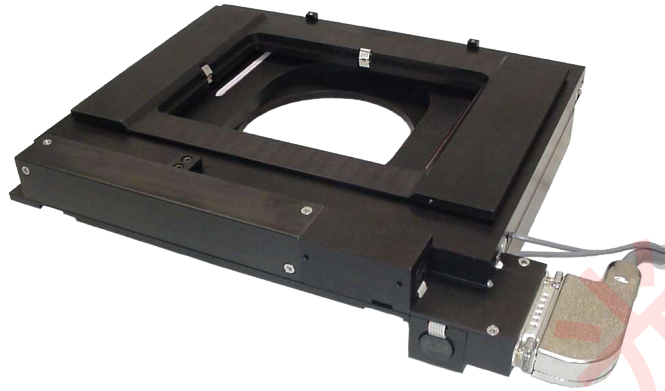


PZU-2000 XYZ Automated Stage with Piezo Z-Axis Top Plate



The PZU-2000 XYZ stage has been specifically designed to provide a high resolution, and highly repeatable, means of controlling the X, Y, and Z position of the microscope stage. The XY axes derive their precise control through the use of closed-loop DC servomotors employing high-resolution rotary encoders for positioning feedback. By using closed-loop control for the stage position, there is no chance that the stage will become lost, as can occur with open-loop micro-stepped stages after a number of moves and direction changes. The XY stage utilizes crossed-roller slides, high-precision lead screws, and zero-backlash miniature geared DC servomotors for smooth and accurate motion. The 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 150 μm with nanometer accuracy (300 μm and 500 μm range is 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 microprocessor-controlled MS-2000 control unit provides for RS-232 and USB communication with a host computer for control of the XYZ axis.

Stages, controllers and top plates are sold separately.

Features

- Closed-loop control of the X, Y, and Z-axes for precise positioning and highly repeatable focusing
- Wide dynamic speed range with adjustable trapezoidal move profiles
- Smooth adjustable dual-range joystick control
- Backlit LCD display shows X, Y, and Z coordinates
- "Zero" and "Home" button for simple stand-alone operations
- Compact ergonomic tabletop control unit size is 6" D x 9" W x 3" H (9 cm x 23 cm x 16½ cm)
- Proven operation with many popular software packages

PZU-2000 Options

- XY axes Linear Encoders for high-accuracy positioning. Linear encoder resolution is 10 nm, with a scale accuracy of 0.3 μm per 10mm and 3 μm per 100 mm. Positioning resolution at sample is < 50 nm.
- Auto Focus (requires NTSC or PAL composite video signal).
- ASI's proven line of Z-axis drives can also be added to the fine focus shaft of the microscope to provide Z-axis positioning with a resolution of 50 nm throughout the range of the microscope's travel. The piezo unit can then be used for fast and accurate Z-axis positioning to any point within the range of travel.
- Other lead screw pitches are available for faster XY translation, or for more precise positioning when using standard rotary encoders.

Specifications for Standard Configuration

XY axis range of travel	114 mm x 100 mm
XY axis resolution (encoder step)	0.088 μm
XY axis lead screw accuracy	0.25 $\mu\text{m}/\text{mm}$
XY axis RMS repeatability	< 0.7 μm
XY axis maximum velocity	7 mm/sec
Z axis range of travel	100 μm (175 μm version optional)
Z axis resolution	1.5nm
Z axis repeatability	± 1 nm
Z axis maximum velocity with setting 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

Product Compatibility

- Leica – Aristoplan, DM4000, DM4500, DM5000, DM6000, DMLB, DMRB, DMRP, DMRXP
- Nikon – Eclipse 80i, Eclipse 90i, Eclipse 800, Eclipse 1000
- Olympus – AX70, BX41, BX50, BX51, BX60, BX61
- Zeiss – AxioImager, AxioLab, AxioPlan, AxioPlan II, AxioPhot I, AxioPhot II, Axioskop, Axioskop II, Axioskop FS IIDiaphot Eclipse TE300, Diaphot Eclipse TE2000, Eclipse Ti
- Olympus – BX50WI, BX51WI, BX61WI, IMT-2, IX50, IX51, IX70, IX71, IX81
- Zeiss – Axioskop FS, Axiovert 35, Axiovert 100, Axiovert 100M, Axiovert 135, Axiovert 135M, Axiovert 200, Axiovert 200M, Axio Observer, IMC 35

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