Piezo shear actuators with inner hole
Operating voltage -250 to 250 V. Lateral displacement is based on the piezoelectric shear effect. Excellent dynamics with minimum electric power requirement. Variants without inner hole or for use in cryogenic and UHV environments to 10⁻⁹ hPa.

Possible modifications
- Piezo ceramic material
- Nonmagnetic versions
- Operating voltage range, displacement, layer thickness, cross-sectional dimension
- Load capacity, force generation
- Mechanical interfaces: flat, spherical, metal, ceramic, glass, sapphire, etc.
- Extra-tight length tolerances

Fields of application
- Industry and research
- Low temperature / vacuum versions to 10⁻⁹ hPa
- Scanning applications
- Microscopy
- Precision mechanics
- Switching applications

P-15x.xxH
- Single and multi-axis versions
- Travel ranges to 10 × 10 × 10 µm
- Extreme reliability: >10⁹ cycles
- Picometer resolution
- Short lead times
Specifications

<table>
<thead>
<tr>
<th>Active axes</th>
<th>Travel range</th>
<th>Surface A × B / ID</th>
<th>Length L</th>
<th>Max. shear load</th>
<th>Axial stiffness</th>
<th>Electrical capacitance</th>
<th>Axial resonant frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-151.03H</td>
<td>X 3*</td>
<td>16 × 16 / 10</td>
<td>5.5</td>
<td>200</td>
<td>870</td>
<td>30</td>
<td>210</td>
</tr>
<tr>
<td>P-151.05H</td>
<td>X 5</td>
<td>16 × 16 / 10</td>
<td>7.5</td>
<td>200</td>
<td>640</td>
<td>49</td>
<td>155</td>
</tr>
<tr>
<td>P-151.10H</td>
<td>X 10</td>
<td>16 × 16 / 10</td>
<td>12</td>
<td>200</td>
<td>400</td>
<td>89</td>
<td>100</td>
</tr>
<tr>
<td>P-153.10H</td>
<td>XYZ</td>
<td>16 × 16 / 10</td>
<td>40</td>
<td>20</td>
<td>120</td>
<td>89 / 89 / 160</td>
<td>30</td>
</tr>
</tbody>
</table>

Travel range: At -250 to 250 V, tolerance -10 / 20 %, * ±30 %.
Length L: Tolerance ±0.3 mm.
Electrical capacitance: Measured at 1 V_{pp}, 1 kHz, RT, tolerance ±20 %.
Axial resonant frequency: Measured at 1 V_{pp}, unloaded, unclamped. The value is halved for unilateral clamping.
Piezo ceramic type: PIC255
Standard connections: PTFE-insulated stranded wires, 100 mm, AWG 32, Ø 0.49 mm.
Operating voltage range: -250 to 250 V
Operating temperature range: -20 to 85 °C
Standard mechanical interfaces: Ceramic (passive PZT)
Outer surface: Epoxy resin
Recommended electronics: E-413, E-508.
Other specifications on request.
Ask about customized versions.

Drawings / Images

PICA Shear P-1xx.xx and P-1xx.xxH actuator (with inner hole). A, B, L, see data table. Dimensions in mm. The number of axes and wires depends on the type.

Axis and cable assignment for PICA shear actuators. GND: 0 V, +: ±250 V.
Principle of shear motion. $\Delta L$ refers to the travel range.

Ordering Information

**P-151.03H**
PICA Shear X piezo actuator, 3 µm travel range, 16 mm × 16 mm cross section, ID 10 mm

**P-151.05H**
PICA Shear X piezo actuator, 5 µm travel range, 16 mm × 16 mm cross section, ID 10 mm

**P-151.10H**
PICA Shear X piezo actuator, 10 µm travel range, 16 mm × 16 mm cross section, ID 10 mm

**P-153.10H**
PICA Shear XYZ piezo actuator, 10 µm × 10 µm × 10 µm travel range, 16 mm × 16 mm cross section, ID 10 mm