

P-287

Z/Tilt Piezoelectric Flexure Stage



- Frictionless Precision Flexure Guiding System
- Vertical Travel to 700 μm
- Tilt to 0.7 degrees
- Non-Magnetic Stainless Steel Design

The P-287 is a high-resolution, piezoelectrically driven flexure stage providing tilt up to 12 mrad and vertical travel up to 700 μm at the tip. A ball seat is machined into the tip to decouple any rotation if the P-287 is used as a linear drive. In that case an external guiding system is recommended (e.g. frictionless diaphragm spring).

Working Principle

P-287 positioners are equipped with high-voltage piezoelectric drives (0 to -1000 V) integrated into a zero stiction/friction, ultra-high-resolution, wire-EDM-cut flexure motion amplifier system. The linear motion of the piezo translator produces an arc motion of the tip.

Application Examples

- Wafer inspection
- Nanopositioning
- Medical analysis
- Biology
- Optics

Notes

See the "Selection Guide" on p. 2-14 *ff.* for comparison with other nanopositioning systems.

Technical Data

Models	P-287.70	Units	Notes see p. 2-84
Active axes	$\theta_x, (Z)$		
Open-loop travel @ 0 to -1000 V	12 (700)	mrad, (μm at tip) $\pm 20\%$	A4
* Open-loop resolution	0.2 (7)	μrad (nm at tip)	C0
Stiffness (in operating direction)	0.13 (at tip)	N/ μm $\pm 20\%$	D1
Push / pull force capacity (in operating direction)	80 / 10	N	D3
Electrical capacitance	290	nF $\pm 20\%$	F1
** Dynamic operating current coefficient (DOCC)	30	$\mu\text{A}/(\text{Hz} \times \text{mrad})$	F2
	0.5	$\mu\text{A}/(\text{Hz} \times \mu\text{m}$ at tip)	
Unloaded resonant frequency	380	Hz $\pm 20\%$	G2
Operating temperature range	- 40 to 80	$^{\circ}\text{C}$	H2
Voltage connection	VH		J1
Weight (with cables)	195	g $\pm 5\%$	
Body material	N-S		L
Recommended amplifier/controller (codes explained p. 2-17)	B, I		

* For further information see p. 2-8. Resolution of PI piezo nanopositioners is not limited by friction or stiction. The value given is noise equivalent motion with E-507 amplifier.

** Dynamic Operating Current Coefficient in μA per Hz and mrad (μm).

Example: Sinusoidal scan of 10 mrad at 10 Hz requires approximately 3 mA drive current.

Ordering Information

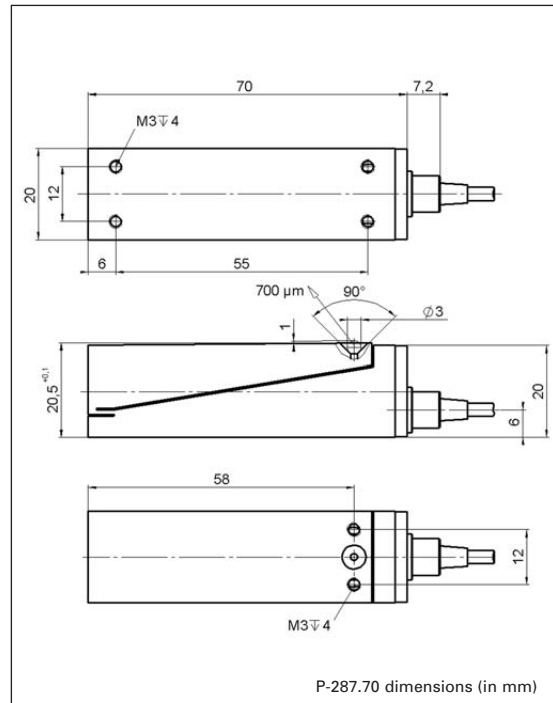
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Vertical / Tilt Piezo Flexure Stage, 12 mrad, 700 μm

Options:

P-703.20

High-Vacuum Modification



Piezo Actuators

Nanopositioning & Scanning Systems

Active Optics / Steering Mirrors

Tutorial: Piezo-electrics in Positioning

Capacitive Position Sensors

Piezo Drivers & Nanopositioning Controllers

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