

Piezoactuated Optomechanics Piezo Mirror-shifters Piezodriven Translation Stages



Piezo Mirror-shifters

Piezo mirror-shifters are used for ultrafine axial positioning of mirrors and other optical components without the use of heavy stages or other external guiding mechanisms.

Piezo mirror-shifters are internally preloaded resulting in high resonance frequencies, outperforming hereby conventional arrangements like stages etc. with regard to dynamics and stability.

Piezo mirror-shifters are mainly used in coherent optics like interferometry or holography eg. phase shift arrangements for measuring surface topographies with a resolution in the submicron range.

Mounting of piezo mirror-shifters is done by

- using an adaptor for fitting to mirror mounts
- using the rear side tapped holes
- clamping at the circumference.

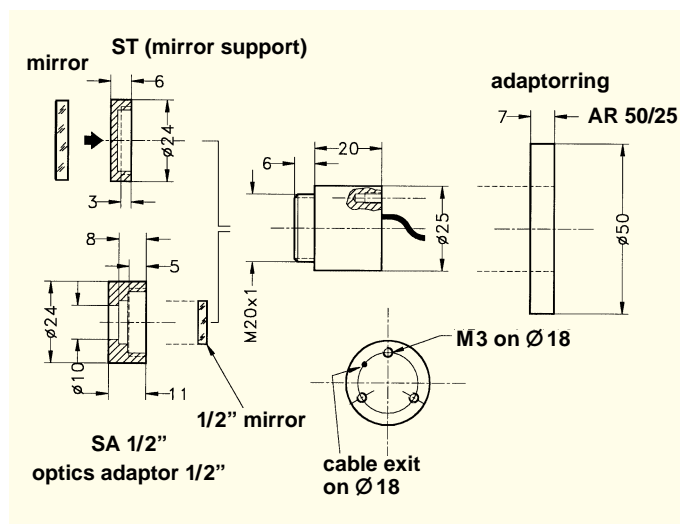
For attaching mirrors to the shifter, mirror supports or optics adaptors are used.

The mirror support ST is a flat screw-on cap where the mirrors are glued on.

The optics adaptors SA are especially for easy mounting and changing of 1/2" and 1" mirrors.

The mirror-shifters are driven by standard amplifiers described in the corresponding data sheet. In applications where not the full travel of the shifter is used, it is reasonable to use power supplies with lower output voltage. Usually such electronics show higher output currents, which results in a wider frequency range of the shifters operation.

Piezo Mirror-shifter STr-25



Technical data	max. operating voltage V	travel µm	capacitance nF	resonance frequency kHz
STr-25/150/6	+ 150	6	2500	15
STr-25/500/3	+ 500	3	60	15
STr-25/500/6	+ 500	6	150	15
STr-25/1000/3	+1000	3	30	15
STr-25/1000/6	+1000	6	60	15

Max. weight of optics,
when mounted

horizontally: 20 g

Electrical

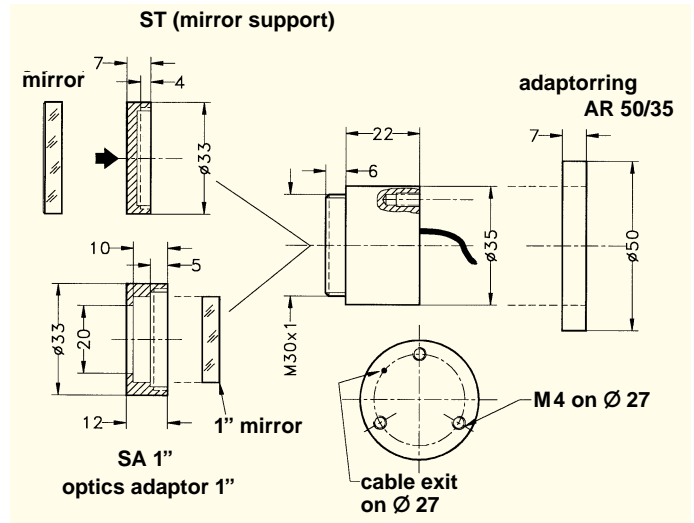
connection: 1 m coaxial cable with BNC-connector
or LEMOSA (see catalog "amplifiers")

Option: inverse polarity

Accessories: mirror support ST25 (for glueing on the mirror)
optics adaptor SA 1/2" for inserting 1/2" optics
adaptorring for mounting the shifters to mirror mounts AR 25/50
other sizes of adaptor rings on request

The mirror shifter is delivered incl. 1 mirror support ST.

Piezo Mirror-shifter STr-35



Technical data	max. operating voltage V	travel μm	el. capacitance nF	resonant frequency kHz
STr-35/150/6	+ 150	6	2800	10
STr-35/500/3	+ 500	3	125	15
STr-35/1000/3	+1000	3	60	15
STr-35/1000/6	+1000	6	125	15

Max. weight of optics, when mounted horizontally: 40 g

Electrical connection: 1 m coax cable with BNC-connector or LEMOSA (see catalog "amplifiers")

Option: negative polarity

Accessories: mirror support ST 35
optics adaptor SA 1"
adaptor ring AR 35/50
(other dimensions on request)

The mirror shifter is delivered incl. 1 mirror support ST.

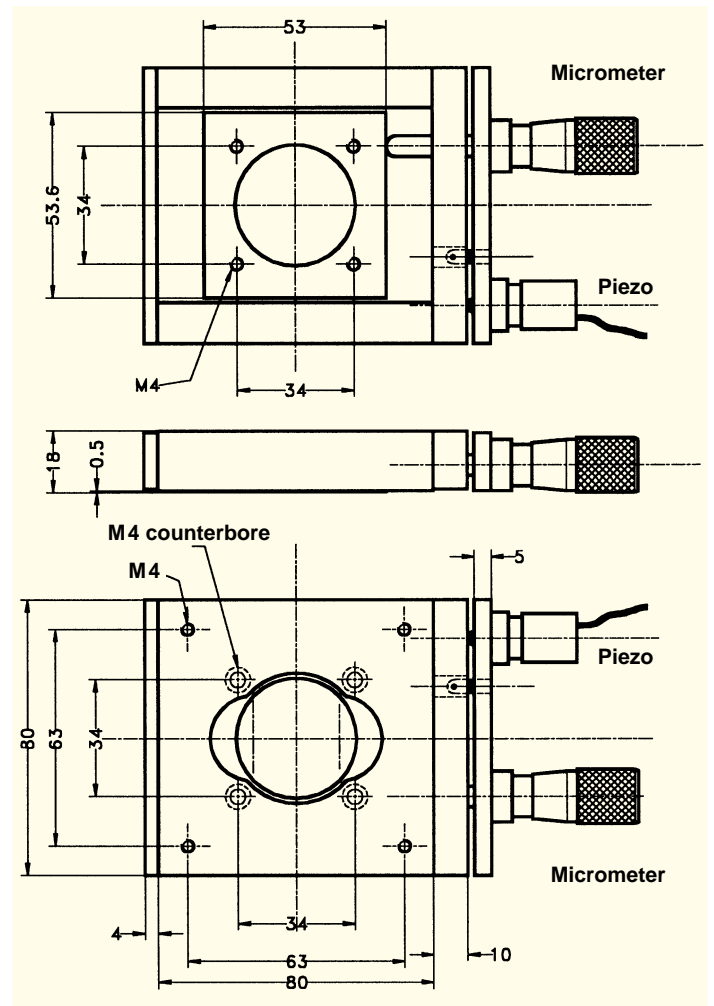
Translation stage MRL 80.25 P

with magnifying mechanism for piezo travel
 compatible with former Klinger/MicroControle optical system
 with NEWPORT/MicroControle optical system
 with Spindler & Hoyer stage TB 80-25

Coarse adjust by micrometer: travel 25 mm
 Ultrafine adjust by piezoelements FPSt 150/5/... M12x0.5
 Magnification factor for piezo travel: approx. 1.5
 Piezo range: depends on type of actuator
 e.g. more than 150 μm for
 FPSt 150/5/... M12x0.5

Positioning sensitivity
 of piezoelement: approx. 10 nm
 xyz arrangements available by use of standard mounting
 brackets

Ordering information: stage MRL 80.25 P and type of piezo-
 actuator FPSt 150/5/... M12x0.5
 (... piezo's elongation)
 (see page 6)



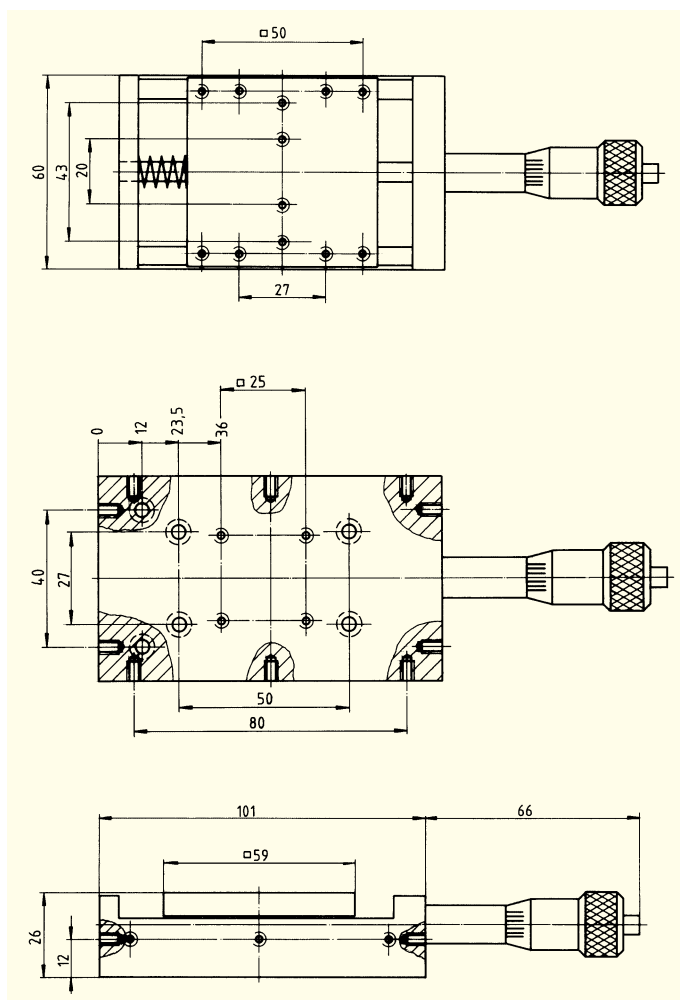
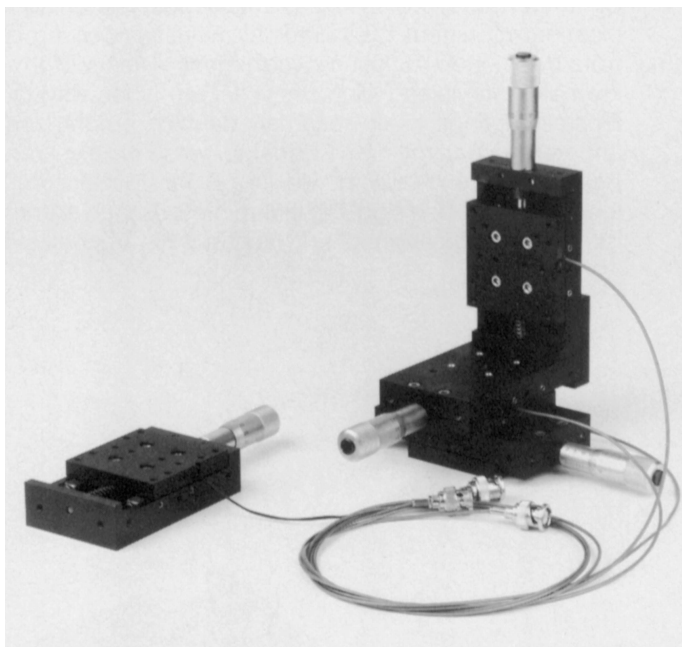
Translation stage PMT with central piezoelement

The translation stage PMT shows a standard coarse adjust by micrometer for 25 mm travel together with an ultrafine piezo-positioning capability. The special feature is the implementation of the axially acting piezo to the sliding part of the stage. By the centric mounting of micrometer and piezo, any torque on the sliding part and rotational deviation during dynamic piezoaction is avoided.

The PMT stages are equipped with a low voltage actuator, showing a travel of approx. 40 μm at 150 V.

The PMT stages can be combined to xy and xyz arrangements

Micrometer range:	25 mm
Ultrafine adjust range by piezoelement:	approx. 40 μm
Positioning sensitivity by piezo actuator:	10 nm
Driving voltage of piezo element:	+150 V
Electrical capacitance of actuator:	1.2 μF
Electrical connection:	1 m coaxial cable / BNC-connector
Ordering code:	PMT 150/40
Stages for operating voltages 500 V/1000 V on request.	



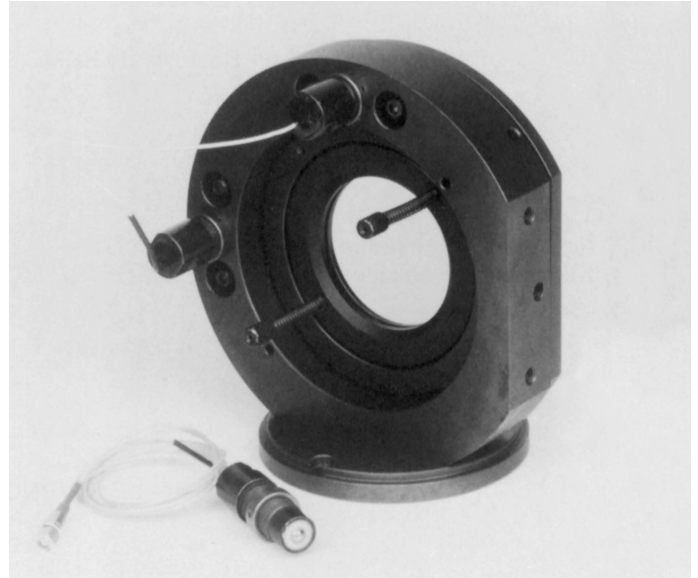
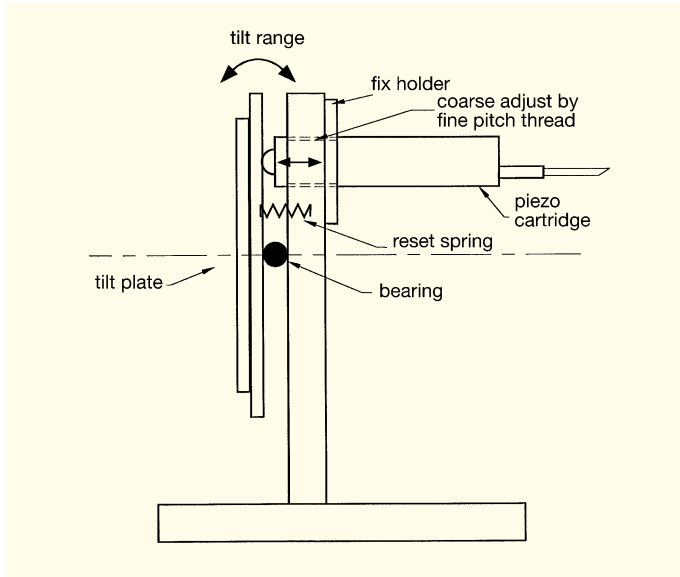
All threads M 4
 All counterbores Inbus M 4
 All dimensions in mm

Frontmount piezo cartridges FPSt 150/5/... M12 x0.5

Stack actuators with front mounting thread offer elegant solutions for implementing piezo drives into optomechanical arrangements featuring coarse and ultrafine adjust within one single element.

(See details in catalog "Piezoelectrical and electrostrictive stack and ring actuators")

Example: Mirror mount with two degrees of freedom



Schematic drawing of a mirror mount based on piezo cartridges for coarse adjust by mounting screw and ultrafine adjustment by piezo action.

Piezo cartridges can withstand high forces or loads, when these are constant during piezo action. This applies to a lot of applications, where a spring induced reset force is applied as in optomechanical arrangements.

To achieve maximum stiffness of the FPSt-mounting a locknut is used.

Standard configuration:

Casing: stainless steel
Electrical connection: 1 m coaxial cable RG 178 with BNC connector

Options:

Coaxial cable RG178 with LEMOSA connectors 00250 or 0S250
Positions detection
ThermoStable

Typ	max. stroke μm	length L mm	el. capacitance nF
FPSt 150/5/20 M12 (BD)	27/20	25	800
FPSt 150/5/30 M12 (BD)	40/30	34	1200
FPSt 150/5/40 M12 (BD)	60/40	43	1600
FPSt 150/5/60 M12 (BD)	80/60	61	2400
FPSt 150/5/80 M12 (BD)	105/80	79	3200
FPSt 150/5/100 M12 (BD)	130/100	97	4000
FPSt 150/5/120 M12 (BD)	160/120	115	4800
FPSt 150/5/140 M12 (BD)	190/140	133	5600

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