

Opto-Mechanics 2011

# Fibre Launch Systems



Elliot Scientific

## Elliot Gold™ Series: Fibre Launch Solutions

### MDE510 Fibre Launch System with High-Precision Adjusters



**ELLIOT MARTOCK**

- 20 nm resolution with patented† high resolution adjusters
- Ultra-stable patented†† design XYZ flexure stage
- Suitable for singlemode fibre (125/250 µm cladding/jacket)
- Orthogonal alignment grooves
- 2 mm travel per axis
- 4.5 kg load capacity

Elliot Gold™ series fibre launch system comprising: 3-axis high-precision manual flexure stage with adjustable force fibre holder, objective lens mount with RMS thread, and small fixed bracket. Suitable for launching free space light beams into singlemode fibre.

All accessories are compatible with the Elliot Gold™ series flexure stages. The optical axis height is 18 mm 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 is supplied with the flexure stages and accessory platforms. The clamp set (MDE154) is available separately if required.

System Constituents:

- MDE710 Adjustable force fibre holder
- MDE330 Elliot Gold™ series XYZ High Precision Flexure Stage
- MDE216 High precision manual adjusters (x3)
- MDE154 Clamp Set
- MDE150 Objective mount (RMS thread)
- MDE148 Small fixed bracket

#### Specifications

Configuration	Right handed version
Fibre holder (Standard)	Double V-groove & clamp arms for 125/250 µm cladding/jacket fibre. Spring-loaded clamp arm force adjusts from 25 to 125 g
Fibre holder (Variants)	FC mount: Specify MDE510FC SMA mount: Specify MDE510SMA
Adjuster Type	Three high precision adjusters (Model MDE216) utilising a patented† lever system with rotary fine and coarse control
Stage travel	2 mm in X, Y and Z axes
Resolution	20 nm
Load capacity	4.5 kg
Arcuate Displacement	X axis 20 µm, Y and Z axes 14 µm (at maximum range of travel)
Optical axis	94 mm above the bottom of the stage
Objective mount	Removable stainless steel sleeve with RMS thread (0.800"-36). Allows on-axis adjustment and exchange of objectives or suitably mounted aspheric or ball lenses

#### Options

- Left-handed version (to special order)
- Custom sized V-grooves

† Patent Nos. GB 2152616B & USA 4617833

†† Patent Nos. GB 2129955B & USA 4635887

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## Elliot Gold™ Series: Fibre Launch Solutions

### MDE511 Fibre Launch System with Simple Adjusters



**ELLIOT MARTOCK**

- Suitable for multimode fibre (125 µm)
- Orthogonal alignment grooves
- 200 nm resolution with 2 mm travel per axis
- 4.5 kg load capacity
- Ultra-stable patented† design XYZ flexure stage

Elliot Gold™ series fibre launch system comprising: 3-axis simple manual flexure stage with basic fibre holder, objective lens mount with RMS thread, and small fixed bracket. Suitable for launching free space light beams into multimode fibre.

All accessories are compatible with the Elliot Gold™ series flexure stages. The optical axis height is 18 mm 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 is supplied with the flexure stages and accessory platforms. The clamp set (MDE154) is available separately if required.

System Constituents:

MDE711 Fibre holder

MDE330 Elliot Gold™ series XYZ High Precision Flexure Stage

MDE217 Manual adjusters 0.25 pitch (x3)

MDE154 Clamp Set

MDE150 Objective mount (RMS thread)

MDE148 Small fixed bracket

#### Specifications

Configuration	Right handed version
Fibre holder	Single V-groove to suit 125 µm fibre with magnetic clamping arm.
Adjuster Type	Three imple manual adjusters, 0.25 pitch (Model MDE217)
Stage travel	2 mm in X, Y and Z axes
Resolution	200 nm
Load capacity	4.5 kg
Arcuate Displacement	X axis 20 µm, Y and Z axes 14 µm (at maximum range of travel)
Optical axis	94 mm above the bottom of the stage
Objective mount	Removable stainless steel sleeve with RMS thread (0.800"-36). Allows on-axis adjustment and exchange of objectives or suitably mounted aspheric or ball lenses

#### Options

Left-handed version (to special order)

Custom sized V-grooves

† Patent Nos. GB 2129955B & USA 4635887

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## Elliot Gold™ Series: Fibre Launch Solutions

### MDE520 High-Precision Polarisation Maintaining Fibre Launch System



**ELLIOT MARTOCK**

- 5 arc seconds rotational resolution
- Orthogonal alignment grooves
- 2 mm travel per axis
- Suitable for PM fibre (125/250 µm cladding/jacket)
- Ultra-stable patented† design XYZ flexure stage
- 20 nm linear resolution with patented†† high resolution adjusters

Elliot Gold™ series polarisation maintaining (PM) fibre launch system comprising: 3-axis high precision flexure stage with high precision fibre rotator, objective lens mount with RMS thread, and large fixed bracket. Suitable for launching free space light beams into PM fibre.

PM fibre requires that the roll axis be adjusted to ensure correct alignment of the laser polarisation and fibre polarisation axes.

All accessories are compatible with the Elliot Gold™ series flexure stages. The optical axis height is 18 mm 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 is supplied with the flexure stages and accessory platforms. The clamp set (MDE154) is available separately if required.

System Constituents:

MDE717 High precision fibre rotator

MDE330 Elliot Gold™ series XYZ High Precision Flexure Stage

MDE216 High precision manual adjusters (x3)

MDE154 Clamp Set x 2

MDE150 Objective mount (RMS thread)

MDE147 Large fixed bracket

#### Specifications

Configuration	Right handed version
Fibre holder	Double V-groove & clamp arms for 125/250 µm cladding/jacket fibre. Spring-loaded clamp arm force adjusts from 25 to 125g
Fibre rotation	Full 360° rotation Engraved scale ± 90° Vernier reads to 30 arc minutes Fine adjustment screw with 5 arc seconds resolution Range ± 5° V-block preset on axis with < 1 µm concentricity error V-block can be re-centred by user
Adjuster Type	Three high precision adjusters (Model MDE216) utilising a patented†† lever system with rotary fine and coarse control
Resolution	20 nm
Load capacity	4.5 kg
Arcuate Displacement	X axis 20 µm, Y and Z axes 14 µm (at maximum range of travel)
Optical axis	94 mm above the bottom of the stage
Objective mount	Removable stainless steel sleeve with RMS thread (0.800"-36). Allows on-axis adjustment and exchange of objectives or suitably mounted aspheric or ball lenses

#### Options

Left-handed version (to special order)

Custom sized V-grooves

† Patent Nos. GB 2152616B & USA 4617833

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## Elliot Gold™ Series: Fibre Launch Solutions

### MDE521 Standard Polarisation Maintaining Fibre Launch System



- ~ 0.1 degrees rotational resolution
- Suitable for PM fibre (125 µm)
- Orthogonal alignment grooves
- 200 nm resolution
- 2 mm travel per axis
- 4.5 kg load capacity
- Ultra-stable patented† design XYZ flexure stage



Elliot Gold™ series polarisation maintaining (PM) fibre launch system comprising: 3-axis simple manual flexure stage with standard fibre rotator, objective lens mount with RMS thread, and small fixed bracket.

PM fibre requires that the roll axis be adjusted to ensure correct alignment of the laser polarisation and fibre polarisation axes.

All accessories are compatible with the Elliot Gold™ series flexure stages. The optical axis height is 18 mm 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 is supplied with the flexure stages and accessory platforms. The clamp set (MDE154) is available separately if required.

System Constituents:

MDE718 Fibre rotator

MDE330 Elliot Gold™ series XYZ High Precision Flexure Stage

MDE217 Manual adjusters 0.25 pitch (x3)

MDE154 Clamp Set

MDE150 Objective mount (RMS thread)

MDE148 Small fixed bracket

#### Specifications

Configuration	Right handed version
Fibre holder	V-groove & single clamp arm for 125 µm fibre. Spring-loaded clamp arm force adjusts from 25 to 125 g
Fibre rotation	Full 360° rotation. Resolution approx 0.1 degrees
Adjuster Type	Three simple manual adjuster, 0.25 pitch (Model MDE217)
Stage travel	2 mm in X, Y and Z axes
Resolution	200 nm
Load capacity	4.5 kg
Arcuate Displacement	X axis 20 µm, Y and Z axes 14 µm (at maximum range of travel)
Optical axis	94 mm above the bottom of the stage
Objective mount	Removable stainless steel sleeve with RMS thread (0.800"-36). Allows on-axis adjustment and exchange of objectives or suitably mounted aspheric or ball lenses

#### Options

Left-handed version (to special order)

Custom sized V-grooves

† Patent Nos. GB 2129955B & USA 4635887

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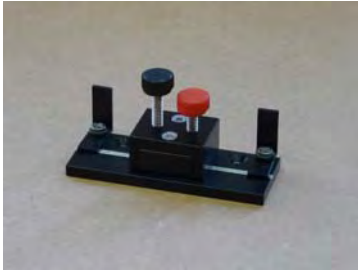
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**Elliot Gold™ Series: Fibre Launch Solutions: Accessory**

**ETB100 Fibre to Fibre Alignment Block**



- Can be used with index matching gel to minimise coupling loss
- Quick and easy mechanical coupling of two bare fibres without splicing
- Simple and economical design



Designed to allow two bare fibres to be coupled quickly and easily without the need for splicing in applications such as OTDR testing.



## Elliot Gold™ Series: 2 & 3-axis Rotation Modules

### MDE183 Pitch and Yaw Stage with Simple Adjusters



**ELLIOT MARTOCK**

- Pitch and yaw adjustment about a single point in space
- $\pm 3^\circ$  range in pitch ( $\theta_Y$ ),  $\pm 5^\circ$  range in yaw ( $\theta_Z$ ):  
Resolution 2.0 arc secs
- Rotation in a true arc - no cross-talk
- Excellent long-term stability
- Swing-out pointer identifies the centre of rotation
- Fits Elliot Gold™ Series XYZ flexure stage to provide 5 & 6 axis operation
- Right or left-handed configuration available
- Add optional fibre or fibre array rotation holders to provide roll axis adjustment  
Standard fibre holders fit top plate

The MDE183 and MDE185 Rotation Stages add pitch and yaw adjustments to the Elliot Gold™ Series XYZ flexure stages. Applicable to a wide range of fibre and device alignment tasks requiring the ultimate in flexibility and precision control.

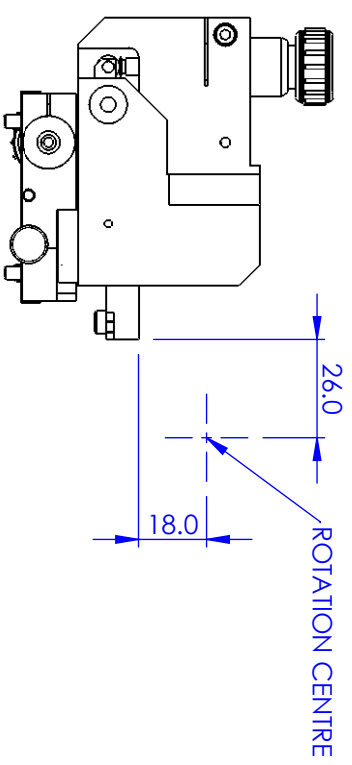
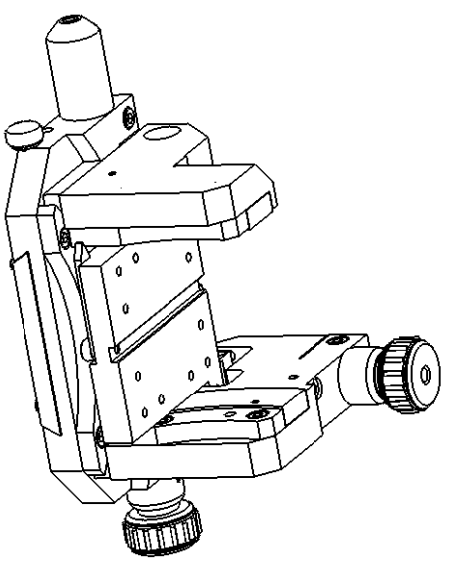
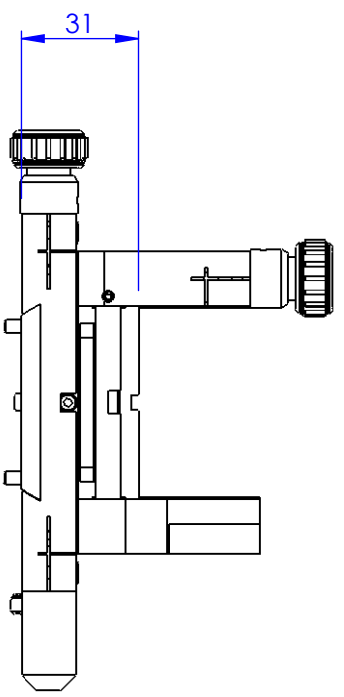
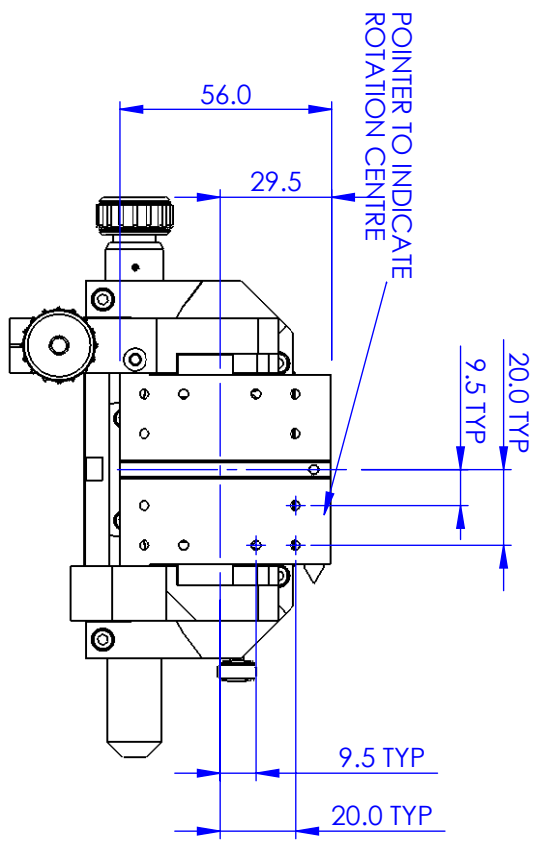
The MDE183 pitch and yaw module provides a  $\pm 3^\circ$  range in pitch and a  $\pm 5^\circ$  range in yaw, with a resolution of 2.0 arc secs. The module has a locating slot to accept Elliot/Martock standard top plate accessories such as fibre holders allowing bare fibre, ribbon cable and connectorised fibre to be used with the rotation module. A locating tongue on the base interfaces with the top plate of the flexure stages. When fitted with a fibre rotator and attached to a stage, the module allows 6-axis manipulation of a fibre about a single point in space. A swing-out pointer identifies the rotation centre for ease of use.

The MDE183 and MDE185 can be used with various top plate accessories from the Elliot/Martock range. These stages can also be mounted on riser blocks for 94 mm or 125 mm optical axis height. The MDE190 riser block is used to extend the axis height of an MDE147 or MDE148 bracket to 125 mm for 5 or 6 axis fibre launch applications.

All accessories are compatible with the flexure stages. The optical axis height is 18 mm 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 accessories requiring attachment in this format are supplied with a clamp set.

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REVISIONS		DATE	APPROVED
REV.	DESCRIPTION		



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NAME	DATE
AUTHOR GW	26/02/2008
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MATERIAL	

<b>Elliott Scientific</b>	
TITLE	
<b>2 AXIS PITCH YAW MODULE</b>	
SIZE	DWG. NO.
<b>A4</b>	<b>MDE183</b>
SCALE: 1:2	THIRD ANGLE PROJECTION
SHEET 1 OF 2	

## Elliot Gold™ Series: 2 & 3-axis Rotation Modules

### MDE185 Pitch and Yaw Stage with High Precision Adjusters



**ELLIOT MARTOCK**

- Pitch and yaw adjustment about a single point in space
- $\pm 3^\circ$  range in pitch ( $\theta Y$ )
- $\pm 5^\circ$  range in yaw ( $\theta Z$ )
- Resolution  $< 0.1$  arc secs
- Rotation in a true arc - no cross-talk
- Excellent long-term stability
- Swing-out pointer identifies the centre of rotation
- Fits Elliot Gold™ Series XYZ flexure stage to provide 5 & 6 axis operation  
Right or left-handed configuration available  
Add optional fibre or fibre array rotation holders to provide roll axis adjustment

The MDE183 and MDE185 Rotation Stages add pitch and yaw adjustments to the Elliot Gold™ Series XYZ flexure stages. Applicable to a wide range of fibre and device alignment tasks requiring the ultimate in flexibility and precision control.

The MDE185 pitch and yaw module provides a  $\pm 3^\circ$  range in pitch and a  $\pm 5^\circ$  range in yaw, with a resolution of  $< 0.1$  arc secs. The module has a locating slot to accept Elliot/Martock standard top plate accessories such as fibre holders allowing bare fibre, ribbon cable and connectorised fibre to be used with the rotation module. A locating tongue on the base interfaces with the top plate of the flexure stages. When fitted with a fibre rotator and attached to a stage, the module allows 6-axis manipulation of a fibre about a single point in space. A swing-out pointer identifies the rotation centre for ease of use.

The MDE183 and MDE185 can be used with various top plate accessories from the Elliot/Martock range. These stages can also be mounted on riser blocks for 94 mm or 125 mm optical axis height. The MDE190 riser block is used to extend the axis height of an MDE147 or MDE148 bracket to 125 mm for 5 or 6 axis fibre launch applications.

#### Specifications

Configuration	Right handed version
Adjuster Type	2x High precision adjusters (Model MDE216)
Range	
$\theta Z$ (yaw)	Coarse adjustment: $\pm 5^\circ$ , Fine adjustment: $\pm 0.1^\circ$
$\theta Y$ (pitch)	Coarse adjustment: $3^\circ$ , Fine adjustment $\pm 0.1^\circ$
Resolution	
$\theta Z$ (yaw)	Coarse adjustment: 5.5 arc seconds, Fine adjustment: $< 0.1$ arc seconds
$\theta Y$ (pitch)	Coarse adjustment: 5.5 arc seconds, Fine adjustment $< 0.1$ arc seconds
Optical axis	125 mm above the bottom of an Elliot Gold™ Series XYZ flexure stage
Cross-talk	No cross-talk - Rotation in a true arc

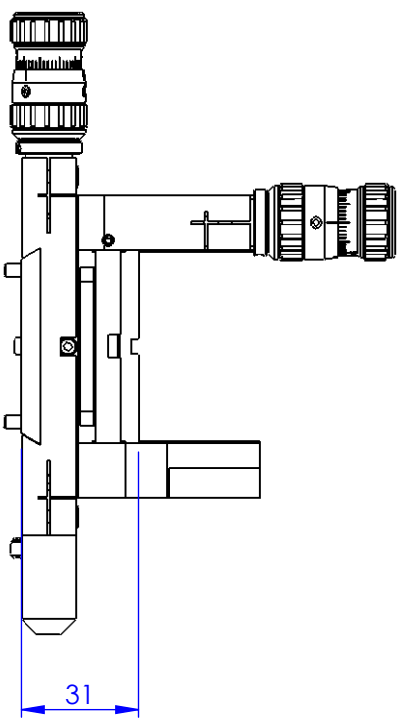
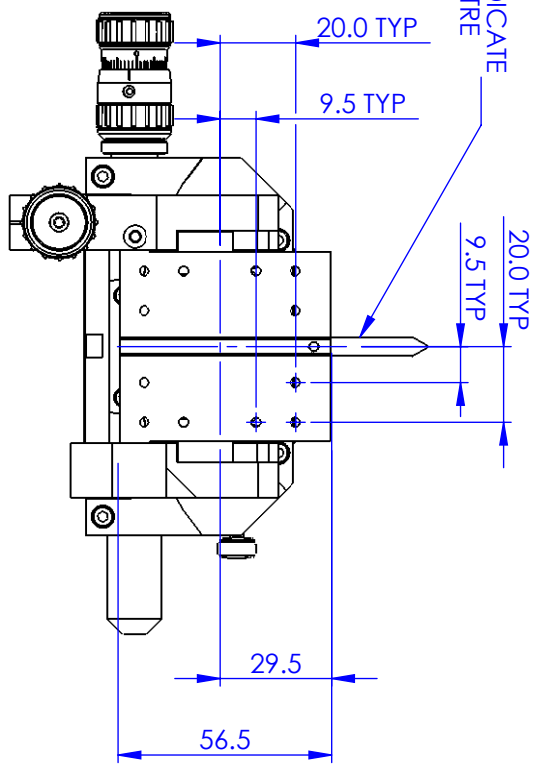
#### Options

Alternative adjusters (simple, high precision, motorised)  
 Left-handed version (to special order)  
 Fibre holders  
 Fibre rotators  
 Fibre array rotator (MDE884LH)  
 Includes Model MDE154 clamp set

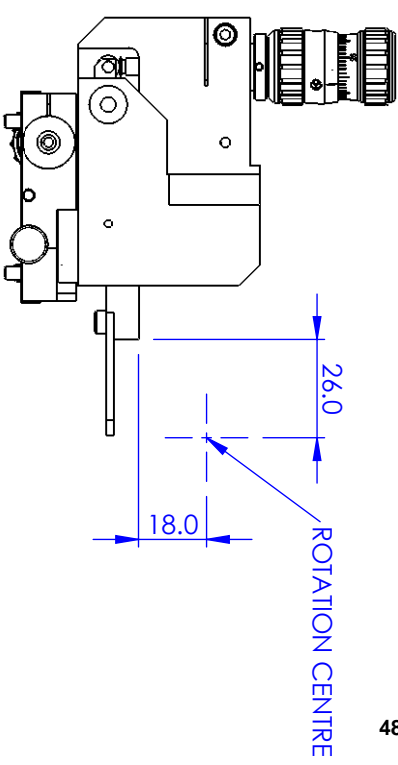
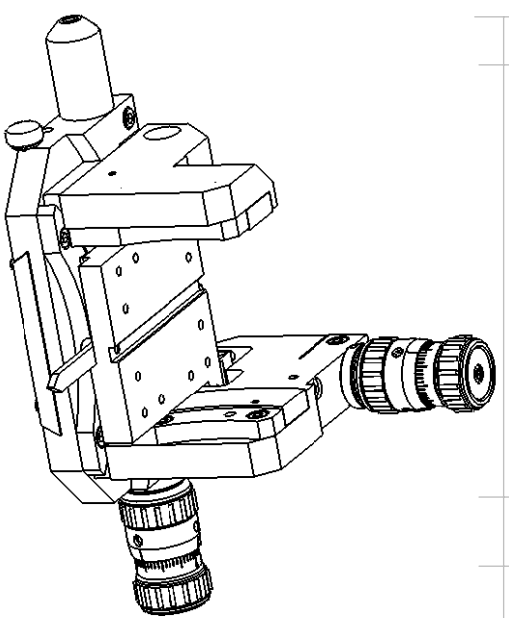
† Patent Nos. GB 2152616B & USA 4617833

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POINTER TO INDICATE  
ROTATION CENTRE



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REV.	DESCRIPTION		



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AUTHOR GW	26/02/2008
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MATERIAL	

<b>Elliott Scientific</b>	
TITLE <b>2 AXIS PITCH YAW MODULE</b>	
SIZE <b>A4</b>	DWG. NO. <b>MDE185</b>
SCALE: 1:2	THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING	SHEET 1 OF 1

**Elliot Gold™ Series: Fibre Rotators**

**MDE717 High Precision Fibre Rotator**



- Slotted design for easy insertion and removal of fibre
- Full 360° rotation
- Fine adjustment screw with 5 arc seconds resolution
- V-block preset on axis with < 1 µm concentricity error
- V-block can be re-centred by user
- Integrates with Elliot Gold™ series flexure stages



Designed for the most demanding rotation and alignment of angular sensitive components. It can be used anywhere that stable, accurate fibre rotation is needed.

The popular MDE717 fibre rotator is an updated version of the original and now offers the same highly accurate rotation in a more stable package.

All accessories are compatible with the Elliot Gold™ series flexure stages. The optical axis height is 18 mm 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 is supplied with the flexure stages and accessory platforms. The clamp set (MDE154) is available separately if required.

**Specifications**

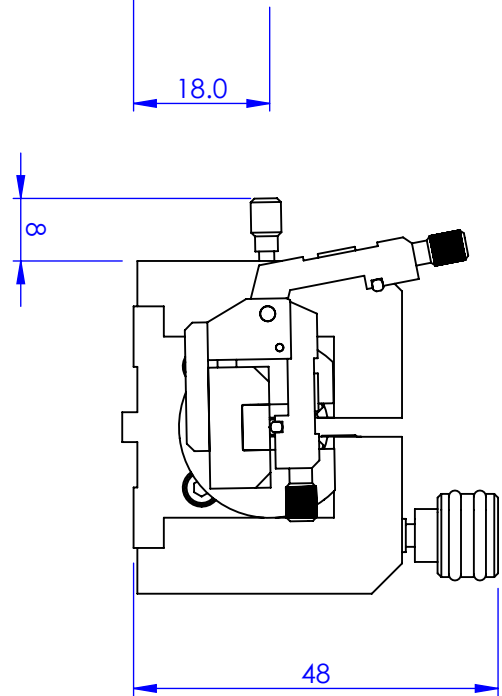
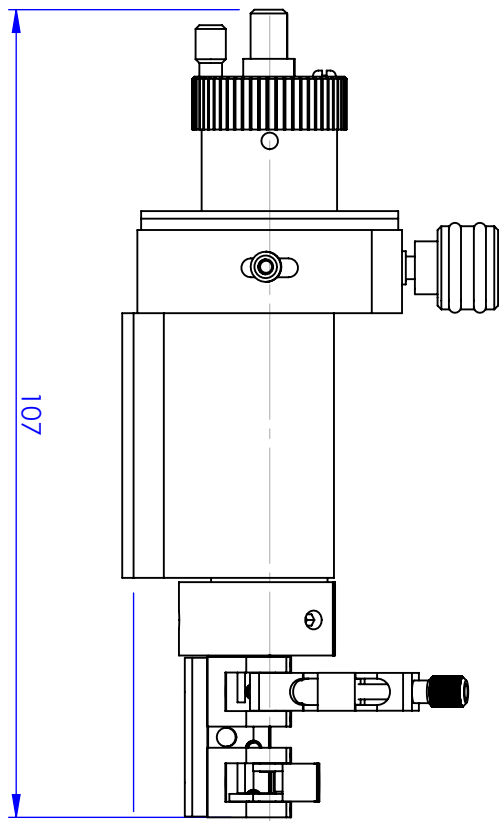
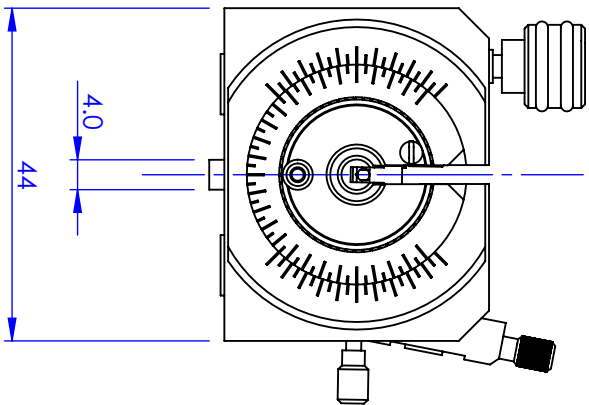
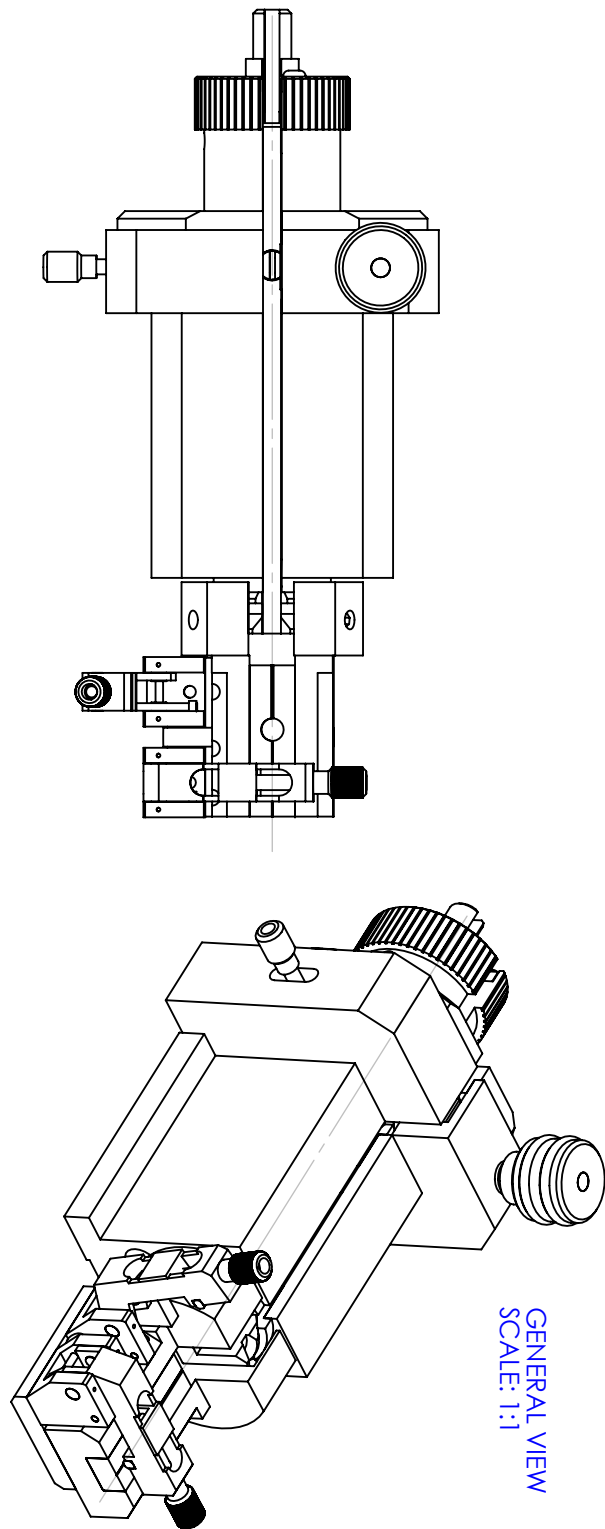
Rotation adjustment	360°
Coarse adjustment	Engraved scale ± 90°, vernier reads to 30 arc minutes
Fine adjustment	Screw with 5 arc seconds resolution
Range	± 5°
Fibre fixturing	Fibre held in double V-groove by two clamp arms
Clamp load	Adjustable 25 g to 125 g
V-block preset on axis with < 1 µm concentricity error	
V-block can be re-centred by user	
Standard V-groove for 125/250 µm fitted	
Split spring sleeve retains fibre in slot at the control end and prevents fouling during rotation	

**Options**

- V-groove custom sizes available
- OEM upgrade kits for fusion splicers to facilitate splicing of PM fibre
- Connectorised fibre version
- Custom configuration compatible with fibre chucks
- Clamp set (Model MDE154)

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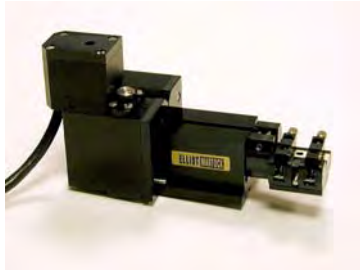
AUTHOR	NAME	DATE
CHECKED	GW	10/09/2010
MATERIAL		

<b>Elliott Scientific</b>	
<b>HIGH PRECISION FIBRE ROTATOR</b>	
SIZE	DWG. NO.
<b>A4</b>	<b>MDE717</b>
SCALE: 1:1	THIRD ANGLE PROJECTION
SHEET 1 OF 2	

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**Elliot Gold™ Series: Fibre Rotators**

**MDE235 Motorised Fibre Rotator**



- Slotted design for easy insertion and removal of fibre
  - Full 360° rotation
  - Integral stepper motor drive
  - Resolution <0.01 degrees
  - Fibre held in variable-force V-groove clamps
  - Standard V-groove for 125/250 µm fitted
  - (Custom sizes available)
  - V-block preset on axis with < 1 µm concentricity error
- Stepper drive controllers available with LabVIEW™ drivers  
Integrates with Elliot Gold™ series flexure stages

The MDE235 is a motorised version of the MDE717 fibre rotator. It includes all the features of the original 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 that stable, accurate fibre rotation is needed.

**Specifications**

Actuator	Stepper motor
Rotation adjustment	Continuous 360°
Resolution	< 0.01° with full step controller
Fibre fixturing	Fibre held in V-groove by two variable force clamp arms
Clamp load	Adjustable 25 g to 125 g
V-block preset on axis with < 1 µm concentricity error	Standard V-groove for 125/250 µm fitted
Split spring sleeve retains fibre in slot at the control end	

**Options**

- V-groove custom sizes available
- OEM upgrade kits for fusion splicers to facilitate splicing of PM fibre
- Custom versions compatible with fibre chucks

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# International Distributors

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Web: [www.laser-technology.com](http://www.laser-technology.com)

Email: [info@laser-technology.com](mailto:info@laser-technology.com)

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