

# Piezo Z Stage

## Compact Nanopositioner



### P-611.Z

- Compact: Surface only 44 mm × 44 mm
- Travel range 100 μm
- Resolution to 0.2 nm
- Particularly inexpensive systems (mechanics and controller)
- Zero-play, high-precision flexure guide system
- Outstanding lifetime due to PICMA® piezo actuators
- X, XY, XZ and XYZ versions

#### Application fields

- Micromachining
- Photonics
- Fiber positioning
- Test procedures and quality assurance

#### 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.

Motion	Unit	Tolerance	P-611.Z0	P-611.ZS
Active axes			Z	Z
Travel range in Z	μm			100
Travel range in Z, open loop	μm	±20%	120	120
Linearity error in Z	%	Typ.		0.1
Yaw (Rotational crosstalk in θX with motion in Z)	μrad	Typ.	±20	±20
Pitch (Rotational crosstalk in θY with motion in Z)	μrad	Typ.	±5	±5
Roll (Rotational crosstalk in θZ with motion in Z)	μrad	Typ.	±5	±5
Bandwidth, 10% step in Z	Hz		40	40

Positioning	Unit	Tolerance	P-611.Z0	P-611.ZS
Bidirectional repeatability in Z	nm	Typ.		5
Resolution in Z, open loop	nm	Typ.	0.2	0.2
Integrated sensor				SGS, indirect position measuring
System resolution in Z	nm			2
Settling time for 10% step in Z	ms		25	25

Drive Properties	Unit	Tolerance	P-611.Z0	P-611.ZS
Drive type			Piezo actuator/PICMA®	Piezo actuator/PICMA®
Electrical capacitance in Z	µF	±20%	1.5	1.5

Mechanical Properties	Unit	Tolerance	P-611.Z0	P-611.ZS
Stiffness in Z	N/µm	±20%	0.45	0.45
Resonant frequency in Z, unloaded	Hz	±20%	460	460
Resonant frequency in Z, under load with 30 g	Hz	±20%	375	375
Resonant frequency in Z, under load with 100 g	Hz	±20%	265	265
Permissible push force in Z	N	Max.	15	15
Permissible pull force in Z	N	Max.	10	10
Guide			Flexure guide/Flexure guide with lever amplification	Flexure guide/Flexure guide with lever amplification
Overall mass	g		176	176
Material			Aluminum, steel	Aluminum, steel

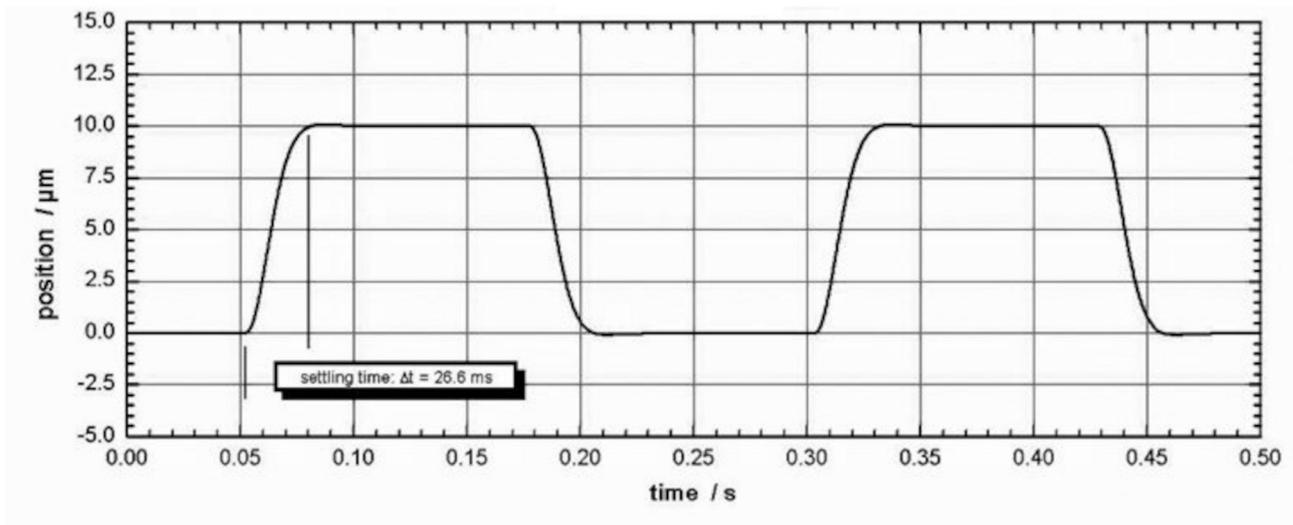
Miscellaneous	Unit		P-611.Z0	P-611.ZS
Operating temperature range	°C		-20 to 80	-20 to 80
Connector			LEMO FFS.00.250.CTCE24	LEMO FFS.00.250.CTCE24
Sensor connector				LEMO FFA.OS.304.CLAC32
Cable length	m		1.5	1.5
Recommended controllers / drivers			E-610, E-625, E-665, E-836	E-610, E-625, E-665, E-709.SRG, E-836

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.

System properties

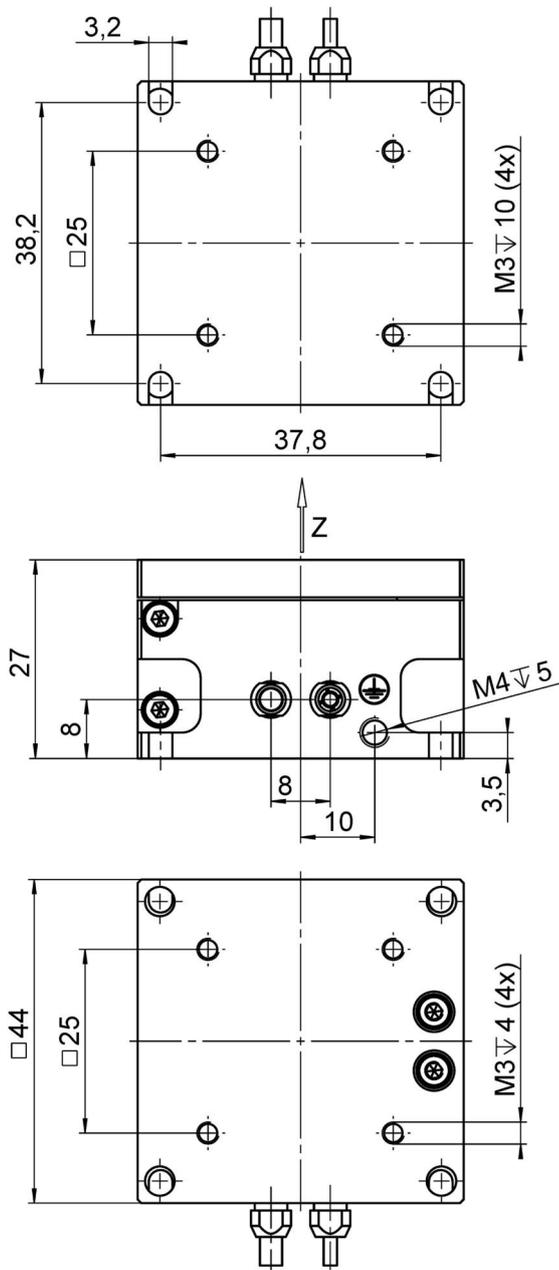
System configuration: P-611.ZS and E-665.SR controller with 30 g load

## Drawings / Images



The P-611.ZS needs a settling time of 26 ms for a 10- $\mu\text{m}$  step with a load of 30 g.

## Drawings / Images



P-611.ZS, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

## Order Information

### P-611.Z0

Piezo Z stage; 120  $\mu$ m travel range (open loop); LEMO connector; 1.5 m cable length

### P-611.ZS

Piezo Z stage; 100  $\mu$ m travel range; SGS, indirect position measuring; LEMO connectors; 1.5 m cable length