PInano® XY(Z) Piezo System

Inexpensive Nanopositioning System for High-Resolution Microscopy

P-545.xR8S

- Inexpensive cost-optimized design with piezoresistive sensors
- Travel ranges to 200 µm × 200 µm × 200 µm
- Including E-727 USB controller and software
- Low profile for easy integration: 20 mm
- Clear aperture for 3×1" microscope slide, recessed insertable holder
- Outstanding lifetime due to PICMA® piezo actuators
- Subnanometer resolution, fast response time in the ms range

P-545.xR8S system, consisting of P-545.2R8H or P-545.3R8H piezo stage and E-727.3RDA controller

Application fields

- High-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.

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.

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-545.2R8S	P-545.3R8S
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-545.2R8S	P-545.3R8S
Integrated sensor			Piezoresistive, direct position measuring	Piezoresistive, direct position measuring
System resolution	nm	Typ.	<1	<1

Drive Properties	Unit	Tolerance	P-545.2R8S	P-545.3R8S
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-545.2R8S	P-545.3R8S
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

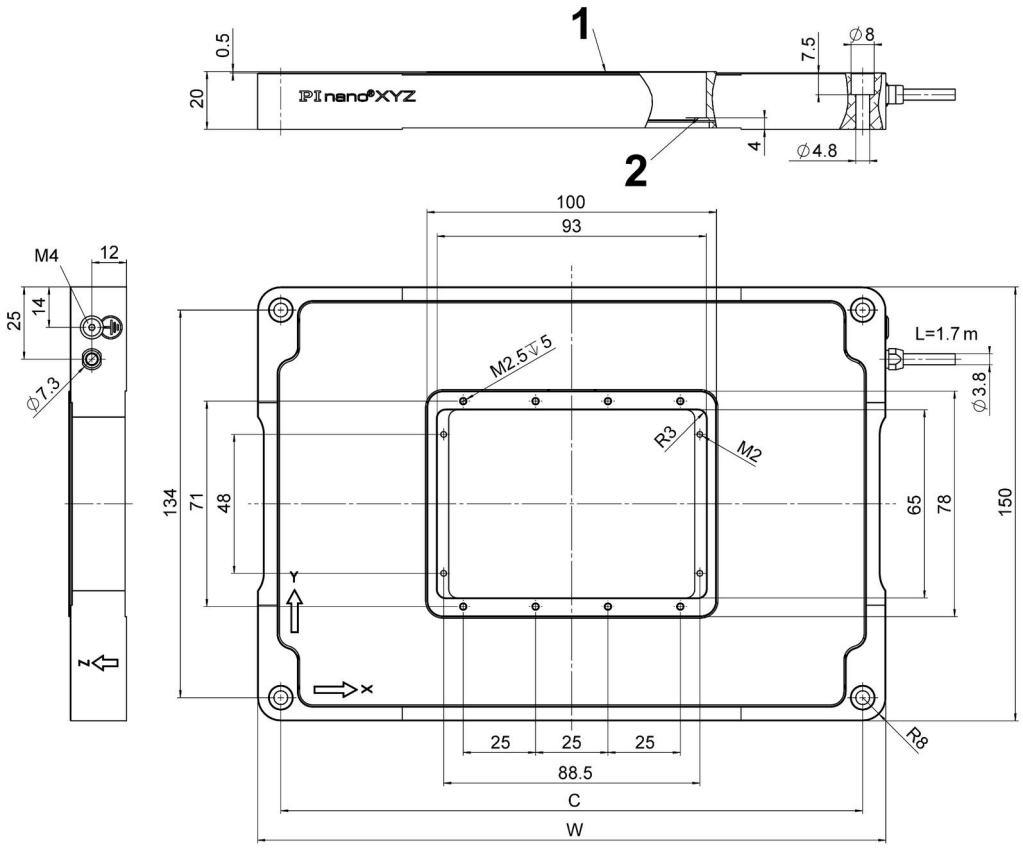
Miscellaneous	Unit	Tolerance	P-545.2R8S	P-545.3R8S
Operating temperature range	°C		15 to 40	15 to 40
Connector			D-sub 37 (m)	D-sub 37 (m)
Cable length	m	+10 cm	1.7	1.7

Controller	Unit		P-545.2R8S	P-545.3R8S
Controller type			E-727.3RDA (in the scope of delivery)	E-727.3RDA (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.

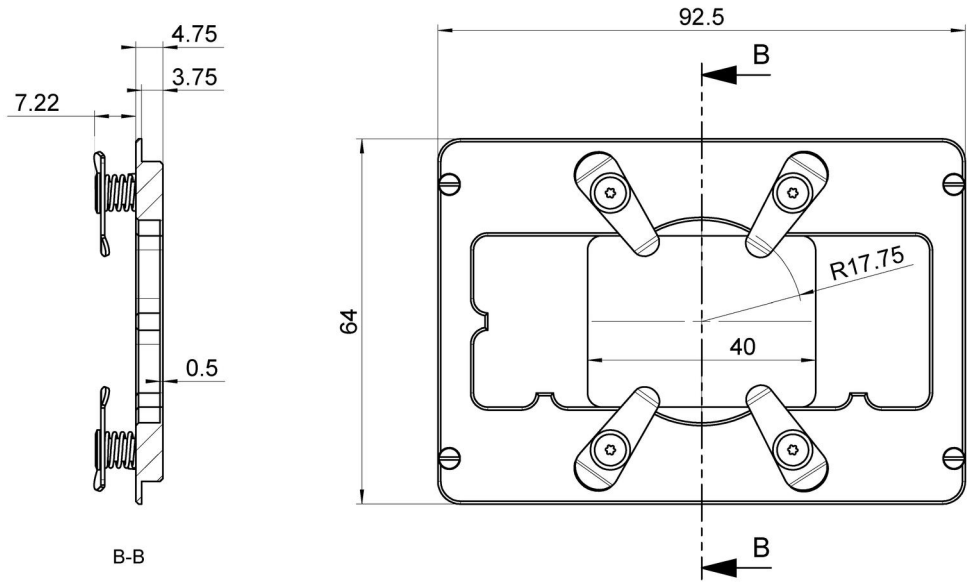
The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

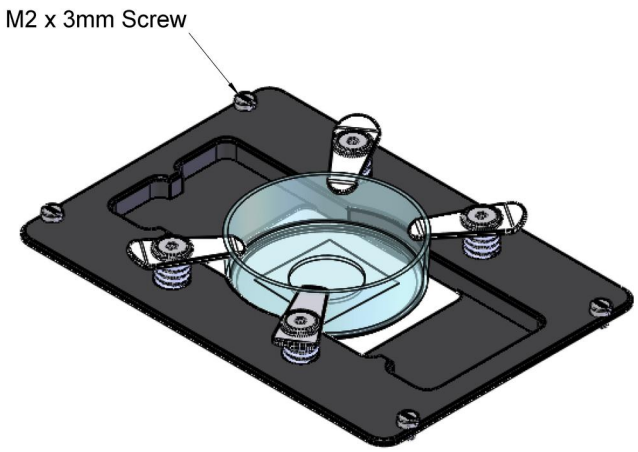
Drawings / Images



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).

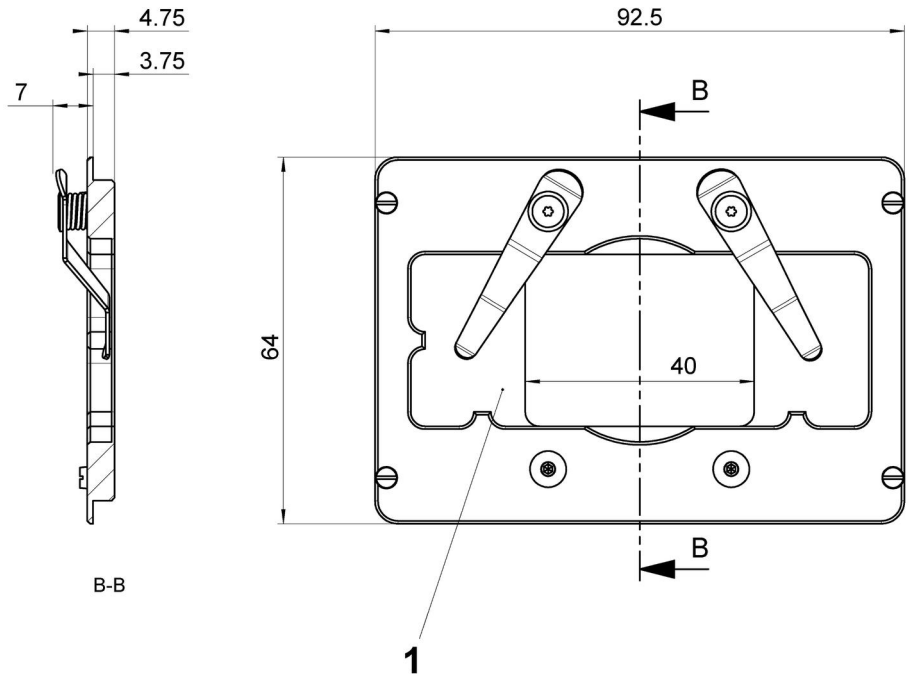
Drawings / Images

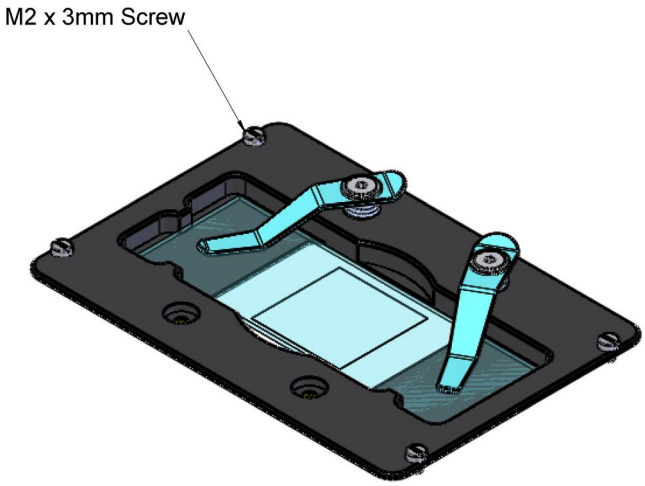




Accessories: P-545.PD3, Petri dish holder, dimensions in mm.

Drawings / Images





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

Order Information

P-545.2R8S
PInano® XY piezo system; clear aperture for microscope slides; 200 µm × 200 µm travel range (X × Y); piezoresistive, direct position measuring; D-sub 37 (m) connector; 1.7 m cable length; with USB digital controller

P-545.3R8S
PInano® XYZ piezo system; clear aperture for microscope slides; 200 µm × 200 µm × 200 µm travel range (X × Y × Z); piezoresistive, direct position measuring; D-sub 37 (m) connector; 1.7 m cable length; with USB digital controller