

# P-733

## XY Piezo Nanopositioning / Scanning Stages with Parallel Metrology

>> Click <http://www.pi.ws/fwd/Piezo-Stage> for the Latest Specs on these Products



P-733 flexure nanopositioner is ideal for single molecule microscopy.

- 100 x 100 µm Travel Range
- For XY Scanning & Positioning
- Parallel-Kinematics/Metrology for Enhanced Responsiveness / Multi-Axis Precision
- Precision Flexure-Guiding System
- Integrated Capacitive Sensors for Resolution < 0.3 nm
- 50 x 50 mm Clear Aperture
- Ultra-High Vacuum Version Available
- Ultra-Fast XY and XYZ Versions Available
- PICMA® High-Performance Piezo Drives

P-733 open-frame, XY piezo-driven stages are fast and highly accurate, nanopositioning and scanning systems. They provide a positioning and

scanning range of 100 x 100 µm together with accuracy and resolution in the nanometer and sub-nanometer range. The 50 x 50 mm clear aperture is ideal for transmitted-light applications such as near-field scanning microscopy.

### Application Examples

- Optical trapping
- Scanning microscopy
- Semiconductor test equipment
- Precision mask and wafer alignment
- Scanning interferometry
- Imaging (resolution enhancement)
- Surface structure analysis
- Biotechnology
- Nanomanipulation
- Biophysics

### Higher Precision Through Parallel Kinematics/Metrology

P-733 piezo scanning stages feature a parallel-kinematics design with direct-measuring, non-contact capacitive position sensors (parallel, direct metrology).

Unlike conventional sensors, capacitive sensors measure 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 disturb-

ances 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.

Parallel kinematics means that all actuators act directly on the same moving platform leading to reduced size, inertia and the elimination of microfriction caused by moving cables. The advantages are enhanced dynamics, higher scanning rates, and better reproducibility.

With parallel metrology, all sensors measure the position of the same moving platform against the same stationary reference (the fixed frame). This means that all motion is inside the servo-loop, no matter which actuator may have caused it, resulting in superior multi-axis precision.

### Dynamic Digital Control for Best Scanning Linearity

Use our new digital control electronics with DDL (Dynamic Digital Linearization) to increase linearity and effective bandwidth in scanning applications by up to 1000-fold (see p. 6-16).

### Working Principle / Reliability

P-733 nanopositioning stages are equipped with the award winning PICMA® piezo drives,

### Ordering Information

**P-733.2CL**  
XY Piezo Flexure Stage, 100 x 100 µm, Parallel Metrology, Cap. Sensors, Lemo Connectors

**P-733.2CD**  
XY Piezo Flexure Stage, 100 x 100 µm, Parallel Metrology, Cap. Sensors, Sub-D Connector

**P-733.2UD**  
Ultrahigh Vacuum – XY Piezo Flexure Stage, 100 x 100 µm, Parallel Metrology, Cap. Sensors, Sub-D Connector

**P-733.2ND**  
Non-magnetic Ultrahigh Vacuum – XY Piezo Flexure Stage, 100 x 100 µm, Parallel Metrology, Cap. Sensors, Non-Magnetic, Sub-D Connector

Ask about custom designs!

integrated into a sophisticated, single-module, parallel-kinematics, flexure guiding system. The flexures are FEA-modeled for 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.



P-733.2UD nonmagnetic XY nanopositioner for ultrahigh vacuum up to 10<sup>-6</sup> hPa.

