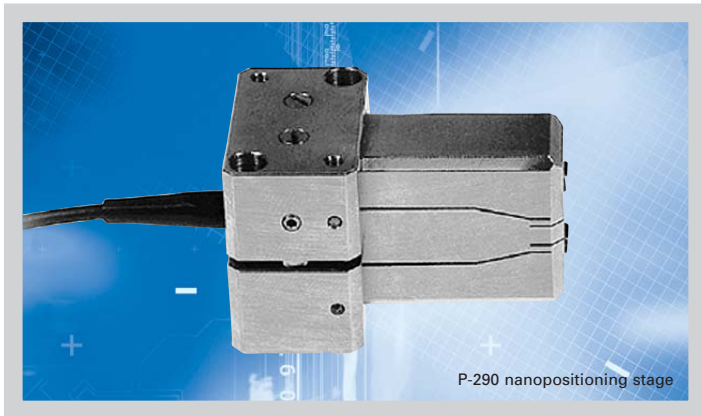


# P-290

## Long-Travel Piezoelectric Z-Nanopositioning Flexure Stage / Actuator



P-290 nanopositioning stage

- Vertical Travel to 1000  $\mu\text{m}$
- Integrated Double-Flexure Motion Amplifier
- Non-Magnetic Stainless Steel Design

The P-290 is a unique, piezo-electrically driven elevator stage providing a 1000  $\mu\text{m}$  stroke. It is designed for high-resolution static and low-frequency dynamic positioning applications.

### Working Principle

The P-290 is a vertical positioning platform based on a piezo-electric drive system. The drive system consists of two stacked piezo flexure tilt positioners (similar to P-287) machined from one solid piece of stainless steel. Each of the two tilt positioners is equipped with a high-voltage piezoelectric stack actuator (0 to -1000 V) integrated into a zero stiction, zero-friction, wire-EDM-cut flexure motion amplifier system. The positioning platform is guided by linear ball bearings to eliminate tilt.

### Application Examples

- Wafer inspection
- Nanopositioning
- Medical analysis
- Biotechnology
- Optics

### Ordering Information

**P-290.00**  
Z Piezo Flexure Stage, 1000  $\mu\text{m}$

#### Options:

**P-703.20**  
High-Vacuum Modification, see the "Piezo Actuators" section, p. 1-44

Ask about custom designs!

### Notes

See the "Piezo Drivers & Nanopositioning Controllers"

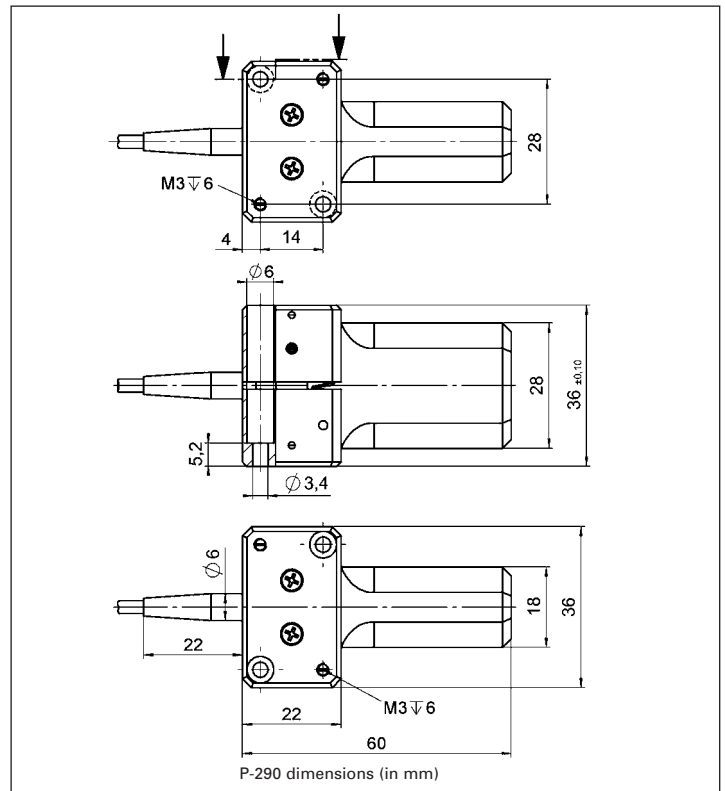
### Technical Data

Models	P-290.00	Units	Notes see p. 2-84
Active axes	Z		
Open-loop travel @ 0 to -1000 V	1000	$\mu\text{m} \pm 20\%$	A4
* Open-loop resolution	20	nm	C0
Stiffness	0.07	N/ $\mu\text{m} \pm 20\%$	D1
Push / pull force capacity (in operating direction)	(50 / 10)	N	D3
Max. ( $\pm$ ) normal load	50	N	D4
Electrical capacitance	500	nF $\pm 20\%$	F1
** Dynamic operating current coefficient (DOCC)	0.63	$\mu\text{A}/(\text{Hz} \times \mu\text{m})$	F2
Unloaded resonant frequency	100	Hz $\pm 20\%$	G2
Operating temperature range	-20 to 80	$^{\circ}\text{C}$	H2
Weight (with cables)	280	g $\pm 5\%$	
Body material	N-S, 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  $\mu\text{A}$  per Hz and  $\mu\text{m}$ .

Example: Sinusoidal scan of 300  $\mu\text{m}$  at 5 Hz requires approximately 1 mA drive current.



section, p. 6-8 ff. for our comprehensive line of low-noise control electronics.

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