

PIFOC High Dynamics Piezo Scanner

Nanopositioning and Scanning System for Microscope Objectives



P-725.xDD

- Shortest settling time under 5 ms with microscope objective
- Travel range 18 μm
- Fine positioning of objectives with sub-nm resolution
- Minimum objective shift due to parallel flexure guiding
- Highest linearity due to direct measuring technology with capacitive sensors
- Inexpensive version with strain gauge sensors
- Compatible with MetaMorph imaging software
- Outstanding lifetime due to PICMA[®] piezo actuators
- QuickLock adapter for easy installation

Fields of application

- Super-resolution microscopy
- Light disc microscopy
- Confocal microscopy
- 3-D imaging
- Screening
- Interferometry
- Measuring technology
- Autofocus systems
- Biotechnology
- Semiconductor tests

Outstanding lifetime thanks to PICMA[®] piezo actuators

The patented PICMA[®] piezo actuators are all-ceramic insulated. This protects them against humidity and failure resulting from an increase in leakage current. PICMA[®] actuators offer an up to ten times longer lifetime than conventional polymer-insulated actuators. 100 billion cycles without a single failure are proven.

Subnanometer resolution with capacitive sensors

Capacitive sensors measure with subnanometer resolution without contacting. They guarantee excellent linearity of motion, long-term stability, and a bandwidth in the kHz range.

High guiding accuracy due to zero-play flexure guides

Flexure guides are free of maintenance, friction, and wear, and do not require lubrication. Their stiffness allows high load capacity and they are insensitive to shock and vibration. They are 100 % vacuum compatible and work in a wide temperature range.

Automatic configuration and fast component exchange

Mechanics and controllers can be combined as required and exchanged quickly. All servo and linearization parameters are stored in the ID chip of the D-sub connector of the mechanics. The autocalibration function of the digital controllers uses this data each time the controller is switched on.

Maximum accuracy due to direct position measuring

Motion is measured directly at the motion platform without any influence from the drive or guide elements. This allows optimum repeatability, outstanding stability, and stiff, fast-responding control.

Specifications

	P-725.CDD	P-725.SDD	Unit	Tolerance
Active axes	Z	Z		
Motion and positioning				
Integrated sensor	Capacitive	SGS		
Travel range at -20 to +120 V, open loop	18	18	μm	+20 % / -0 %
Travel range, closed loop	18	18	μm	
Resolution, open loop	0.2	0.2	nm	typ.
Resolution, closed loop	0.2	0.2	nm	typ.
Linearity error, closed loop	0.04*	0.5	%	typ.
Repeatability	±1.5	±5	nm	typ.
Tilt θ_x , θ_y	2	2	μrad	typ.
Crosstalk in X, Y	150	150	nm	typ.
Mechanical properties				
Stiffness in motion direction	1.5	1.5	N/μm	±20 %
Resonant frequency, no load	1180	1180	Hz	±20 %
Resonant frequency under load, 200 g	450	450	Hz	±20 %
Push/pull force capacity in motion direction	100 / 20	100 / 20	N	max.
Drive properties				
Ceramic type	PICMA® P-887	PICMA® P-887		
Electrical capacitance	3.1	3.1	μF	±20 %
Miscellaneous				
Operating temperature range	-20 to 80	-20 to 80	°C	
Material	Aluminum	Aluminum		
Mass	0.21	0.2	kg	±5 %
Cable length	1.5	1.5	m	±10 mm
Sensor/voltage connection	D-sub 7W2 (m)	LEMO		
Recommended electronics	E-610, E-625, E-665, E-709.CHG, E-754	E-610, E-625, E-665		

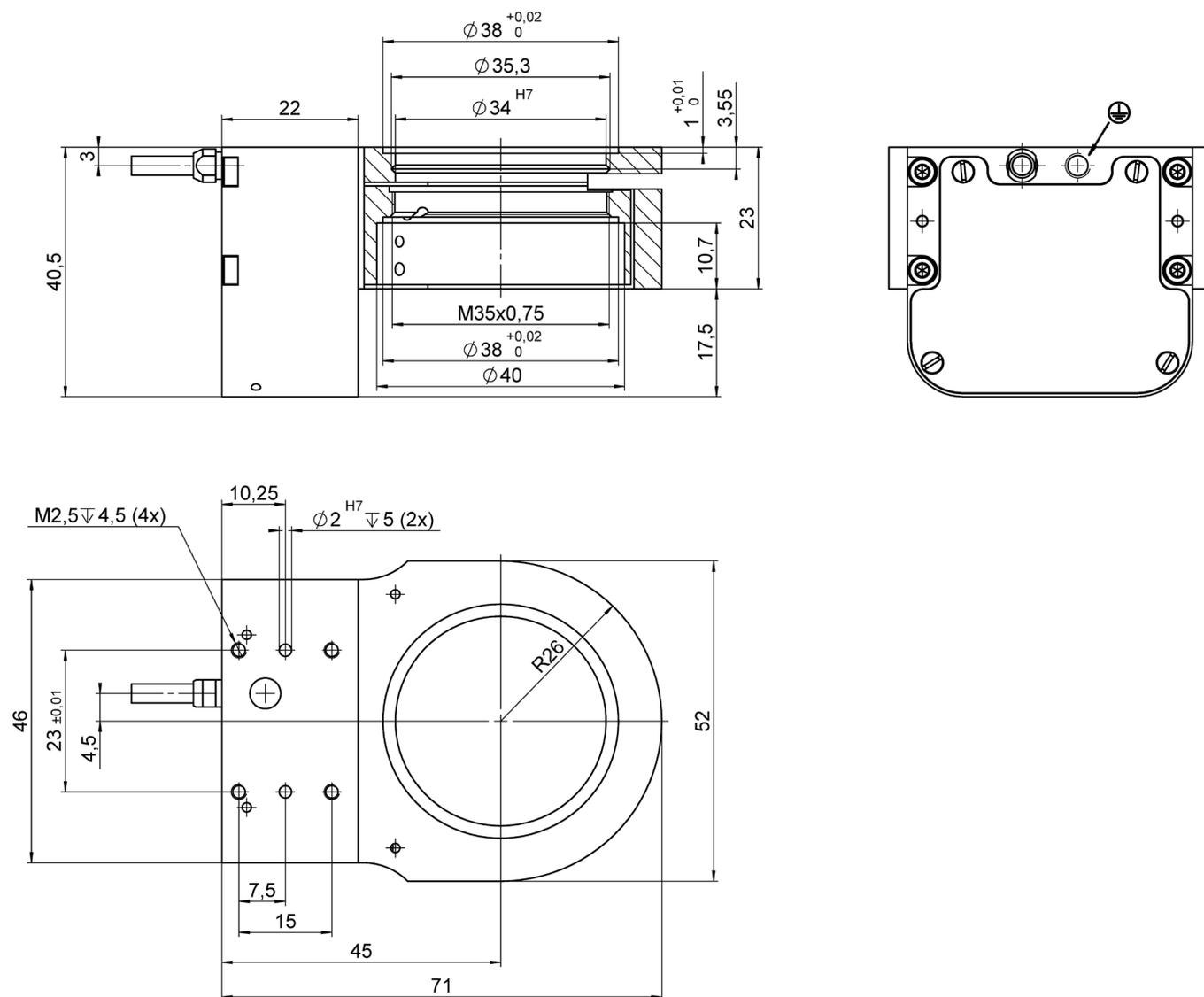
* Nonlinearity of direct drive stages measured with analog controllers is typically up to 0.1 %.

The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

All specifications based on room temperature (22 °C ±3 °C).

Ask about customized versions.

Drawings / Images



P-725.xDD, dimensions in mm

Ordering Information

P-725.CDD

Fast PIFOC piezo nanofocusing system, 18 μm , capacitive sensor, D-sub connector, for QuickLock adapter

P-725.SDD

Fast PIFOC piezo nanofocusing system, 18 μm , strain gauge sensor, LEMO connectors, for QuickLock adapter