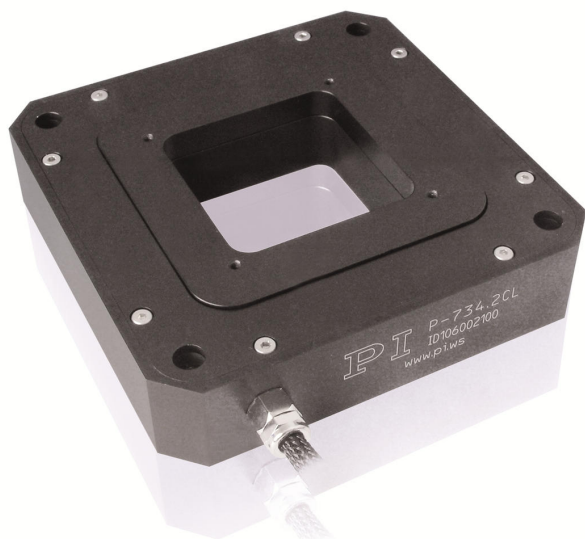


XY Piezo Scanner

Highly Dynamic, Highest Travel Accuracy, with Aperture



P-734

- Flatness 5 nm, ideal for surface analysis and scanning microscopy
- Parallel kinematics for faster response times and higher multi-axis accuracy
- Travel range 100 μm \times 100 μm
- Clear aperture 56 mm \times 56 mm
- Resolution of 0.3 nm due to capacitive position sensors

Application fields

- Scanning microscopy
- Confocal microscopy
- Mask/wafer positioning
- Surface measuring technology
- Nanoimprinting
- Micromanipulation
- Image processing / stabilization
- Nanopositioning with high flatness and straightness of motion

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.

Automatic configuration and fast component exchange

Mechanics and controllers can be combined as required and exchanged quickly. All servo and linearization parameters are stored in the ID chip of the D-sub connector of the mechanics. The autocalibration function of the digital controllers uses this data each time the controller is switched on.

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.

High dynamics multi-axis operation due to parallel kinematics

In a parallel-kinematic multi-axis system, all actuators act on a common platform. The minimum mass inertia and the identical design of all axes allow fast, dynamic, and nevertheless precision motion.

Motion	Unit	Tolerance	P-734.2CD	P-734.2CL
Active axes			X, Y	X, Y
Travel range in X	μm		100	100
Travel range in Y	μm		100	100
Travel range in X, open loop, at -20 to 120 V	μm	+20 / -0 %	110	110
Travel range in Y, open loop, at -20 to +120 V	μm	+20 / -0 %	110	110
Linearity error in X	%	Typ.	0.03	0.03
Linearity error in Y	%	Typ.	0.03	0.03
Flatness (Linear crosstalk in Z with motion in X)	nm	Typ.	±5	±5
Flatness (Linear crosstalk in Z with motion in Y)	nm	Typ.	±5	±5
Pitch (Rotational crosstalk in θX with motion in Y)	μrad	Typ.	±3	±3
Pitch (Rotational crosstalk in θY with motion in X)	μrad	Typ.	±3	±3
Yaw (Rotational crosstalk in θZ with motion in X)	μrad	Typ.	±10	±10
Yaw (Rotational crosstalk in θZ with motion in Y)	μrad	Typ.	±10	±10

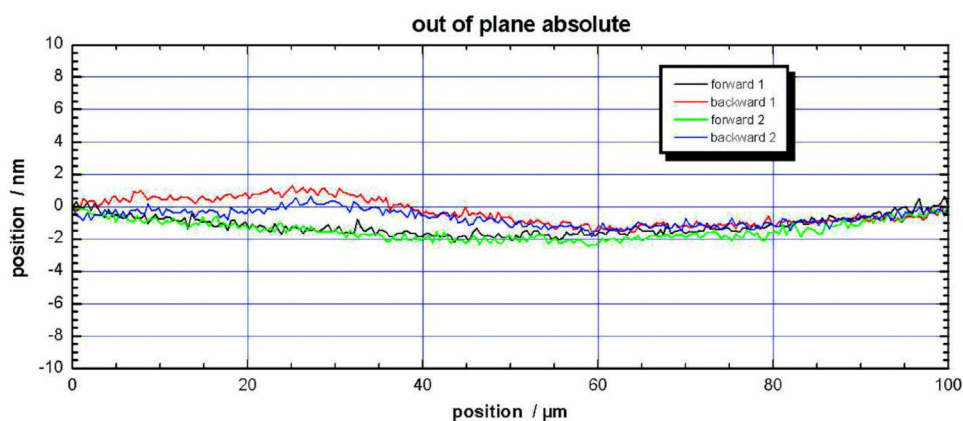
Positioning	Unit	Tolerance	P-734.2CD	P-734.2CL
Resolution in X, open loop	nm	Typ.	0.2	0.2
Resolution in Y, open loop	nm	Typ.	0.2	0.2
Integrated sensor			Capacitive, direct position measuring	Capacitive, direct position measuring
System resolution in X	nm		0.3	0.3
System resolution in Y	nm		0.3	0.3

Drive Properties	Unit	Tolerance	P-734.2CD	P-734.2CL
Drive type			Piezo actuator/PICMA®	Piezo actuator/PICMA®
Electrical capacitance in X	μF	±20%	6.2	6.2
Electrical capacitance in Y	μF	±20%	6.2	6.2

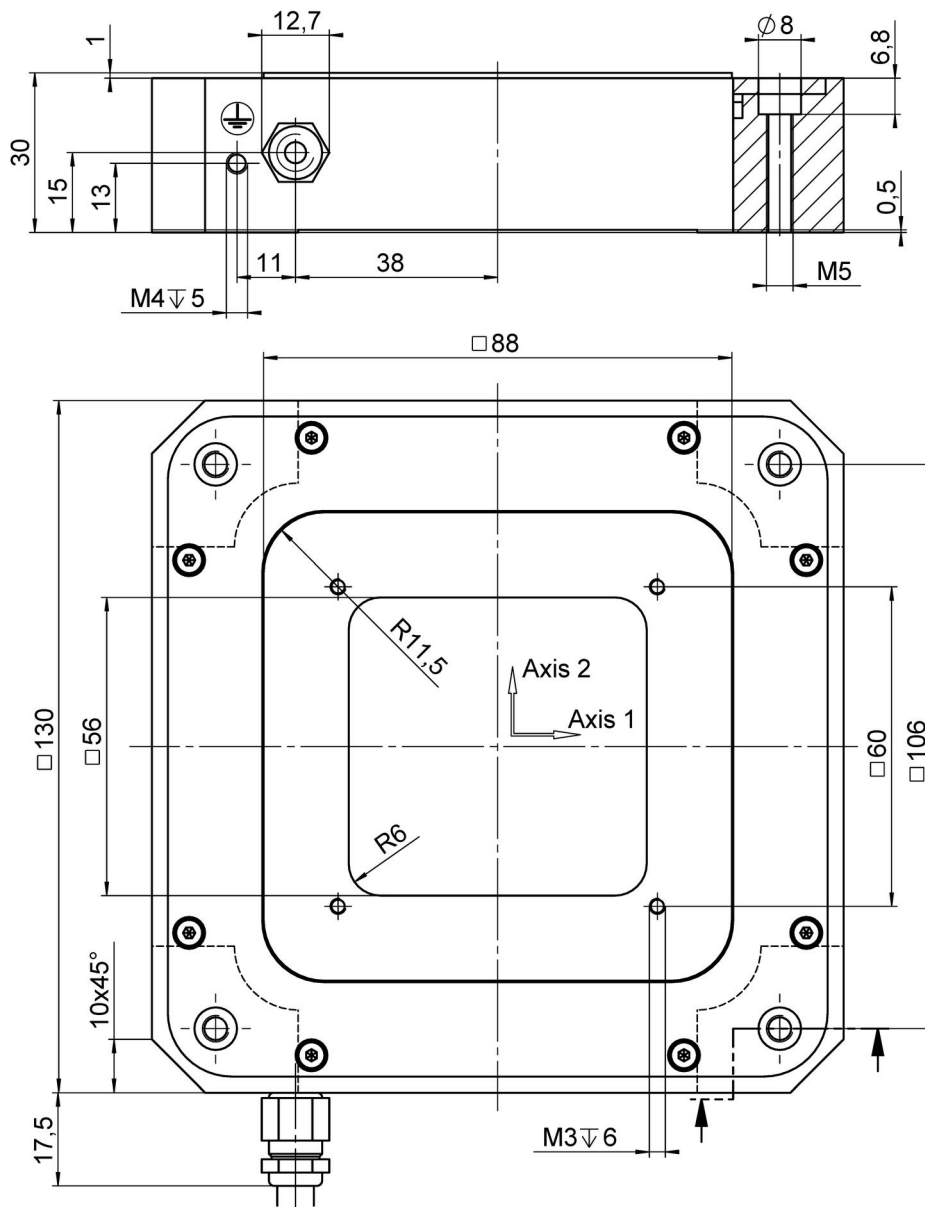
Mechanical Properties	Unit	Tolerance	P-734.2CD	P-734.2CL
Stiffness in X	N/ μ m	$\pm 20\%$	3	3
Stiffness in Y	N/ μ m	$\pm 20\%$	3	3
Resonant frequency in X, unloaded	Hz	$\pm 20\%$	500	500
Resonant frequency in X, under load with 200 g	Hz	$\pm 20\%$	350	350
Resonant frequency in X, under load with 500 g	Hz	$\pm 20\%$	250	250
Resonant frequency in Y, unloaded	Hz	$\pm 20\%$	500	500
Resonant frequency in Y, under load with 200 g	Hz	$\pm 20\%$	350	350
Resonant frequency in Y, under load with 500 g	Hz	$\pm 20\%$	250	250
Permissible push force in X	N	Max.	300	300
Permissible push force in Y	N	Max.	300	300
Permissible push force in Z	N	Max.	20	20
Permissible pull force in X	N	Max.	100	100
Permissible pull force in Y	N	Max.	100	100
Guide			Flexure guide/Flexure guide with lever amplification	Flexure guide/Flexure guide with lever amplification
Overall mass	g	$\pm 5\%$	1040	1040
Material			Aluminum	Aluminum

Miscellaneous	Unit		P-734.2CD	P-734.2CL
Operating temperature range	$^{\circ}\text{C}$		-20 to 80	-20 to 80
Connector			D-sub 25W3 (m)	LEMO LVPZT
Sensor connector				LEMO for capacitive sensors
Cable length	m		1.5	1.5
Recommended controllers / drivers			E-712, E-727	E-500, E-503, E-505, E-509

Drawings / Images



Typical flatness of P-734 motion is in the low nanometer range.



P-734, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

Order Information

P-734.2CD

XY piezo scanner; 100 $\mu\text{m} \times 100 \mu\text{m}$ travel range (X \times Y); capacitive, direct position measuring; D-sub 25W3 (m); 1.5 m cable length

P-734.2CL

XY piezo scanner; 100 $\mu\text{m} \times 100 \mu\text{m}$ travel range (X \times Y); capacitive, direct position measuring; LEMO LVPZT; 1.5 m cable length