

PIHera XY Piezo Stage

HIGH- PRECISION XY NANOPositionING SYSTEMS WITH VARIABLE TRAVEL RANGES

P-620.2 – P-629.2



- + Travel ranges 50 to 1800 μm
- + Resolution to 0.1 nm
- + Positioning accuracy 0.02 %
- + Direct metrology with capacitive sensors
- + X, XY, Z, XYZ versions

Specifications

	P-620.2CD P-620.2CL	P-621.2CD P-621.2CL	P-622.2CD P-622.2CL	P-625.2CD P-625.2CL	P-628.2CD P-628.2CL	P-629.2CD P-629.2CL	Unit	Tolerance
Active axes	X, Y	X, Y	X, Y	X, Y	X, Y	X, Y		
Motion and positioning								
Integrated sensor	Capacitive	Capacitive	Capacitive	Capacitive	Capacitive	Capacitive		
Open- loop travel X, Y, -20 to 120 V	60	120	300	600	950	1800	μm	min. (20% / -0%)
Closed- loop travel in X, Y	50	100	250	500	800	1500	μm	
Open- loop resolution in X, Y	0.1	0.2	0.4	0.5	0.5	2	nm	typ.
Closed- loop resolution in X, Y	0.2	0.4	0.7	1.4	3.5	3.5	nm	typ.
Linearity error in X, Y	0.02	0.02	0.02	0.03	0.03*	0.03**	%	typ.
Repeatability X, Y	± 2	± 2	± 2	± 5	± 10	± 14	nm	typ.
Pitch / yaw	± 3	± 3	± 3	$\pm 3 / \pm 5$	$\pm 20 / \pm 5$	$\pm 30 / \pm 5$	μrad	typ.
Mechanical properties								
Stiffness X, Y	0.22	0.25	0.2	0.1	0.05	0.1	N/ μm	± 20 %
Unloaded resonant frequency X	575	420	225	135	75	60	Hz	± 20 %
Unloaded resonant frequency Y	800	535	300	195	105	100	Hz	± 20 %
Loaded resonant frequency in X, 50 g	270	285	180	120	60	55	Hz	± 20 %
Resonant frequency in Y @ 50 g	395	365	215	150	85	85	Hz	± 20 %
Resonant frequency in X @ 100 g	285	220	160	105	55	50	Hz	± 20 %
Loaded resonant frequency in Y @ 100 g	300	285	175	125	75	80	Hz	± 20 %
Push / pull force capacity in motion direction	10 / 5	10 / 8	10 / 8	10 / 8	10 / 8	10 / 8	N	max.
Load capacity	10	10	10	10	10	10	N	max.
Lateral force	10	10	10	10	10	10	N	max.
Drive properties								
Piezo ceramic	PICMA® P-883	PICMA® P-885	PICMA® P-885	PICMA® P-885	PICMA® P-887	PICMA® P-888		

Electrical capacitance in X, Y	0.35	1.5	3.1	6.2	19	52	μF	±20 %
Dynamic operating current coefficient in X, Y	0.9	1.9	1.9	1.6	3	4.3	μA / (Hz × μm)	±20 %
Miscellaneous								
Operating temperature range	-20 to 80	-20 to 80	-20 to 80	-20 to 80	-20 to 80	-20 to 80	°C	
Material	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum		
Dimensions	30 mm × 30 mm × 21.5 mm	40 mm × 40 mm × 25 mm	50 mm × 50 mm × 25 mm	60 mm × 60 mm × 25 mm	80 mm × 80 mm × 25 mm	100 mm × 100 mm × 40 mm		
Mass	0.195	0.295	0.348	0.43	0.7	1.37	kg	±5 %
Cable length	1.5	1.5	1.5	1.5	1.5	1.5	m	±10 mm
Sensor / voltage connection	CD versions: Sub- D special CL versions: LEMO							

Lower axis: X; upper axis: Y.

Versions without sensor are available under the P-62x.20L ordering number; operating temperature range -20 to 150 °C. Sensor / voltage connection LEMO

Vacuum versions to 10⁻⁹ hPa are available as P-62x.2UD.

The resolution of PI piezo nanopositioners is not limited by friction or stiction. Value given as noise with [E-710 digital controller](#).

* With digital controller. With analog controllers 0.05 %

** With digital controller. With analog controllers 0.08 %

Recommended controller / amplifier (CD versions)

[E-610 controller / amplifier](#), [E-625 piezo controller \(bench-top\)](#), [E-665 powerful servo controller \(bench-top\)](#), [E-712 digital piezo controller \(modular\)](#), [E-725 multi-channel digital controller \(bench-top\)](#), [E-761 digital piezo controller \(PCI board\)](#)

Recommended controller / amplifier (CL versions)

[E-500 modular piezo controller system](#) with E-505 amplifier module (1 per axis, high performance) and E-509 controller

Recommended controller / amplifier (0L versions, open-loop)

[E-500 modular piezo controller system](#) with E-505 amplifier module (1 per axis, high performance)

Order Information

P-620.2CD

Precise PIHera XY Nanopositioning System, 50 μm × 50 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s)

P-620.2CL

Precise PIHera XY Nanopositioning System, 50 μm × 50 μm, Direct Metrology, Capacitive Sensors, LEMO Connector(s)

P-621.20L

Precise PIHera XY Nanopositioning System, 60 μm × 60 μm, Open- Loop, LEMO Connector(s)

P-620.2UD

Precise PIHera XY Nanopositioning System, 50 μm × 50 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s), Vacuum- Compatible to 10⁻⁹ hPa

P-621.2CD

Precise PIHera XY Nanopositioning System, 100 μm × 100 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s)

P-621.2CL

Precise PIHera XY Nanopositioning System, 100 μm × 100 μm, Direct Metrology, Capacitive Sensors, LEMO Connector(s)

P-621.20L

Precise PIHera XY Nanopositioning System, 120 μm × 120 μm, Open- Loop, LEMO Connector(s)

P-621.2UD

Precise PIHera XY Nanopositioning System, 100 μm × 100 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s), Vacuum- Compatible to 10⁻⁹ hPa

P-622.2CD

Precise PIHera XY Nanopositioning System, 250 μm × 250 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s)

P-622.2CL

Precise PIHera XY Nanopositioning System, 250 μm × 250 μm, Direct Metrology, Capacitive Sensors, LEMO Connector(s)

P-622.20L

Precise PIHera XY Nanopositioning System, 300 μm × 300 μm, Open- Loop, LEMO Connector(s)

P-622.2UD

Precise PIHera XY Nanopositioning System, 250 μm × 250 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s), Vacuum- Compatible to 10⁻⁹ hPa

P-625.2CD

Precise PIHera XY Nanopositioning System, 500 μm × 500 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s)

P-625.2CL

Precise PIHera XY Nanopositioning System, 500 μm × 500 μm, Direct Metrology, Capacitive Sensors, LEMO Connector(s)

P-625.20L

Precise PIHera XY Nanopositioning System, 600 μm × 600 μm, Open- Loop, LEMO Connector(s)

P-625.2UD

Precise PIHera XY Nanopositioning System, 500 μm × 500 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s), Vacuum- Compatible to 10⁻⁹ hPa

P-628.2CD

Precise PIHera XY Nanopositioning System, 800 μm × 800 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s)

P-628.2CL

Precise PIHera XY Nanopositioning System, 800 μm × 800 μm, Direct Metrology, Capacitive Sensors, LEMO Connector(s)

P-628.20L

Precise PIHera XY Nanopositioning System, 1000 μm × 1000 μm, Open- Loop, LEMO Connector(s)

P-628.2UD

Precise PIHera XY Nanopositioning System, 800 μm × 800 μm, Direct Metrology, Capacitive Sensors, Sub- D Connector(s), Vacuum- Compatible to 10⁻⁹ hPa

P-629.2CD

PIHera XY Piezo Nanopositioning Stage, 1500 µm × 1500 µm, Capacitive Sensors, Sub- D Connector(s)

P-629.2CL

PIHera XY Piezo Nanopositioning Stage, 1500 µm × 1500 µm, Capacitive Sensors, LEMO Connector(s)

P-629.20L

Precise PIHera XY Nanopositioning System, 1800 µm × 1800 µm, Open- Loop, LEMO Connector(s)

P-629.2UD

PIHera XY Piezo Nanopositioning Stage, 1500 µm × 1500 µm, Capacitive Sensors, Sub- D Connector(s), Vacuum- Compatible to 10⁻⁹ hPa

Controllers / Drivers / Amplifiers

[E-610 Piezo Amplifier / Controller](#)

[E-621 Piezo Servo- Controller & Driver](#)

[E-625 Piezo Servo- Controller & Driver](#)

[E-836 Compact Piezo Amplifier / OEM Module](#)

[E-665 Piezo Amplifier / Servo Controller](#)

[E-712 Digital Piezo Controller](#)

[E-725 Digital Piezo Controller](#)

[E-761 Digital Piezo Controller](#)

[E-500 • E-501 Modular Piezo Controller](#)

[E-505 Piezo Amplifier Module](#)

[E-509 Signal Conditioner / Piezo Servo Module](#)

Accessories

[P-895.1DLC Adapter Cable, Sub- D 7W2 \(f\) to LEMO Connectors \(m\)](#)

[P-895.1LDC Adapter Cable, Sub- D 7W2 \(f\) to LEMO Connectors \(m\)](#)

Related Products

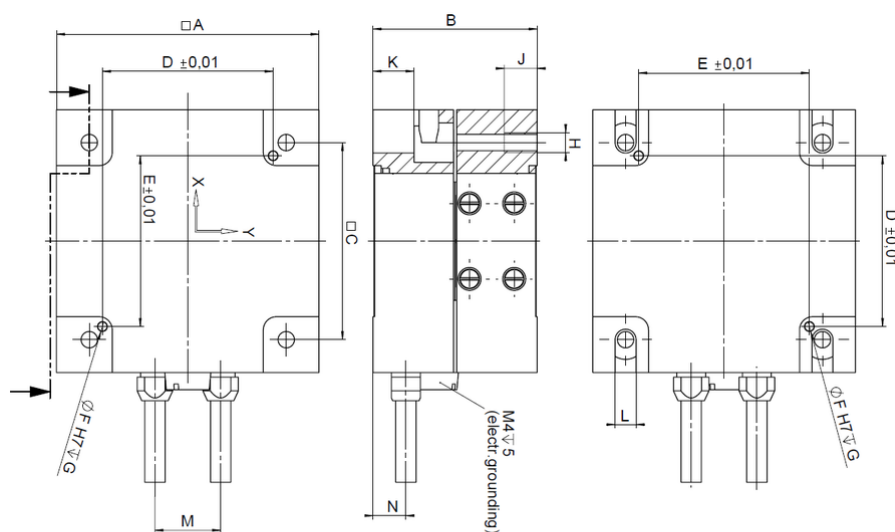
[P-541.2 • P-542.2 XY Piezo Stage](#)

[P-611.1 Linear Piezo Positioning System](#)

[P-612.2 XY Piezo Nanopositioning System](#)

[P-620.Z – P-622.Z PIHera Precision Z- Stage](#)

Drawings / Images



P-62x.2CD/.2CL/.20L
dimensions in mm

	A	B	C	D	E	∅ F	G	H	J	K	L	M	N
P-620.2CD / 20L	30	21,5	24	24	19	1,01	1,5	M2	3,5	5,1	2,2	9	6
P-621.2CD / 20L	40	25	30	26	26	1,51	2,5	M3	5	6,25	3,2	10	5
P-622.2CD / 20L	50	25	40	35	35	1,51	2,5	M3	5	6,25	3,2	11	5
P-625.2CD / 20L	60	25	50	46	46	1,51	2,5	M3	6	6,25	3,2	11	5
P-628.2CD / 20L	80	30	70	66	66	1,51	2,5	M3	6	6,75	3,2	11	5
P-629.2CD / 20L	100	40	90	82	82	2,01	3,5	M4	7	9,75	4,3	16	7,5