

PIFOC High-Load Objective Scanner

Highly Dynamic Scanning System with Long Travel Range for Heavy Objectives



P-726

- Highly dynamic positioning and scanning for large objectives
- Resonant frequency 1120 Hz; 560 Hz with 210 g objective mass
- Typ. step-and-settle about 6 ms
- Travel range 100 μm
- Highest linearity, stability, and control dynamics due to direct-measuring capacitive sensors
- Resolution 0.3 nm
- Zero-play, high-precision flexure guide system for better focus stability

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

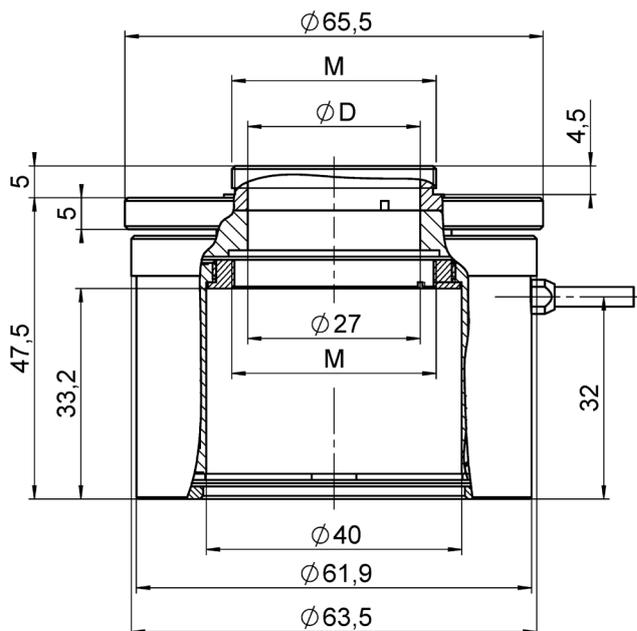
	P-726.1CD	Unit	Tolerance
Active axes	Z		
Motion and positioning			
Integrated sensor	Capacitive / direct measuring		
Travel range, closed loop	100	µm	
Resolution, closed loop	0.4	nm	typ.
Resolution, open loop	0.3	nm	typ.
Linearity error, closed loop	0.02	%	typ.
Repeatability	±3	nm	typ.
Crosstalk in X, Y	50	nm	typ.
Mechanical properties			
Stiffness in motion direction	3.4	N/µm	±20 %
Resonant frequency, no load	1120	Hz	±20 %
Resonant frequency, under load, 210 g	560	Hz	±20 %
Resonant frequency, under load, 310 g	480	Hz	±20 %
Push/pull force capacity in motion direction	100 / 50	N	max.
Load capacity	20	N	max.
Drive properties			
Piezo ceramic type	PICMA® P-885		
Electrical capacitance	6	µF	±20 %
Miscellaneous			
Operating temperature range	-20 to 80	°C	
Material	Aluminum, steel		
Objective thread	M32		
Mass	575	g	±5 %
Cable length	1.5	m	±10 mm
Sensor/voltage connection	D-sub 7W2 (m)		
Recommended electronics	E-505, E-621, E-625, E-665, E-709, E-754		

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.

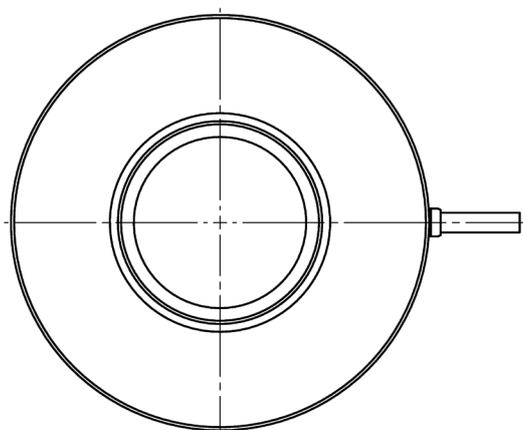
All specifications based on room temperature (22 °C ±3 °C).

Ask about customized versions.

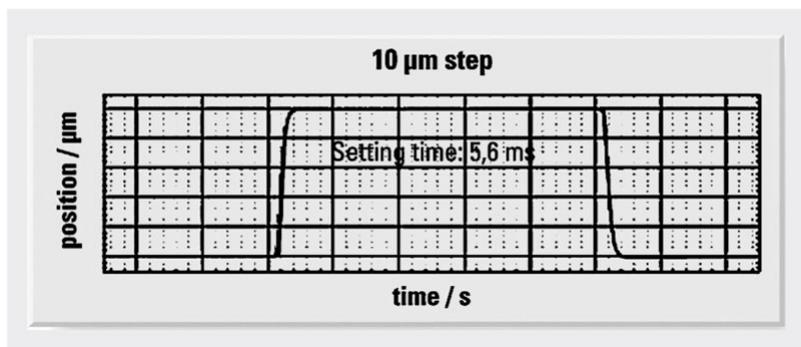
Drawings / Images



Quicklock	M	D
P-726.04	M28x0,75	23
P-726.05	M32x0,75	27
P-726.06	M26x1/36"	21
P-726.11	M25x0,75	21
P-726.12	W0,8x1/36"	16



P-726 with QuickLock thread adapter, dimensions in mm



Settling behavior of the P-726 under load

Microscope Turret



Knurled Ring



Turret Ring



PIFOC



Objective Ring



Objective

Exploded view of the P-726 QuickLock adapter with P-726 PIFOC (mounting tools in the scope of delivery)

Ordering Information

P-726.1CD

High dynamics PIFOC piezo nanofocusing system, 100 μm , capacitive sensor