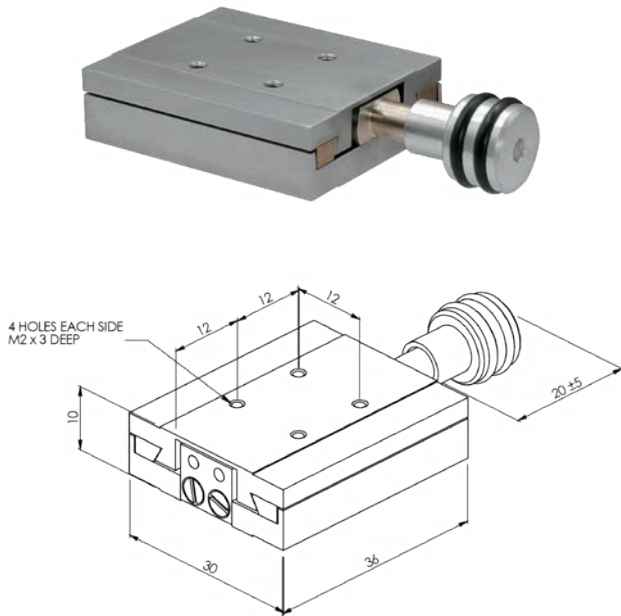


SMALL MICROPOSITIONERS - 255 Series

Elliot|Martock micropositioning stages are ideal for applications where space is at a premium, such as in tightly packed optical set ups or in industrial systems for aligning components during assembly. Our stages range from small (10 mm travel) to very small (5 mm travel) to ultra-small (3 mm travel), as described on the following pages (pp.22-25), and include options for vacuum preparation, low magnetic response, axis locks and adjuster type. Our micropositioning stages use dovetail designs. Unlike miniature ball slide stages, dovetail stages are unlikely to be permanently damaged by temporary distortion, as the load is supported on a comparatively large area.

Single-Axis Micropositioner

MDE255A



- Small dovetail stages in multi-axis configurations
- Very smooth movement produced by precision lapping of matched pairs of slides
- 10 mm travel
- Sensitivity <0.5 μm with standard adjusters
- Very fine thread adjusters with 0.25 mm pitch
- Micrometer adjuster option (-M) reading to 0.01 mm
- Lockable option (-L)
- Vacuum compatible option (-V)
- Low magnetic response option (-LM)
- Post mountable with MDE856 adaptor (p.29)
- Table mountable with MDE292 adaptor (p.29)
- Mounts directly on MDE282 or MDE282G rotation stages (p.26)
- Compatible with MDE723 fibre holder (p.13)

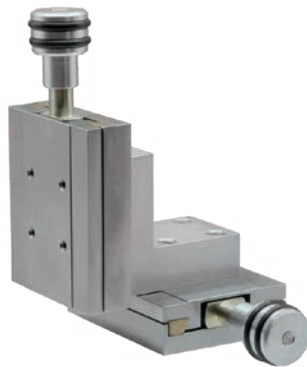
2-Axis Micropositioner

MDE255A-XZ



2-Axis Micropositioner

MDE255A-YZ



Lockable option (-L) adds a plate and clamping screw to the side of each stage. Threaded holes are provided on both sides so that the lock plate can be easily moved from one side to the other for easy access.



Micrometer option (-M) replaces the standard adjuster(s) on all versions except vacuum compatible (-V) and low magnetic response (-LM) types.



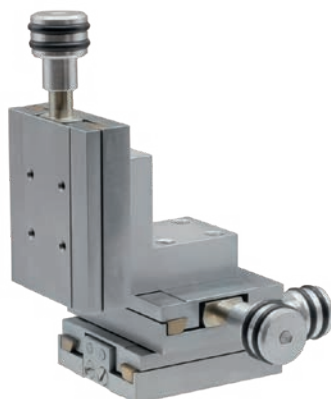
2-Axis Micropositioner

MDE258A



3-Axis Micropositioner

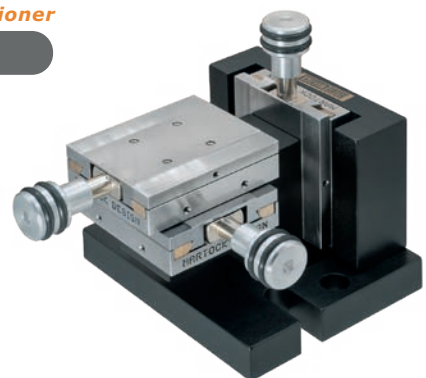
MDE259A



The MDE850 3-axis configuration shown below is a special version of the 255 Series where the mounting surface is horizontal and can be fitted with an adaptor plate (MDE851, not shown) that is compatible with flexure stage accessories. Micrometer adjusters can be fitted (MDE850-M) in place of the standard adjusters.

3-Axis Micropositioner

MDE850



SMALL MICROPOSITIONERS – 255 Series

Micropositioners with circular apertures are useful for mounting small optics or laser diodes in cylindrical packages, among many other applications. By combining two independent dovetail slides it is possible to construct a 2-axis positioner with no interaction between the axes. Adaptor MDE253 (p.29) permits these micropositioners to be surface mounted, and adaptor MDE254 (p.29) provides a mount for the MDE255A linear stage (p.22) to create a 3-axis positioner (MDE257, below). Direct fit into 270 Series tilt stages (p.28) creates 4-axis and 5-axis axis positioners.

2-Axis Micropositioner

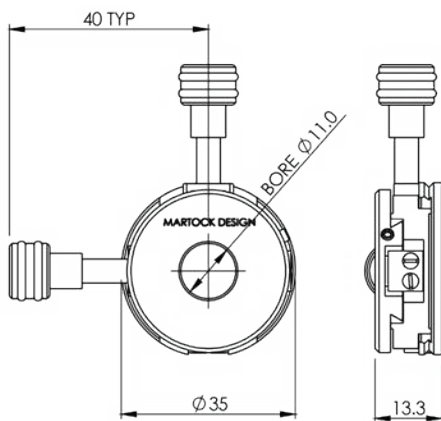
MDE251



Standard 11 mm diameter bore



Optional 15 mm diameter bore



- 2-axis dovetail stages with circular aperture for independent use or in combination with 255 Series linear stages
- ± 1 mm travel per axis, with no interaction between axes
- 11 mm diameter bore (15 mm option as MDE251-15)
- Sensitivity $< 0.5 \mu\text{m}$ with standard adjusters
- Very fine thread adjusters with 0.25 mm pitch
- Micrometer adjuster option (-M) reading to 0.01 mm
- Post mountable using MDE254 adaptor (p.29)
- Plate mountable using MDE253 adaptor (p.29)
- Mounts directly on MDE270 tilt stage (p.28)
- Standard 11 mm diameter bore version compatible with MDE722 fibre holder (p.13)

3-Axis Micropositioner

MDE257

The 3-axis MDE257 assembly comprises the MDE251 yz micropositioner fitted to the MDE255A x -axis micropositioner (p.22) using the MDE254 angle plate adaptor (p.29) to build a micropositioner for small laser diodes, optics or other devices, or for optical fibres with the addition of the MDE722 spigot mounting fibre holder (p.13). Micrometer adjuster version (-M) shown (right).

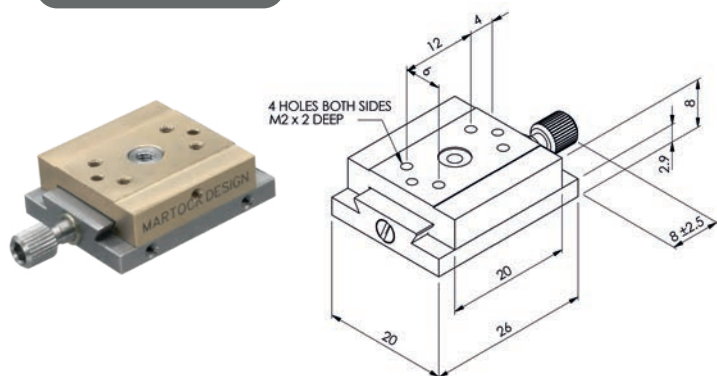


Product	Description
MDE255A	Single-axis (x) micropositioner
MDE255A-XZ	2-axis (xz) micropositioner (2 x MDE255A and bracket)
MDE255A-YZ	2-axis (yz) micropositioner (2 x MDE255A and bracket)
MDE258A	2-axis (xy) micropositioner (2 x MDE255A)
MDE259A	3-axis (xyz) micropositioner (MDE258A, MDE255A and bracket)
MDE251	2-axis (yz) micropositioner in circular format with 11 mm diameter bore
MDE251-15	2-axis (yz) micropositioner in circular format with 15 mm diameter bore
MDE257	3-axis (xyz) micropositioner (MDE255A, MDE251 and MDE254)
MDE850	3-axis (xyz) micropositioner with horizontal platform (3 x MDE255A and bracket)
MDE851	Adaptor plate to mount flexure stage accessories to 255 Series, MDE850 and MDE850-M
-M	Append to part code to specify micrometer adjuster(s)
-L	Append to part code to specify lockable version (not available for MDE251 or MDE251-15 but can be applied to MDE255A used in MDE257)
-V	Append to part code to specify vacuum compatible version (special preparation, and use of vacuum grease; not for use in pressure below high vacuum; not available for -M versions; not available for MDE251 or MDE251-15)
-LM	Append to part code to specify low magnetic response version (ceramic ball on adjuster; stainless steel spring; maximum field not specified; not available for -M versions; not available for MDE251 or MDE251-15)

VERY SMALL MICROPOSITIONERS – 260 Series

Single-Axis Micropositioner

MDE261A



- Very small dovetail stages in multi-axis configurations
- Very smooth movement produced by precision lapping of matched pairs of slides
- 5 mm travel
- Sensitivity $<0.5 \mu\text{m}$ with standard knurled adjusters with socket for hex key (2.5 mm A/F)
- Very fine thread adjusters with 0.25 mm pitch
- Micrometer adjuster option (-M) reading to 0.01 mm
- Lockable option (-L)
- Vacuum compatible option (-V)
- Low magnetic response option (-LM)
- Post mountable with MDE857/MDE858 adaptors (p.29)
- Table mountable with MDE293 adaptor (p.29)
- Mounts directly on MDE283 rotation stage (p.26)
- Mounts on MDE270 tilt stage (p.28) with MDE273 adaptor (p.29)
- Compatible with MDE723 fibre holder (p.13)

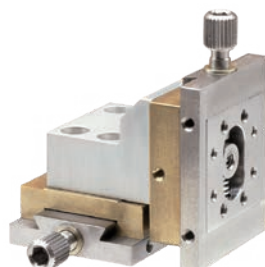
2-Axis Micropositioner

MDE261A-XZ



2-Axis Micropositioner

MDE261A-YZ



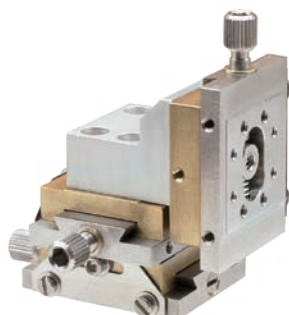
2-Axis Micropositioner

MDE262A



3-Axis Micropositioner

MDE263A



Lockable option (-L) adds a plate and clamping screw to each axis. Mounting holes are provided on both sides so that the lock plate can be moved from one side to the other for easy access, where permitted by the configuration.

Micrometer option (-M) replaces the standard knurled adjuster(s). Available on all versions except vacuum compatible (-V) and low magnetic response (-LM) types.

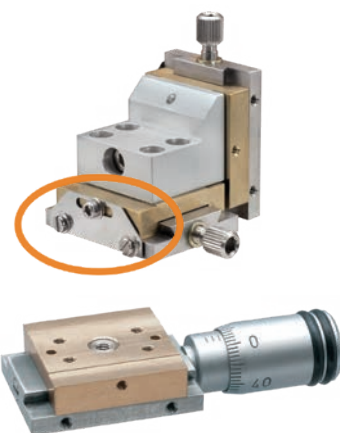


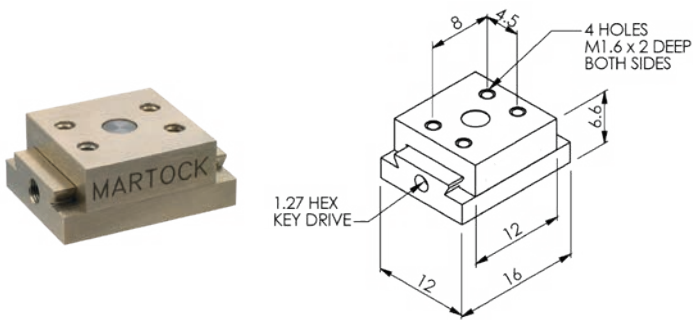
Image shows lockable version (-L)

Product	Description
MDE261A	Single-axis (x) micropositioner
MDE261A-XZ	2-axis (xz) micropositioner (2 x MDE261A and bracket)
MDE261A-YZ	2-axis (yz) micropositioner (2 x MDE261A and bracket)
MDE262A	2-axis (xy) micropositioner
MDE263A	3-axis (xyz) micropositioner (MDE262A, MDE261A and bracket)
-M	Append to part code to specify micrometer adjuster(s)
-L	Append to part code to specify lockable version
-V	Append to part code to specify vacuum compatible version (special preparation, and use of vacuum grease; not for use in pressure below high vacuum; not available for -M versions)
-LM	Append to part code to specify low magnetic response version (ceramic ball on adjuster; stainless steel spring; maximum field not specified; not available for -M versions)

ULTRA-SMALL MICROPOSITIONERS – 265 Series

Single-Axis Micropositioner

MDE265



- Ultra-small dovetail stages in multi-axis configurations
- Very smooth movement produced by precision lapping of matched pairs of slides
- 3 mm travel
- Sensitivity <0.5 μm
- Very fine thread flush mounted adjusters with 0.25 mm pitch operated by hex key (1.27 mm A/F) for compactness and fine control
- Knurled knob option (-KN) with socket for hex key (1.27 mm A/F)
- Vacuum compatible option (-V)
- Low magnetic response option (-LM)
- Post mountable with MDE857/MDE858 adaptors (p.29) except for MDE267 which has a base with M4 thread
- Compatible with MDE730 fibre holder (p.13)

2-Axis Micropositioner

MDE266



2-Axis Micropositioner

MDE268



3-Axis Micropositioner

MDE267



3-Axis Micropositioner

MDE269



The -KN knurled knob option replaces standard flush-mounted adjuster(s) on all versions. The knob includes a socket for a hex key (1.27 mm A/F).



Knurled adjusters are also available for retrofitting to existing stages in place of the standard adjusters as MD-054115.

APPLICATION NOTE

For greater access to the adjusters on the MDE267, the MDE267-ID variant has the xy section rotated by 180° about the vertical axis. This version is recommended if the knurled adjusters are specified, to provide space for the adjuster knobs on all axes.

Product	Description
MDE265	Single-axis (x) micropositioner
MDE266	2-axis (xy) micropositioner
MDE267	3-axis (xyz) micropositioner on base with M4 hole
MDE267-ID	As MDE267 with xy section rotated 180° about vertical axis
MDE268	2-axis (xz) micropositioner
MDE269	3-axis (xyz) micropositioner
-KN	Append to part code to specify knurled knob adjuster(s) (not available for MDE267; use MDE267-ID instead)
-V	Append to part code to specify vacuum compatible version (special preparation, and use of vacuum grease; not for use in pressure below high vacuum)
-LM	Append to part code to specify low magnetic response version (ceramic ball on end of adjuster; stainless steel spring; maximum field not specified)

SMALL ROTATION STAGES – 280 Series

Of the many rotation stages available on the market, few are both very small and very precise in operation. **Elliot|Martock** 280 Series rotation stages address these requirements with two size options. The compact MDE282 type is 48 mm in diameter, and the miniature MDE283 type is just 33 mm in diameter. Our rotation stages have 360° free rotation with a locking screw, and a tangent screw to provide fine control.

- High precision lapped bearing
- 360° free rotation with locking screw
- Fine adjustment range $\pm 5^\circ$ with 5 arcsec resolution
- Post mountable with MDE859 adaptor (p.29)
- MDE282 models are table mountable with MDE292 adaptor (p.29)
- MDE283 models are table mountable with MDE293 adaptor (p.29)

Compact Rotation Stage

MDE282



Compact Rotation Stage

MDE282G



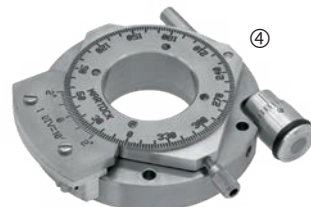
Compact Rotation Stage

MDE282-20



Compact Rotation Stage

MDE282-20G



MDE282 compact rotation stages have a 360° engraved main scale with 2° divisions, and fine control with 2 arcmin divisions marked on the adjuster barrel. M6 threaded^{①②} and 20 mm diameter clear bore^{③④} models can be fitted with a 10 arcmin vernier which itself can be adjusted and clamped over a 16° range^{②④}.

Miniature Rotation Stage

MDE283

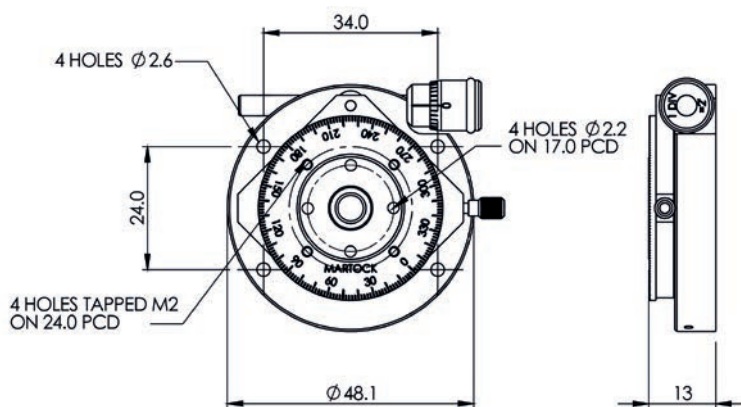


Miniature Rotation Stage

MDE283-8



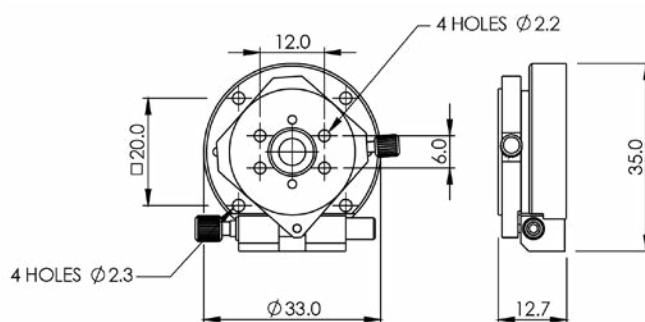
MDE283 miniature rotation stages feature a knurled adjuster with a slotted end for ease of operation in the tightest of spaces. M6 threaded^⑤ and 8 mm clear bore^⑥ models are available.



APPLICATION NOTE

MDE282 and MDE282G have a mounting hole array to attach a 255 Series micropositioner (pp.22) on top.

MDE283 and MDE283-8 have a mounting hole array to attach a 260 Series micropositioner (p.24) on top.



Product	Description
MDE282	Compact rotation stage; M6 threaded bore with 8 mm diameter counterbore
MDE282G	As MDE282 with 10 arcmin vernier
MDE282-20	As MDE282 with 20 mm clear bore
MDE282-20G	As MDE282G with 20 mm clear bore
MDE283	Miniature rotation stage; M6 threaded bore with 8 mm diameter counterbore
MDE283-8	As MDE283 with 8 mm diameter clear bore

MINIATURE ADJUSTERS

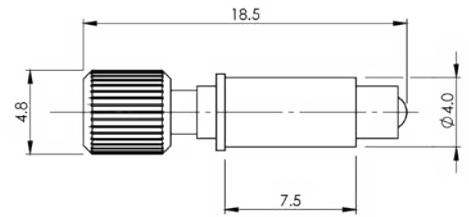
The precision adjusters that we use in our micropositioner stages (pp.22-25) are available separately for customers wishing to build their own custom positioning systems. Our adjusters have a stainless steel spindle with a hard steel ball tip and nickel silver nut.

Miniature Adjuster

MDE208A



- 5 mm travel
- Knurled knob with socket for hex key (2.5 mm A/F) for finer control
- Miniature type with very smooth operation and 4 mm diameter sleeve
- Very fine thread with 0.25 mm pitch
- Positioning to $<0.5 \mu\text{m}$

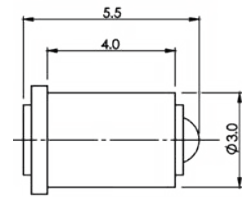


Miniature Adjuster

MDE213



- 3 mm travel
- Socket for hex key (1.27 mm A/F)
- Ultra-compact type with very smooth operation and 3 mm diameter sleeve
- Very fine thread with 0.25 mm pitch
- Positioning to $<0.5 \mu\text{m}$

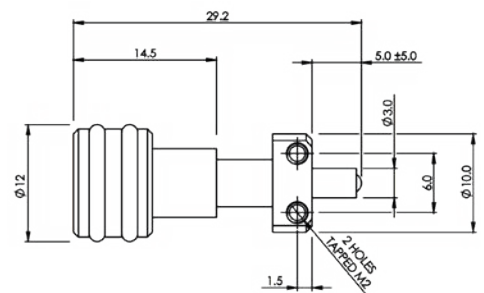


Miniature Adjuster

MDE214A



- 10 mm travel
- Very smooth operation with mountable nut (M2 threaded holes)
- Very fine thread with 0.25 mm pitch
- Positioning to $<0.5 \mu\text{m}$

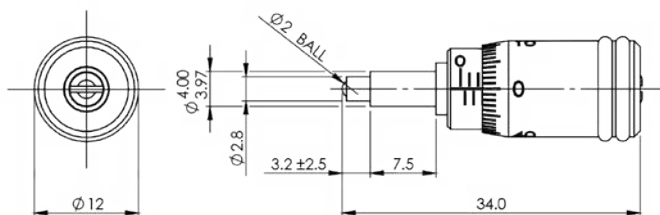


MICROMETERS

The very compact micrometers that we use in our micropositioner stages are available separately for customers wishing to build their own custom positioning systems. The micrometers have a stainless steel screw with a hard steel ball on the spindle tip. Positioning resolution is similar to that of the miniature adjusters above, with the advantage of distance measurement via 0.01 mm graduations.

Micrometer

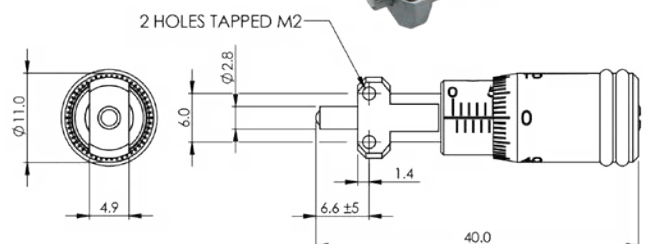
MDE206



- 5 mm travel with 4 mm diameter mounting spigot
- Positioning to $<0.5 \mu\text{m}$
- 0.01 mm graduations, 0.5 mm travel per revolution

Micrometer

MDE219



- 10 mm travel with mountable nut (M2 threaded holes)
- Positioning to $<0.5 \mu\text{m}$
- 0.01 mm graduations, 0.5 mm travel per revolution

PRECISION TILT STAGES – 270 Series

Elliot|Martock high precision tilt stages provide direct fit angular adjustment for MDE251 circular format *xy* stages (p.23). The 260 Series micropositioners (p.24) and MDE283 rotation stages (p.26) can be added via the MDE273 adaptor plate (p.29).

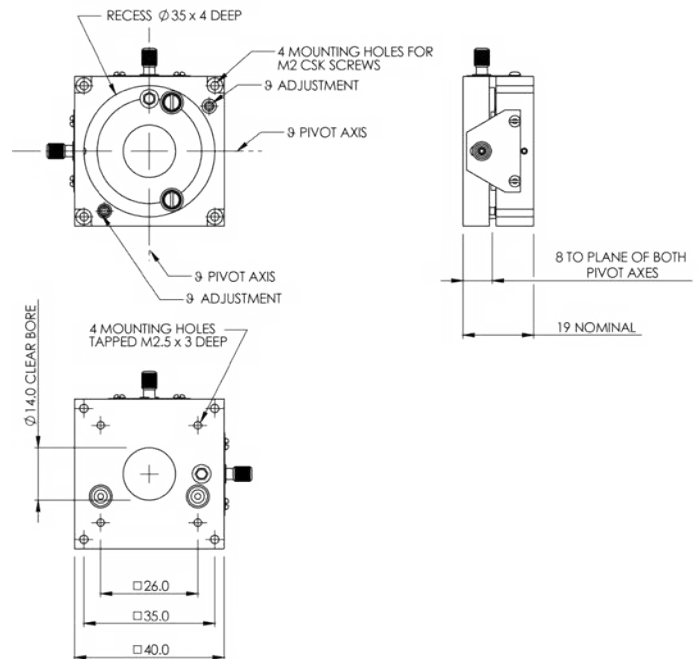
Precision Tilt Stage

MDE270



- Kinematic gimbal design provides independent adjustment on two axes
- Angular position lockable with clamp on each axis
- $\pm 1.5^\circ$ range with 5 arcsec resolution on each axis
- Both axes pass through centre of stage
- 14 mm diameter clear bore
- Angular adjustment via hex key (2.5 mm A/F)
- Mounting options using M2 clearance holes, M2.5 threaded holes or M4 post mount with MDE274 adaptor (p.29)

The MDE270 precision tilt stage can be assembled into a 4-axis micropositioner with the addition of the circular format MDE251 2-axis micropositioner (p.23) as MDE276. With the further addition of the MDE274 adaptor block (p.29) and MDE255A micropositioner (p.22), a 5-axis micropositioner is created as MDE277.



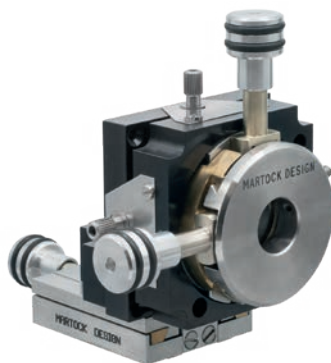
4-Axis Micropositioner

MDE276



5-Axis Micropositioner

MDE277

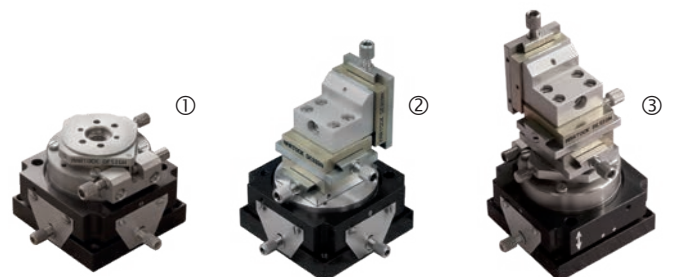


APPLICATION NOTE

With the addition of the MDE273 adaptor plate (p.29), the MDE270 precision tilt stage can be fitted with the MDE283 rotation stage (p.26)^① or 260 Series micropositioners (p.24)^②. Combinations such as tilt stage, adaptor plate, rotation stage and micropositioner are possible^③.

APPLICATION NOTE

The addition of the spigot-mounting MDE722 fibre holder (p.13) develops the MDE276 and MDE277 into very compact fibre manipulators.



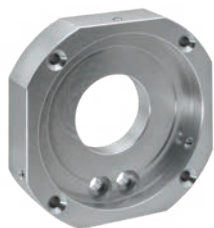
Product	Description
MDE270	Precision tilt stage
MDE276	4-axis micropositioner (MDE270 and MDE251)
MDE277	5-axis micropositioner (MDE270, MDE251, MDE254 and MDE255)
-M	Append to part code to specify micrometer adjusters on MDE251 and MDE255

ADAPTORS FOR MICROPOSITIONING STAGES

Adaptors are available to facilitate mounting of micropositioners, rotation stages and tilt stages to posts and tables, and to build various combinations of parts for increased functionality.

Mounting Plate

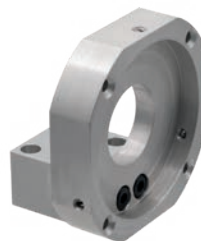
MDE253



Mounting plate for MDE251 circular format 2-axis micropositioner (p.23) using three grub screws. Mounts to a surface using screws (four 2.2 mm countersunk screw holes provided).

Angled Mounting Plate

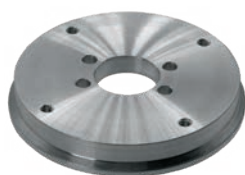
MDE254



Angle mounting plate for MDE251 circular format 2-axis micropositioner (p.23). As MDE253 (left) with addition of MDE856 mounting block (below).

Mounting Plate

MDE273



Mounting plate to adapt MDE283 miniature rotation stage (p.26) or 260 Series micropositioner (p.24) to MDE270 precision tilt stage (p.28).

Mounting Block

MDE274



Mounting block to attach MDE270 tilt stage (p.28) to 255 Series micropositioner (p.22), with M4 threaded hole for post mounting.

Table Mounting Plate

MDE292/293

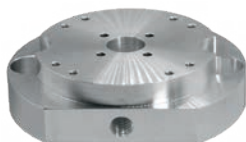


Table mounting plate with M6 threaded hole on one side for post mounting. Use MDE292 for MDE282 rotation stage (p.26) or 255 Series micropositioners (p.22); use MDE293 for MDE283 rotation stage (p.26) or 260 Series micropositioner (p.24).

Mounting Block

MDE856



Mounting block for 255 Series micropositioners (p.22), with M4 threaded hole in two places for post mounting in vertical or horizontal orientation.

Mounting Block

MDE857



Mounting block for 260 Series (p.24) and 265 Series (p.25) micropositioners, with M4 threaded hole for post mounting.

Mounting Block

MDE858



Mounting block for use with MDE857 (far left) to allow vertical or rotational mounting of 260 Series (p.24) or 265 Series (p.25) micropositioners, with M4 threaded hole for post mounting.

Mounting Block

MDE859



Mounting block for MDE282 or MDE283 rotation stages (p.26), with M4 threaded hole in two places for post mounting in vertical or horizontal orientation.

Table Mounting Plate

MDE860



Table mounting plate for holding MDE270 precision tilt stage (p.28) or MDE253 mounting plate (above). Can also be used to table mount flexure stage top plate accessories (pp.13-18).