

PIHera Vertical Precision Z Positioner

Variable Travel Ranges and Axis Configuration



P-620.Z - P-622.Z

- Travel ranges 50 μm to 250 μm (350 μm open loop)
- Resolution to 0.1 nm
- Linearity error only 0.02 %
- Direct metrology with capacitive sensors
- X, XY, Z, XYZ versions

Fields of application

- Interferometry
- Microscopy
- Nanopositioning
- Biotechnology
- Test applications
- Semiconductor technology

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.

Suitable for sophisticated vacuum applications

All components used in the piezo systems are excellently suited for use in vacuum. No lubricant or grease is necessary for operating. Polymer-free piezo systems allow particularly low outgas rates.

Specifications

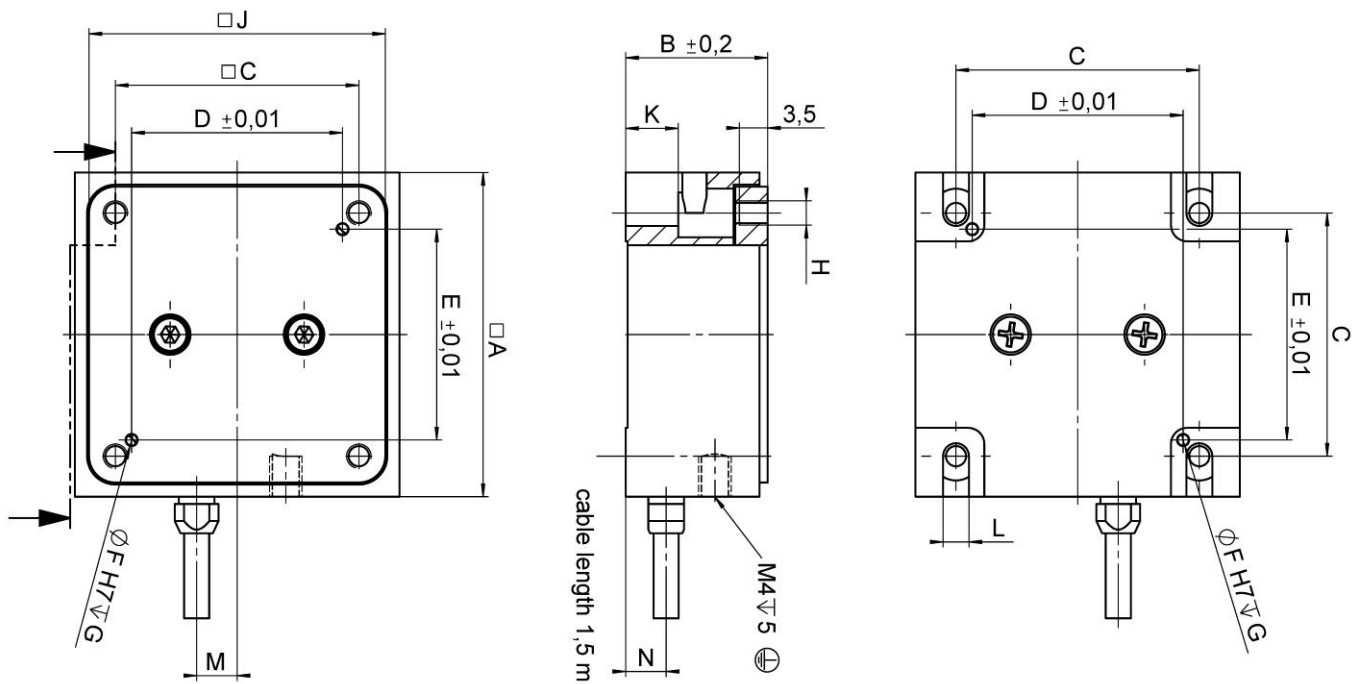
	P-620.ZCD / P-620.ZCL	P-621.ZCD / P-621.ZCL	P-622.ZCD / P-622.ZCL	Unit	Tolerance
Active axes	Z	Z	Z		
Motion and positioning					
Integrated sensor	Capacitive	Capacitive	Capacitive		
Travel range at -20 to 120 V, open loop	65	140	350	µm	+20 % / -0 %
Travel range, closed loop	50	100	250	µm	
Resolution, open loop	0.1	0.2	0.5	nm	typ.
Resolution, closed loop	0.2	0.3	1	nm	typ.
Linearity error	0.02	0.02	0.02	%	typ.
Repeatability	±1	±1	±1	nm	typ.
Tilt θ_x, θ_y	<20	<20	<80	µrad	typ.
Mechanical properties					
Stiffness	0.5	0.6	0.24	N/µm	±20 %
Resonant frequency, no load	1000	790	360	Hz	±20 %
Resonant frequency, under load, 30 g	690	500	270	Hz	±20 %
Push/pull force capacity	10 / 5	10 / 8	10 / 8	N	max.
Load capacity	10	10	10	N	max.
Lateral load capacity	10	10	10	N	max.
Drive properties					
Ceramic type	PICMA® P-883	PICMA® P-885	PICMA® P-885		
Electrical capacitance	0.7	3	6.2	µF	±20 %
Miscellaneous					
Operating temperature range	-20 to 80	-20 to 80	-20 to 80	°C	
Material	Aluminum	Aluminum	Aluminum		
Dimensions	30 mm × 30 mm × 15 mm	40 mm × 40 mm × 17.5 mm	50 mm × 50 mm × 17.5 mm		
Mass	0.12	0.17	0.24	kg	±5 %
Cable length	1.5	1.5	1.5	m	±10 mm
Sensor/voltage connection	CD versions: Sub-D 7W2 (m) CL versions: LEMO	CD versions: Sub-D 7W2 (m) CL versions: LEMO	CD versions: Sub-D 7W2 (m) CL versions: LEMO		
Recommended electronics	E-503, E-505, E-610, E- 621, E-625, E-665, E- 709, E-754	E-503, E-505, E-610, E- 621, E-625, E-665, E- 709, E-754	E-503, E-505, E-610, E- 621, E-625, E-665, E- 709, E-754		

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.

Versions without sensor are available under the P-62x.Z0L order numbers; operating temperature range -20 to 150 °C; LEMO voltage connection.

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

Drawings / Images



	A	B	C	D	E	Ø F	G	H	J	K	L	M	N
P-620.ZCD / ZOL	30	15	24	19	24	1,01	2	M2	28	5	2,2	4,5	6
P-621.ZCD / ZOL	40	17,5	30	26	26	1,51	2,5	M3	36,5	6,5	3,2	5	5
P-622.ZCD / ZOL	50	17,5	40	35	35	1,51	2,5	M3	46,5	6,5	3,2	5	5

P-62x.2CD / .2CL / .2OL, dimensions in mm

Ordering Information

P-620.ZCD

Precise PIHera vertical nan positioning stage, 50 μm , direct position measuring, capacitive sensor, Sub-D connector

P-620.ZCL

Precise PIHera vertical nan positioning stage, 50 μm , direct position measuring, capacitive sensor, LEMO connector(s)

P-620.Z0L

Precise PIHera vertical nan positioning stage, 65 μm , without sensor, LEMO connector(s)

P-621.ZCD

Precise PIHera vertical nan positioning stage, 100 μm , direct position measuring, capacitive sensor, Sub-D connector

P-621.ZCL

Precise PIHera vertical nan positioning stage, 100 μm , direct position measuring, capacitive sensor, LEMO connector(s)

P-621.Z0L

Precise PIHera vertical nan positioning stage, 140 μm , without sensor, LEMO connector(s)

P-622.ZCD

Precise PIHera vertical nan positioning stage, 250 μm , direct position measuring, capacitive sensor, Sub-D connector

P-622.ZCL

Precise PIHera vertical nan positioning stage, 250 μm , direct position measuring, capacitive sensor, LEMO connector(s)

P-622.Z0L

Precise PIHera vertical nan positioning stage, 350 μm , without sensor, LEMO connector(s)