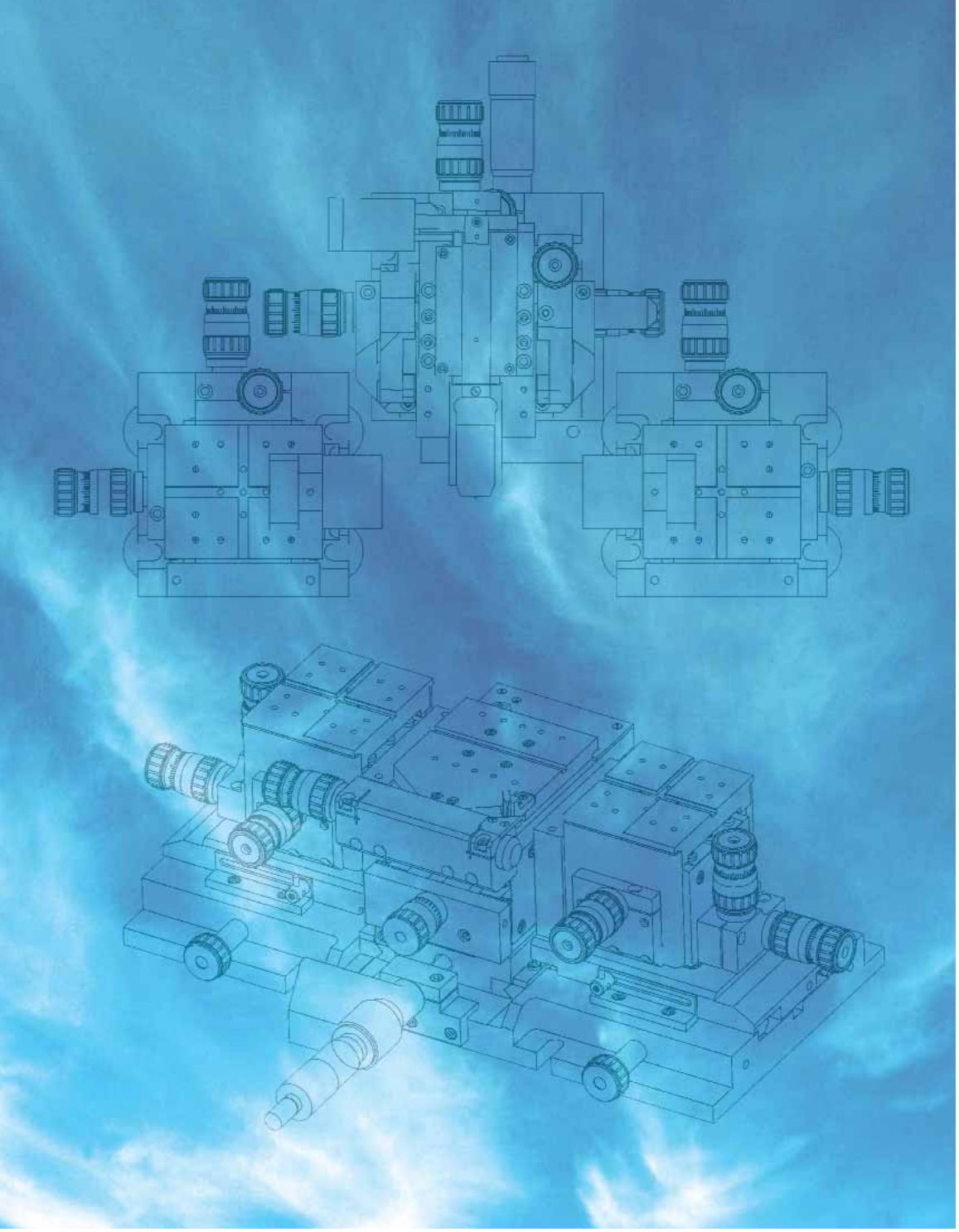


solution science

Elliot Scientific

for research and industry

Fibre Positioners

Ultra-small Positioners

Waveguide Manipulators

Automated Alignment Systems

UltraFast Pulse Measurement

OEM Design and Manufacture

ELLIOT MARTOCK

Company Profile

solution science
Elliot Scientific
for research and industry

Elliot Scientific was founded in 1990. Our extensive range of micropositioners and fibre optic products are manufactured in the UK and our headquarters are in Harpenden, Herts.

Elliot Scientific has been ISO 9002 registered since December 1993 and is currently working towards certification for ISO9001:2000.

We market our products under the names of Elliot Scientific and Elliot/Martock.

Elliot Scientific Ltd Headquarters in Harpenden, UK

Martock Design Limited

ELLIOT MARTOCK

Martock Design has been engaged in the design, development and manufacture of high precision instruments and equipment for the scientific and industrial communities Since 1973.

The first XYZ Flexure stage was designed and patented in 1982, since then a range of small high precision micropositioners and accessories has been designed and developed in conjunction with users of the equipment, with a number of patents awarded.

In 1992, Martock Design Ltd appointed Elliot Scientific Ltd as worldwide distributor for their product range. In February 1995, Elliot Scientific signed a manufacturing agreement for all Martock Design products. In February 2003 Elliot Scientific completed the purchase of all the shares of Martock Design. Martock Design is now a fully owned subsidiary of Elliot Scientific.

Apart from the standard items described in this catalogue, the company regularly designs and manufactures both modified versions of standard products in response to customer requests as well as complete custom systems.

OEM and Custom Designs

Elliot Scientific and Martock Design have worked closely together to design, manufacture and market this complete range of fine positioning systems. Many of these products have evolved from ideas and concepts requested by customers requiring customised manipulation systems.

We welcome the chance to work with you on developing solutions for your specific needs, whether for a small project or for large quantity OEM requirements. We have the flexibility to develop prototypes and the manufacturing expertise to produce in large volume.

Please call with your ideas or needs; we're here to help!

ELLIOT Gold™ Series

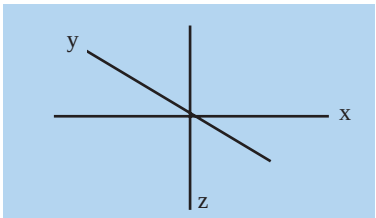
SETTING A NEW STANDARD IN FIBRE / DEVICE MANIPULATION

- *20 nm resolution*
- *Patented XYZ Flexure Stage **
- *Patented High Resolution Adjuster ***
- *2mm travel in X,Y & Z*
- *Orthogonal alignment groove allows device positioning along X or Y axis*
- *Many adjuster options*
- *Left-handed version available*

The ELLIOT Gold™ Series MDE 122 comes fitted with 3 x MDE 216 High Precision Adjusters

The ELLIOT Gold™ Series of XYZ Flexure Stages has been developed from the highly successful MDE 102 Series. With over 15 years experience designing and building XYZ Flexure Stages, we have introduced a product which encapsulates updated mechanical design with customer requested features. These include:

- *Enhanced robustness*
- *Improved long term stability*
- *4.5kg load capacity*
- *Higher resolution*
- *Simple replacement of adjusters (allows customer retro-fitting of alternative adjusters such as piezo)*
- *Y axis mounting groove follows line of tapped holes on optical table for ease of alignment.*

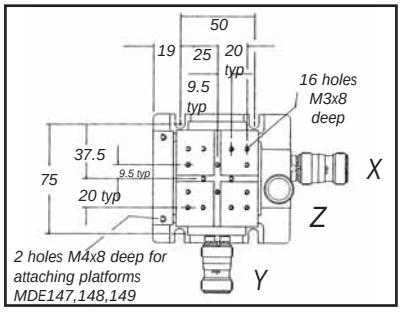


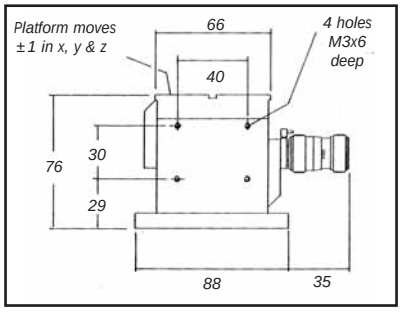
- *Arcuate displacement:*

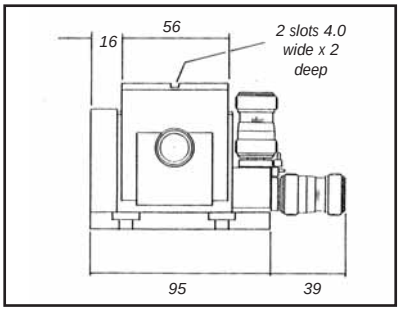
  X Axis 20 µm

  Y & Z Axes 14µm

  Up to 4 times better than competing systems







Optical Axis: The optical axis height of all Flexure Stage accessories is 18mm. Therefore, the optical axis height of a mounted accessory is 94mm.

** Patent Nos: GB 2129955B USA 4635887* *** Patent Nos: GB 2152616B USA 4617833*

ALTERNATIVE CONFIGURATIONS

MDE120 fitted with MDE 217 adjusters for non-critical manual positioning.

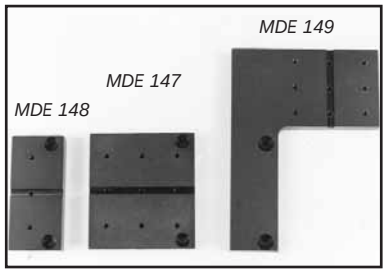
MDE 123 fitted with MDE 218 piezo adjusters for hands-off adjustment with 10nm resolution.

MDE 125 fitted with MDE 227 Long-travel piezo adjusters for increased range (100 μm)

Please note that different adjusters can be fitted to each axis to allow the positioner to be configured in the most cost-effective way for your application.

ORDERING INFORMATION

Product	Resolution	Adjusters Fitted
MDE 122	*20 nm*	*3 x MDE 216 High Precision Adjusters*
MDE 120	*200 nm*	*3 x MDE 217 0.25 Pitch Adjusters*
MDE 123	*10 nm*	*3 x MDE 218 Piezo Adjusters*
MDE 125	*50 nm*	*3 x MDE 227 Long Travel Piezo Adjusters*



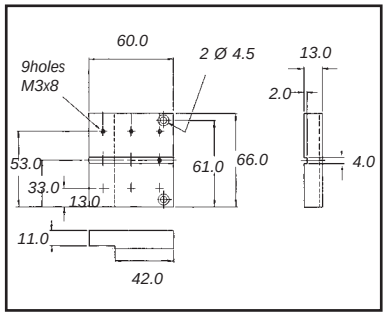
The fixed brackets attach to the front vertical pillar on the flexure stage using two M4 screws. They provide a convenient rigid surface for mounting standard Elliot / Martock accessories for alignment with items on the moving top plate of the flexure stage.

The fixed platform is referred to as the "Fixed World" while the flexure stage top plate can be regarded as the "Moving World".

When mounting these brackets, a steel rule is a useful aid to ensuring that the brackets are in-line with the optical axis defined by the XYZ stage.

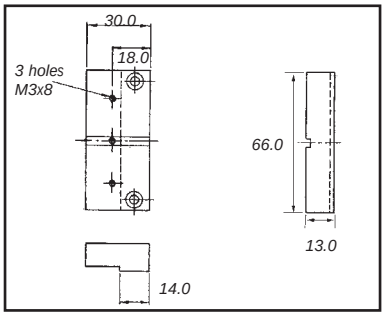
MDE 147

Large fixed bracket for mounting accessories along X axis. Slot length 60mm.



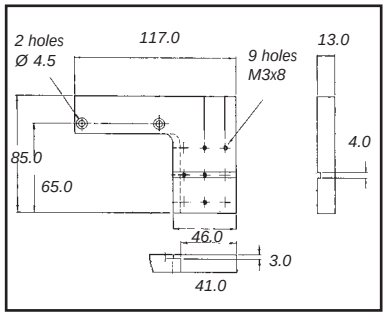
MDE 148

Small fixed bracket for mounting accessories along X axis. Slot length 20mm.



MDE 149

L-shaped bracket for mounting accessories along Y axis. Slot length 46mm.



MDE 190

Riser block which mounts between the MDE 147 (or MDE 148) and the flexure stage vertical pillar to raise the optical axis to 125mm. This is needed when configuring a 5 or 6 axis fibre launch with an MDE 183 or MDE 185 mounted on the "Moving World."

See page 23 for a free-standing platform using these brackets.

FIBRE LAUNCH SYSTEMS

The most common configuration for a fibre launch involves launching light from a free-space laser beam into an optical fibre. Flexure stages and accessories are ideal for this application and a number of common configurations are available as standard part numbers. Our comprehensive range of accessories means that other configurations may be easily assembled.

MDE 510 COMPLETE SYSTEM INCLUDES:

MDE 216 High Precision Adjusters

MDE 710 Adjustable Force Fibre Holder

MDE 150 Objective Mount (mount your chosen objective lens, ball lens or aspheric)

MDE 148 Small Fixed Bracket

MDE 511 COMPLETE SYSTEM INCLUDES:

MDE 217 0.25 Pitch Adjusters

MDE 711 Fibre Holder

MDE 150 Objective Mount

MDE 148 Small Fixed Bracket

ORDERING INFORMATION

Product	Resolution	Application	
MDE 510	*20 nm*	*Singlemode fibre*	*See * below*
MDE 511	*200 nm*	*Multimode fibre*	*See * below*

FIBRE LAUNCH: POLARISATION PRESERVING

When launching into polarisation maintaining fibre, the roll axis must be adjusted to align polarisation axes correctly.

MDE 520 COMPLETE SYSTEM INCLUDES:

MDE 216 High Precision Adjusters

MDE 717 High Precision Fibre Rotator (P. 9)

MDE 150 Objective Mount

MDE 147 Large Fixed Bracket

MDE 521 COMPLETE SYSTEM INCLUDES:

MDE 217 0.25 Pitch Adjusters

MDE 718 Fibre Rotator (P. 9)

MDE 150 Objective Mount

MDE 148 Small Fixed Bracket

ORDERING INFORMATION

Product	Resolution
MDE 510	*20 nm*
MDE 511	*200 nm*

** Please specify fibre cladding & jacket diameters. If unspecified, 125 µm cladding & 250 µm jacket diameter will be assumed and fibre vee groove provided accordingly.*
Order objective lens separately: see p 23

XYZ FLEXURE STAGE ACCESSORIES


MDE 150

All accessories are designed to be compatible. The optical axis is 18mm above the platform surface and on the centre-line of the location slot. Where necessary a locating tongue forms part of the accessory. A standard clamp system is used and all clampable accessories are supplied with the MDE 154 clamp set.

MDE 150 OBJECTIVE / BALL LENS MOUNT

This has a removable stainless steel sleeve cut with the microscope objective thread. Allows easy adjustment and exchange of objectives or other components having the standard RMS 0.800" - 36 thread.

MDE 156 EXTENSION TUBE
Extends reach by 25mm allowing access to components on wide platforms.

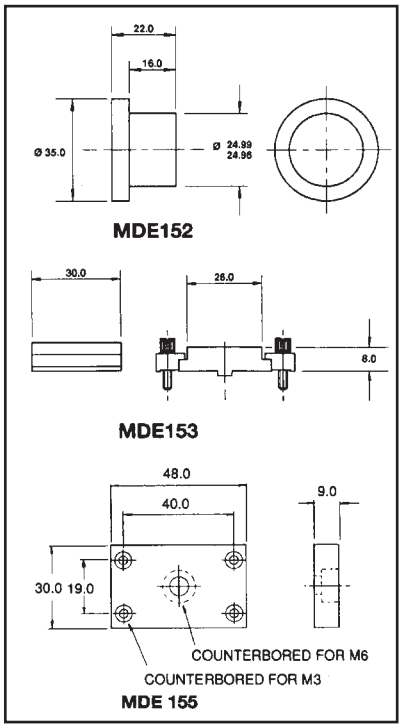
MDE 151 PLAIN MOUNT
As MDE 150 but without threaded sleeve. The 25mm bore will hold 25mm components such as Component Flange MDE 152 or Spindler & Hoyer .

MDE 152 COMPONENT FLANGE
Aluminium alloy flange which can be machined by Elliot Scientific or customer to hold components such as fibre chucks.

MDE 153 COMPONENT PLATE
Clamps to Flexure Stage giving a basic platform for mounting of non-standard components.

MDE 154 CLAMP SET
Supplied with all clamped accessories, includes two clamps plus screws and socket key.

MDE 155 ADAPTOR PLATE
To enable M6 table post holders to fit XYZ flexure top.



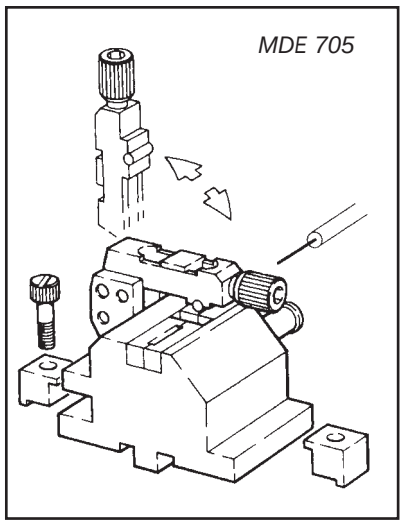

MDE 150 fitted with MDE 156 Extension Tube

FIBRE HOLDERS

A comprehensive range of fibre holders using vacuum, magnet or spring-loaded clamps is available.

User replaceable V-grooves enable the user to work with different fibre sizes economically.

Custom grooves are our speciality.


MDE 705

VACUUM HOLDING

- *Fibres 125 µm or larger. Jacket up to 1mm held by clamp arm (MDE 705 only)*
- *Very low forces on fibre*
- *Vacuum is applied through a fine slot for even clamping of fibre.*
- *Vacuum V-groove can be dismantled for cleaning.*
- *Vacuum connection is via a fitting for 4mm bore pipe or by the M5 port.*

CLAMP HOLDING

- *Any fibre size. Jacket up to 1mm*
- *Clamp force adjustable from 25 to 125 g (higher loads available on request).*
- *Clamp arm swings clear of V-groove for easy loading of fibre.*
- *Very easy to use.*
- *Contact point on fibre is a resilient pad*

V-GROOVES FOR CLAMP ARM TYPES

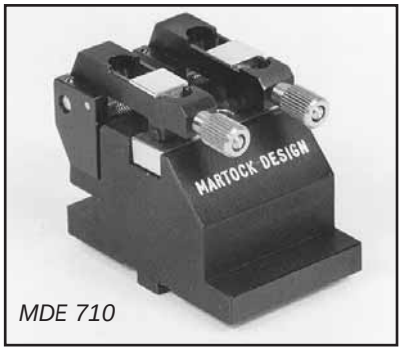
- *Integral double V ensures alignment and support for fibre jacket. (MDE 710 & MDE 722)*
- *Can be made for any combination of fibre and jacket diameters.*
- *Made from corrosion-resistant copper & nickel alloy*
- *Double V-groove to suit 125/250 µm fibre supplied as default.*
- *Replacement V-grooves available.*

OPTICAL AXIS

- *The optical axis height of an accessory mounted on an XYZ Flexure Stage is 94mm.*

ORDERING INFORMATION

Product	Specification
MDE 705	Vacuum V cladding & clamp arm for jacket *
MDE 709	Double V-groove & single clamp arm for cladding only **
MDE 710	Double V-groove & clamp arms for cladding & jacket *
MDE 715	Vacuum V for cladding only. 125 µm- 400 µm diameter
MDE 720	Replacement V-groove (Not MDE 711 or MDE 718) Order as MDE 720-xxx / xxx for cladding and jacket diameters. Clamp Arm assemblies available separately as MDE 726



MDE 710

* To suit 125 µm/250 µm fibre unless otherwise specified.

** To suit 125 µm fibre unless otherwise specified.

MDE 711

- Simple economical design
- Single V-groove to suit 125 µm fibre unless specified.
- Replacement single V-grooves available: order as MDE 712 / XXX to specify fibre diameter


MDE 711

MDE 722 FIBRE HOLDER

- Technical specification as MDE 710
- Has 11mm diameter spigot to fit MDE251, MDE250-S, MDE257, MDE 257M, MDE276/MDE276M, MDE277/MDE277M
- Spigot is slotted for easy insertion of fibre
- Clamp arms can be fitted either side of V-groove.

MDE 719 FIBRE ROTATOR

- Fits MDE 265 Series Positioners
- Spindle rotates 360°
- Fine adjustment: ± 5° range Resolution 30 arc secs
- Holds fibre ferrules only
- Works with any ferrule up to 4.5mm diameter (Customer to specify size)

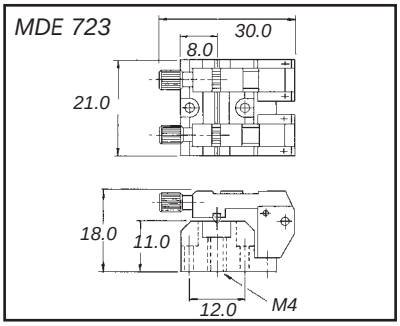

MDE 722

MDE 723 FIBRE HOLDER

- Technical specification as MDE 710
- Fits MDE 255 Series and MDE 260 Series Positioners (except MDE 257 & MDE 257M).
- Optical Centre height 11mm
- M4 hole on base for post mounting.

MDE 730 FIBRE HOLDER

- Fits MDE 265 Series Positioners
- Optical Centre height 5.0mm
- Fibre retained by magnet (supplied)
- V-groove for 125 mm fibre supplied unless otherwise specified.

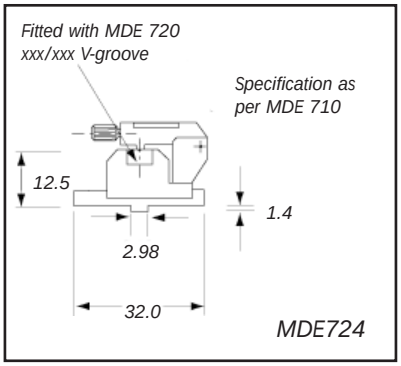


MDE 723

MDE 724 FIBRE HOLDER

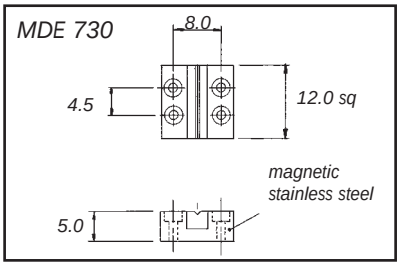
- Technical specification as MDE 710
- Fits Melles Griot / Photon Control flexure stages : Optical axis height 12.5mm Location tongue 3mm wide

Note: MDE 723 719 730 are supplied with mounting screws



MDE724

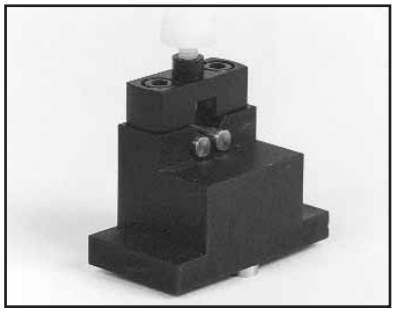

MDE 719



MDE 730

FERRULE HOLDER

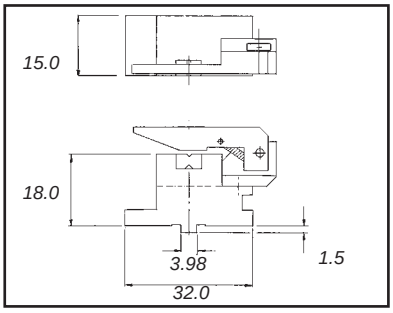
MDE 700 & MDE 701



- *Holds optical fibre terminated with a cylindrical ferrule*
- *Can also be used to hold GRIN lenses*
- *"V" groove formed by two stainless steel rods 9mm long*
- *Nylon clamp screw avoids damage to component being held*
- *For ferrules of diameter 2-4.5mm order MDE 700*
  For ferrules of diameter 1-2mm order MDE 701

GRIN LENS HOLDER

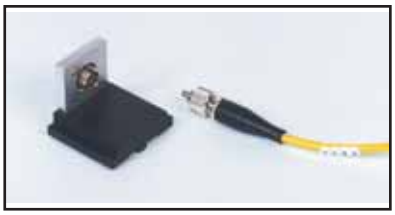
MDE 734



- *Reversible vee block 4mm long*
- *To hold GRIN lenses dia 1-2mm & 2-3mm*
- *Optical axis height 18mm*

CONNECTORISED FIBRE HOLDERS

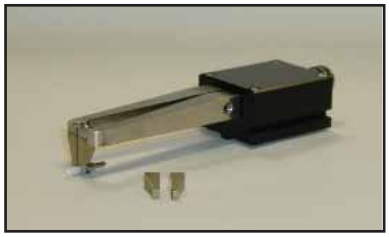
MDE 735, MDE 736, MDE 737



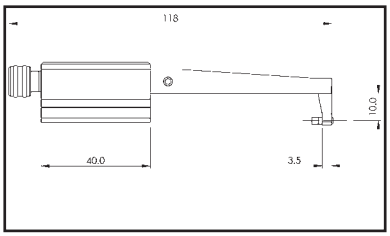
- *MDE 735 for FC/PC Connector Mounts*
- *MDE 736 for SMA Connector Mounts*
- *MDE 737 for ST Connector Mounts*

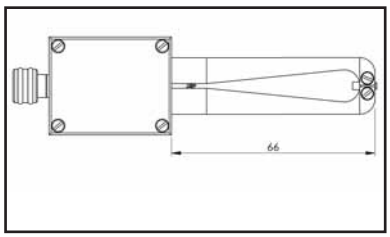
FIBRE GRIPPER

E 770



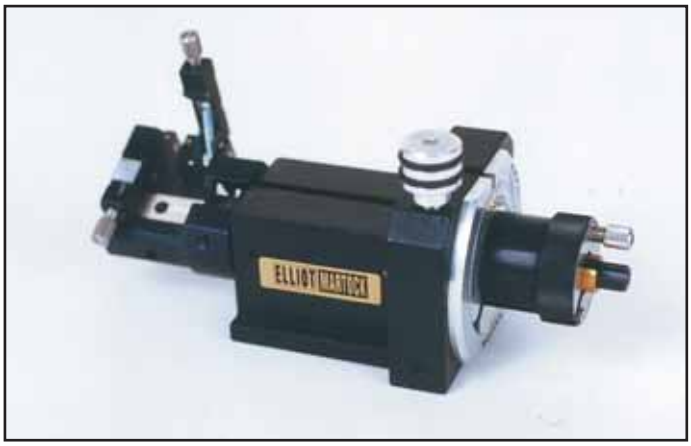
The E770 Fibre Gripper is a new product designed to fit on Elliot/Martock flexure stages for demanding fibre alignment tasks. Interchangeable grips facilitate its use from clad fibres to ferrules in excess of 3mm diameter.

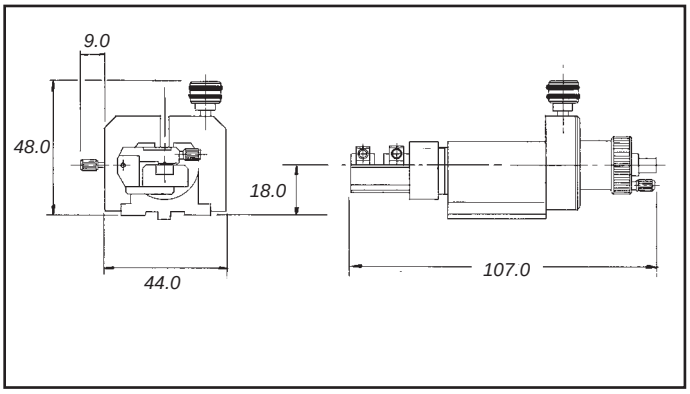




- *Integrates with ELLIOT Gold™ Series flexure stages*
- *Compact manual design*
- *Gripping arms contoured to allow a clear view and/or tool access*
- *Rapid loading and unloading feature*
- *Easily interchangeable grips accommodate all sizes of fibre and ferrules*
- *Extended reach for restricted access laser diode alignment tasks*
- *Minimal gripped length to maximise package accessibility*
- *Repeatable gripping force*

HIGH PRECISION FIBRE ROTATOR



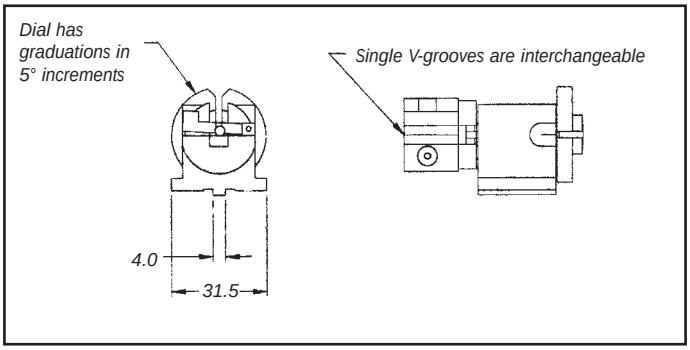


The popular MDE 717 has been updated and now offers the same highly accurate rotation in a more stable package

MDE 717

- *Slotted design for easy insertion and removal of fibre.*
- *Full 360^{o} rotation*
- *Engraved scale ± 90^{o}. Vernier reads to 30 arc min.*
- *Fine adjustment screw. 5 arc sec resolution. Range ± 5^{o}.*
- *Fibre held in V-groove by two Clamp Arms. Clamp loads adjustable 25g-125g*
- *V-block pre-set on axis with less than 1 µm of concentricity error when rotated.*
- *V-block can be re-centred by user*
- *V-groove for 125/250 µm fibre fitted. Other sizes available if specified.*
- *Split spring sleeve retains fibre in slot at the control end and prevents fouling during rotation.*

FIBRE ROTATOR



The new version of the MDE 718 is an economical alternative to the MDE 717 for less demanding rotation requirements

MDE 718

- *Slotted design for easy insertion and removal of fibre.*
- *Full 360^{o} rotation*
- *Resolution approximately 0.1 degrees.*
- *Fibre held in V-groove by single Clamp Arm. Clamp load adjustable 25g-125g.*
- *V-block can be re-centred by user*
- *V-groove for 125 µm fibre fitted. Other sizes available if specified.*
- *Replacement V-groove - Order as MDE 712/XXX specifying fibre diameter*

Sometimes it is convenient to handle fibres in a fibre chuck, for example when working with delicate lensed fibres the fibre can be retracted into the chuck for protection. Please contact Elliot Scientific for more details of how the rotators can be modified to work with fibre chucks.

OEM versions of these rotators have been produced and are supplied as "upgrade kits" to a number of manufacturers of fusion splicers to accommodate splicing of Polarisation Maintaining fibre.

ELLIOT Gold™ Series

2 AND 3 AXIS ROTATION MODULES

MDE 183 Pitch and Yaw Module

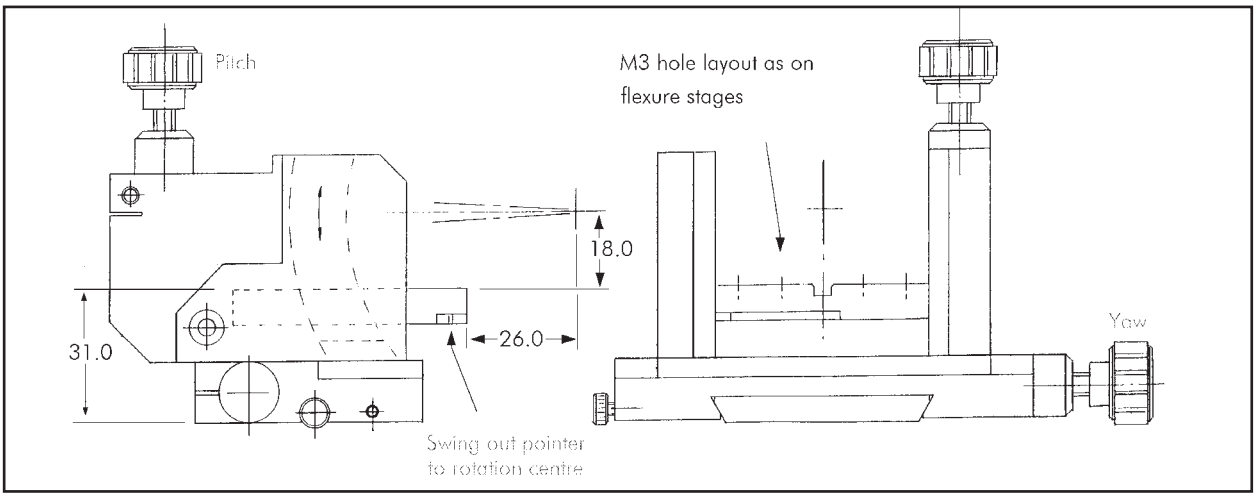
The MDE 183 Rotation stage has been developed to add pitch, yaw and roll adjustment to the well established MDE 122 flexure stage for a wide range of fibre and device alignment tasks. The basic module screws onto the MDE 122 using a dovetail bracket allowing coarse adjustment along the optical axis.

The addition of the MDE 717 precision fibre rotator to the top plate gives true 6 axis manipulation about a single point in space.

The top plate accepts all of the existing Elliot / Martock fibre holders allowing bare fibre, ribbon cable and connectorised fibre to be used with the rotation module.

MDE 183 MODULE INCLUDES:

- *Pitch and Yaw Adjustment about a Single Point in Space.*
- *± 3 ^{o} Range in θ Y*
- *± 5 ^{o} Range in θ Z*
- *Resolution: 2 arc secs (MDE 183)*
  < 0.1 arc secs (MDE 185)
- *Fits on Standard MDE 122 XYZ Flexure Stage for 5 & 6 Axis Operation.*
- *Right or Left - Handed Configuration*
- *Use with MDE 717 for 360^{o} Roll with 5 arc secs Resolution.*
- *Standard Fibre Holders Fit Top Plate*
- *Optical Axis Height 125mm (on MDE 122)*
- *Precision Bearings give Rotation in a True Arc - no crosstalk.*
- *Excellent Long Term Stability*
- *User Replaceable Adjusters*



MDE 183 Pitch and Yaw Module with MDE217 Adjusters

5 AND 6 AXIS POSITIONERS

The MDE 183 & 185 can be used with various top plate accessories from the Elliot / Martock range

For example: Ribbon Cable Alignment use with MDE 884 Ribbon Cable Rotator

These stages can also be mounted on riser blocks for 94mm or 125mm optical axis height.

The MDE 190 riser block is used to extend the axis height of an MDE 147 or 148 bracket to 125mm for 5 or 6 axis fibre launch applications.

Please call for other configurations.

MDE 187 - 6 Axis Positioner

Options for Roll Axis :

Accessory	Coarse Travel	Coarse Resolution	Fine Travel	Fine Resolution
MDE 717	360^o	30 arc minutes	$\pm 5^o$	5 arc secs
Recommended for rotation of Polarisation Maintaining Fibre				
MDE 884	$\pm 4^o$	1 arc sec	20 arc minutes	< 0.1 arc secs
Recommended for ribbon cable alignment.				

NB In both configurations the fibre tip can be set at a point in space 18mm above the top plate and 26mm out from the front of the top plate. An indicator dial is provided to help the user position the tip of a fibre at this point.

Product	Description
MDE 183	Pitch and Yaw Module with MDE 217 Adjusters
MDE 185	Pitch and Yaw Module with MDE 216 Adjusters
MDE 187	6 Axis Positioner with MDE 717 Rotator and MDE 216 Adjusters

"BUTT-MAN™" FIBRE-TO-FIBRE ALIGNMENT VEE BLOCK

"BUTT-MAN" is designed to allow two fibres to be coupled quickly and easily without the need for splicing in applications such as OTDR testing. Typical losses are 0.8dB (0.3dB best). Each fibre is initially gripped in the outer thumb-loaded clamps. The left hand clamp moves smoothly along the X axis moving the fibre along the V-groove into contact with the fixed fibre. This movement can be clamped if required. Index matching gel can be used in the V-groove to improve the coupling efficiency.

Once aligned, the two central V-block fibre clamps (optional) can be used to hold the fibre ends firmly in the V-groove while a measurement is made.

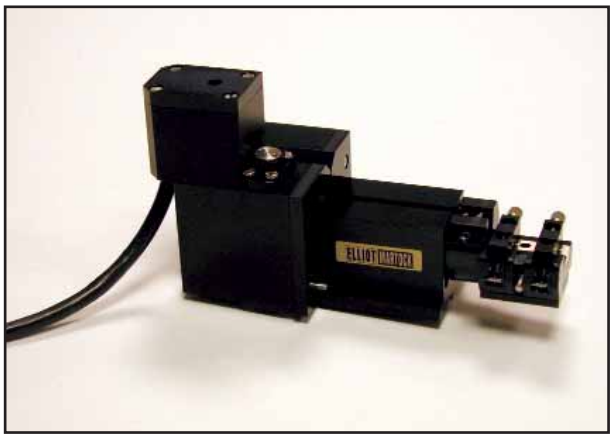
ORDERING INFORMATION

Product	Description
MDE 725	"BUTT-MAN" with thumb loaded clamps & V-block clamps *
MDE 725A	"BUTT-MAN" with thumb loaded clamps only *

** When ordering please state diameter for your fibre. V-grooves to suit 125-400 microns are available. If two different fibres are to be coupled, please state both diameters.*

Standard product is continuous V-groove to suit 125 micron fibre

MOTORISED ACTUATORS

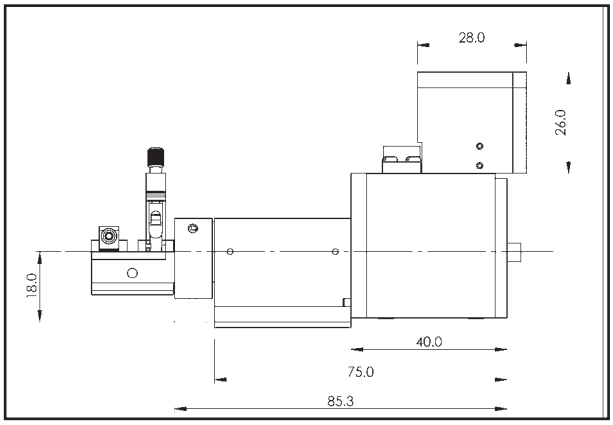


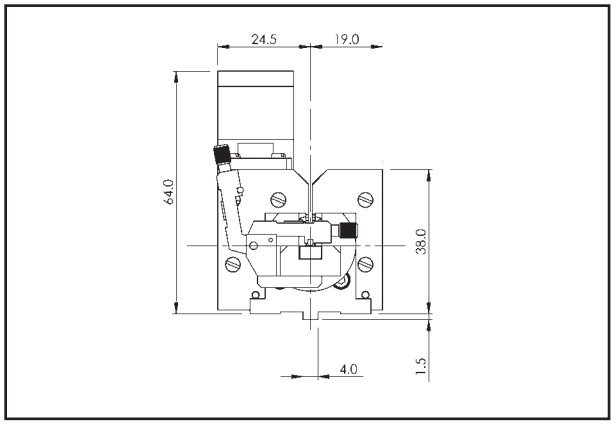
MDE 235 MOTORISED FIBRE ROTATOR

The MDE 235 is a motorised version of the popular MDE 717 fibre rotator. It includes all the features of the original but with the addition of a smooth and accurate stepper motor drive.

Designed for the demanding rotation and alignment of angular sensitive components it can be used anywhere stable accurate rotation is needed.

- *Slotted design for easy insertion and removal of fibre.*
- *Full 360° rotation.*
- *Integral stepper motor drive.*
- *Resolution <0.01° with ½ step controller.*
- *Fibre held in variable force V-groove clamps.*
- *Standard V-groove for 125/250 µm fitted. Custom sizes available.*
- *V-block pre-set on axis with less than 1µm concentricity error.*
- *Stepper drive controllers available.*
- *Integrates with ELLIOT Gold flexure stages*



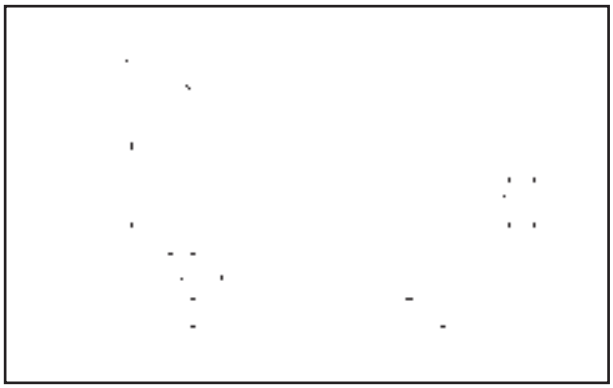


MDE 231 MOTORISED ACTUATOR

The MDE 231 is a stepper motor driven 8mm actuator.

The non-rotating spindle offers low noise translation or rotation when integrated with flexure stages, pitch and yaw stages and rotation units.

It has been developed for the demanding rotation & alignment of fibre optic components and for use where stable accurate rotation is needed.



- *Integral stepper motor drive and gearbox*
- *Non rotating spindle*
- *Resolution 0.254 µm single step*
- *Maximum speed 0.5 mm/s*
- *Travel 8mm*
- *Manual adjustment is available using a hex key*
- *Stepper drive controllers available*
- *Integrates with ELLIOT Gold flexure stages and rotation units*

PIEZO ADJUSTERS

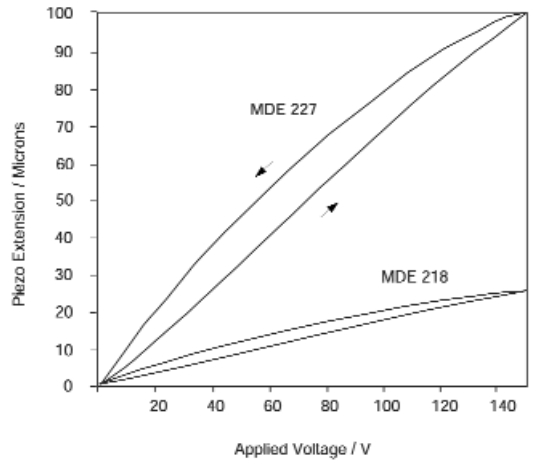
Although the manual MDE 216 adjuster can make movements with 20nm resolution there are applications where either greater resolution or "hands-free" operation of the positioner is required.

The MDE 218 adjuster offers 25 µm of direct drive piezo travel with 10nm resolution.

The MDE 227 adjuster gives 100 µm of piezo travel with 50nm resolution. This utilises a version of the patented lever system in the MDE 216 manual adjuster to amplify the extension of a 40 µm piezo stack. The graph opposite shows the measured hysteresis of both adjusters fitted to a flexure stage.

Both versions have a manual coarse control and connect directly into the 12mm drive aperture on the flexure stage.

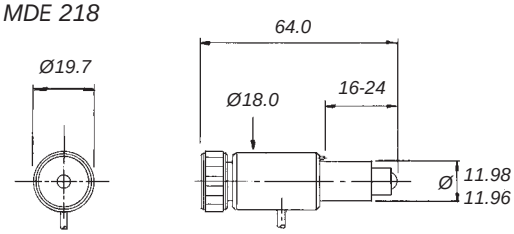
HYSTERESIS GRAPH OF MDE218 & MDE227



PIEZO ADJUSTER MDE 218

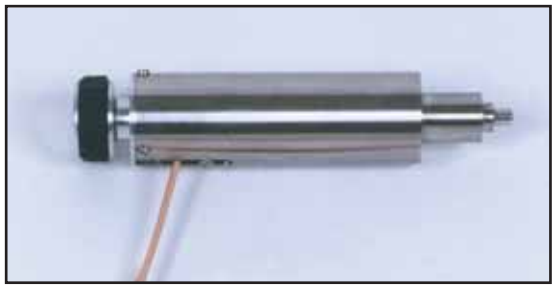
- *25 µm direct piezo drive*
- *10nm resolution*
- *8mm coarse travel on 0.25 pitch thread*
- *Operating voltage range 0 - 150V*
- *Hysteresis: 12 - 15%*
- *Adjustable hard stop prevents damage to piezo when axis is at full mechanical extension*

MDE 218

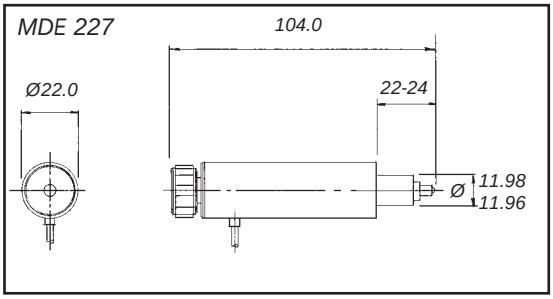


LONG TRAVEL PIEZO ADJUSTER MDE 227

- *100 µm piezo travel using a 40 µm piezo stack and lever system in adjuster*
- *50 nm resolution piezo operation*
- *± 1mm travel on coarse drive with 1µm resolution.*
- *On drives such as the MDE 227 an integral hex adjuster is built into the coarse drive. The adjuster protrudes significantly from the flexure stage body, so finger pressure effects during manual adjustment can cause cross-talk between axes. Adjustment using a ball-headed hex key removes finger pressure effects and the adjuster is driven in the intended axis only.*
- *12-15% hysteresis*
- *0-150V operating voltage range.*



MDE 227



MANUAL ADJUSTERS

Several adjusters are available to fit the 12mm diameter bore on the XYZ Flexure Stage. These are all user-replaceable and allow the stage to be configured exactly as required.

HIGH PRECISION ADJUSTER MDE 216

- *Patented mechanical lever system*
- *20nm resolution*

COARSE ADJUSTMENT

- *8mm travel, 1 micron resolution*

FINE ADJUSTMENT

- *0.3mm travel, 20nm resolution*
- *Very smooth feel; largely independent of applied load*
- *Negligible backlash*
- *Santoprene control ring allows a delicate touch and reduces heat transfer into the drive*
- *Positive travel limit stops on control knob*
- *Graduated knob (50 arbitrary divisions).*
- *Output via non-rotating hard steel ball*

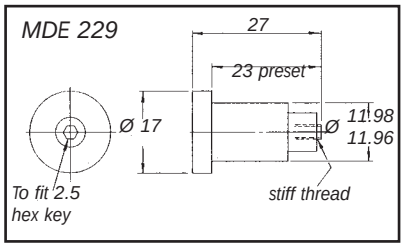
SIMPLE ADJUSTER MDE 217

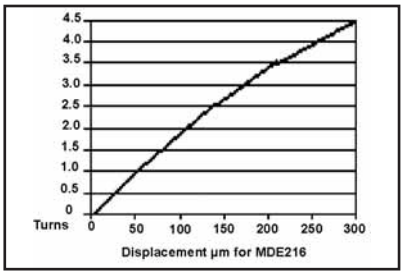
- *0.25 pitch thread*
- *Coarse travel 8mm, resolution 1micron*

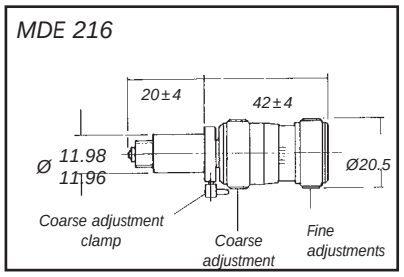
FIXED AXIS MDE 229

Used when 3rd axis is not required on flexure stage. For example when used as a YZ waveguide mount between two XYZ stages.

M3 thread allows easy removal







ULTRAFINE MIRROR MOUNT ADJUSTER

MDE 215

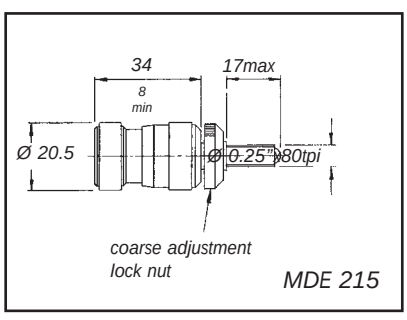
To improve the resolution of a mirror mount simply retrofit the MDE 215 into an existing 1/4-80 tapped hole. Using the same patented mechanism as used on our MDE 216 you can achieve linear sensitivity of 20nm. This plus the ability to lock the coarse drive gives a significant improvement in the precision of the mirror mount.

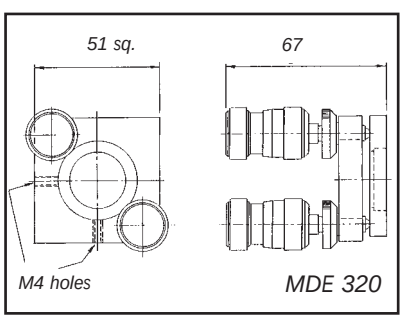
ULTRAFINE KINEMATIC MIRROR MOUNT

MDE 320

The MDE 320 mount consists of a conventional kinematic mirror mount for 25mm (1") optics fitted with 2 of the MDE 215 adjusters.

Resolution of the mirror mount is increased from around 2 arc secs to 0.1 arc sec.





PIEZO CONTROLLER

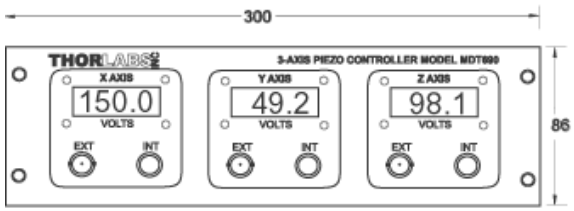
MDT 690 PIEZO DRIVER

- *Output Voltage: 0 -150V*
- *Output Current: 60mA / channel*
- *Channels: 3 independent*
- *Output Noise: <3mV RMS*
- *Output Stability: 0.1% over 16 hours*
- *Power Requirements: 115/230V AC 50-60Hz*
- *External Voltage Control with 15x gain*
- *LCD digital readout on each channel*
- *Internal/External Voltage Control*

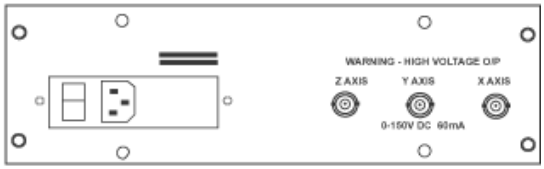
The Elliot / Thorlabs MDT 690 is an ideal 3 channel controller for flexure stages fitted with either MDE 218 or MDE 227 piezo adjusters. It combines a precision output voltage for maximum piezo resolution with a high current capability to allow external modulation of the piezo.

The piezo adjusters are connected to 3 x BNC outputs on the rear panel of the controller and the voltage applied to each channel independently using the knobs on the front panel. Each channel has its own LCD display which shows the applied voltage.

External signals in the range 0-10V can be applied to the front panel BNC connectors allowing remote control of the unit from a voltage source or D/A converter.



FRONT PANEL



BACK PANEL

Product	Description
MDT 693	*3 Channel Piezo Controller*
MDE 623	*3 Channel Controller with MDE123 flexure stage - 25µm travel, 10nm resolution*
MDE 625	*3 Channel Controller with MDE125 flexure stage - 100µm travel, 50nm resolution*

MICROSCOPE ACHROMATIC OBJECTIVES

Product	Magnification	Numerical Aperture	Working Distance
MDE 170	*x4*	*0.12*	*22mm*
MDE 172	*x10*	*0.25*	*6.5mm*
MDE 173	*x20*	*0.40*	*1.3mm*
MDE 174	*x40*	*0.65*	*0.6mm*

A range of achromatic objective lenses suitable for use with the Fibre Launch systems. All models are coated with a broadband anti-reflection coating over the visible wavelength range.

DALi 2: DEVICE AUTOMATIC ALIGNMENT SYSTEM

ALIGNMENT OF SINGLE-MODE FIBRES AND PHOTONIC DEVICES HAS NEVER BEEN EASIER

- *3 Axis Piezo Controller for 150V Piezos*
- *Menu-Driven Set-Up and Operation*
- *1 Button Search & Optimise routine*
- *Store Parameter sets for each alignment*
- *Full control over scan parameters*
- *Full IEEE 488.2 specification*
- *LabVIEW drivers available*

The DALi 2 E-2200 builds on the success of the DALi E-2100 incorporating some significant performance enhancements. Like its predecessor, The DALi 2 has been designed to speed up and automate a wide range of photonic alignment tasls for development, testing and production.

- ***High visibility black on white LCD display***
- ***Power meter display***
- ***Improved input Stage***
- ***Improved tracking features***
- ***Desk or 19 inch rack mounted***
- ***Floating input stage***
- ***Improved output stage***

DALi 2 consists of a 3 axis Piezo Controller suitable for driving the popular Elliot / Martock Gold Series range of flexure stages fitted with 150V piezo adjusters.
A unique calibration feature allows DAli to be used with any piezo devices working on 0-150V by allowing the user to set up the delay in the electronics to match whatever mechanics are being driven.
Featuring a convenient menu driven user interface, the DALi 2 includes algorithms for locating and optimising an optical signal based on a signal fed back from any suitable detector.

A complete set of parameters for any particular alignment can be stored and recalled, making it simple to switch between alignment tasks.

An IEEE 488.2 interface is provided giving full remote control of the instrument and allowing it to be incorporated into fully automated test & measurement or production alignment systems. LabVIEW and LabWindows CVI drivers are available for this instrument.

PRINCIPLE OF OPERATION

The DALi 2 works by continuously monitoring an optical feedback signal to correct for relative movements betwen the two components being aligned.

The first step is to acquire a signal above the operating threshold of the system. This is done by selecting "Search" from the front panel at which point the fibre is scanned in a raster pattern over the full range of travel of the piezo adjusters. This allows an area up to 100 μm x 100 μm to be searched for an optical signal. As soon as a signal is found, an indication appears on the screen of the instrument and the unit switches (either manually or automatically) into "Track" mode.

In Track mode the fibre is dithered in a small circle in the plane perpendicular to the optical axis in order to generate modulation in the detected signal. This modulation is interpreted and corrective signals are fed back to the corresponding piezo axes. This process is analogue and occurs virtually in real-time, with the whole process including the initial search taking a matter of seconds.

Once the fibre has been aligned successfully it continues to dither about the peak of the signal unless "Hold" is selected from the menu. On this command the fibre moves to the centre of the dither pattern onto the peak of the signal.

Two DALis can be operated with different dither signals to align input and output fibres to waveguides.

SPECIFICATIONS

Piezo Driver

Channels	*3*
Current	*60mA per channel*
Voltage	*0 - 150V*
Stability	*< 0.1%*
Output Noise	*< 100mV rms*
Display	*Piezo voltage, Detector current, function,dB power level*

Detector Input

Source	*Voltage or current*
Range	*Autoranging in 6 ranges,20nA to 2mA*
Thru	*0.1% accuracy, bandwidth 1KHz*
Bias	*-100V to +100V*

Automatic Alignment

Programmable Dither	*17nm - 25µm scan size, adjustable in XYZ*
Programmable Gain	*0-25 in steps of 0.1*
Programmable Frequency	*25Hz to 325Hz with Y & Z in quadrature, X independent*
Threshold	*0.5% full scale*

IEEE 488 Interface

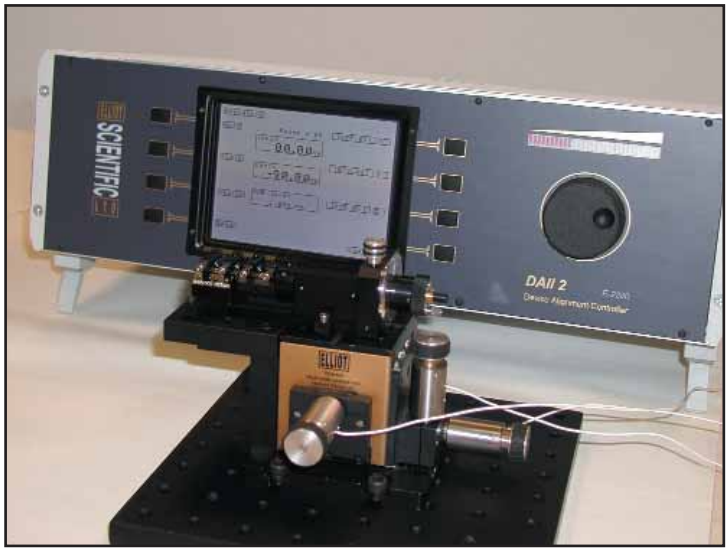
IEEE 488.2 interface with full access to all set-up, operation, and menu commands.

LabVIEW and LabWindows CVI drivers available

General

Operating Voltage 110V / 230V
CE approved

APPLICATIONS



Above: DAli2 with Elliot / Martock MDE 2350 Manipulator - Automatic alignment of polarisation-maintaining fibre and devices.

USE DAli for:

* *Fibre - Laser Diode Alignment*
* *Fibre - Lensed Element - Laser Diode Alignment*
* *Alignment of input and output fibres to Active or Passive Waveguide Devices.*
* *Fibre - Fibre coupling*
* *Ribbon Cable - Device alignment*
* *Compensation for epoxy drift during device pigtailing*
* *Compensation for thermal drift during long term device characterisation*
* *LED - Multimode fibre Alignment (using 100µm piezo adjusters)*

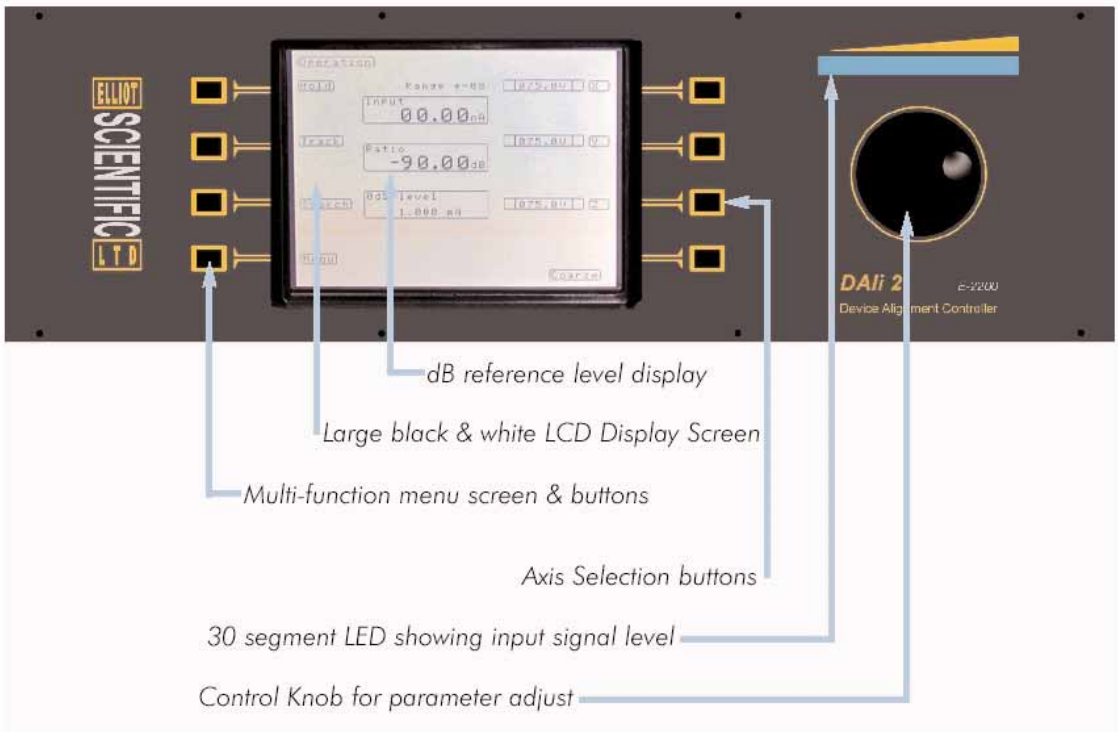
"APPLICATION NOTES" ARE AVAILABLE DESCRIBING HOW TO USE DALi WITH POSITIONERS FROM THE ELLIOT / MARTOCK GOLD SERIES TO SOLVE SPECIFIC PHOTONIC DEVICE ALIGNMENT PROBLEMS.

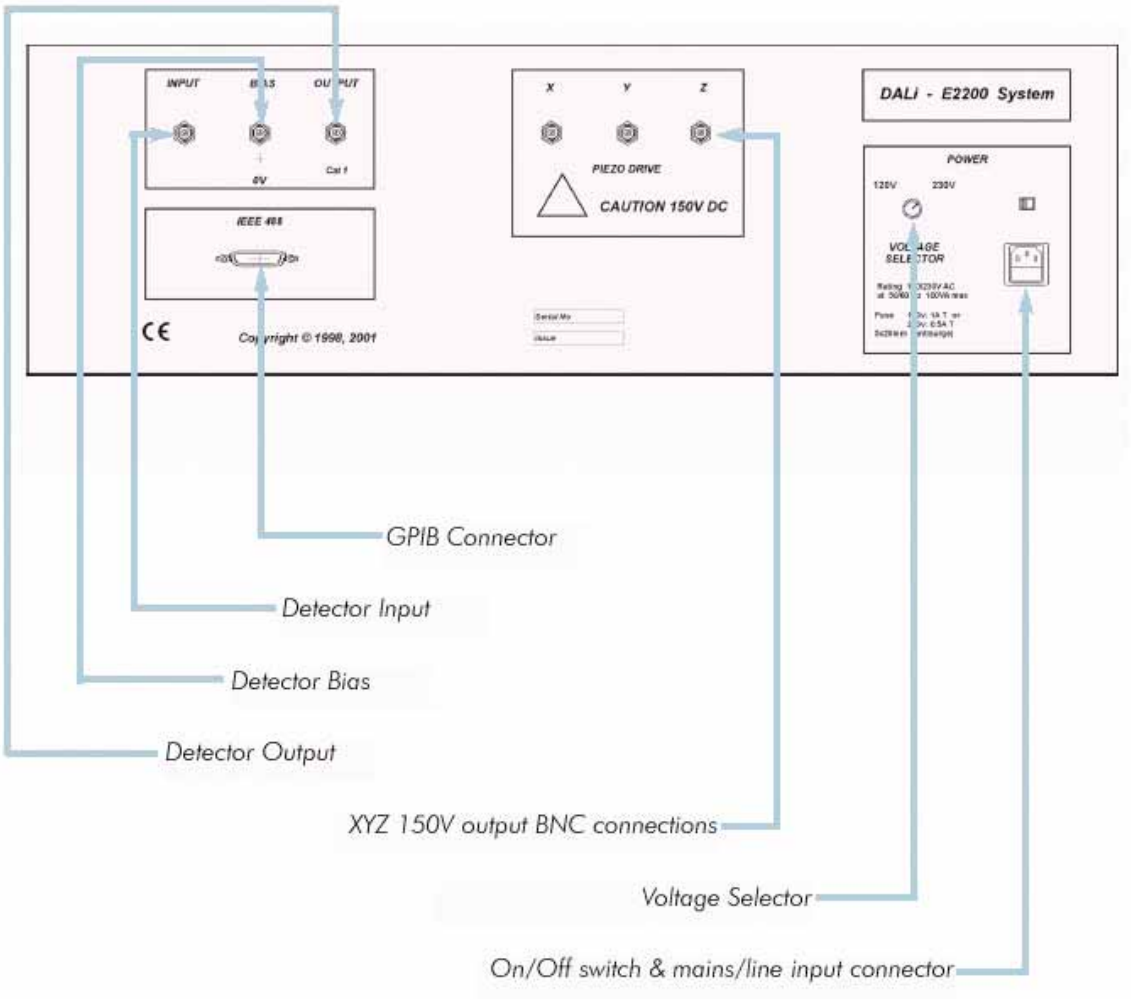
PLEASE CONTACT ELLIOT SCIENTIFIC FOR COPIES OF THESE

ORDERING INFORMATION

Model Number	Description
E - 2200	*Automatic alignment system with IEEE interface*
E - 2223	*As above plus MDE 123 piezo driven XYZ positioner from Elliot / Martock range.*
E - 2225	*As above plus MDE 125 piezo driven XYZ positioner from Elliot / Martock range.*

DALI 2: FRONT & BACK PANEL SCHEMATICS





ELLIOT Gold™ Series Professional

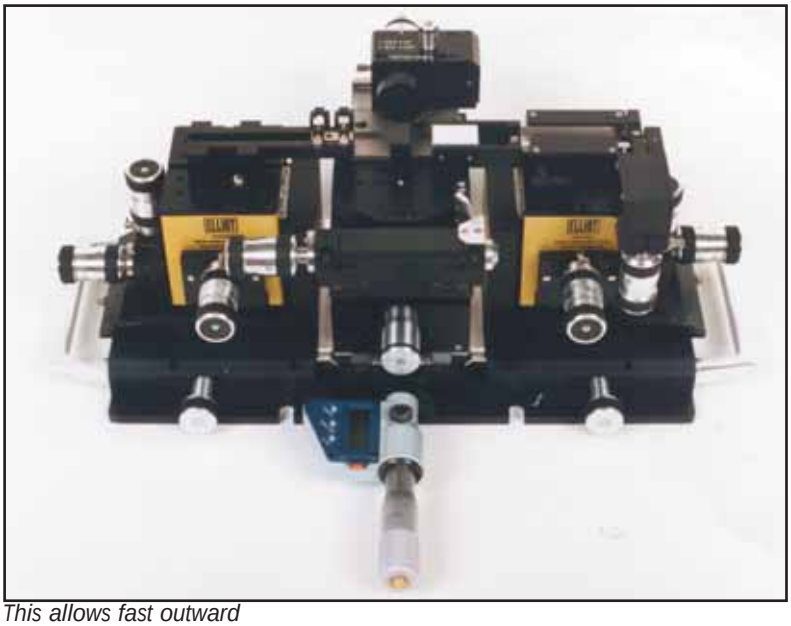
SETTING A NEW STANDARD IN DEVICE/WAVEGUIDE MANIPULATION

Alignment of single mode fibres to photonic devices has never been an easy task and the Elliot / Martock range was originally developed to facilitate this. With optical waveguide devices however, things get more difficult as it is necessary to align fibres (or fibre arrays) to the input and output of a device. ELLIOT Gold™ *Professional The Workstation MDE 881 has been designed specifically to address this sort of alignment and is suitable for use with a wide range of devices and fibre types in both characterisation and pigtailing applications.*

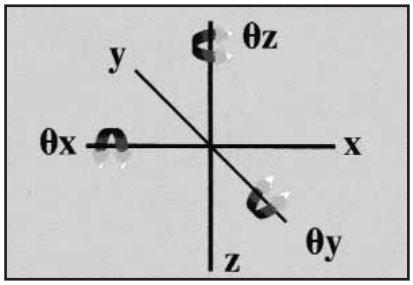
DEVICE / WAVEGUIDE MANIPULATOR

- *6 Axis manipulation*
- *No cross-talk*
- *All 6 axes are truly independent of each other*
- *Direct readout of waveguide position.*
- *Fast-track rack & pinion drive for easy access to central workstation.*
- *Portable & stable - no need for an optical table.*
- *Incorporates two* ELLIOT Gold™ *MDE 122 Flexure Stages with 20nm sensitivity.*

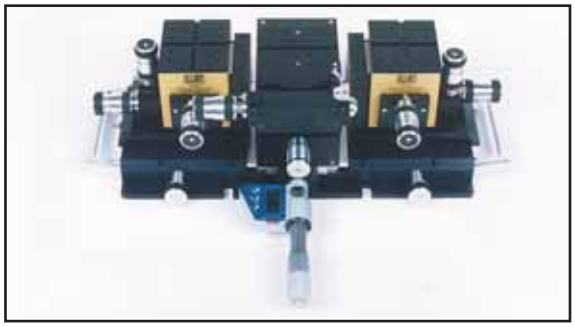
The MDE 881 waveguide manipulator has been designed with the end-user in mind. Incorporating our patented XYZ Flexure Stages and High Precision Adjusters, it offers convenient operator features such as 40mm travel rack & pinion drives on each flexure stage.



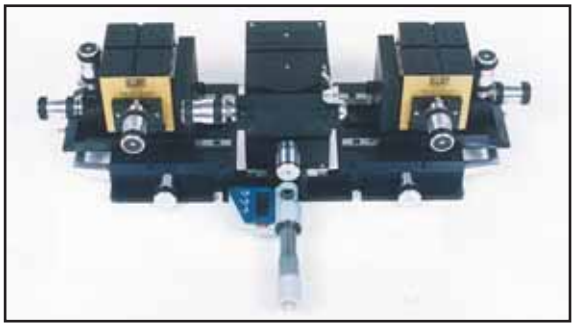
This allows fast outward movement of the XYZ stages holding the fibres in order to access the central stage. Adjustable end-stops are provided to prevent the fibres touching the waveguide facets and to accurately re-locate them. Digital readout of the Y travel is provided to allow the operator to read waveguide positions. Stepping the fibre across the substrate to locate individual waveguides becomes a simple task.



Independent axis control. No cross-talk



Fast Rack & Pinion drive for easy access. Left: Closed for Alignment

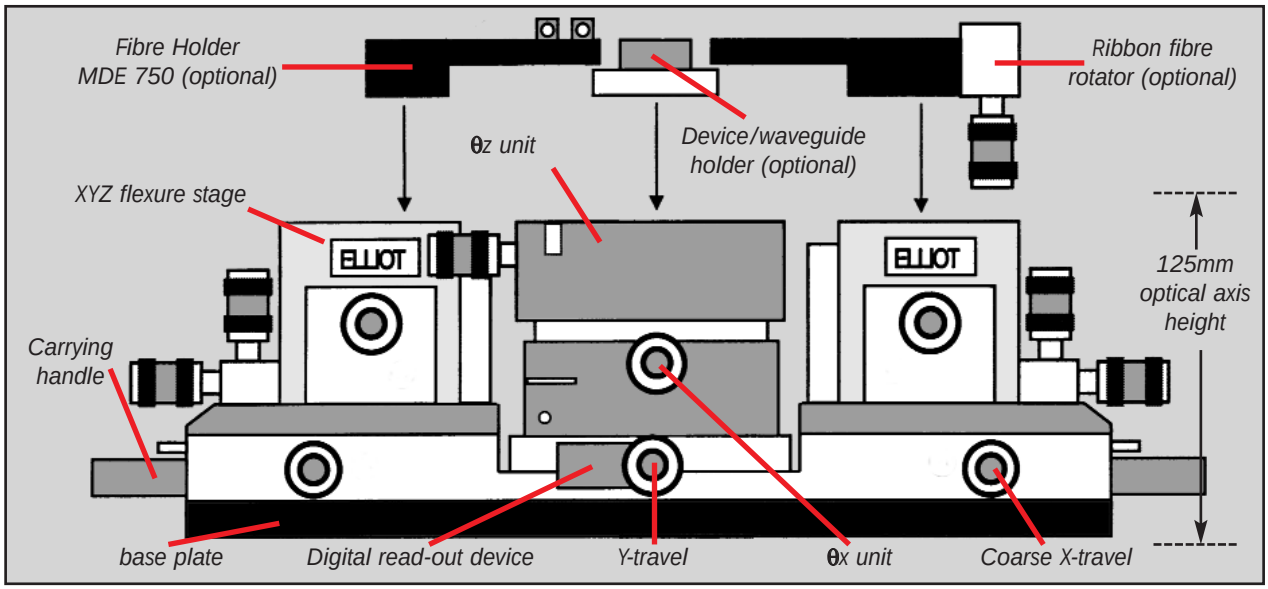


Right: Open for Loading

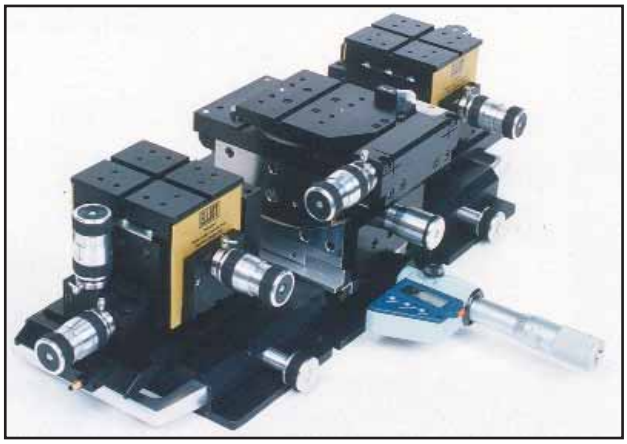
The ELLIOT Gold Series Professional Workstation MDE 881 comprises two XYZ flexure stages mounted on a base plate, with central platform for rotation, tilt and transverse motion. The XYZ Flexure stages can be fitted with single fibre or ribbon fibre holders, this latter type also having a rotation feature.

These can be moved out from the central station by a 40mm travel rack and pinion drive.
All other XYZ Flexure Stage top plate accessories, e.g MDE 717 fibre rotator are compatible.

The central module provides roll (θx)and pitch (θy) at a height of 125mm from the bottom of the base plate and these both coincide with the yaw (θz) axis at a height of 18mm above the middle of the top plate of the θz rotation unit. All six axes are truly independent of each other (no cross-talk). Rotation axes are defined by curved bearings hence rotation is always in a true arc.



Product	Description
MDE881	ELLIOT Gold Series Professional Workstation • Axis height 125mm • Incorporates two MDE 122 flexure stages with 20nm sensitivity in XYZ • 40mm coarse X travel • Central workstation with θx and θz of ±4° to 1 arc sec resolution, Y travel of 25mm with 50nm resolution and direct digital readout of position to 1µm, and Z-travel of 6mm with 2µm resolution.



CENTRAL WORKSTATION - DETAILED SPECIFICATION

Axis	Specification
θx & θz	± 4° rotation about the X and Z axes with 1 arc sec resolution
θy	± 1° rotation about Y axis adjustable by hex key supplied with MDE 881. Adjustment is useful for aligning to waveguides mounted on epoxy in packages where device is not necessarily sitting flat. Optional accessories MDE 890 and MDE 891 can be used to extend the rotation range - useful for holding components such as Fabry-Perot filters
Y - travel	25mm travel standard (50mm optional) with 50nm resolution and direct digital read-out of position to 1 µm.
Z - travel	6mm with 2µm resolution by means of hex key adjuster

DEVICE / WAVEGUIDE MANIPULATOR IN MODULAR FORMAT

For applications where the geometry of the standard MDE 881 is not suitable we offer the system in its key component parts, allowing custom set-ups to be configured on an optical table or breadboard. This approach means that the system can be purchased in parts as required.

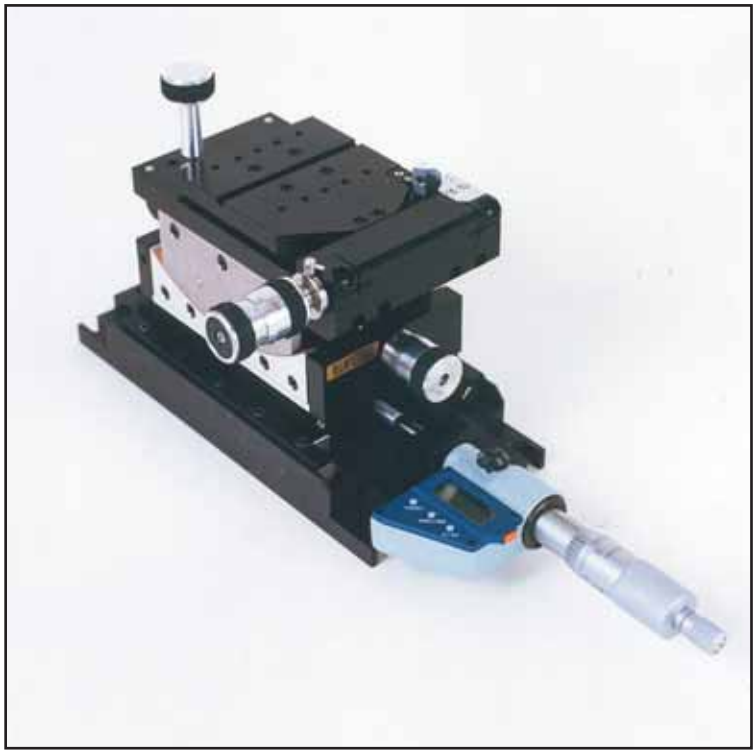
The optical axis height of mounted components on this version is also 125mm.

MDE 883 - CENTRAL WORKSTATION

- *Performance same as central platform on MDE 881*
- *Standard version has 25mm travel, 50mm also available.*
- *Mounts directly onto 25mm or 1" pitch optical table or breadboard.*
- *125mm optical axis height*

Application Note:

The MDE883 can be used in situations where the standard in-line configuration of the MDE 881 is not suitable. For example when the waveguide inputs are angled 90 degrees apart. Alternatively, building the system in kit form offers a more flexible system suitable for laboratory use on a wide range of applications.



MDE 889-60 RACK & PINION SLIDE

- *60 mm travel*
- *Lockable*
- *Bolts directly to optical table*
- *Adjustable end-stop defines position to < 1µm accuracy*
- *Large thumbwheel for faster adjustment*

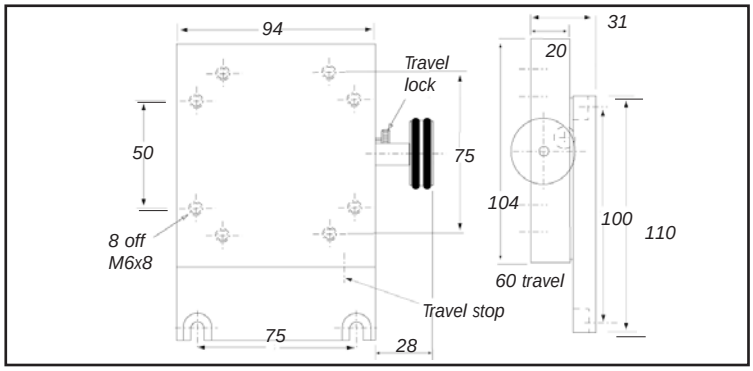
Application Note:

A system with the same functionality as the MDE 881 can be built up on a breadboard or optical table using:

2 x MDE 122

1 x MDE 883

2 x MDE 889-60

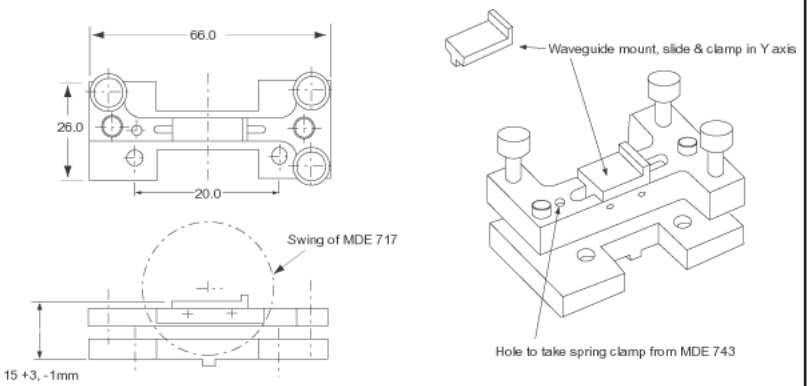


OPTIONS & ACCESSORIES - WAVEGUIDE HOLDERS

Product Code	Description
MDE 747	*Waveguide mount with kinematic adjustment of pitch and roll, plus height. Short length allows access with microscope objectives for endfire coupling.* *Adjustable location ridge allows substrate to be placed parallel along optical axis.*

MDE 747 WAVEGUIDE MOUNT

- *Waveguide mount slides & clamps in Y direction 12mm*
- *Optical axis height 15mm ± 3mm*
- *Angular travel ± 3 ^{o}*
- *Fits on flexure stages and MDE147, MDE 148, and MDE 149 brackets*
- *Mechanical clamp arm from MDE 743 may be fitted to stage.*

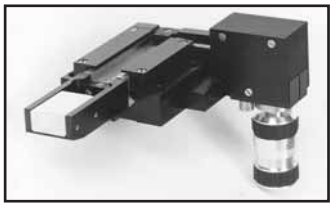
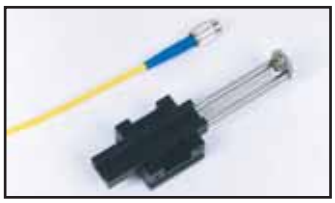


Product Code	Description
MDE 890	*θy device/waveguide holder with X-adjustment of bracket. Attaches to central platform of MDE 881 or any Elliot/Martock flexure stage. θy is 360° with ±1ª rotation to 1 arc sec resolution. Spindle assembly is adjustable along X-direction by 16mm.* *Customer or Elliot to machine mounting block supplied to suit requirements.*
MDE 891	*As MDE 890 with addition of X- and Z-adjustment. Has +8/-2mm Z-axis travel relative to spindle.* *Suitable for holding components such as Fabry-Perot filters during fibre attachment.*
MDE 741/xx *MDE 742/xx* *MDE743/xx*	*Basic waveguide/substrate mount. Fix with tape or glue. Standard lengths are /10, /14, /30mm.** *Vacuum waveguide mount available in /10, /14, /30mm lengths as standard. Vacuum hold-down groove cut to suit application.** *Waveguide mount with mechanical clamp arm and adjustable end-stop. Available in /10, /14, /30mm lengths.**

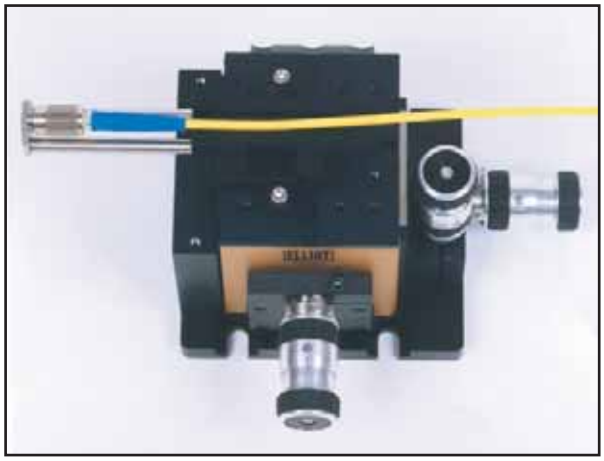
** Use MDE 744, 745 or 746 with MDE 717 or MDE 718*

OPTIONS & ACCESSORIES

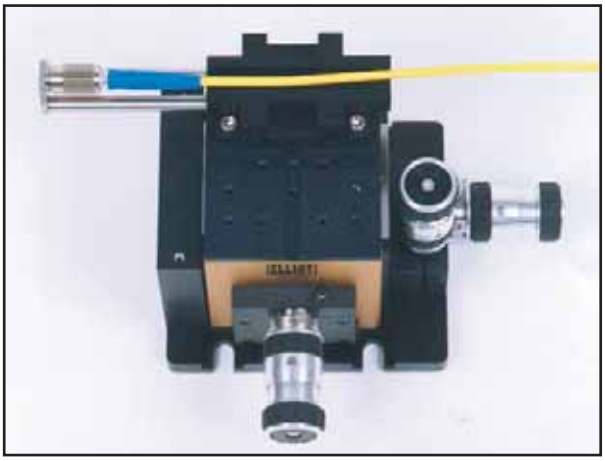
All Clampable Accessories are supplied with the MDE 154 Clamp Set

Product Code	Description
MDE 884RH *MDE 884LH*	*θx ribbon cable / crystal manipulator (long reach). Rotates exactly on x-axis, maintains 18mm centre height. Right and Left handed versions available. Can also be supplied with θy and θz adjustments. Front block is machined by Elliot or Customer to locate silicon vee groove block on the fibre ribbon.* *RH version shown* 
MDE 750	*Long reach fibre holder for bare fibre. Fibre held in user-replaceable vee-groove by spring clamps (as on MDE 710). New Universal Base MDE 752 allows fibres to be located offset from central axis.* 
MDE 751	*FC/PC connectorised version of MDE 750. Holds standard patchcords.* *Other connector types available on request* 
MDE 752	*Universal base for holding components on top of flexure stages. Compatible with MDE 754 Sumitomo SS4 ribbon holder. New design locates in either of the two orthogonal slots on flexure stage top plate for offset component mounting.* 
MDE 753	*Long Reach Microscope Objective Holder. Unit fits onto MDE 752 as shown allowing objective to be placed in positions offset to the optical axis. Internal RMS thread for easy mounting of objectives. Recommended for DWDM component inspection* 

OFFSET MOUNTING OF COMPONENTS USING MDE 752



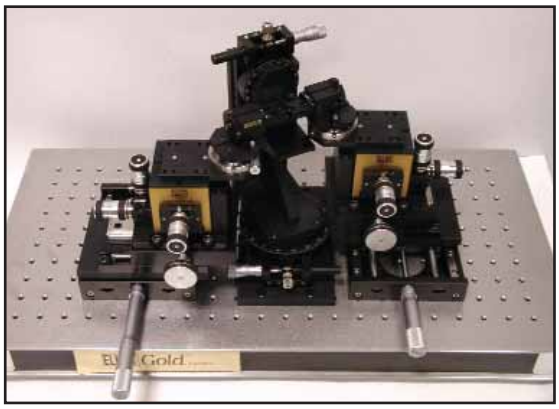
Standard mounting of fibre on Optical Axis



Offset mounting using orthogonal top plate for alignment to DWDM components

ALIGNMENT SYSTEMS

MDE 22885 SOA ALIGNMENT SYSTEM



The MDE 22885 is a specialised system for the alignment of SOAs and other similar dual ended devices with angled facets.

The system is comprised of two 5 axis stages with ELLIOT Gold™ Series flexure stages, long travel units, and two axis fibre rotation mounts.

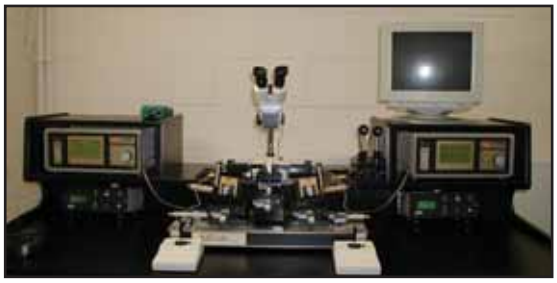
The central unit is a 2 axis rotation device mount, configured for mounting of passive or active single channel or multi channel planar devices.

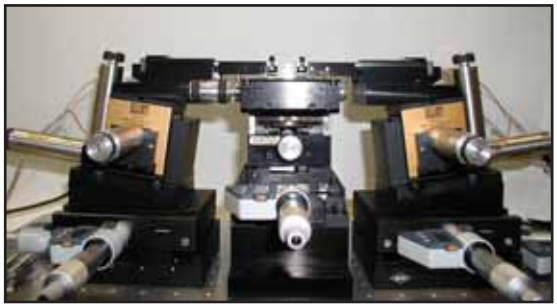
The linear axes of the flexure stages can be automated with a DALi alignment controller and piezo adjusters

Automated alignment is of particular benefit when working with lensed fibres.

- *Slotted design for easy insertion and removal of fibre*
- *Full 360° rotation on all rotational axes.*
- *Piezo drives available for linear axes*
- *Can be configured for variable facet angle.*
- *Fibre held in V-groove clamps.*
- *Standard V-groove for 125/250 µm fitted. Custom sizes available.*

E 22883 E-WEDGE™ V-GROOVE ALIGNMENT SYSTEM





The E-Wedge™ is designed to provide automatic alignment for multi channel optical devices and fibre v-groove arrays.

The E-Wedge system includes automatic roll axis optimisation and compensation for angled device facets. The E-Wedge can be configured as a dual-ended automatic waveguide/device alignment workstation providing simultaneous alignment of input and output fibre arrays.

The system can be customised to provide the number of axes needed for any particular devices. Holding fixtures are available for the full range of devices, fibres and v-groove arrays. Custom fixtures can also be provided.

Automatic alignment is provided by two DALi controllers, designed to speed up and automate alignment in a wide range of applications such as laser diode to single-mode fibre, or input and output pigtailing to waveguide devices, couplers, splitters and WDMs.

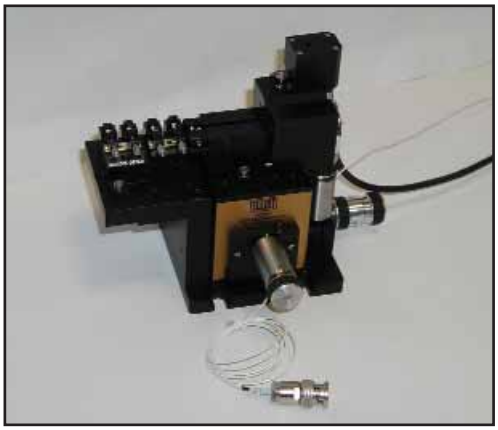
The E-2200 comprises a sophisticated 3-axis piezo actuator controller suitable for the piezo-driven versions of our flexure stages, and works by locating and optimising an optical signal fed back from any suitable detector.

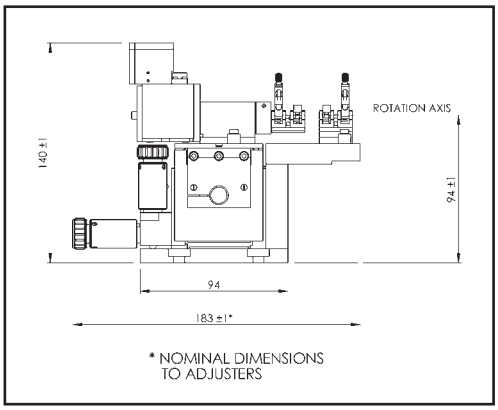
The user interface features a convenient menu-driven system with full control over the scan parameters. An IEEE-488.2 interface with LabView and LabWindows CVI drivers are provided for full remote control of the instrument, allowing it to be incorporated into automated test and measurement rigs or production alignment systems.

Resolution
10nm in XY and Z axes (25 micron piezo drive)
50nm in XY and Z axes (100 micron piezo drive)
<0.1 arc secs rotation

ALIGNMENT SYSTEMS

MDE 2350 PM FIBRE ALIGNMENT SYSTEM



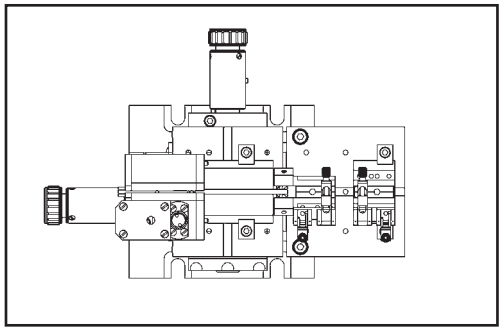


The MDE 2350 comprises an MDE 235 motorised fibre rotator mounted on an ELLIOT Gold™ Series 3 axis piezo driven flexure stage.

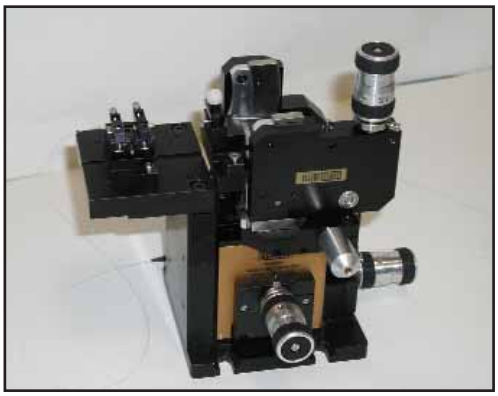
A DALi automatic alignment system is used to maintain alignment while the fibre is rotated.

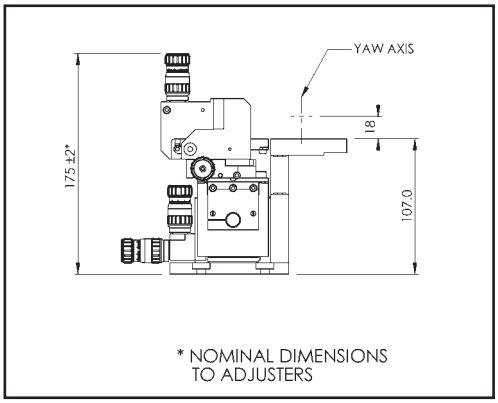
Designed for the alignment of angular sensitive components it is particularly effective for the alignment of polarisation maintaining fibre and components.

- *Slotted design for easy insertion and removal of fibre.*
- *Full 360° rotation.*
- *Integral stepper motor drive.*
- *Resolution <0.01° single step.*
- *Maximum speed 18°/s (20 s for 360°)*
- *Fibre held in variable force V-groove clamps.*
- *Standard V-groove for 125/250 µm fitted. Custom sizes available.*
- *V-block pre-set on axis with less than 1µm concentricity error.*
- *Stepper drive controllers available with Labview drivers for auto rotation alignment*



MDE 9183 FIBRE COLLIMATOR ALIGNMENT SYSTEM

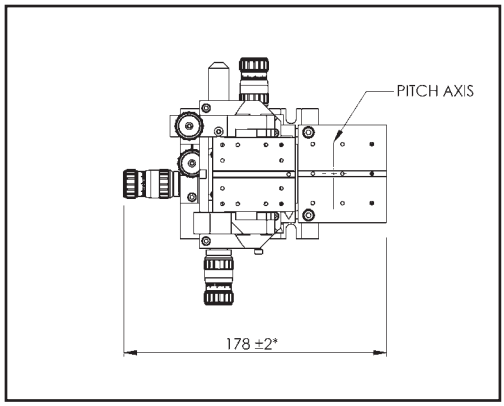




The MDE 9183 is configured for the alignment of fibre collimators.

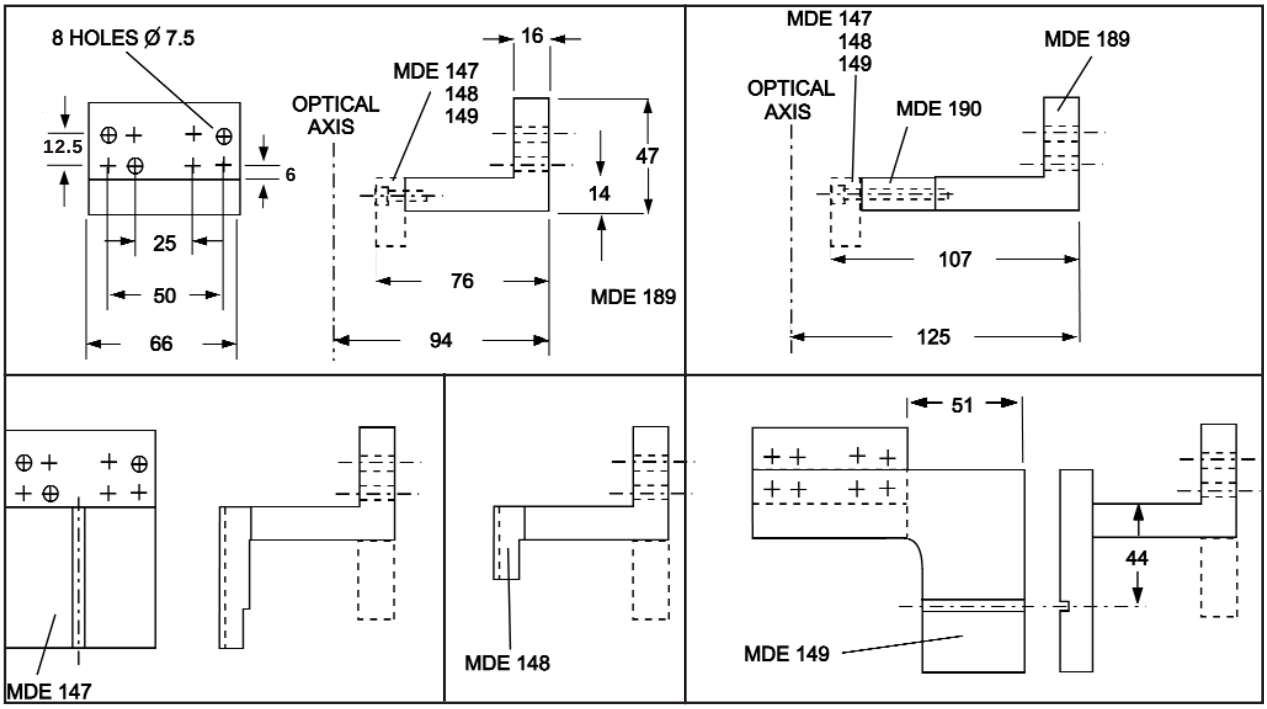
It utilises the accurate MDE 185 two axis pitch and yaw stage and ELLIOT Gold™ Series flexure stages giving accurate 5 axis control.

- *Precision bearings give pure rotation, no crosstalk*
- *+/- 5° pitch, +/- 3° yaw*
- *Manual or stepper motor adjustment*
- *Resolution <0.1 arc secs manual.*
- *MDE 231 stepper actuator gives <1 arc secs resolution*
- *125mm optical axis height*
- *Standard tooling for collimators and ferrules*
- *Stepper drive controllers available with Labview drivers for auto rotation alignment.*



FIXED MOUNTING BRACKETS

When used with the MDE 147,148, and 149 top plates the MDE 189 bracket provides a simple fixed platform for mounting the standard device and fibre holders. Bolted directly to an optical breadboard, the MDE 189 gives an optical axis height of 94mm (compatible with the flexure stages.) Add Riser Block MDE 190 to raise the axis to 125mm for use with combinations of stages at 125mm. MDE 190 is also used when building up 5 or 6 axis fibre launch configurations.



A SERIES OF "APPLICATIONS NOTES" ARE AVAILABLE DESCRIBING HOW TO USE A PARTICULAR SET OF POSITIONERS FOR A SPECIFIC APPLICATION - PLEASE CALL FOR DETAILS

XY LENS POSITIONERS

A range of economical, post mountable lens holders with X and Y adjustment for lens centring applications and general laboratory use.

MDE 872 50mm LENS MOUNT

- *Mounts 2" or 50mm lens*
- *Travel in X & Y +/- 2.5mm*
- *Insert clamping of optic*
- *2.035" - 40 thread on rear for mounting Thorlabs lens tubes.*

MDE 870 25mm LENS MOUNT

MDE 871 12.5mm LENS MOUNT

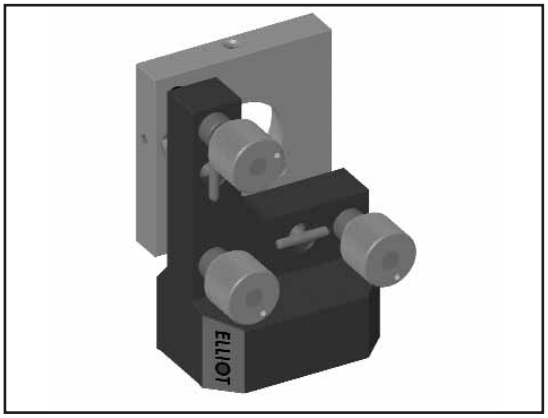
- *Mounts 1" or 25mm lens (MDE870)*
- *Mounts 0.5" or 12.5mm lens (MDE871)*
- *Travel in X & Y +/- 2.5mm*
- *Insert clamping of optic*

CUSTOM & OEM SYSTEMS

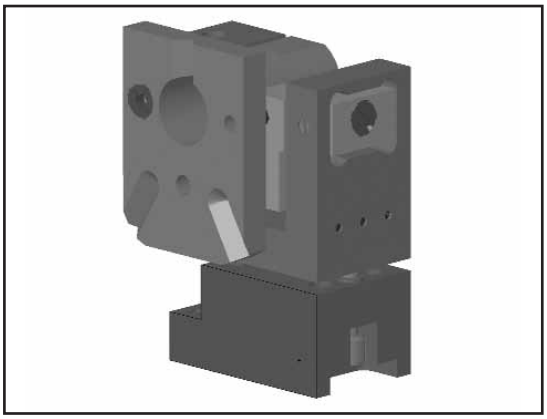
Our in-house design and flexible manufacturing gives us the capability to design custom one-off and volume OEM micropositioning systems. Using the latest 3D design software we can provide solutions for the most demanding positioning tasks. Here are some examples of custom and OEM systems we have recently developed for clients.

Ultra-compact multi-axis stages can be designed to fit in the most challenging size constraints. This unit is part of an X-ray Monochromator and has 2 rotation and 1 linear axes in a volume no larger than 20 x 21 x 55mm.

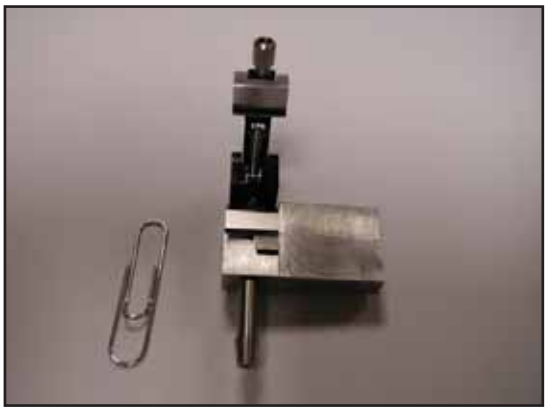
Multi-axis miniature manipulator providing 2 rotation and 2 limear axes. This unit is assembled from standard Elliot Martock components with custom interfaces and adaptors.



Kinematic mirror mounts using the highest quality adjusters give smooth and accurate adjustment needed for custom laser and optical set-ups.



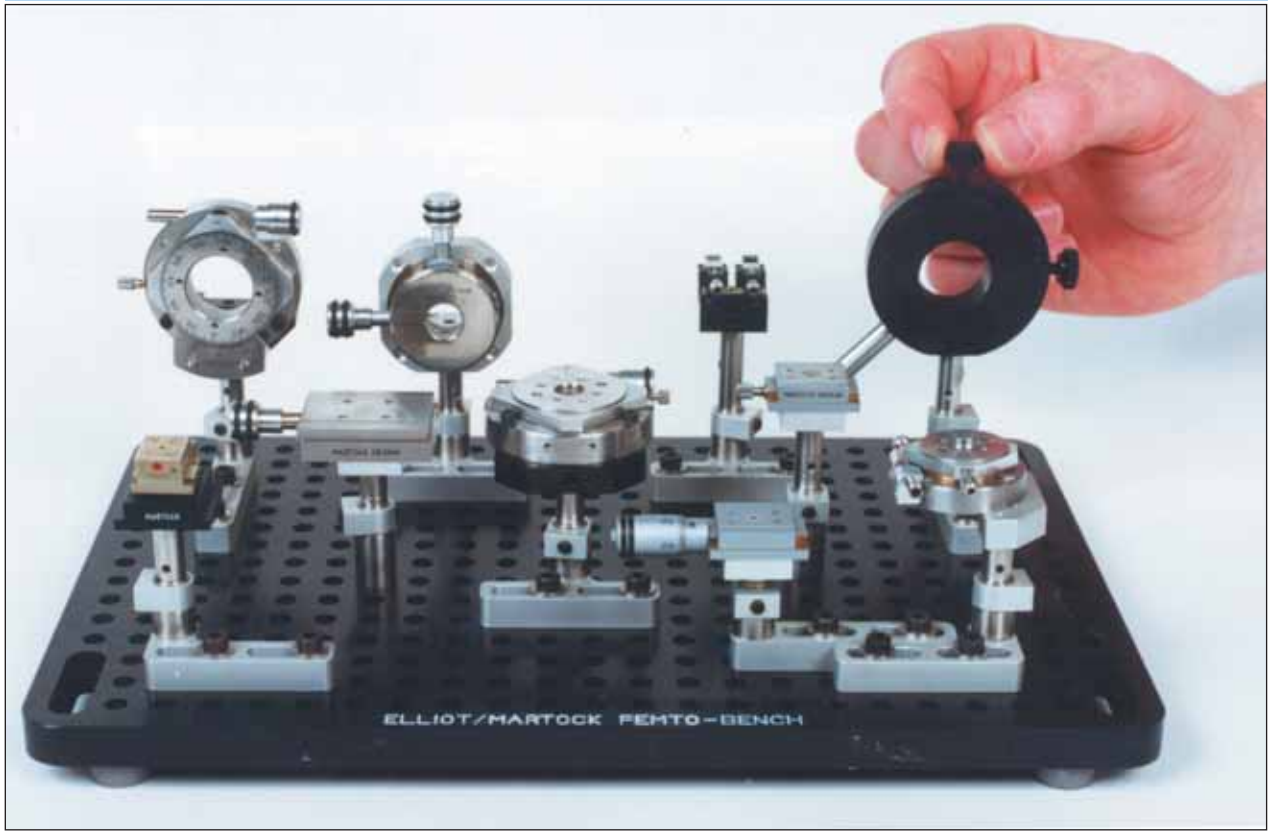
OEM design of multi-axis mount with 3 linear axes. Such stages are available in non-magnetic and vacuum compatible materials.



Tooling can be designed with either mechanical clamp or vacuum for a full range of V-groove arrays.

Vacuum waveguide holders can be mnufactured for any size of device. This shows a unit for holding a 5 x 8mm device.

FEMTO-BENCH™



The increased usage of diode lasers, diode-pumped devices, OPS's and integrated optics demands the usage of a smaller mounting area, FEMTO BENCH™ is the answer.

- *Stand alone experiments*
- *Mount components on 12.5mm matrix*
- *Mount complex optical systems in small areas*
- *Transport your experiment*
- *Compatible with M4 and M6 accessories*

FEMTO BENCH™ is ideal for those applications which require a high density of components in a small area. Whether you need a dense packing of components on top of an existing optical table or a stand alone optical system to be carried from room to room or locked away, FEMTO BENCH™ is the solution.

Many companies can offer a breadboard with a 12.5mm matrix of mounting holes. However Elliot Martock offers a complete range of miniature posts, post holders and bases which integrate with our range of very small micropositioners allowing you to set up truly miniature experiments. Unique 'precision recess location' allows accurate location of pillars or bases to high tolerance without screwing down in order to lay out the FEMTO BENCH™ quickly. Once happy with the layout then the component can be screwed down.

- *M4 holes on 12.5mm matrix*
- *Integrate Elliot Martock or other components*
- *Precision recess location*
- *Bases move along accurately defined axes*
- *Stack FEMTO BENCH™ vertically or horizontally*
- *Can be mounted directly on optical table*
- *Unique close proximity location*
- *Supplied with detachable resilient feet*

COMPONENT COMPATIBILITY

All our posts use M4 studs so any existing components with M4 tapped holes can be mounted. You can even mount 25mm pitch/M6 bases and post bases with our M6 locating bush and a M4 screw. This allows you to mix-and-match M4 and M6 accessories on FEMTO BENCH™ and it can be mounted on an imperial or metric optical table.

ORDERING INFORMATION

Product	Size	Material
FEMTO BENCH™ MDE 802	*20 x 15 x 1.2cm*	*Black anodised stress-relieved Aluminium alloy, 12.5mm matrix M4 holes*
FEMTO BENCH™ MDE 804	*20 x 30 x 1.2cm*	
FEMTO BENCH™ MDE 805	*30 x 30 x 2.0cm*	

FEMTO-BENCH™

POST HOLDER, STRAIGHT BASE:

Locating bushes fit the recesses in the FEMTO BENCH™ and the slots in the base, so the Post Holder can be moved along an accurately defined axis before clamping. The post clamp can be orientated through 360 degrees for convenience. Supplied with locating bushes and screws.

MDE 835 H = 25mm

POST HOLDERS "L" BASE AND "T" BASE:

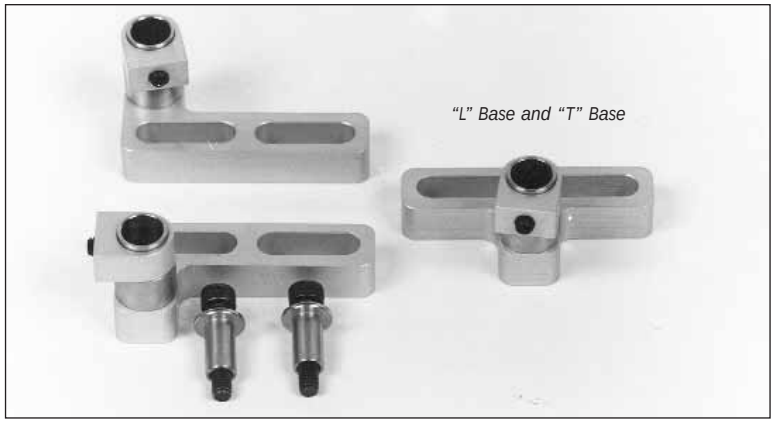
As MDE835 with the added feature that they can be positioned in close proximity to each other and to Fixed Post Holders, whilst retaining an accurately defined axis. Supplied with locating bushes and screws.

MDE 823 "L" Base RH
MDE 829 "L" Base LH
MDE 817 "T" Base

POST HOLDER, FIXED:

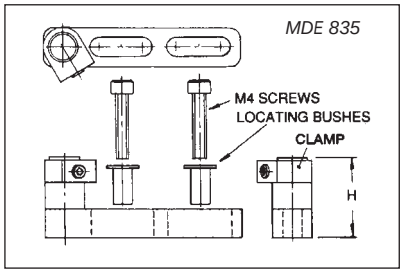
Locates directly into the recesses of the FEMTO BENCH™ giving a very rigid and accurate mounting. Clamp as for other Post Holders. Supplied with top clamp feature and M4 screw.

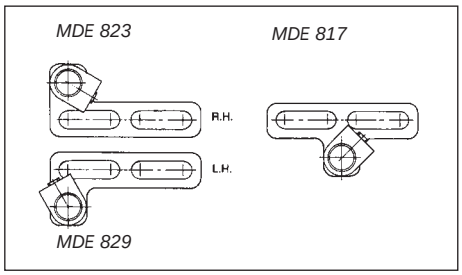
MDE 811 H = 25mm

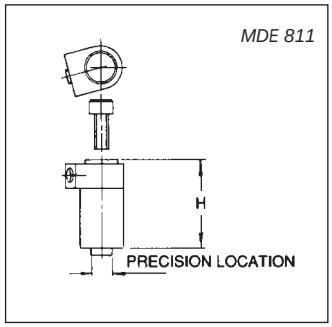


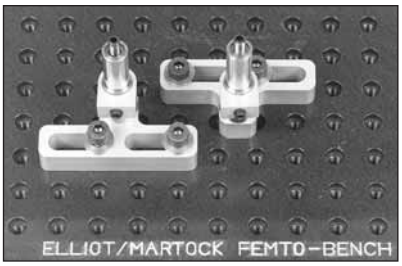
"L" Base and "T" Base

Post Holder, Fixed

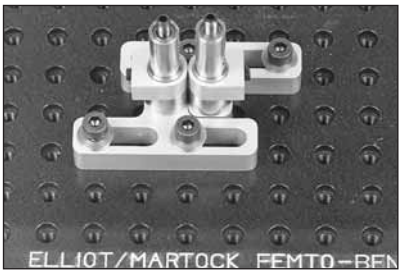








Bases move along accurately defined axes.



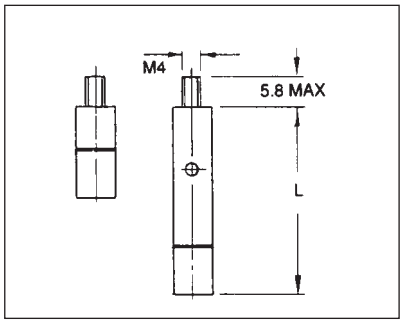
FEMTO-BENCH™

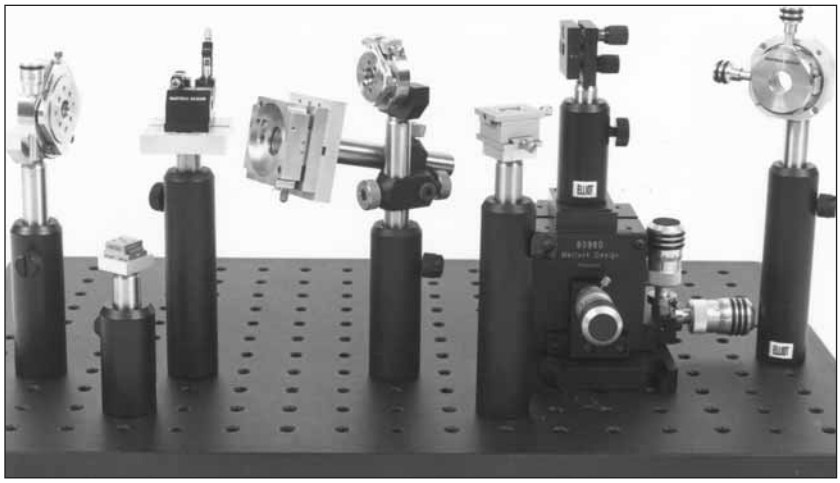
POSTS: STAINLESS STEEL

Tightened onto equipment by hex key via axial hole or by using the key as a tommy bar in the cross hole. Max recommended protrusion from post holder is indicated by a groove.

MDE 841 L=19mm

MDE 843 L=39mm



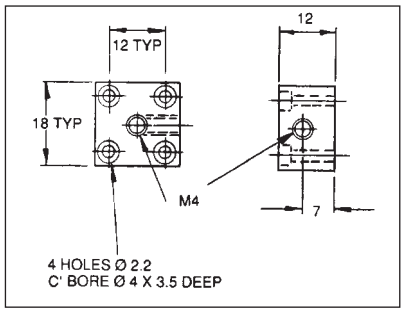


800 SERIES ADAPTERS

- *Post Mount Elliot Martock positioners onto FEMTO BENCH™*
- *Post Mount Elliot Martock positioners to any M4 stud post.*

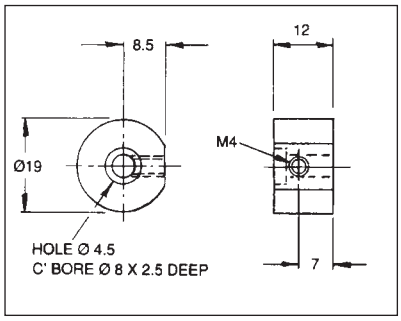
MDE 856 ADAPTER

Fits MDE 255 – 259 Series slides. Mount slide vertical or horizontal on post.



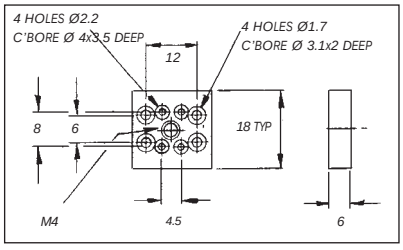
MDE 858 ADAPTER

Used in conjunction with MDE 857 to allow vertical or rotational mounting of MDE 260 and MDE 265 series slides.



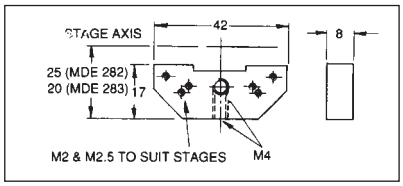
MDE 857 ADAPTER

Fits MDE 260 & MDE 265 Series slides. Mount slide horizontal on post.



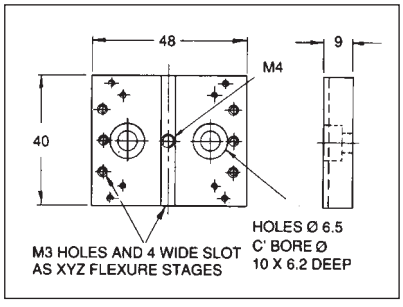
MDE 859 ADAPTER

Fits MDE 282 & MDE 283 Rotation Stages.Mount Rotation stages in vertical or horizontal plane.



MDE 860 ADAPTER

Fits MDE 270 Tilt Stage, MDE 253 Adaptor Plate and all XYZ Flexure Stage accessories. Can be attached to conventional 25mm pitch tables using M6 screws.



VERY SMALL MICROPOSITIONERS

MDE 250 SERIES

- *For use where space is limited*
- *Very smooth backlash-free motion*
- *Wide range of configurations adaptors and accessories*

MDE 250-S AND 251 XY CENTRING MICROPOSITIONERS

- *Travel in X and Y ±1mm*
- *Standard 11mm bore suits small laser diodes*
- *Fibre Centring using Fibre Holder MDE 722*
- *Optional 15 mm diameter bore available. Suits some laser diodes*
- *Largely stainless steel construction*
- *Choice of mounting methods (see below)*

MDE 251 PRECISION XY MICROPOSITIONER

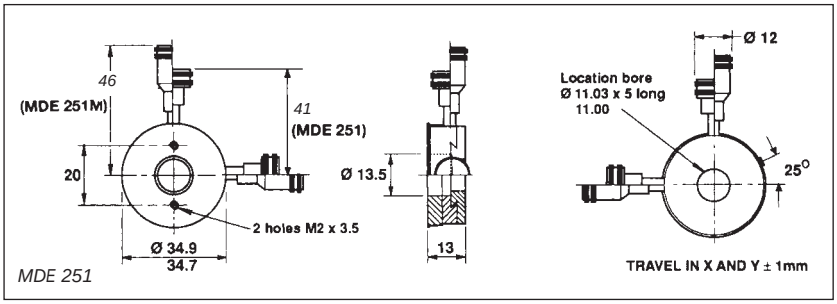
- *Two independent dovetail slides*
- *No interaction between X and Y adjustments*
- *Fine thread 0.25mm pitch adjusters*
- *Sensitivity <0.5 µm*
- *Micrometer version MDE 251M*
- *Large bore (15mm) version MDE 251–15*

MDE 250-S CENTRING MOUNT

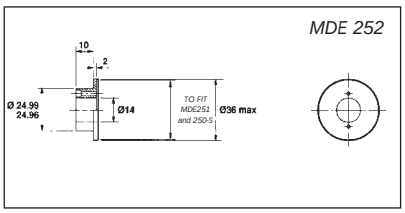
- *Simple centring screw design*
- *Sensitivity in X and Y <2µm*
- *All significant dimensions as MDE 251*
- *Large bore (15mm) version MDE 250-S-15*

MDE 250S

MDE 251



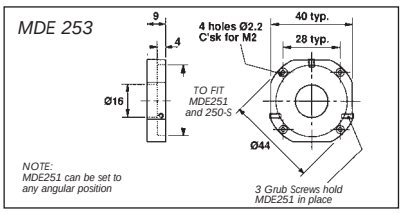
MDE 251



Use MDE 252 for spigot mounting or to fit into Spindler and Hoyer Microbench.

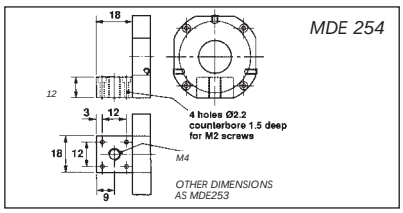
Use MDE 253 or 254 for plate or angle plate mounting.

Use MDE 254 for M4 post mounting.



Use MDE 270 to add tilting movements. (see MDE 276 P.30)

Use MDE 257 if Z movement is needed.(see P.28)



Use MDE 277 if Z movement and tilting are needed. (see P.30)

Use MDE 722 to hold optical fibres. (see P.7)

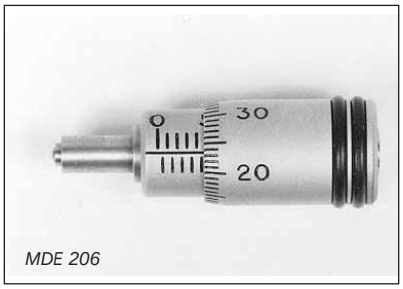
Note: Surfaces mating with these micropositioners must be truly flat. Unflat surfaces or overtightened screws will cause the slide motion to be jerky and stiff due to distortion. Dovetail slides, unlike miniature ball slides, are unlikely to be permanently damaged by temporary distortion, as the load is supported on a comparatively large area.

MICROMETERS

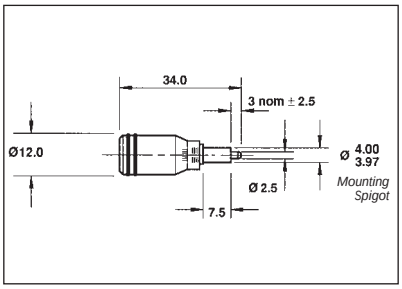
MDE 206 AND MDE 219

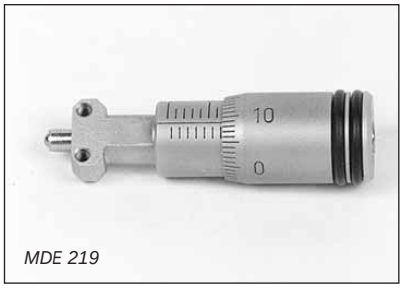
- *Very compact*
- *Designed particularly for micropositioning applications*
- *Stainless steel screw with hard steel ball on spindle tip*
- *Very smooth motion allows positioning to 0.5µm*
- *0.01mm graduations, 0.5mm per revolution*
- *Rubber rings give a sensitive but precise grip*

Range: *MDE 206* *0-5mm*
MDE 219 *0-10mm*

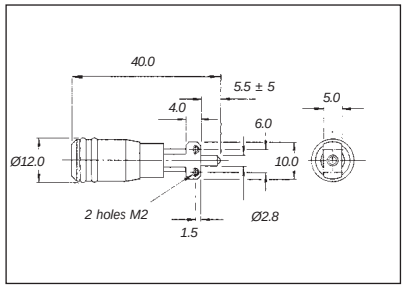


MDE 206





MDE 219

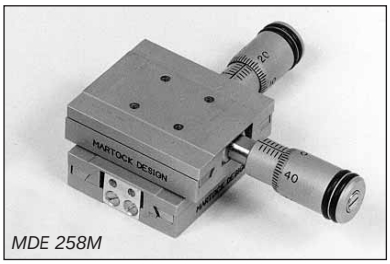


VERY SMALL MICROPOSITIONERS

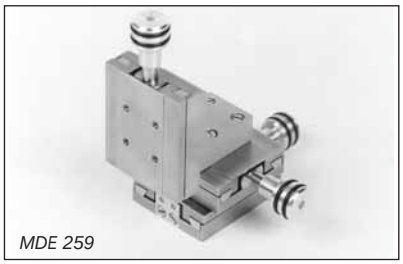
MDE 255 SERIES

- *Based on a small dovetail slide*
- *Very smooth movement produced by lapping*
- *Travel 10mm, Sensitivity <0.5µm with adjusters*
- *Wide range of configurations*
- *M4 post mounting option, using MD E856*
- *Rotation option using MDE 282*
- *Table mounting option using MDE 292*
- *0.25 pitch adjusters or micrometers reading to 0.01mm*
- *Fibre holder available MDE 723*
- *Lockable version*
- *Main parts stainless steel*
- *Non-magnetic options*

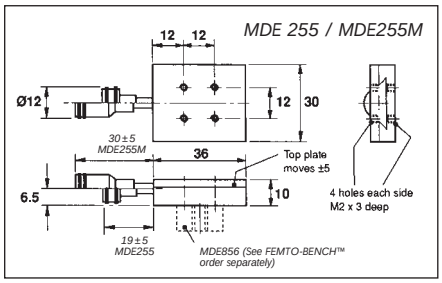
MDE 255

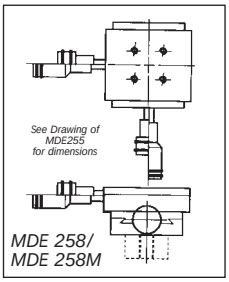


MDE 258M

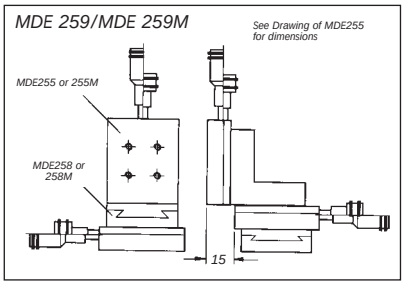


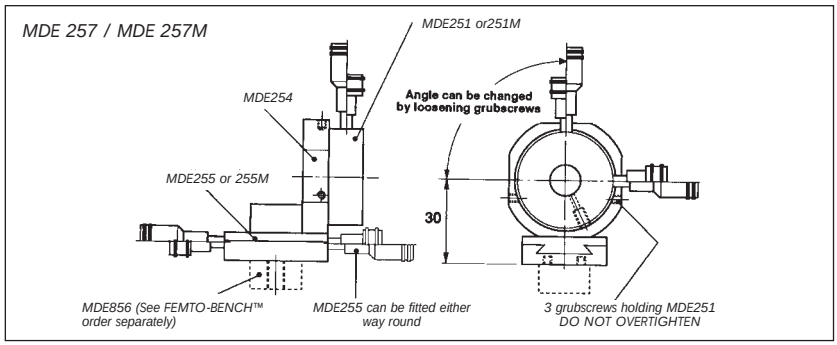
MDE 259





MDE 258/
MDE 258M



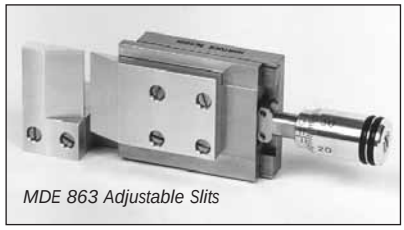


MDE 257

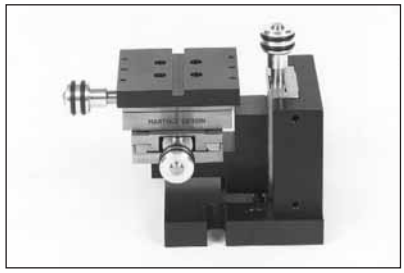
ORDERING INFORMATION

Product	Specification
MDE 255	*Single axis micropositioner*
MDE 255M	*Single axis micropositioner with micrometer*
MDE 255-XZ	*XZ micropositioner (2 off MDE 255 and bracket)*
MDE 255M-XZ	*XZ micropositioner (2 off MDE 255M and bracket)*
MDE 255-YZ	*YZ micropositioner (2 off MDE 255 and bracket)*
MDE 255M-YZ	*YZ micropositioner (2 off MDE 255M and bracket)*
MDE 856	*Adaptor Block (adapts MDE 255 series to M4 mounting posts)*
MDE 257	*XYZ Micropositioner (MDE 255, MDE 251, MDE 254)*
MDE 257M	*XYZ Micropositioner (MDE 255M, MDE 251M, MDE254)*
MDE 258	*XY Micropositioner (2 off MDE 255)*
MDE 258M	*XY Micropositioner (2 off MDE 255M)*
MDE 259	*XYZ Micropositioner(MDE 258, MDE 255 and bracket)*
MDE 259M	*XYZ Micropositioner (MDE 258M, MDE 255M and bracket)*
	Note: MDE xxxM denotes micropositioner with micrometers.

Note: Surface mating with these micropositioners must be truly flat. Unflat surfaces or overtightened screws will cause the slide motion to be jerky and stiff due to distortion. Dovetail slides, unlike miniature ball slides, are unlikely to be permanently damaged by temporary distortion, as the load is supported on a comparatively large area.



MDE 863 Adjustable Slits



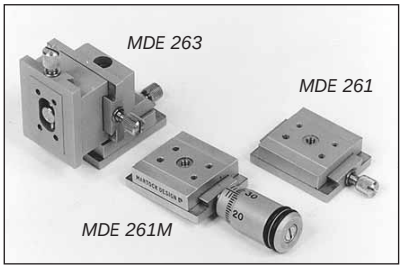
MDE 850 fitted with MDE 851 accessory platform

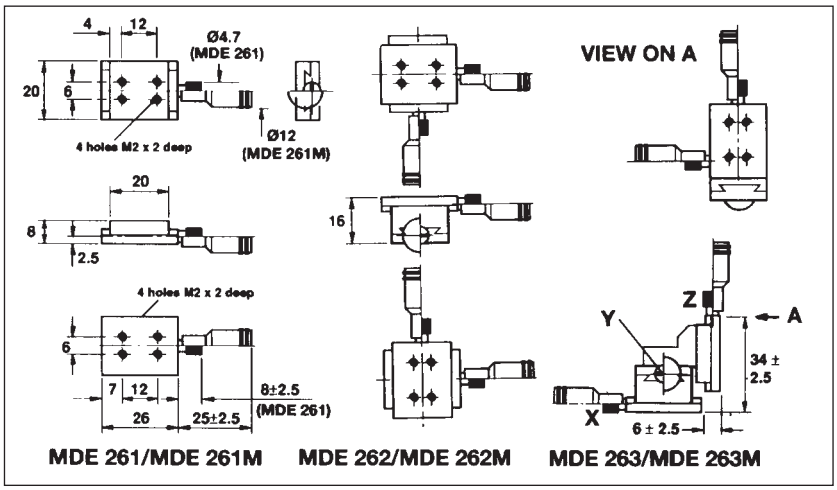
PLEASE CONTACT US FOR MORE INFORMATION ON ALTERNATIVE ARRANGEMENTS MDE 850/851 OR ON ADJUSTABLE SLITS MDE 863

ULTRA-SMALL MICROPOSITIONERS

MDE 260 SERIES

- *Based on ultra-small dovetail slides*
- *Very smooth movement produced by lapping*
- *Travel 5mm, Sensitivity <0.5µm with adjusters*
- *Adjuster knob slotted for remote adjustment with screwdriver*
- *Wide range of configurations*
- *0.25 pitch adjusters or micrometers reading to 0.01mm*
- *Rotation option using MDE 283*
- *Table mounting option using MDE 293*
- *Tilting option using MDE 270 and MDE 273*
- *Post mounting using MDE 857 (and MDE 858 if required)*
- *Fibre holder available: MDE 723*
- *Lockable version*



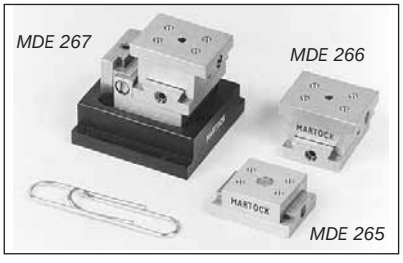


ORDERING INFORMATION

Product	Specification
MDE 261	*Single axis micropositioner*
MDE 261M	*Single axis micropositioner with micrometer*
MDE 261-XZ	*XZ Micropositioner (2 off MDE 261 and bracket)*
MDE 261M-XZ	*XZ Micropositioner (2 off MDE 261M and bracket)*
MDE 261-YZ	*YZ Micropositioner (2 off MDE 261 and bracket)*
MDE 261M-YZ	*YZ Micropositioner (2 off MDE 261M and bracket)*
MDE 262	*XY Micropositioners (2 axis micropositioner)*
MDE 262M	*XY Micropositioner (2 axis micropositioner with micrometers)*
MDE 263	*XYZ Micropositioner (MDE 262, MDE 261 and bracket)*
MDE 263M	*XYZ Micropositioner(MDE262M, MDE261M and bracket)*
	Note: MDE xxxM denotes micropositioner with micrometers

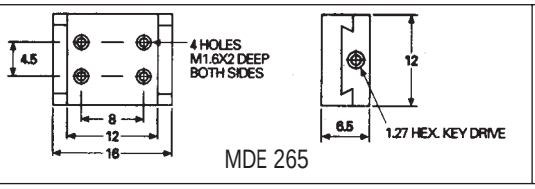
MDE 265 SERIES

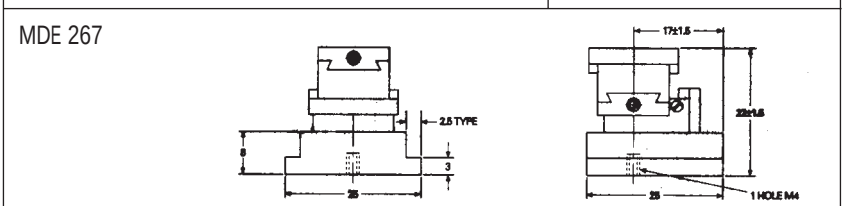
- *Based on very small dovetail slides*
- *Some of the smallest micropositioners available anywhere*
- *Very smooth movement produced by lapped slides*
- *Travel 3mm, Sensitivity <0.5µm*
- *0.25 pitch adjusters with 1.27mm hex. socket*
- *Ball hex. driver supplied*
- *MDE 267 version can be M4 post mounted. For others use MDE 857 plus MDE 858 for side mounting*
- *Fibre holders available:- MDE 719 and MDE 730*
- *Knurled knob adjuster option*



ORDERING INFORMATION

Product	Specification
MDE 265	*Single axis micropositioner*
MDE 266	*XY micropositioner*
MDE 267	*XYZ micropositioner on base with M4 hole*
MDE 268	*XZ micropositioner*
MDE 269	*XYZ micropositioner*





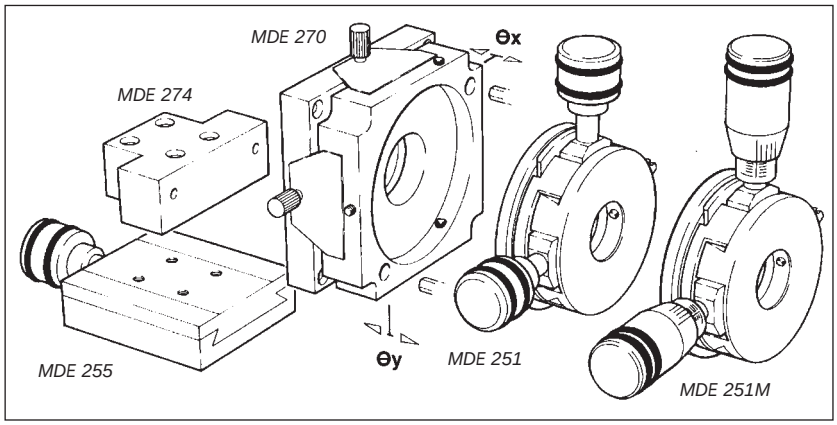
TILT STAGES

MDE 270 SERIES

A high precision tilting stage provides angular adjustment to a range of Elliot Martock linear micropositioners and to Rotation Stage MDE283.

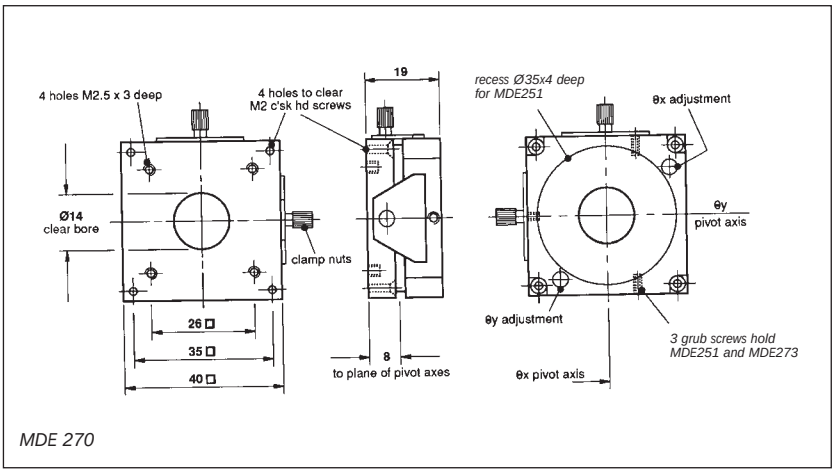
MDE 270 PRECISION TILT STAGES

- *Kinematic gimbal design gives independent adjustment on two axes*
- *Clamps fitted to angular motions*
- *Range on each axis 3° Sensitivity 5 seconds of arc*
- *Adjustment using hex. key*
- *Mounting options using M2 clearance holes, M2.5 tapped holes, or M4 post mounting using MDE 274*

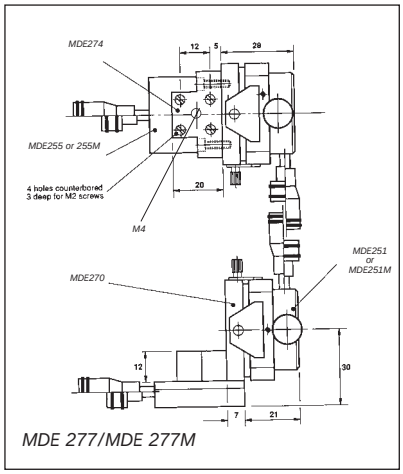


MDE 251 specification and application see page 27. To hold optical fibres in these 4 or 5axis micropositioners use MDE 722.

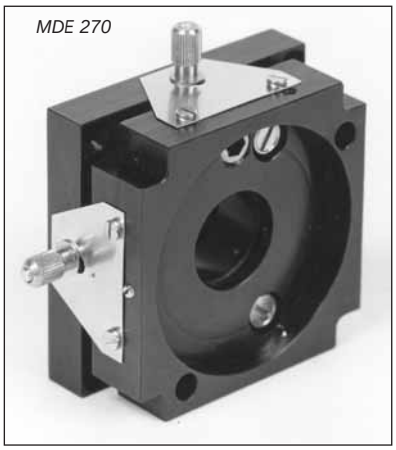
To add Rotation Stage MDE 283 or linear micropositioner MDE 260 Series use Adaptor Plate MDE 273.



MDE 270



MDE 277/MDE 277M



ORDERING INFORMATION

Product	Specification
MDE 270	*Precision Tilt Stage*
MDE 273	*Adaptor Plate*
MDE 274	*Adaptor Block*
MDE 276	*4 axis micropositioner (MDE 270 and MDE 251)*
MDE 276M	*4 axis micropositioner with micrometers (MDE 270 and MDE 251M)*
MDE 277	*5 axis micropositioner (MDE 270, MDE 251, MDE 274 and MDE 255)*
MDE 277M	*5 axis micropositioner with micrometers (MDE 270, MDE 251M, MDE 274 and MDE 255M*

ROTATION STAGES

MDE 282 AND MDE 283

- *Very compact*
- *High precision lapped bearing*
- *360° rotation with clamp screw*
- *Tangent screw fine adjustment 10° range*
- *Resolution 5 arc seconds*
- *Elliot Martock linear micropositioners can be fitted*
- *Table adaptors available*
- *Alternative bore options*
- *Mainly stainless steel construction*
- *M4 post adaptor MDE 859 available*

MDE 283

Can be fitted with MDE 261, 262, 263 micropositioners, Standard bore is as shown, alternative bore is 8.0 diameter through (order as MDE 283-8). To add tilting adjustments to stage base plate see MDE 270.

MDE 282

Has a calibrated fine adjustment control. 1 division = 2 arc minutes and has a hole array to allow MDE 255, 257, 258 and 259 micropositioners to be attached. The central bore is as detailed on the MDE 283 drawing (M6).

MDE282G

In addition to the standard features it has a 360° scale of 2° divisions plus a 10 arc minute vernier which in itself can be adjusted and clamped over a 16° range.

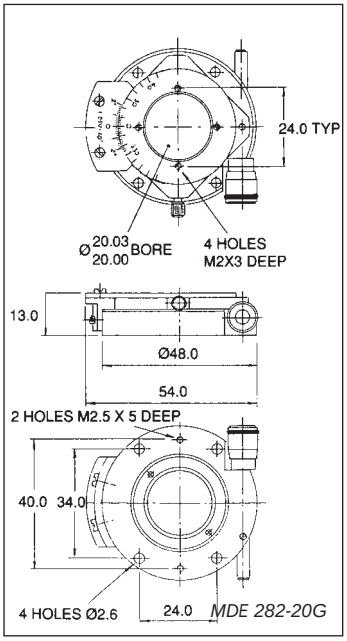
MDE 282–20G

MDE 282-20

This is similar to the MDE 282 but is produced with a clear bore of 20mm.

MDE 282-20G

This stage also features the 20mm bore but in addition includes the degree scale and vernier scale described for the MDE282G.

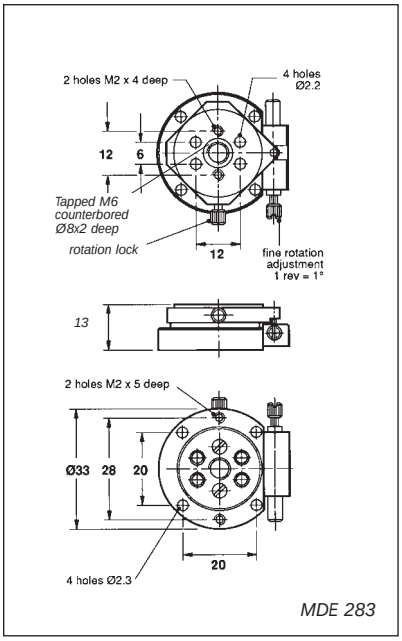


MDE 282-20G

MDE 282 *MDE 283*

ADAPTOR PLATES MDE 292 AND MDE 293

- *Adapts Rotation Stages to optical tables*
- *Alternative M6 hole for post mounting*
- *MDE292 also suits MDE255 Series micropositioners*
- *MDE293 also suits MDE260 Series micropositioners*



MDE 283

PLEASE CALL OR E-MAIL FOR DRAWING OF MDE 292 AND MDE 293 ADAPTOR PLATES

MINIATURE ADJUSTERS

MDE 208

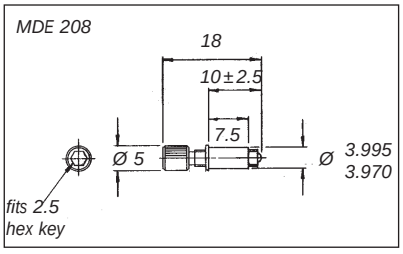
- *Extremely compact*
- *Very fine thread – 0.25mm pitch*
- *Positioning to 0.2µm by using screwdriver slot in knob*
- *Stainless Steel spindle with hard steel ball tip and nickel silver nut*
- *5mm travel (optional 10mm call for more information)*

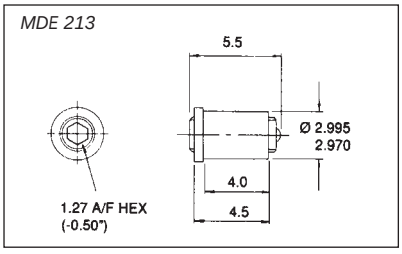
MDE 213

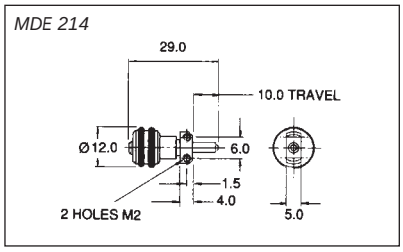
- *Positioning to 0.2µm by using 1.27 A/F Ball Drive key supplied*
- *3mm travel (optional longer travel, call for more information)*
- *Materials as MDE 208*

MDE 214

- *10mm of travel*
- *Side mount nut*
- *Positioning to 0.5µm*
- *Materials as MDE 208*







All dimensions drawings are shown in third angle projection.

solution science

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