PT Piezo Tube Actuators

**HIGH-DYNAMICS OPERATION WITH LOW LOADS**

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**PT120 – PT140**
- Radial, lateral and axial displacement
- Sub-nanometer resolution
- Ideal for OEM applications
- Large choice of designs

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**Piezo actuator / scanner tube**
Operating voltage of up to 1000 V or bipolar up to ±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

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

*Quartered electrodes for XY deflection, UHV-compatible to 10⁻⁹ hPa*

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Dimensions (mm) L × OD × ID</th>
<th>Max. operating voltage [V]</th>
<th>Electrical capacitance [nF] ±20%</th>
<th>Max. change in length [µm]</th>
<th>Max. XY deflection [µm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT230.94</td>
<td>30 × 3.2 × 2.2</td>
<td>±250</td>
<td>4 × 2.1</td>
<td>±4.5</td>
<td>±35</td>
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<tr>
<td>PT230.14</td>
<td>30 × 6.35 × 5.35</td>
<td>±250</td>
<td>4 × 4.5</td>
<td>±4.5</td>
<td>±16</td>
</tr>
<tr>
<td>PT230.24</td>
<td>30 × 10.0 × 9.0</td>
<td>±250</td>
<td>4 × 6.9</td>
<td>±4.5</td>
<td>±10</td>
</tr>
</tbody>
</table>

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 Vpp, 1 kHz, RT. Quartered electrodes for XY deflection. Outer electrode thin film (CuNi, Au), inner electrodes fired-silver.

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Max. displacement data refers to respective max. operating voltage. Piezo ceramic type: PIC 151. Capacitance at 1 Vpp, 1 kHz, RT. Inner electrode on positive potential, fired-silver electrodes inside and outside as standard. Option: Outer electrode thin film (CuNi, Au).

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PICMA® Stack Multilayer Ring Actuator

WITH INNER HOLE

- 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 µm. 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, micro-dispensing, life sciences

WWW.PI.WS
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 Al₂O₃.

Recommended preload for dynamic operation: 15 MPa.

Maximum preload for constant force: 30 MPa.

Axial resonant frequency: measured at 1 Vpp, unloaded, unclamped.

The value is halved for unilateral clamping.

Electrical capacitance: Tolerance ±20%, measured at 1 Vpp, 1 kHz, RT.

Operating temperature range: -40 to 150°C.

Ask about custom designs!

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### Preliminary data

<table>
<thead>
<tr>
<th>Dimension</th>
<th>P-080.311</th>
<th>P-080.341</th>
<th>P-080.391</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions OD x ID x L</td>
<td>8 x 4.5 x 8.5</td>
<td>8 x 4.5 x 16</td>
<td>8 x 4.5 x 36</td>
<td>mm x mm x mm</td>
</tr>
<tr>
<td>Nominal travel range</td>
<td>5.5 ± 20 %</td>
<td>11 ± 20 %</td>
<td>25 ±10 %</td>
<td>µm</td>
</tr>
<tr>
<td>Blocking force</td>
<td>800</td>
<td>825</td>
<td>850</td>
<td>N</td>
</tr>
<tr>
<td>Stiffness</td>
<td>145</td>
<td>75</td>
<td>34</td>
<td>N/µm</td>
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<tr>
<td>Electrical capacitance</td>
<td>0.86</td>
<td>1.7</td>
<td>4.0</td>
<td>µF</td>
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<tr>
<td>Resonant frequency</td>
<td>160</td>
<td>85</td>
<td>40</td>
<td>kHz</td>
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</tbody>
</table>

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P080, dimensions in mm

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