

PZM-2000 OEM Manual Stage with Piezo Z-Axis Top Plate



If you do not require automated XY movement, but do require automated Z-axis positioning for acquiring precise Z-axis stacks, then the PZM-2000 is the solution. On select models of inverted microscopes, ASI can modify or exchange your existing OEM stage with a PZM-2000 unit. We can procure a manual OEM stage for you, if necessary.

The PZM-2000 consists of ASI's proven piezo top plate mounted within your existing OEM stage. This requires a completely new top plate be machined for the OEM stage, however, this allows us to provide an elegant solution. The optional PZM-C Controller complements the ASI PZM-2000 piezo-Z manual microscope stage retrofit.

The PZM-2000 has been designed to provide a high resolution, and highly repeatable, means of controlling the Z-position of the microscope stage. The X- and Y-axes are manually controlled utilizing the original OEM stage controls. The piezo top plate of the stage accepts standard K-size slide inserts that are available for any sample, i.e., slides, Petri dishes, multi-well plates, etc. The slide insert is moved in the Z-axis via a piezo element with a range of 100 μm and with nanometer accuracy (200 μm and 500 μm ranges are also available). By moving the sample along the Z-axis, any objective can be used, eliminating twisting wires or needed spacers as required when a piezo element is put onto a single objective. The piezo stage can be controlled remotely with a 0-10 VDC analog input voltage, or optionally, with a PZM-2000 controller or a calibrated manual ten-turn potentiometer.

PZM-2000 Features

- Closed-loop control of Z-axis for precise and highly repeatable focusing
- Nanometer-scale resolution, repeatability, and accuracy
- Proven operation with many popular software packages
- Stage wings for even more room for attachments

PZM-2000 Options

- X- and Y-axes linear encoders for high-accuracy positioning, incorporated into the stage plates
- Stage inserts to hold a variety of slides, dishes, sealed glass chambers, multi-well microplates, perfusers, heaters, and many other special items
- Other lead screw pitches are available, as shown below
- Stage wings for even more room for attachments



Specifications

X- and Y-axes range of travel	Standard OEM Stage
Z-axis range of travel ($\pm 5\%$)	150 μm , 300 μm (100 μm and 200 μm versions optional)
Z-axis resolution	1.5 nm
Z-axis repeatability	± 1 nm
Z axis maximum velocity with settling time	5 mm/s
(~ 10 ms per move)	
Z-axis resonant frequency (unloaded)	> 1 kHz
Z-axis top plate maximum load	500 g
Z-axis top plate stiffness ($\pm 20\%$)	3 N/ μm
Z-axis top plate in-plane tilt (typical)	10 μrad

ADEPT Piezo Controller Specifications

Specification	PZ-2150FT	PZ-2300FT	PZ-2500FT
Piezo travel range ($\pm 5\%$)	150 μm	300 μm	500 μm
Piezo smallest move / resolution*	2.2 nm	4.5 nm	7.6 nm
Maximum load for full range travel	2 kg	1 kg	1 kg
Transient response time**	11 – 15 ms		
External analog input (BNC)	0 - 10 V		
Maximum input frequency	20 Hz		
Maximum continuous output current	13 mA		

**Time taken to travel 10%-90% for moves below 30% travel range with 600 g load.

*In external input mode, use of a higher bit DAC will increase resolution. For example a 0-10 analog voltage from the DAC results in the following:

PZ-2150FT

External Analog input	Steps	Resolution
16 bit DAC	65536	2.2 nm
17 bit DAC	131075	1.1 nm
18 bit DAC	262144	0.55 nm