NanoCube® XYZ Piezo System

Compact Multi-Axis Piezo System for Nanopositioning and Fiber Alignment

P-611.3

- Travel range to 120 µm × 120 µm × 120 µm
- Ultracompact: 44 mm × 44 mm × 44 mm
- Resolution to 0.2 nm
- Fast response behavior
- Zero-play, high-precision flexure guide system
- Outstanding lifetime due to PICMA® piezo actuators
- For fast scanning
- Version with integrated fiber holder
- Particularly inexpensive systems

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.

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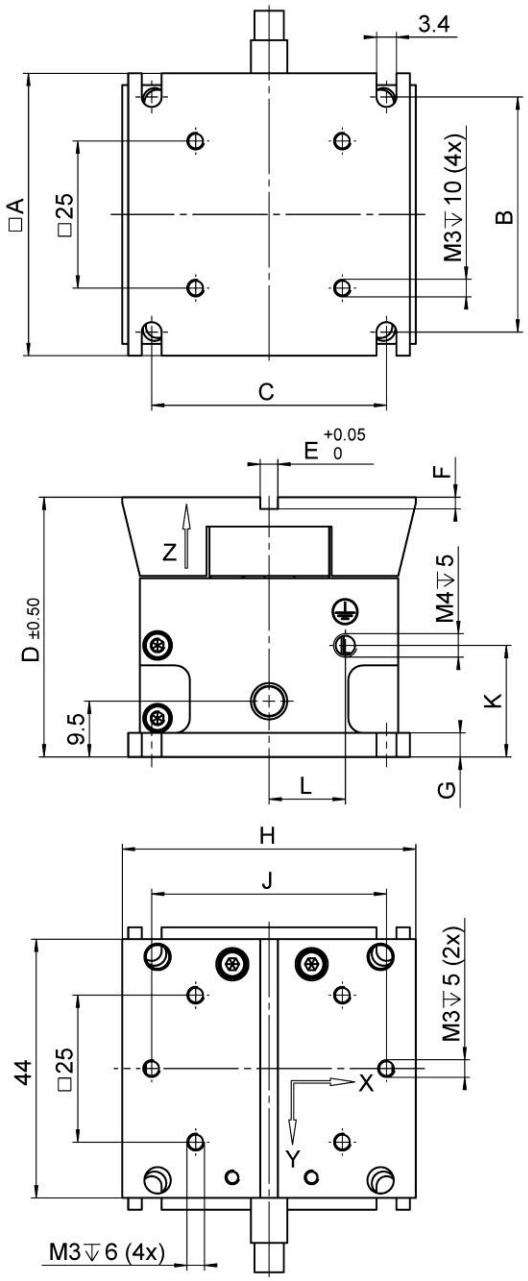
Specifications

	P-611.3S P-611.3SF	P-611.3O P-611.3OF	Unit	Tolerance
Active axes	X, Y, Z	X, Y, Z		
Motion and positioning				
Integrated sensor	SGS			
Travel range at -20 to 120 V, open loop	120 / axis	120 / axis	µm	+20 % / -0 %
Travel range, closed loop	100 / axis	–	µm	
Resolution, open loop	0.2	0.2	nm	typ.
Resolution, closed loop	1	–	nm	typ.
Linearity error	0.1	–	%	typ.
Repeatability	<10	–	nm	typ.
Pitch in X, Y	±5	±5	µrad	typ.
Tilt θ_X (motion in Z)	±10	±10	µrad	typ.
Yaw in X	±20	±20	µrad	typ.
Yaw in Y	±10	±10	µrad	typ.
Tilt θ_Y (motion in Z)	±10	±10	µrad	typ.
Mechanical properties				
Stiffness	0.3	0.3	N/µm	±20 %
Resonant frequency X / Y / Z, no load	350 / 220 / 250	350 / 220 / 250	Hz	±20 %
Resonant frequency under load in X / Y / Z, 30 g	270 / 185 / 230	270 / 185 / 230	Hz	±20 %
Resonant frequency under load in X / Y / Z, 100 g	180 / 135 / 200	180 / 135 / 200	Hz	±20 %
Push/pull force capacity in motion direction	15 / 10	15 / 10	N	max.
Load capacity	15	15	N	max.
Drive properties				
Ceramic type	PICMA® P-885	PICMA® P-885		
Electrical capacitance	1.5	1.5	µF	±20 %
Miscellaneous				
Operating temperature range	-20 to 80	-20 to 80	°C	
Material	Aluminum, steel	Aluminum, steel		
Dimensions	P-611.3S: 44 mm × 44 mm × 43.2 mm P-611.3SF: 48 mm × 50 mm × 44.2 mm	P-611.3O: 44 mm × 44 mm × 43.2 mm P-611.3OF: 44 mm × 50 mm × 44.2 mm		
Mass	0.32	0.32	kg	±5 %
Cable length	1.5	1.5	m	±10 mm
Voltage connection	Sub-D 25 (m)	Sub-D 25 (m)		
Sensor connection	Sub-D 25 (m)	–		
Recommended electronics	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.
Adapter cable with LEMO connectors for sensor and operating voltage available.
All specifications based on room temperature (22 °C ±3 °C).
Ask about customized versions.

Drawings / Images



	A	B	C	D	E	F	G	H	J	K
P-611.3O	44	38.2	37.8	43.2	-	-	3.5	44	-	3.5
P-611.3S	44	38.2	37.8	43.2	-	-	3.5	44	-	3.5
P-611.3OF	44	38.2	37.8	44.2	3	2	3.5	50	40	3.5
P-611.3SF	48	40	40	44.2	3	2	4.1	50	40	19

P-611.3, dimensions in mm

Ordering Information

P-611.3S
NanoCube® XYZ nanopositioning system, 100 µm × 100 µm × 100 µm, strain gauge sensors

P-611.3O
NanoCube® XYZ nanopositioning system, 120 µm × 120 µm × 120 µm, without sensor

P-611.3SF
NanoCube® XYZ nanopositioning system, 100 µm × 100 µm × 100 µm, strain gauge sensors, integrated fiber holder

P-611.3OF
NanoCube® XYZ nanopositioning system, 120 µm × 120 µm × 120 µm, without sensor, integrated fiber holder