

PI nano[®] Cap XY(Z) Piezo System

Capacitive Position Measuring for Super-Resolution Microscopy



P-545.xC8S

- Highest stability and repeatability
- Travel ranges to 200 μm \times 200 μm \times 200 μm
- Including E-727 USB controller and software
- Subnanometer resolution
- Fast response in the ms range
- Low profile for easy integration: 20 mm
- Recessed sample holders, freely revolving nosepiece

Fields of application

- Super-resolution microscopy
- Screening
- Confocal microscopy
- Biotechnology
- High reliability even in environments with high air humidity

Outstanding lifetime thanks to PICMA[®] piezo actuators

The patented PICMA[®] piezo actuators are all-ceramic insulated. This protects them against humidity and failure resulting from an increase in leakage current. PICMA[®] actuators offer an up to ten times longer lifetime than conventional polymer-insulated actuators. 100 billion cycles without a single failure are proven.

Subnanometer resolution with capacitive sensors

Capacitive sensors measure with subnanometer resolution without contacting. They guarantee excellent linearity of motion, long-term stability, and a bandwidth in the kHz range.

High guiding accuracy due to zero-play flexure guides

Flexure guides are free of maintenance, friction, and wear, and do not require lubrication. Their stiffness allows high load capacity and they are insensitive to shock and vibration. They are 100 % vacuum compatible and work in a wide temperature range.

Maximum accuracy due to direct position measuring

Motion is measured directly at the motion platform without any influence from the drive or guide elements. This allows optimum repeatability, outstanding stability, and stiff, fast-responding control.

Extensive software for rapid start of productive operation

Thanks to support of MATLAB and NI LabVIEW as well as all common operating systems (Windows, Linux, and OS X), integration succeeds in virtually every environment – quickly and efficiently. Sophisticated programming examples and software tools such as PIMikroMove shorten the time to productive operation considerably.

Specifications

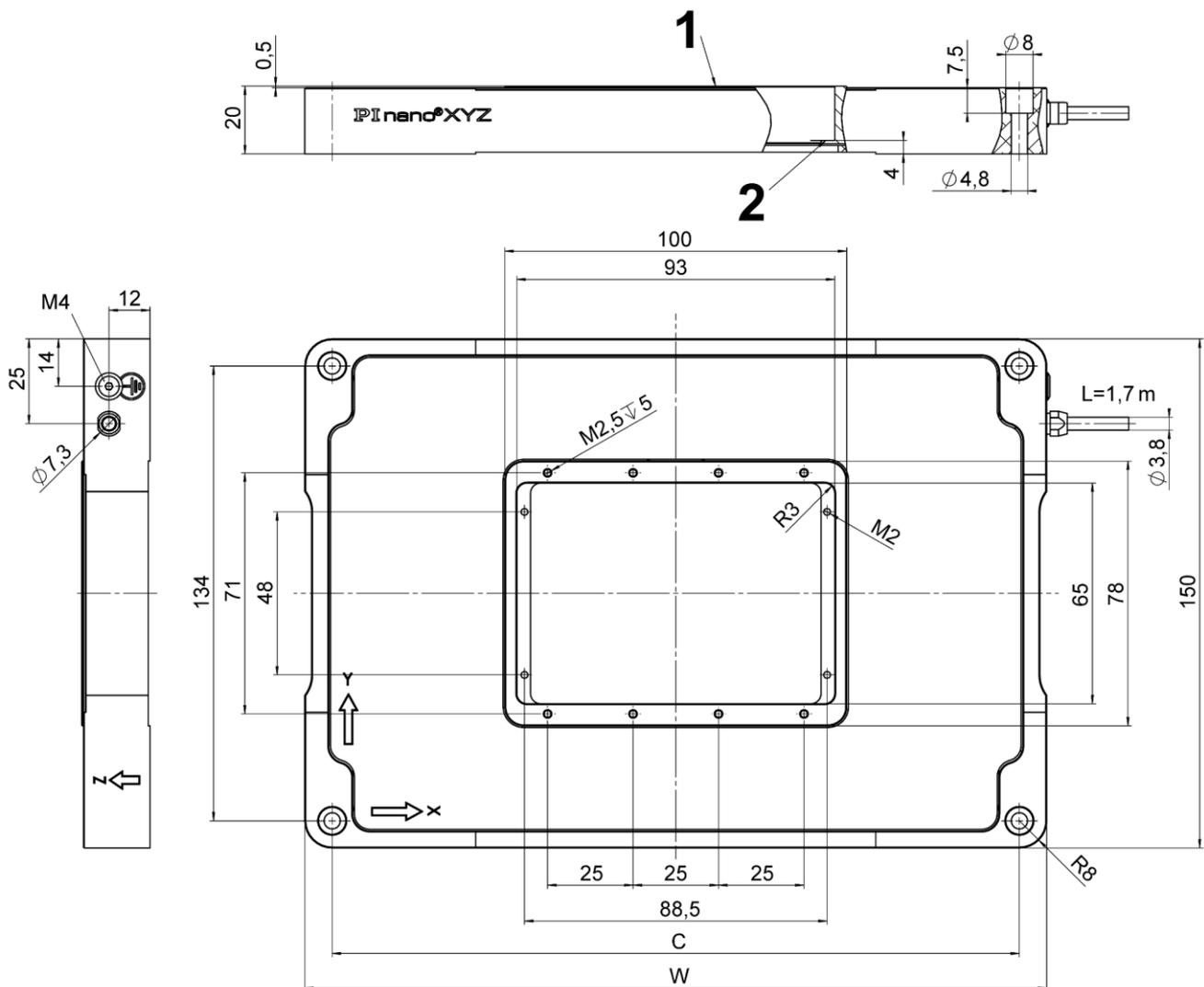
	P-545.2C8S	P-545.3C8S	Unit	Tolerance
Active axes	X, Y	X, Y, Z		
Motion and positioning				
Integrated sensor	Capacitive	Capacitive		
Travel range, closed loop	200 × 200	200 × 200 × 200	µm	
Resolution, closed loop*	<1	<1	nm	typ.
Mechanical properties				
Push/pull force capacity	50 / 30	50 / 30	N	max.
Recommended load**	0.5	0.5	kg	max.
Drive properties				
Piezo ceramic	PICMA® P-885	PICMA® P-885		
Electrical capacitance	6 (X, Y)	6 (X, Y), 12 (Z)	µF	±20 %
Miscellaneous				
Operating temperature range	15 to 40	15 to 40	°C	
Material	Aluminum	Aluminum		
Mass	1	1.2	kg	±5 %
Cable length	1.7	1.7	m	+10 cm
piezo controller	E-727.3CDA (in the scope of delivery)			
Communication interfaces	Ethernet, USB, RS-232, serial SPI high-speed interface			
Analog input / Analog output	Sub-D 15 Input via 18-bit A/D converter Output via 20-bit D/A converter			
Command set	PI General Command Set (GCS)			
User software	PIMikroMove			
Software drivers	NI LabVIEW drivers, shared libraries for Windows and Linux			
Supported functions	Wave generator, data recorder, drift compensation, macros			

* The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

** For dynamic operation. Higher dynamics are possible with a reduced load.

All specifications based on room temperature (22 °C ±3 °C).

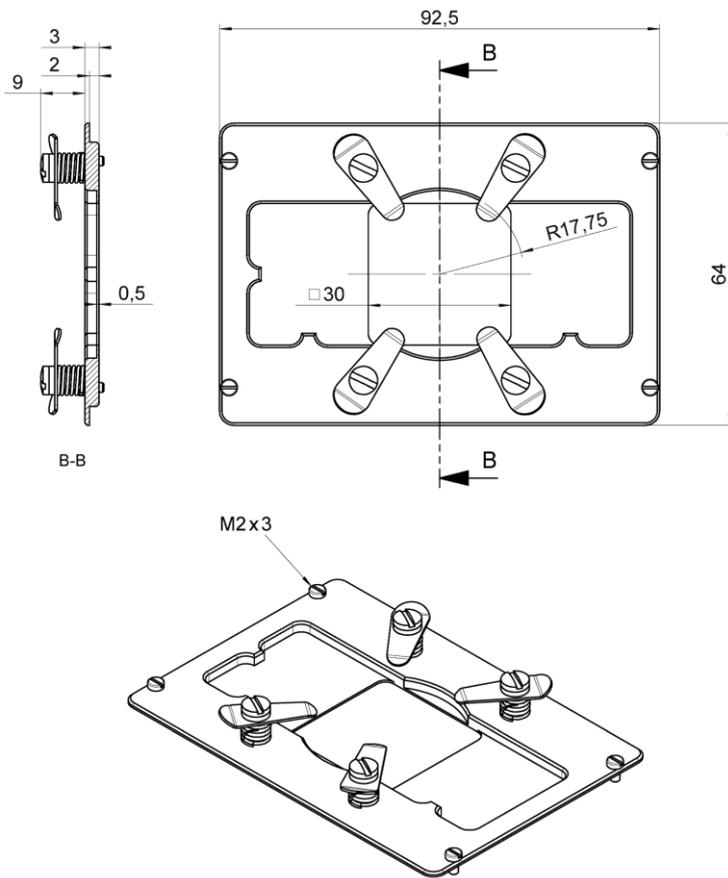
Drawings / Images



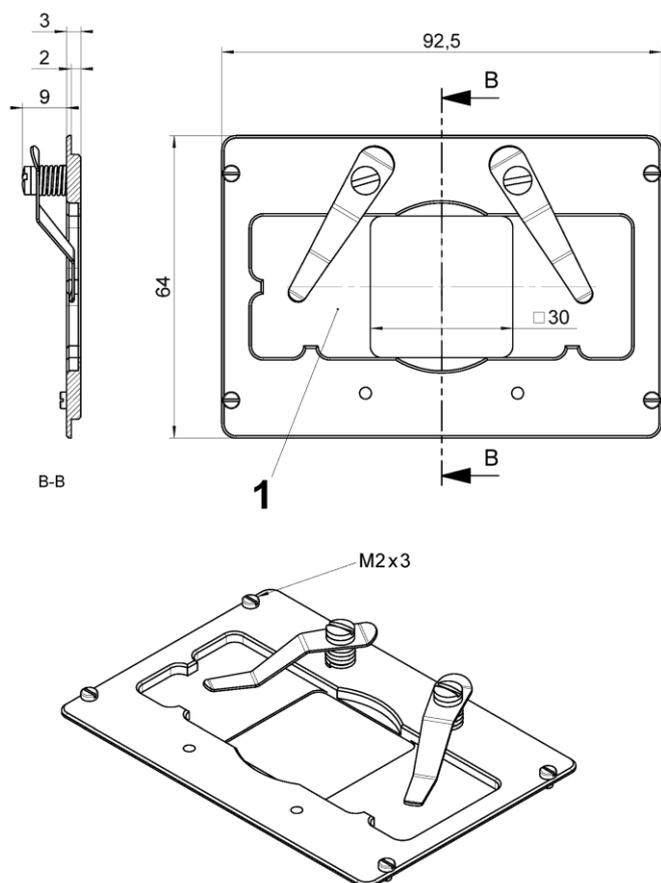
P-545.xx8S, dimensions in mm. P-545.3x8S: W = 217, C = 201. P-545.2x8S: W = 182, C = 166.

1: Upper mounting surface of the motion platform

2: Lower mounting surface of the motion platform



Accessories: P-545.PD3, Petri dish holder, dimensions in mm



Accessories: P-545.SH3, microscope slide holder, dimensions in mm

1: Recess for standard microscope slides (25 mm × 75 mm)

Ordering Information

P-545.2C8S

PI nano[®] XY piezo system, clear aperture for microscope slides, 200 μm × 200 μm, capacitive sensors, with USB digital controller

P-545.3C8S

PI nano[®] XYZ piezo system, clear aperture for microscope slides, 200 μm × 200 μm × 200 μm, capacitive sensors, with USB digital controller

Accessories

P-545.PD3

Petri dish holder, 35 mm, for PI nano[®] piezo stages

P-545.SH3

Microscope slide holder for PI nano[®] piezo stages

P-545.C18

Coverslip holder with opening for coverslips 18 mm × 18 mm, suitable for P-545.SH3

P-545.C22

Coverslip holder with opening for coverslips 22 mm × 22 mm, suitable for P-545.SH3

P-545.C25

Coverslip holder with opening for coverslips 25 mm × 25 mm, suitable for P-545.SH3

P-545.PP3

Universal holding plate for accessory for Plnano® piezo stages

M-545.2MO

XY stage, 25 mm × 25 mm, micrometer drive, high stability, compatible with PI piezo stages, for Olympus microscopes (IX2, IX3)

M-545.2MN

XY stage, 25 mm × 25 mm, micrometer drive, high stability, compatible with PI piezo stages, for Nikon microscopes (TI series)

M-545.2ML

XY stage, 25 mm × 25 mm, micrometer drive, high stability, compatible with PI piezo stages, for Leica microscopes (DMI series)

M-545.2MZ

XY stage, 25 mm × 25 mm, micrometer drive, high stability, compatible with PI piezo stages, for Zeiss microscopes (Axio Observer)