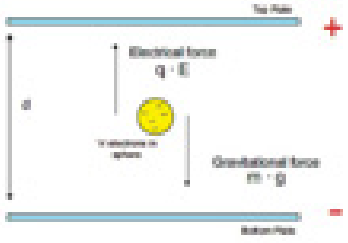
Experiments Possible

- **To determine the charge of an electron by Millikan's Oil Drop Method**

Charge of an electron can be obtained from this relation,

$q = ((V2 / V1) + 1) [(4 / 3 \pi r3) (\rho - \rho air) g d] / V$

V1 - Terminal Velocity
V2 - New Terminal Velocity
r - Radius of the Drop
ρ - Density of Liquid
ρ_{air} - Density of Air
g_{air} - Acceleration due to Gravity
d - Distance between the Plates V - potential Difference



Scope of Supply

Oil drop Control Unit
Model No. : ED-EM-01-OCU
Chamber Voltage : 0-2 KV
Quantity : 1 No.



Top Charging Plate
Model No. : ED-EM-01-TCP
Material : Brass
Quantity : 1 No.



Camera Lens Assembly
Model No. : ED-EM-01-CLA
Magnification : 30 X
Quantity : 1 No.



Atomizer
Model No. : ED-EM-01-AM
Quantity : 1 No.



Droplet Chamber
Model No. : ED-EM-01-DC
Quantity : 1 No



Camera
Model No. : ED-EM-01-CCDC
Connectivity : USB 2.0
Quantity : 1 No.



LED Illumination Unit
Model No. : ED-EM-01-LIU
Wave length : 589 nm
Optical power : 1W
Quantity : 1 No.



Accessories
Measuring Scale
Focusing Needle
Netbook PC (Optional)
Sample Liquid
User Manual
Software











Features

- High resolution camera delivers clear view of oil droplet
- Holmarc's user friendly software helps to monitor and measure the parameters of droplet movement
- Light can be controlled to illuminate the droplets inside the chamber
- Atomizer helps to spray tiny oil droplets

Apparatus for the Study of Photo Electric Effect (Plank's Constant)

Model: HO-ED-EM-02

Holmarc's Photo Electric Apparatus (Model No: HO-ED-EM-02) is an instrument for studying the Photo Electric Effect and to obtain the Planck's constant.

A halogen source provides light energy to the photo tube. A filter wheel is placed in between the light source and photo tube to select different wavelengths. The filter wheel includes five narrow band interference filters to get the precise wavelength. A vacuum photo tube is kept inside the tube housing. This tube has very low anode dark current to achieve better results. The microprocessor controlled electronic interface gives the current and voltage readouts. The regulated power supply has 0 - 2V variable voltage to provide the stopping potential for electrodes. The ammeter gives accurate current output measurement facility. Toggle switch is provided to change the current range. The lamp house, filter wheel and photo tube housing are placed on an optical rail.

Scope of supply

Rail Based Platform
Model No. : ED-EM-02-RP
Length : 500 mm
Material : Anodized Aluminium Alloy
Quantity : 1 No.



Tungsten Halogen Lamp with Mount
Model No. : ED-EM-02-THLM
Output : 20 W
Quantity : 1 No.



Photo Electric Effect Control Unit
Model No. : ED-EM-02-PECU
Voltage : 0 - 2 V
Current : nano - micro Amperes
Quantity : 1 No.



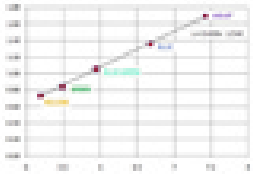
Filter Wheel with Interference Filters
Model No. : ED-EM-02-FWIF
Diameter : 15 mm
Wave length : 404, 450, 505, 546, 578nm
Quantity : 1 No. each



Photosensitive Device with Mount
Model No. : ED-EM-02-PSD
Type : Vacuum photo tube
Quantity : 1 No.



Accessories
Dust protective Cover
User Manual





Experiments Possible

- **Determination of Planck's constant**

If we plot the Stopping potential versus frequency, we will get a straight line whose slope is h/e , where h is the planck's constant and e is the electron charge.

Photo electric effect is the liberation of electrons from the surface of a material by absorption of energy from incident light. For each metal, there exists a minimum binding energy for electron, which is a characteristic of the element, called the work function .When a photon strikes a bound electron, it transfers its energy to the electron.

If this energy is less than the metal's work function, the photon is remitted and no electrons are liberated. If this energy is greater than an electron's binding energy, the electron escapes from the metal with a kinetic energy equal to the difference between the photon's original energy and the electron's binding energy.

The stopping potential is measured by varying the anode voltage until the current drops to zero. The slope of a plot of stopping potential versus frequency is the value of the ratio, h/e.

Hence the value of Planck's constant (h) and work function of the material can be determined. This instrument also imparts students, fundamental understanding of the quantum nature of light.

e/m Experiment Apparatus (Thomson's method)

Model: HO-ED-EM-03

Holmarc's e/m apparatus (Model No: HO-ED-EM-03) is designed for the measurement of the charge to mass ratio e/m, of the electron. This equipment also facilitates the demonstration of effects of electric and magnetic fields on a moving charged particle. It consists of a fine beam electron tube known as e/m tube, a pair of Helmholtz coils and the electronic control box. The e/m tube consists of a filament as cathode, an accelerating anode and a pair of deflection plates. The heater heats the cathode, which emits electrons. The electrons are accelerated by the potential applied between the cathode and the anode.

The grid is held positive with respect to the cathode and negative with respect to the anode. The tube is filled with helium at low pressure. The electron tube is placed between a pair of Helmholtz coils.
The electronic control unit provides the energy requirements for the tube and Helmholtz coil. The Helmholtz coil is a pair of coils separated by a distance of the coil radius. The e/m tube generates a fine electron beam by applying accelerating voltage. Electron collisions with the gas molecules excite the gas molecules and produce light emission in a cylindrical sheath around the electron beam. As the excited molecules relax, the electron paths become visible.

This e/m apparatus is also used for demonstration of electron beam deflection using the deflection plates. When we apply current to the Helmholtz coil, uniform magnetic field is generated and as a result, the fine electron beam changes its path to circular. By measuring the accelerating potential (V), the current through the Helmholtz coils (I) and the radius of the circular electron beam (r) we can find out the electron-mass ratio.

Specification

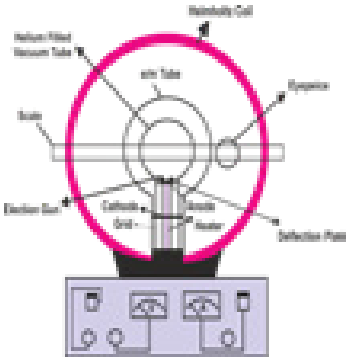
Accelerating voltage	:	0 - 250 V DC
Coil current	:	0.5 - 2.5 A, reversible
Deflection plate voltage	:	50-250 V, reversible
Display	:	Two row LCD display
Power input	:	230 VAC 50 Hz



Experiment Possible

- **To measure the Charge to Mass ratio of Electron (e/m)**

e/m = [(125 a^2 / 128 π^2 N^2) x 10^{14}] (V / I^2 D^2)
Where
V - Accelerating Potential
a - Radius Of The Helmholtz Coils
N - Number Of Turns On Each Helmholtz Coil
I - Current Through The Helmholtz Coils
D - Diameter Of The Electron Beam Path
In our Helmholtz coil number of turns on each coil N = 140 and the radius a = 13.5 cm



Features

- **Excellent for accurate measurements of charge–to–mass ratio**
- **Clear observation of circular electron beam path**
- **Change in direction of the coil current possible**

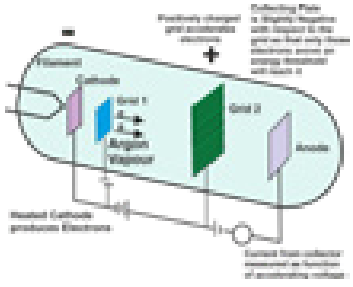
Franck Hertz Experiment Apparatus

Model: HO-ED-EM-04

The Franck - Hertz Apparatus (Model No: HO-ED-EM-04) is designed for verifying the existence of quantized states. The instrument can, not only lead to a plot of the amplitude spectrum curve by means of point by point measurement, but also directly display the amplitude spectrum curve on the oscilloscope screen.

The Franck-Hertz experiment is a fundamental quantum physics experiment which confirmed the quantization of atomic energy levels. This experiment supports Bohr model of atom. Apparatus used for the experiment consist of a tube containing low pressure gas, fitted with four electrodes.

The four electrodes are: an indirectly heated, oxide coated, cathode as an electron source, two grids G and G and a plate A, which serves as an 1 2 electron collector. In this experiment, the electron beam is produced by thermionic emission from a filament. The electrons are accelerated, passed through the vapour, and are then retarded (decelerated) by a few volts before collection at the anode. All these takes place in an argon filled tube.



When an electron has an inelastic collision with an argon atom, the kinetic energy lost to the atom causes one of the outer orbital electrons to be pushed up to the next higher energy level. This excited electron, within a very short time, falls back into the ground state level, emitting energy in the form of photons. The original bombarding electron is again accelerated toward the grid anode and this excitation energy can be measured.

Specification

Franck - Hertz Tube : Argon Filled Tetrode



Power Supply Unit

V_{G1K}	:	1.20 – 5.00 V (continuously variable)
V_{G2K}	:	0.00 – 75.00 V (continuously variable)
V_{G2A}	:	1.30 - 14.50 V (continuously variable)
Filament Voltage	:	2.8 - 3.40V (continuously variable)

Saw tooth waveform for CRO display

Scanning Voltage	:	0 - 75 V
Scanning Frequency	:	18 ± 2 Hz
Input Power	:	230 V / 50 Hz



Experiment Possible

- **To measure the excitation potential of Argon using the Franck - Hertz method**

Frank Hertz Experiment can be used to verify that atomic systems have discrete energy levels by bombarding electrons and observing the difference in energy levels

Franck-Hertz Experiment (Neon/Mercury Tube) Model No: HO-ED-EM-04N/M

In this model, we can study the excitation potential of Neon / Mercury using the Franck-Hertz Method. When excited, Neon emits visible light due to the energy drop from intermediate levels to a ground state which is in the red-yellow region of the spectrum. We can observe parallel bands of light between the control grid and the accelerator grid. Like argon tube, neon tube can also be operated at room temperature.

Specifications:

Franck-Hertz Tube : Neon/Mercury

Filled Tetrode

Filament voltage : 4.2 – 12 V

Control voltage V_{G1K} : 9 V

Accelerating voltage V_{G2K} : 0- 75 V

Counter voltage V_{G2A} : 1.5 – 10 V

Apparatus for the study of Biot-Savart's Law

Model: HO-ED-EM-05.

Holmarc's Apparatus Model No: HO-ED-EM-05 has been designed for the study of Biot - Savart's law. This law can be applied practically to calculate the magnetic field produced by an arbitrary current distribution. It gives fundamental quantitative relationship between an electric current and the magnetic field it produces. The law is also valid for a current consisting of charges flowing through space. The magnetic field along the axis of wire loops and coils of different dimensions is measured using a Gauss meter. The relationship between the maximum field strength and the dimension is investigated and a comparison is made between the measured and the theoretical effects of position. The Gauss meter probe is mounted on a rail with a scale. It can be moved smoothly and precisely for measurement of magnetic field along the center of the coils. In general, any current loop has a magnetic field and thus has a magnetic dipole moment. This helps to explain why some materials exhibit strong magnetic properties.

Scope of supply

Single Coils

Model No.	:	ED-EM-05-SC
Diameter	:	10 cm, 15 cm, 20 cm, 25 cm.
Turns	:	400
Wire Gauge	:	SWG 24
Material	:	Copper
Quantity	:	1 No. Each



Axial Gauss Probe holder with Stand

Model No.	:	ED-EM-05-APS
Material	:	Anodized Aluminium
Quantity	:	1 No



Optical Rail

Model No.	:	ED-EM-05-OR
Material	:	Anodized Aluminium
Length	:	1000 mm
Quantity	:	1 No.



Connector (without cable)

Quantity	:	1 No.



Constant Current Power Supply

Model No.	:	ED-EM-05-CCPS
Input	:	230 V, 50 Hz
Output	:	40 V DC, 0-1.2 A variable
Quantity	:	1 No.



Digital Gauss Meter with Axial Gauss Probe

Model No.	:	ED-EM-05-GMAP
Resolution	:	0.1 gauss at 200 G range
Range	:	200 G, 2 KG, 20 KG & 40 KG
Accuracy	:	±0.5%, ±½ digit at 2 KG 20 KG and 40 KG range ±1% ±0.5%, ±½ digit at 2 KG ±1 digit at 200G range
Temperature	:	Up to 40°C
Display	:	3½ digits 7 segment LED DPM
Power	:	220 V ±10%, 50 Hz
Quantity	:	1 No.



Connecting Cables

Quantity	:	1 No.



Accessories Instruction Manual

Helmholtz Coil

The Helmholtz Coil consists of two coils that have the same radius and mounted on a base to provide a uniform magnetic field between the coils. The base has a slot that allows the coils to be spaced apart at any distance from 3 cm to 20 cm (center-to-center distance). The separation for Helmholtz coils is marked on the base.

Single Coil

For a single coil of radius r with N turns carrying current I, the magnetic field due to the coil at a distance x along the axis passing through the center of the coil and perpendicular to its plane can be calculated using the Biot - Savart Law . Magnetic field value is measured for different currents.

Experiment Possible

- To study the variation of magnetic field due to Helmholtz coil and single coil carrying current
- To determine the magnetic field constant
- To measure the magnetic flux density in the middle of various wire loops using the gauss meter



B-H Curve / Magnetic Hysteresis Curve Experiment

Model: HO-ED-EM-09

Holmarc's B-H curve experiment model no: HO-ED-EM-09 is used for the analysis of the magnetic hysteresis loop / B-H curve for soft iron & laminated iron cores used in two coils bound electromagnet with DC current supply.

Magnetic field intensity H & flux density B is measured & hysteresis loop recorded using the dedicate software. Remenance & coercive field strength of soft & laminated iron cores evaluated with the help of software.

Relating to the magnetising properties of a material especially an electromagnet; which is first magnetised & demagnetised we can notice a delay or lagging in magnetic material known as magnetic hysteresis. The lagging of magnetic flux density (B) behind the magnetic field strength (H) is very interesting using different types of soft / hard ferromagnetic materials.

Our software automatically tracks the B-H curve for soft iron core material which is used in electromagnet. As we know, when magnetic field increases; as we increase the current in dc power supply magnetic flux density also increases in the electromagnetic slot which is measured automatically using gauss probe provided in the slot. Flux density reaches a maximum & saturated as we can see in hysteresis loop however magnetic field goes to further increment.

When we decrease the magnetic field flux density retain in the core shows residual magnetism Br. This time Magnetic field H is zero. Holmarc B-H software as per theory increase the magnetic field H in the reverse direction by increasing the current (i) for reducing flux density to zero & find Coercive force / field Hc.

Further increment of H saturates the B in reverse direction. Decrease the H in to zero again, while the residual flux present in the reverse direction. Software increases the H value to make flux density zero & continues increment of H makes the flux density B saturates again. So this track / loop is known as magnetic hysteresis or B-H curve plot.

Experiments Possible

1. **Find the coercive force, remenance, Residual magnetism, BH curve saturation from graph**
2. **Magnetic hysteresis loop recorded for soft iron core and laminated core electromagnet**



Scope of Supply

Electromagnet
Coil

Number of turns	:	600
Resistance	:	2 ohm
Gauge	:	21
Core materials	:	laminated iron, soft iron and MS (mild steel)



DC current power supply for electromagnet

Type	:	Constant Current Power Supply
Current range	:	-1 A to +1 A
PC interface	:	RS 232/USB
Power input	:	230V, 50 Hz
power consumption	:	50 W



Gauss probe (rectangular type)

Range	:	0-10K Gauss
Transducer	:	In As
Resolution	:	1 Gauss



Accessories
RS232 cable & converter
Power socket & DC connector cable
Laptop (Optional)



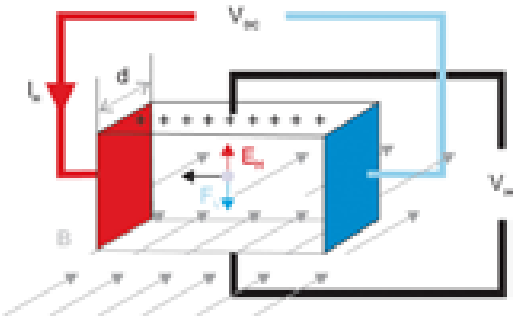
Hall effect Apparatus

Model: HO-ED-EM-06

Holmarc's Hall Effect apparatus (Model no: HO-ED-EM-06) is designed with state of the art modules and components. Digital display is used for all value read outs. Electromagnets, gauss meter, power supply, etc. are designed and made as separate modules for students to understand the apparatus and the principles involved easily. Safety is given due consideration in the design of the apparatus

The system consists of two cartridges, each of which is equipped with 'p' and 'n' doped germanium crystal .The cartridges can be plugged easily and safely into the D connector system. The Hall Effect set up provides all operating parameters for the samples and displays the Hall voltage, sample current as well as the sample temperature. The doped Germanium samples are used to measure the Hall-voltage as a function of the sample current, the magnetic flux density and the sample temperature.

The Hall voltage is caused by the deflection of the moving charge carriers in the magnetic field due to the Lorentz force, of which, direction can be predicted by the right hand rule. The sign of the Hall coefficient is determined by the polarity of the charge carriers: a negative sign implies carriers with a negative charge ("normal Hall effect"), and a positive sign indicates carriers with a positive charge ("anomalous Hall effect"). The Hall coefficient depends on the material and the temperature.



Specification

Hall Current	:	0 - 10 mA
Hall Voltage	:	0 - 200 mV
Temperature	:	Ambient - 60°C
Crystal	:	n - type and p - type lightly doped Germanium (Ge)
Field density	:	0 - 5 ± 5% KG

Experiment Possible

- **Measurement of Hall voltage as a function of**

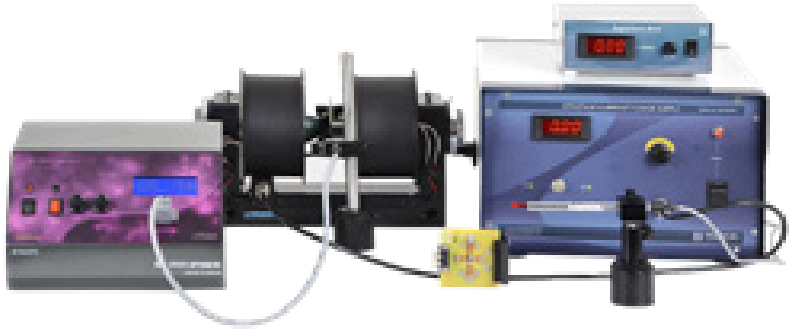
a. Magnetic flux density
Introduce the gauss meter probe between the poles of electromagnet. Change the current from zero up to its maximum value and from maximum to zero. Note the corresponding field strength from gauss meter at different intervals. Plot a graph Magnetic field Vs Current.

b. Sample temperature
Electrons in a semiconductor only become available for conduction when they acquire enough thermal energy to reach a conduction state; this makes the carrier concentration highly dependent on temperature.

c. Sample current
Connect the sample control probe to Hall Effect Control and turn on the Hall Effect set up. Vary the sample current from zero up to its maximum value in equal intervals. Note the corresponding Hall voltage readings. Plot the graph, Hall voltage as a function of the sample current.
for n and p - doped germanium crystals.

- **Determination of density and mobility of charge carriers**

We get Carrier Density from the equation,
$n = [1/(R_H e)]$ c m^3
We get Carrier Mobility from the equation,
$\mu = R_H . \sigma$ c m^2 $Volt^{-1}$ sec^{-1}
where σ is the conductivity of material



- **Determination of Hall coefficient of semi conductor crystals**

The Hall voltage V_H is caused by the deflection of the moving charge carriers in the magnetic field due to the Lorentz force, whose direction may predicted by the right hand rule. The factor 1 / (ne) is called Hall coefficient R_H.

$R_H = (V_H / B) \times (d / I_H) \; c\, m^3$ Coulomb^{-1}

B- Magnetic flux density

I_H - Current through the semi conductor

d- Thickness of the conductor

n- Concentration of charge carriers

Scope of supply

Hall Effect Control Unit
Model No. : ED-EM-06-HECU
Current : 0 - 10 mA
Voltage : 0 - 200 mV
Temperature : Ambient - 60°C
Display : 20 x 4 Alpha Numeric LCD
Quantity 1 No.



Gauss Probe Holder with Mount
Model No. : ED-EM-06-GPHM
Material : Anodized Aluminum alloy
Quantity : 1 No.



Hall Effect Cartridge
Model No. : ED-EM-06-HEC
Material : n and p type lightly doped Germanium (Ge)
Quantity : 1 No. each



Constant Current Power Supply
Model No. : ED-EM-06-CCPS
Output : 0 - 3.5 A Current
Quantity : 1 No.



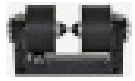
Sample control Holder with Rigid Base
Model No. : ED-EM-06-SHRB
Material : Anodized Aluminum alloy
Quantity : 1 No.



Digital Gauss Meter
Model No. : ED-EM-06-DGM
Range : 0 - 20 K Gauss
Transducer : In As
Quantity : 1 No.



Electromagnet
Model No. : ED-EM-06-EM
Max magnetic field : 5K Gauss (at 20mm pole space)
Quantity : 1 No.



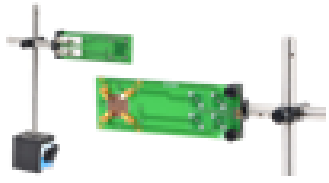
Accessories
Connecting Cables
User Manual



Hall Effect Sample Holder for Electromagnet

Model: HO-SHEM-01

The sample holder HO-SHEM-01 facilitates the positioning of samples, like the crystals or thin films exhibiting Hall effect, between the two poles of an electromagnet. It also has the spring loaded pogo pin contacts which make electrical contact at four points in the sample surface. These contacts are taken out as four BNC connectors to apply a voltage or current to the sample, or to perform a voltage or current measurement. Parallel to the BNC connectors, contacts are also available through a Single In Line plastic connector.



Number of contacts	:	4
Number of BNC connectors	:	4
Additional connector	:	4 pin SIP connector
Contact mechanism	:	Spring loaded pogo pin with gold coating
Minimum Sample Dimensions		mm x 5 mm x 0.5 mm (Length x Width x Thickness)
5 Maximum Sample Dimensions		20 mm x 20 mm x 2.5 mm (Length x Width x Thickness)

Magnetic Susceptibility - Quincke's Method

Model: HO-ED-EM-07

Holmarc's Magnetic Susceptibility - Quincke's Method Apparatus (Model No: HO-ED-EM-07) is designed for the determination of magnetic susceptibility of a given solution. The apparatus consists of a pair of electromagnets and a Quincke's tube in which the sample is taken. This tube is U shaped and has two limbs, one with very narrow width compared to the other. So, the change in the level of the liquid in the narrow limb does not affect the level in the wider limb. The magnetic field is measured using a digital Gauss meter. In Holmarc's apparatus, the rise in liquid by the application of magnetic field is measured using a traveling microscope. On applying magnetic field, the liquid in the Quincke's tube either rise or fall. If the liquid is paramagnetic with respect to the surrounding air , the liquid level will rise and if it is diamagnetic, then the liquid level will fall. In this apparatus, paramagnetic liquid is used and the liquid level will rise. The Quincke's Method is used to determine magnetic susceptibility of paramagnetic substance in the form of a liquid or an aqueous solution. This method is based on the force experienced by a magnetized material in a non-uniform magnetic field. When an object is placed in a magnetic field, a magnetic moment is induced in it. The magnetic susceptibility is a proportionality constant which is dimensionless and indicates the degree of magnetization of a material in response to an applied magnetic field. A liquid sample in a narrow tube placed between the poles of a magnet experiences a force and hence when the field is turned on, the meniscus in the narrow tube rises by an amount h, relative to its zero-field position. Measuring this rise enables to determine the susceptibility of the solution.

Scope of supply

Electromagnet
Model No. : ED-EM-07-EM
Max magnetic : 1 Tesla at 10mm pole
Quantity : 1 No.



Gauss Probe Holder with Mount
Model No. : ED-EM-07-GPHM
Material : Anodized Aluminum alloy
Quantity : 1 No.



Travelling Microscope
Model No. : ED-EM-07-TM
Magnification : 10 X
Micrometer Travel : 25 mm
Least Count : 0.01 mm
Quantity : 1 No.



Constant Current Power Supply
Model No. : ED-EM-07-CCPS
Output Current : 0 - 3.5 A
Quantity : 1 No.



Digital Gauss Meter
Model No. : ED-EM-07-DGM
Range : 0 - 20 K Gauss
Transducer : In As
Quantity : 1 No.



Quincke's Tube with Stand
Model No. : ED-EM-07-QTS
Quantity : 1 No.





Accessories
Test Sample
Connecting Cables
User Manual

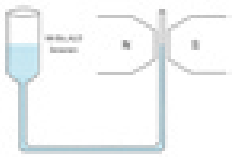
Experiment Possible

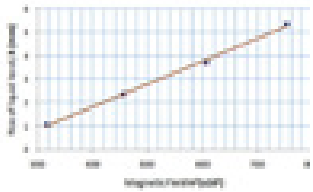
- **Calibration of the magnetic field**

Introduce the gauss meter probe between the poles of electromagnet. Change the current from zero up to its maximum value and from maximum to zero. Note the corresponding field strength from gauss meter at different intervals. Plot a graph Magnetic field Vs Current.

- **Measurement of magnetic susceptibility of paramagnetic Solutions**

Mass susceptibility of the solution, χ'solution can be obtained from this relation.
$\chi'solution = (ms / ms + mw) \chi'salt + (mw / ms + mw) \chi'water$
where $\chi'water = -0.72 \times 10^{-6}$, ms is the mass of the salt dissolved in ms of water.





Features
- Precise and accurate measurements
- Superior image quality of traveling microscope with precision micrometer drive
- Digital gauss meter gives direct reading of magnetic field in the 0 - 20 KG range



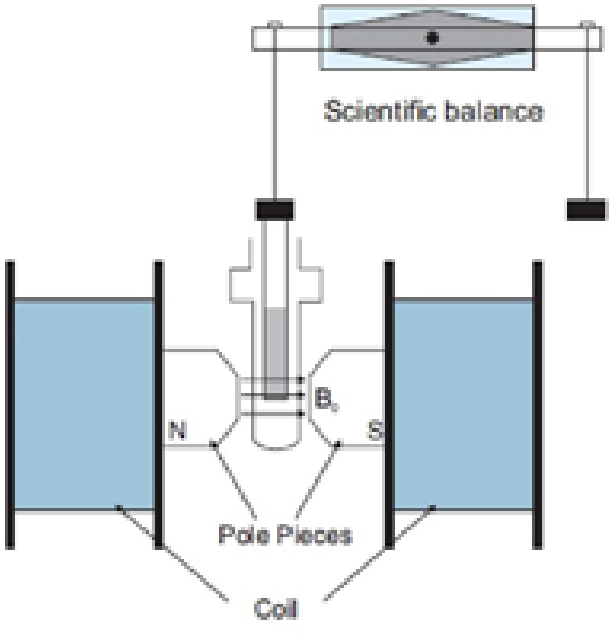
Magnetic Susceptibility - Gouy's method

Model: HO-ED-EM-08

Holmarc's Magnetic Susceptibility - Gouy's Method Apparatus (Model No: HO-ED-EM-08) is designed for the determination of magnetic susceptibility of solid samples. The apparatus consists of a pair of electromagnets with constant current power supply and a tube in which the sample powder is taken. The magnetic field is measured using a digital Gauss meter. The sample weight measurements are taken with the help of a Gouy balance. In the Gouy's method of susceptibility measurement, the solid sample in the form of a long cylinder is hung from the pan of a balance and is placed in such a way that one end of the sample is between the pole pieces of the magnet and the other one is outside the field. The force exerted on the sample by the inhomogeneous magnetic field is obtained by measuring the apparent gain or loss in sample weight. A sample with a para magnetic compound will be pulled down towards the magnet and will provide a positive difference in apparent mass. Diamagnetic compounds can either exhibit no apparent change in weight or a negative change, as the sample is slightly repelled by the applied magnetic field. With a para magnetic sample, the magnetic induction is stronger than the applied field and magnetic susceptibility is positive. A diamagnetic sample has a magnetic induction much weaker than the applied field, and a respective negative magnetic susceptibility.

Material	Magnetic Susceptibility x 10^{-5} ($cm^3 \cdot mol^{-1}$)
Tungsten	6.8
Cesium	5.1
Aluminum	2.2
Lithium	1.4
Magnesium	1.2
Sodium	0.72

The Gouy balance measures the apparent change in the mass of the sample as it is repelled or attracted by the region of high magnetic field between the poles. The sample is suspended between the magnetic poles through an attached string. The experimental procedure requires two separate reading to be performed. An initial balance reading is performed on the sample of interest without a magnetic field. A subsequent balance reading is taken with an applied magnetic field. The apparent change in mass from the two balance readings is the result of magnetic force on the sample



Experiment Possible

- **Calibration of the magnetic field**

Introduce the gauss meter probe between the poles of electromagnet. Change the current from zero up to its maximum value and from maximum to zero. Note the corresponding field strength from gauss meter at different intervals. Plot a graph Magnetic field Vs Current.

- **Measurement of Magnetic Susceptibility of paramagnetic solid samples**

Features

- **Precise and accurate measurements**
- **Digital gauss meter gives direct reading of magnetic field in the 0 – 20 KG range**
- **Gouy's balance and Specimen holder with mount**

Scope of supply

Electromagnet
Model No. : ED-EM-08-EM
Max magnetic : 1 Tesla (at 10mm pole space)
Quantity : 1 No.



Gauss Probe Mount
Model No. : ED-EM-08-GPHM
Material : Anodized Aluminum alloy
Quantity : 1 No.



Gouy's balance
Model No. : ED-EM-08-GB
Quantity : 1 No.



Accessories
Connecting Cables
User Manual

Constant Current Power Supply
Model No. : ED-EM-08-CCPS
Output Current : 0 - 3.5 A
Quantity : 1 No.



Digital Gauss Meter
Model No. : ED-EM-08-DGM
Range : 0 - 20 K Gauss

Transducer : In As
Quantity : 1 No.

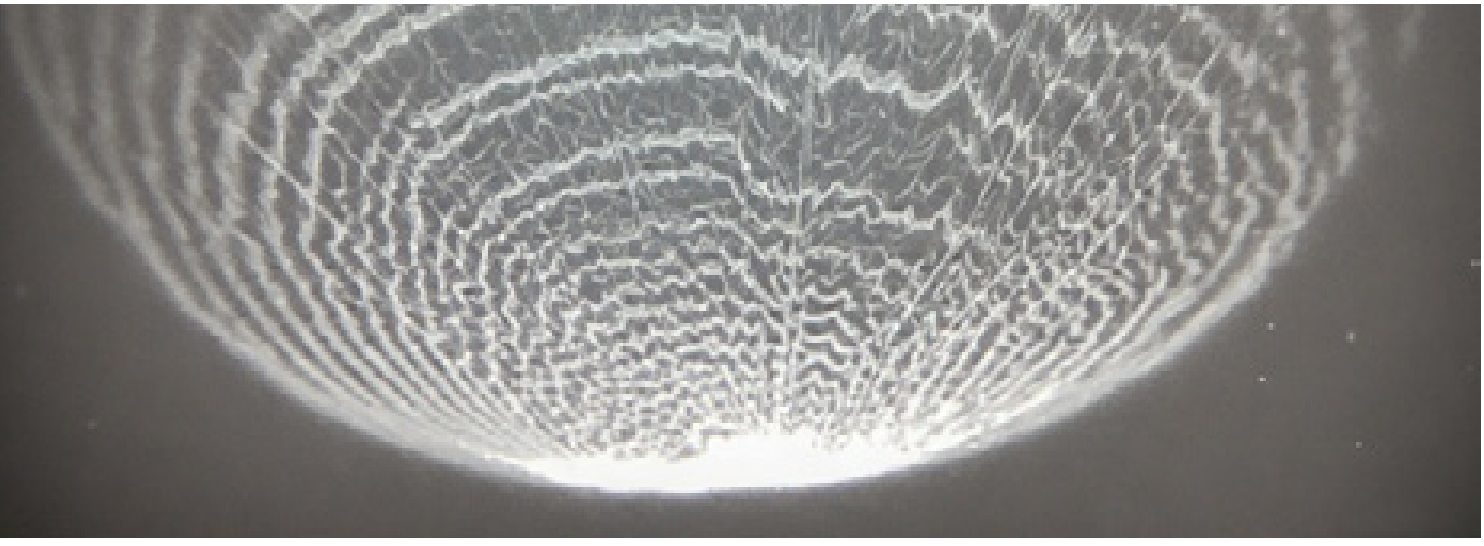


Specimen holder with mount
Model No. : ED-EM-08-SHM
Quantity : 1 No

Connect with our engineers and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service



Acoustics

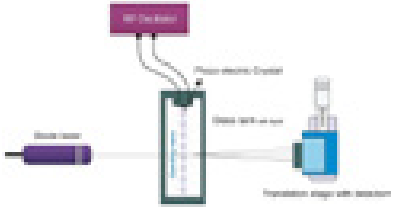


Detector Based Apparatus for Ultrasonic Diffraction Model: HO-ED-A-01

The Ultrasonic diffraction apparatus is used to study diffraction of light by ultrasonic waves. Ultrasonic sound refers to sound with a frequency greater than the human audible range (20Hz to 20 KHz). When an ultrasonic wave propagates through a medium, the molecules in that medium vibrate over very short distance in a direction parallel to the longitudinal wave. The apparatus consists of a graduated long rail and rail carriages appropriately fitted with laser head, an RF oscillator and a detector with translation stage. The ultrasonic diffraction setup uses laser as light source. As the laser beam is intense and monochromatic, we get clear higher order diffraction pattern. The ultrasonic waves generated by the transducer travels down the medium (liquid) and gets reflected at the bottom (flat glass plate) of the cell. The incident and reflected waves interfere and a stationary / standing wave pattern is formed. The laser head is mounted using a kinematic holder. This helps to direct the laser beam through the liquid and then to the detector conveniently. The diffraction pattern is scanned using a translation stage with freedom in X axis. The

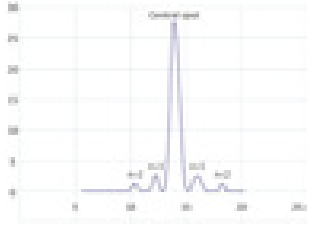
Specification of Piezo Electric Crystals

Dimension	:	20 mm diameter x 0.7 mm thickness
Resonant frequency fr	:	3 MHz ± 50 KHz
Resonant impedance Zm	:	≤ 6 Ω.
Static capacitance Cs	:	570 0pF ± 15% @ 1 kHz
Dimension	:	20 mm diameter x 0.4 mm thickness
Resonant frequency fr	:	5 MHz ± 100 KHz
Resonant impedance Zm	:	≤ 0.48 Ω.
Static capacitance Cs	:	3800 pF ± 20% @ 60 Hz/1 V



Experiment Possible

- **To find the velocity of ultrasonic wave in liquids**



The velocity of ultrasonic wave in a liquid,

$V = \upsilon \Lambda$

Where υ is the frequency of the crystal oscillator and Λ is the wavelength of ultrasonic wave.

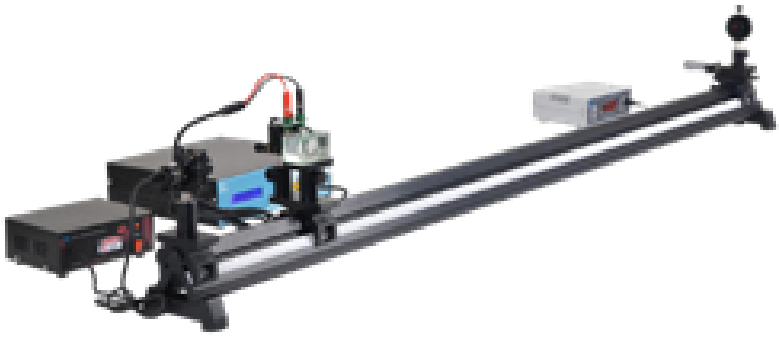
We have,

$\Lambda = n\lambda / \sin\theta$

Where n is the order of diffraction, λ is the wavelength of the laser used and θ is the angle of diffraction.

$\theta = \tan^{-1}(D / L)$

D is the order length and L is the distance measured from the crystal oscillator to the detector.



To find the bulk modulus of the given liquid

The bulk modulus of the liquid,
$\beta = \rho V2$

Where ρ is the density of the liquid and V is the velocity of the ultrasonic wave.

To find the compressibility of the liquid

The compressibility of a liquid is the reciprocal of bulk modulus,
$K = 1 / \rho V2$

Where ρ is the density of the liquid and is V the velocity of the ultrasonic wave.

Scope of Supply

Optical Rail
Model No. : ED-A-01-OR
Length : 1500mm
Material : Black anodized Aluminum alloy
Quantity : 1 No.



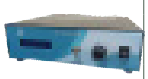
Glass tank Mount with Crystal Holder
Model No. : ED-A-01-GMCH
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Quantity : 1 No.



Glass Tank
Model No. : ED-A-01-GT
Material : Float
Dimension : 50 x 35 x 35 mm
Quantity : 2 Nos.



RF Oscillator
Model No. : ED-A-01-RFO
Frequency Range : 2 - 6 MHz
Quantity : 1 No.



Detector Output Measurement Unit
Model No. : ED-A-01-DOMU
Sensor Type : Photo Transistor
Display : 7 segment, 3 ½ digit
Range : 0 - 199 milli amperes
Quantity : 1 No.



Kinematic Laser Mount
Model No. : ED-A-01-KLM
Material : Black anodized Aluminum alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees
Quantity : 1 No.



Detector Mount with X- Translation
Model No. : ED-A-01-DMXT
Material : Black anodized Aluminum alloy
Travel : 25mm
Resolution : 0.01 mm
Diameter : 30 mm
Quantity : 1 No.



Piezo Electric Crystals
Model No. : ED-A-01-PEC
Frequency : 3, 5 MHz
Quantity : 1 No. each



Diode Laser with Power supply (Red)
Model No. : ED-A-01-DLPR
Wave length : 650 nm
Optical power : 3 mW
Quantity : 1 No.



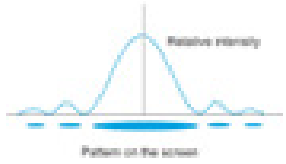
Accessories
Connecting Cables
User Manual



Because of continuous product improvement, the various data listed are subjected to change without notice. Please confirm before ordering

Screen Based Apparatus for Ultrasonic Diffraction

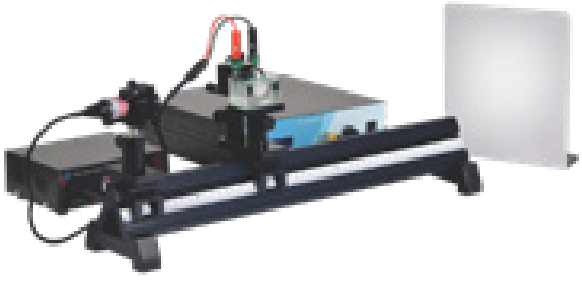
Model: HO-ED-A-01A



The Ultrasonic diffraction apparatus is used to study diffraction of light by ultrasonic waves. Ultrasonic sound refers to sound with a frequency greater than the human audible range (20Hz to 20 KHz). When an ultrasonic wave propagates through a medium, the molecules in that medium vibrate over very short distance in a direction parallel to the longitudinal wave. The apparatus consists of a graduated rail and rail carriages appropriately fitted with a laser head, an RF oscillator, a glass tank mount with crystal holder and a screen. The ultrasonic waves generated by the transducer travels down the medium (liquid)and gets reflected at the bottom (flat glass plate) of the cell. The incident and reflected waves interfere and a stationary / standing wave pattern is formed. The pattern can be observed on a screen or a wall and we can plot diffraction pattern on a graph paper for further calculations.

Specification Of Piezo Electric Crystals

Dimension	:	20 mm diameter x 0.7 mm thickness
Resonant frequency fr	:	3 MHz ± 50 KHz
Resonant impedance Zm	:	≤ 6 Ω.
Static capacitance Cs	:	570 0pF ± 15% @ 1 kHz
Dimension	:	20 mm diameter x, 0.4 mm thickness
Resonant frequency fr	:	5 MHz ± 100 KHz
Resonant impedance Zm	:	≤ 0.48 Ω.
Static capacitance Cs	:	3800 pF ± 20% @ 60 Hz/1 V



Experiment Possible

- **To find the velocity of ultrasonic wave in liquids**

The velocity of ultrasonic wave in a liquid,
$V = \upsilon \Lambda$
Where υ is the frequency of the crystal oscillator and Λ is the wavelength of ultrasonic wave.
We have,
$\Lambda = n\lambda / \sin\theta$
Where n is the order of diffraction, λ is the wavelength of the laser used and θ is the angle of diffraction.
$\theta = \tan^{-1}(D / L)$
D is the order length and L is the distance measured from the crystal oscillator to the detector.

To find the bulk modulus of the given liquid
The bulk modulus of the liquid,
$\beta = \rho V2$

Scope of Supply

Optical Rail

Model No.	:	ED-A-01-OR
Length	:	500mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Glass tank Mount with Crystal Holder

Model No.	:	ED-A-01A-GMCH
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Quantity	:	1 No.



Glass Tank

Model No.	:	ED-A-01A-GT
Material	:	Float
Dimension	:	50 x 35 x 35 mm
Quantity	:	2 Nos.



RF Oscillator

Model No.	:	ED-A-01A-RFO
Frequency Range	:	2 - 6 MHz
Quantity	:	1 No.



Kinematic Laser Mount

Model No.	:	ED-A-01A-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 No.



Screen

Model No.	:	ED-A-01A-S
Material	:	Acrylic
Dimension	:	300 x 200 mm
Quantity	:	1 No.



Piezo Electric Crystals

Model No.	:	ED-A-01A-PEC
Frequency	:	3, 5 MHz
Quantity	:	1 No. each



Diode Laser with Power supply (Red)

Model No.	:	ED-A-01A-DLPR
Wave length	:	650 nm
Optical power	:	3 Mw
Quantity	:	1 No.



Kundt's Tube Apparatus

Model: HO-ED-A-02

Holmarc's Kundt's tube apparatus (Model No: HO-ED-A-02) is a device for measuring the speed of sound. Any waves traveling along the medium will reflect back when they reach the end creating a standing wave allowing harmonics to be identified. Nodes occur at fixed ends and antinodes at open ends. Furthermore, it provides an insight into the interesting phenomenon of standing sound waves.

In this experiment the amplitude of the sound wave can be observed at different locations in the tube, allowing a half wave length to be measured between an adjacent maximum and minimum.

Here, one-side closed cylindrical transparent pipe filled with air is used as a resonator. One end of the tube is attached with a loudspeaker where as the other end is fixed with a movable piston with reflector and a microphone.

An AC voltage applied to the loudspeaker, tunes the membrane to vibrations that are transferred to the gas or air column. Frequency can be changed by enlargement or diminishment of the glass cylinder as well as by changing the frequency of the generator.

Specification

- Transparent solid tube, 59 mm dia x 1000 mm long
- End housing fixed with 2" speaker for creating the sound waves
- Piston on a long rod to create variable length closed tubes
- Driver unit to interface the microphone to an amplifier or oscilloscope

Scope of Supply

Kundt's Tube with Graduated Scale
Model No. : ED-A-02-KTGS
Material : PMMA
Length : 1000 mm
Diameter : 60 mm
Quantity : 1 No.



Head Phone
Model No. : ED-A-02-HP
Quantity : 1 No.



Kundt's Tube Control Unit
Model No. : ED-A-02-KTCU
Quantity : 1 No.



Speaker with Sound sealing Case
Model No. : ED-A-02-SSC
Quantity : 1 No



Microphone with Piston
Model No. : ED-A-02-MP
Quantity : 1 No



Speaker
Model No. : ED-A-02-SP
Quantity : 1 No.



Accessories
User Manual
CRO (optional)

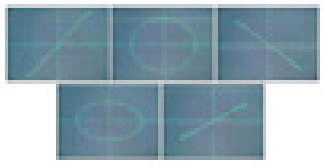


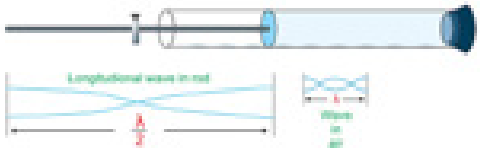
Experiment Possible

- **To find the velocity of sound in air with the help of head phone**

The velocity of the wave is,
$V = \upsilon\lambda$
Where υ is the frequency and λ is the wavelength in the case of longitudinal waves, the wavelength is the difference between two consecutive compressions or rarefactions.

To find the velocity of sound in air using Lissajous Figures
A sine wave from an audio oscillator and the signal picked up by a movable microphone to produce Lissajous figures and determine the speed of sound.







Ultrasonic Diffraction using Goniometer

Model: HO-ED-A-03

Holmarc's Ultrasonic diffraction with Goniometer (Model No: HO-ED-A-03) is a standard classical diffraction experiment used in physics labs. Ultrasonic diffraction apparatus is used to study diffraction of light by ultrasonic waves. Ultrasonic sound refers to sound with a frequency greater than the human audible range (20Hz to 20 KHz). When an ultrasonic wave propagates through a medium, the molecules in that medium vibrate over very short distance in a direction parallel to the longitudinal wave. The ultrasonic diffraction experimental setup uses sodium lamp as light source. As the sodium light is passes through the glass tank, we will observe clear higher order diffraction pattern on the eyepiece of the spectrometer. Our high resolved Spectroscopic Goniometer stage helps to distinguish the fringe pattern at certain frequencies.

The ultrasonic waves generated by the transducer travels through the medium (liquid) and get reflected at the side by side (flat glass plate) of the cell. The incident and reflected waves interfere and a stationary / standing wave pattern is formed. Piezo electric crystals are mounted using a kinematic holder at the centre of Goniometer. This helps to direct the sodium light through the liquid and then to the detector/eyepiece conveniently by using the spectroscopic arm design. The diffraction pattern is changed by replacing the crystals like 3 MHz to 5MHz.The velocity of ultrasonic waves in liquids can be calculated from this experiment.

Specification

Source	:	Sodium lamp with power supply
Goniometer stage resolution	:	1arc min
Slit	:	Micrometer controlled slit
Resolution of slits	:	10 microns
Crystal	:	Piezo electric
Resonant frequency	:	3MHz, 5MHz (± 50 KHz)
Crystal Dimension	:	20 mm diameter, 0.7 mm thickness
Frequency range of RF Oscillator	:	2MHz - 6MHz
Glass tank	:	Float glass

Scope of Supply

- Spectrometer Goniometer
- Piezo electric crystals
- Glass tank
- RF Oscillator unit
- Sodium lamp with power supply
- Crystal holder unit with
- kinematic x-y tilts
- Accessories

Experiments Possible

- **To find the velocity of ultrasonic wave in liquids**
- **To find the bulk modulus of the given liquid**
- **To find the compressibility of the liquid**

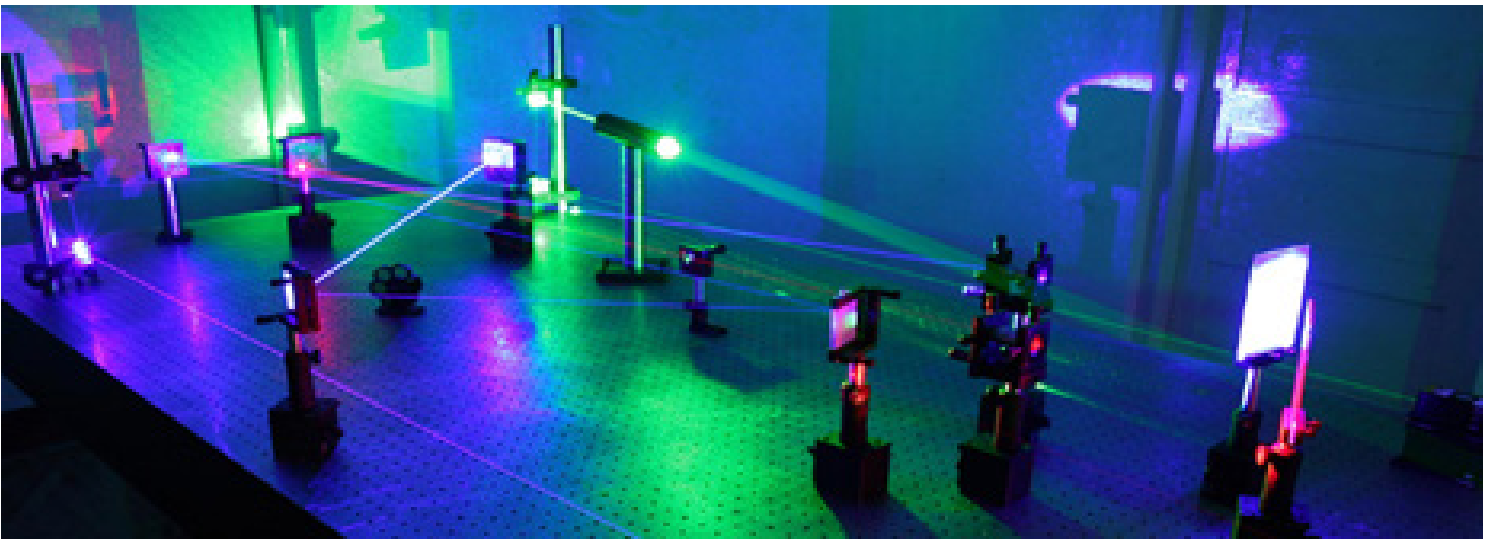
- MS painted Body
- Inner side walls with Acoustic Insulation Foam Kit
- Fire-resistant 'BS476 Class-0' flammability

Features

- **Precised Design**
- **Sodium lamp is used as light source**
- **3 MHz & 5 MHz crystals**
- **High Quality Optics**



Holography



Holographic Lab

Model: HO-ED-H-02

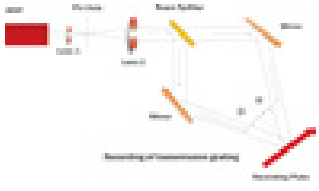
Holmarc's Holography Lab (Model: HO-ED-H-02) is developed for recording holograms in academic and research institutions. The equipment includes, vibration isolated table, opto-mechanical modules, optical components, sample silver halide plates, processing chemicals etc. All components and modules used in this kit are of industrial quality and reliability. By changing the laser source and recording plates, the equipment can be used for commercial hologram recording as well. In depth training in hologram making is given for all our customers free of cost at our holographic laboratory with either He- Cd or He-Ne lasers

Holography is known as "lens less photography" in which an image is captured not as an image focused on a film, but as an interference pattern at the film. The recorded holographic image has both phases and amplitude information where as a photographic image has only amplitude information.

A coherent He-Ne laser (632.8nm) is used as the light source. A variable beam splitter splits the laser beam into two. One of the beams illuminates the object and the scattered light from the object illuminate the holographic plate while the second beam directly illuminates the holographic plate. As the path length of both beams are equal, interference fringes will form at the holographic plate and will get recorded. The recorded plate is then chemically developed by washing in developing solution. The developed plate, under proper illumination, produce a three dimensional image of the object.

Experiment Possible

Recording of Diffraction Gratings



Recording and reconstruction of Transmission Holograms





Recording and reconstruction of Reflection Holograms

Transmission Holograms

A transmission hologram is one where the object and reference beams are incident on the photosensitive plates / films from the same side. A recorded transmission hologram can only be reconstructed using the same light source which is used for recording.



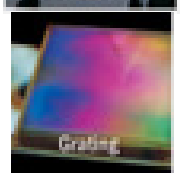
Reflection Holograms

A reflection hologram is one where the object and reference beams are incident on the plates from opposite sides of the plate. The reconstructed object is then viewed by white light from the same side of the plate where the white light is incident.



Holographic Transmission Gratings

A holographic transmission grating is one where two reference beams are incident on the plates from the same side. The resulting straight line interference fringes will get recorded by the plate. When a white light passes through the transmission grating, it will split the Grating white light into its component spectrum.



Scope of Supply

Optical Honeycomb Tabletop with Pneumatic Isolated Support
Model No. : ED-H-02-OTPS
Material : Stainless Steel
Dimensions : 1800 x 1200 x 200 mm
Quantity : 1 No.



Mirror Mount with Magnetic Base - 25
Model No. : ED-H-02-MMB25
Material : Black anodized Aluminium alloy
Diameter : 25 mm
Degrees of freedom : 2 Degrees of freedom
Quantity : 3 Nos.



Plate Holder with Magnetic Base
Model No. : ED-H-02-PHMB
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Variable Beam splitter Mount with Magnetic Base
Model No. : ED-H-02-VBMB
Diameter : 75 mm
Thickness : 3 mm
Quantity : 1 No.



Laser Clamp
Model No. : ED-H-02-LC
Material : Black anodized Aluminium alloy
Quantity : 1 set



Mirror - 50
Model No. : ED-H-02-M50
Diameter : 50 mm
Thickness : 6 mm
Material : Borofloat
Coating : Protected Aluminium
Quantity : 2 Nos.



Helium- Neon Laser (Red)

Model No. : ED-H-02-HNLR
Wave length : 632.8nm
Optical power : 5 mW
Polarization : Linear
Quantity : 1 No.



Beam Steering device with Magnetic Base
Model No. : ED-H-02-BSMB
Material : Black anodized Aluminium alloy
Adjustments : Using 80 tpi lead screws
Adjustment Range : +/-3 degrees



Mirror Mount with Magnetic Base - 50
Model No. : ED-H-02-MMB50
Material : Black anodized Aluminium alloy
Diameter : 50 mm
Degrees of freedom : 2 degrees
Quantity : 3 Nos.



Spatial Filter assembly with Magnetic Base
Model No. : ED-H-02-SFMB
Microscope Objective : 20 X
Pinholes : 15 microns
Quantity : 3 Sets



Object Holder with Magnetic Base
Model No. : ED-H-02-OHMB
Material : Black anodized Aluminium alloy
Quantity : 1 No.



Mirror - 25
Model No. : ED-H-02-M25
Diameter : 25 mm
Thickness : 6 mm
Material : Borofloat
Coating : Protected Aluminium
Quantity : 5 Nos.



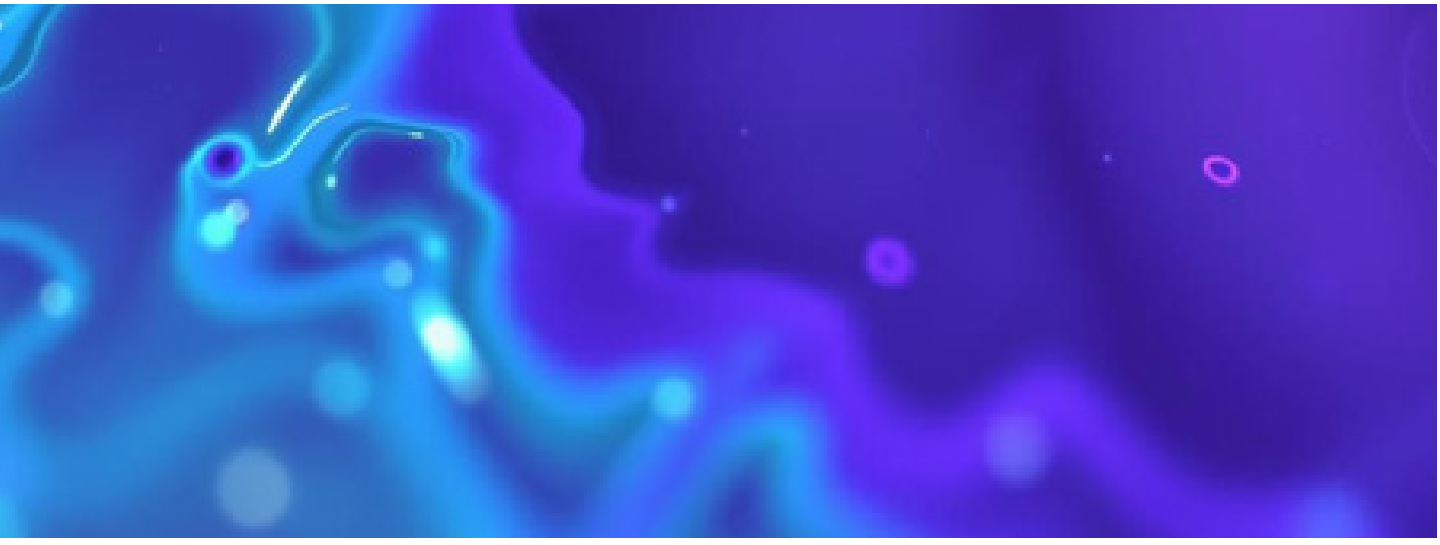
Variable Beam Splitter
Model No. : ED-INT-15-GP
Diameter : 75 mm
Thickness : 3 mm
R / T ratio : Continuously variable rom 0 - 90%
Material : N - BK7
Coating : Aluminium
Quantity : 1 No.



Accessories
Holography Plates (PFG-01) 60 Nos.
Screens 4 Nos.
Sample Objects 2 Nos.
Plastic Trays 3 Nos.
Bevel Protractor 1 No.
Analog Stop watch 1 No.



Thin Film Characterization



Spectrophotometer

Model: HO-SPE-3000S

Holmarc's Spectrophotometer (Model No: HO-ED- TH-01) is ideal for education, research and industrial applications. Unlike other entry level spectrophotometers, it employs the classic Czerny - Turner monochromator design, which ensures low stray light. It uses 1200 lines/mm blazed holographic grating as the dispersion element providing high wavelength resolution. It also employs a sigma delta ADC of 16 bit resolution for photometric measurements. A graphic LCD screen is used to plot an absorbance v/s wavelength graph. The data can then be analyzed for peaks and valleys.

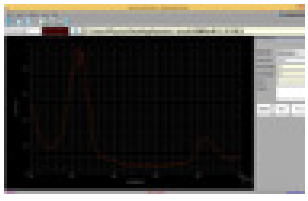
The spectrophotometer can measure the amount of absorbance or lack of absorbance of different colored light for a given molecule. The absorbance spectrum is a graph of a sample's absorbance at different wavelengths.

In a spectrophotometer, the amount of light passing through the sample cell is measured by a photometer. The photometer delivers a voltage signal to a processing unit. The signal changes as the amount of light absorbed by the liquid changes. According to Beer's law, the amount of light absorbed by a medium is proportional to the concentration of the absorbing material or solute present. Thus the concentration of a colored solute in a solution can be determined in the lab by measuring the absorbance of light at a given wavelength.



Experiment Examples

- To study the absorbance and transmittance of different samples at different wavelengths
- Absorbance/ transmittance



- To find the thin film thickness(100 nm to 3 micron) from the transmission spectrum

Features

- **Compact and easy to use**
- **LCD display is large enough to read from any distance**
- **Selectable resolutions**

Variable Angle Laser Ellipsometer

Model: HO-VALE-01

Ellipsometry is a very sensitive optical technique which provides unequaled capabilities for thin film metrology. Ellipsometry exploits phase information and polarization state of light and so can achieve angstrom level resolution. The main advantages of ellipsometry are its non-destructive character, high sensitivity and wide measurement range. The optical parameters like thickness and refractive indices of a thin film can be determined precisely by this technique.

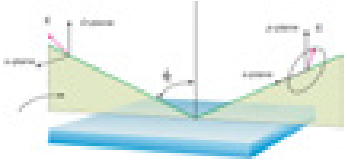
In the ellipsometer model no: HO-ED-TH-02, a circularly polarized light is made incident on the test substrate and the reflected light which is linearly polarized is analyzed for polarization changes. The instrument consists of two concentrically rotating arms around a precisely graduated disc fixed to a heavy base. A laser source is held on one arm and the detector assembly on the other arm. The graduated disc has 1° scale and 0.1° resolution achieved through a vernier. Power supplies for laser source and detector are placed separately. Polarizer, analyzer and quarter wave plate are held in precision rotary stages in the optical path with precise graduations having 0 - 360° range and 0.1° resolution. Glan-Thompson Prisms are used for both polarizer and analyzer.

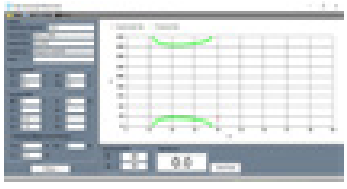
Sample is placed on a precision micrometer driven vertical stage with height adjustment range of 10 mm and resolution 0.01 mm. Incident angle for laser source can be adjusted between 30° and 90°. For null method, detector can be replaced with a miniature screen for visual determination of null point, if required.

As shown in the Fig., randomly polarized laser light (532nm) passes through a polarizer which changes the polarization of light from random polarization to linear polarization. The linearly polarized light then passes through a quarter-wave plate (set the fast axis at 45 degree) which changes the polarization state from linear to circular. After reflection from the sample thin film, the circularly polarized light becomes linearly polarized and an analyzer measures the degree of polarization.

Experiment Possible

- Study of refractive index of thin films
- Thickness of thin film samples





Specification

Measurement range	:	1 nm ~ 300 nm
Incident angle	:	0° ~ 90°, Error 0.1
Rotation Range		
Polarizer	:	0° ~ 360°
Quarter-Wave	:	0° ~ 360°
Resolution	:	0.1 degree
Laser	:	DPSS (532nm, 5mW)
Laser Arm		
Rotation Range	:	70 degree (from horizontal plane)
Main Scale Division	:	1 degree
Resolution	:	0.1 degree
Detector		
Type	:	Si Photodiode
Active area	:	5.8 x 5.8 mm
Detector Arm		
Rotation Range	:	70 degree (from horizontal plane)
Main Scale Division	:	1 degree
Resolution	:	0.1 degree
Sample Holder		
Height Adjustment	:	10mm Range
Drive Resolution	:	10 microns
Tilting Range	:	+/- 2 degree



Variable Angle Spectroscopic Ellipsometer

Model: HO-SE-01

Spectroscopic Ellipsometer is widely used for thin film analysis and measurements. Holmarc's spectroscopic ellipsometer incorporates Rotating Analyzer Ellipsometry technology to characterize thin film samples. It uses a high speed CCD array detection to collect the entire spectrum. It measures films from nanometer thickness up to tens of microns and the optical properties from transparent to absorbing materials. It accurately measures optical constants like refractive index, film thickness and extinction coefficient.

Our standard system comes with Quartz-Halogen lamp for visible through IR range. Our spectroscopic ellipsometer software allows the user to measure and analyze multilayer thin films and complex thin film structures. An autocollimator, Z stage and tilt platforms are provided for sample alignment. XY motorized stage and motorized rotation stages are provided as unoptional feature for mapping thin film uniformity.

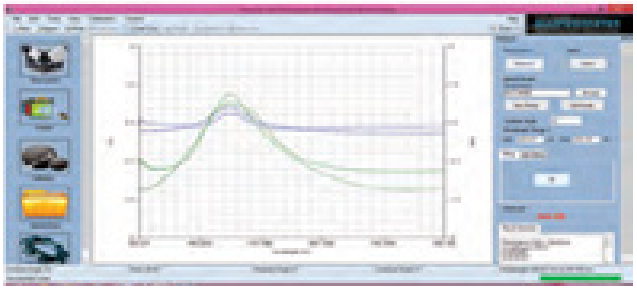


Fig. Software Image

Principle of Ellipsometry

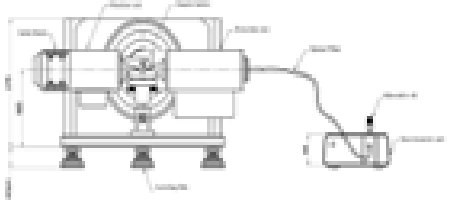
Ellipsometry is a highly sensitive technique for thin film analysis. The principle relies on the changes in the polarization state of light when reflecting from a surface. To characterize the polarization state, corresponding to the direction of the electric filed of the electromagnetic wave; two directions are chosen as reference, p-direction (parallel) and sdirection (perpendicular). The reflected light has phase changes that are different for p-direction and s-direction. Ellipsometry measure this state of polarization;

$$p = r_p / r_s = \tan \Psi e^{i\Delta}$$

Where Ψ and Δ are the amplitude ratio and phase shift of the p and s components respectively. Since ellipsometry measures ratio of two values, it is very accurate and repeatable.

Specification

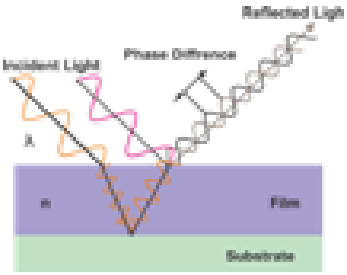
Spectral range	:	450 - 800 nm
Detector	:	CCD
Resolution	:	2 nm
Light source	:	Halogen lamp
Incident Angle	:	50-75 degree(Resolution: 0.1 degree, Automated operation)
Thickness Measurement	:	0.1nm - 10micron Range
Resolution of film thickness	:	0.01nm
Resolution of measured R.I	:	0.001
Sample alignment	:	Semi-automated (optical detection) with manual 10mm height adjustment and tilt
Sample stage features	:	X - Y translation over 150 x 150mm (optional)
Measurable film parameters	:	Refractive index, extinction coefficient, absorption coefficient and film thickness





Thin film Spectroscopic Reflectometer

Model: HO-NNSR-01



Thin Film Spectroscopic Reflectometer is a fundamental instrument used for the analysis of thin film thickness in industry and research. Holmarc's TFSR Model No: HO-ED-TH- 04 is able to analyze thin film's thickness, complex refractive index and surface roughness with high speed and repeatability. TFSR theory works with complex matrix form of Fresnel equations for reflectance and transmittance. Absolute reflectance spectroscopy is the principle behind Reflectometer; which is the ratio of the intensity of the reflected light beam (usually monochromatic) to the intensity of the incident beam.

Light beam normally incident on the sample surface in turn reflect from top and bottom of the thin film surfaces which get interfered and is directed through optical fiber to CCD attached spectrometer via computer. On the monitor we get spectrogram with interference oscillations directly proportional to the thin film thickness.

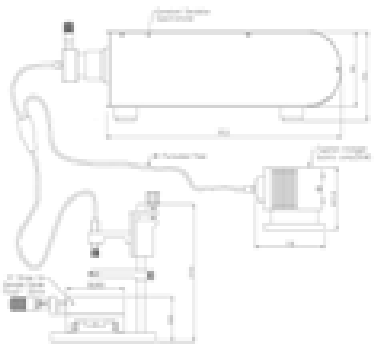
Holmarc's Reflectometer can be used to analyze single, free standing and rough layer thickness of various stacks such as di-electric, crystalline, amorphous, metallic and absorbing samples. Roughness treatment is done with EMA modeling.

Specification

Film thickness range	:	20 nm - 35 μm
Reflectance wavelength range	:	400 nm - 850 nm
Transmittance / absorbance range	:	0 - 100% (Customized)
Light source	:	Tungsten Halogen Quartz Lamp, 50W
Detector	:	CCD linear array, 3648 pixels
Spectrometer	:	Grating spectrometer
Precision typically for SiO2 on NSF - 66	:	Precision typically for SiO2 on NSF - 66
Accuracy for same sample	:	$\pm$ 2 nm
Optical Power	:	50 W
Light spot size	:	2 mm
Optical fiber	:	Multimode Bi-furcated fiber with SMA fiber coupler
Reference Sample	:	Polished NSF - 66 / Float Glass (Microscopic slide 1 mm)
Standard Sample	:	ITO thin film on float glass, SiO2 thin film on NSF - 66 Substrate
Measuring modes	:	Curve fitting / Regression Algorithms, FFT, FFT + Curve Fit
Dispersion formulas	:	Cauchy's, Sellmeiers & Empirical Models
Material library	:	Extendable material user library
EMA models	:	Linear EMA, Bruggemann, Maxwell Garnett, Lorentz - Lorenz models
Material Library	:	Extendable Material user library
PC Interface	:	USB

Features

- Analyze single layer films
- User extendable materials library
- Data can be saved as an Excel or text file
- Parameterized models
- Advanced mathematical fitting algorithm
- FFT based thickness measurement
- Extraction of thickness and optical constants
- Fiber optic probe for reflectance measurements at normal incident angle
- CCD linear array image sensor for simultaneous measurement of reflectance at each wavelength





Theta 2 theta advanced Spectrophotometer

Model: HO-SPA-3411D / HO-SPA-1990

The need for reliable measurement techniques for optical characterisation of thin films is growing. HOLMARC's Theta 2 Theta Spectrophotometer is a useful tool for characterizing the absorption, transmission and reflectivity of a variety of scientifically important materials, such as pigments, coatings, windows, and filters.

Automated theta 2 theta goniometer tool is used for variable angle spectroscopy, measuring absolute reflectance and transmittance of samples at different angles for characterization of the optical or electronic properties of materials. Reflectance measurements can measure color of a sample or examine differences between objects for sorting and quality control.

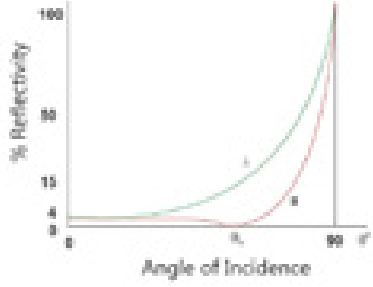
This advanced spectrophotometer gives precise measurements of spectral parameters such as reflection, transmission, and optical density in all spectral range of UV, VIS and NIR. Spectral transmission and reflection measurements at any desired angle with a resolution of 0.5 can be carried out with this spectrophotometer. Two reserch models are available for angular photometric measurements HO-SPA-1990P and HO-SPA-3411D.

The model:HO-SPA-1990P is a scientific grade photometer equipped with high sensitive silicon photodiode as detector. Angles for illumination and measurement can be set independently. The device employs classic Czerny - Turner monochromator design, which ensures low stray light. It uses 1200 lines/mm blazed holographic grating as the dispersion element, providing high wavelength resolution.

It also employs a sigma delta ADC of 16 bit resolution, for photometric measurements. Customized accessories are available to address individual application requirements.

The software developed for this instrument has facilities for setting up and calibration in addition to scanning and manual readout. Scanning is possible for a desired wavelength range too. This feature can save time whenever full wavelength range scan is not necessary.

The software stores and displays the data acquired on MS Excel sheet. This helps to plot graph with ease whenever required. A variety of accessories are included such as test tube holder, temperature control holder, long path length cuvette holder & multiple cell holder, to enhance different application needs.



Features

- **Specially designed for optical characterization**
- **Ideal for reflectance, transmission, absorp–tion and optical density measurements.**
- **Design optimized for low stray light.**
- **Interchangeable holders for solid, liquid and thin film samples.**

Specifications

Model	HO-SPA-3411D	HO-SPA-1990P
Bandwidth	1nm	0.5nm
Optical system	C-T monochromator, 1200 l/mm holographic grating	
Wavelength range	340 ~1100nm	190 ~ 900nm
Photometric method	Transmittance,Absorbance,Concentration	
Wavelength accuracy	±0.5nm	
Wavelength repeatability	±0.1nm	
Absorbance range	±0.002A (0 ~ 0.5A), ±0.004A (0.5 ~ 1A), ±0.3% T	
Photometric accuracy	≤0.001A (0 ~ 0.5A), ≤0.002A (0.5 ~ 1A), ±0.1% T	
Stray light	≤0.05% T	
Baseline straightness	±0.002A	
Detector	Si-Photodiode	
Light source	Quartz Halogen Lamp	Deuterium/Halogen
Cell holder	Two-position 10mm standard cuvette holder	
Theta 2 Theta measurements	Goniometer for Angular Measurements Type : Theta 2 Theta Measuring Stage Sample Holder : Up to 50x50mm size, Custom Size Available Angular Measurement Range : 30° - 180° Positioning Resolution : 0.5°	
Control Mode	PC control Software	



Solar Cell



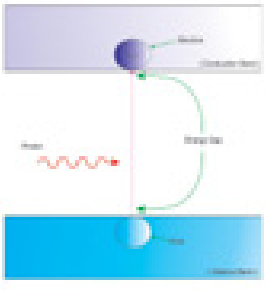
Solar Cell Characterization Apparatus

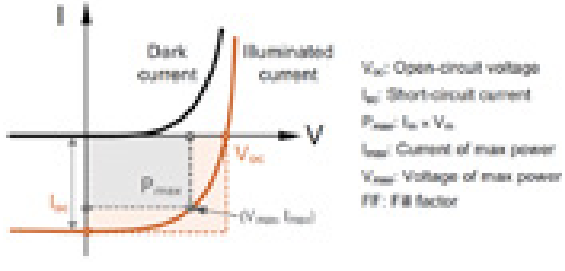
Model: HO-ED-SC-01

Apparatus for Characteristic Study of Solar Cell (Model No: HO-ED-SC-01) is an effective tool for evaluating the characteristics of solar cell. This apparatus allows students in introductory physics course to plot I-V characteristics of a solar cell by a simple experiment. Important parameters such as fill factor, short circuit current, and open circuit voltage can be measured.

The apparatus consist of variable DC power supply, LED, solar cell. A variable DC power supply of -5v to 5 v is used for onducting the experiment. Light source is provided by LED. The illumination intensity of the LED can be controlled. LED and solar cell is fixed to metallic casings for ease of placing in the experimental set up. The terminals of LED and solar cell are taken out through an insulated wire, which has a pair of alligator clips or a stereo connector.

Solar cells can absorb electromagnetic waves and convert the absorbed photon energy into electrical energy. It is a semiconductor device, which generates an emf when illuminated by light. When the energy of the incident photon is larger than the band gap, the photon can be absorbed by the semiconductor to create an electron-hole pair. The electrons and holes are then driven by the internal electric field in the diode to produce a photocurrent (light-generated current).





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Experiment Possible

- **To plot the I - V characteristic curve of a solar cell**

Set the solar cell facing towards a light source (LED) and bring the intensity of LED to the maximum using its rotary knob. Increase the voltage by changing the current through the solar cell and record current corresponding to the voltage. Plot the IV curve with current in the vertical axis, and voltage in the horizontal axis. This is the I-V characteristic curve of a solar cell.

- **To observe the relationship of current, voltage and power in a solar cell, and to identify the maximum power point, the short circuit current, and the open circuit voltage**

Plot the IV curve with current in the vertical axis, and voltage in the horizontal axis. Note open circuit voltage (when current = 0), the short circuit current (when voltage = 0).
The current and voltage of each data set is then multiplied together giving a value for power. Plot another graph, with power in the vertical axis, and the voltage in the horizontal axis. This is the power graph. Indicate the



maximum power in the power curve, and find the respective voltage and current.

- **To evaluate fill factor of the solar cell**

The filling factor (FF) is defined to be Pm / (Isc.Voc), which represents an important parameter used to evaluate the quality of the solar cell.
Pm is the maximum output power of the solar cell, i.e., the maximum value of I * V .
Short-circuit current (Isc) is the output current of the solar cell when the external circuit is shorted, i.e., zero load resistance.
Open-circuit voltage (Voc) is the output voltage of the solar cell when the external circuit is open, i.e., infinite load resistance. Voc is also referred to as photovoltaic voltage.

Scope of Supply

Solar Cell Characterization control unit

Model No.	:	ED-SC-01-SCCU
Voltage	:	0 - 5V
Input	:	230 V AC / 50 Hz
Quantity	:	1 No.



Kinematic LED mount

Model No.	:	ED-SC-01-KLM
Material	:	Black anodized Aluminum alloy
Adjustments	:	Using 80 tpi lead screws
Adjustment Range	:	+/-3 degrees
Quantity	:	1 Nos.



LED module

Model No.	:	ED-SC-01-LED
LED power	:	1 W
Color	:	White
Quantity	:	1 No.



Optical Rail

Model No.	:	ED-SC-01-OR
Length	:	500mm
Material	:	Black anodized Aluminum alloy
Quantity	:	1 No.



Cell Mount

Model No.	:	ED-SC-01-CM
Material	:	Black anodized Aluminum alloy
Diameter	:	30 mm
Quantity	:	1 No. each



Solar cell

Model No.	:	ED-SC-01-SC
Quantity	:	1 No.



AC Power code

Model No.	:	ED-SC-01-APC
Type	:	3 core 3 Pin
Quantity	:	1 No.



Spectral Response Measurement Apparatus

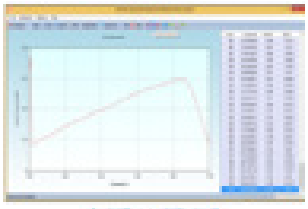
Model: HO-AE-SR18

Spectral response is the ratio of the current generated by the solar cell to the power incident on the solar cell or a detector. Spectral response measurement apparatus measures short circuit current of solar cell at selected wavelengths over a broad range of wavelengths.

HOLMARC's Spectral response measurement system (Model NO: HOAE-SR18) is capable of measuring the spectral response of any kind of photovoltaic devices, such as single or multi junction solar cells or sensors in an area up to 30mm^2. Measurements can be taken in the wavelength range from 360 to 1100 nm at a resolution of 1nm. Current, normalized with respect to light power versus wavelength gives spectral response of the cell. Spectral response is directly related to external quantum efficiency. The measurements can be performed by interfacing to a computer. Third party Source Measure Unit with (SMU) can be used for the measurement of the current through, and also to apply the voltage to, the sample. Holmarc also supply a complete solar cell characterization system (Model HO-SC-QEIV) which has internal source measure circuit to perform both IV and spectral response measurements.

Features

- **The system can be used in standalone mode**
- **PC software for user interface**
- **Plot browser to read spectral response at each wavelength**
- **Wavelength range between 360 to 1100 nm**
- **Stepping motor scanning for precision wavelength positioning**



Reference Photodiode specs

Active area	:	5.8 x 5.8 mm
Wavelength Range	:	360 nm to 1100 nm
Wavelength of Peak Sensitivity	:	960 nm
Photosensitivity	:	0.58 A/W at 960 nm
Typical Short Circuit Current at 100lx	:	31 Micro Ampere
Dark Current	:	50 pA
Rise Time	:	10 micro second

Software Features

- Controls the monochromator
- Performs scans of user defined wavelength range
- Plots spectral response of the sample at a specified wavelength range
- Export the results to spreadsheet file
- Operating system requirement: Windows XP / 7/ 8 / 8.1 / 10



Specifications

Light source	:	50W Tungsten Halogen lamp
Wavelength Range	:	360 nm to 1100 nm (Optional - up to 2000 nm)
Monochromator	:	Czerny - Turner
Optical Design		
Main Mirrors	:	Parabolic type with Enhanced Aluminum Coating
Focal Length	:	150 mm
Dispersion Element	:	Holographic Grating
Grating Density	:	1200 l / mm
Filter Unit	:	Higher order cut off filter wheel
Sample size	:	Up to 30 mm x 30 mm

Two probes, one movable in X axis and the other in Y axis, to make contact with the sample
Alternative contact option through alligator clips
Built-in transimpedance amplifier for the measurement of photocurrent through the sample

User Interface	:	PC software
PC Interface	:	RS232 or USB (Using a USB to serial converter)

Conductivity Cell Measurement Setup

Model: HO-AE-CCM18

HOLMARC'S Model: HO-ED-SC-05 is a computerized conductivity setup to measure the conductivity of the semiconducting thin film samples by varying temperature in vacuum.

Temperature of the sample at the time of measurement can be set at a range of ambient to 150°C. The conductivity is measured at different points of temperatures, by applying a voltage range from 0 - 300 V and measuring the resulting current. A curve of current is recorded and plotted against temperature by the software. The process is carried out inside a vacuum chamber of up to 10-2 mbar vacuum pressure. Rotary vacuum pump is supplied along with the instrument.

Experiment Possible

- **To measure the conductivity of semiconducting thin film samples**

Semiconductors have various useful properties that can be exploited for the realization of a large number of high performance devices in fields such as electronics and optoelectronics. Many novel semiconductors, especially in the form of thin films, are continually being developed. As the film becomes thinner, the properties acquire greater importance in the miniaturization of elements such as resistors, transistors, capacitors, and solar cells.

Specification

Temperature range	:	Ambient to 150°C
Sample holder diameter	:	5 cm
Drive voltage	:	0 to 300 V
Measurement resolution	:	0.1 nA
Measurement accuracy	:	1 nA
PC interface	:	RS232

Application

- Water quality testing for regulatory compliance.
- Chemical manufacturing to ensure product quality.
- Food production for safety and quality control.
- Environmental monitoring for ecosystem health.
- Pharmaceutical manufacturing for drug safety.



Astro Physics



Solar Characteristics Measurement Set Up

Model: HO-ED-AP-01

Holmarc has introduced new experiments for solar physics. It is a branch of astrophysics that specializes in exploiting and explaining the detailed measurements that are possible only for our closest star.

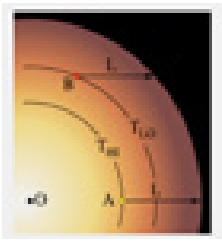
The base of all experiments in this kit is to study our Sun. Because the Sun is uniquely situated for close-range observation (other stars cannot be resolved with anything like the spatial or temporal resolution that the Sun can) there is a split between the related discipline of observational astrophysics (of distant stars) and observational solar physics.

Holmarc Newtonian Reflective Telescopes For Solar Observation

Model	:	HO-AAP-SV315SP Reflective Telescopes
		300 mm Dia 1500 mm FL Newtonian Telescope
Optics	:	High performance diffraction free optics
Coating	:	Metallic Aluminium Coating with SiO over coat for durability
Movement	:	Manual Horizontal and vertical scanning
Filter	:	Equipped with Solar Filter and Large sensor CCD Camera
Model	:	HO-AAP-SV418SP Reflective Telescopes
	:	400 mm Dia 1800 mm FL Newtonian Telescope
Optics	:	High performance diffraction free optics
Coating	:	Metallic Aluminium Coating with SiO over coat for durability
Movement	:	Manual Horizontal and vertical scanning
Filter	:	Equipped with Solar Filter and Large sensor CCD Camera
Model	:	HO-AAP-SV522SP Reflective Telescopes
		500 mm Dia 2200 mm FL Automated Newtonian Telescope
Optics	:	High performance diffraction free optics
Coating	:	Metallic Aluminium Coating with SiO over coat for durability
Movement	:	Manual Horizontal and vertical scanning
Filter	:	Equipped with Solar Filter and Large sensor CCD Camera

Experiment Examples

Solar Limb Darkening Effect
Sun Spot & Flares
Solar Radiation Spectrum
Measurement of Sunshine Duration
Atmospheric Extinction Study
Perihelion & Aphelion
Solar Eclipse & Other transits



Solar Limb Darkening Effect

Limb darkening refers to the diminishing of intensity in the image of a star as the star moves from the center of the image to the edge or “limb” of the image. Limb darkening occurs as the result of two effects:

1. The density of the star diminishes as the distance from the center increases.
2. The temperature of the star diminishes as the distance from the center increases.

Sun Spot

Sunspots are temporary phenomena on the photosphere of the Sun that appear visibly as dark spots compared to surrounding regions. They are caused by intense magnetic activity, which inhibits convection by an effect comparable to the eddy current brake, forming areas of reduced surface temperature. They usually appear as pairs, with each sunspot having the opposite magnetic pole to the other.



Although they are at temperatures of roughly 2700–4200°C, the contrast with the surrounding material at about 5,500°C leaves them clearly visible as dark spots, as the luminous intensity of a heated black body (closely approximated by the photosphere) is a function of temperature to the fourth power. If the sunspot is isolated from the surrounding photosphere it would be brighter than the Moon. Sunspots expand and contract as they move across the surface of the Sun and can be as small as 16 kilometers (10 mi) and as large as 160,000 kilometers (100,000 mi) in diameter, making the larger ones visible from Earth without the aid of a telescope.

Solar Flares



A solar flare is a sudden brightening observed over the Sun’s surface or 25 the solar limb, that is interpreted as a large energy release up to 6 × 10 joules of energy (about a sixth of the total energy output of the Sun in every second). The frequency of occurrence of solar flares varies, from several per day when the Sun is particularly “active” to less than one per week when the Sun is “quiet”, following the 11-year cycle (the solar cycle). Large flares are less frequent than smaller ones.

Solar Radiation Spectrum



Solar radiation is partly absorbed, scattered and reflected by molecules, aerosols, water vapor and clouds as it passes through the atmosphere. The solar beam arriving directly at the earth’s surface is called direct solar radiation. Direct solar radiation is observed from sunrise to sunset.
Using a solar radiation scanning spectrometer solar radiation spectrum is continuously monitored and recorded from a range of 350-1100nm. With the help of motorized solar tracker, solar spectrum in various zenith angles can be recorded (looking vertically, the zenith angle is 0°, and is 90° at the horizon).
The software developed for the instrument has facilities for setting up and calibration in addition to scanning and manual readout. Scanning is possible for desired wavelength range as well. This feature can save time whenever full wavelength range scan is not necessary. The software saves and displays the data acquired on MS Excel sheet. This helps to plot graph with ease whenever required.

Measurement of Sunshine Duration

Sun photometer unit with tracking mechanism is used for this application. Using photodiode the light intensity of solar radiation is measured

Atmospheric Extinction Study



Atmospheric extinction is the reduction in brightness of stellar objects as their photons pass through our atmosphere. Two different mechanisms contribute to extinction: absorption and scattering. Normally, most of the extinction in the Earth's atmosphere is due to scattering; absorption becomes important when the air is full of smoke. Extinction is much stronger in blue light than in red light. This effect is usually called "reddening".
Extinction values for different wavelengths in various angles (looking vertically, the zenith angle is 0°, and is 90° at the horizon) can be measured using Solar scope with tracker and narrow bandpass interference filters. Four interference filters can be accommodated in the Solar scope.

Perihelion & Aphelion and Perigee & Apogee Measurements

Aphelion - perihelion and perigee - apogee. Both mean different things. Perihelion and aphelion is about the minimum and maximum distance between Earth and Sun, and the perigee and apogee, refers to the minimum and maximum distance between the Moon and Earth.

Distance between Earth and Sun

The average distance is about 150 million kilometers (149.6). This distance of 149.6, is defined as an astronomical unit or 1 AU, and is equal to about 8.2 light minutes, because light from the Sun, takes about 8 minutes to reach the Earth. In fact Earth's orbit is not perfectly circular, so the distance between Earth and Sun varies slightly over the year, from a minimum of 147,100,000 km to a maximum of 152,100,000 km. So semimajor axis of Earth's orbit is 149597887.5 km (149.6). When closest to the Sun (or perihelion), the planet is 147,098,074 km, or 0.98 AU. At the farthest point from the Sun (or aphelion) is 152,097,701 km or 1.02 AU.

Solar eclipse

As seen from the Earth, a solar eclipse occurs when the Moon passes between the Sun and Earth, and the Moon fully or partially blocks ("occults") the Sun. This can happen only at new moon, when the Sun and the Moon are in conjunction as seen from Earth in an alignment. In a total eclipse, the disk of the Sun is fully obscured by the Moon. In partial and annular eclipses, only part of the Sun is obscured

A Total eclipse in the umbra
B Annular eclipse in the antumbra
C Partial eclipse in the penumbra

Transit of planet

A transit of planet across the Sun takes place when the planet passes directly between the Sun and Earth, becoming visible against the solar disc (and hence obscuring a small portion of it). During a transit, planet can be seen from Earth as a small black disc moving across the face of the Sun. The duration of such transit is usually measured in hours. A transit is similar to a solar eclipse by the Moon

Astronomy and Astrophysics Experiment Set up

Model: HO-ED-AP-04

In this experiment setup for optical astronomy, we use high resolution telescope, high resolution spectrometer and charge-coupled devices (CCDs). Main observations are in the range of 400nm to 900 nm wavelength. The same equipment can as well be used to observe near-ultraviolet and nearinfrared radiation.

Experiments are designed for observational practice of celestial objects by using telescope and other astronomical measuring apparatus. The study of astronomy with direct experiments is not always feasible, as properties of distant universe are mostly unknown. However, this is partly compensated by the fact that astronomers have a vast number of visible examples of stellar phenomena that can be examined. This allows observational data to be plotted on graphs and general trends recorded. Nearby examples of specific phenomena, such as variable stars, can be used to infer the behavior of more distant representatives. Those distant yardsticks can then be employed to measure other phenomena in that neighborhood, including the distance to a galaxy.

Recommended Holmarc Newtonian Reflective Telescopes For Stellar Measurements

Model	HO-AAP-SV315 Reflective Telescopes
Optics	High performance diffraction free optics
Coating	Metallic Aluminium Coating with SiO over coat for durability
Movement	Manual Horizontal and vertical scanning
Additional Fetaures	Filter wheel with ND Filters, Colour filter holder, Laser guiding unit for LIDAR up gradation and star spotting (DPSS Laser), Scanning Software with software development kit (Visual C++ [MatLAB and LAB View Command can be executed]) etc

Model	HO-AAP-SV418 Reflective Telescopes
	400mm Dia 1800mm FL Automated Newtonian Telescope
Optics	High performance diffraction free optics
Coating	Metallic Aluminium Coating with SiO over coat for durability
Movement	Manual Horizontal and vertical scanning
Additional Fetaures	Filter wheel with ND Filters, Colour filter holder, Laser guiding unit for LIDAR up gradation and star spotting (DPSS Laser), Scanning Software with software development kit (Visual C++ [MatLAB and LAB View Command can be executed]) etc.

Model	HO-AAP-SV522 Reflective Telescopes
	500mm Dia 2200mm FL Automated Newtonian Telescope
Optics	High performance diffraction free optics
Coating	Metallic Aluminium Coating with SiO over coat for durability
Movement	Manual Horizontal and vertical scanning
Additional Fetaures	Filter wheel with ND Filters, Colour filter holder, Laser guiding unit for LIDAR up gradation and star spotting (DPSS Laser), Scanning Software with software development kit (Visual C++ [MatLAB and LAB View Command can be executed]) etc.



Experiment Possible

- Characteristics study of a CCD camera
- To study the solar limb darkening effect
- Polar alignment of an astronomical telescope
- To estimate the relative magnitude of a group of stars
- To study the atmospheric extinction for different colors
- To study the effective temperature of stars by B-V photometry
- To estimate the night sky brightness with a photometer
- To estimate the distance to the moon by parallax method
- To estimate the distance to a Cepheid variable
- To study the variability of delta Scuti type stars
- To study the variability of RS CVn binaries
- Polarization of day/moon light Rayleigh scattering



Solid-state stellar photometer



1MP 1.8” Cooled CCD camera

Temperature determination of an artificial star by photometry

Model HO-ED-AAP-TAS

HOLMARC's Experiment setup for estimating temperature of an artificial star by photometry, helps us to find the surface temperature of a tungsten halogen lamp. And also a demonstration of the Wein's displacement law which says that "As the temperature of a star increases, the peak of its continuous spectrum shifts to shorter (bluer)".We can study the wavelength shifting in the spectrum of a halogen lamp as the surface temperature of the lamp varies. We are going through the following two experiments using our setup Model HO-ED-AAP-TAS Please check whether the following

B-V Photometry

A way to estimate the surface temperature of a star is by using filters. More specifically, in 1953 Johnson and Morgan introduced a system of filters U (Ultraviolet, 364nm), B (Blue, 442nm) and V (Visible, 540nm) called the UBV photometric system. Letting the light of a star to pass through a filter we measure the flux of the passing light and we come up with three numbers FU, FB and FV which correspond to the measured fluxes. By having the fluxes for Blue and Visual Filter we can calculate the B-V index.

As many researchers showed there is a relation between the B-V index and the surface temperature of a star. Furthermore, Ballesteros, provided a formula by which someone can estimate the surface temperature using flux data from any two filters of different wavelengths.

$$B - V = -2.5 \log(F_B/F_V)$$

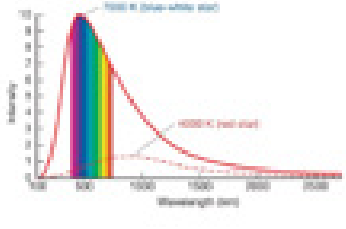
But since the most common photometric system is the UBV photometric system, Ballesteros provided as an example a simple equation from which someone can estimate a star's surface temperature by using the B - V index

$$T = 4600(1/(0.92(B-V)+1.7)+1/(0.92(B-V)+0.62))$$

The Experiments Possible

- Verification of Weins displacemet law(black-body radiation curve for differenttemperatures will peak at different wavelengths that are inversely proportional to the temperature).
- Finding the surface temperature of an artificial star(halogen lamp) using b-v index.

A black body can be defined as an object which absorbs and emits all frequencies of radiation. When it is at thermal equilibrium it is a perfect emitter. But the emitted light is not at the same frequency since the light was initially absorbed rather it will be distributed between different frequencies forming a 'blackbody spectrum'. The characterization studies of a blackbody spectrum have gone through different mile stones such as Rayleigh – Jean's law, Wein's displacement law and at last the Planck's law. It is interesting to study the relationship between the intensity of the blackbody





we can make use of a Tungsten Halogen lamp for creating a blackbody spectrum. The usage of tungsten Halogen lamp is because we get smooth and stable spectrum output, and is useful in both visible and near infrared (NIR) region. Therefore we can have a demonstration to Wein's displacement law using the tungsten halogen lamp spectrum, the total radiation output increases like the fourth power of the material temperature. As the temperature of the tungsten increases the curve moves towards shorter temperature. We can change the temperature of the tungsten by changing the voltage applied to the lamp.

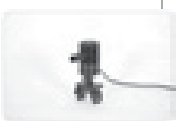
Scope of Supply

Optical Rail



Model No.	:	ED-AAP-TAS-OR
Length	:	500mm
Material	:	Black anodized Aluminium alloy

Halogen lamp with collimating lens



Model No.	:	ED-AAP-TAS-CL
Lamp	:	Quartz halogen Lamp (20 W)
Supply	:	Constant current switched mode power supply
Lamp Housing	:	Forced Air-cooled type
Construction	:	Aluminium
Collimating and collection optic Diameter	:	50 mm
Focal length	:	150mm



Collection optics assembly

Model No.	:	ED-AAP-TAS-OA
Material	:	BK7 or equivalent
Effective Focal Length Tolerance	:	ED-AAP-TAS- ± 1%
Diameter Tolerance	:	+ 0.0, - 0.2 mm
Surface Quality	:	40 - 20 (scratch-dig)

Spectrometer



Model No.	:	ED-AAP-TAS-CDS
Wavelength Range	:	380-1050 nm
Input fiber connector	:	SMA 905
Stray light	:	<0.06%@532 nm (<0.1% overall)
Detector	:	Toshiba TCD1304AP Linear CCD Array
Pixel number	:	3648
Pixel Well Depth	:	100,00 electrons
Signal-to-noise Ratio	:	1000:1 (at full scale)
A/D Resolution	:	16 bit
Integration Time	:	0.1 to 6500 ms
Frame rate	:	up to 138 fps
PC interface	:	USB 2.0
Software	:	Spectra QSR V2.26 software (Free with spectrometer)

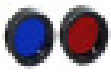
Optical fibre



Model No.	:	ED-AAP-TAS-MMOF
Fiber Diameter	:	1 mm
Length	:	1 m

SMA coupled

Colour filters



Model No.	:	ED-AAP-TAS-CF

B (Blue, 430 nm) and V (Visible, 530 nm)

Sources and Detectors



Diode Laser

Red & Green diode laser

Holmarc's diode laser module consists of a laser diode along with collimating optics enclosed in a metallic case and a power supply with Automatic Power Control (APC). The laser module has 25mm diameter and 50mm length so that it can be held conveniently in a kinematic or rigid mount. Collimating lens is an aspheric lens with anti-reflection coating. The soft start feature of the power supply assures smooth switch on and long life.



Diode Laser

The beam profile of diode laser is elliptical shape with dimension nearly 6mm x 3mm. It produces coherent projection of light in the visible to infrared range.
It consists of a laser diode along with collimated beam condition. The specifications are given below.

Model No	3mW Red diode laser	5mW Red diode laser	5mW Green diode laser
	DL-R-3	DL-R-5	DL-G-5
Wavelength	650 nm	650 nm	532 nm
Optical Power	3 mW	5 mW	5 mW
Supply Voltage	230 VAC / 110 VAC	230 VAC / 110 VAC	230 VAC / 110 VAC
Operating Current	28 mA	36 mA	< 300 mA
Operating Temperature	10°C~35°C	10°C~35°C	10°C~35°C
Storage Temperature	0°C~50°C	0°C~50°C	0°C~50°C
Spot Size	< 6.5 mm	< 6.5 mm	< 6.5 mm
Lifetime	> 3000 hrs	> 3000 hrs	> 3000 hrs

DPSS Laser

Model No: DPSS-G-100

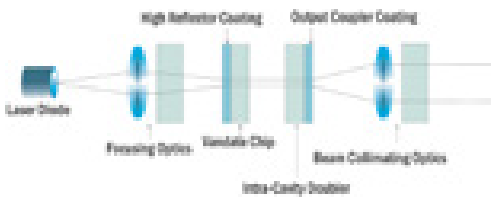


Diode Pumped Solid State (DPSS) lasers are more compact and efficient compared to gas lasers. In DPSS lasers, output emission is achieved by pumping a solid gain medium. Green laser light sources are popular in medical devices and biological research. Green is a primary color and is aesthetically attractive. They exhibit excellent output stability, exceptional mode purity and extremely low power consumption. They are an ideal choice for many laboratory applications.

The power supply and laser head are both compact and light weight. There are mounting holes to facilitate easy mounting.

Specification

Output Power @ 25°C	:	1 ~ 100 mW
Operating Current	:	< 1200 mA
Operation Mode	:	CW 532 nm, TEMoo
Line Width	:	< 0.1 nm
Linear Polarization	:	> 100 : 1
Beam Diameter (1 / e2)	:	< 1.2mm
Beam Divergence (1 / e2, Full Angle)	:	< 1.5 mrad
Power Stability	:	< 5% (RMS, over 2 hrs)
Point Stability	:	0.0 5mrad
Operating Temperature	:	10°C ~ 30°C
Expected Operating Lifetime	:	> 5000 hours
Beam Roundness	:	> 95%



DPSS Laser Mount



Model No HOM-DPSS-G-15090
150 x 90 mm Platform Size
Tilting range +/- 2 degrees
Driven by 80 tpi leadscrews

M6 & M4 tapped holes for mounting
Kinematic Platform for tilt & linear Adjustments
These mounts are manufactured with mounting holes suitable for DPSS lasers. Three lead screws supported by the kinematic design of the mount enables tilt as well as linear adjustments. The base of the mount has holes suitable for breadboard mounting.

Lamp Houses

Model No: HO-SP-MSTH-06

HOLMARC offers a number of light sources for the spectral range of 200 - 2000nm which can be mounted directly to our monochromators or can be used independently. With the appropriate adapters, some of the light sources can be mounted to our monochromators along with optical chopper or filter wheel. Additional adapters and interface devices are available for focusing and launching the light directly into optical fibers.



HO-LH-DT-02 HO-LH-MD HO-LH-SVC HO-LH-MV HO-LH-ODT-08



Deuterium
Spectral Range : 200 - 400nm
Good UV lamp, generally with higher output than Xenon lamps



Tungsten Halogen
Spectral Range : 350 - 2400nm
Continuous spectral output.
More stable than Xenon lamps

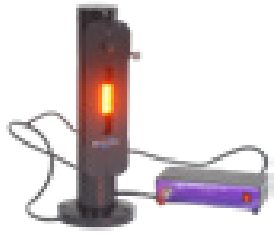
Xenon
Spectral Range : 200 - 2500nm
: 250 - 2500nm (Ozone free version)

Mercury Vapor Lamp
Model No : HO-LH-MV100W



Mercury-vapor lamp is a gas discharge lamp that uses mercury in an excited state to produce light. They offer long life time as well as intense lighting for spectral applications.

Sodium Vapor Lamp
Model No : HO-LH-SV35W, HO-LH-SVC



Sodium vapor lamp is a gas discharge lamp that uses sodium in an excited state to produce light. The lowpressure sodium lamp has remarkably high luminous efficiency. The radiation is nearly mono-chromatic, yellow in color.

Multi Spectrum Tube Housing for spectral calibration
Model No: HO-SP-MSTH-06



Holmarc's Multi Spectrum Tube Housing holds six spectrum discharge tubes simultaneously. It can quickly switch from one gas to another without displacing the lamp housing. Power supply is common for all discharge tubes, kept inside the unit.

The gas tubes are permanently enclosed to protect the tubes from breakage. Optical fiber can be directly attached to this unit for fiber optic spectrometers

Lamp Houses for Spectral Study

Xenon Arc lamps are excellent sources of continuous light. The bright emission from short arc between the anode and cathode makes these lamps high intensity point sources, capable of being collimated with the proper lens configuration or re imaged onto a fiber bundle.

Xenon arc lamp Specifications

		150 W Model	300W
Model No.		HO-SP-XE150	HO-SP-XE300
Quartz Type	:	Ozone Free	Ozone Free
Wavelength Range	:	250 - 2500 nm	250 - 2500 nm
Wattage	:	150 W	300 W
Voltage	:	18 V	20 V
Amperage	:	8.5 A	15 A
Current Range	:	7 - 8 A	13 - 16 A
Open Circuit Voltage	:	60 V	60 V
Luminous Flux	:	2900	7000
Luminous Intensity	:	290	700
Average Luminance	:	20000 lm	27000 lm
Overall Length	:	145 mm	174 mm
Lamp Length	:	125 mm	150 mm
Tip to Shoulder Length	:	57 mm	63.5 mm
Bulb Diameter	:	20 mm	23.87 mm
Cathode / Anode Pin	:	M4 x 0.7	10-32 UNC-2B
Cathode / Anode Base	:	0.39	0.50
Arc Length	:	2 mm	2.54 mm
Lamp Housing	:	Forced Air Cooled	Forced Air Cooled
Construction	:	Metallic	Metallic



Xenon Arc lamps are excellent sources of continuous light. The bright emission from short arc between the anode and cathode makes these lamps high intensity point sources, capable of being collimated with the proper lens configuration or re imaged onto a fiber bundle.

Deuterium Lamp with power supply unit



Deuterium lamps are excellent sources of high intensity ultraviolet radiation ranging from 185nm to 400nm. Emission in visible and infrared regions are negligible. This makes deuterium lamps ideal sources for UV spectroscopy, and as UV spectral irradiance standards.

Deuterium Lamp Housing has condensing lens assembly that collects and collimates the lamp's radiation. Output is a 25mm diameter beam.

Specifications



Lamp specifications		
Lamp	:	Deuterium
Wavelength Range	:	185 - 400 nm
Powersupply	:	Fixed Constant Current Switch Mode Power Supply
Lamp Housing	:	Forced Air Cooled Type
Construction	:	Aluminum
Collimation & Collection Optics Dia	:	25 mm

Model	:	Source
HO-SP-DL20	:	20 W Deuterium
HO-SP-DHL20	:	20 W Deuterium & 20 W Halogen Lamp Selection by flip mirro

Quartz Halogen Lamp with power supply unit



Quartz Halogen lamps are popular alternative to arc lamps which have better output stability without strong UV light emission. Quartz Halogen lamps are perferable for radiometric and photometric applications as well as excitation sources of visible to NIR light. The lamp housing is equipped with cooling vents that allow convection currents to bathe the lamp with cool air during operation. A metallic lining inside the lamp house assists the spherical reflector to direct the maximum possible level of luminous flux into the collector lens system to the microscope optical train.

Lamp specifications

Lamp	:	Quartz Halogen
Wavelength Range	:	340 - 2700 nm
Power Supply	:	Constant Current Switch Mode Power Supply
Supply	:	Fixed
Lamp Housing	:	Forced Air Cooled Type
Optical Element	:	Concave metallic mirror for filament refocusing
Construction	:	Aluminum
Collimation & Collection Optics Dia	:	25 mm

Model	:	Wattage
HO-SP-QHL150	:	150W
HO-SP-QHL100	:	100W
HO-SP-QHL50	:	50W
HO-SP-QHL20	:	20W
HO-SP-QHL10	:	10W

Dual Gooseneck LED Illuminator - 4000 lumens

Model : HO-SP-DGL4000



Dual Gooseneck LED Illuminator has two flex and stay arms. These LED light units with intensity control give maximum light output of 4000 lumens. Each arm has 2000 lumens output white LED and focus lens. The arms are 300 mm long and there is on / off and dimmer switches to provide fine control. This unit exhibits good control and even illumination. Color temperature is 6000 degree kelvin.

LED High Bright LED Capsule

Model No: HO-HBL-Y
Y - Color - R/Y/B/G/W



For ease of mounting special ultra luminous intensity LED's are housed in metallic casing. The collimating optics in front of the LED helps to get focused beam to increase its lighting efficiency. As the LED is encased in a metallic capsule, the body acts as a heat sink. Brightness is adjustable continuously. This is ideal for a variety of illumination applications where collimated light is required. Various color options are available.

specifications

LED power	:	900 Lumen
Colour	:	Red, Blue, Green, White
Luminosity control	:	Front panel knob
LED capsule	:	Aluminium
Finish	:	Anodized
Power supply	:	Built-in
Power input	:	Aluminum
Collimation & Collection Optics Dia	:	230V / 50Hz

Deuterium Halogen Source

Holmarc's Deuterium Halogen source is a specially designed light source that covers 200 nm to 2500 nm wavelength range. In this compact lamp house both Deuterium and Halogen lights are combined to a single optical path using and motorized rotation mechanism. Output port provided with SMA connector for fiber coupling. High quality optical design delivers maximum light coupling to the optical fiber



This light source can be used as a UV-VIS-NIR source for different spectroscopic applications. Filter holder, shutter, cuvette / sample holder can be provided optionally.

Model No.	:	HO-HDL-01
Wavelength Range	:	190 nm - 2.5 μm
Source	:	Deuterium & Tungsten Halogen
Lamp Wattage	:	20W Deuterium & 20W halogen
Input Voltage	:	230 V

High Bright LED

Model No : HO-HBL-XY



Special ultra luminous intensity LED's are housed in metallic casing for ease of mounting. The collimating lens in front of the LED helps to get focused beam and increase it's lighting efficiency. As the LED is encased in a metallic capsule, the body acts as a heat sink. Brightness is continuously adjustable. Built-in constant current power supply provides consistent luminosity. They are ideal for a variety of illumination applications where collimated light is required. Various color options are available.

X - LED power - 1 / 3 Y - Color - R / Y / B / G / W

Mounted High Bright LED with variable power supply

Model No : HO-HBL-M-XY

Specification



LED power : 1 W, 3 W
Colour : Red, Yellow, Blue, Green, White
Luminosity control : Front panel knob
LED capsule : Aluminium
Finish : Anodized
Power supply : Built-in
Power input : 230 V / 50 Hz

Special ultra luminous intensity LED's are fixed to metallic casing provided with M6 thread for post mounting. The LED is encased in metallic cell so that the body acts as a heat sink. Brightness is continuously adjustable. Built-in constant current power supply provides consistent luminosity. Various color options are available. Light emitting angle is 120 degree. These LED's have long operating life and are available in red, yellow, blue, green and white.

Measurement Devices -Detector Output Measurement Unit

Model No : PS-D-LK

Specification



Measurement range : 0 - 199 μA / mA
Resolution : 0.1 μA / mA
Detector module : PPD-LK-PT
Detector : Photo Transistor
Detector supply : +5 V
Display : 3 digit, 7 segment LED
Power input : 230 V / 50 Hz

Detector Output Measurement Unit measures and displays the current flowing through a detector. It is used for the characteristics study of lasers and other light sources.

Optical Power Meter OPM Series

+/-5 % Accuracy
Silicon photodiode sensor



Specification



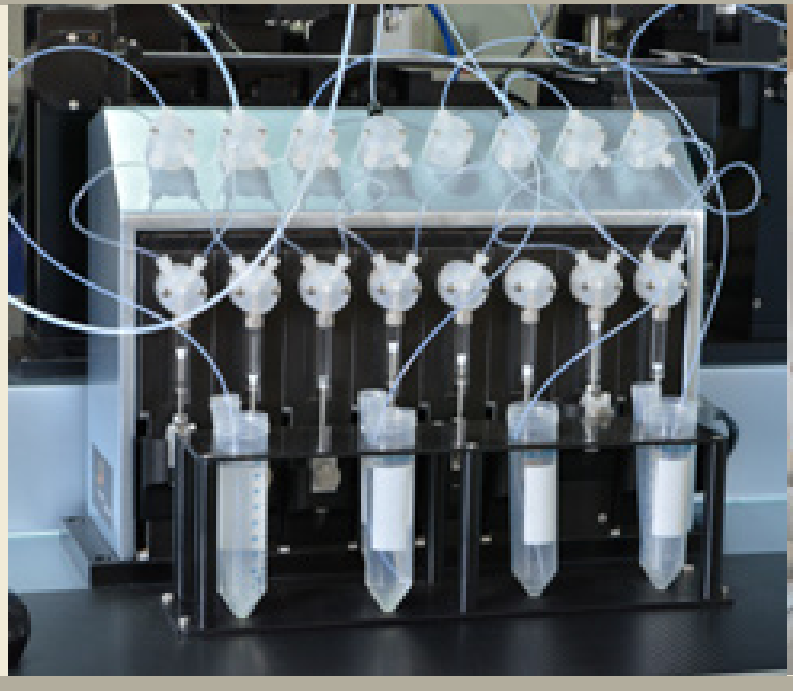
Sensor - Si photodiode (5.8 x 5.8 mm)
Display - Alphanumeric LCD or Touch Screen
Sampling rate - 2 times / sec
Measuring ranges - 20 μW, 200 μW, 2 mW & 20 mW
Accuracy - +/-5 %
Power input - 230 VAC

Model No.	HO-OPM-01A	HO-OPM-02A	HO-OPM-03	HO-OPM-04
Display	Alphanumeric LCD	Alphanumeric LCD	Touch Screen Interface	Touch Screen Interface
Wavelength range	400 nm to 1100 nm	200 nm to 1100 nm	400 nm to 1100 nm	200 nm to 1100 nm

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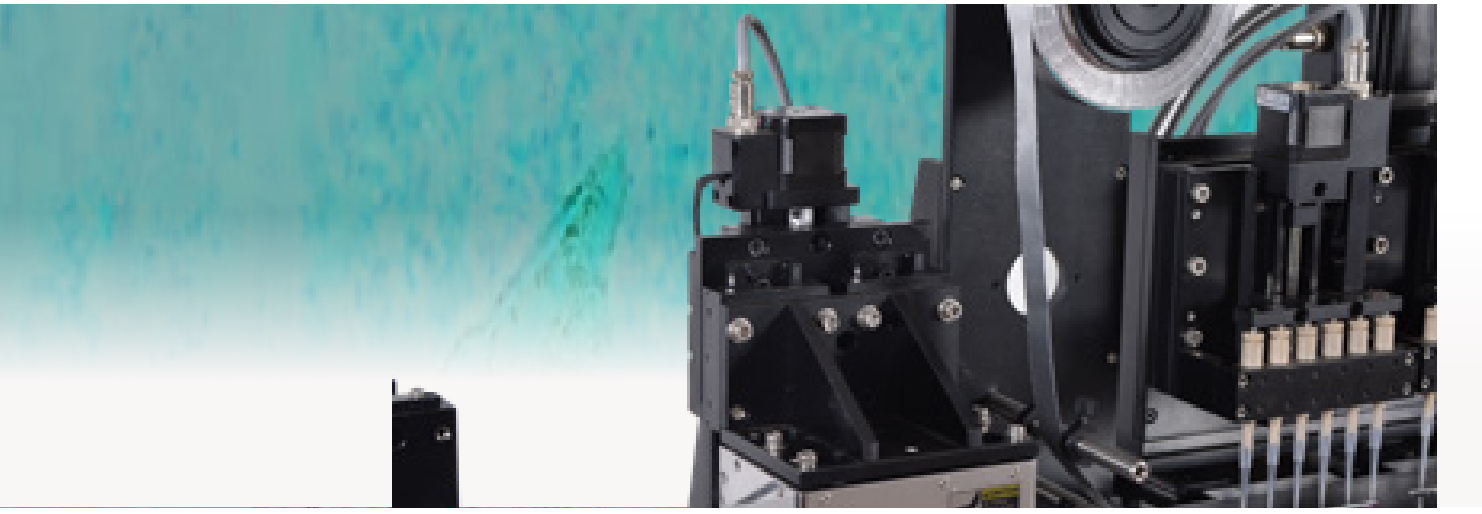
LABORATORY AUTOMATION

908 LABORATORY AUTOMATION
909 Reel to Reel Printing Machine
910 Stages and Laboratory Automation
910 Linear Slides
910 MS Series
912 Linear Slides
912 MS Series
914 Linear Roller Slides
914 ARS Series
916 Single Channel Dispensing Station
916 MICRO Plate 8 Channel Precision Dispensing Station
917 Multi-channel Precision Line Dispenser
918 Flowline F100
920 Automated Filling & Sealing station TDU9000S
922 Automated Filling & Sealing station TDU7000S
923 Automated Dispensing System
924 Glass Cutting and Slicing Machine
926 Multi Axis Manipulator
926 Automated Microscopy Positioning
927 Vial Dispensing Station
927 Large XY Scanning Machine





Stages and Laboratory Automation



Linear motion Slides from Holmarc are ready to fit, cost effective, factory preloaded, low friction, light weight slides that are ready for installation right out of the box. Balls or crossed rollers act as the interface between base and carriage by perfectly rolling on four surfaces arranged at 90 degree, called guide ways. In the case of slides from HOLMARC, hardened and ground rods act as guide ways. Wear and tear is negligible even after long use as there is a perfect rolling contact between rolling elements and guide ways. Friction is very less and in most cases, coefficient of friction is less than 0.002. The slides can support heavy loads without compromising performance accuracies. Factory pre-loading of the slides during assembly practically eliminates play and wobble.

Our linear motion slides proove to be the best solution for the ever-demanding performance requirements of modern machine tool shops. They are specially made to operate dry, offering self-lubrication with high performance.These features make our system best suited for OEM applications.

Linear Slides

MS Series

Miniature Slides are designed as complete and compact assemblies for space restricted linear motion applications. As in the case of other standard slides, hardened and precision ground alloy steel rods are used as guide ways. Play and wobble are practically eliminated by pre-loading the slides during assembly at our factory. Smooth and friction free motion is guaranteed by ensuring perfect rolling between balls and guide ways.



Holmarc manufactures miniature slides in four series depending on their width and thickness. Many models are available in each series for differing travel ranges. There are mounting holes at top (moving part) and base (fixed part) for the ease of use. In addition to these standard products, holmarc also manufactures custom slides. We also entertain custom specification of mounting holes without any increase in cost from standard models.

MS 14 Series

Model No.	MS - 14 x 20	MS - 14 x 25	MS - 14 x 30	MS - 14 x 40
Travel	10	12	15	25
Load capacity (Kg)	0.3	0.5	0.7	1
L (mm)	20	25	30	40
A (mm)	12	17	22	32
B (mm)	4	4	4	4

MS 20 Series

Model No:	MS - 20 x 20	MS - 20 x 25	MS - 25 x 30	MS - 20 x 40	MS - 20 x 50
Travel	10	15	20	25	30
Load capacity (Kg)	0.5	1	2	3	5
L (mm)	20	25	30	40	50
A (mm)	10	15	20	30	5
B (mm)	30	5	50	40	5

MS 25 Series

Model No	MS - 25 x 20	MS - 25 x 30	MS - 25 x 40	MS - 25 x 50	MS - 25 x 75
Travel	10	15	20	25	35
Load capacity (Kg)	1	3	4	4	7
L (mm)	25	30	40	50	75
A (mm)	15	20	30	40	50
B (mm)	5	5	5	5	5

MS 25 Series

Model No	MS - 35 x 35	MS - 35 x 40	MS - 35 x 50	MS - 35 x 75
Travel	15	20	30	35
Load capacity (Kg)	3	4	5	7
L (mm)	35	40	50	75
A (mm)	20	25	35	60
B (mm)	7.5	7.5	7.5	7.5

Linear Slides

MS Series

Ball slides, as the name suggests, use balls as rolling elements. Each ball will have four point contact with guide way during its entire travel. Point contact rolling helps in self cleaning of the rolling path on the guide ways. Hence, the ball slides are maintenance free and are suitable for operation without lubrication. Ball slides exhibit significantly less friction compared to roller slides. Due to this feature, for applications where smooth, low friction movements are more important than load capacity and shock resistance, ball slides make better choice.



Factory pre-load adjustment prevents side play and black lash

Steel shafts, ground over entire length, are used as guide ways

Built-in mounting holes make its use easy and time efficient

Light weight aluminium carriage and base

High accuracy and repeatability

Built-in mounting holes

Lubrication free operation

No lubrication required

MS 50 Series

Model No.	Travel	Load capacity (Kg)	L (mm)	A (mm)	B (mm)
MS - 50 x 50	30	4	50	15	10
MS - 50 x 60	40	5	60	20	10
MS - 50 x 75	50	6	75	25	12.5
MS - 50 x 100	75	7	100	25	12.5
MS - 50 x 150	100	10	150	25	12.5
MS - 50 x 200	150	15	200	25	12.5
# For Vacuum compatible stage order VC series Slide : Eg:- VCMS - 50 x					

ABS 20 Series

Model No:					
ABS 50 x 75	25	10	75	50	12.5
ABS 50 x 75A	12.5	12	75	50	12.5
ABS 50 x 100	50	18	100	75	12.5
ABS 50 x 100A	50	24	100	75	12.5
ABS 50 x 150	100	18	150	50	25
ABS 50 x 150A	50	24	150	50	25
ABS 50 x 150B	25	30	150	50	25
ABS 50 x 200	150	24	200	50	25
ABS 50 x 200A	100	30	200	50	25
ABS 50 x 200B	50	38	200	50	25
ABS 50 x 250	200	28	250	50	25
ABS 50 x 250A	150	34	250	50	25
ABS 50 x 250B	100	40	250	50	25
ABS 50 x 300	250	36	300	50	25
ABS 50 x 300A	200	42	300	50	25
ABS 50 x 300B	150	48	300	50	25
ABS 50 x 300C	100	54	300	50	25
ABS 50 x 350	300	38	350	50	25
ABS 50 x 350A	250	46	350	50	25
ABS 50 x 350B	200	52	350	50	25
ABS 50 x 350C	150	58	350	50	25
ABS 50 x 400	350	48	400	50	25
ABS 50 x 400A	300	56	400	50	25
ABS 50 x 400B	250	62	400	50	25
ABS 50 x 400C	200	68	400	50	25
ABS 50 x 400D	150	78	400	50	25

ABS 65 Series

Model No.	Travel	Load capacity (Kg)	L (mm)	A (mm)	B (mm)
ABS 65 x 75	25	10	75	50	12.5
ABS 65 x 75A	12.5	14	75	50	12.5
ABS 65 x 100	50	12	100	75	12.5
ABS 65 x 100A	25	16	100	75	12.5
ABS 65 x 150	100	18	150	50	25
ABS 65 x 150A	50	24	150	50	25
ABS 65 x 150B	25	30	150	50	25
ABS 65 x 200	150	24	200	50	25
ABS 65 x 200A	100	30	200	50	25
ABS 65 x 200B	50	38	200	50	25
ABS 65 x 200C	25	44	200	50	25
ABS 65 x 250	200	28	250	50	25
ABS 65 x 250A	150	34	250	50	25
ABS 65 x 250B	100	40	250	50	25
ABS 65 x 250C	50	46	250	50	25
ABS 65 x 300	250	36	300	50	25
ABS 65 x 300A	200	42	300	50	25
ABS 65 x 300B	150	48	300	50	25
ABS 65 x 300C	100	54	300	50	25
ABS 65 x 350	300	38	350	50	25
ABS 65 x 350A	250	46	350	50	25
ABS 65 x 350B	200	52	350	50	25
ABS 65 x 350C	150	58	350	50	25
ABS 65 x 400	350	48	400	50	25
ABS 65 x 400A	300	56	400	50	25
ABS 65 x 400B	250	62	400	50	25
ABS 65 x 400C	200	68	400	50	25
ABS 65 x 400D	150	80	400	50	25

ABS 90 Series

Model No.	Travel	Load capacity (Kg)	L (mm)	A (mm)	B (m)
ABS 90 x 100	50	18	100	75	12.5
ABS 90 x 100A	25	24	100	75	12.5
ABS 90 x 150	100	16	150	50	25
ABS 90 x 150A	75	21	150	50	25
ABS 90 x 150B	50	24	150	50	25
ABS 90 x 200	150	24	200	50	25
ABS 90 x 200A	100	30	200	50	25
ABS 90 x 200B	50	38	200	50	25
ABS 90 x 250	200	28	250	50	25
ABS 90 x 250A	150	34	250	50	25
ABS 90 x 250B	100	40	250	50	25
ABS 90 x 250C	50	46	250	50	25
ABS 90 x 300	250	36	300	50	25
ABS 90 x 300A	200	42	300	50	25
ABS 90 x 300B	150	48	300	50	25
ABS 90 x 300C	100	54	300	50	25
ABS 90 x 350	300	38	350	50	25
ABS 90 x 350A	250	46	350	50	25
ABS 90 x 350B	200	52	350	50	25
ABS 90 x 350C	150	58	350	50	25
ABS 90 x 400	350	48	400	50	25
ABS 90 x 400A	300	56	400	50	25
ABS 90 x 400B	250	62	400	50	25
ABS 90 x 400C	200	68	400	50	25
ABS 90 x 400D	150	80	400	50	25

Specifications

1. Co-efficient of friction	Less than 0.002
2. Positional Repeatability	0.002 mm
3. Straight- line accuracy	0.01 mm / 25mm travel.

Linear Roller Slides

ARS Series

In roller slides, rollers which are placed alternately crisscrossed to each other are used as rolling elements. Hardened, precision ground and flattened rods are used as guide ways. The rollers are encased in a nylon cage. A line contact is maintained between guide ways and rollers throughout the travel range, achieving perfect rolling motion. Load capacity is increased at least 10 fold as a result of line contact of rollers compared to ball slides using equal diameter balls.

Co-efficient of friction in roller slides is 0.004, when preloaded. This is almost double that of ball slides of similar size. Where load capacity is more important than friction, roller slides are preferable.



High accuracy and repeatability

Light weight aluminium carriage and base

Alternately crossed rollers handle force in any direction

Factory pre-load adjustment prevents side play and back lash

Built-in mounting holes make installation easy and time efficient

Specifications

1. Co-efficient of friction	0.004
2. Positional Repeatability	0.002 mm
3. Straight- line accuracy	0.01 mm / 25mm travel

ARS 90 Series

Model No:	Travel	Load capacity (Kg)	L (mm)	A (mm)	B (mm)
ARS 50 x 100	50	35	100	75	12.5
ARS 50 x 100A	25	45	100	75	12.5
ARS 50 x 150	75	50	150	50	25
ARS 50 x 150A	50	60	150	50	25
ARS 50 x 150B	25	75	150	50	25
ARS 50 x 200	150	55	200	50	25
ARS 50 x 200A	100	65	200	50	25
ARS 50 x 200B	50	95	200	50	25
ARS 50 x 200C	25	115	200	50	25
ARS 50 x 250	200	50	250	50	25
ARS 50 x 250A	150	70	250	50	25
ARS 50 x 250B	100	100	250	50	25
ARS 50 x 250C	50	125	250	50	25
ARS 50 x 300	300	70	300	50	25
ARS 50 x 300A	200	85	300	50	25
ARS 50 x 300B	150	105	300	50	25
ARS 50 x 300C	100	135	300	50	25
ARS 50 x 300D	50	155	300	50	25
ARS 50 x 350	300	75	350	50	25
ARS 50 x 350A	250	90	350	50	25
ARS 50 x 350B	200	110	350	50	25
ARS 50 x 350C	150	130	350	50	25
ARS 50 x 350D	100	160	350	50	25
ARS 50 x 400	350	75	400	50	25
ARS 50 x 400A	300	95	400	50	25
ARS 50 x 400B	250	115	400	50	25
ARS 50 x 400C	200	135	400	50	25
ARS 50 x 400D	150	160	400	50	25

ARS 65 Series

Model No:	Travel	Load capacity (Kg)	L (mm)	A (mm)	B (mm)
ARS 65 x 75	25	30	75	50	12.5
ARS 65 x 75A	12.5	40	75	50	12.5
ARS 65 x 100	50	35	100	75	12.5
ARS 65 x 100A	25	45	100	75	12.5
ARS 65 x 150	75	70	150	50	25
ARS 65 x 150A	50	60	150	50	25
ARS 65 x 150B	25	75	150	50	25
ARS 65 x 200	150	50	200	50	25
ARS 65 x 200A	100	65	200	50	25
ARS 65 x 200B	50	95	200	50	25
ARS 65 x 200C	25	115	200	50	25
ARS 65 x 250	200	50	250	50	25
ARS 65 x 250A	150	70	250	50	25
ARS 65 x 250B	100	100	250	50	25
ARS 65 x 250C	50	125	250	50	25
ARS 65 x 300	250	60	300	50	25
ARS 65 x 300A	200	85	300	50	25
ARS 65 x 300B	150	105	300	50	25
ARS 65 x 300C	100	135	300	50	25
ARS 65 x 350	300	65	350	50	25
ARS 65 x 350A	250	90	350	50	25
ARS 65 x 350B	200	110	350	50	25
ARS 65 x 350C	150	130	350	50	25
ARS 65 x 400	350	70	400	50	25
ARS 65 x 400A	300	95	400	50	25
ARS 65 x 400B	250	115	400	50	25
ARS 65 x 400C	200	135	400	50	25
ARS 65 x 400D	150	160	400	50	25

ABS 90 Series

Model No	Travel	Load capacity (Kg)	L (mm)	A (mm)	B (mm)
ARS 90 x 100	50	35	100	75	12.5
ARS 90 x 100A	25	45	100	75	12.5
ARS 90 x 150	75	50	150	50	25
ARS 90 x 150A	50	60	150	50	25
ARS 90 x 150B	25	75	150	50	25
ARS 90 x 200	150	40	200	50	25
ARS 90 x 200A	100	65	200	50	25
ARS 90 x 200B	50	95	200	50	25
ARS 90 x 200C	25	115	200	50	25
ARS 90 x 250	200	50	250	50	25
ARS 90 x 250A	150	70	250	50	25
ARS 90 x 250B	100	100	250	50	25
ARS 90 x 250C	50	125	250	50	25
ARS 90 x 300	250	60	300	50	25
ARS 90 x 300A	200	85	300	50	25
ARS 90 x 300B	150	105	300	50	25
ARS 90 x 300C	100	135	300	50	25
ARS 90 x 350	300	65	350	50	25
ARS 90 x 350A	250	90	350	50	25
ARS 90 x 350B	200	110	350	50	25
ARS 90 x 350C	150	130	350	50	25
ARS 90 x 400	350	60	400	50	25
ARS 90 x 400A	300	95	400	50	25
ARS 90 x 400B	250	115	400	50	25
ARS 90 x 400C	200	135	400	50	25
ARS 90 x 400D	150	160	400	50	25

Single Channel Dispensing Station

Model: HO-BL-SCDS-214P



Holmarc's single channel dispensing station (Model : HO-BL-SCDS-214P) automates repetitive dispensing of liquids in to bottles or container in the pre determined quantities. The system consist of a peristaltic pump, conveyor belt for positioning of bottler in x axis, two axis positioning (Y & Z) for dispensing nozzle and stand alone controllers with user interface integrated in the station.

Specifications

Type	Single Channel Dispensing
Feeding	Motorized Conveyer System
Feeding Tray Size	Standard, 96 Well Plate
Dispensing	Peristaltic Pump
Flow rates	0-1 to 5 ml / min
Motor	Stepper Motor
Power supp	220 - 240 v 50/60 Hz supply
User Interface	20 x 4 Line LCD & 15 Keys Keyboard

Use of peristaltic pump with easily replaceable tubes prevent contamination or the pump liquid in this case do not touch any of the pump parts except the tubing.

MICRO Plate 8 Channel Precision Dispensing Station

(96 Well Plate Standard) Model: HO-BL-MPPD-214S

HOLMARC Bio LABS™ MICRO Plate Dispensing Station is specially designed tool suitable for fast, repetitive dispensing of microliter to milliliter volumes into 8 channel well container. It ensures precise dispensing and offers an economical, compact, and reliable alternative to existing microplate dispensers.

Accurate and precise dispensing are guaranteed without time consuming re-calibration, cassette replacement and maintenance. Model HO-BL-MPPD-214S is a 8 channel dispenser designed for 96 well plates. It incorporates a microprocessor controlled syringe pump for optimal performance and guarantees optimal precision and accuracy. The user controlled dispense flow rates allow low to high speed dispensing for any application. Holmarc Bio LAB DI software provides a high degree of control over process parameters. Column selection offers the choice of dispensing a few columns, or a complete plate. For optimal dispensing accuracy, the software allows fine tuning the dispense volume. It can be used for any dispensing task with microtiter plates in molecular biology, immunology, genomics both in clinical as well as pre-clinical activities.

Holmarc can also under take custom modifications in the system like individual dispense heads (different fluids can be dispensed into a single microplate), optical reader, fluorescence detection unit etc.



No recalibration required

Fast and accurate dispensing rate

Specifications

8 Nozzle Dispensing
Accurate dispense channels
Low dead volume
Fast dispenses
Adjustable dispensing range
Configurable for different well plates
Microprocessor-controlled syringe pump
Removable tubings
Small footprint
No recalibration required
Minimum dispense volume of 1 μL
Dispense precision : ≤ 5% CV

Multi-channel Precision Line Dispenser

Model: HO-BL-MCPLD-214L

Holmarc's multi channel line dispensing system can be used for production as well as research in life science and bio-technology for dispensing reagent liquid in line or dot format on sheet substrate. Up to four lines can be printed at the same time with different dispensing rate for each line.

Independent syringe pumps are used for each line. All parameters are programable from the front panel of stand alone controller of the system.

Specifications	
Applicable sheet size	Max. 320 x 320 mm
Dispenser	Syringe pump
Dispensing volume : Line	Minimum 0.5µl / cm
Dot	Minimum 0.5 µl / dot
Accuracy	< 1.0% deviation from expected result at full stroke
Precision	≤ 0.05% CV at full stroke
Feeding speed	Adjustable
Power	110 Volt or 230 Volt, 50 Hz or 60 Hz

With precision line dispensing facility

Seperate pumping system for each channe

Features

- Precision Line dispensing Facility
- Can dispense reagent from 1 line to multi-lines or dot simultaneously
- Reversible pump allows easy pursing and cleaning.
- Height adjuster for tip to control space between dispensing lines.
- Programmable parameters for adjusting dispensing volume and feeding table speed.
- Separate pumping system for each channel ensures accurate dispensing



Flowline F100

HOLMARC FlowLine F100 can be used for printing lines and dots in various substrates. The standard machine has 3 pumps for line printing and one optional pump for conjugate spraying. Additional pump options are available. The short length tubing of this machine reduces the reagent wastage. The average out put is 120 sheets per Hour.

Specifications

Standalone mode of operation with easy to use User Interface
Small machine footprint
Automated adjustable line positions
Pumps : Precision Syringe Pumps
Standard Configuration : 3 for reagent line printing
Nozzles : Stainless steel solenoid valve controlled nozzles for non contact printing. PEEK nozzles for contact Printing
Adjustable nozzle height and nozzle width.
Operating Range : 550mm
Dispense area : 100 mm x 550 mm sheet, can accommodate card size from 50 mm to 10 mm width and upto 550 mm length
Syringe 250 µl (standar
Tubing : Standard Teflon Tubing with Standard Connectors
Adjustments : Nozzle contac
Line distance adjustable from 4 mm to 10mm
Conjugate spray nozzle height
Nozzle contact angle
Easy switch from contact to non contact Printing

Options

Contact or non-contact printing machine

Optional Systems for dot printing

Ungradable upto 10 Pumps

Conjugate Spraying Nozzles

Optional Sheet Feeding Trays

ARS 65 Series

Model No:	F100-01	F100-02
	Contact Printer with 2 Line Printing Pumps and 1 Conjugate Spray Pump	3 pumps with 2 Non Contact printing nozzles, 2 Contact Printing Nozzles and 1 Spray Nozzle.



Flowline F200

This 200 x 200mm printing machine is equipped with micro dispensing solenoid spray valve which can spray liquid onto the sample sheet as small as 400 micron. System can dispense patterns of dots, strips, arcs and on different planes or curved surface with automatic control panel. Continuous flow of the sample solution is achieved by a dual syringe pump with solenoid valve. It can continuously cycle allowing two syringes to dispense fluid while the opposite two syringes are refilling. Pump reverses at end of cycle and delivery continues.

Integrated vacuum table is provided for holding thin sheet stock in place by drawing air down through the table. It eliminates the need for tape while printing. For printing monitoring / inspection a 5MP CMOS camera is used.







Features

- High speed operation
- Compact & versatile
- All contact parts made from high quality Stainless Steel 316
- Machine body is elegantly finished from Stainless Steel 304
- Cartridge sensing system to avoid wastage of costly liquid
- High filling accuracy of ± 0.5% in single dosing
- All operations on one platform, hence less space requirement

Process

- Cartridge loading on tray/conveyor
- Cartridge Automatic position sensing
- Transparency photo-metric inspection
- Crack scratch and deformation detection by polarizer imager unit
- Automatic rejection module for rejecting failed Cartridges
- Rejection and filling counts will be displayed on monitor

Automated Filling & Sealing station TDU9000S

1. Automated i4 Cartridge Filling / Sealing station (TDU 9000S) with QR code printing, labeling & reader online system.

Model : HO-BLI-TDU9000S

TDU9000S is a 3 x 6 channel Precision Automated Inspection, Filling & Sealing station. Designed for filling and sealing and optical inspection of cartridges and tubes used in pharmaceuticals, biotech and bio-pharmaceutical industry. Machine is compact and provides higher production output. It also fulfills the desires of many manufacturers to have a truly customized solution to fit their needs.

Pre-inspection Automation : System design Based on Si Photodiode photo-metric measurements and a camera based polarized bottom leak scratch detection. The onboard camera and detector unit will analyse each cuvettes for transparency, crack, scratch and other deformation.







Technical Specifications

Output	500 Cartridges / Hr
Movements	Motorized conveyor system
Controls	Automated rejection & counter unit
Measurement parameters for rejection	Transparency, crack & scratch
Photo-metric Unit	Hamamatsu Si Photodiode detector
Transmittance Range	0 to 100 %
Resolution	0.1 %
Absorbance Range	0 to 2 A
Resolution	0.001 A
Digital Imaging Unit	5 MP camera based system for deformation inspection
Sensor	CMOS, Color, 5Mp
Optical format	1/2.5”
Active imager size	5.70mm x 4.28mm (7.13mm diagonal)
Active pixels	2592 H x 1944 V
Pixel size	2.2um x 2.2um
Dynamic range	67.7dB
Shutter	Electronic rolling shutter
Software interface	TWAIN / DirectShow
Operating mode	Continuous output
Adapter type	C’ Mount
Polarizer type	Linearly polarized
Polarizer rotator	360 degree continuous
Resolution	1 degree
Operation Mode	Stand alone
Operation	Microprocessor controlled unit
Drives	M torque BIPOLAR MICROSTEP DRIVER
Structural Materials	Teflon / stainless steel / Black Anodized Alluminum Alloys
Power supply	220 - 240v 50/60 Hz supply



TDU 9000S Filling / Sealing Specifications

Cartridge Type	i4
Output	500 Cartridges / Hr
Filling Range	1ul to 300ul
No. of filling head	18
No. of liquid channels	3
No. of filling per channel	6
Output	1000 cartridges / hr
Cartridge Type	Plastic
Contact Parts	Stainless Steel 316
Material construction	Stainless Steel 304
Filling pump type	Syringe Pump - Micro pipettes
Filling Format	3 x 6 Channel
Actuator	Stepper Motor
Cutting Unit	Mechanical
Dispensing accuracy	+/- 0.5% Max
Sealing unit	RT-200 Degree C variable temperature Head
Filling Module	6 Channel Motorized Pipetter with aspiration / dispensing controls
QR Code reader	Integrated QR code inspection system on label feeder
Labeling	Automated online labeling with optical inspection (System will automatically sense the QR passed sticker and stick on the cartridges accordingly)
Operation Mode	PC Based
Operation	Microprocessor controlled unit
Drives	M torque BIPOLAR MICROSTEP DRIVER
Structural Materials	Teflon / stainless steel / Black Anodized Aluminum Alloys
Power supply	220-240v 50/60 Hz supply

Process

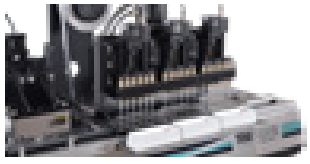
- Cartridge loading on tray / conveyor
- Cartridge Automatic position sensing
- Sticker roll feeder movement
- QR Code Reading - sensing process
- Auto labeling and fixing by sensing the cartridge
- 6 Channel Motorized Pipetter Aspiration process
- 6 Channel Motorized Pipetter liquid Dispensing process
- Cartridge Sealing process
- Cartridge cutting/ finishing process
- QR Code/ bar-code reading process
- Rejection/warning of failed Cartridges
- Rejection and filling counts will be displayed on a monitor(All datas are saved on a computer for future analysis)
- Output Collection (Manual)

Automated Filling & Sealing station TDU7000S

TDU7000S is a 3 x 6 channel Precision Automated Filling & Sealing station. Designed for filling and sealing of cartridges and tubes used in pharmaceuticals, biotech and biopharmaceutical industry. Machine is compact and provides higher production output. it also fulfils the desires of many manufacturers to have a truly customized solution to fit their needs.

Technical Specifications

Model	TDU7000S
Filling Range	1ul to 300ul
No. of filling head	18
No. of liquid channels	3
No. of filling per channel	6
Output	1200 cartridges / hr
Cartridge Type	Plastic
Contact Parts	Stainless Steel 316
Material construction	Stainless Steel 304
Filling pump type	Syringe Pump - Micro pipettes
Power Supply	230V A
Overall Dimension	1260mm (L) x 400mm (W) x 600mm (H)

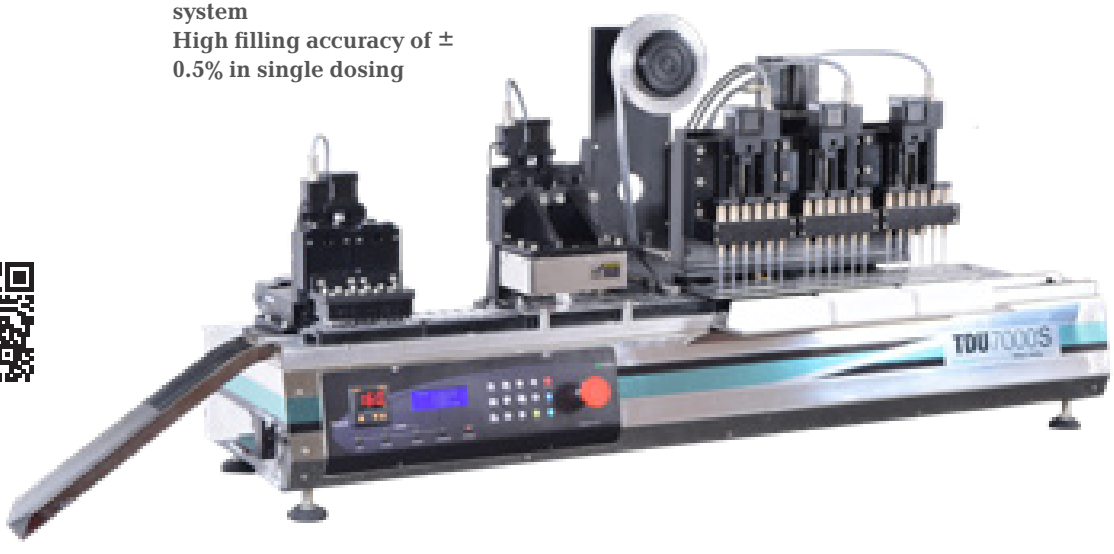


Salient Features

Compact & versatile
All contact parts made from high quality Stainless Steel 316.
Machine body is elegantly finished from Stainless Steel 304.
Cartridge sensing system to avoid wastage of costly liquid.
High filling accuracy of ± 0.5% in single dosing. All operations on one platform, hence less space requirement.



With Cartridge sensing system
High filling accuracy of ± 0.5% in single dosing



www.holmarc.com | sales@holmarc.com
+91 920-719-7771 / (72 / 76)

Automated Dispensing System

Holmarc HO-ADS-5H Series automated Relay sealing machines are designed for accurate glue dispensing using any pneumatic syringe barrel or valve systems. The system has a preheating facility which is useful for efficient sealing when using high viscous glues. 5 axis motions handle each relay separately for heating and dispensing. The machine comes along with an easy to use software, to create different motion profiles .The software introduces simple commands like move, speed, delay, dispenser ON and dispenser OFF for the programming . Two motion profiles can be saved for a single relay. User can execute these profiles separately on use. User can save any no of profiles in the PC and 25 no's in the machine hardware.







Specifications

Model	HO-ADS-5H
Platform range	200 x 200 mm
Travel range Platform XY	200 x 200 mm
Travel range Z	25 x 25 mm
Travel range Relay XY	25 x 25 mm
XYZ Repeatability	25 x 25 mm
Resolution	.03 mm (Half step mode)
Accuracy	.05 mm (Half step mode)
Maximum Speed	30 mm/sec (all axis)
Relay Fixture Type	Anodized alumunium
Relay Fixture	2 Nos
Material Construction	Mild Steel
Power Supply	110 ~ 230V 50Hz AC
Overall Dimension	500mm (L) x 430mm (W) x 560mm (H)

Note : Dispenser, Pneumatic Valve are not included in the scope of supply.

Glass Cutting and Slicing Machine

Holmarc's Glass Cutting and Slicing Machine Model: OptoFab ????is designed for precision cutting and slicing of glass substrates. Engineered with robust motorized control, high-resolution components, and user-friendly operation, this machine ensures clean, accurate slices with minimal chipping. It is ideal for research laboratories, manufacturing units, and materials science applications requiring repeatable and customizable cutting performance. This machine ensures precise control, long-term stability, and operator safety, making it a reliable addition to any professional cutting environment.

Specifications

Bed Travel	At least 250mm x 450mm
Bed Movement	Motorized
Z-axis Cutting Movement	Motorized
Cutting Speed	Adjustable from 6 to 99 mm/min
Minimum Slice Thickness	5 mm
Cutting Wheel Type	: Diamond Cut-Off Wheel
Cutting Wheel Diameter	250 mm
Wheel Holding Diameter	32 mm
Cutting Thickness	3.5 mm
Cutting Accuracy	0.5 to 1 mm

Workpiece Holder:	
Level Angle:	±45°
Longitudinal Angle	±10⁰
Lifting Height	200 mm

Spindle Speed	Adjustable from 3000 to 4000 RPM
Power Supply	220V AC, 50Hz, 2 kW
Structural Frame	Mild Steel with hard-coated painted finish

Rotating Table	
Rotation	360° continuously rotatable
Mechanism	Precision worm gear with double-bearing support
Load Capacity	10 kg
Marking	Graduated rotary scale for visual reference
Construction Material	High-grade aluminum or sturdy alloy
Surface Finish	Black anodized

Maximum Substrate Dimensions (Oscillation mode):	350 x 200 x 85 mm
Maximum Substrate Dimensions (Side cut mode):	170 x 200 x 85 mm

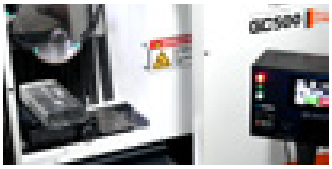
Glass Cutter

250mm x 450mm Motorized Travel with 6 to 99 mm/min cutting speed



Rotating Table

360° continuously rotatable with 10 Kg Load Capacity



Workpiece Holder:



Control Software





Multi Axis Manipulator

Model: HO-APS-300R2



Conventional and digital radiography techniques with multi axis manipulator have been widely used by industries for routine and in-service inspection for non destructive testing (NDT). Automated positioning and movement systems (manipulators) enablequality radiography images with minimum number of exposures. Holmarc manufactures six axes manipulators for X-ray & CT applications as standard products. The system is equipped with six motorized axis and two / three manual stages. On one of the arms, X-ray source (100kgs approx.) can be mounted while flat panel with lead mask (200kgs approx.) can be mounted on the other arm. Both these arms have X-Z movement (300 mm) with accuracy of 50 micron and option to have two more additional motorized axes. At the center of these two arms, the sample stage is mounted with motorized X, Y, Z and rotation stages. The manipulator makes the alignment of the source, detector and sample easy and precise. The position (rotation) of sample and automatically acquired radiography images for each are used to create computed tomogram of objects. Optional features such as motorized shutters, mounts for additional sources and detector etc. are available. We can tailor the system to our customers needs as well.

Useful for both X-ray & CT applications

Automated positioning & alignment of source, detector & sample

Automated Microscopy Positioning

Model: HO-MXY-200-Z-200

All the three linear stages are stepper motor controlled and have precision rolling contact bearings to ensure straight-line accuracy and repeatability in measurements. These stages are fitted with optical encoder having 1 micron resolution. Travel for X, Y and Z stages are 250 mm. Optical head or scanning units can be fitted to the Z stage using suitable angle brackets. Vertical measurements can be taken by repeated focusing at the points of interest.

Digital read outs with 1 micron resolution is fitted to the vertical column at ergonomical eye sight location. The read outs have large LED display and various programmable features like error compensation, calibration, etc.. We can also stack XYZ stage according to customer's request. It is connected with our motion controller unit and can be controlled by computer software via RS232 interface.

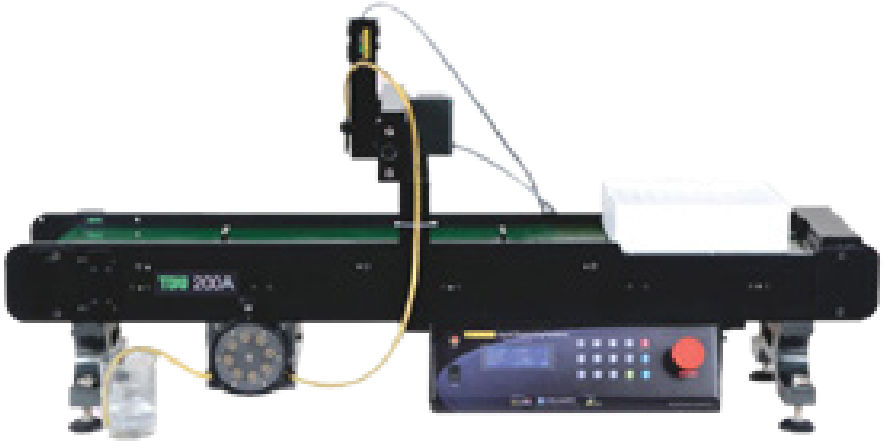
Excellent repeatabilty in measurements

Digital readouts with 1 micron resolution



Vial Dispensing Station

Model: HO-APS-300R2



Holmarc's single channel dispensing station automates repetitive dispensing of liquids in to bottles or container in the pre determined quantities. The system consist of a peristaltic pump, conveyor belt for positioning of bottles in x axis, two axis positioning (Y & Z) for dispensing nozzle and stand alone controllers with user interface integrated in the station.

Use of 8 roller peristaltic pump with easily replaceable tubes prevent contamination or the pump liquid in this case do not touch any of the pump parts except the tubing.

Large XY Scanning Machine

Model: HO-XY-1000

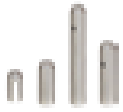


The 1X1meter XY stage has been developed by Holmarc for non-destructive testing of honeycomb panels by ultrasound technique. The source and detector head were fixed on carriage of the XY stage. The system is used to scan entire area of the panel under test in shortest possible time period. The stage has toothed belt and pulley system driven by stepper motor for fast XY positioning. The electronics hardware has computer interfacing facility for detector integration as well as for XY raster scan programming.

Holmark Manufactures Opto Mechanical Components and Breadboards

Post Mounting System - 8mm,12mm,12.7mm,16mm


PH Series Post Holders


P Series Post


Pedestal Adapter


PF Series Pedestal Fork


Post Collar


Translating Post Holder

Post Bases, Clamps


Post Bases


Pedestal Bases


Switchable Magnetic Post Bases

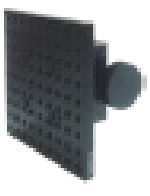

Radial Slotted Base Plate

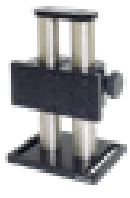

Swivel Post Base


Post Clamps


Slotted Plates


Pedestal Post Clamp/ Pillar Post Clamp


Large Post Clamp Plates


Heavy Duty Post Dual Rod System

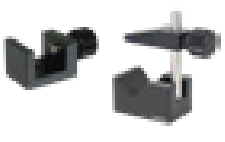
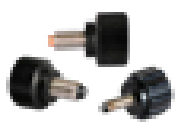

C & V type clamps


Table Clamps


Thread Adapters


Thump Screws


SHC Screws


All in One Screw kit

Optics Mounts

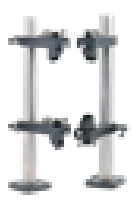

Apertures

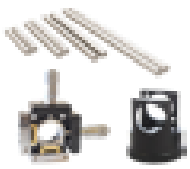

Fiber Positioners


Optical Chopper


Motorised Shutter


Lens Tube Assembly System


Beam Steering Device


Rod Assembly


Precision Tilting Platform


4 Axis Platform


Single Axis Tilting Platfrom


Gimbal Mirror Mounts


Motorized Gimbal Mirror Mounts



Kinematic Platform Mount | Kinematic Prism Mount | Tilt and Rotation Stage | Rigid Camera Lens Mounts | Self Centering Lens Mounts | Circular Adjustable Lens Mount



V Type Adjustable Lens Mount | Kinematic Cylindrical Lens Mount | Rigid Camera Lens Mounts | YZ Lens Mounts / Objective Lens Mounts | Focus Adjustable Lens Mounts | Rigid Objective Lens Mounts



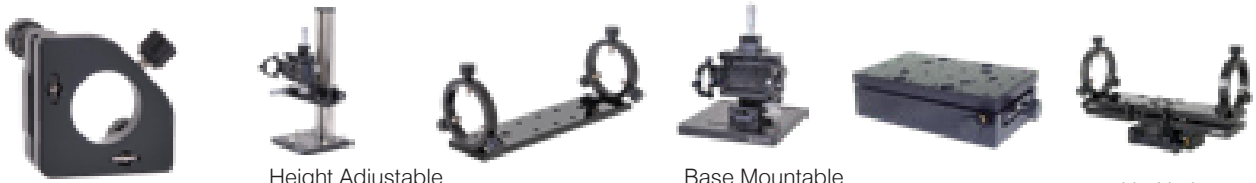
XYZ Lens Mounts | Five Axis Lens Mount | Kinematic Lens Mounts | 5 axis Objective Mounts | Stackable Flip Filter Mount | Multiple Filter Holder



Square & Rectangular Filter Holder | Motorized Filter Wheel | Plate Holder / Glass Slide Holders | Diffuser Plate with Rotator | Apertures | Precision Polarizer Rotator with Tilt



Motorized Polarizer Rotator | Kinematic Mount For Rectangular Optics | Rigid Flip Mount | Plain Mirror Mounts | Kinematic Cirular Optic Mount | Top Adjustable Mounts



Kinematic Diode Laser Mount | Height Adjustable XZ Tilt & Rotation Laser Mount | He-Ne laser Mount | Base Mountable XZ Tilt & Rotation Laser Mount | DPSS Laser Mount | He-Ne Laser Mount Tilt And Rotation

HOLOGRAPHY MICROSCOPE


Digital Holography


Inverted Digital Holography


Motorized Digital Holography


Digital Inline Holography 1


Digital Inline Holograph

MOTORIZED MICROSCOPE


TM O1


TM O2

FLUORESCENCE MICROSCOPE


Fluorescence Imaging


Inverted Fluorescence


Confocal Fluorescence Correlation Spectrometer

INSPECTION MICROSCOPE


Automated


Laser Microscope

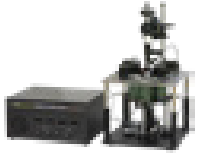

Work Station


Laser Ablation Inspection


Digital Inspection


Inspection with Boom Stand

PROBE STATION MICROSCOPE


Quadrupole Magnetic Probe


HV - IV

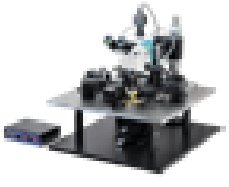

Piezoelectric


Probe Station System T01 EC

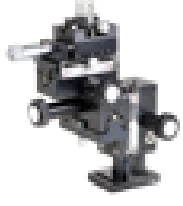

Probe Station Trinocular T01L


Probe Station 2M


Probe Station 4M


Probe Station 8M


RF Probe Station

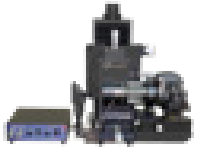

Micro manipulator


Motorized Micro Manipulator


Probe Accessories

AUTO MICROSCOPE


Horizontal Microscope


Long Working Distance


Precision XY Manual Stage


Manual Sample Holder

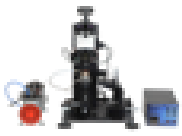

Auto microscope 1


Auto microscope 2

2D TRANSFER SYSTEM




2D Transfer System Digital Microscope






2D Transfer System with Trinocular Microscope 1 and 2



Thermal Lens Microscope



Inverted Microscope



Basic Laboratory Microscope



AutomaticLaboratory Microscope




Tele microscope

Optical Measuring Instruments





Auto Measuring Microscope



Upright digital Measuring



Auto Digital Microscope



Auto Metallurgy



Metallurgy Microscope



Tool Maker's Microscope



Telecentric Digital Inspection



Traveling Microscope 01



Traveling Microscope 02



Digital Traveling Microscope



Digital Traveling Microscope 5x



Autocollimator & Accessories



Digital Autocollimator



Autocollimator & Accessories



Autocollimator with Vertical Stand





External XYZ Tilt Sample Holder



Adapter for Petridish




Microscopy External Positioning System

Goniometer & Spectrometer



Goniometer



CCD Spectrometer



CCD Spectrometer CG216



CD Spectrometer CG214



Scanning Spectrometer

Monochromator



Stitched Scanning Spectrometer



Multi Scanning Spectrometer



Standard Monochromator



DUAL Grating Mini



Scientific Monochromators





Laser Raman Spectrometer



Compact Model



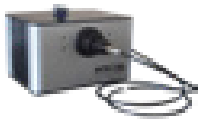
Research Grade Upright Raman



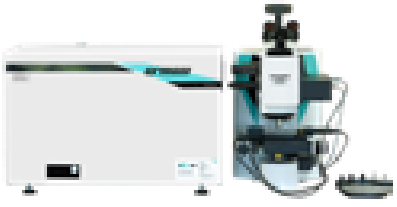
Confocal Laser Raman



Fluorescence Spectrometer



Spectra Accessories



Confocal Micro Raman Upright



Confocal Micro Raman Inverted



Lens Assembly

SOURCES & DETECTORS



CCD Camera



Light Souces



Fiber Optics Patch Cords



Optical Chopper



Integrating Sphere

Spectrophotometer







Spectrophotometer Single Beam and Double Beam



Thete 2 Theta



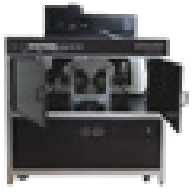


Diffuse Reflectance Spectrophotometer

Ellipsometer




Variable Angle Laser and Spectroscopic Ellipsometer


Magneto Optic Ellipsometry



Fizeau Interferometer

Contact Angle Meters


Base Model






Contact Angle Meter with Dispenser to camera positioning unit, Motorized Substrate Holder, Automated Dispenser, Temperature Control and high speed Camera

Polarimeter


Digital Polarimeter


Spectroscpic Polarimeter

Refractometer



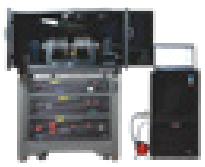
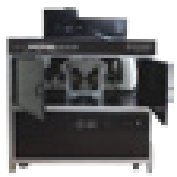
Automatic & Spectroscopic Digital Refractometer

Reflectometer

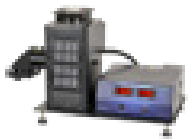

Near Normal Spectroscopic


Reflectometer

Magneto Optical Kerr Effect Station




Magneto Optic Spectrometer
Spectroscopic Kerr / Faraday / Ellipsometry

Solar Simulator


Solar Simulator 1

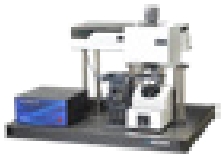

IV Measurement System


IV Measurement with Keithley SMU


Schlieren Imaging System



Laser Scribing / Ablation


LBIC


Impedance Tube


Photodetector Characterization


Conductivity Cell


Lees Disc Apparatus


Speckle Pattern Interferometer


Triboelectric Measurement


Z Scan System

Optics

Prisms

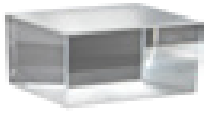

RIGHT ANGLE PRISMS


DOVE PRISMS

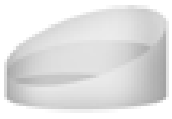

PENTA PRISMS


EQUILATERAL PRISMS


SCHMIDT PRISMS PRISMS


RHOMBOID PRISMS

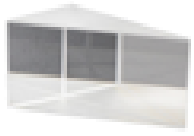

PELLIN BROCA PRISM


WEDGE PRISMS


AMICI ROOF PRISMS


SEMI CIRCULAR PRISMS


CORNER CUBE REFLECTORS


LITTROW PRISMS

Lenses


POSITIVE AND NEGATIVE


CYLINDRICAL


ACHROMATIC LENSES


PLANO CONVEX AND CYLINDRICAL LENSES


PLANO CONCAVE LENSES


PLANO CONCAVE LENSES


BI CONVEX LENSE


BI CONVEX LENSE


Axicons


Plano Aluminium Silver Mirrors


Cone Mirrors

Optical Systems


Variable Beam Expanders


Cylindrical Beam Expanders


Fiber Collimator / Focusers




Eye Loupe

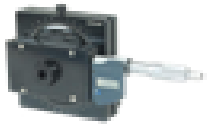

Variable Neutral Density Filters

Polarizing Optics


Multiple-Order Wave Plates


Zero - Order Wave Plates


Fresnel Rhomb Retarders


Soleil - Babinet Compensator

Absorptive Neutral Density Filters

Motorized Linear and Rotation Stages



Manual XY Theta Stage





XYZ Positioner





XYZ Compact Translation Stage



4 Axis Stages



Five Axis Positioner



XYZ Heavy Duty Translation Stages



Heavy Duty Manual Stage



Cryostat Positioner



Heavy Duty Goniometer Rx Ry Rz



Rotation Stages



Angle display unit



WRSC series Rotation Stages



Motorized Theta 2 Theta Stage



Rotation stage with IP65 rating



Motorized Goniometer



Sine Drive Angular Stage

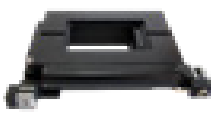


Motorized Actuator





Motorized Translation Stages



XY Moving Platform



Motorized Vertical Translation Stages



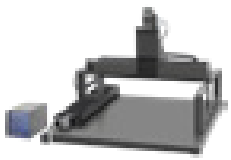
Motorized Two Axes Gimbal Stage



Control Electronics & Software



Automated XYZ Traverse System



Gantry Design Stage



Dual Axis Antenna Positioner



Antenna Positioner



Pitch & Yaw Positioning



Position Controlled Stage



Radiography Multi Axis Manipulator Conventional, Digital & CT



Cartesian Design Stage





Motorized Multi Axis Stage

Research LAB Products

Nano Fiber Electrospinning Unit





HO-NFES-040B


Dual Pump with Humidity Control


Yarning System

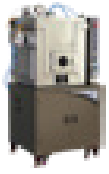
Spray Pyrolysis Equipment


Flame Assisted SP




Nano Fiber Spinning Yarning


SPE Larger Version


Vacuum Spray Automated


Programmable Multi Nozzle

UV Ozone Cleaner


UV Ozone leaner 150


UV Ozone leaner 250


UV Ozone leaner 350


UV Ozone leaner 400

Silar Coating System




SILAR Coating with Stirrer


SILAR Coating Stirrer S


SILAR Magnetic Stirrer 1


SILAR Magnetic Stirrer 2


SILAR for Large Substrate


Magnetic Stirrer & Ultrasonic Bath


SILAR without heater and stirrer 1

Dip Coating Unit

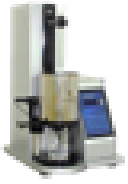

SILAR without heater and stirrer 2


Magnetic Stirrer Air Tight Chamber

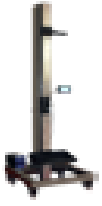

Dip Coater


Multiple Dip Coater


Angle Dependent Dip Coater


DCU Infrared Dryer


DCU with Hot Chamber


Long Travel Dip Coating


DCU with Blue Light Curing


DCU with Magnetic Stirrers & Air Tight Chamber

Spin Coating Unit



Spin Coating Unit



SPU with UV curing system



SPU 4 Channel Syringe Pump



SPU Glove Box Compatible



SPU Polypropylene body



SPU Larger Version

Other Equipments



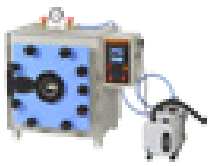
Bench Top Rubbing Machine







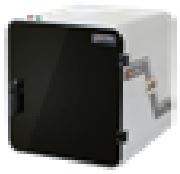
Thermocycler



Vacuum Oven



EC Discharge Machining



UV Laser Writing System



UVLW for Photolithography



T Discharge Rate Measurement



Ion Exchanger



Syringe Pump



Peristaltic Pump



Desktop Dispensing Unit



PC based water cooled electromagnet



Hot Plate XYZ Positioner



Mini Sample Heater



4 Tesla Electromagnet Lab

Laboratory Automation



Single Channel Dispensing Station



MICRO Plate 8 Channel Precision Dispensing Station



Multi-channel PLD



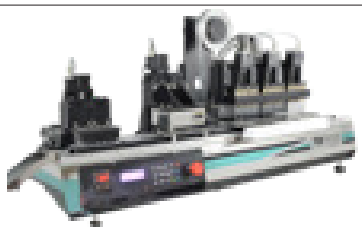
Flowline F100



Reel to Reel Printing



Automated i4 Cartridge Filling / Sealing station



3 x 6 channel Precision Automated Filling & Sealing station



Multi Axis Manipulator



Gantry Design Stage

Index A

10X Eye Loupe 632
12.7mm Post System 568
12mm Post System 562
16 mm Post System 573
2D Transfer System 112
2D Transfer System with Digital Microscope 1 and 2 112
2D Transfer System with Trinocular Microscope 116
45° Rod Mirrors 625
4 Axis Stages 676
4 Tesla Electromagnet - Magnet Lab 448
532nm RESEARCH GRADE 216
532nm Research Grade Upright 184
5 axis Stage 760
8 mm Post System 560
Achromatic Lenses 606
Acoustic Enclosure 498
Acoustics 878
Adapters & Accessories 517
All in One Screw kit 589
Amici Roof Prisms 615
ANALYTICAL INSTRUMENTS 274
Angle Dependent Dip Coating Unit 416
Antenna Positioner 772
Apertures 551
Apparatus for Characteristic study of Diode Laser 836
Apparatus for Determination of Particle Size 855
Apparatus for Studying Diffraction from Reflection Grating 854
Apparatus for the study of Biot-Savart's Law 871
Apparatus for the Study of Photo Electric Effect (Plank's Constant) 868
Apparatus for the Study of Polarisation by Waveplates 828
ARS Series 914
Astronomy and Astrophysics Experiment Set up 899
Astro Physics 896
Autocollimator 270
Auto Digital Microscope 264
Automated Dispensing System 923
Automated Equipment 388
Automated Filling & Sealing station TDU7000S 922
Automated Filling & Sealing station TDU9000S 920
Automated Inspection Microscope 44
Automated Micro Raman 216
Automated Microscopy Positioning 926
Automated Multi-wavelength Laser Scribing/ablation/Cutting station with Micro Inspection Camera 328
Automatic Refractometer 290
Auto Measuring Microscope (Dual Camera) 250
Auto Metallurgy Microscope 256
Automicroscope 46
Axicons 608
B-H Curve / Magnetic Hysteresis Curve Experiment 872
Babinet Compensator 829
Beam Expanders 633
Beamsplitters 618
Beamsplitters 621
Beam Steering Device 528
Belt Driven High Speed Translation Stage (Linear) 725
Belt Driven High Speed Translation Stage (XY) 726
Bench Top Rubbing Machine 432
Bevel : 0.2mm x 45degree 612
Bi - Concave Lenses 603
Bi - Convex Lenses 601
Black Enclosures 495
BREADBOARDS, TABLETOPS, RAILS & CARRIAGES 456
Brewster's Angle Apparatus 816
Broadband Light Sources 228
Broadband Metallic Mirror 624
C & V type clamps 584
C - Type Clamps 584
CCD Based Constant Deviation Spectrometer 780
CCD Spectrophotometer / Fluorometer 132
CD 214 Series 164
CG216 Series 162
Characterization of Transparent Optical Materials 344
Circular Windows 617
Coated prism divert the incident beam by 60° 614
Compact Post Clamp 583
Compatible Stepper Motor 708
Concave Cylindrical Lenses 605
Concave Mirror 623
Condensers 635
Conductivity Cell Measurement Setup 342
Conductivity Cell Measurement Setup 895
Cone Mirror 624
Confocal Fluorescence 68
Confocal Fluorescence Correlation Spectrometer 66
Confocal Laser Raman Spectrometer 186
Confocal Laser Raman Spectrometer 790
Confocal Micro Laser Ablation with integrated galvano scanning unit 324
Confocal Raman Spectroscopy 188
Confocal Real-time Laser Beam Induced Current and Photoluminescence Measurement Unit 332
Contact Angle Instrument for Under -Liquid Low Energy Surfaces 246
Contact Angle Meter - Base Model 238
CONTACT ANGLE METER 236
Contact Angle Meter 238
Contact Angle Meter 244
Contact Angle Meter 862
Contact Angle Meter with Dispenser to camera positioning unit, Motorized Substrate Holder,Automated Dispenser & Temperature Control 242
Contents
Continuous Rotation - 360° 704
Control Electronics & Software 710
Controller for Motorized Lab jack 594
Copper tipped set-screws 587
Cornus Interference Apparatus 794
Cross Correlation Spectrometer 68
Cryostat Positioner 696
Cryostat Positioner 696
Cryostat Positioner 697
Cryostat Positioner 697
CT216 Series 160
Cube / Prism mounts 526
Custom Breadboards & Support 465
Custom Impedance Tube 338
Custom Micro Motion Controls 712
Cyclical Force Generator 348
Cylindrical Achromatic Lenses 606
Cylindrical Achromatic Lenses 607
Cylindrical Beam Expander Tube 634
Cylindrical Lenses 605
Damped Heavy Duty Post 581
Design Stage 764
Desktop Vibration Isolation Support 480
Detector Based Apparatus for Diffraction Experiments 851
Diffraction 850
Diffused Reflectance Spectrophotometer 148
Diffuse Reflectance Spectrophotometer 146
Diffusers & Polarizing Optics 626
Diffusers 626
Digital Autocollimator 272
Digital Holography 24
Digital Holography Microscope (DHM) 28
Digital Holography Microscope - Inverted 30
Digital Holography Microscope 24
Digital Inline 64
Digital Inline Holography Microscope 62

Digital Inspection Microscope 84
Digital Inverted Microscope 42
Digital Microscope 262
Digital Polarimeter 288
Digital Traveling Microscope 268
Diode Laser 902
Dip Coating Unit 410
Dip Coating Unit 410
Dip Coating Unit 412
Dip Coating Unit 414
Dip Coating Unit 418
Dip Coating Unit 420
Dip Coating Unit 422
Dove Prisms 611
Dovetail Triangular 500
DPSS Laser 903
Dual Axis Antenna Positioner with Azimuth and Elevation Control 774
DUAL Grating f/3.5 Monochromator 180
Dual Pump Nano Fiber Electrospinning Unit 364
Dual Pump Nano Fiber Electrospinning Unit 368
Dual Rod System 583
e/m Experiment Apparatus (Thomson's method) 869
Educational spectrophotometer 791
Electricity and Magnetism 866
Electrochemical Discharge 440
Electronic Speckle 346
Electronic Speckle Pattern Interferometer (ESPI) 814
Ellipsometer 276
Enclosure Construction System 496
Enclosures 490
Equilateral Prisms 612
Extra Large Breadboards 464
Fabry - Perot Etalon 808
Fabry - Perot Interferometer (CCD Based) 810
Fabry - Perot Interferometer (Projection Based) 809
Faraday Effect Apparatus (Liquid Sample) 820
Faraday Effect Apparatus (Multi Wavelength) 822
Faraday Effect Apparatus 818
Faraday Modulator 230
Fiber Chuck and Holders 554
Fiber Collimator / Focusers 635
Fiber Optics 832
Filter Mounts 543
Five Axis Positioner 676
Fizeau Interferometer 124
Fizeau Interferometer 812
Fizeau Interferometer with Encoder Rail System 126
Flame Assisted 382
Flame Spectrometer 781
Flowline F100 918
Fluorescence Imaging Microscope 34
Fluorescence Microscope 34
Fluorescence Microscope 66
Fluorescence Spectrometer 220
Fresnel Rhomb Retarders 630
Fresnel's Biprism Diffraction Apparatus 856
Gantry Design Stage GTNDT Series 766
Geometrical Optics Experiment Apparatus 859
Gimbal Mirror Mounts 523
Glass Cutting and Slicing Machine 924
Glove Box 354
Goniometer- Worm Gear Drive 698
Goniometer Based Apparatus for Diffraction 853
GSM Series Goniometer 698
Hall effect Apparatus 873
Hall Effect Sample Holder for Electromagnet 874
HC - 2 Rail & Carriers 502
HC - 3 Rail & Carriers 503
Heavy Duty 715
Heavy Duty Breadboards 463
Heavy Duty Goniometer 700
Heavy Duty Goniometers 702
Heavy Duty Labjack 592
Heavy Duty Post Base 582
Heavy Duty Post System 581
Heavy Duty Stage 678
Heavy Duty TS 679
Heavy Duty XY Moving Platform 682
Heavy Duty XZ Stage 678
High Sensitivity Laser Based Magneto-Optical Kerr Effect Station 282
HO-HMA-Series 715
HO-MA Series 715
Holographic Lab 884
Holography 884
Holography Microscope 64
Honeycomb Breadboards 468
Honeycomb Breadboards 471
Honeycomb Breadboards Extreme Light Weight 469
Honeycomb Breadboards Light Weight 470
Honeycomb Tabletops 472
Horizontal Microscope 106
HV-IV Probe System 88
Hydrogen Spectra - Balmer Series Apparatus 783
Illumination System 128
IMAGING 60
Impedance Tube 336
Industrial Electrospinning 380
Industrial Scale Needle-less Electrospinning Unit 380
Inspection Microscope 40
Inspection Microscope 72
INSTRUMENTS 60
Interferometer 124
Interferometry 792
Inverted 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer 196
Inverted microscope – Fluorescence (Brightfield, Phase contrast, Epi-fluorescence) 38
Inverted microscope – Phase contrast 40
Kerr Effect Apparatus 824
Kinematic Mirror Mounts 508
Kundt's Tube Apparatus 881
LAB EQUIPMENTS 350
Lab Jacks 590
LABORATORY AUTOMATION 908
Laboratory Microscope 52
Laminar Flow Hood 352
Laminar Flow Work Table 352
Large Mounting Clamp 583
Large XY Scanning Machine 927
Laser & Opto Electronics 836
Laser Ablation 324
Laser Ablation Inspection Microscope 80
Laser Induced Current Measurement 332
Laser Microscope 74
Laser Mounts 549
Laser Raman Spectrometer (CCD Based) 789
Laser Raman Spectrometer (PMT Based) 788
Laser Raman Spectrometer 182
Led, Laser Diode & Photodiode Characterization Apparatus 848
Lees Disc Apparatus 340
Lee's Disc Apparatus 865
Lens Assembly Spectral Measurement System 234
Lenses 600
Lens Mounts 537
Lens Tube Assembly System 530
Light Beam Induced Current (LBIC) Measurement 334
Light Sources, Detectors & Accessories 222
Light Sources 226
LINEAR AND ROTATION TRANSLATION STAGES 638
Linear Film Polarizers 627
Linear Roller Slides 914
Linear Slides 910
Linear Slides 912
Linear Translation Stage 640
Liquid Lens Apparatus 858
Littrow Prisms 614
Long Travel Translation Stage 686
Long Travel Translation stages MLTS series (Linear and XY) 724
LTSV-35 Translation Stage : 656
LTSV-50 Translation Stage : Side Drive 660
LTSV-65 Translation Stage : 664

LTSV-90 Translation Stage 668
LTTS 125 Series 691
LTTS 150 Series 692
LTTS 200 Series 694
LTTS 250 Series 695
LTTS 50 Series 689
LTTS 75 Series 690
Lyot Depolarizer 627
Machining System 440
Mach Zehnder Interferometer 806
Magnetic Stirrer and Hot Plates 452
Magnetic Susceptibility - Gouy's method 876
Magnetic Susceptibility - Quincke's Method 875
Magneto Optic Ellipsometry 280
Magneto Optic Spectrometer 286
Magnetostriction with Michelson Interferometer 800
Malus Law Apparatus 817
Manual Labjack 590
Manual XY Theta Stage 672
Material - BK7 612
Measurement System - VIS IR 300
Measurement System 284
Measurement Unit 304
Measuring Microscope (Dual Camera) 252
Measuring Microscope 250
Measuring Microscope 254
Measuring Microscope 262
Mechanics 862
Meniscus Lenses 604
Metallic Cube Beamsplitters 619
Metallic Enclosures 492
Metallurgy Microscope 256
Metric - English Thread Adapters 585
Metric Allen Key, Washers & Nut 589
Metric Set Screws 588
Metric Socket Cap Screws 588
METROLOGY INSTRUMENTS 248
Michelson Interferometer (Compact Model) 798
Michelson Interferometer (Piezo Electric Effect) 804
Michelson Interferometer (Sodium D'Lines) 802
Michelson Interferometer (Standard Model) 796
MICRO Plate 8 Channel Precision Dispensing Station 916
Microscope & LCD display 82
Microscope (DHM) 24
Microscope 260
Microscope Objectives 636
MICROSCOPES 22
Microscope Translation Stage 108
Millikan's Oil Drop Apparatus 866
Mini Breadboards 458
Mini Monochromator 174
Mirrors 622
MLS Series Translation Stages 688
Modular Spectrophotometer 150
MOKE 282
Motorised Shutter 559
Motorized 5 Axis Stage 762
Motorized Actuators 714
Motorized Digital Holography Microscope (DHM) 26
Motorized Goniometer 744
Motorized Heavy Duty 750
Motorized Heavy Duty Labjack 593
Motorized Labjack 591
Motorized Linear Stage 716
Motorized Microscope 32
Motorized Microscope TM01 - Trinocular 32
Motorized Multi Axis Stage 754
Motorized Precision 724
Motorized Rotation Stage 746
Motorized Rotation Stage 748
MOTORIZED ROTATION TRANSLATION STAGES 706
Motorized Translation Stages 729
Motorized Translation Stages 731
Motorized Translation Stages 732
Motorized Translation Stages 734
Motorized Translation Stages 736
Motorized Translation Stages LMS series 722
Motorized Translation Stages MTS-M35 series 717
Motorized Translation Stages MTS-M series 718
Motorized Translation Stages MTS series 720
Motorized Translation Stages RCMTS-35 Series 727
Motorized Two Axes Gimbal Stage 742
Motorized Vertical Translation Stages 596
Motorized Vertical Translation Stages 740
Motorized XY Moving Platform 738
Mounting Accessories 466
Mounting Clamp 582
MRSC Series 748
MS Series 910
MS Series 912
Multi-channel Precision Line Dispenser 917
Multi Axis Manipulator 926
Multi Axis Translation Stages 672
Multi Channel Scanning Spectrometer 170
Multiple-Order Wave Plates 628
MXYTS Series 738
Nano Fiber Double Spinning & Yarning System 376
Nano Fiber Electrospinning Unit 356
Nano Fiber Electrospinning Unit 356
Nano Fiber Electrospinning Unit 372
Nano Fiber Electrospinning Unit with Support 360
Near Normal Spectroscopic Reflectometer 292
Nema 23 High Vacuum 708
Nylon tipped set-screws 586
Nylon tipped thumb screws 587
Optical Chopper 232
Optical Chopper 558
Optical Rail & Carrier 500
Optical systems 632
Optical Table and Side Curtains 499
Optic Rails 500
OPTICS 598
Optics 858
Opto Mechanical Kit 581
OPTO MECHANICS 504
Other Equipments 434
Others 128
Overhead Shelf with Curtain 486
Overhead Shelves 482
P-LE Series Post 564
P16D-LE Series Posts 574
P16D Series Posts 573
Parabolic Concave Mirrors 625
Passive Support (Automated Pressure & Level Controlled) 474
Passive Vibration Isolation System 476
Pattern Interferometer (ESPI) 346
PC based water cooled electromagnet 450
Pedestal Adapter 566
Pedestal Adapter 575
Pedestal Post Holder 566
Pedestal Post Holder 571
Pellin Broca Prisms 614
Penta Prisms 612
Peristaltic Pump 446
PF Series Pedestal Fork 566
PF Series Pedestal Fork 575
PF Series Pedestal Fork 576
PH-16D Series Post Holder 574
Photodetector Characterization Setup 318
Photoluminescence Measurement Apparatus 784
PH Series Post 565
PH Series Post Holders 561
PH Series Post Holders 570
PHYSICS LAB INSTRUMENTS 776
Piezoelectric Probe Station 90
Pitch & Yaw Positioning Mechanism for Subsonic Wind Tunnel 770
Plano - Concave Lenses 602
Plano - Convex Lenses 600
Plano Aluminium Mirrors 622
Plano Convex and Plano 605

Plano Silver Mirror 623
Plate Beamsplitters 618
Platforms 506
Pockel Effect Apparatus 826
Polarimeter 288
Polarization 816
Polarizer Mounts 548
Polarizers 627
Polarizing Optics 627
Positioner 770
Positive and Negative Achromatic Lenses 606
Post Bases 577
Post Clamps 579
Post Collar 567
Post Mounting Systems 560
Post Spacer 582
PPH Series Pedestal Post Holder 575
Precision Tilting Platform 506
Precision Translation Stage 654
Prisms 610
Prisms 610
Probe Station Microscope 86
Probe Station Platform & Accessories 102
Probe Station System 96
Probe Station System T01 EC 92
Probe Station System T01L 94
Programmable Multi-Nozzle 390
P Series Post 562
P Series Post 568
Quadrupole Magnetic Probe Station 86
Quantum Efficiency & IV Measurement System 294
Quantum Efficiency & Spectral Response Measurement System 298
Quantum Efficiency 294
Quantum Efficiency 300
Radiography Multi Axis Manipulator 768
Raman / PL Microscope 184
RCMTS-125 Series 731
RCMTS-150 Series 732
RCMTS-200 Series 734
RCMTS-250 Series 736
RCMTS-50 Series 729
RCMTS Series Motorized Stages 728
Rectangular and Square Windows 616
Reel to Reel Printing Machine 909
Reflectometer 292
Refractometer 290
Refractometer 861
RF Probe Station System 100
Rhomboid Prisms 614
Right Angle Prisms 610
Rigid Tabletop Support 478
Rod Assembly 534
Rotation Stage 702
Rotation Stages - 704
Rotation Stages MRSH Series 750
Rotation stage with IP65 rating 752
Scattering Photometer Single Channel Light Detection 158
Schlieren Imaging System 320
Schlieren Imaging System 322
Schmidt Prisms 612
Schmidt Prisms 615
Scientific Monochromators 176
Screen Based Apparatus for Diffraction Experiments 850
Screen Based Apparatus for Ultrasonic Diffraction 880
Second Harmonic Generation 844
Set Screws 586
SHC Screws 588
Side Drive 656
Side Drive 664
Side Drive 668
Silar Coating System 396
Silar Coating System 396
Silar Coating System 398
SILAR Coating System 400
SILAR Coating System 402
SILAR Coating System for Large Substrate 406
SILAR Coating System with Magnetic Stirrer & Ultrasonic Bath 404
SILAR Coating System without heater and Stirrer 408
Sin216R Series 746
Sine Drive Angular Stage 746
Single & Dual Axis 702
Single Axis 698
Single Channel Dispensing Station 916
Single Slit Diffraction and Heisenberg's uncertainty principle 852
Slide Scanner 50
Slotted Plates 580
Small Size Transparent Enclosures & Black Enclosures 494
Solar Cell 892
Solar Cell Characterization Apparatus 892
Solar Characteristics Measurement Set Up 896
Solar Simulator & IV Measurement 314
Solar Simulator 1 308
Solar Simulator 2 310
Solar Simulator 308
Solar Simulator with IV Measurement System 312
Soleil - Babinet Compensator Fresnel Rhomb Retarders 631
Solid Breadboards 458
Solid Breadboards with aperture 465
Sources and Detectors 902
SPE 3000 Series Spectrophotometer 134
SPE 6000 Series 138
Spectra CT UV-VIS-NIR CCD Based 168
Spectra CT UV-VIS-NIR CCD Based 170
Spectral characteristics of LED 843
Spectral Quantum Efficiency & IV 304
Spectral Response Measurement Apparatus 316
Spectral Response Measurement Apparatus 894
Spectra UV-VIS-NIR High Throughput 180
Spectra UV-VIS-NIR Quasar Series 176
Spectra UV-VIS-NIR Standard Monochromator 172
Spectrometer-Goniometer 778
Spectrometer - Goniometer 779
Spectrometer 160
Spectrometer 216
Spectrometer Goniometer 1 154
Spectrometer Goniometer 154
Spectrometer Goniometer 2 156
SPECTROPHOTOMETER 130
Spectrophotometer 132
Spectrophotometer 138
Spectrophotometer 142
Spectrophotometer 886
Spectroscopic Kerr / Faraday / Ellipsometry 286
Spectroscopic Magneto - Optic Rotation 284
SPECTROSCOPY 152
Spectroscopy 778
Spherical Singlets 600
Spin Coating Unit 424
Spraying System 390
Spray Pyrolysis Equipment (Table Top) 384
Spray Pyrolysis Equipment 382
Spray Pyrolysis Equipment 386
Spray Pyrolysis Equipment Unit 382
Stages and Laboratory Automation 910
Standard 471
Standard Models with different Mirror sizes 320
Standard Solid Breadboards 460
Stepper Motors 708
Stitched Scanning Spectrometer 168
Syringe Pump 442
System with Keithley SMU 314
Table Clamps 584
Tabletop Support 474
Telecentric Digital Inspection / 262
Telemicroscope 120
Telemicroscope 122
Temperature determination of an artificial star by photometry 900

Thermal Lens Microscope - Confocal 72
Thermocycler 436
Theta 2 Theta Advanced 142
Theta 2 Theta Advanced scanning Spectrophotometer SPA216 Series 144
Theta 2 theta advanced Spectrophotometer 890
Thin Film Characterization 886
Thin film Spectroscopic Reflectometer 889
Thumb Screws 587
Tool Maker's 260
Tools & Accessories 585
Translating Pedestal Post Holder 568
Translating Pedestal Post Holder 573
Translating Pedestal Post Holder 576
Translating Post Holder 567
Translating Post Holder 572
Translating Post Holder 576
Translation Stage with Vernier readout 687
Traveling Microscope 266
Trinocular Inspection Microscope 78
Trinocular Microscope 54
Trinocular microscope with Digital display and Trinocular Microscope with fiber optics cable 58
TS-35 Translation Stage 640
TS-50 Translation Stage 642
TS-65 Translation Stage 644
TS-90 Translation Stage 646
TS 120 Translation Stage 650
TSQ-90 Translation Stage 648
TSQ 120 Translation Stage 652
TSV - 35 Translation Stage 654
TSV-50 Translation Stage 658
TSV-65 Translation Stage 662
TSV-90 Translation Stage 666
Tube Lens - Infinity corrected 632
Ultrasonic Diffraction using Goniometer 882
Uncoated prism ideal for dispersion of white light into spectrum 614
Upright 532nm Research-Grade Probe Station based Micro Electroluminescence/ Raman Spectrometer 202
Upright 532nm RESEARCH GRADE Automated Confocal Micro Raman Spectrometer 190
Upright INSI Raman 208
UV-VIS-NIR Scanning Spectrometer 166
UV Ozone Cleaner 150 392
UV Ozone Cleaner 350 400 394
UV Ozone Cleaner 392
V - Type Clamps 584
Vacuum Compatible 762
Vacuum Oven and Ion Exchanger 438
Vacuum Spray Pyrolysis 388
Variable Angle Laser Ellipsometer 276
Variable Angle Laser Ellipsometer 887
Variable Angle Spectroscopic Ellipsometer 278
Variable Angle Spectroscopic Ellipsometer 888
Variable Beam Expanders 634
Variable Beamsplitters (Mounted) 620
Vertical Laminar Flow with 499
Vertical Translation Stage 670
Vial Dispensing Station 927
VTS Series 671
Wave Plates / Retarders 628
Wedge Prisms 613
Windows 616
with Boom Stand 78
with Height Adjustment 478
with Magnetic Stirrer 402
with Motorized Polarizer Rotator 128
with Overhead Stirrer 400
Wooden Drawer Shelf 488
Work Station with Inspection 82
WRSC series Rotation Stages 705
WRS series Rotation Stages 705
Xenon Light Source 313
XY Moving Platform 680
XY Moving Platform 738
XY Theta Stage 756
XYTSM Series 680
XYTS Series XY Moving Platform 684
XYTSWM Series XY Heavy Duty Moving Platform 683
XYTSWM Series XY Moving Platform 681
XYTSW Series XY moving Stage 685
XYZ Compact Translation Stage 672
XYZ Compact Translation Stage 673
XYZ Compact Translation Stage 673
XYZ Compact Translation Stage 673
XYZ Compact Translation Stage 674
XYZ Compact Translation Stage 674
XYZ Compact Translation Stage 675
XYZ Heavy Duty Translation Stages 677
XYZ Positioner 675
XYZ Stage 758
XYZTS Series 679
XZTS 300-300 678
Z - Scan Characterization Kit 344
Z-Scan system 841
Zeeman Effect Apparatus (Transverse & Longitudinal configuration) 786
Zeeman Effect Apparatus 785
Zero - Order Wave Plates 629
Ø12.7 mm 572
Ø12.7 mm 573

Index B Models

5ALM - 75 541
5ALM - 100 541
5AMOH 542
5A - OFH 522
5A - OFH - 125 522
5XYKM-50 541
19-IN-RS-12U-A 489
19-IN-RS-12U-D 489
19-IN-RS-14U-B 489
19-IN-RS-14U-E 489
42ST40-1A-V 709
45B-100-AL 467
45B-150-AL 467
45B-200-AL 467
45B-250-AL 467
45B-300-AL 467
45B-350-AL 467
45-BM-10 519
45-BM-12.5 519
45-BM-25 519
45-BM-38 519
45-BM-50 519
45-MM-10 517
45-MM-12.5 517
45-MM-25 517
45-MM-38 517
45-MM-50 517
45-MMH-15 520
45-MMH-30 520
45-MMH-50 520
57ST51-4A-V 708
90B-100-AL 467
90B-150-AL 467
90B-200-AL 467
90B-250-AL 467
90B-300-AL 467
90B-350-AL 467
-TKM-25 535
A
ABC-65 582
ABC-120 583
AB-DRS 583
AB - LMS 75100 723
AB - LMS 75150 723
AB - LMS 75200 723
AB - LMS 100100 723
AB - LMS 100150 723
AB - LMS 100200 723
AB - LMS 150150 723
AB - LMS 150200 723
AB - LMS 200200 723
AB-MTS 6565 721
AB-MTS 9090 721
AB-MTS 90115 721
AB-MTS 90150 721
ABS 50 x 75 912
ABS 50 x 75A 912
ABS 50 x 100 912
ABS 50 x 100A 912
ABS 50 x 150 912
ABS 50 x 150A 912
ABS 50 x 150B 912
ABS 50 x 200 912
ABS 50 x 200A 912
ABS 50 x 200B 912
ABS 50 x 250 912
ABS 50 x 250A 912
ABS 50 x 250B 912
ABS 50 x 300 912
ABS 50 x 300A 912
ABS 50 x 300B 912
ABS 50 x 300C 912
ABS 50 x 350 912
ABS 50 x 350A 912
ABS 50 x 350B 912
ABS 50 x 350C 912
ABS 50 x 400 912
ABS 50 x 400A 912
ABS 50 x 400B 912
ABS 50 x 400C 912
ABS 50 x 400D 912
ABS 65 x 75 913
ABS 65 x 75A 913
ABS 65 x 100 913
ABS 65 x 100A 913
ABS 65 x 150 913
ABS 65 x 150A 913
ABS 65 x 150B 913
ABS 65 x 200 913
ABS 65 x 200A 913
ABS 65 x 200B 913
ABS 65 x 200C 913
ABS 65 x 250 913
ABS 65 x 250A 913
ABS 65 x 250B 913
ABS 65 x 250C 913
ABS 65 x 300 913
ABS 65 x 300A 913
ABS 65 x 300B 913
ABS 65 x 300C 913
ABS 65 x 350 913
ABS 65 x 350A 913
ABS 65 x 350B 913
ABS 65 x 350C 913
ABS 65 x 400 913
ABS 65 x 400A 913
ABS 65 x 400B 913
ABS 65 x 400C 913
ABS 65 x 400D 913
ABS 90 x 100 913
ABS 90 x 100A 913
ABS 90 x 150 913
ABS 90 x 150A 913
ABS 90 x 150B 913
ABS 90 x 200 913
ABS 90 x 200A 913
ABS 90 x 200B 913
ABS 90 x 250 913
ABS 90 x 250A 913
ABS 90 x 250B 913
ABS 90 x 250C 913
ABS 90 x 300 913
ABS 90 x 300A 913
ABS 90 x 300B 913
ABS 90 x 300C 913
ABS 90 x 350 913
ABS 90 x 350A 913
ABS 90 x 350B 913
ABS 90 x 350C 913
ABS 90 x 400 913
ABS 90 x 400A 913
ABS 90 x 400B 913
ABS 90 x 400C 913
ABS 90 x 400D 913
ABTS - 35 641
ABTS - 50 643
ABTS - 65 645, 647
ABTS - 120 651
ABTSQ - 90 649
ABTSQ - 120 655
ABTSV-35 653, 657, 659, 661
ABTSV - 65 663, 665
ABTSV - 90 667, 669
ABZTS - 35 641
ABZTS-65 645, 647
ABZTS - 120 651
ABZTSQ - 90 649
ABZTSQ - 120 655
ABZTSV - 65 663, 665
ABZTSV - 90 667
AD - GMM - 25 523
AD-GMM-25 523
AD - GMM - 50 523
AD-GMM-50 523
AD-GMM-75 523
AD-GMM-100 523
ADN-25 518
ADN-38 518
ADN-50 518
AHDP - 38 529
ALDN-25 518
ALDN-38 518
ALDN-50 518
Allen key 497
ALM - 25 539
ALM - 50 539
ALM - 100 539
ALM - B - 50 539
ALM - B - 90 539
ALM - B - 135 539
ALM - B - 165 539
ALM-C-25 538
A - M6M4 518
AP30 563
AP40 563
AP50 563
AP75 563
AP100 563
AP125 563
AP150 563
APN30 569, 570
APN40 569, 570
APN50 569, 570
APN75 569, 570
APN100 569, 570
APN125 569, 570
APN150 569, 570
APNT30 569, 570
APNT40 569, 570
APNT50 569, 570
APNT75 569, 570
APNT100 569, 570
APNT125 569, 570
APNT150 569, 570
APT30 564
APT40 564
APT50 564
APT75 564
APT100 564
APT125 564
APT150 564
APTS - 35 641
APTS - 50 643
APTS - 65 645, 647
APTS - 120 651
APTSQ - 90 649
APTSQ - 120 655
APTSV-35 653, 657, 659, 661
APTSV - 65 663, 665
APTSV - 90 667, 669
AR-OHS-1200 484
AR-OHS-1500 484
AR-OHS-1800 484
AR-OHS-2400 484
AR-OHS-3000 484
ARS 50 x 100 914
ARS 50 x 100A 914
ARS 50 x 150 914
ARS 50 x 150A 914
ARS 50 x 150B 914
ARS 50 x 200 914
ARS 50 x 200A 914
ARS 50 x 200B 914
ARS 50 x 200C 914
ARS 50 x 250 914
ARS 50 x 250A 914
ARS 50 x 250B 914
ARS 50 x 250C 914
ARS 50 x 300 914
ARS 50 x 300A 914
ARS 50 x 300B 914
ARS 50 x 300C 914
ARS 50 x 300D 914
ARS 50 x 350 914
ARS 50 x 350A 914
ARS 50 x 350B 914
ARS 50 x 350C 914
ARS 50 x 350D 914
ARS 50 x 400 914
ARS 50 x 400A 914
ARS 50 x 400B 914
ARS 50 x 400C 914
ARS 50 x 400D 914
ARS 65 x 75 915
ARS 65 x 75A 915
ARS 65 x 100 915
ARS 65 x 100A 915
ARS 65 x 150 915
ARS 65 x 150A 915
ARS 65 x 150B 915
ARS 65 x 200 915
ARS 65 x 200A 915
ARS 65 x 200B 915
ARS 65 x 200C 915
ARS 65 x 250 915
ARS 65 x 250A 915
ARS 65 x 250B 915
ARS 65 x 250C 915
ARS 65 x 300 915
ARS 65 x 300A 915
ARS 65 x 300B 915
ARS 65 x 300C 915
ARS 65 x 350 915
ARS 65 x 350A 915
ARS 65 x 350B 915
ARS 65 x 350C 915
ARS 65 x 400 915
ARS 65 x 400A 915
ARS 65 x 400B 915
ARS 65 x 400C 915
ARS 65 x 400D 915
ARS 90 x 100 915
ARS 90 x 100A 915
ARS 90 x 150 915
ARS 90 x 150A 915
ARS 90 x 150B 915
ARS 90 x 200 915
ARS 90 x 200A 915
ARS 90 x 200B 915
ARS 90 x 200C 915
AS - 0.5 552
AS - 2 552
AS - 3 552
AS - 4 552
AS - 5 552
AS - 6 552
AS - 7 552
AS - 9 552
AS - 10 552
AVI204S 475
AVI2303S 475
B
BB-25-EXT 533
BB-25-INT 533
BB 60-30 471
BB 60-60 471
BB 90-60 471
BB 90-90 471
BB 120-90 471
BB 120-120 471
BB 180-120 471
BB-100100-AL-B 462
BB-100100-AL-BT 462
BB-100100-AL-D 461
BB-100100-AL-DT 461
BB-100100-AL-NT 461
BB-100100-AL-T 461
BB-100100-SS 461
BB-100100-SSM 462
BB-100200-AL-B 462
BB-100200-AL-BT 462
BB-100200-AL-D 461
BB-100200-AL-DT 461
BB-100200-AL-T 461
BB-150400-AL-B 462
BB-150400-AL-BT 462
BB-150400-AL-D 461
BB-150400-AL-DT 461
BB-150400-AL-T 461
BB-200200-AL-B 462
BB-200200-AL-BT 462
BB-200200-AL-D 462
BB-200200-AL-DT 461
BB-200200-AL-NT 461
BB-200200-AL-T 461
BB-200200-SS 461
BB-200200-SSM 462
BB-200400-AL-B 462
BB-200400-AL-BT 462
BB-200400-AL-D 462
BB-200400-AL-DT 461
BB-200400-AL-NT 461
BB-200400-AL-T 461
BB-200400-SS 461
BB-200400-SSM 462
BB-300300-AL-B 462
BB-300300-AL-BT 462
BB-300300-AL-D 462
BB-300300-AL-DT 461
BB-300300-AL-T 461
BB-300400-AL-B 462
BB-300400-AL-BT 462
BB-300400-AL-D 462
BB-300400-AL-DT 461
BB-300400-AL-NT 461
BB-300400-AL-T 461
BB-300400-SS 461
BB-300400-SSM 462
BB-400400-AL-B 462
BB-400400-AL-BT 462
BB-400400-AL-D 462
BB-400400-AL-DT 461
BB-400400-AL-NT 461
BB-400400-AL-T 461
BB-400400-SS 461
BB-400400-SSM 462
BB-400600-AL-B 462
BB-400600-AL-BT 462
BB-400600-AL-D 462
BB-400600-AL-DT 461
BB-400600-AL-T 461
BB-400600-SS 461
BB-400600-SSM 462
BBNM 60-30 471
BBNM 60-60 471
BBNM 90-60 471
BBNM 90-90 471
BBNM 120-90 471
BBNM 120-120 471
BBNM 180-120 471
BDS-400-2A 488
BDS-400-2B 488
BDS-400-3B 488
BDS-400-A 488
BDS-400-B 488
BDS-600-2D 488
BDS-600-2E 488
BDS-600-D 488
BDS-600-E 488
BDS-600-EE 488
BLE-300-300-HD 495
BLE-300-300-SLD 495
BLE-600-300-HD 495
BLE-600-300-SLD 495
BLE-600-600-HD 495
BLE-600-600-SLD 495
BLE-900-600HD 495
BLE-900-600-SLD 495
BLE-900-900-HD 495
BLE-900-900-SLD 495
BLE-A-B-C-HD 495
BLE-A-B-C-SLD 495
BLRM3-EPI 57
BLRM3-FL 57
BLRM3-TS 56
BLRM3-TS-D 59
BM-AK-12.5 511
BM-AK-25 511
BM-AK-38 511
BM-AK-50 511
BM-AK-T-12.5 511
BM-AK-T-25 511
BM-AK-T-38 511
BM-AK-T-50 511
BM-AM01 46
BM-CS-12.5 511
BM-CS-25 511
BM-CS-38 511
BM-CS-50 511
BM-CS-T-12.5 511
BM-CS-T-25 511
BM-CS-T-38 511
BM-CS-T-50 511
BM-LS-12.5 511
BM-LS-25 511
BM-LS-38 511
BM-LS-50 511
BM-LS-T-12.5 511
BM-LS-T-25 511
BM-LS-T-38 511
BM-LS-T-50 511
BM-Mu-25 511
BM-Mu-38 511
BM-Mu-50 511
BM-Mu-T-25 511
BM-Mu-T-38 511
BM-Mu-T-50 511
BMX-AK-25 514
BMX-AK-38 514
BMX-AK-50 514
BMX-AK-T-25 514
BMX-AK-T-38 514
BMX-AK-T-50 514
BMX-CS-25 514
BMX-CS-38 514
BMX-CS-50 514
BMX-CS-T-25 514
BMX-CS-T-38 514
BMX-CS-T-50 514
BMX-LS-25 514
BMX-LS-38 514
BMX-LS-50 514
BMX-LS-T-25 514
BMX-LS-T-38 514
BMX-LS-T-50 514
BMX-Mu-25 514
BMX-Mu-38 514
BMX-Mu-50 514
BMX-Mu-T-25 514
BMX-Mu-T-38 514
BMX-Mu-T-50 514
BP-HO-HMA-25 715
BP-HO-HMA-50 715

BP - LMS 75100 723
BP - LMS 75150 723
BP - LMS 75200 723
BP - LMS 100100 723
BP - LMS 100150 723
BP - LMS 100200 723
BP - LMS 150150 723
BP - LMS 150200 723
BP - LMS 200200 723
BPL-RLC-HC1 503
BPL-RLC-HC2 503
BPL-RLC-HC3 503
BP-LTTS50-50 689
BP-LTTS50-75 689
BP-LTTS50-100 689
BP-LTTS50-150 689
BP-LTTS75-50 690
BP-LTTS75-75 690
BP-LTTS75-100 690
BP-LTTS75-150 690
BP-LTTS75-200 690
BP-LTTS75-250 690
BP-LTTS125-100 691
BP-LTTS125-150 691
BP-LTTS125-200 691
BP-LTTS125-350 691
BP-LTTS125-500 691
BP-LTTS150-100 692, 694
BP-LTTS150-150 692, 694
BP-LTTS150-200 692, 694
BP-LTTS150-300 692, 694
BP-LTTS150-500 692, 694
BP-LTTS150-750 692, 694
BP-LTTS250-100 695
BP-LTTS250-150 695
BP-LTTS250-200 695
BP-LTTS250-300 695
BP-LTTS250-500 695
BP-LTTS250-750 695
BP-LTTS250-1000 695
BP-MGM-35 744
BP-MGM-63 744
BP-MGM75 744
BP-MGM-90 744
BP-MTS 6565 721
BP-MTS-6565 721
BP-MTS 9090 721
BP-MTS 90115 721
BP-MTS 90150 721
BP-MTS-90150 721
BP-MTSM-3535 719
BP-MTSM-3550 719
BP-MTSM-3760 719
BP-MTSM-5050H 719
BP-MTSM-5065H 719
BP-MTSM-5075H 719
BP-MTSM-5090H 719
BP-RCMTS50-50 729
BP-RCMTS50-75 729
BP-RCMTS50-100 729
BP-RCMTS50-150 729
BP-RCMTS75-50 730
BP-RCMTS75-100 730
BP-RCMTS75-150 730
BP-RCMTS75-200 730
BP-RCMTS75-250 730
BP-RCMTS125-100 731
BP-RCMTS125-150 731
BP-RCMTS125-200 731
BP-RCMTS125-300 731
BP-RCMTS125-500 731
BP-RCMTS150-100 733
BP-RCMTS150-150 733
BP-RCMTS150-200 733
BP-RCMTS150-300 733
BP-RCMTS150-500 733
BP-RCMTS200-100 735
BP-RCMTS200-200 735
BP-RCMTS200-300 735
BP-RCMTS200-500 735
BP-RCMTS200-750 735
BP-RCMTS250-100 737
BP-RCMTS250-200 737
BP-RCMTS250-250 737
BP-RCMTS250-300 737
BP-RCMTS250-500 737
BP-RCMTS250-750 737
BP-RCMTS250-1000 737
BP-RLC-HC1 -100 503
BP-RLC-HC1 -175 503
BP-RLC-HC2-75 503
BP-RLC-HC2 -100 503
BPTS - 35 641
BPTS - 50 643
BPTS - 65 645, 647
BPTS - 120 651
BP-TSC5030 687
BP-TSC5050 687
BP-TSC5075 687
BP-TSC5090 687
BPTSQ - 90 649
BPTSQ - 120 655
BPTSV-35 653, 657, 659, 661
BPTSV - 65 663, 665
BPTSV - 90 667, 669
BR-OHS-1200 484
BR-OHS-1500 484
BR-OHS-1800 484
BR-OHS-2400 484
BR-OHS-3000 484
BSD-25-20-P 529
BSD-25-25-B 529
BSD-25-30-B 529
BSD-25-30-P 529
BSD-25-50-B 529
BSD-25-50-P 529
BSD-25-60-B 529
BSD-25-60-P 529
BSD-25-L-20-P 529
BSD-25-L-25-B 529
BSD-25-L-30-B 529
BSD-25-L-30-P 529
BSD-25-L-50-B 529
BSD-25-L-50-P 529
BSD-25-L-60-B 529
BSD-25-L-60-P 529
BSM3L6 587
BSM3L8 587
BSM3L12 587
BSM3L14 587
BSM3L18 587
BSM3L22 587
BSM3L27 587
BSM4L6 587
BSM4L8 587
BSM4L12 587
BSM4L14 587
BSM4L18 587
BSM4L22 587
BSM4L27 587
BSM6L8 587
BSM6L12 587
BSM6L14 587
BSM6L18 587
BSM6L22 587
BSM6L27 587
BSPC - 12 580
BTM6L27 588
BX-20-3BAS-A-B 497
BX-20-3TAS-A-B 497
BX-20-CC 497
BX-20-HG 497
BX-20-M3-10 497
BX-20-M4-10 497
BX-20-MGH 497
BX-20-PH4 497
BX-20-RB 497
BX-20RL-210 497
BX-20RL-260 497
BX-20RL-310 497
BX-20RL-360 497
BX-20RL-410 497
BX-20RL-460 497
BX-20RL-510 497
BX-20RL-560 497
BX-20RL-710 497
BX-20RL-860 497
BX-20RL-960 497
BX-20RL-1200 497
BX-20-SSU 497
BX-20-TB 497
BX-20-TN 497
C
CA-25-CM 519
CA-25-RMS 519
CA-MM-10 517
CA-MM-12.5 517
CA-MM-25 517
CA-MM-50 517
CBSA-10 519
CBSA-12.5 519
CBSA-15 519
CBSA-20 519
CBSA-25 519
CBSA-38 519
CBSA-50 519
CBSPC-25 520
CBSPC-38 520
CBSPC-50 520
C-DRS 583
CFC - 12.5 543
CFC - 25 543
CFC - 38 543
CFC - 50 543
CGM-35-37 699
CGM-50-43 699
CGM-65-50 699
CGM-200 700
CGMRZ-300-200 701
CGRD-CG-50 534
CGRD-CG-75 534
CGRD-CG-100 534
CGRD-CG-150 534
CGRD-CG-200 534
CGRD-CG-250 534
CLM - 15 539
CLM - 25 539
CLM - 30 539
CLM - 50 539
CMA-10 519
CMA-12.5 519
CMA-25 519
CMA-38 519
CMA-50 519
C - OAD - 25 531
CPC - 25 547
CPC - 50 547
CPC - 75 547
CPC - 100 547
CPL - 25 546
CPL - 50 546
CPL - 75 546
CPL - 100 546
C - TC - 12 584
C - TC - 25 584
C - TC - 50 584
CT - HDPC 583
CTS-5AL-Mμ05 676
CTS-5AR-Mμ05 676
CUB-25-30 533
CUB-25-HM1 533
CUB-CB-25-15 535
CUB-CB-25-25 535
CUB-PB-25-15 536
CUB-PB-25-25 536
D
DM115 645
DM125 647, 649
DPR - 100 547
DPR - 150 547
DPR - 165 547
DPR - 200 547
DPR - 250 547
DPR - 300 547
DPSS-G-100 903
DRS - 300 583
DRS - 500 583
DRS - 800 583
DRS - 1000 583
DVIS - 01 480
E
EBB-500500-AL 464
EBB-500500-AL-T 464
EBB-500600-AL 464
EBB-500600-AL-T 464
EBB-600600-AL 464
EBB-600600-AL-T 464
EBB-750750-AL 464
EBB-750750-AL-T 464
EBB-800800-AL 464
EBB-800800-AL-T 464
EBB-900900-A 464
EBB-900900-AL 464
ED-A-01A-DLPR 880
ED-A-01A-GMCH 880
ED-A-01A-GT 880
ED-A-01A-KLM 880
ED-A-01A-PEC 880
ED-A-01A-RFO 880
ED-A-01A-S 880
ED-A-01-DLPR 879
ED-A-01-DMXT 879
ED-A-01-DOMU 879
ED-A-01-GMCH 879
ED-A-01-GT 879
ED-A-01-KLM 879
ED-A-01-OR 879, 880
ED-A-01-PEC 879
ED-A-01-RFO 879
ED-A-02-HP 881
ED-A-02-KTCU 881
ED-A-02-KTGS 881
ED-A-02-MP 881
ED-A-02-SP 881
ED-A-02-SSC 881
ED-AAP-TAS-CDS 901
ED-AAP-TAS-CF 901
ED-AAP-TAS-CL 901
ED-AAP-TAS-MMOF 901
ED-AAP-TAS-OA 901
ED-AAP-TAS-OR 901
ED-D-01-CM 850
ED-D-01-DC 850
ED-D-01-DLPR 850
ED-D-01-KLM 850
ED-D-01-OR 850
ED-D-01-WS 850
ED-D-02A-CM 852
ED-D-02A-DC 852, 853
ED-D-02A-DLPR 852
ED-D-02A-DMX 852
ED-D-02A-DOMU 852
ED-D-02A-KLM 852
ED-D-02A-OR 852
ED-D-02-CM 851
ED-D-02-DC 851
ED-D-02-DLPR 851
ED-D-02-DMX 851
ED-D-02-DOMU 851
ED-D-02-KLM 851
ED-D-02-OR 851
ED-D-03-CLM 853
ED-D-03-CM 853
ED-D-03-G 853
ED-D-03-OR 853
ED-D-03-SM 853
ED-D-03-T 853
ED-D-04-DLPR 854
ED-D-04-KLM 854
ED-D-04-OR 854
ED-D-04-RG 854
ED-D-05-DLPR 855
ED-D-05-GS 855
ED-D-05-KLM 855
ED-D-05-OR 855
ED-D-05-SHM 855
ED-D-07-ALM 857
ED-D-07-BM 857
ED-D-07-BP 857
ED-D-07-EPM 857
ED-D-07-OR 857
ED-D-07-SLPS 857
ED-D-07-SM 857
ED-EM-01-AM 867
ED-EM-01-CCDC 867
ED-EM-01-CLA 867
ED-EM-01-DC 867
ED-EM-01-LIU 867
ED-EM-01-OCU 867
ED-EM-01-TCP 867
ED-EM-02-FWIF 868
ED-EM-02-PECU 868
ED-EM-02-PSD 868
ED-EM-02-RP 868
ED-EM-02-THLM 868
ED-EM-05-APS 871
ED-EM-05-CCPS 871
ED-EM-05-GMAP 871
ED-EM-05-OR 871
ED-EM-05-SC 871
ED-EM-06-CCPS 874
ED-EM-06-DGM 874
ED-EM-06-EM 874
ED-EM-06-GPHM 874
ED-EM-06-HEC 874
ED-EM-06-HECU 874
ED-EM-06-SHRB 874
ED-EM-07-CCPS 875
ED-EM-07-DGM 875
ED-EM-07-EM 875
ED-EM-07-GPHM 875
ED-EM-07-QTS 875
ED-EM-07-TM 875
ED-EM-08-CCPS 877
ED-EM-08-DGM 877
ED-EM-08-EM 877
ED-EM-08-GB 877
ED-EM-08-GPHM 877
ED-EM-08-SHM 877
ED-F-02-BLA 833
ED-F-02-DLPR 833
ED-F-02-DM 833
ED-F-02-DOMU 833
ED-F-02-FC 833
ED-F-02-FCH 833
ED-F-02-FHAT 833
ED-F-02-KLM 833
ED-F-02-LFCM 833
ED-F-02-MMOF 833
ED-F-02-OR 833
ED-F-02-SMOF 833
ED-F-02-XYZT 833
ED-F-03-BBS 835
ED-F-03-BLA 835
ED-F-03-DLPR 835
ED-F-03-DM 835
ED-F-03-DOMU 835
ED-F-03-FC 835
ED-F-03-FCH 835
ED-F-03-FHAT 835
ED-F-03-KLM 835
ED-F-03-LFCM 835
ED-F-03-MMOF 835
ED-F-03-SMOF 835
ED-F-03-XYZT 835
ED-H-02-BSMB 885
ED-H-02-HNLR 885
ED-H-02-LC 885
ED-H-02-M25 885
ED-H-02-M50 885
ED-H-02-MMB25 885
ED-H-02-MMB50 885
ED-H-02-OHMB 885
ED-H-02-OTPS 885
ED-H-02-PHMB 885
ED-H-02-SFMB 885
ED-H-02-VBMB 885
ED-INI-02-TS 795
ED-INT-01-BSP 793, 795
ED-INT-01-LEDM 793
ED-INT-01-LEDP 793
ED-INT-01-LHRB 793
ED-INT-01-OF 793
ED-INT-01-PCL750 793
ED-INT-01-PCL1000 793
ED-INT-01-SLPS 793
ED-INT-01-TMRB 793
ED-INT-02-KERB 795
ED-INT-02-LEDM 795
ED-INT-02-LEDP 795
ED-INT-02-OF 795
ED-INT-02-PCL750 795
ED-INT-02-PCL1000 795
ED-INT-02-SLPS 795
ED-INT-02-TMRB 795
ED-INT-02-WHC 795
ED-INT-02-WHW 795
ED-INT-06-BBS 797
ED-INT-06-BS 797
ED-INT-06-BSM 797
ED-INT-06C-BS 799
ED-INT-06C-BSM 799
ED-INT-06C-DLPR 799

ED-INT-06C-GS 799
ED-INT-06C-KLM 799
ED-INT-06C-MC 799
ED-INT-06C-MMPT 799
ED-INT-06C-MMT 799
ED-INT-06C-RBP 799
ED-INT-06C-RS 799
ED-INT-06-DLPG 797, 807
ED-INT-06-DLPR 797
ED-INT-06-GS 797, 803
ED-INT-06-KLM 797
ED-INT-06M-BBS 801
ED-INT-06M-BS 801
ED-INT-06M-BSM 801
ED-INT-06-MC 797
ED-INT-06M-DLPR 801
ED-INT-06M-ECM 801
ED-INT-06M-EP 801
ED-INT-06M-KLM 801
ED-INT-06M-MC 801
ED-INT-06M-MMT 801
ED-INT-06-MMPT 797
ED-INT-06-MMT 797
ED-INT-06M-SM 801
ED-INT-06M-SR 781, 801
ED-INT-06P-BBS 805
ED-INT-06P-BS 805
ED-INT-06P-BSM 805
ED-INT-06-PC 797
ED-INT-06P-DLPR 805
ED-INT-06P-KLM 805
ED-INT-06P-MC 805
ED-INT-06P-MMP 805
ED-INT-06P-MMT 805
ED-INT-06P-PSP 805
ED-INT-06P-WS 805
ED-INT-06-RS 797
ED-INT-06S-BBS 803
ED-INT-06S-BS 803
ED-INT-06S-BSM 803
ED-INT-06S-CCDC 803
ED-INT-06S-CLA 803
ED-INT-06S-CLAM 803
ED-INT-06S-DLPR 803
ED-INT-06S-DPM 803
ED-INT-06S-KLM 803
ED-INT-06-SM 797
ED-INT-06S-MC 803
ED-INT-06S-MMPT 801, 803
ED-INT-06S-MMT 803
ED-INT-06S-RS 803
ED-INT-06S-SLPS 803
ED-INT-09-DLPR 808
ED-INT-09-FPE 808
ED-INT-09-KLM 808
ED-INT-09-OR 808
ED-INT-10A-CCDC 811
ED-INT-10A-CF 811
ED-INT-10A-CFM 811
ED-INT-10A-CLAM 811
ED-INT-10A-DLPR 811
ED-INT-10A-FPI 811
ED-INT-10A-KLM 811
ED-INT-10A-MVPS 811
ED-INT-10A-OR 811
ED-INT-10A-PCLM 811
ED-INT-10-DLPG 809
ED-INT-10-DLPR 809
ED-INT-10-DSM 809
ED-INT-10-FPI 809
ED-INT-10-KLM 809
ED-INT-10-OR 809
ED-INT-10-PCLM 809
ED-INT-12-BBS 807
ED-INT-12-BS 807
ED-INT-12-BSM 807
ED-INT-12-DLPR 807
ED-INT-12-GS 807
ED-INT-12-KLM 807
ED-INT-12-MC 807
ED-INT-12-MMPT 807
ED-INT-12-MMT 807
ED-INT-12-PC 807
ED-INT-12-RS 807
ED-INT-12-SM 807
ED-INT-14-ADM 813
ED-INT-14-BS 813
ED-INT-14-CCDC 813
ED-INT-14-CLA 813
ED-INT-14-DPSL 813
ED-INT-14-FI 813
ED-INT-14-RFM 813
ED-INT-14-SPA 813
ED-INT-14-TFM 813
ED-INT-15-BBVS 815
ED-INT-15-BS 815
ED-INT-15-BSM 815
ED-INT-15-CCDM 815
ED-INT-15-CLAM 815
ED-INT-15-DM 815
ED-INT-15-DP 815
ED-INT-15-GHM 815
ED-INT-15-GP 815, 885
ED-INT-15-HCU 815
ED-INT-15-HNL 815
ED-INT-15-MC 815
ED-INT-15-MM 815
ED-INT-15-PRM 815
ED-INT-15-SFA 815
ED-INT-15-TOML 815
ED-LOE-01A-DLPG 838
ED-LOE-01A-DLPR 838
ED-LOE-01A-KLM 838
ED-LOE-01A-OR 838
ED-LOE-01A-PRM 838
ED-LOE-01-DLPRW 837
ED-LOE-01-DOMU 837
ED-LOE-01-KLM 837
ED-LOE-01-OR 837
ED-LOE-01-PRM 837
ED-LOE-02-DLPR 840
ED-LOE-02-DM 840
ED-LOE-02-KLM 840
ED-LOE-02-MOED 840
ED-LOE-02-OR 840
ED-LOE-02-PRM 840
ED-LOE-06-DLPR 849
ED-LOE-06-DM 849
ED-LOE-06-KLM 849
ED-LOE-06-MOED 849
ED-LOE-06-OR 849
ED-LOE-06-PRM 849
ED-LOE-OEMU 840, 847, 849
ED-LOL-01-BBS 846
ED-LOL-01-BLA 847
ED-LOL-01-BS 847
ED-LOL-01-BSM 846
ED-LOL-01-CF 847
ED-LOL-01-CM 846
ED-LOL-01-DLPRM 847
ED-LOL-01-DLPRR 847
ED-LOL-01-DLPRW 847
ED-LOL-01-DOMU 847
ED-LOL-01-FC 847
ED-LOL-01-FCH 846
ED-LOL-01-GT 847
ED-LOL-01-KLM 846
ED-LOL-01-LFC 846
ED-LOL-01-MC 847
ED-LOL-01-MMOF 847
ED-LOL-01-MMPT 846
ED-LOL-01-MMT 846
ED-LOL-01-MOED 847
ED-LOL-01-MSM 846
ED-LOL-01-PCXL 847
ED-LOL-01-PMM 846
ED-LOL-01-PMR 847
ED-LOL-01-PRM 846
ED-LOL-01-RS 846
ED-LOL-01-SM 846
ED-LOL-01-XYZT 846
ED-M-02-LLGP 864
ED-M-02-MSRB 864
ED-M-02-STP 864
ED-M-02-TM 864
ED-M-02-WHW 864
ED-M-02-YMTB 864
ED-O-01-BCL 858
ED-O-01-BCPM 858
ED-O-01-LEDP 858
ED-O-01-PD 858
ED-O-01-PHC 858
ED-O-01-RSRB 858
ED-O-02-CCLM 860
ED-O-02-CCMM 860
ED-O-02-CXLM 860
ED-O-02-CXMM 860
ED-O-02-DLM 860
ED-O-02-DLPR 860
ED-O-02-DOMU 860
ED-O-02-GDM 860
ED-O-02-GT 860
ED-O-02-HSM 860
ED-O-02-KLM 860
ED-O-02-LEDP 860
ED-O-02-MAM 860
ED-O-02-OM 860
ED-O-02-OR 860
ED-O-02-SFA 860
ED-O-02-WGM 860
ED-O-02-WSM 860
ED-O-03-BCLM 861
ED-O-03-DPM 861
ED-O-03-KLM 861
ED-O-03-LEDP 861
ED-O-03-OR 861
ED-O-03-PCLMP 861
ED-O-03-WSM 861
ED-P-01-KLM 817, 818
ED-P-01-PRM 817, 818
ED-P-02-DLPR 817, 818
ED-P-02-DM 817, 818
ED-P-02-DOMU 817, 818
ED-P-02-OR 817, 818
ED-P-04A-CCPS 821
ED-P-04A-DLPG 821
ED-P-04A-DLPR 821
ED-P-04A-DMX 821
ED-P-04A-DOMU 821
ED-P-04A-EMM 821
ED-P-04A-KLM 821
ED-P-04A-LST 821
ED-P-04A-OR 821
ED-P-04A-PPR 821
ED-P-04A-PRM 821
ED-P-04-CCPS 819
ED-P-04-DLPG 819
ED-P-04-DLPR 819
ED-P-04-DMX 819
ED-P-04-DOMU 819
ED-P-04-EMM 819
ED-P-04-GRS 819
ED-P-04-KLM 819
ED-P-04-OR 819
ED-P-04-PPR 819
ED-P-04-PRM 819
ED-P-05A-BBS 825
ED-P-05A-BS 825
ED-P-05A-BSM 825
ED-P-05A-DM 825
ED-P-05A-DOMU 825
ED-P-05A-DPLM 825
ED-P-05A-DPSL 825
ED-P-05A-KC 825
ED-P-05A-KCM 825
ED-P-05A-KMM 825
ED-P-05A-MC 825
ED-P-05A-PCLM 825
ED-P-05A-PRM 825
ED-P-05A-SMPS 825
ED-P-05B-DLPR 827
ED-P-05B-DMX 827
ED-P-05B-DOMU 827
ED-P-05B-EOC 827
ED-P-05B-KLM 827
ED-P-05B-OR 827
ED-P-05B-PCM 827
ED-P-05B-PPR 827
ED-P-05B-PRM 827
ED-P-05B-SMPS 827
ED-P-07-DLPR 828
ED-P-07-DM 828, 829
ED-P-07-DOMU 828
ED-P-07-KLM 828, 829
ED-P-07-OR 828
ED-P-07-PRM 828
ED-P-07-WPM 828
ED-P-08-BCM 829
ED-P-08-DLPR 829
ED-P-08-DOMU 829
ED-P-08-OR 829
ED-P-08-PRM 829
ED-S-03A-BRC 783
ED-S-03A-CDS 781, 783
ED-S-03A-GSSB 783
ED-S-03A-LPMLS 783
ED-S-03A-MMF 783
ED-S-03A-STC 783
ED-S-03A-THLS 783
ED-S-03A-ZLF 783
ED-S-04A-CCD 787
ED-S-04A-CCDC 786
ED-S-04A-CLA 786, 787
ED-S-04A-DCML 786
ED-S-04A-DGM 786, 787
ED-S-04A-EM 786, 787
ED-S-04A-EMPS 786, 787
ED-S-04A-FPEM 786, 787
ED-S-04A-GFM 786, 787
ED-S-04A-GPHM 786, 787
ED-S-04A-IRFM 786, 787
ED-S-04A-MVPS 786, 787
ED-S-04A-PVA 786, 787
ED-S-04A-RBP 786, 787
ED-SC-01-APC 893
ED-SC-01-CM 893
ED-SC-01-KLM 893
ED-SC-01-LED 893
ED-SC-01-OR 893
ED-SC-01-SC 893
ED-SC-01-SCCU 893
EDU 2001-L66 481
EDU 2001-L96 481
ELCT-25-5 532
ELCT-25-10 532
ELCT-25-15 532
ELCT-25-25 532
ELCT-25-50 532
ELCT-25-100 532
ELCT-25-150 532
ELCT-25-175 532
ELCT-25-200 532
ELLBB 60-30 469
ELLBB 60-60 469
ELLBB 90-60 469
ELLBB 90-90 469
ELLBB 120-90 469
ELLBB 120-120 469
ELLBB 180-120 469
ELLNMBB 60-30 469
ELLNMBB 60-60 469
ELLNMBB 90-60 469
ELLNMBB 90-90 469
ELLNMBB 120-90 469
ELLNMBB 120-120 469
ELLNMBB 180-120 469
ELR - 25 531
EMTA15F4 586
EMTA15F6 586
EMTA25F4 586
EMTA25F6 585
F
F100-01 918
F100-02 918
FAD-25 FC 532
FAD-25-MA 532
FALM - 25 540
FALM - 50 540
FAPC-12 580
FC-1-20 554
FC-1-30 554
FC-1-50 554
FC-1-65 554
FCH - 12.5 544
FCH - 25 544
FCH - 38 544
FCH - 50 544
FCH - I - 20 554
FCH-T2-FC 554
FCH-T2-FC-1 554
FCH-T2-SMA 554
FCH-T2-ST 554
FCH-TI-FC 554
FCH-TI-FC-1 554
FCH-TI-SMA 554
FCH-TI-ST 554
FH-25-FC 518
FH-25-FCH 518
FH-25-SMA 518
FIM5000S 37
FLB - 25 517
FLB - 25 - B 517
FLB - 38 517
FLB - 50 517
FLC-25-8 533
FLCL-25-20 531
FLCL-25-20-TL 531
FLCL-25-25 531
FLCL-25-25-TL 531
FLCL-25-35 531
FLCL-25-35-TL 531
FLCS-25-12 530
FLCS-25-12-TL 530
FLCS-25-15 530
FLCS-25-15-TL 530
FLCT-25-10 532
FLCT-25-15 532
FLCT-25-35 532
FLCT-25-50 532
FLRMM - 12.5 508
FLRMM - 25 508
FLRMM - 50 508
FP-FCH-12.5 543
FP-FCH-25 543
FP-FCH-50 543
FP-SH-75 543
FRC-60-60-DT 491
FRC-60-60-HD 491
FRC-90-60-DT 491
FRC-90-60-HD 491
FRC-90-90-DT 491
FRC-90-90-HD 491
FRC-120-90-DT 491
FRC-120-90-HD 491
FRC-120-120-DT 491
FRC-120-120-HD 491
FRC-180-120-DT 491
FRC-180-120-HD 491
FRC-A-B-C-HD 491
FRC-A-B-C-SLD 491
FSF-90-90-B 487
FSF-90-90-T 487
FSF-120-90-B 487
FSF-120-90-T 487
FSF-120-120-B 487
FSF-120-120-T 487
FSF-180-120-B 487
FSF-180-120-T 487
FSF-180-150-B 487
FSF-180-150-T 487
FSF-240-120-B 487
FSF-240-120-T 487
FSF-240-150-B 487
FSF-240-150-T 487
FSF-300-120-B 487
FSF-300-120-T 487
FSF-300-150-B 487
FSF-300-150-T 487
FSF-360-150-B 487
FW - 0.5 - 1 545
FW - 0.5 - 2 545
FW 1 - 1 545
FW 1 - 2 545
G
GI7575 685, 739
GI125125 685, 739
GI225125 685, 739
GI225195 685, 739
GI325195 685, 739

GM-35-37 698
GM-35-55 698
GM-50-43 698
GM-50-63 698
GM-65-50 698
GM-65-75 698
GM-200 700
G M412 564, 574
G M612 564, 574
GMM-10 524
GMM-12 524
GMM-14 524
GMM-16 524
GMM-125 524
GMM-150 524
GMM-200 524
GMM-250 524
GMM-300 524
GMM-360 524
GMM-400 524
GMM-Mu-25 523
GMM - Mu - 25-P 523
GMM-Mu-50 523
GMM - Mu - 50-P 523
GMM-Mu-75 523
GMM-Mu-100 523
GTNDT 100 766
GTNDT 200 766
GTNDT 200-ACS 766
GTNDT 300 766
GTNDT 300-ACS 766
GTNDT 500 766
GTNDT 500-1000 766
GTNDT 500-1000-ACS 766
GTNDT 500-1200 766
GTNDT 500-1200-ACS 766
GTNDT 500-ACS 766
GTNDT 800-1500 766
GTNDT 800-1500-ACS 766
GXYTSWM25 681
GXYTSWM50 681
GY-He-LM-30 550
GY-He-LM-50 550
H
HAB-LTTS-125 691
HAB-LTTS-150 692
HAB-LTTS-250 695
HAB-RCMTS-50 729
HAB-RCMTS-150 733
HAB-RCMTS-200 735
HAB-RCMTS-250 737
HAB-TSC-5050 687
HA-LM-50 550
HBB-300300-AL 463
HBB-300400-AL 463
HBB-400400-AL 463
HBB-400600-AL 463
HB-MTSM-3760 719
HB-MTSM-5050H 719
HB-MTSM-5065H 719
HB-MTSM-5075H 719
HB-MTSM-5090H 719
HD LJ180-100 592
HD LJ200-200 592
HD LJ200-200-A 592
HD LJ250-250 592
HD LJ250-250-A 592
HD LJ300-300-A 592
HD LJ300-300-B 592
HD-LOE-01-XYZT 837
HDP - 150 529, 581
HDP - 200 529, 581
HDP - 250 529, 581
HDP - 300 529, 581
HDP - 350 581
HDP - 400 581
HDP - 500 529, 581
HDP - 600 529, 581
HDPS - 0.1 582
HDPS - 0.2 582
HDPS - 0.5 582
HDPS - 1 582
HDPS - 1.5 582
HDPS - 2 582
HDPS - 5 582
HDPS - 10 582
HDPS - 20 582
HDPS - 25 582
HDPS - 50 582
HD - R 529, 582
HD - R90 582
HD - SQ 529, 582
HD - SQ90 582
HE-DT-PSV 227
HeLM - 30 549
HeLM - 50 549
HO-000 88
HO-2DTS-DM-01 114
HO-2DTS-DM-02 114
HO-2DTS-TM-01 118
HO-2DTS-TM-01CM1 118
HO-2DTS-TM-02BD 118
HO-A216FR 286
HO-A216MOE-PH 280
HO-ADU-01 703
HO-ADU-02 703
HO-AE-CCM18 895
HO-AE-ESP18 346
HO-AE-LD18 340, 342, 865
HO-AE-LD18-APC 865
HO-AE-LD18-BD 865
HO-AE-LD18-HUD 865
HO-AE-LD18-LDCU 865
HO-AE-LD18-TS 865
HO-AE-SR18 316, 894
HO-AIS-B01 264
HO-AIS-B01-M 264
HO-AIS-B01-S 264
HO-AMM-B01 258
HO-AMS-DE01 250
HO-AMS-FL5000 37
HO-AMS-FL5000CX 37
HO-APS-300R2 771, 773, 926, 927
HO-APS-300R2-ZZ 771, 773
HO-APS-500R2 773
HO-APS-500R2-ZZ 773
HO-ARP-10 615
HO-ARP-15 615
HO-ARP-20 615
HO-ARP-25 615
HO-ARPC-10 615
HO-ARPC-15 615
HO-ARPC-20 615
HO-ARPC-25 615
HO-ASP-500 289
HO - BE2X - A3 633
HO - BE2X - A5 633
HO - BE2X - A10 633
HO - BE2X - A15 633
HO - BE5X - A2 633
HO - BE5X - A3 633
HO - BE5X - A5 633
HO - BE5X - A10 633
HO - BE10X - A2 633
HO - BE10X - A3 633
HO - BE10X - A4 633
HO - BE10X - A5 633
HO - BE15X - A2 633
HO - BE15X - A3 633
HO-BLI-TDU9000S 920
HO-BL-MCPLD-214L 917
HO-BL-MPPD-214S 916
HO-BLRM3-DL940 56
HO-BLRM-LWD-F 59
HO-BM-AM02 47
HO-BM-AM03 49
HO-BMM-EA12.5 624
HO-BMM-EA25 624
HO-BMM-EA50 624
HO-BMM-ES12.5 624
HO-BMM-ES25 624
HO-BMM-ES50 624
HO-BMM-PG12.5 624
HO-BMM-PG25 624
HO-BMM-PG50 624
HO-BMM-UEA12.5 624
HO-BMM-UEA25 624
HO-BMM-UEA50 624
HO-BS-F-12.5 621
HO-BS-F-25 621
HO-BS-F-50 621
HO-BS-N-12.5 621
HO-BS-N-25 621
HO-BS-N-50 621
HO-BVL25-1.2 604
HO-BVL25-1.2B 604
HO-BVL25-1.2C 604
HO-BVL25-1.6 604
HO-BVL25-1.6B 604
HO-BVL25-1.6C 604
HO-BVL25-02 604
HO-BVL25-02B 604
HO-BVL25-02C 604
HO-BVL25-3.2 604
HO-BVL25-3.2B 604
HO-BVL25-04 604
HO-BVL25-04B 604
HO-BVL25-04C 604
HO-BVL25-06 604
HO-BVL25-06B 604
HO-BVL25-06C 604
HO-BVL25-08 604
HO-BVL25-08B 604
HO-BVL25-12 604
HO-BVL25-12B 604
HO-BVL25-12C 604
HO-BVL25-20 604
HO-BVL25-20B 604
HO-BVL25-20C 604
HO-BVL25-40 604
HO-BVL25-40B 604
HO-BVL25-40C 604
HO-BVL50-1.6 604
HO-BVL50-1.6B 604
HO-BVL50-02 604
HO-BVL50-02B 604
HO-BVL50-02C 604
HO-BVL50-03 604
HO-BVL50-03B 604
HO-BVL50-03C 604
HO-BVL50-04 604
HO-BVL50-04B 604
HO-BVL50-04C 604
HO-BVL50-06 604
HO-BVL50-06B 604
HO-BVL50-06C 604
HO-BVL50-10 604
HO-BVL50-10B 604
HO-BVL50-10C 604
HO-BVL50-20 604
HO-BVL50-20B 604
HO-BVL50-20C 604
HO-BXL12.5-1.2 602
HO-BXL12.5-1.2B 602
HO-BXL12.5-1.2C 602
HO-BXL12.5-1.6 602
HO-BXL12.5-1.6B 602
HO-BXL12.5-1.6C 602
HO-BXL12.5-02 602
HO-BXL12.5-2.4 602
HO-BXL12.5-2.4B 602
HO-BXL12.5-2.4C 602
HO-BXL12.5-02B 602
HO-BXL12.5-02C 602
HO-BXL12.5-3.2 602
HO-BXL12.5-3.2B 602
HO-BXL12.5-3.2C 602
HO-BXL12.5-04 602
HO-BXL12.5-04B 602
HO-BXL12.5-04C 602
HO-BXL25-01 602
HO-BXL25-1.6 602
HO-BXL25-1.6B 602
HO-BXL25-1.6C 602
HO-BXL25-01B 602
HO-BXL25-01C 602
HO-BXL25-02B 602
HO-BXL25-02C 602
HO-BXL25-3.2 602
HO-BXL25-3.2B 602
HO-BXL25-3.2C 602
HO-BXL25-04 602
HO-BXL25-04B 602
HO-BXL25-04C 602
HO-BXL25-06 602
HO-BXL25-06B 602
HO-BXL25-06C 602
HO-BXL25-08 602
HO-BXL25-08B 602
HO-BXL25-08C 602
HO-BXL25-12 602
HO-BXL25-12B 602
HO-BXL25-12C 602
HO-BXL25-20 602
HO-BXL25-20B 602
HO-BXL25-20C 602
HO-BXL25-40 602
HO-BXL25-40B 602
HO-BXL25-40C 602
HO-BXL50-1.6 602
HO-BXL50-1.6B 602
HO-BXL50-1.6C 602
HO-BXL50-02 602
HO-BXL50-02B 602
HO-BXL50-02C 602
HO-BXL50-03 602
HO-BXL50-03B 602
HO-BXL50-03C 602
HO-BXL50-04 602
HO-BXL50-04B 602
HO-BXL50-04C 602
HO-BXL50-06 602
HO-BXL50-06B 602
HO-BXL50-06C 602
HO-BXL50-10 602
HO-BXL50-10B 602
HO-BXL50-10C 602
HO-BXL50-20B 602
HO-BXL50-20C 602
HO-CAL25-02 606, 608
HO-CAL25-02B 606, 608
HO-CAL25-02C 606, 608
HO-CAL25-03 606, 608
HO-CAL25-03B 606, 608
HO-CAL25-03C 606, 608
HO-CAL25-04 606, 608
HO-CAL25-04B 606, 608
HO-CAL25-04C 606, 608
HO-CAL25-06 606, 608
HO-CAL25-06B 606, 608
HO-CAL25-06C 606, 608
HO-CAL25-08 606, 608
HO-CAL25-08B 606, 608
HO-CAL25-08C 606, 608
HO-CAL25-10 606, 608
HO-CAL25-10B 606, 608
HO-CAL25-10C 606, 608
HO-CCMA-12.5-02 624
HO-CCMA-12.5-04 624
HO-CCMA-25-01 624
HO-CCMA-25-02 624
HO-CCMA-25-03 624
HO-CCMA-50-01 624
HO-CCMA-50-02 624
HO-CCMA-50-03 624
HO-CCMA-50-04 624
HO-CCMA-75-01 624
HO-CCMA-75-02 624
HO-CCMA-75-2.6 624
HO-CCMA-100-05 624
HO-CCMA-100-10 624
HO-CCMA-100-15 624
HO-CCMA-150-6.6 624
HO-CCMA-150-10 624
HO-CG216-2075 162
HO-CG216-3290 162
HO-CG216-4010 162
HO-CM-2 625
HO-CM-3 625
HO-CM-5 625
HO-CM-10 625
HOCM-MV202 78
HOCM-TM202 120
HO-CRM225UC 216
HO-CRYO-50 696
HO-CRYO-50HA 697
HO-CRYO-50S 697
HO - CS25 - 0.8 635
HO - CS25 - 1.6 635
HO - CS25 - 2.4 635
HO - CS50 - 0.6 635
HO - CS50 - 0.8 635
HO - CS50 - 1.2 635
HO-CT216 161
HO-CT216-2010 133
HOCT216-2010 161
HO-CT216-3010 133, 161
HO-CT216-3582 161
HO-CT216-4065 133, 161
HO-CT216-UV 133, 161
HO-DF-25-15 626
HO-DF-25-22 626
HO-DF-25-32 626
HO-DF-50-15 626
HO-DF-50-22 626
HO-DF-50-32 626
HO-DF-50S-15 626
HO-DF-50S-22 626
HO-DF-50S-32 626
HO-DF-100-15 626
HO-DF-100-22 626
HO-DF-100-32 626
HO-DF-100S-15 626
HO-DF-100S-22 626
HO-DF-100S-32 626
HO-DF-150S-15 626
HO-DF-150S-22 626
HO-DF-150S-32 626
HO-DF-200S-15 626
HO-DF-200S-22 626
HO-DF-200S-32 626
HO-DFRH-10 630
HO-DFRQ-10 630
HO-DHM-IT01 30
HO-DHM-UT01 28
HO-DHM-UT01-FA 24, 26
HO-DIHM-HT01 62
HO-DIHM-T01 64
HO-DMM-M1 255
HO-DP-5 611
HO-DP-10 611
HO-DP-15 611
HO-DP-20 611
HO-DP-25 611
HO-DP-500 289
HO-DPC-5 611
HO-DPC-10 611
HO-DPC-15 611
HO-DPC-20 611
HO-DPC-25 611
HO-DRM-01 441
HO-DTM-01 268
HO-DTM-5X-01 269
HO-ED-A-01 878
HO-ED-A-01A 880
HO-ED-A-02 881
HO-ED-A-03 882
HO-ED-AP-01 896
HO-ED-AP-04 899
HO-ED-D-01 850
HO-ED-D-02 851
HO-ED-D-02A 852, 853
HO-ED-D-04 854
HO-ED-D-05 855
HO-ED-D-07 856
HO-ED-EM-01 866
HO-ED-EM-02 868
HO-ED-EM-03 869
HO-ED-EM-04 870
HO-ED-EM-05 871
HO-ED-EM-06 873
HO-ED-EM-07 875
HO-ED-EM-08 876
HO-ED-EM-09 872
HO-ED-F-02 832
HO-ED-F-03 834
HO-ED-H-02 884
HO-ED-INT-01 792
HO-ED-INT-02 794
HO-ED-INT-06 796
HO-ED-INT-06C 798
HO-ED-INT-06M 800

HO-ED-INT-06P 804
HO-ED-INT-06S 802
HO-ED-INT-09 808
HO-ED-INT-10 809
HO-ED-INT-10A 810
HO-ED-INT-12 806
HO-ED-INT-14 812
HO-ED-INT-15 814
HO-ED-LOE-01 836
HO-ED-LOE-01A 838
HO-ED-LOE-02 839
HO-ED-LOE-04 843
HO-ED-LOE-04-LPS 843
HO-ED-LOE-04-S 843
HO-ED-LOE-05 844
HO-ED-LOE-06 848
HO-ED-LOL-01 845
HO-ED-M-02 863
HO-ED-O-01 858
HO-ED-O-02 859
HO-ED-O-03 861
HO-ED-P-01 816
HO-ED-P-02 817
HO-ED-P-04 818
HO-ED-P-04A 820
HO-ED-P-04B 822
HO-ED-P-04B-01A 823
HO-ED-P-04B-APR 823
HO-ED-P-04B-CCPS 823
HO-ED-P-04B-EMM 823
HO-ED-P-04B-FWF 823
HO-ED-P-04B-GMAP 823
HO-ED-P-04B-GRS 823
HO-ED-P-04B-HLPS 823
HO-ED-P-04B-LM 823
HO-ED-P-04B-OR 823
HO-ED-P-04B-PRM 823
HO-ED-P-04B-WS 823
HO-ED-P-05A 824, 826
HO-ED-P-07 828
HO-ED-P-10 830
HO-ED-PS6 156
HO-ED-S-03A 781
HO-ED-S-03B 783
HO-ED-S-03B-CDS 784
HO-ED-S-04A 785
HO-ED-S-04B 786
HO-ED-S-06 788
HO-ED-S-07 784
HO-ED-S-08 791
HO-ED-S-08A 791
HO-ED-S-08-ADU 791
HO-ED-S-08-DSM 791
HO-ED-S-08-HLPS 791
HO-ED-S-0203 780
HO-ED-S-0203-MAPS 781
HO-ED-S-0203-MAS 781
HO-ED-S-0203-THLS 781
HO-ED-SC-01 892
HO-EM3000S 449
HO-EM5000S 449
HO-EM7000S 448, 449, 450
HO-EPB-5 613
HO-EPB-10 613
HO-EPB-20 613
HO-EPB-25 613
HO-EPB-38 613
HO-EPB-50 613
HO-EPBC-5 613
HO-EPBC-10 613
HO-EPBC-20 613
HO-EPBC-25 613
HO-EPBC-38 613
HO-EPBC-50 613
HO-EPF-5 613
HO-EPF-10 613
HO-EPF-20 613
HO-EPF-25 613
HO-EPF-38 613
HO-EPF-50 613
HO-EPFC-3 613
HO-EPFC-5 613
HO-EPFC-10 613
HO-EPFC-20 613
HO-EPFC-25 613
HO-EPFC-38 613
HO-EPFC-50 613
HO-FA-TM01 44
HO-FCCS 68
HO-FI410 231
HO-FI532 231
HO-FI632 231
HO-FI650 231
HO-FI785 231
HO-FM05C 231
HO-FM10C 231
HO-FM015C 231
HO-FO-FC5 635
HO-FO-FC10 635
HO-FO-FC20 635
HO-FO-FC40 635
HO-FOP-A05 225
HO-FOP-A10 225
HO-FOP-A15 225
HO-FOP-A20 225
HO-FOP-A25 225
HO-FOP-A50 225
HO-FOP-FS1505S 225
HO-FOP-FS1510S 225
HO-FOP-FS1520S 225
HO-FOP-FS1540S 225
HO-FOP-FS1560S 225
HO-FOP-FS15100S 225
HO-FO-SMA5 635
HO-FO-SMA10 635
HO-FO-SMA20 635
HO-FO-SMA40 635
HO-HBL-M-XY 907
HO-HBL-XY 906
HO-HDL-01 151, 229
HO-HET-2048 455
HO-HET-RT20 455
HO-HM1X-5X 107
HO-HMA-25 715
HO-HMA-50 715
HO-HM-CB 106
HO-HPC-01 453
HO-HPC-02 453
HO-HTDG 175F2 180
HO-IAD-BTR-01 432
HO-IAD-BTR-02 432
HO-IAD-BTR-03 432
HO-IAD-CAM-01 241, 862
HO-IAD-CAM-01A 241
HO-IAD-CAM-01B 241
HO-IAD-CAM-01BC 242
HO-IAD-CAM-02 244, 246
HO-IAD-OC-01 558
HO-IAD-SG-01 158, 160
HO-IAD-SG-02 159
HO-IAD-ZS-01A 841
HO-IAD-ZS-01A-ALM 842
HO-IAD-ZS-01A-AW 842
HO-IAD-ZS-01A-BBRS 842
HO-IAD-ZS-01A-CH 842
HO-IAD-ZS-01A-DCCU 842
HO-IAD-ZS-01A-DPSS 842
HO-IAD-ZS-01A-KMM 842
HO-IAD-ZS-01A-MLTS 842
HO-IAD-ZS-01A-NDFW 842
HO-IAD-ZS-01A-PDM 842
HO-IAD-ZS-01A-VAM 842
HO-IAD-ZS-01A-VBSM 842
HO-IMM-T01 259
HO-IMPR-01 128
HO-KDLM-20 549
HO-LAIM-01 80
HO-LDP-10 627
HO-LDU-5KN 434
HO-LDU-20N 434
HO-LFP-12.5 627
HO-LFP-25 627
HO-LFP-50 627
HO-LFPS-12.5 627
HO-LFPS-25 627
HO-LFPS-50 627
HO-LH-LG-01 853
HO-LH-MV100W 226
HO-LMS-01 77
HO-LMS-02 77
HO-LP-12.5 614
HO-LP-25 614
HO-LPC-12.5 614
HO-LPC-25 614
HO-LS-PP-01 446
HO-LS-PP-M01 447
HO-LS-PSA-P-600300 103
HO-LSWS300X i 328
HO-LWS-PUV-T 441
HO-MA-15 715
HO-MA-25 715
HO-MCBS-10 619
HO-MCBS-15 619
HO-MCBS-20 619
HO-MCBS-25 619
HO-MCBS-50 619
HO-MDLM-01 129
HOM-DPSS-19090 549
HOM-DPSS-G-15090 549
HO-MEPS-105P 110
HO-MEPS-5020M 110
HO-MG-IMR 40
HO-MM214D-50X* 253
HO-MM214V-50X 253
HO-MM221V 262
HO-MM-SP-01 444
HO-MM-SP-02 444
HO-MM-T01 258
HO-MOM-FR20C 231
HO-MPC-1H 594
HO-MPCBS-25A 619
HO-MPCBS-25B 619
HO-MPCBS-25C 619
HO-MPCBS-50A 619
HO-MPCBS-50B 619
HO-MPCBS-50C 619
HO-MPSBS-25A 618
HO-MPSBS-25B 618
HO-MPSBS-25C 618
HO-MPSBS-50A 618
HO-MPSBS-50B 618
HO-MPSBS-50C 618
HO-MS-01 452
HO-MS-25 559, 560
HO-MV215-BLRM 52
HO-MV224 Series 52
HO-MXY-200-Z-200 926
HO-MXYR-300 756
HO-MXYZ-10F 758
HO-MXYZ-100 758
HO-MXYZ-100B 758, 759
HO-MXYZ-100C 758, 759
HO-MXYZ-100D 758
HO-MXYZ-100E 758
HO-MXYZ-100F 759
HO-MXYZ-100F-ACS 758, 759
HO-MXYZCA-50VC 762
HO-MXYZR-500 755
HO-NAL12.5-02 607
HO-NAL12.5-02B 607
HO-NAL12.5-02C 607
HO-NAL12.5-04 607
HO-NAL12.5-04B 607
HO-NAL12.5-04C 607
HO-NAL25-02 607
HO-NAL25-2.8 607
HO-NAL25-2.8B 607
HO-NAL25-2.8C 607
HO-NAL25-02B 607
HO-NAL25-02C 607
HO-NAL25-04 607
HO-NAL25-04B 607
HO-NAL25-04C 607
HO-NAL25-06 607
HO-NAL25-06B 607
HO-NAL25-06C 607
HO-NAL50-03 607
HO-NAL50-03B 607
HO-NAL50-03C 607
HO-NFES-040 356
HO-NFES-040B 360
HO-NFES-043 372
HO-NFES-043C 364
HO-NFES-043CH 368
HO-NFES-045 372
HO-NFES-SYS 376
HO-NML25-04 604
HO-NML25-04C 604
HO-NML25-05 604
HO-NML25-05C 604
HO-NML25-06 604
HO-NML25-06C 604
HO-NML25-08 604
HO-NML25-08C 604
HO-NML25-10 604
HO-NML25-10C 604
HO-NML25-12 604
HO-NML25-12C 604
HO-NML25-20C 604
HO-NNSR-01 292, 889
HO-NNSR-02 293
HO-OFIZ-215 124
HO-OFIZ-216A 126
HO-OI-AC1 271, 273
HO-OI-AC3 271, 273
HO-OI-EAC 271
HO-OPM-01A 849
HO-PA-EPI 637
HO-PA-EPI 5X 637
HO-PA-EPI 10X 637
HO-PA-EPI 40X 637
HO-PA-EPI 60X 637
HO-PA-EPI 80X 637
HO-PA-EPI 100x 637
HO-PAL12.5-02 607
HO-PAL12.5-02B 607
HO-PAL12.5-02C 607
HO-PAL12.5-04 607
HO-PAL12.5-04B 607
HO-PAL12.5-04C 607
HO-PAL12.5-06 607
HO-PAL12.5-06B 607
HO-PAL12.5-06C 607
HO-PAL25-1.6 607
HO-PAL25-1.6B 607
HO-PAL25-1.6C 607
HO-PAL25-02 607
HO-PAL25-02C 607
HO-PAL25-03 607
HO-PAL25-03B 607
HO-PAL25-03C 607
HO-PAL25-04B 607
HO-PAL25-04C 607
HO-PAL25-06 607
HO-PAL25-06B 607
HO-PAL25-06C 607
HO-PAL25-08 607
HO-PAL25-08B 607
HO-PAL25-08C 607
HO-PAL25-10 607
HO-PAL25-10B 607
HO-PAL25-10C 607
HO-PAL25-12 607
HO-PAL25-12B 607
HO-PAL25-12C 607
HO-PAL25-16 607
HO-PAL25-16B 607
HO-PAL25-16C 607
HO-PAL25-20 607
HO-PAL25-20B 607
HO-PAL25-20C 607
HO-PAL50-02 607
HO-PAL50-02B 607
HO-PAL50-02C 607
HO-PAL50-03 607
HO-PAL50-03B 607
HO-PAL50-03C 607
HO-PAL50-04 607
HO-PAL50-04B 607
HO-PAL50-04C 607
HO-PAL50-05 607
HO-PAL50-05B 607
HO-PAL50-05C 607
HO-PAL50-06 607
HO-PAL50-06B 607
HO-PAL50-06C 607
HO-PAL50-08 607
HO-PAL50-08B 607
HO-PAL50-08C 607
HO-PAL50-10 607
HO-PAL50-10B 607
HO-PAL50-10C 607
HO-PAL50-15 607
HO-PAL50-15B 607
HO-PAL50-15C 607
HO-PAL50-20 607
HO-PAL50-20B 607
HO-PAL50-20C 607
HO-PA-MO4X 636
HO-PA-MO10X 636
HO-PA-MO20X 636
HO-PA-MO40X 636
HO-PA-MO60X 636
HO-PA-MO100X 636
HO-PAPO-LWD2X 637
HO-PAPO-LWD5X 637
HO-PAPO-LWD10X 637
HO-PAPO-LWD20X 637
HO-PAPO-LWD50X 637
HO-PBB-5 614
HO-PBB-10 614
HO-PBF-5 614
HO-PBF-10 614
HO-PBS-5 614
HO-PBS-10 614
HO-PCCM-150-08 625
HO-PCCM-150-10 625
HO-PCCM-200-06 625
HO-PCCM-200-7.5 625
HO-PCCM-250-4.8 625
HO-PCCM-250-06 625
HO-PCCM-300-05 625
HO-PCCM-300-6.7 625
HO-PCCM-360-8.3 625
HO-PCCM-400-10 625
HO-PCCM-400-12.5 625
HO-PCMA-10 622
HO-PCMA-12.5 622
HO-PCMA-25 622
HO-PCMA-50 622
HO-PCMA-75 622
HO-PCMA-100 622
HO-PCMS-10 623
HO-PCMS-12.5 623
HO-PCMS-25 623
HO-PCMS-50 623
HO-PCMS-75 623
HO-PCMS-100 623
HO-PDC-01 318
HO-PML25-04 604
HO-PML25-04C 604
HO-PML25-05 604
HO-PML25-05C 604
HO-PML25-06 604
HO-PML25-06C 604
HO-PML25-08 604
HO-PML25-08C 604
HO-PML25-10 604
HO-PML25-10C 604
HO-PML25-12 604
HO-PML25-12C 604
HO-PML25-20 604
HO-PML25-20C 604
HO-PP-5 612
HO-PP-10 612
HO-PP-20 612
HO-PP-25 612
HO-PP-38 612

HO-PP-40 612
HO-PPC-5 612
HO-PPC-10 612
HO-PPC-20 612
HO-PPC-25 612
HO-PPC-38 612
HO-PPC-40 612
HO-PSMA-10 622
HO-PSMA-12.5 622
HO-PSMA-25 622
HO-PSMA-50 622
HO-PSM-M3M1L 104
HO-PSM-M3M1LR 104
HO-PSM-M3M1R 104
HO-PSM-M3M3L 104
HO-PSM-M3M3LR 104
HO-PSM-M3M3R 104
HO-PSMS-10 623
HO-PSMS-12.5 623
HO-PSMS-25 623
HO-PSMS-50 623
HO-PSM-T01-2M 98
HO-PSM-T01-4M 99
HO-PSM-T01-8M 99
HO-PSM-T01-EC 92, 94
HO-PSS-RF-02 100
HO-PVL12.5-02 603
HO-PVL12.5-2.4 603
HO-PVL12.5-2.4B 603
HO-PVL12.5-2.4C 603
HO-PVL12.5-02B 603
HO-PVL12.5-02C 603
HO-PVL12.5-04 603
HO-PVL12.5-04B 603
HO-PVL12.5-04C 603
HO-PVL25-1.2 603
HO-PVL25-1.2B 603
HO-PVL25-1.2C 603
HO-PVL25-1.6 603
HO-PVL25-1.6B 603
HO-PVL25-1.6C 603
HO-PVL25-02 603
HO-PVL25-02B 603
HO-PVL25-02C 603
HO-PVL25-3.2 603
HO-PVL25-3.2B 603
HO-PVL25-3.2C 603
HO-PVL25-04 603
HO-PVL25-04B 603
HO-PVL25-04C 603
HO-PVL25-06 603
HO-PVL25-06B 603
HO-PVL25-06C 603
HO-PVL25-08 603
HO-PVL25-08B 603
HO-PVL25-08C 603
HO-PVL25-12 603
HO-PVL25-12B 603
HO-PVL25-12C 603
HO-PVL25-20 603
HO-PVL25-20B 603
HO-PVL25-20C 603
HO-PVL25-40 603
HO-PVL25-40B 603
HO-PVL25-40C 603
HO-PVL50-1.6 603
HO-PVL50-1.6B 603
HO-PVL50-1.6C 603
HO-PVL50-02 603
HO-PVL50-02B 603
HO-PVL50-02C 603
HO-PVL50-03B 603
HO-PVL50-03C 603
HO-PVL50-04 603
HO-PVL50-04B 603
HO-PVL50-04C 603
HO-PVL50-06 603
HO-PVL50-06B 603
HO-PVL50-06C 603
HO-PVL50-10 603
HO-PVL50-10B 603
HO-PVL50-10C 603
HO-PVL50-20 603
HO-PVL50-20B 603
HO-PVL50-20C 603
HO-PXCL10-10 605
HO-PXCL10-10B 605
HO-PXCL10-10C 605
HO-PXCL10-20 605
HO-PXCL10-20B 605
HO-PXCL10-20C 605
HO-PXCL10-25 605
HO-PXCL10-25B 605
HO-PXCL10-25C 605
HO-PXCL10-30 605
HO-PXCL10-30B 605
HO-PXCL10-30C 605
HO-PXCL12-10 605
HO-PXCL12-10B 605
HO-PXCL12-10C 605
HO-PXCL12-15 605
HO-PXCL12-15B 605
HO-PXCL12-15C 605
HO-PXCL15-40 605
HO-PXCL15-40B 605
HO-PXCL15-40C 605
HO-PXCL20-15 605
HO-PXCL20-15B 605
HO-PXCL20-15C 605
HO-PXCL20-20 605
HO-PXCL20-20B 605
HO-PXCL20-20C 605
HO-PXCL20-25 605
HO-PXCL20-25B 605
HO-PXCL20-25C 605
HO-PXCL20-30 605
HO-PXCL20-30B 605
HO-PXCL20-30C 605
HO-PXCL20-40 605
HO-PXCL20-40B 605
HO-PXCL20-40C 605
HO-PXCL20-50 605
HO-PXCL20-50B 605
HO-PXCL20-50C 605
HO-PXCL25-30 605
HO-PXCL25-30B 605
HO-PXCL25-30C 605
HO-PXCL30-40 605
HO-PXCL30-40B 605
HO-PXCL30-40C 605
HO-PXCL30-50 605
HO-PXCL30-50B 605
HO-PXCL30-50C 605
HO-PXCL30-60 605
HO-PXCL30-60B 605
HO-PXCL30-60C 605
HO-PXCL40-75 605
HO-PXCL40-75B 605
HO-PXCL40-75C 605
HO-PXCL50-100 605
HO-PXCL50-100B 605
HO-PXCL50-100C 605
HO-PXCL50-150 605
HO-PXCL50-150B 605
HO-PXCL50-150C 605
HO-PXCL50-250 605
HO-PXCL50-250B 605
HO-PXCL50-250C 605
HO-PXCL50-500 605
HO-PXCL50-500B 605
HO-PXCL50-500C 605
HO-PXCL70-100 605
HO-PXCL70-100B 605
HO-PXCL70-100C 605
HO-PXCL75-150 605
HO-PXCL75-150B 605
HO-PXCL75-150C 605
HO-PXCL75-250 605
HO-PXCL75-250B 605
HO-PXCL75-250C 605
HO-PXCL75-500 605
HO-PXCL75-500B 605
HO-PXCL75-500C 605
HO-PXL12.5-1.2 601
HO-PXL12.5-1.2B 601
HO-PXL12.5-1.2C 601
HO-PXL12.5-1.6 601
HO-PXL12.5-1.6B 601
HO-PXL12.5-1.6C 601
HO-PXL12.5-02 601
HO-PXL12.5-2.4 601
HO-PXL12.5-2.4B 601
HO-PXL12.5-2.4C 601
HO-PXL12.5-02B 601
HO-PXL12.5-02C 601
HO-PXL12.5-3.2 601
HO-PXL12.5-3.2B 601
HO-PXL12.5-3.2C 601
HO-PXL12.5-04 601
HO-PXL12.5-04B 601
HO-PXL12.5-04C 601
HO-PXL12.5-08 601
HO-PXL12.5-08B 601
HO-PXL12.5-08C 601
HO-PXL25-01 601
HO-PXL25-1.6 601
HO-PXL25-1.6B 601
HO-PXL25-1.6C 601
HO-PXL25-01B 601
HO-PXL25-01C 601
HO-PXL25-02 601
HO-PXL25-02B 601
HO-PXL25-02C 601
HO-PXL25-3.2 601
HO-PXL25-3.2B 601
HO-PXL25-3.2C 601
HO-PXL25-04 601
HO-PXL25-04B 601
HO-PXL25-04C 601
HO-PXL25-06 601
HO-PXL25-06B 601
HO-PXL25-06C 601
HO-PXL25-08 601
HO-PXL25-08B 601
HO-PXL25-08C 601
HO-PXL25-12 601
HO-PXL25-12B 601
HO-PXL25-12C 601
HO-PXL25-20 601
HO-PXL25-20B 601
HO-PXL25-20C 601
HO-PXL25-40 601
HO-PXL25-40B 601
HO-PXL25-40C 601
HO-PXL30-1.3 601
HO-PXL30-1.3B 601
HO-PXL30-1.3C 601
HO-PXL30-1.6 601
HO-PXL30-1.6B 601
HO-PXL30-1.6C 601
HO-PXL30-2.5 601
HO-PXL30-2.5B 601
HO-PXL30-2.5C 601
HO-PXL30-3.3 601
HO-PXL30-3.3B 601
HO-PXL30-3.3C 601
HO-PXL30-05 601
HO-PXL30-05B 601
HO-PXL30-05C 601
HO-PXL30-6.6 601
HO-PXL30-6.6B 601
HO-PXL30-6.6C 601
HO-PXL30-8.3 601
HO-PXL30-8.3B 601
HO-PXL30-8.3C 601
HO-PXL30-10 601
HO-PXL30-10B 601
HO-PXL30-10C 601
HO-PXL30-16.6 601
HO-PXL30-16.6B 601
HO-PXL30-16.6C 601
HO-PXL50-1.6 601
HO-PXL50-1.6B 601
HO-PXL50-1.6C 601
HO-PXL50-02 601
HO-PXL50-02B 601
HO-PXL50-02C 601
HO-PXL50-03 601
HO-PXL50-03B 601
HO-PXL50-03C 601
HO-PXL50-04 601
HO-PXL50-04B 601
HO-PXL50-04C 601
HO-PXL50-06 601
HO-PXL50-06B 601
HO-PXL50-06C 601
HO-PXL50-08 601
HO-PXL50-08B 601
HO-PXL50-08C 601
HO-PXL50-10 601
HO-PXL50-10B 601
HO-PXL50-10C 601
HO-PXL50-20 601
HO-PXL50-20B 601
HO-PXL50-20C 601
HO-PY-WT01 770
HO-PZPSM-T01C 90
HO-QMPS-2000S 86
HO-RGMAM-COM3AR 769
HO-RGMAM-OM3AR 769
HO-RHB-10 615
HO-RHB-20 615
HO-RHB-25 615
HO-RHB-50 615
HO-RM45-03 625
HO-RM45-04 625
HO-RM45-05 625
HO-RM45-06 625
HO-RM45-08 625
HO-RM45-10 625
HO-RM45-12 625
HO-RM45-15 625
HO-RMM-TM01 32, 33
HO-RPB-A-5 611
HO-RPB-A-10 611
HO-RPB-A-20 611
HO-RPB-A-25 611
HO-RPB-A-38 611
HO-RPB-A-50 611
HO-RPB-B-5 611
HO-RPB-B-10 611
HO-RPB-B-20 611
HO-RPB-B-25 611
HO-RPB-B-38 611
HO-RPB-B-50 611
HO-RPB-C-5 611
HO-RPB-C-10 611
HO-RPB-C-20 611
HO-RPB-C-25 611
HO-RPB-C-38 611
HO-RPB-C-50 611
HO-RPB-D-5 611
HO-RPB-D-10 611
HO-RPB-D-20 611
HO-RPB-D-25 611
HO-RPB-D-38 611
HO-RPB-D-50 611
HO-RPB-E-5 611
HO-RPB-E-10 611
HO-RPB-E-20 611
HO-RPB-E-25 611
HO-RPB-E-38 611
HO-RPB-E-50 611
HO-RPB-F-5 611
HO-RPB-F-10 611
HO-RPB-F-20 611
HO-RPB-F-25 611
HO-RPB-F-38 611
HO-RPB-F-50 611
HO-RPF-A-5 611
HO-RPF-A-10 611
HO-RPF-A-20 611
HO-RPF-A-25 611
HO-RPF-A-38 611
HO-RPF-A-50 611
HO-RPF-B-5 611
HO-RPF-B-10 611
HO-RPF-B-20 611
HO-RPF-B-25 611
HO-RPF-B-38 611
HO-RPF-B-50 611
HO-RPF-C-5 611
HO-RPF-C-10 611
HO-RPF-C-20 611
HO-RPF-C-25 611
HO-RPF-C-38 611
HO-RPF-C-50 611
HO-RPF-D-5 611
HO-RPF-D-10 611
HO-RPF-D-20 611
HO-RPF-D-25 611
HO-RPF-D-38 611
HO-RPF-D-50 611
HO-RPF-E-5 611
HO-RPF-E-10 611
HO-RPF-E-20 611
HO-RPF-E-25 611
HO-RPF-E-38 611
HO-RPF-E-50 611
HO-RPF-F-5 611
HO-RPF-F-10 611
HO-RPF-F-20 611
HO-RPF-F-25 611
HO-RPF-F-38 611
HO-RPF-F-50 611
HO-RPS-A-5 611
HO-RPS-A-10 611
HO-RPS-A-20 611
HO-RPS-A-25 611
HO-RPS-A-38 611
HO-RPS-A-50 611
HO-RPS-B-5 611
HO-RPS-B-10 611
HO-RPS-B-20 611
HO-RPS-B-25 611
HO-RPS-B-38 611
HO-RPS-B-50 611
HO-RPS-C-5 611
HO-RPS-C-10 611
HO-RPS-C-20 611
HO-RPS-C-25 611
HO-RPS-C-38 611
HO-RPS-C-50 611
HO-RPS-D-5 611
HO-RPS-D-10 611
HO-RPS-D-20 611
HO-RPS-D-25 611
HO-RPS-D-38 611
HO-RPS-D-50 611
HO-RPS-E-5 611
HO-RPS-E-10 611
HO-RPS-E-20 611
HO-RPS-E-25 611
HO-RPS-E-38 611
HO-RPS-E-50 611
HO-RPS-F-5 611
HO-RPS-F-10 611
HO-RPS-F-20 611
HO-RPS-F-25 611
HO-RPS-F-38 611
HO-RPS-F-50 611
HO-SBC-10 631
HO-SBC-10B 631
HO-SC-IV 312
HO-SC-IVK 314
HO-SCP-B20 612
HO-SCP-B50 612
HO-SC-QE 298
HO-SC-QE-C1 300, 334
HO-SC-QEIV 294
HO-SC-QEIV225 304
HO-SC-SS300C 309
HO-SC-XE150 313
HO-SC-XE300 313
HO-SDIS-150A 321
HO-SDIS-150B 321
HO-SDIS-200A 321
HO-SDIS-200B 321
HO-SDIS-200B-IM 322
HO-SDIS-300A 321
HO-SDIS-300B 321
HO-SE-01 278, 888
HO-SE-01XY 278
HO-SFRQ-10 630
HO-SHEM-01 874
HO-Sin216R 747
HO-Sin216R4 747
HO-Sin216R8 747
HO-SIS-S01 127
HO-SO-ITA219C3 339
HO-SP-3S300F 168
HO-SP-3S300FS 170
HO-SP-10 615
HO-SP-25 615
HO-SP-100F4 174
HO-SP-125F5 174
HO-SP-150F6 174
HO-SPA-1990 890
HO-SPA-1990P 891
HO-SPA-3411D 890, 891
HO-SPA-LSH20F 222
HO-SPA-LSHD20 222
HO-SPA-LSL10F 222
HO-SPA-LSMD-OF200 223
HO-SPA-LSXe-OF200 223
HO-SPA-OF200 222
HO-SPA-OFSP 222
HO-SPA-OFSPM2T 223
HO-SPA-OFSPM3T 223
HO-SPA-OFSPML2T 223
HO-SPA-OFSPMLT 223
HO-SP-CRM215 186, 790

HO-SP-CRM 221 184
HO-SP-CRM224H 190
HO-SP-CRM224HEL 202
HO-SP-CRM224HR 196
HO-SP-CRM224T 190
HO-SP-CRM224TE 190
HO-SP-CRM224TEL 202
HO-SP-CRM224TR 196
HO-SP-CRM224TRE 196
HO-SP-CRM225EM-INS 208
HO-SP-CRM225H-INS 208
HO-SP-DRS 100 146
HO-SP-DRSP100 148
HO-SPE-3000S 886
HO-SP-FRS-225Xe 220
HO-SP-ISP-50 233
HO-SP-ISP-100 233
HO-SP-ISP-150 233
HO-SPLF 1 442
HO-SPLF-1DC 444
HO-SPLF 1H 442
HO-SPLF-1VM 445
HO-SPLF 2 442
HO-SPLF 2D 442
HO-SPLF 2DH 442
HO-SPLF 2H 442
HO-SPLF 4 442
HO-SPLF-4D-P60-C 443
HO-SPLF 4H 442
HO-SPLF 10 442
HO-SPLF 10H 442
HO-SPLF-ES 1 445
HO-SPLF-ES 2 445
HO-SPLF-ES 2D 445
HO-SPLF-ES 4 445
HO-SPLF-ES 4D 445
HO-SPLF-ES 10 445
HO-SP-LRS218 183
HO-SP-M01S 172
HO-SP-M03S 172
HO-SP-MFCS2C 66
HO-SP-MSTH-06 903
HO-SP-RE-01 154, 778
HO-SP-RE-01-CLM 779
HO-SP-RE-01-EP 779
HO-SP-RE-01-G 779
HO-SP-RE-01-HG 779
HO-SP-RE-01-HP 779
HO-SP-RE-01-MLPS 779
HO-SP-RE-01-OR 779
HO-SP-RE-01-SM 779
HO-SP-RE-01-T 779
HO-SP-RE-02 156, 779
HO-SP-RE-02-EP 780
HO-SP-RE-02-G 780
HO-SP-RE-02-HG 780
HO-SP-RE-02-HP 780
HO-SP-RE-02-MLPS 780
HO-SP-RE-03DM 157
HO-SP-S100 166
HO-SP-SCCD2080FC 132
HO-SP-SQR 176
HO-SP-SQR-MS200F 150
HO-SP-VIS3965 222
HO-SP-XE150 229
HO-SP-XE300 229
HO-SSC-01 42, 50
HO-TH-01 410
HO-TH-01BC 412
HO-TH-01B I 411
HO-TH-02 418
HO-TH-02B 418
HO-TH-02C 422
HO-TH-02MD 414
HO-TH-03 396
HO-TH-03A 396
HO-TH-03A8 398
HO-TH-03B 402
HO-TH-03B1 402
HO-TH-03BC 420
HO-TH-03BV1 404
HO-TH-03C 404
HO-TH-03D 408
HO-TH-03D1 408
HO-TH-03E 400
HO-TH-03F 406
HO-TH-03S 398
HO-TH-04 386
HO-TH-04A 386
HO-TH-04BT 384
HO-TH-04C3 390
HO-TH-04C3H 390
HO-TH-04FA 382
HO-TH-05 424
HO-TH-05G 428
HO-TH-05GV 428
HO-TH-05LS 430
HO-TH-05S 426
HO-TH-05TS4 426
HO-TH-ADDC1 416
HO-THC-01 436
HO-TH-UVT150 392
HO-TH-UVT250 392
HO-TH-UVT350 394
HO-TH-UVT400 394
HO-TH-VSP-500T 388
HO-TLM-0IB 123
HO-TLM-0IC 122, 123
HO-TLM-C218 72
HO-TM-01 266
HO-TM-02 266
HO-TM215VM-50X* 254
HO-TMM-01 260
HO-TMM-02 260
HO-TMM-03 260
HO-UGM-01 435
HO-VALE-01 276, 887
HO-VBE-01 634
HO-VBE-02 634
HO-VBE-03 634
HO-VBE-04 634
HO-VBS-F50 620
HO-VBS-F75 620
HO-VBS-F100 620
HO-VBS-N50 620
HO-VBS-N100 620
HO-VIS214ORMS 284
HO-VO-01 438
HO-WMH-12.5 628
HO-WMH-12.5-405 628
HO-WMH-12.5-488 628
HO-WMH-12.5-514 628
HO-WMH-12.5-532 628
HO-WMH-12.5-633 628
HO-WMH-12.5-670 628
HO-WMH-12.5-780 628
HO-WMH-12.5-808 628
HO-WMH-25 628
HO-WMH-25-405 628
HO-WMH-25-488 628
HO-WMH-25-514 628
HO-WMH-25-532 628
HO-WMH-25-633 628
HO-WMH-25-670 628
HO-WMH-25-780 628
HO-WMH-25-808 628
HO-WMQ-12.5 628
HO-WMQ-12.5-405 629
HO-WMQ-12.5-488 629
HO-WMQ-12.5-514 629
HO-WMQ-12.5-532 629
HO-WMQ-12.5-633 629
HO-WMQ-12.5-670 629
HO-WMQ-12.5-780 629
HO-WMQ-12.5-808 629
HO-WMQ-25 628
HO-WMQ-25-405 629
HO-WMQ-25-488 629
HO-WMQ-25-514 629
HO-WMQ-25-532 629
HO-WMQ-25-633 629
HO-WMQ-25-670 629
HO-WMQ-25-780 629
HO-WMQ-25-808 629
HO-WPB-1 613
HO-WPB-2 613
HO-WPB-4 613
HO-WPB-6 613
HO-WPB-8 613
HO-WPB-10 613
HO-WPBB-1 613
HO-WPBB-2 613
HO-WPBB-4 613
HO-WPBB-6 613
HO-WPBB-8 613
HO-WPBB-10 613
HO-WPBC-1 613
HO-WPBC-2 613
HO-WPBC-4 613
HO-WPBC-6 613
HO-WPBC-8 613
HO-WPBC-10 613
HO-WPS-1 613
HO-WPS-2 613
HO-WPS-4 613
HO-WPS-6 613
HO-WPSB-1 613
HO-WPSB-2 613
HO-WPSB-4 613
HO-WPSB-6 613
HO-WPSC-1 613
HO-WPSC-2 613
HO-WPSC-4 613
HO-WPSC-6 613
HO-WRB-10-1 616
HO-WRB-10-3 616
HO-WRB-15-1 616
HO-WRB-15-3 616
HO-WRB-20-1 616
HO-WRB-20-3 616
HO-WRB-30-1 616
HO-WRB-30-3 616
HO-WRBB-10-1 616
HO-WRBB-10-3 616
HO-WRBB-15-1 616
HO-WRBB-15-3 616
HO-WRBB-20-1 616
HO-WRBB-20-3 616
HO-WRBB-30-1 616
HO-WRBB-30-3 616
HO-WRBC-10-1 616
HO-WRBC-10-3 616
HO-WRBC-15-1 616
HO-WRBC-15-3 616
HO-WRBC-20-1 616
HO-WRBC-20-3 616
HO-WRBC-30-1 616
HO-WRBC-30-3 616
HO-WSB-25-1 616
HO-WSB-25-3 616
HO-WSB-50-1 616
HO-WSB-50-3 616
HO-WSBB-25-1 616
HO-WSBB-25-3 616
HO-WSBB-50-1 616
HO-WSBB-50-3 616
HO-WSBC-25-1 616
HO-WSBC-25-3 616
HO-WSBC-50 616
HO-WSBC-50-1 616
HO-WSPSM-T01CL 82
HO-WZH-10M 629
HO-WZH-10M-488 629
HO-WZH-10M-514 629
HO-WZH-10M-532 629
HO-WZH-10M-633 629
HO-WZH-10M-670 629
HO-WZH-10M-780 629
HO-WZH-10M-808 629
HO-WZH-22M-405 629
HO-WZH-22M-488 629
HO-WZH-22M-514 629
HO-WZH-22M-532 629
HO-WZH-22M-633 629
HO-WZH-22M-670 629
HO-WZH-22M-780 629
HO-WZH-22M-808 629
HO-WZQ-10M-405 630
HO-WZQ-10M-488 630
HO-WZQ-10M-514 630
HO-WZQ-10M-532 630
HO-WZQ-10M-633 630
HO-WZQ-10M-670 630
HO-WZQ-10M-780 630
HO-WZQ-10M-808 630
HO-WZQ-22M-405 630
HO-WZQ-22M-488 630
HO-WZQ-22M-514 630
HO-WZQ-22M-532 630
HO-WZQ-22M-633 630
HO-WZQ-22M-670 630
HO-WZQ-22M-780 630
HO-WZQ-22M-808 630
HO-XY-1000 927
HO-XY-MS50 109
HO-XY-S25 109
HO-XYZ6A-65 762
HO-XYZCA-100-SM 761
HO-XYZCA-100-ZZ 761
HPRA-3-5 551
HPRA-3-10 551
HPRA-3-15 551
HPRA-3-20 551
HPRA-3-25 551
HPRA-3-30 551
HPRA-3-35 551
HPRA-3-50 551
HPRA-3-100 551
HPRA-3-200 551
HR-SS150WRM1-50A 310
HR-SS150WRM2-50B 310
HR-SS150WRM2-50C 310
HR-SS300WRM1-50A 310
HR-SS300WRM1-50U 310
HR-SS300WRM1-100A 310
HR-SS300WRM1-100ATSP 311
HR-SS300WRM2-100B 310
HR-SS300WRM2-100C 310
HR-SS300WRM3-100U 310
HS-LTS-100 725
HS-LTS-200 725
HS-LTS-300 725
HS-LTS-500 725
HS-LTS-600 725
HS-LTS-750 725
HS-LTS-1000 725
HS-LTS-1250 725
HS-LTS-1500 725
HS-LTS-1750 726
HS-XYLTS-100-100 726
HS-XYLTS-200-200 726
HS-XYLTS-300-300 726
HS-XYLTS-500-500 726
HS-XYLTS-600-600 726
HS-XYLTS-750-750 726
HS-XYLTS-1000-1000 726
HS-XYLTS-1250-1250 726
HS-XYLTS-1500-150 726
HVC-MVTS-125-10 741
HVC-MVTS-125-25 741
HVC-MVTS-125-50 741
HVC-MVTS-125180-10 741
HVC-MVTS-125180-25 741
HVC-MVTS-200200-10 741
HVC-MVTS-200200-25 741
HVC-MVTS-200200-50 741
I
IDB - 75 577
IDBM - 75 577
IM-PH-EPI 38, 39
INE1000 380
K
KCLM - 50 540
KCLM - 75 540
KLM - 25 542
KLM - 50 542
KLM - C 542
KLM - T - 25 542
KLM - T - 50 542
KLM - T - C 542
KMC-75 CS 521
KMC-75 Mu5 521
KMC-100 CS 521
KMC-100 Mu5 521
KMC-125 CS 521
KMC-125 Mu5 521
KMC-AK-12.5 512
KMC-AK-25 512
KMC-AK-38 512
KMC-AK-50 512
KMC-AK-T-12.5 512
KMC-AK-T-25 512
KMC-AK-T-38 512
KMC-AK-T-50 512
KMC-CS-12.5 512
KMC-CS-25 512
KMC-CS-38 512
KMC-CS-50 512
KMC-CS-T-12.5 512
KMC-CS-T-25 512
KMC-CS-T-38 512
KMC-CS-T-50 512
KMC-LS-12.5 512
KMC-LS-25 512
KMC-LS-38 512
KMC-LS-50 512
KMC-LS-T-12.5 512
KMC-LS-T-25 512
KMC-LS-T-38 512
KMC-LS-T-50 512
KMC-Mu-25 512
KMC-Mu-38 512
KMC-Mu-50 512
KMC-Mu-T-25 512
KMC-Mu-T-38 512
KMC-Mu-T-50 512
KMC-SC-75 CS 522
KMC-SC-75 Mu5 522
KMC-SC-100 CS 522
KMC-SC-100 Mu5 522
KMC-SC-125 CS 522
KMC-SC-125 Mu5 522
KMD05L - AK 513
KMD05L - AKT 513
KMD05L - LS 513
KMD05L - LST 513
KMD05R - AK 513
KMD05R - AKT 513
KMD05R - LS 513
KMD05R - LST 513
KMD25L - AK 513
KMD25L - AKT 513

KMD25L - CS 513
KMD25L - CST 513
KMD25R - AK 513
KMD25R - AKT 513
KMD25R - CS 513
KMD25R - CST 513
KMMOH 542
KMMOH - T 542
KMR-75 CS 521
KMR-75 Mu5 521
KMR-100 CS 521
KMR-100 Mu5 521
KMR-125 CS 521
KMR-125 Mu5 521
KMR-AK-25 510
KMR-AK-38 510
KMR-AK-50 510
KMR-AK-T-25 510
KMR-AK-T-38 510
KMR-AK-T-50 510
KMR-CS-25 510
KMR-CS-38 510
KMR-CS-50 510
KMR-CS-T-25 510
KMR-CS-T-38 510
KMR-CS-T-50 510
KMR-LS-25 510
KMR-LS-38 510
KMR-LS-50 510
KMR-LS-T-25 510
KMR-LS-T-38 510
KMR-LS-T-50 510
KMR-Mu-25 510
KMR-Mu-38 510
KMR-Mu-50 510
KMR-Mu-T-25 510
KMR-Mu-T-38 510
KMR-Mu-T-50 510
KPM-38 526
KPM-50 526
KPM-75 526
KPM-90 526
KPMD-38 526
KPMD-50 526
KPMD-75 526
KPMD-90 526
KPMD-T-38 526
KPMD-T-50 526
KPMD-T-75 526
KPMD-T-90 526
KPMS-38 526
KPMS-50 526
KPMS-75 526
KPMS-90 526
KPMS-T-38 526
KPMS-T-50 526
KPMS-T-75 526
KPMS-T-90 526
KPM-T-38 526
KPM-T-50 526
KPM-T-75 526
KPM-T-90 526
KTM-25 527
KTM-50 527
KTM-T-25 527
KTM-T-50 527
L
LBP-KM-25 520
LBP-KM-50 520
LBP-KM-75 520
LC-DRS 583
LCT-25-25 531, 532
LCT-25-30 531
LCT-25-35 531
LCT-25-50 531
LCT-25-75 531
LCT-25-100 531
LCT-25-125 531
LED-RF-1 492, 493
LED-RF-2 492, 493
LFC - 1 553
LFC - 1 FC 553
LJ120 - 75 590
LJ150 - 100 590
LJ180 - 100 590
LJSS250 - 150 590
LJSS250 - 200 590
LJSS250 - 250 590
LJSS300 - 150 590
LJSS300 - 250 590
LJSS300 - 300 590
LJSS300 - 350 590
LLBB 60-30 470
LLBB 60-60 470
LLBB 90-60 470
LLBB 90-90 470
LLBB 120-90 470
LLBB 120-120 470
LLBB 180-120 470
LLC-25-20 531
LLC-25-25 531
LLC-25-35 531
LLNMBB 60-30 470
LLNMBB 60-60 470
LLNMBB 90-60 470
LLNMBB 90-90 470
LLNMBB 120-90 470
LLNMBB 120-120 470
LLNMBB 180-120 470
LM - 75 539
LM-C-50 538
LM-FW1 533
LM-FW2 533
LMHH 1200-600 352
LMHH-TT 1200-600 352
LMHV-90-90-B 499
LMHV-90-90-T 499
LMHV-120-90-B 499
LMHV-120-90-T 499
LMHV-120-120-B 499
LMHV-120-120-T 499
LMHV-180-120-B 499
LMHV-180-120-T 499
LMHV-180-150-B 499
LMHV-180-150-T 499
LMHV-240-120-B 499
LMHV-240-120-T 499
LMHV-240-150-B 499
LMHV-240-150-T 499
LMHV-300-120-B 499
LMHV-300-120-T 499
LMHV-300-150-B 499
LMHV-300-150-T 499
LMHV-360-150-B 499
LMHV-360-150-T 499
LMS 75100 - 1 723
LMS 75100 - 2 723
LMS 75100 - 3 723
LMS 75150 - 1 723
LMS 75150 - 2 723
LMS 75200 - 1 723
LMS 75200 - 2 723
LMS 100100 - 1 723
LMS 100100 - 2 723
LMS 100100 - 3 723
LMS 100150 - 1 723
LMS 100150 - 2 723
LMS 100200 - 1 723
LMS 100200 - 2 723
LMS 150150 - 1 723
LMS 150150 - 2 723
LMS 150200 - 1 723
LMS 150200 - 2 723
LMS 200200 - 1 723
LMS 200200 - 2 723
LMS 250250 - 1 723
LMS 250250 - 2 723
LNST-CG-12.5 536
LOE-01A-CMOS 838
L - TC - 50 581, 584
LTH-25 532
LTH-25T 532
LTSV35-Mu05-01 657
LTSV35-Mu05-02 657
LTSV35-Mu05-03 657
LTSV35-Mu05-04 657
LTSV35-Mu05-05 657
LTSV35-Mu10-01 657
LTSV35-Mu10-02 657
LTSV35-Mu10-03 657
LTSV35-Mu10-04 657
LTSV35-Mu10-05 657
LTSV50-Mu05-01 661
LTSV50-Mu05-02 661
LTSV50-Mu05-03 661
LTSV50-Mu05-04 661
LTSV50-Mu05-05 661
LTSV50-Mu10-01 661
LTSV50-Mu10-02 661
LTSV50-Mu10-03 661
LTSV50-Mu10-04 661
LTSV50-Mu10-05 661
LTSV65-Mu05-01 665
LTSV65-Mu05-02 665
LTSV65-Mu05-03 665
LTSV65-Mu05-04 665
LTSV65-Mu05-05 665
LTSV65-Mu10-01 665
LTSV65-Mu10-02 665
LTSV65-Mu10-03 665
LTSV65-Mu10-04 665
LTSV65-Mu10-05 665
LTSV90-Mu05-01 669
LTSV90-Mu05-02 669
LTSV90-Mu05-03 669
LTSV90-Mu05-04 669
LTSV90-Mu05-05 669
LTSV90-Mu10-01 669
LTSV90-Mu10-02 669
LTSV90-Mu10-03 669
LTSV90-Mu10-04 669
LTSV90-Mu10-05 669
LTTS50-50 689
LTTS50-50Z 689
LTTS50-75 689
LTTS50-75Z 689
LTTS50-100 689
LTTS50-100Z 689
LTTS50-150 689
LTTS50-150Z 689
LTTS75-50 690
LTTS75-50Z 690
LTTS75-75 690
LTTS75-75Z 690
LTTS75-100 690
LTTS75-100Z 690
LTTS75-150 690
LTTS75-150Z 690
LTTS75-250 690
LTTS75-250Z 690
LTTS125-100 691
LTTS125-150 691
LTTS125-200 691
LTTS125-300 691
LTTS125-500 691
LTTS150-100 692
LTTS150-150 692
LTTS150-200 692
LTTS150-300 692
LTTS150-500 692
LTTS150-750 692
LTTS150-800 692
LTTS200-100 694
LTTS200-100-10P 694
LTTS200-150 694
LTTS200-150-10P 694
LTTS200-200 694
LTTS200-200-10P 694
LTTS200-300 694
LTTS200-300-10P 694
LTTS200-500 694
LTTS200-500-10P 694
LTTS200-750 694
LTTS200-750-10P 694
LTTS250-100 695
LTTS250-100-10P 695
LTTS250-150 695
LTTS250-150-10P 695
LTTS250-200 695
LTTS250-200-10P 695
LTTS250-300 695
LTTS250-300-10P 695
LTTS250-500 695
LTTS250-500-10P 695
LTTS250-750 695
LTTS250-750-10P 695
LTTS250-1000 695
LTTS250-1000-10P 695
M
M3 589
M3SCGB6 588
M3SCGB10 588
M3SCGB12 588
M3SCGB16 588
M3SCGB20 588
M3 SHC 589
M3SHC6 588
M3SHC10 588
M3SHC12 588
M3SHC16 588
M3SHC20 588
M3SHC25 588
M4 589
M4SCGB6 589
M4SCGB10 589
M4SCGB12 589
M4SCGB16 589
M4SCGB20 589
M4 SHC 589
M4SHC6 588
M4SHC10 588
M4SHC12 588
M4SHC16 588
M4SHC20 588
M4SHC25 588
M6 589
M6L12 588
M6SCGB6 589
M6SCGB10 589
M6SCGB12 589
M6SCGB16 589
M6SCGB20 589
M6 SHC 589
M6SHC6 588
M6SHC10 588
M6SHC12 588
M6SHC16 588
M6SHC20 588
M6SHC25 588
M25MH 529
M25MH-L 529
M56 641
M106 641
M250 651
M510 643
M515 645
M525 647, 649
M1010 643
M1015 645
M1025 647, 649
M1050 651
MA-PD35 110
MA-PD40 110
MA-PD60 110
MA-PD80 110
MA-PD94 110
MA-PD100 110
MA-PD145 110
MA-PD150 110
MB - 50 529, 577, 582
MBB-75100-AL 459
MBB-75100-NA 459
MBB-75100-SS 459
MBB-75150-AL 459
MBB-75150-NA 459
MBB-75150-SS 459
MBB-75200-AL 459
MBB-75200-NA 459
MBB-75200-SS 459
MBB-75250-AL 459
MBB-75250-NA 459
MBB-75250-SS 459
MBB-100100-AL 459
MBB-100100-NA 459
MBB-100100-SS 459
MBB-100150-AL 459
MBB-100150-NA 459
MBB-100150-SS 459
MBB-100200-AL 459
MBB-100200-NA 459
MBB-100200-SS 459
MBB-100250-AL 459
MBB-100250-NA 459
MBB-100250-SS 459
MBB-150150-AL 459
MBB-150150-NA 459
MBB-150150-SS 459
MBB-150200-AL 459
MBB-150200-NA 459
MBB-150200-SS 459
MBB-150250-AL 459
MBB-150250-NA 459
MBB-150250-SS 459
MBB-200200-AL 459
MBB-200200-NA 459
MBB-200200-SS 459
MBB-200250 459
MBB-200250-AL 459
MBB-200250-NA 459
MBB-250250- 459
MBB-250250-AL 459
MBB-250250-NA 459
M-CUB-OP-25 534
M-CUB-OP-30 534
META4F15 585
META4F25 585
META4M15 585
META6F15 585
META6M15 585
META6M25 585
MET-DS-400-2A 488
MET-DS-400-2B 488
MET-DS-400-3A 488
MET-DS-400-3B 488
MET-DS-400-A 488
MET-DS-400-B 488
MET-DS-600-2D 488
MET-DS-600-2E 488
MET-DS-600-D 488
MET-DS-600-E 488
MET-DS-600-EE 488
MFW - 0.5 546
MFW - 0.5 - 5 546
MFW - 1 546
MFW - 2 546
MGM-35-55 744
MGM-50-63 744
MGM-65-75 744
MGM 90-100 744
MGS-100A 743
MGS-100-OA 743
MGS-200A 743
MGS-200-OA 743
MIM-4A-10 104
MIM-4A-15 104
MIM-4A-20 104
MIM-4A-25 104
MIMA-LH-12 103
MIMA-LH-12M 103
MIMA-RH-12 103
MIMA-RH-12M 103
MIM-PRH-45A 105
MIM-PRH-90A 105
M-KM-25 535
MLJ300 - 150 591
MLJ300 - 250 591
MLJ300 - 300 591
MLJ350 - 250 591
MLJ350 - 300 591
MLJ350 - 350 591
MLS-6565-1 688
MLS-7575-1 688
MLS-75100-1 688
MLS-75150-1 688
MLS-75200-1 688
MLS-100100-1 688
MLS-100150-1 688
MLS-100200-1 688
MLS-150150-1 688
MLS-150200-1 688
MLS-200200-1 688
MLTS-100-250 724
MLTS-100-350 724
MLTS-100-500 724
MLTS-175-175 724
MLTS-175-175-XY 724
MLTS-175-275-XY 724
MLTS-175-350 724
MLTS-175-500 724
MLTS-175-500-XY 724
MLTS-250-250 724
MLTS-250-250-XY 724
MLTS-250-400 724
MLTS-250-400-X 724
MLTS-250-600 724
MLTS-250-600-X 724
MLXYTS-550 739, 763
MM-AK-25 509
MM-AK-38 509
MM-AK-50 509
MM-AK-T-25 509
MM-AK-T-38 509
MM-AK-T-50 509
MM-CS-25 509
MM-CS-38 509
MM-CS-50 509
MM-CS-T-25 509
MM-CS-T-38 509
MM-CS-T-50 509
MM-Mu-25 509
MM-Mu-38 509
MM-Mu-50 509
MM-Mu-T-25 509
MM-Mu-T-38 509
MM-Mu-T-50 509
MO-GMM-4 525
MO-GMM-6 525
MO-GMM-8 525
MO-GMM-25 525
MO-GMM-50 525
MO-GMM-75 525
MO-GMM-100 525
MO-GMM-150 525
MO-GMM-200 525
MOH - C 537, 541
MOH - R 537, 541
M-OP-25 534
M-OP-30 534
M-OP-BMP-M6 536
M-OP-FC01 536
M-OP-FC02 536
M-OP-FL25 536
M-OP-ID18 536
M-OP-LC25 536
M-OP-MO 536
M-OP-P H01 536
MPBS - 6565 578
MPB - XY - 50 578

MPC-1-ST-OL 594, 711
MPC-2-SV-OL 594, 711
MPC-3-ST-OL 594, 711
MPC-4-ST-CL-H 594, 711
MPC-4-SV-OL 594, 711
MPC-6-ST-OL 594, 711
M - PMR 25 535
M-PS-OP-30 534
MRS 50 749
MRS 75 749
MRS 100 749
MRS-100 749
MRS 150 749
MRS-150 749
MRS 200 749
MRSC 40 748
MRSC 50 748
MRSC 75 748
MRSC 100 748
MRSC 150 748
MRSC 200 748
MRSC 300 748
MRSC 400 748
MRSC 500 748
MRSH 300 751
MRSH 300-ACS 751
MRSH 400 751
MRSH 400-ACS 751
MRSH 500 751
MRSH 500-ACS 751
MRSH -IP65-300 752
MRSH -IP65-300-ACS 752
MRSH -IP65-500 752
MRSH -IP65-500-ACS 752
MS - 14 x 20 911
MS - 14 x 25 911
MS - 14 x 30 911
MS - 14 x 40 911
MS - 20 x 20 911
MS - 20 x 25 911
MS - 20 x 40 911
MS - 20 x 50 911
MS - 25 x 20 911
MS - 25 x 30 911
MS - 25 x 40 911
MS - 25 x 50 911
MS - 25 x 75 911
MS - 35 x 35 911
MS - 35 x 40 911
MS - 35 x 50 911
MS - 35 x 75 911
MS - 50 x 50 912
MS - 50 x 60 912
MS - 50 x 75 912
MS - 50 x 100 912
MS - 50 x 150 912
MS - 50 x 200 912
MSSID-12 553
MSSID-20 553
MSSID-25 553
MSSID-37 553
MSSID-50 553
M-ST-OP-25 534
MTE-60-60-HD 492
MTE-60-60-SLD 492
MTE-90-60-HD 492
MTE-90-60-SLD 492
MTE-90-90-HD 492
MTE-90-90-SLD 492
MTE-120-90-HD 492
MTE-120-90-SLD 492
M-TOP-25 534
M - TR - XY25 535
M - TR - Z25 535
MTS-6565-1-01 721
MTS-6565-1-02 721
MTS-6565-1-03 721
MTS-6565-1-04 721
MTS-6565-1-05 721
MTS-6565-2-01 721
MTS-6565-2-02 721
MTS-6565-2-03 721
MTS-6565-2-04 721
MTS-6565-2-05 721
MTS-7575-1-01 721
MTS-7575-1-02 721
MTS-7575-1-03 721
MTS-7575-1-04 721
MTS-7575-1-05 721
MTS-7575-2-01 721
MTS-7575-2-02 721
MTS-7575-2-03 721
MTS-7575-2-04 721
MTS-7575-2-05 721
MTS-9090-1-01 721
MTS-9090-1-02 721
MTS-9090-1-03 721
MTS-9090-1-04 721
MTS-9090-1-05 721
MTS-9090-2-0 721
MTS-9090-2-01 721
MTS-9090-2-02 721
MTS-9090-2-03 721
MTS-9090-2-05 721
MTS-90115-1-01 721
MTS-90115-1-02 721
MTS-90115-1-03 721
MTS-90115-1-04 721
MTS-90115-1-05 721
MTS-90115-2-01 721
MTS-90115-2-02 721
MTS-90115-2-03 721
MTS-90115-2-04 721
MTS-90115-2-05 721
MTS-90150-1-01 721
MTS-90150-1-02 721
MTS-90150-1-03 721
MTS-90150-1-04 721
MTS-90150-1-05 721
MTS-90150-2-01 721
MTS-90150-2-02 721
MTS-90150-2-03 721
MTS-90150-2-04 721
MTS-90150-2-05 721
MTS-M3535-1-01 717
MTS-M3535-1-02 717
MTS-M3535-1-03 717
MTS-M3535-1-04 717
MTS-M3535-1-05 717
MTSM-3760 719
MTSM-3760F 719
MTSM-5050-F 719
MTSM-5050-H 719
MTSM-5050-HC 719
MTSM-5065-H 719
MTSM-5065-HC 719
MTSM-5065-HF 719
MTSM-5075-H 719
MTSM-5075-HC 719
MTSM-5075-HF 719
MTSM-5090-H 719
MTSM-5090-HC 719
MTSM-5090-HF 719
MVTS-65-10 597, 740
MVTS-65-25 597, 740
MVTS-75-10 597, 740
MVTS-75-25 597, 740
MVTS-90-10 597, 740
MVTS-90-25 597, 740
MVTS-125-10 597, 740
MVTS-125-25 597, 740
MVTS-125-50 597, 740
MVTS-5065-10 597, 740
MVTS-5065-25 597, 740
MVTS-125180-10 597, 740
MVTS-125180-25 597, 740
MVTS-125180-50 597, 740
MVTS-200200-10 597, 740
MVTS-200200-25 597, 740
MVTS-200200-50 597, 740
MXY-MZ-100 753
MXY-MZ-100-25 753
MXY-MZ-100-A 753
MXY-MZ-150 753
MXY-MZ-150-A 753
MXY-MZ-200 753
MXY-MZ-200-A 753
MXY-MZ-200-B 753
MXYTS150150 738
MXYTS170170 738
MXYTS270170 738
MXYTS270240 738
MXYTS270270 738
MXYTS370240 738
MXYTS370370 738
MXYTSW175175 739
MXYTSW225175 739
MXYTSW225225 739
MXYTSW325225 739
MXYTSW325295 739
MXYTSW425295 739
MXYZCTS-80 754
O
O-BVL25-3.2C 604
O-BVL25-08C 604
O-BVL50-1.6C 604
O-BXL50-20 602
OHS-90-90-B 487
OHS-90-90-T 487
OHS-120-90-B 487
OHS-120-90-T 487
OHS-120-120-B 487
OHS-120-120-T 487
OHS-180-120-B 487
OHS-180-120-T 487
OHS-180-150-B 487
OHS-180-150-T 487
OHS-240-120-B 487
OHS-240-120-T 487
OHS-240-150-B 487
OHS-240-150-T 487
OHS-300-120-B 487
OHS-300-120-T 487
OHS-300-150-B 487
OHS-300-150-T 487
OHS-360-150-B 487
OHS-360-150-T 487
OHS-1200 483
OHS-1500 483
OHS-1800 483
OHS-2400 483
OHS-3000 483
OHS-B-1200 482
OHS-B-1500 482
OHS-B-1800 482
OHS-B-2400 482
OHS-B-3000 482
OHS-CRL-25 485
OHS-LED-1 485
OHS-LED-2 485
OHS-LED-4 485
OHS-LED-SP-1 485
OHS-PEG-10 485
OHS-PEG-QA-1 484
OHS-PEG-QA-2 484
OHS-PEG-QA-3 484
OHS-PS-1 485
OHS-PS-5 485
OHS-PS-10 485
OHS-PS-16 485
OHS-SBU-1 484
OHS-SBU-2 484
OHS-SBU-3 484
OHS-SBU-08 484
O-NML25-20 604
O-PAL25-02B 607
O-PVL50-03 603
O-VBS-N75 620
P
P8 - 20 560
P8 - 25 560
P8 - 30 560
P8 - 40 560
P8 - 50 560
P8 - 75 560
P8 - 100 560
P8 - 150 560
P16D - 30 573, 574
P16D - 50 573
P16D - 75 573
P16D - 100 573
P16D - 125 573
P16D - 150 573
P16D - 200 573
P16D - 250 573
P16D - 300 573
P16D - LE 50 574
P16D - LE 75 574
P16D - LE 100 574
P16D - LE 125 574
P16D - LE 150 574
P16D - LE 200 574
P16D - LE 250 574
P20 562
P25 562
P - 30 581
P30 562
P - 40 581
P40 562
P - 50 581
P50 562
P - 75 581
P75 562
P - 100 581
P100 563
P125 563
P - 150 581
P150 563
P200 563
P250 563
PA - M4M4 518
PA - M4M6 518
PA - M6M6 518
PB - 1850 577
PB - 1865 577
PB - 6525 577, 581
PB - 6550 577, 581
PB - 7525 577, 581
PB - 7530 577
PB - 9030 577
PBS - 6525 578
PB - SW - 30 578
PB - XY - 50 578
PC - 12 567, 581
PC - 16 576
PF - 25 566, 575, 581
PF - 38 529
PH8 - 20 561
PH8 - 30 561
PH8 - 40 561
PH8 - 50 561
PH8 - 75 561
PH8 - 100 561
PH - 16D - 30 574
PH - 16D - 40 574
PH - 16D - 50 574
PH - 16D - 75 574
PH - 16D - 100 574
PH - 16D - 150 574
PH - 16D - 200 574
PH - 16D - 250 574
PH20 565
PH - 30 581
PH30 565
PH40 565
PH - 50 581
PH50 565
PH - 75 581
PH75 565
PH - 100 581
PH100 565
PH - 150 581
PH150 565
PHN20 571
PHN30 571
PHN40 571
PHN50 571
PHN75 571
PHN100 571
PHN150 571
PHNT20 571
PHNT30 571
PHNT40 571
PHNT50 571
PHNT75 571
PHNT100 571
PHNT150 571
PHT8 - 10 562
PHT8 - 20 562
PHT8 - 30 562
PHT8 - 40 562
PHT8 - 50 562
PHT8 - 75 562
PHT20 565
PHT30 565
PHT40 565
PHT50 565
PHT75 565
PHT100 565
PHT150 565
PINH-5.0 551
PINH-10 551
PINH-15 551
PINH-20 551
PIN-H-025 551
PINH-25 551
PINH-30 551
PINH-35 551
PIN-H-050 551
PIN-H-075 551
PIN-H-100 551
PIN-H-200 551
PIN-H-300 551
P - LE 50 564
P - LE 75 564
P - LE 100 564
P - LE 125 564
P - LE 150 564
P - LE 200 564
PMC - 25 548
PMC - 50 548
PMP - 25 548
PMP- 50 548
PMRD-CS-25 528
PMRD-CS-38 528
PMRD-CS-50 528
PMRP-CS-25 528
PMRP-CS-38 528
PMRP-CS-50 528
PMRS-CS-25 528
PMRS-CS-38 528
PMRS-CS-50 528
PN20 568
PN25 568
PN30 568
PN40 568
PN50 569
PN75 569
PN100 569
PN125 569
PN150 569
PN200 569
PN250 569
PNT200 569
PNT250 569
PPA - PG - 12D 581
PPH-16D-30 575
PPH-16D-40 575
PPH-16D-50 575
PPH-16D-75 575
PPH-16D-100 575
PPH-16D-150 575
PPH-16D-200 575
PPH-16D-250 575
PPH-30 566
PPH-40 566
PPH-50 566
PPH-75 566
PPH-100 566
PPHN-30 572
PPHN-40 572
PPHN-50 572
PPHN-75 572
PPHN-100 572
PPHN-150 572
PS-15A-1 492, 493
PS-15A-2 492, 493
PS-15A-3 492, 493
PS-D-LK 907
PT8 - 20 561
PT8 - 25 561
PT8 - 30 561
PT8 - 40 561
PT8 - 50 561
PT8 - 75 561
PT8 - 100 561
PT8 - 125 561
PT8 - 150 561
PT20 563
PT25 563
PT30 563
PT40 563
PT50 563
PT75 563
PT100 563
PT125 563
PT150 563
PT200 563
PT250 563
PVISI 60-60 476
PVISI 90-60 476
PVISI 90-90 476
PVISI 120-90 476
PVISI 120-120 476
PVISI 180-120 476
PVISI 180-150 476
PVISI 240-120 476
PVISI 240-150 476
PVISI 300-120 476
PVISI 300-150 476
PVISI 360-150 476
Q
QC - FCH - 12.5 543
QC - FCH - 25 543
QC - FCH - 38 543
QC - FCH - 50 543
R
RA-25 518
RA-50 518
RAC - 8 579
RAC - 12 579, 581

RAC - 16 579
RACR16 - 12 579
RCMTS35-50-1 727
RCMTS35-75-1 727
RCMTS35-100-1 727
RCMTS35-150-1 727
RCMTS50-50-1 729
RCMTS50-75-1 729
RCMTS50-100-1 729
RCMTS50-150-1 729
RCMTS75-50-A 730
RCMTS75-50-Z 730
RCMTS75-100-A 730
RCMTS75-100-Z 730
RCMTS75-150-A 730
RCMTS75-150-Z 730
RCMTS75-200-A 730
RCMTS75-200-Z 730
RCMTS75-250-A 730
RCMTS75-250-Z 730
RCMTS125-100-2
731, 733
RCMTS125-100-B
731
RCMTS125-150-2
731, 733
RCMTS125-150-B
731
RCMTS125-200-2
731, 733
RCMTS125-200-B
731
RCMTS-125-300 445
RCMTS125-300-2
731, 733
RCMTS125-300-B
731
RCMTS125-500-2
731, 733
RCMTS125-500-B
731
RCMTS150-100-B
733
RCMTS150-150-B
733
RCMTS150-200-B
733
RCMTS150-300-B
733
RCMTS150-500-2 733
RCMTS150-500-B
733
RCMTS150-750-2 733
RCMTS200-100-2 735
RCMTS200-100-B
735
RCMTS200-200-2 735
RCMTS200-200-B
735
RCMTS200-300-2 735
RCMTS200-300-B
735
RCMTS200-500-2 735
RCMTS200-500-B
735
RCMTS200-750-2 735
RCMTS200-750-B
735
RCMTS250-100-2 737
RCMTS250-100-B
737
RCMTS250-200-2 737
RCMTS250-200-B
737
RCMTS250-250-2 737
RCMTS250-250-B
737
RCMTS250-300-2 737
RCMTS250-300-B
737
RCMTS250-500-2 737
RCMTS250-500-B
737
RCMTS250-750-2 737
RCMTS250-750-B
737
RCMTS250-1000-2
737
RCMTS250-1000-B
737
RFH - 50 544
RFHD - 25 544
RLC-HC2-25 502
RLC-HC2-50 502
RLC-HC2-75 502
RLC-HC2-100 502
RLC-HC2-125 502
RLC-HC2-150 502
RLC-HC3-25 503
RLC-HC3-50 503
RLC-HC3-75 503
RLC-HC4-25 500
RLC-HC4-38 500
RLC-HC4-50 500
RLC-HC4-75 500
RLC-HC4-100 500
RLDT-300 501
RLDT-350 501
RLDT-400 501
RLDT-450 501
RLDT-500 501
RLDT-550 501
RLDT-600 501
RLDT-650 501
RLDT-700 501
RLDT-750 501
RLDT-1000 501
RL-HC2-250 502
RL-HC2-500 502
RL-HC2-750 502
RL-HC2-1000 502
RL-HC2-1250 502
RL-HC2-1500 502
RL-HC2-2000 502
RL-HC3-500 503
RL-HC3-750 503
RL-HC3-1000 503
RL-HC3-1250 503
RL-HC3-1500 503
RL-HC3-2000 503
RL-HC4-500 500
RL-HC4-750 500
RL-HC4-1000 500
RL-HC4-1250 500
RL-HC4-1500 500
RL-HC4-2000 500
RLM-10 537
RLM-12.5 537
RLM-18 537
RLM-20 537
RLM-25 537
RLM-30 537
RLM-32 537
RLM-38 537
RLM-50 537
RLM-75 537
RLM-100 537
RMM - 12.5 508
RMM - 25 508
RMM - 38 508
RMM - 50 508
RMM - 75 508
RMS - OAD - 25 531
RS-25 702
RS-35 702
RS-50 702
RS-75 702
RS-100 702
RS-125 702
RS-150 702
RSC-50 703
RSC-50T 703
RSC-75 703
RSC-75T 703
RSC-100 703
RSC-125 703
RSC-150 703
RTS 60-60 477
RTS 90-60 477
RTS 90-90 477
RTS 120-90 477
RTS 120-120 477
RTS 180-120 477
RTS 180-150 477
RTS 240-120 477
RTS 240-150 477
RTS 300-120 477
RTS 300-150 477
RTS 360-150 477
S
S - 1 552
S - 8 552
S90-DMu10-02 649
S10141 224
SB-KM-15 520
SB-KM-50 520
SCLM - 50 538
SCLM - 75 538
SCLM - 100 538
SCLM-AK- 50 538
SCLM-AK- 75 538
SCLM-AK- 100 538
SFAS 553
SFAS - VC 553
SFH - 50 544
SFHD - 25 544
SFW - 1 545
SFW - 2 545
SFW - 3 545
SFW - 4 545
SGTS 200 767
SGTS 300 767
SGTS 400 767
SGTS 500 767
SLC-25-12 530
SLP - 25 580
SLP - 75 580
SLP - 275 580
SM3L8 586
SM3L12 586
SM3L14 586
SM3L18 586
SM3L22 586
SM3L27 586
SM3L32 586
SM4L8 586
SM4L12 586
SM4L14 586
SM4L18 586
SM4L22 586
SM4L27 586
SM4L32 586
SM6L8 586
SM6L12 586
SM6L14 586
SM6L18 586
SM6L22 586
SM6L27 586
SM6L32 586
SOC-25-6 532
SOC-25-9 532
SOC-25-12.7 532
SOC-25-18 532
SP - CA - 25 537
SPE-3000 S 136
SPE-3000 S-T 136
SPE-3000 S-TI 136
SPE 3000 S UV 137
SPE 3000 S UV-T 137
SPE 3000 S UV-TI 137
SPE 6000 S 140
SPE 6000 S-T 140
SPE 6000 S -TI 140
SPE 6000 S UV 141
SPE 6000 S UV-T 141
Spring washer 497
SR-1-25 530
SR-2-25 530
SR-3-25 530
SR-5-25 530
SR-10-25 530
SR-20-25 530
SSCGM-35-37 699
SSCGM-50-43 699
SSCGM-65-50 699
SSGM-35-37 698
SSGM-35-55 698
SSGM-50-43 698
SSGM-50-63 698
SSGM-65-50 698
SSGM-65-75 698
SSID-12 552
SSID-20 552
SSID-25 552
SSID - 25 - 22 533
SSID-37 552
SSID-50 552
SSLTSV35-Mu05-01
657
SSLTSV35-Mu05-02
657
SSLTSV35-Mu05-03
657
SSLTSV35-Mu05-04
657
SSLTSV35-Mu05-05
657
SSLTSV35-Mu10-01
657
SSLTSV35-Mu10-02
657
SSLTSV35-Mu10-03
657
SSLTSV35-Mu10-04
657
SSLTSV35-Mu10-05
657
SSLTSV50-Mu05-01
661
SSLTSV50-Mu05-02
661
SSLTSV50-Mu05-03
661
SSLTSV50-Mu05-04
661
SSLTSV50-Mu05-05
661
SSLTSV50-Mu10-01
661
SSLTSV50-Mu10-02
661
SSLTSV50-Mu10-03
661
SSLTSV50-Mu10-04
661
SSLTSV50-Mu10-05
661
SSLTSV65-Mu05-01
665
SSLTSV65-Mu05-02
665
SSLTSV65-Mu05-03
665
SSLTSV65-Mu05-04
665
SSLTSV65-Mu05-05
665
SSLTSV65-Mu10-01
665
SSLTSV65-Mu10-02
665
SSLTSV65-Mu10-03
665
SSLTSV65-Mu10-04
665
SSLTSV65-Mu10-05
665
SSLTSV90-Mu05-01
669
SSLTSV90-Mu05-02
669
SSLTSV90-Mu05-03
669
SSLTSV90-Mu05-04
669
SSLTSV90-Mu05-05
669
SSLTSV90-Mu10-01
669
SSLTSV90-Mu10-02
669
SSLTSV90-Mu10-03
669
SSLTSV90-Mu10-04
669
SSLTSV90-Mu10-05
669
SS-RS-25 702
SS-RS-35 702
SS-RS-50 702
SS-RS-75 702
SS-RS-100 702
SS-RS-125 702
SS-RS- 150 702
SS-RSC-50 703
SS-RSC-50T 703
SS-RSC-75 703
SS-RSC-75T 703
SS-RSC-125 703
SS-RSC-150 703
SSTSV35-Mu05-01
655
SSTSV35-Mu05-02
655
SSTSV35-Mu05-03
655
SSTSV35-Mu05-04
655
SSTSV35-Mu05-05
655
SSTSV35-Mu10-01
655
SSTSV35-Mu10-02
655
SSTSV35-Mu10-03
655
SSTSV35-Mu10-04
655
SSTSV35-Mu10-05
655
SSTSV50-Mu05-01
659
SSTSV50-Mu05-02
659
SSTSV50-Mu05-03
659
SSTSV50-Mu05-04
659
SSTSV50-Mu05-05
659
SSTSV50-Mu10-01
659
SSTSV50-Mu10-02
659
SSTSV50-Mu10-03
659
SSTSV50-Mu10-04
659
SSTSV50-Mu10-05
659
SSTSV65-DMu01-01
663
SSTSV65-DMu01-02
663
SSTSV65-DMu01-03
663
SSTSV65-DMu01-04
663
SSTSV65-DMu01-05
663
SSTSV65-Mu10-01
663
SSTSV90-DMu01-0
667
SSTSV90-DMu01-01
667
SSTSV90-DMu01-02
667
SSTSV90-DMu01-03
667
SSTSV90-DMu01-04
667
SSTSV90-Mu05-01
667
SSTSV90-Mu05-02
667
SSTSV90-Mu05-03
667
SSTSV90-Mu05-04
667
SSTSV90-Mu05-05
667
SSTSV90-Mu10-01
667
SSTSV90-Mu10-02
667
SSTSV90-Mu10-03
667
SSTSV90-Mu10-04
667
SSTSV90-Mu10-05
667
SS-WRS-50 705
SS-WRS-75 705
SS-WRS-100 705
SS-WRS-150 705
SS-WRS-200 705
SS-WRS-300 705
SS-WRSC-50 705
SS-WRSC-75 705
SS-WRSC-100 705
SS-WRSC-150 705
SS-WRSC-200 705
SS-WRSC-300 705
SS XYTSWM-150-C
683
SS XYTSWM-150-S
683
SS XYTSWM-200-C
683
SS XYTSWM-200-S
683
SS XYTSWM-250-C
683
SS XYTSWM-250-S
683
SVRA 553
SWPC - 8 579
SWPC - 12 579, 581
SWPC - 16 579
T
TABM-CS-25 516
TABM-CS-38 516
TABM-CS-50 516
TABM-CS-75 516
TABM-Mu-25 516
TABM-Mu-38 516
TABM-Mu-50 516
TABM-Mu-75 516
TAPM-CS-65 516

TAPM-CS-75 516
TAPM-CS-100 516
TAPM-Mu-50 516
TAPM-Mu-75 516
TAPM-Mu-100 516
TBM-01 348
TBM-02 348
TBM-03 348
TC-5AL-Mu 5 557
TC-5AL-Mu 10 557
TC-5AR-Mu 5 557
TC-5AR-Mu 10 557
TC - 35 584
TC - 50 584
TC - 75 584
TC-CFA-L 556
TC-CFA-S 556
TC - CM 555
TC-FC 555
TC-FCH 555
TC - HM1 555
TC - RMS 555
TC-RS-76 556
TC-SMA 555
TC-ST 555
TC-XYZ-L-Mμ 5 557
TC-XYZ-L-Mμ10 557
TC-XYZ-R-Mμ 5 557
TC-XYZ-R-Mμ10 557
TC XZ-Mμ 5 556
TC XZ-Mμ 10 556
TDU7000S 922
TE-60-60-HD 493
TE-60-60-SLD 493
TE-90-60-HD 493
TE-90-60-SLD 493
TE-90-90-HD 493
TE-90-90-SLD 493
TE-120-90-HD 493
TE-120-90-SLD 493
TE-120-120-HD 493
TE-120-120-SLD 493
TE-180-120-HD 493
TE-180-120-SLD 493
TE-A-B-C-HD 493
TE-A-B-C-SLD 493
TEPC - 8 579
TEPC - 12 579
TEPC - 16 579
TLC-25-8 530
TM3L6 587
TM3L8 587
TM3L12 587
TM3L14 587
TM3L18 587
TM3L22 587
TM4L6 587
TM4L8 587
TM4L12 587
TM4L14 587
TM4L18 587
TM4L22 587
TM6L6 588
TM6L8 588
TM6L14 588
TM6L18 588
TM6L22 588
TPH-16D-75 576
TPH-16D-100 576
TPH-16D-150 576
TPH-16D-200 576
TPH-16D-250 576
TPH-75 567
TPH-75N 572
TPH-75NT 572
TPH-75T 567
TPH-100 567
TPH-100N 572
TPH-100NT 572
TPH-100T 567
TPH-150 567
TPH-150N 572
TPH-150NT 572
TPH-150T 567
TPPH-16D-75 576
TPPH-16D-100 576
TPPH-16D-150 576
TPPH-16D-200 576
TPPH-75 568
TPPH-100 568
TPPH-150 568
TPPHN-75 573
TPPHN-100 573
TPPHN-150 573
TR-2-25 530
TR-3-25 530
TR-5-25 530
TR-10-25 530
TR-20-25 530
TRS-25 527
TRS-50 527
TRSD-25 527
TRSD-50 527
TRSD-100-150 506, 507
TRSS-25 527
TRSS-50 527
TS35-Mu05-01 641
TS35-Mu05-02 641
TS35-Mu05-03 641
TS35-Mu05-04 641
TS35-Mu05-05 641
TS50-Mu05-01 643
TS50-Mu05-02 643
TS50-Mu05-03 643
TS50-Mu05-05 643
TS50-Mu10-01 643
TS50-Mu10-02 643
TS50-Mu10-03 643
TS50-Mu10-04 643
TS50-Mu10-05 643
TS65-DMu10-01 645
TS65-DMu10-02 645
TS65-DMu10-03 645
TS65-DMu10-04 645
TS65-DMu10-05 645
TS65-Mu05-01 645
TS65-Mu05-02 645
TS65-Mu05-03 645
TS65-Mu05-04 645
TS65-Mu05-05 645
TS65-Mu10-01 645
TS65-Mu10-02 645
TS65-Mu10-03 645
TS65-Mu10-04 645
TS65-Mu10-05 645
TS90-DMu10-01 647, 649
TS90-DMu10-02 647
TS90-DMu10-03 647, 649
TS90-DMu10-04 647, 649
TS90-DMu10-05 647, 649
TS90-Mu05-01 647
TS90-Mu05-02 647
TS90-Mu05-03 647
TS90-Mu05-04 647
TS90-Mu05-05 647
TS90-Mu10-01 647, 649
TS90-Mu10-02 647, 649
TS90-Mu10-03 647, 649
TS90-Mu10-04 647, 649
TS90-Mu10-05 647, 649
TS120-Mu05-01 651
TS120-Mu05-02 651
TS120-Mu05-03 651
TS120-Mu05-04 651
TS120-Mu05-05 651
TS120-Mu10-01 651, 653
TS120-Mu10-02 651, 653
TS120-Mu10-03 651, 653
TS120-Mu10-04 651, 653
TS120-Mu10-05 651, 653
TSC-9-5030 687
TSC-9-5050 687
TSC-9-5075 687
TSC-9-5090 687
TSE-300-300-HD 494
TSE-300-300-SLD 494
TSE-600-300-HD 494
TSE-600-300-SLD 494
TSE-600-600-HD 494
TSE-600-600-SLD 494
TSE-900-600HD 494
TSE-900-600-SLD 494
TSE-900-900-HD 494
TSE-900-900-SLD 494
TSE-A-B-C-HD 494
TSE-A-B-C-SLD 494
TSQ90-Mu5-01 649
TSQ90-Mu5-02 649
TSQ90-Mu5-03 649
TSQ90-Mu5-04 649
TSQ90-Mu5-05 649
TSQ120-Mu5-01 653
TSQ120-Mu5-02 653
TSQ120-Mu5-03 653
TSQ120-Mu5-04 653
TSQ120-Mu5-05 653
TSV35-Mu05-01 655
TSV35-Mu05-02 655
TSV35-Mu05-03 655
TSV35-Mu05-04 655
TSV35-Mu05-05 655
TSV35-Mu10-01 655
TSV35-Mu10-02 655
TSV35-Mu10-03 655
TSV35-Mu10-04 655
TSV35-Mu10-05 655
TSV50-Mu05-01 659
TSV50-Mu05-02 659
TSV50-Mu05-03 659
TSV50-Mu05-04 659
TSV50-Mu05-05 659
TSV50-Mu10-01 659
TSV50-Mu10-02 659
TSV50-Mu10-03 659
TSV50-Mu10-04 659
TSV50-Mu10-05 659
TSV65-DMu01-01 663
TSV65-DMu01-02 663
TSV65-DMu01-03 663
TSV65-DMu01-04 663
TSV65-DMu01-05 663
TSV65-Mu10-01 663
TSV65-Mu10-02 663
TSV65-Mu10-03 663
TSV65-Mu10-04 663
TSV65-Mu10-05 663
TSV90-DMu01-01 667
TSV90-DMu01-02 667
TSV90-DMu01-03 667
TSV90-DMu01-04 667
TSV90-DMu01-05 667
TSV90-Mu10-01 667
TSV90-Mu10-02 667
TSV90-Mu10-03 667
TSV90-Mu10-04 667
TSV90-Mu10-05 667
TT 90-90 473
TT 120-90 473
TT 120-120 473
TT 180-120 473
TT 180-150 473
TT 240-120 473
TT 240-150 473
TT 300-120 473
TT 300-150 473
TT 360-150 473
TTNM 90-90 473
TTNM 120-90 473
TTNM 120-120 473
TTNM 180-120 473
TTNM 180-150 473
TTNM 240-120 473
TTNM 240-150 473
TTNM 300-120 473
TTNM 300-150 473
TTNM 360-150 473
V
VAB-LTTS50-50 689
VAB-LTTS50-75 689
VAB-LTTS50-100 689
VAB-LTTS50-150 689
VAB-LTTS75-50 690
VAB-LTTS75-75 690
VAB-LTTS75-100 690
VAB-LTTS75-150 690
VAB-LTTS75-200 690
VAB-LTTS125-100 691
VAB-LTTS125-150 691
VAB-LTTS125-200 691
VAB-LTTS125-350 691
VAB-LTTS125-500 691
VAB-LTTS150-100 692, 694
VAB-LTTS150-150 692, 694
VAB-LTTS150-200 692, 694
VAB-LTTS150-300 692, 694
VAB-LTTS150-500 692, 694
VAB-LTTS150-750 692, 694
VAB-LTTS250-100 695
VAB-LTTS250-150 695
VAB-LTTS250-200 695
VAB-LTTS250-300 695
VAB-LTTS250-500 695
VAB-LTTS250-750 695
VAB-LTTS250-1000 695
VAB-RCMTS50-50 729
VAB-RCMTS50-75 729
VAB-RCMTS50-100 729
VAB-RCMTS50-150 729
VAB-RCMTS75-50 730
VAB-RCMTS75-100 730
VAB-RCMTS75-150 730
VAB-RCMTS75-200 730
VAB-RCMTS75-250 730
VAB-RCMTS125-100 731
VAB-RCMTS125-150 731
VAB-RCMTS125-200 731
VAB-RCMTS125-300 731
VAB-RCMTS125-500 731
VAB-RCMTS150-100 733
VAB-RCMTS150-150 733
VAB-RCMTS150-200 733
VAB-RCMTS150-300 733
VAB-RCMTS150-500 733
VAB-RCMTS200-100 735
VAB-RCMTS200-200 735
VAB-RCMTS200-300 735
VAB-RCMTS200-500 735
VAB-RCMTS200-750 735
VAB-RCMTS250-100 737
VAB-RCMTS250-250 737
VAB-RCMTS250-300 737
VAB-RCMTS250-500 737
VAB-RCMTS250-750 737
VAB-RCMTS250-1000 737
VAB-TSC5030 687
VAB-TSC5050 687
VAB-TSC5075 687
VAB-TSC5090 687
VB-MTSM-3535 719
VB-MTSM-3550 719
VB-MTSM-3760 719
VB-MTSM-5050H 719
VB-MTSM-5065H 719
VB-MTSM-5075H 719
VB-MTSM-5090H 719
V - TC - 12 584
V - TC - 25 584
V - TC - 50 584
VTS-5-10-Mu10 671
VTS-5-Mu10 671
VTS-10-90-DMu 671
VTS-10-90-Mu10 671
VTS-10-DMu 671
VTS-10-Mu10 671
VTS-25-90-DMu 671
VTS-25-90-Mu10 671
VTS-25-DMu 671
VTS-25-Mu10 671
W
WRS-50 705
WRS-75 705
WRS-100 705
WRS-150 705
WRS-200 705
WRS-300 705
WRSC-100 705
WRSC-150 705
WRSC-200 705
WRSC-300 705
X
XYA-40 672
XYMOH 540
XY-MR-50-150 111
XY-MR-100 111
XYTS150150 684
XYTS170170 684
XYTS270170 684
XYTS270240 684
XYTS370240 684
XYTSM25-DMu 680
XYTSM-25-Mu-10 680
XYTSM50-DMu 680
XYTSM-50-Mu-10 680
XYTSW175175 685, 739
XYTSW225225 685, 739
XYTSW325225 685, 739
XYTSW325295 685, 739
XYTSW425295 685, 739
XYTSWM25 681
XYTSWM25-DMu 681
XYTSWM-25-Mu-10 681
XYTSWM50 681
XYTSWM-50-DMu 681
XYTSWM-50-Mu-10 681
XYTSWM-150-C 683
XYTSWM-150-S 683
XYTSWM-200-C 683
XYTSWM-200-S 683
XYTSWM-250-C 683
XYTSWM-250-S 683
XYZ4A 676
XYZCTS 35-35 675
XYZCTS50-10 673
XYZCTS 50-50 675
XYZCTS50-SU 673
XYZCTS 60-60 675
XYZCTS65 673, 674
XYZCTS90 674
XYZCTS90-DMu01 674
XYZLM-25 541
XYZLM-50 541
XYZMOH 542
XYZTS 500-350 679
XYZTS 625-525 679
XYZTS 700-340 679
XYZTS-150150-3 677
XYZTS-200200-3 677
XYZTS-250200-3 677
XZTS 300-300 678
Y
YZLM-25 540
YZLM-50 540

Product Warranty

GENERAL TERMS AND CONDITIONS OF WARRANTY

Every Holmarc Instruments and its accessories are warranted by HOLMARC OPTOMECHATRONICS LTD for a period of ONE YEAR from the date of original purchase Holmarc will repair or replace a product, or part thereof, found by Holmarc to be defective, provided the defective part is returned to Holmarc, with proof of purchase. This warranty applies to the original purchaser and our distributors and is non-transferable. Each returned part or product must include a written statement detailing the nature of the claimed defect, as well as the end user's name, address, and phone number. This warranty is not valid in cases where the product has been abused or mishandled, where unauthorized repairs have been attempted or performed, or where depreciation of the product is due to normal wear-and tear. Holmarc specifically disclaims special indirect, of consequential damages or lost profit which may result from a breach of this warranty. Any implied warranties which cannot be disclaimed are hereby limited to a term of one year from the date of original retail purchase. Holmarc reserves the right to change product specifications or to discontinue products without notice

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Products are guaranteed to be free from defects in material and workmanship, for a period of 1 year. In addition to the 1 year warranty, breadboards and optical tables are warranted for 5 yrs against delamination if used according to the instructions. The sole remedy is repair or replacement of the defective product, or at Base Lab Tools option, a refund of the purchase price. Holmarc offers installation services on all systems and vibration control equipment We provide a lifetime guarantee that all of our passively damped optical tables and breadboards will meet all originally stated performance specifications under normal use and proper handling .We provide a lifetime guarantee that all our optical table tops and breadboards (both passive and actively damped) will be free from defects in workmanship, including delamination of the top and bottom skins, under normal use and proper handling. In addition, all control electronics and active damping modules for our actively damped tables carry a 1 year warranty from date of shipment.

OPTICAL COMPONENTS & SYSTEMS

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NON-WARRANTY REPAIRS

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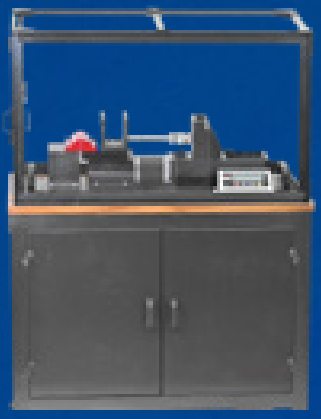
Corporate Office
Door No. 37/386, Manath Tower, Opp. Kalamassery Police Station, Changampuzha Nagar P.O, Kochi, Kerala, India, Pin - 682033

Registered Office
B.7., H.M.T. Industrial Estate, H.M.T. P.O, Kalamassery, Kochi, Kerala, India, Pin - 683 503

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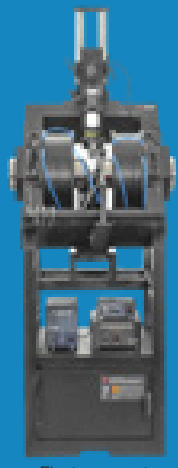
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Registered Office
B.7., H.M.T. Industrial Estate, H.M.T.
P.O, Kalamassery, Kochi, Kerala,
India, Pin - 683 503

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HOLMARC® HOLMARC
OPTO MECHATRONICS LTD

www.holmarc.com
sales@holmarc.com
+91 920-719-7771 / (72 / 76)

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