



APPLIED SCIENTIFIC
INSTRUMENTATION

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 compliments the ASI PZM-2000 piezo-Z manual microscope stage retrofit. The unit provides an LCD readout of position, an external focusing knob, RS-232 serial control, home & zeroing controls all in a small 6 x 4 inch footprint.

The PZM-2000 has been specifically designed to provide a high resolution, and highly repeatable, means of controlling the Z position of the microscope stage. The XY 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 in the Z-plane, 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 volt D.C. 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-axes 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



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PZM-2000 Options

- X and Y-axis Linear Encoders for high-accuracy positioning, incorporated into the stage plates
- Stage Inserts to hold a variety of slides, dishes, sealed glass chambers, multiwell 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

XY axis range of travel	Standard OEM Stage
	150 µm, 300 µm (100 µm & 200 µm versions optional)
Z axis range of travel (± 5%)	
Z axis resolution	1.5 nm
Z axis repeatability	± 1 nm
Z axis maximum velocity with settling time	5 mm/sec
(~ 10 ms per move)	
Z axis resonant frequency (unloaded)	> 1 KHz
Z axis top plate maximum load	500 grams
Z axis top plate stiffness (± 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 (+/- 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	2Kg	1Kg	1Kg
Transient Response time**	11 – 15 ms		
External Analog input (BNC)	0 to 10 Volts		
Maximum Input Frequency	20 Hz		
Maximum Continuous Output Current	13mA		

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