

Pinano® Cap XY(Z) Piezo System

Capacitive Position Measuring for Super-Resolution Microscopy



P-545.xC8S

- Highest stability and repeatability
- Travel ranges to 200 μm × 200 μm × 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

P-545.xC8S system, consisting of P-545.2C8H or P-545.3C8H piezo stage and E-727.3CDA controller

Application fields

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

Outstanding lifetime thanks to PICMA® piezo actuators

The 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 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 macOS), 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.

Motion	Unit		P-545.2C8S	P-545.3C8S
Active axes			X Y	X Y Z
Travel range in X	μm		200	200
Travel range in Y	μm		200	200
Travel range in Z	μm		–	200

Positioning	Unit	Tolerance	P-545.2C8S	P-545.3C8S
Integrated sensor			Capacitive, indirect position measuring	Capacitive, indirect position measuring
System resolution	nm	Typ.	<1	<1

Drive Properties	Unit	Tolerance	P-545.2C8S	P-545.3C8S
Drive type			PICMA®	PICMA®
Electrical capacitance in X	µF	±20%	6	6
Electrical capacitance in Y	µF	±20%	6	6
Electrical capacitance in Z	µF	±20%	—	12

Mechanical Properties	Unit	Tolerance	P-545.2C8S	P-545.3C8S
Permissible push force in Z	N	Max.	50	50
Permissible pull force in Z	N	Max.	30	30
Guide			Flexure guide with lever amplification	Flexure guide with lever amplification
Overall mass	kg	±5%	1	1.2
Material			Aluminum	Aluminum

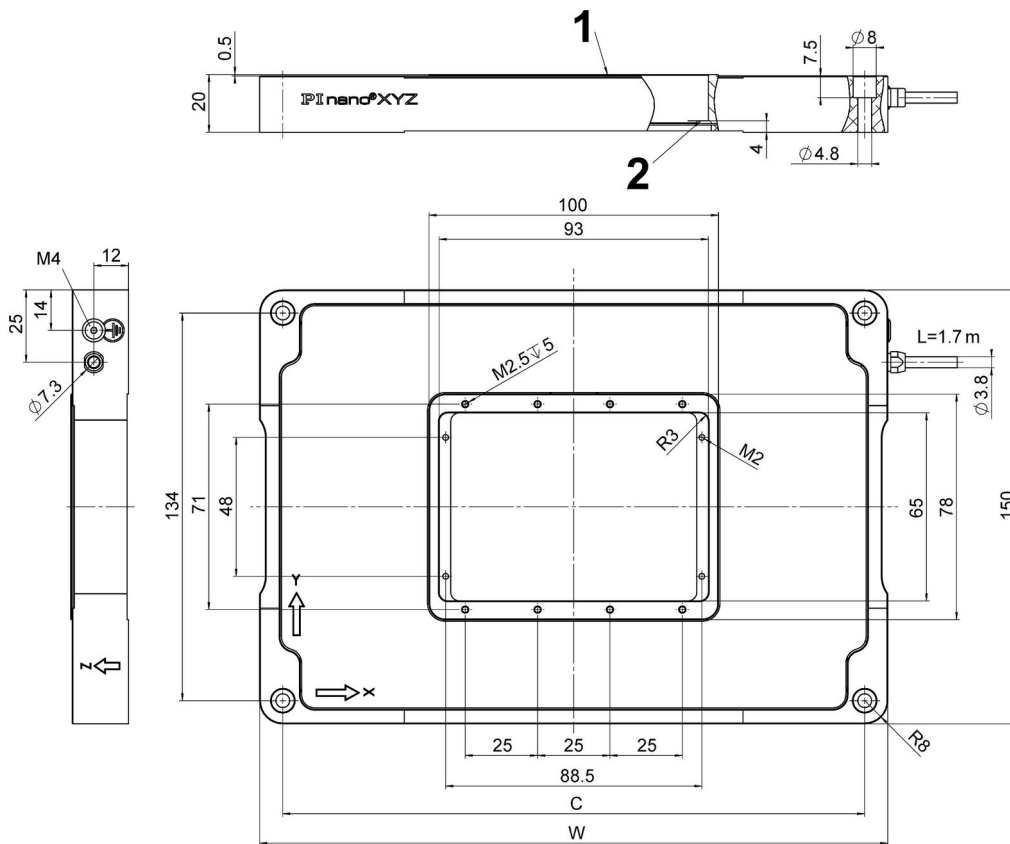
Miscellaneous	Unit	Tolerance	P-545.2C8S	P-545.3C8S
Operating temperature range	°C		15 to 40	15 to 40
Connector			D-sub 25W3 (m)	D-sub 25W3 (m)
Cable length	m	+10 cm	1.7	1.7

Controller	Unit	Tolerance	P-545.2C8S	P-545.3C8S
Controller type			E-727.3CDA (in the scope of delivery)	E-727.3CDA (in the scope of delivery)
Application-related functions			Makro Data recorder	Makro Data recorder
Motion types			Wave generator	Wave generator
Communication interfaces			Ethernet RS-232 SPI USB	Ethernet RS-232 SPI USB
Command set			GCS 2.0	GCS 2.0
User software			PIMikroMove	PIMikroMove
Software - APIs			C, C++, C# MATLAB NI LabView	C, C++, C# MATLAB NI LabView
I/O lines			Analog input via 18-bit A/D converter; Analog output via 20-bit D/A converter.	Analog input via 18-bit A/D converter; Analog output via 20-bit D/A converter.

Permissible push force in Z: The recommended load for dynamic operation is 0.5 kg (max.). Higher dynamics are possible with a reduced load.

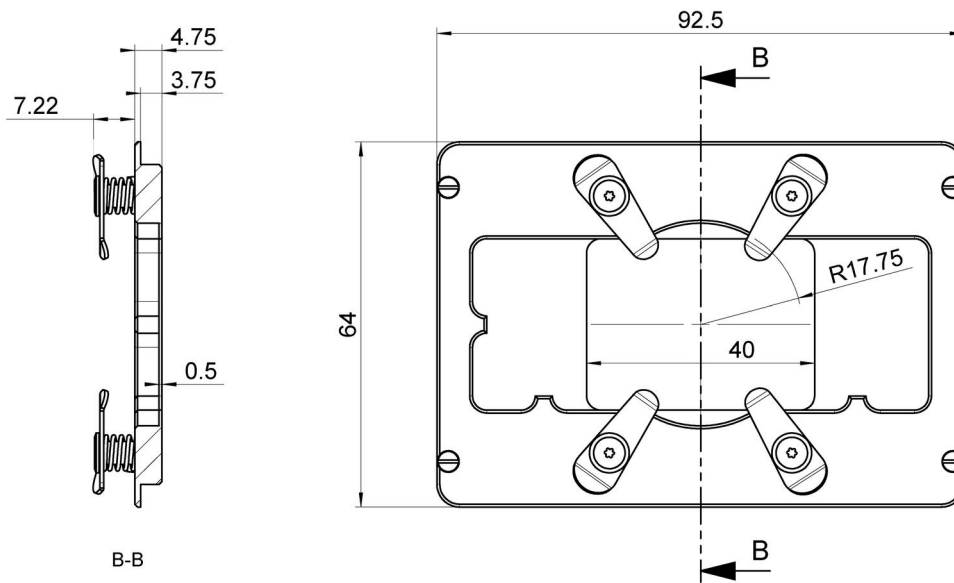
The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

Drawings / Images

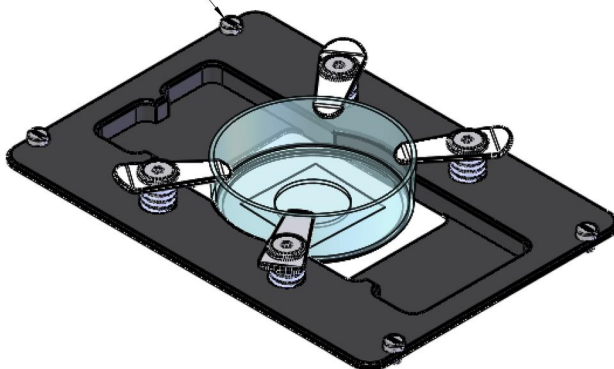


P-545.xx8S, dimensions in mm. P-545.3x8S: W = 217, C = 201. P-545.2x8S: W = 182, C = 166. 1: Upper mounting surface of the motion platform with eight M2.5 mounting holes. 2: Lower mounting surface of the motion platform with four M2 mounting holes (through holes).

Drawings / Images

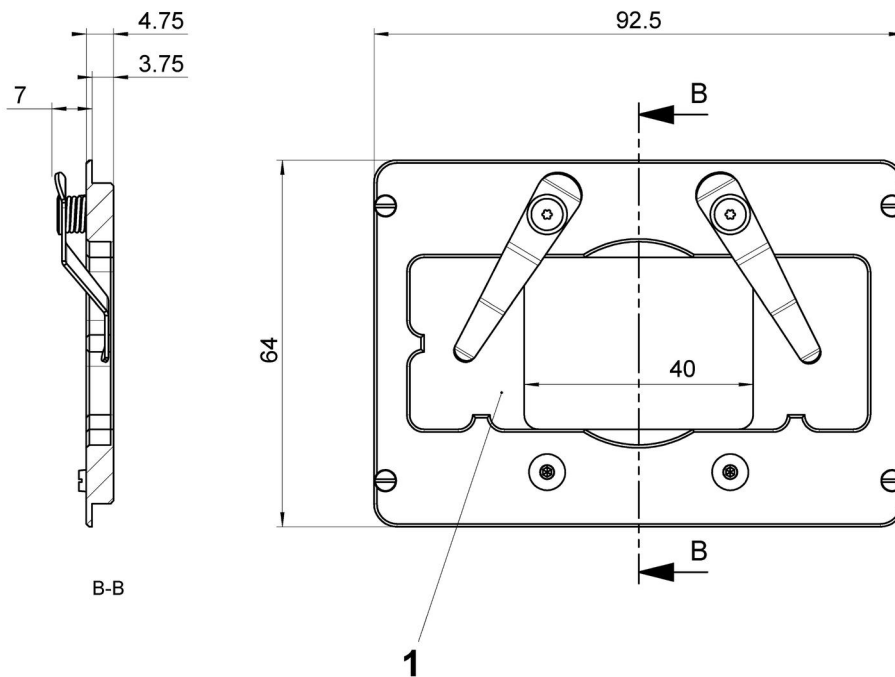


M2 x 3mm Screw

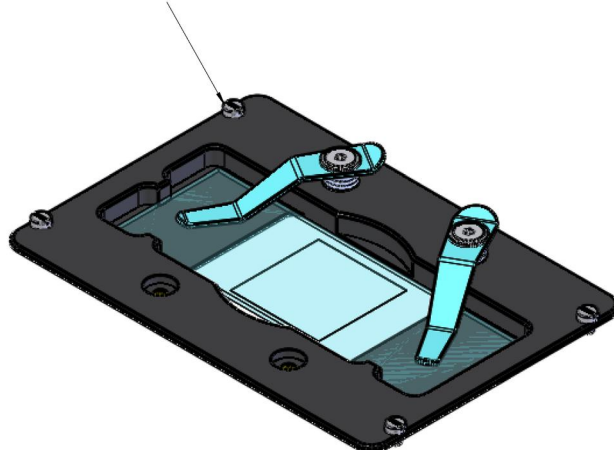


Accessories: P-545.PD3, Petri dish holder, dimensions in mm.

Drawings / Images



M2 x 3mm Screw



Accessories: P-545.SH3, microscope slide holder, dimensions in mm. 1: Recess for standard microscope slides (25 mm × 75 mm).

Order Information

P-545.2C8S

Plnano® Cap XY piezo system; clear aperture for microscope slides; 200 μm × 200 μm travel range (X × Y); capacitive, indirect position measuring; D-sub 25W3 (m) connector; 1.7 m cable length; with USB digital controller

P-545.3C8S

Plnano® Cap XYZ piezo system; clear aperture for microscope slides; 200 μm × 200 μm × 200 μm travel range (X × Y × Z); capacitive, indirect position measuring; D-sub 25W3 (m) connector; 1.7 m cable length; with USB digital controller