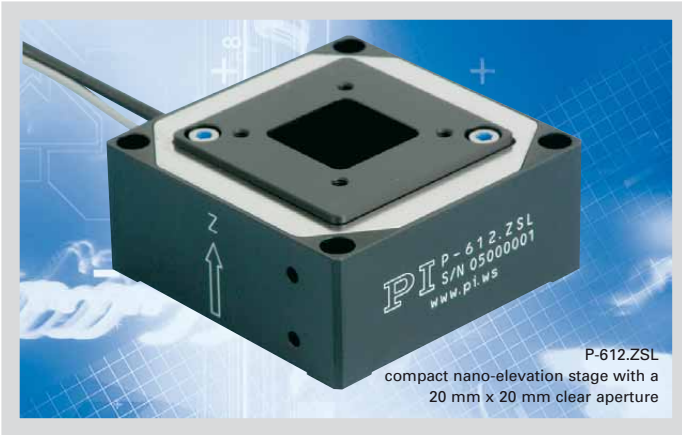


P-612.Z Piezo Z Stage

Compact Nanopositioning Stage with Aperture



- Travel Range 100 μm
- Resolution to 0.2 nm
- Linearity 0.2 %
- Compact: Footprint 60 x 60 mm
- Very Cost-Effective Controller/Piezomechanics Systems
- Frictionless, High-Precision Flexure Guiding System
- Outstanding Lifetime Due to PICMA® Piezo Actuators

These elevation stages are cost-effective, compact, piezo-based positioning systems with travel ranges of 100 μm . The space-saving design features a footprint of only 60 x 60 mm. The 20 x 20 mm clear aperture makes them ideally suited for sample positioning in microscopy. Equipped with PICMA® piezo drives and zero-stiction, zero-friction flexure guiding system, the series pro-

Application Examples

- Interferometry
- Scanning microscopy
- Nanopositioning
- Biotechnology
- Quality assurance testing
- Semiconductor fabrication

vides nanometer-range resolution and millisecond response time.

Position Servo-Control with Nanometer Resolution

High-resolution, broadband, strain gauge sensors (SGS) are applied to appropriate locations on the drive train and measure the displacement of the moving part of the stage relative to the base. The SGS sensors assure optimum position stability in the nanometer range and fast response.

The open-loop models are ideal for applications where fast response and very high resolution are essential, but absolute positioning is not important. They can also be used when the position is controlled by an external sensor

such as an interferometer, a PSD (position sensitive detector), CCD chip / image processing system, or the eyes and hands of an operator.

High Reliability and Long Lifetime

The compact P-612 systems are equipped with preloaded PICMA® high-performance piezo actuators which are integrated into a sophisticated, FEA-modeled, flexure guiding system. The PICMA® actuators feature cofired ceramic encapsulation and thus provide better performance and reliability than conventional piezo actuators. Actuators, guiding system

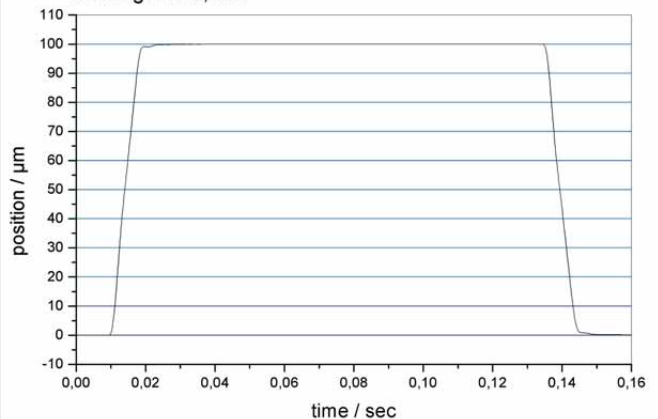
Ordering Information

P-612.ZSL
Vertical Nanopositioning Stage,
100 μm , 20 x 20 mm Aperture,
SGS-Sensor

P-612.Z0L
Vertical Nanopositioning Stage,
100 μm , 20 x 20 mm Aperture,
No Sensor

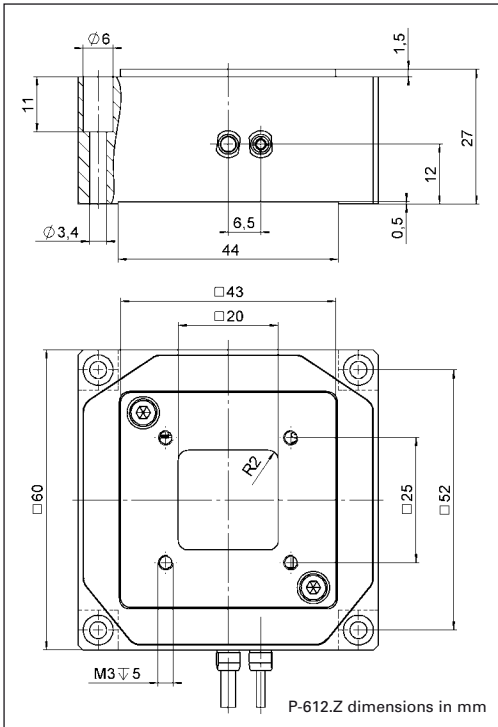
and sensors are maintenance-free, not subject to wear and offer an extraordinary reliability.

P-612.ZSL 100 μm -Step
Settlingtime 9,5ms



Settling takes less than 10 ms over the entire travel range in closed-loop operation





System properties

System configuration	P-612.ZSL and E-625.SR controller, 30 g load
Closed-loop amplifier small signal bandwidth	110 Hz
Closed-loop amplifier large signal bandwidth	80 Hz
Settling time (10% step width)	8 ms

Technical Data

Model	P-612.ZSL	P-612.Z0L	Units	Tolerance
Active axes	Z	Z		
Motion and positioning				
Integrated sensor	SGS	–		
Open-loop travel, -20 to +120 V	110	110	µm	min. (+20%/-0%)
Closed-loop travel	100	–	µm	calibrated
Open-loop resolution	0.2	0.2	nm	typ.
Closed-loop resolution	1.5	–	nm	typ.
Linearity, closed-loop	0.2	–	%	typ.
Repeatability	±4	–	nm	typ.
Runout θ_x, θ_y	±10	±10	µrad	typ.
Crosstalk X, Y	±20	±20	µm	typ.
Mechanical properties				
Stiffness in motion direction	0.63	0.63	N/µm	±20%
Unloaded resonant frequency	490	490	Hz	±20%
Resonant frequency under load	420 (30 g)	420 (30 g)	Hz	±20%
Load capacity	15 / 10	15 / 10	N	Max.
Drive properties				
Ceramic type	PICMA® P-885	PICMA® P-885		
Electrical capacitance	3	3	µF	±20%
Dynamic operating current coefficient	3.8	3.8	µA/(Hz • µm)	±20%
Miscellaneous				
Operating temperature range	-20 to 80	-20 to 80	°C	
Material	Aluminum	Aluminum		
Mass	0.28	0.275	kg	±5%
Cable length	1.5	1.5	m	±10 mm
Sensor / voltage connection	LEMO	LEMO (no sensor)		

Linear Actuators & Motors

Nanopositioning / Piezoelectrics

Piezo Flexure Stages / High-Speed Scanning Systems

Linear

Vertical & Tip/Tilt

2- and 3-Axis

6-Axis

Fast Steering Mirrors / Active Optics

Piezo Drivers / Servo Controllers

Single-Channel

Multi-Channel

Modular

Accessories

Piezoelectrics in Positioning

Nanometrology

Micropositioning

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Resolution of PI Piezo Nanopositioners is not limited by friction or stiction. Value given is noise equivalent motion with E-503 amplifier. (p. 2-146) Recommended controller / amplifier E-610 servo controller / amplifier card (p. 2-110), E-625 servo-controller, bench-top (p. 2-114), E-665 high-power servo-controller with display, bench-top (p. 2-116), E-660 bench-top for open-loop systems (p. 2-119)