

P-545 PInano™ Trak High-Speed Piezo Tracking Stage

Fastest XYZ Microscope Stage to Enable use of Full Turret Motion



PInano™ series nanopositioning stages feature a very low profile of 0.8" (20mm) and use a full slide mounted at the bottom. They deliver very fast and highly accurate motion with sub-nanometer resolution in up to 3 axes.

- **Ultra Fast: < 5msec Response Time:**
Ideal for Tracking Applications
- **Low Profile for Easy Integration: 20 mm (0.8")**
- **Full Slide Mounted at Bottom:**
Turret can Rotate w/o Moving Objective in and out
- **Up to 70 x 70 x 50 μm Travel Range**
- **10X Longer Lifetime due to**
Proprietary PICMA® Piezo Technology
- **Cost Effective due to Low-Cost Piezoresistive Sensors**
- **Compatible w/ Leading Image Acquisition Software**
- **Closed-Loop Control for High Repeatability and Accuracy**
- **Sub-Nanometer Resolution and Millisecond Step Time,**
ideal for Super-Resolution Microscopy
- **USB Controller Included**
- **Optional Long Travel Piezomotor / Manual Stage**

High Speed Long Travel, Low Profile, Ideal for Single Molecule Tracking

The new PInano™ XY and XYZ high-speed piezo scanning stages are optimized for easy integration into high resolution microscopes. They feature a very low profile of 0.8" (20 mm), a large aperture, and extremely fast response with subnanometer closed-loop resolution— ideal for leading-edge particle tracking and microscopy applications. Longest lifetime is guaranteed by the integrated ceramic encapsulated PICMA® piezo actuators. Due to the significantly higher humidity resistance, the patented PICMA® design provides up to 10 times longer life than conventional piezo actuators.

Cost Effective Design, High Performance

PInano™ series piezo positioning systems are designed to provide high performance at minimum cost. The system consists of the mechanics and an advanced controller optimized for the piezo stages. For highly stable, closed loop operation, piezoresistive sensors are applied directly to the moving structure and precisely measure the displacement of the stage platform. The very high sensitivity of these sensors provides optimum position stability and responsiveness as well as sub-nanometer resolution. The proprietary servo controller significantly improves the motion linearity compared to conventional piezoresistive sensor controllers.

Working Principle / Reliability

Flexures optimized with Finite Element Analysis (FEA) are employed to guide the PInano™ series stages. FEA techniques give the design the highest possible stiffness in, and perpendicular to, the direction of motion, and to minimize linear and angular runout. Flexures allow extremely high-precision motion, no matter how minute, as they are completely free of play and friction. The award-winning PICMA® piezo 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 maintenance-free, these nanopositioning systems achieve outstanding levels of reliability:

Ordering Information

P-545.2D7

PInano™ Trak XY High-Speed Piezo Tracking Stage with large Aperture, 70x70 μm, Piezoresistive Sensors, with USB Piezo Controller

P-545.3D7

PInano™ Trak XYZ High-Speed Piezo Tracking Stage with large Aperture, 70x70x50 μm, Piezoresistive, Sensors, with USB Piezo Controller

Ask about custom designs!

Application Examples

- Biotechnology
- Microscopy
- Scanning microscopy
- Confocal microscopy
- Semiconductor testing
- Handling

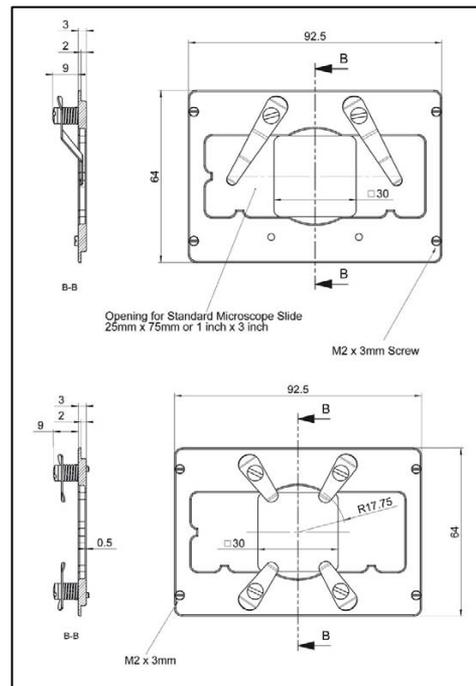


PInano™ XYZ piezo scanner mounted on a M-545.2P long travel, ultrasonic motor microscope stage. The XYZ piezo nanopositioning stages provide <1 nm resolution and are available with up to 200μm scanning range. The high stability and autolocking feature of M-545 provides significant advantages over other microscope stage designs when using fast piezo scanning stages. Request paper on long term stability!

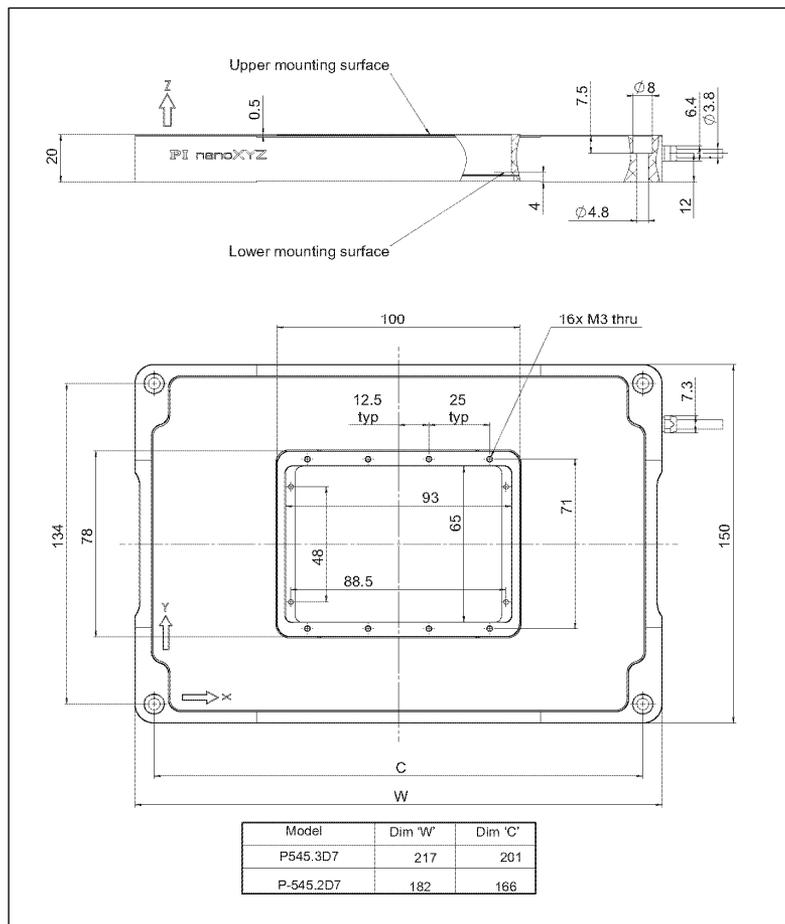
Preliminary Specs

Models	Plnano™ XY	Plnano™ XYZ	Units	Tolerance
Active axes	X,Y	X,Y,Z		
Integrated sensor	Piezoresistive	Piezoresistive		
Closed-loop travel	70 x70	70 x70x50	µm	
*Resolution	<1	<1	Nm	typ.
Linearity	+/-0.1	+/-0.1	%	typ.
Repeatability	<5	<5	Nm	typ.
Push/pull force capacity in motion direction	100 / 30	100 / 30		max.
Max. payload	500	500	g	max.
Drive properties				
Ceramic type	PICMA®	PICMA®		
Recommended operating temp. range	20 to 30	20 to 30	°C	
Material	Aluminum	Aluminum		
Mass	1	1.2	kg	±5%
Cable length	2	2	m	±10 mm

*Resolution of PI Piezo Nanopositioners is not limited by friction or stiction. Value given is noise equivalent motion measured with interferometer



Accessories: P-545.SH3 slide holder (above) and P-545.PD3 petri dish holder (below), dimensions in mm



P-545, Plnano™ piezo stage, dimensions in mm