

# PT Piezo Tube Actuators

HIGH-DYNAMICS OPERATION WITH LOW LOADS



## PT120 – PT140

- Radial, lateral and axial displacement
- Sub-nanometer resolution
- Ideal for OEM applications
- Large choice of designs

### Piezo actuator / scanner tube

Operating voltage of up to 1000 V or bipolar up to  $\pm 250$  V. Monolithic piezoceramic actuator with minimal geometric tolerances. Radial and axial contraction, low load capacity. UHV-compatible versions with multi-segmented electrodes

### Custom designs with modified specifications

- Materials
- Operating voltage range, displacement
- Tolerances
- Applied sensors
- Special high / low temperature versions
- Geometric shapes: Rectangular, inner hole
- Segmentation of the electrodes, wrap-around electrodes, circumferential insulating borders
- Non-magnetic

### Possible dimensions

- Length L max. 70 mm
- Outer diameter OD 2 to 80 mm
- Inner diameter ID 0.8 to 74 mm
- Min. wall thickness 0.30 mm



Special versions of the PT Piezo Scanner Tubes with multi-segmented outer electrodes and wrap-around electrodes

### Fields of application

Research and industry, UHV environment up to  $10^{-9}$  hPa. For microdosing, micromanipulation, scanning microscopy (AFM, STM, etc.), fiber stretching

Order Number	Dimensions [mm] L x OD x ID	Max. operating voltage [V]	Electrical capacitance [nF] $\pm 20\%$	Max. change in contraction [ $\mu\text{m}$ ]	Max. diameter contraction [ $\mu\text{m}$ ]
PT120.00	20 x 2.2 x 1.0	500	3	5	0.7
PT130.90	30 x 3.2 x 2.2	500	12	9	0.9
PT130.10	30 x 6.35 x 5.35	500	18	9	1.8
PT130.20	30 x 10.0 x 9.0	500	36	9	3
PT130.40	30 x 20.0 x 18.0	1000	35	9	6
PT140.70	40 x 40.0 x 38.0	1000	70	15	12

Max. displacement data refers to respective max. operating voltage.

Piezo ceramic type: PIC 151.

Capacitance at  $1 V_{pp}$ , 1 kHz, RT.

Inner electrode on positive potential, fired-silver electrodes inside and outside as standard. Option: Outer electrode thin film (CuNi, Au).

## Scanner tubes

Quartered electrodes for XY deflection, UHV-compatible to  $10^{-9}$  hPa

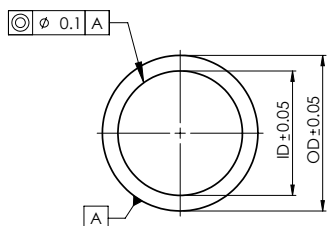
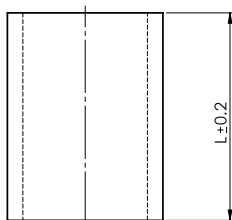
Order Number	Dimensions [mm] L x OD x ID	Max. operating voltage [V]	Electrical capacitance [nF] $\pm 20\%$	Max. change in length [ $\mu\text{m}$ ]	Max. XY deflection [ $\mu\text{m}$ ]
PT230.94	30 x 3.2 x 2.2	$\pm 250$	4 x 2.1	$\pm 4.5$	$\pm 35$
PT230.14	30 x 6.35 x 5.35	$\pm 250$	4 x 4.5	$\pm 4.5$	$\pm 16$
PT230.24	30 x 10.0 x 9.0	$\pm 250$	4 x 6.9	$\pm 4.5$	$\pm 10$

Max. displacement data refers to respective max. operating voltage. Max. XY displacement for simultaneous control with +250 / -250 V at opposite electrodes.

Piezo ceramic type: PIC 255. Bakeout temperature up to 150°C.

Capacitance at  $1 V_{pp}$ , 1 kHz, RT.

Quartered electrodes for XY deflection. Outer electrode thin film (CuNi, Au), inner electrodes fired-silver.



PT Piezo Tube actuators, dimensions in mm. L, OD, ID see data table

## PICMA® Stack Multilayer Ring Actuator

WITH INNER HOLE



### P-080

- Inner hole for preload or as aperture for optical applications
- Superior lifetime
- Ideal for dynamic operation
- Microsecond response
- Subnanometer resolution

#### Multilayer stack actuators

Flexible travel range up to 30  $\mu\text{m}$ . Annular cross-section for easy integration.  
UHV-compatible to  $10^{-9}$  hPa, high bakeout temperature

#### PICMA® piezo linear actuators

Low operating voltage -20 to 100 V. Ceramic insulation.  
High reliability and long lifetime

#### Available options

Different heights, easy to mount on customer request.  
Variety of shapes. Precision-ground end plates for reduced tolerances

#### Fields of application

Research and industry. For laser tuning, microdispensing, life sciences

Preliminary data	P-080.311	P-080.341	P-080.391	Unit
Dimensions OD × ID × L	8 × 4.5 × 8.5	8 × 4.5 × 16	8 × 4.5 × 36	mm × mm × mm
Nominal travel range	5.5 ± 20 %	11 ± 20 %	25 ± 10 %	μm
Blocking force	800	825	850	N
Stiffness	145	75	34	N/μm
Electrical capacitance	0.86	1.7	4.0	μF
Resonant frequency	160	85	40	kHz

All data at 0 to 100 V.

Standard connections: PTFE-insulated stranded wires, 100 mm, AWG 30 (Ø 0.61 mm).

For optional solderable contacts without stranded wires, change order number extension to 0.

Piezo ceramic type PIC 252. Ceramic end plates made of Al<sub>2</sub>O<sub>3</sub>.

Recommended preload for dynamic operation: 15 MPa.

Maximum preload for constant force: 30 MPa.

Axial resonant frequency: measured at 1 V<sub>ppr</sub>, unloaded, unclamped.

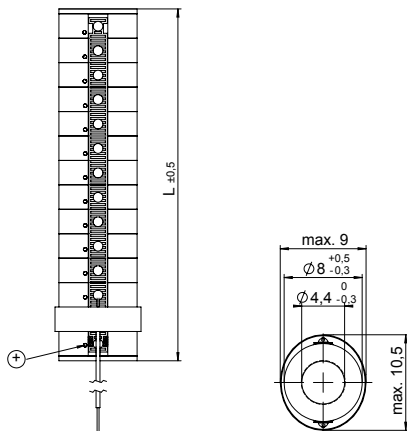
The value is halved for unilateral clamping.

Electrical capacitance: Tolerance ±20%, measured at 1 V<sub>ppr</sub>, 1 kHz, RT.

Operating voltage: -20 to 100 V.

Operating temperature range: -40 to 150°C.

Ask about custom designs!



P-080, dimensions in mm