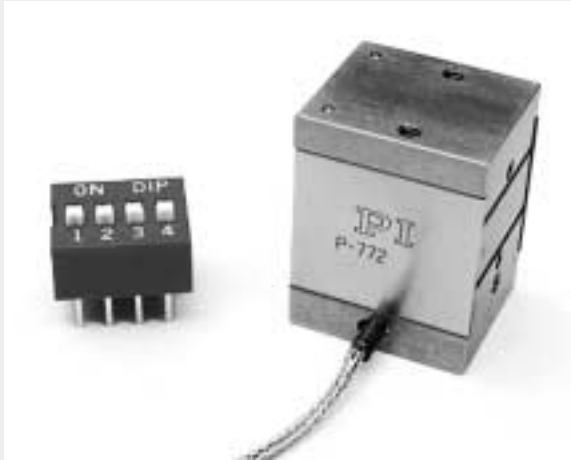


P-772

**Ultra-Compact PZT
NanoAutomation® Stages**



P-772.1CD
Flexure NanoPositioner
(DIP switch for size comparison)

- **Ideal for Head/Media Test & Fiber Optics**
- **Smallest Flexure-Guided Stage with Capacitive Feedback**
- **Resolution < 0.1 nm**
- **Ultra-Fast Response (1.7 kHz Resonant Frequency)**
- **ID Chip for AutoCalibrate Function**

P-772 NanoAutomation® stages are the smallest flexure-guided NanoPositioners with integrated capacitive feedback currently available on the market. They provide a positioning and scanning range of up to 10 µm, sub-nanometer resolution and ultra-fast response. P-772 stages are designed for applications with loads up to 100 grams.

AutoCalibration

For optimized operation and interchangeability of the nanomechanics and controller, model P-772.1CD is equipped with an ID chip which holds all calibration data and sends it to the digital controller (e.g. E-750.CP) when powered up. Model P-772.1CL can be used with analog and digital controllers.

Working Principle

P-772 are 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 capacitive position feedback sensor provides sub-nanometer-scale resolution and stability in closed-loop operation (with PI servo-control electronics).

Notes

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

Application Examples

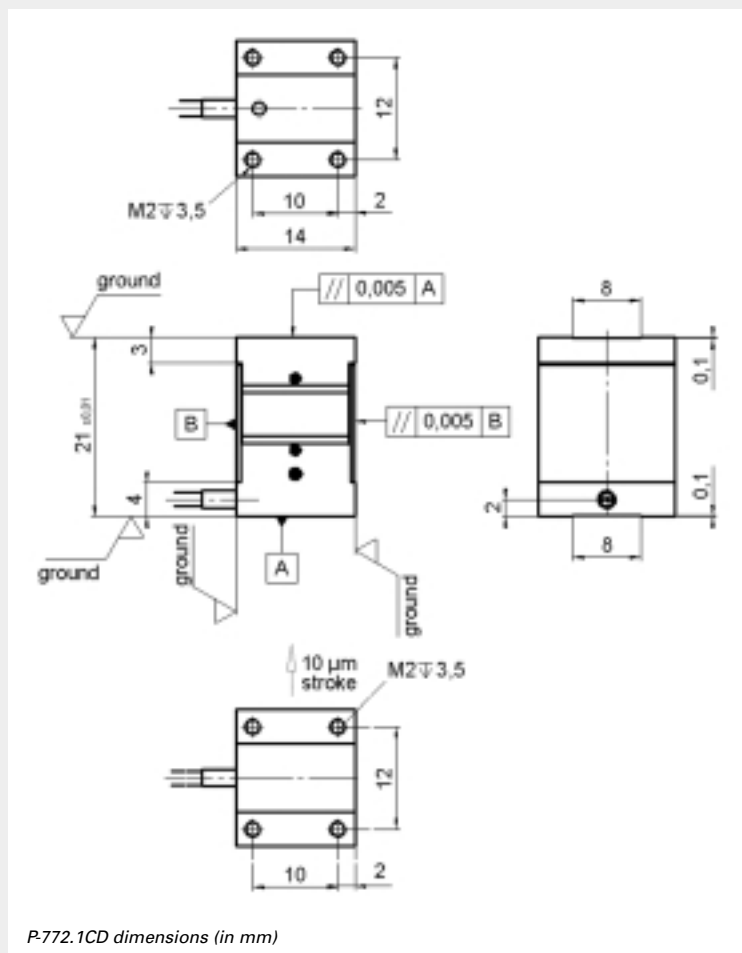
- Head/media test
- Disk drive test
- Laser tuning
- Fiber optics
- Metrology
- Nanopositioning
- Scanning microscopy
- Scanning interferometry
- Biotechnology
- Micromanipulation, etc.

Ordering Information

P-772.1CD
Ultra-Compact NanoAutomation® Stage, Capacitive Sensor, AutoCalibrate, Sub-D Connector

P-772.1CL
Ultra-Compact NanoAutomation® Stage, Capacitive Sensor, Lemo Connector

Custom Designs for Volume Buyers



P-772.1CD dimensions (in mm)

Technical Data

Models	P-772.1CD	P-772.1CL	Units	Notes see p. 2-44
Active axes	X	X		
Open-loop travel @ 0 to 100 V	12	12	$\mu\text{m} \pm 20\%$	A2
Closed-loop travel \geq	10	10	μm	A5
Integrated feedback sensor	capacitive	capacitive		B
Closed-loop / open-loop ** resolution \leq	0.05 / 0.05	0.05 / 0.05	nm	C1
Closed-loop linearity (typ.) ***	0.03	0.03	%	
Full-range repeatability (typ.)	± 1	± 1	nm	C3
Stiffness	7	7	$\text{N}/\mu\text{m} \pm 20\%$	D1
Push/pull force capacity (in operating direction)	50 / 5	50 / 5	N	D3
Max. (+/-) normal load	0.5	0.5	kg	D4
Lateral force limit	10	10	N	D5
Electrical capacitance	0.9	0.9	$\mu\text{F} \pm 20\%$	F1
* Dynamic operating current coefficient (DOCC)	9	9	$\mu\text{A}/(\text{Hz} \times \mu\text{m})$	F2
Unloaded resonant frequency	1700	1700	$\text{Hz} \pm 20\%$	G2
Operating temperature range	- 20 to 80	- 20 to 80	$^{\circ}\text{C}$	H2
Voltage connection	D	VL		J1
Sensor connection	D	2 x C		J2
Weight (w/o cables)	170	170	$\text{g} \pm 5\%$	
Body material	N-S	N-S		L
Recommended Amplifier/Controller (codes explained p. 6-46)	M	H, F, L		

* Dynamic Operating Current Coefficient in μA per hertz and μm .

Example: Sinusoidal scan of $10 \mu\text{m}$ at 10 Hz requires approximately 0.9 mA drive current.

** Resolution of PZT NanoPositioners is not limited by friction or stiction. Noise equivalent motion with E-503, E-710

*** with digital controller