

This product family has been replaced by the following new product:

>> P-601 PiezoMove™ Z-Actuator

P-783

Piezoelectric Z-Nanopositioning Stage / Actuator with Direct Metrology



Ordering Information

P-783.ZL
Vertical Piezo Flexure Stage,
300 μm, LVDT Sensor

Ask about custom designs!

the actual distance between the fixed frame and the moving part of the stage. This results in higher motion linearity, long-term stability, phase fidelity, and—because external disturbances are seen by the sensor immediately—a stiffer, faster-responding servo-loop. See p. 2-4 ff. and p. 5-2 ff. for more information.

- Z-Travel to 300 μm
- Low Profile
- Frictionless Precision Flexure Guiding System
- Internal Motion Amplifier
- Closed-Loop Resolution <10 nm
- PICMA® High-Performance Piezo Drives

Working Principle / Reliability

P-783 nanopositioning stages are equipped with the award winning PICMA® piezo drives, integrated into a sophisticated flexure guiding system. The wire-EDM-cut flexures are FEA

Long Travel Range

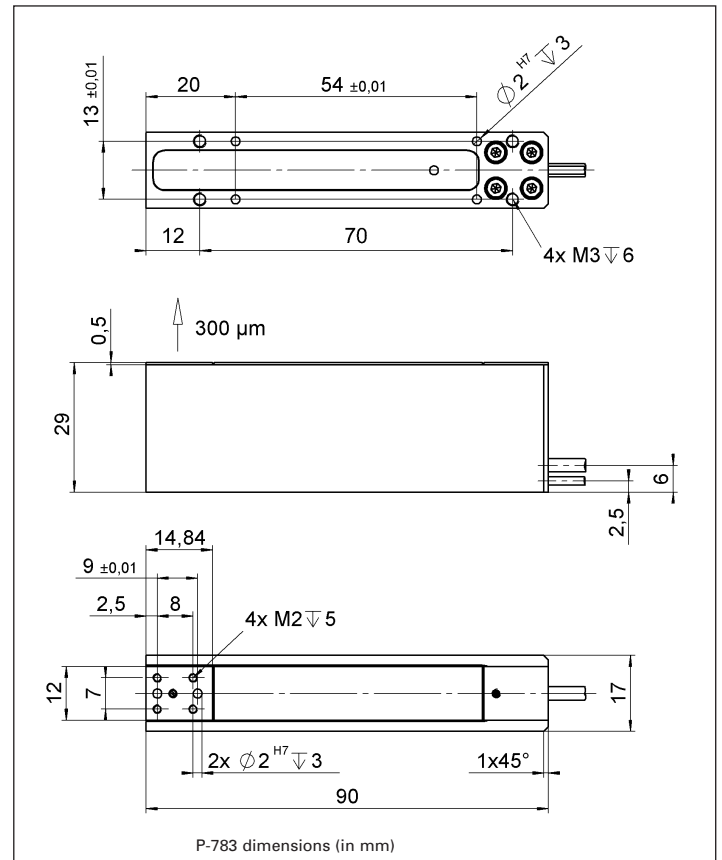
The P-783 piezo nano-Z-axis stage is a compact, closed-loop actuator providing a positioning and scanning range of up to 300 μm. It is designed for applications with loads ranging from a few grams to a few hundred grams.

Direct-Metrology LVDT Sensor

P-783 stages feature direct-measuring, non-contact LVDT sensors (direct metrology). Unlike indirect sensors, direct-metrology sensors measure

Application Examples

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



modeled for zero stiction, zero friction and exceptional guiding precision. The ceramic-encapsulated PICMA® drives are more robust than conventional piezo actuators, featuring superior lifetime and performance in both dynamic and static applications.

Because guidance, actuators and sensors are all frictionless and maintenance-free, these nanopositioning systems achieve outstanding levels of reliability.

Notes

See the “Piezo Drivers & Nanopositioning Controllers” 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.

Technical Data

Models	P-783.ZL	Units	Notes see p. 2-84
Active axes	Z		
Open-loop travel @ 0 to 100 V	300	µm ±20%	A2
Closed-loop travel	300	µm	A5
Integrated feedback sensor	LVDT		B
* Closed-loop / open-loop resolution	10 / 1	nm	C1
Closed-loop linearity (typ.)	0.1	%	
Full-range repeatability (typ.)	±15	nm	C3
Stiffness	0.15	N/µm ±20%	D1
Push / pull force capacity (in operating direction)	20 / 10	N	D3
Max. normal load	+20 / -5	N	D4
Lateral force limit	0.5	N	D5
Lateral runout (tip/tilt) (typ.)	10 / 25	µrad	E1
Electrical capacitance	5.4	µF ±20%	F1
** Dynamic operating current coefficient (DOCC)	2	µA/(Hz x µm)	F2
Unloaded resonant frequency	300	Hz ±20%	G2
Resonant frequency @ 24 g load	240	Hz ±20%	G3
Resonant frequency @ 100 g load	160	Hz ±20%	G3
Operating temperature range	-20 to 80	°C	H2
Voltage connection	VL		J1
Sensor connection	L		J2
Weight (with cables)	160	g ±5%	
Body material	Al, (platform: steel)		L
Recommended amplifier/controller (codes explained p. 2-17)	H, E		

* For calibration 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-503 amplifier.

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

Piezo Actuators

Nanopositioning & Scanning Systems

Active Optics / Steering Mirrors

Tutorial: Piezo-electrics in Positioning

Capacitive Position Sensors

Piezo Drivers & Nanopositioning Controllers

Hexapods / Micropositioning

Photonics Alignment Solutions

Motion Controllers

Ceramic Linear Motors & Stages

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