

XZ and XYZ Nanopositioner

Compact Two-Axis Piezo System for Nanopositioning



P-611.XZ • P-611.2

- Compact: Surface 44 mm × 44 mm
- Travel range to 120 μm × 120 μm
- Resolution to 0.2 nm
- Particularly inexpensive systems (mechanics and controller)
- Zero-play, high-precision flexure guide system
- Outstanding lifetime due to PICMA® piezo actuators
- Also available as linear and Z stage, and as XYZ version

Fields of application

- Interferometry
- Microscopy
- Nanopositioning
- Biotechnology
- Test procedures and quality assurance
- Photonics
- Fiber positioning
- Semiconductor technology

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.

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.

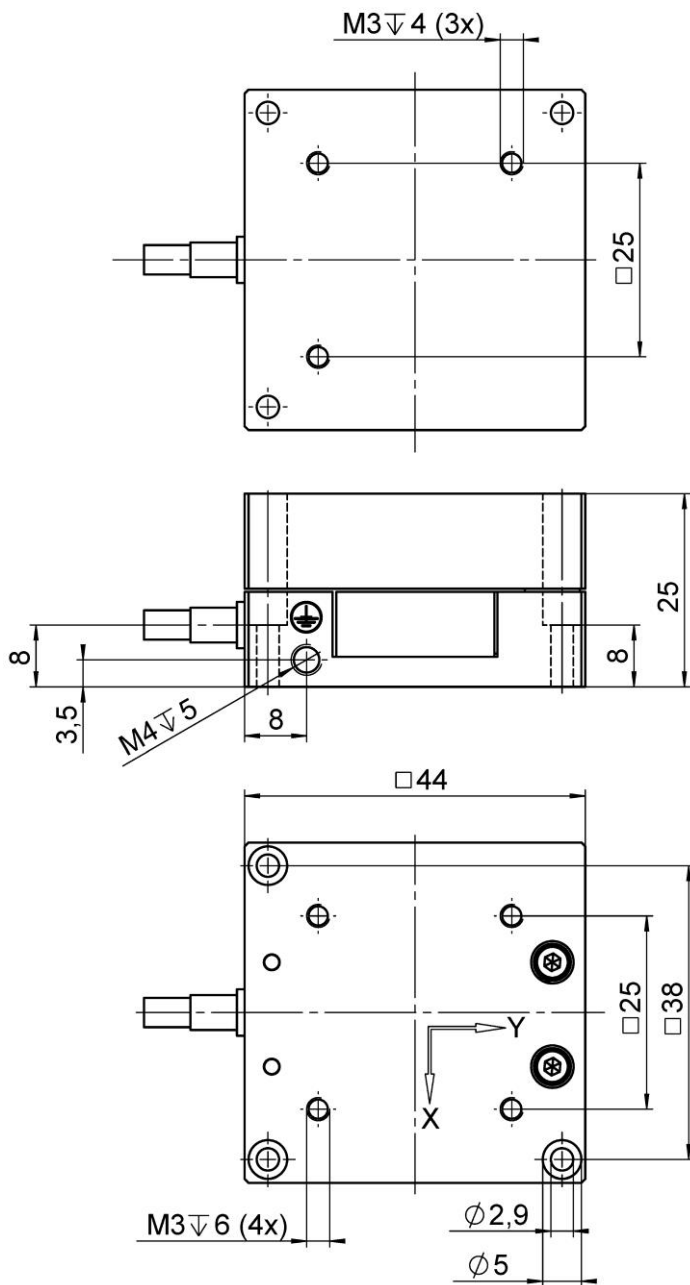
Specifications

	P-611.2S	P-611.20	P-611.XZS	P-611.XZ0	Unit	Tolerance
Active axes	X, Y	X, Y	X, Z	X, Z		
Motion and positioning						
Integrated sensor	SGS	–	SGS	–		
Travel range at -20 to 120 V, open loop	120	120	120	120	µm	+20 % / - 0 %
Travel range, closed loop	100	–	100	–	µm	
Resolution, open loop	0.2	0.2	0.2	0.2	nm	typ.
Resolution, closed loop	2	–	2	–	nm	typ.
Linearity error	0.1	–	0.1	–	%	typ.
Repeatability	<10	–	<10	–	nm	typ.
Pitch in X, Y	±5	±5	±5	±5	µrad	typ.
Tilt θ_x (motion in Z)	–	–	±10	±10	µrad	typ.
Yaw in X	±20	±20	±20	±20	µrad	typ.
Yaw in Y	±10	±10	–	–	µrad	typ.
Tilt θ_y (motion in Z)	–	–	±10	±10	µrad	typ.
Mechanical properties						
Stiffness	0.2	0.2	0.2 Z: 0.35	0.2 Z: 0.35	N/µm	±20 %
Resonant frequency, no load	X: 345; Y: 270	X: 345; Y: 270	X: 365; Z: 340	X: 365; Z: 340	Hz	±20 %
Resonant frequency, under load, 30 g	X: 270; Y: 225	X: 270; Y: 225	X: 280; Z: 295	X: 280; Z: 295	Hz	±20 %
Resonant frequency, under load, 100 g	X: 180; Y: 165	X: 180; Y: 165	X: 185; Z: 230	X: 185; Z: 230	Hz	±20 %
Push/pull force capacity in motion direction	15 / 10	15 / 10	15 / 10	15 / 10	N	max.
Load capacity	15	15	15	15	N	max.
Drive properties						
Ceramic type	PICMA® P-885	PICMA® P-885	PICMA® P-885	PICMA® P-885		
Electrical capacitance	1.5	1.5	1.5	1.5	µF	±20 %
Miscellaneous						
Operating temperature range	-20 to 80	-20 to 80	-20 to 80	-20 to 80	°C	
Material	Aluminum, steel	Aluminum, steel	Aluminum, steel	Aluminum, steel		
Dimensions	44 mm × 44 mm × 25 mm	44 mm × 44 mm × 25 mm	44 mm × 44 mm × 34 mm	44 mm × 44 mm × 34 mm		
Mass	0.235	0.235	0.27	0.27	kg	±5 %
Cable length	1.5	1.5	1.5	1.5	m	±10 mm
Sensor connection	LEMO	–	LEMO	–		
Voltage connection	LEMO	LEMO	LEMO	LEMO		
Recommended electronics	E-503, E-505, E-663, E-664, E-727	E-503, E-505, E-663, E-664, E-727	E-503, E-505, E-663, E-664, E-727	E-503, E-505, E-663, E-664, E-727		

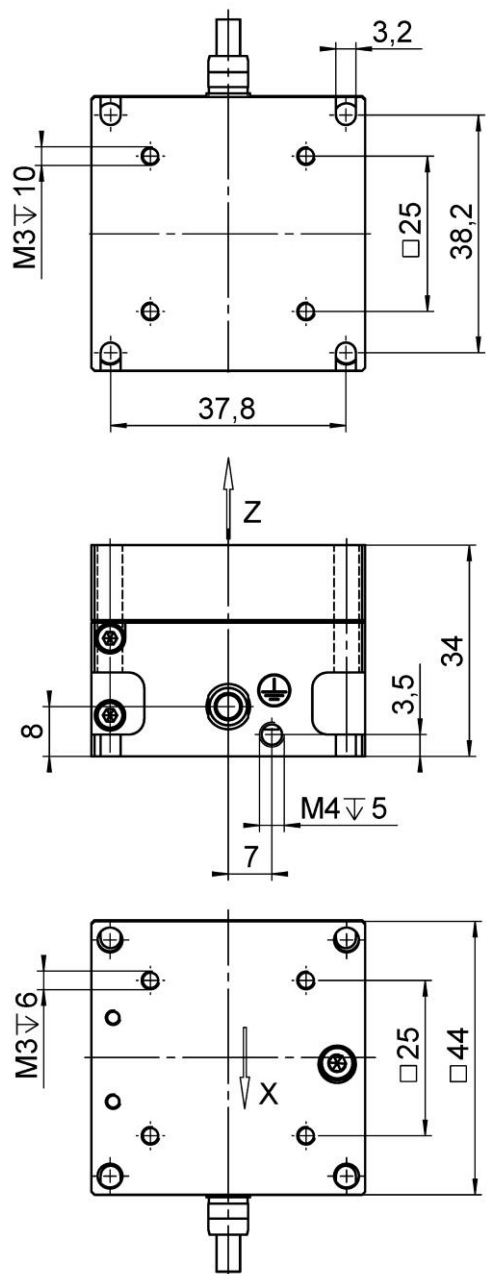
The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

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

Drawings / Images



P-611.2S, dimensions in mm



P-611.XZS, dimensions in mm

Ordering Information

P-611.2S

XY nanopositioning system, 100 μm \times 100 μm , strain gauge sensors

P-611.20

XY nanopositioning system, 120 μm \times 120 μm , without sensor

P-611.XZS

XZ nanopositioning system, 100 μm \times 100 μm , strain gauge sensors

P-611.XZ0

XZ nanopositioning system, 120 μm \times 120 μm , without sensor