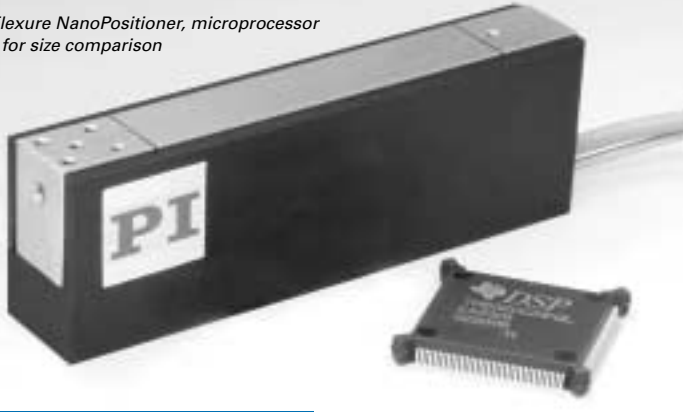


P-783

Vertical Piezo Flexure NanoPositioner

P-783 Flexure NanoPositioner, microprocessor shown for size comparison



Application Examples

- Metrology
- Wafer inspection
- PCB inspection
- Nanopositioning
- Switching
- Biotechnology
- Micromanipulation

- Z-Travel to 300 μm
- Internal Motion Amplifier
- Resolution < 10 nm

The P-783 Piezo Flexure Stage is a compact, long-travel actuator providing a positioning and scanning range of up to 300 μm . It is designed for applications with loads ranging typically from a few grams to a few hundred grams.

Notes

See the "PZT Control Electronics" section for our comprehensive line of low-noise modular and OEM control electronics for computer and manual control.

Long Travel Range

The integrated motion amplifier provides a large travel range in a very compact package. An LVDT (linear variable differential transformer) feedback sensor is integrated in the unit for closed-loop operation with excellent repeatability.

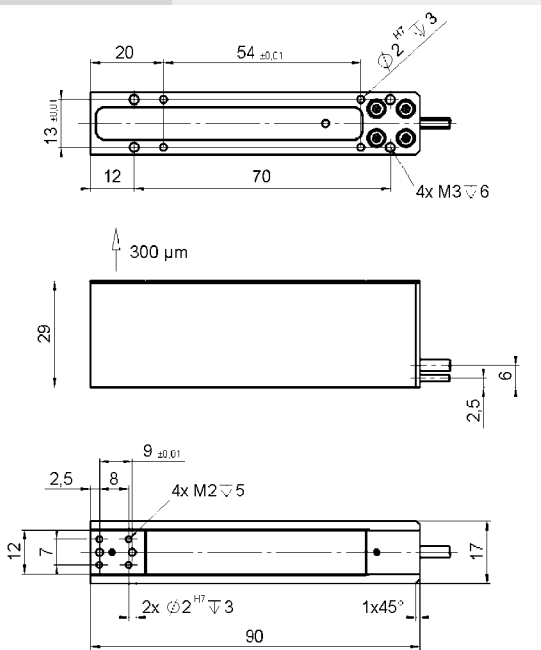
Working Principle

The P-783 is equipped with a low-voltage piezoelectric drive (0 to 100 V) integrated into a sophisticated flexure guiding system. The force exerted by the piezo drive pushes a multi-flexure parallelogram via an integrated motion amplifier. The wire-EDM-cut flexures are FEA-modeled for zero stiction/friction, ultra-high resolution and exceptional guiding

precision. An integrated LVDT position feedback sensor provides nanometer-scale resolution and stability in closed-loop operation (with PI electronics as recommended).

Ordering Information

P-783.ZL
 Vertical PZT Flexure Stage,
 300 μm , LVDT Sensor
Custom Designs for Volume Buyers



P-783 dimensions (in mm)

Technical Data

Models	P-783.ZL	Units	Notes see p. 2-44
Active axes	Z		
Open-loop travel @ 0 to 100 V	300	$\mu\text{m} \pm 20\%$	A2
Closed-loop travel \geq	300	μm	A5
Integrated feedback sensor	LVDT		B
Closed-loop / open-loop ** resolution \leq	10 / 1	nm	C1
Closed-loop linearity (typ.)	0.1	%	
Full-range repeatability (typ.)	± 15	nm	C3
Stiffness	0.15	N/ $\mu\text{m} \pm 20\%$	D1
Push/pull force capacity (in operating direction)	20/10	N	D3
Max. normal load	+2/-0.5	kg	D4
Lateral force limit	0.5	N	D5
Lateral runout (tip/tilt) (typ.)	10 / 25	μrad	E1
Electrical capacitance	5.4	$\mu\text{F} \pm 20\%$	F1
* Dynamic operating current coefficient (DOCC)	2	$\mu\text{A}/(\text{Hz} \times \mu\text{m})$	F2
Unloaded resonant frequency	300	Hz $\pm 20\%$	G2
Resonant frequency @ 24 g load	240	Hz $\pm 20\%$	G3
Resonant frequency @ 100 g load	160	Hz $\pm 20\%$	G3
Operating temperature range	- 20 to 80	$^{\circ}\text{C}$	H2
Voltage connection	VL		J1
Sensor connection	L		J2
Weight (with cables)	160	g $\pm 5\%$	
Body material	Al, (platform: steel)		L
Recommended Amplifier/Controller (codes explained p. 6-46)	H, E		

* Dynamic Operating Current Coefficient in μA per hertz and μm . Example: Sinusoidal scan of 30 μm at 10 Hz requires approximately 0.6 mA drive current.

** Resolution of PZT NanoPositioners is not limited by friction or stiction. Noise equivalent motion with E-503 amplifier.