

Microscope Stage Family with Ultrasonic Linear Drives

Extreme Stability, Low Profile, Fast Response, Direct Position Measurement



Ultrasonic motor XY microscope stage with inserted optional Piezo-Z scanning stage. Stages come with controller, joystick & software

Application Examples

- Biotechnology
- Microscopy
- Scanning microscopy
- Confocal microscopy
- Semiconductor test equipment

- **Integrated Closed-Loop Linear Piezomotor Drives Provide Smooth Motion and High Speed to 150 mm/sec**
- **Significantly Higher Stability than Conventional Lead-screw-Driven Stages: Self-Locking at Rest, no Servo Dither**
- **Travel Ranges to 225x85mm**
- **Integrated Linear Encoders, Sensor Resolution to 0.1 μm**
- **Compact Design, Low Profile, Mounts Directly to Microscope**
- **Compatible with Piezo-Z and Piezo XYZ Scanning Stages**



Customized long travel PILine® microscope stages

Compact Design

All PI microscope stages are designed for excellent stability. The PILine® piezomotor stages excel in precision positioning and automation applications. Their form factors are optimized for a low profile height; the mounting pattern is compatible with a variety of flexure actuated PI piezo nanopositioning / scanning stages.

10X Higher Stability

The PILine® stages are based on a completely different drive principle. than conventional motorized translation stages. The compact integrated piezo-electric linear motors and linear encoders make both the lead screw duct and the bulky flanged, stepper motors employed in traditional stages obsolete. An ultrasonic ceramic piezo linear motor directly drives the moving platform. At rest the motor directly clamps the stage, without holding current, allowing the exceptional long term stability

Compatibility to PI Nanopositioning and Scanning Stages

A number of standard PI piezo flexure stages can be mounted directly on the motorized stage. Depending on the application, these highly specialized, ultra-precise nanopositioning systems provide fast XYZ scanning (for fluorescence microscopy) or Z-motion (3D imaging, Z-stacks).

Inverted and Upright Microscopes

PILine® stages can be designed for inverted or upright microscopes. Talk to us about your application!

Advantages of PI Ultrasonic Motors over Classical Drives

- Self-Locking at rest, no servo dither, no heat
- Smaller Form Factor
- No vibration, smooth motion
- Higher acceleration, speed
- No rotating shafts, gears, ...
- Non-magnetic, vacuum compatible drive principle



M-545 piezomotor microscope stage, 25x25mm travel range The controller and a joystick is included with all systems.

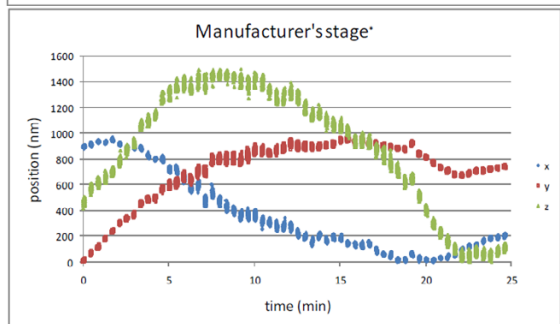
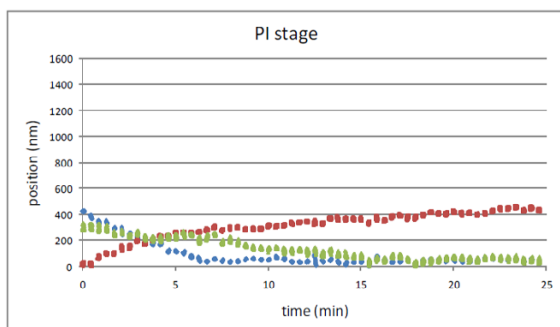
PILine® Microscope Stage Family, General Specs

Description	XY Microscope stage with controller, software and joystick
Travel range	100x75 to 225x85mm
Controller	C-867.262
Joystick	Included (USB)
Compatible piezo-Z / XYZ stages	P-736K003, P-737, PI Mars, PInano™
Max Speed	Up to. 150mm/sec
Resolution	0.1µm
Repeatability	0.4µm
Max load	5 kg
Mass	4kg

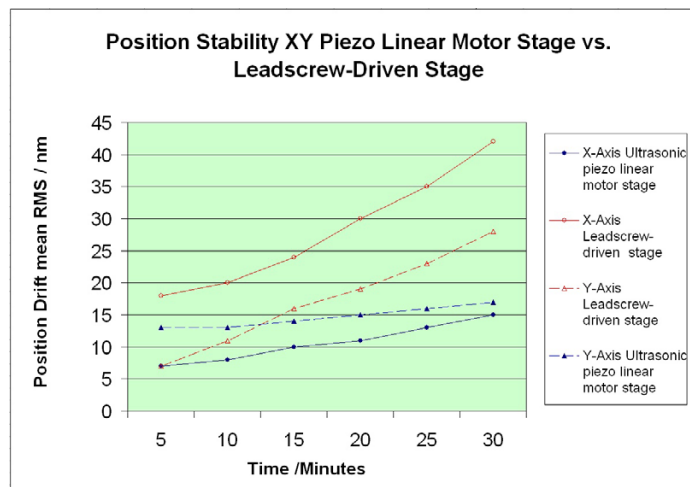


Custom Piezo-Z flexure stage, 200µm Travel, sub-nanometer resolution, millisecond response.

*PILine® Microscope Stages have several advantages over classical stepper and electromagnetic motor stages: Stability: Self clamping, low heat generation at low speed, no heat at rest. Convenience: Lower noise than stepper motors. Precision and stiffness: direct drive and direct metrology encoders. Large dynamic range: Fast response and crisp settling, smooth and high velocity constancy even at low velocities of 20µm/sec.



Stability comparison if a PI M-545 manual microscope stage (top) with a manufacturer's stage (bottom). Green: Z; Red:Y; Blue: X



Position stability of PI M-686 piezomotor stage vs leadscrew driven stage. Excerpt from: Design Considerations for Micro- and Nanopositioning, Leveraging the Latest for Biophysical Applications, Current Pharmaceutical Biotechnology, 2009, 10, 515-521 by S.C. Jordan, and P.C. Anthony. <http://www.bentham.org/cpb/sample/cpb10-5/0008G%5B1%5D.pdf>



M-545 manual microscope stage

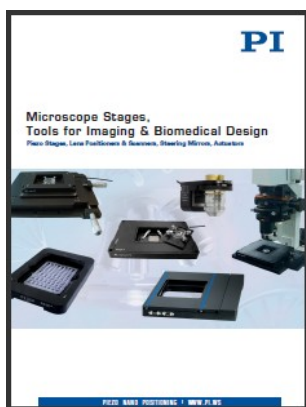


PInano™ low profile XYZ piezo flexure scanning stage

Program Overview

- Piezo Ceramic Actuators & Motors
- Piezo Nanopositioning Systems and Scanners
- Active Optics / Tip-Tilt Platforms
- Capacitive Nanometrology Sensors
- Piezo Electronics: Amplifiers and Controllers
- Hexapod 6-Axis Positioners / Robots
- Micropositioning Stages & Actuators
- Photonics Alignment Systems, Solutions for Telecommunications
- Motor Controllers
- Ultrasonic Linear Motors

Download the Tools for Microscopy Catalog



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