Preloaded Piezo Actuators
For High Loads and Forces, with Position Sensor

P-843
- Outstanding lifetime due to PICMA® piezo actuators
- Travel range to 90 µm
- Push force capacity to 800 N
- Pull force capacity to 300 N
- µs response time
- Subnanometer resolution
- Vacuum-compatible versions

Fields of application
- Static and dynamic precision positioning
- Fiber positioning
- Laser tuning
- Nanotechnology

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.

Suitable for sophisticated vacuum applications
Piezo actuators do not require lubrication and do not cause abrasion. The all-ceramic isolated PICMA® actuators also do not require polymer isolation and are therefore ideal for vacuum applications.
## Specifications

<table>
<thead>
<tr>
<th></th>
<th>P-843.10</th>
<th>P-843.20</th>
<th>P-843.30</th>
<th>P-843.40</th>
<th>P-843.60</th>
<th>Unit</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travel range at 0 to 100 V</strong></td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>90</td>
<td>µm</td>
<td></td>
</tr>
<tr>
<td><strong>Sensor</strong></td>
<td>SGS</td>
<td>SGS</td>
<td>SGS</td>
<td>SGS</td>
<td>SGS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.3</td>
<td>0.6</td>
<td>0.9</td>
<td>1.2</td>
<td>1.8</td>
<td>nm</td>
<td>±20 %</td>
</tr>
<tr>
<td><strong>Static large-signal stiffness</strong></td>
<td>57</td>
<td>27</td>
<td>19</td>
<td>15</td>
<td>10</td>
<td>N/µm</td>
<td></td>
</tr>
<tr>
<td><strong>Push force capacity</strong></td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td><strong>Pull force capacity</strong></td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td><strong>Torque on tip</strong></td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>Nm</td>
<td>max.</td>
</tr>
<tr>
<td><strong>Electrical capacitance</strong></td>
<td>1.5</td>
<td>3</td>
<td>4.5</td>
<td>6</td>
<td>9</td>
<td>µF</td>
<td>±20 %</td>
</tr>
<tr>
<td><strong>Resonant frequency f₀ (no load)</strong></td>
<td>18</td>
<td>14</td>
<td>10</td>
<td>8.5</td>
<td>6</td>
<td>kHz</td>
<td>±20 %</td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td>-40 to 80</td>
<td>-40 to 80</td>
<td>-40 to 80</td>
<td>-40 to 80</td>
<td>-40 to 80</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td><strong>Mass without cable</strong></td>
<td>31</td>
<td>42</td>
<td>53</td>
<td>64</td>
<td>86</td>
<td>g</td>
<td>±5 %</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>37</td>
<td>55</td>
<td>73</td>
<td>91</td>
<td>127</td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

* Models with SGS allow closed loop linearity up to 0.15 % and are shipped with performance reports.
** The resolution of the system is only limited by the noise of the amplifier and measuring technology because PI piezo actuators are free of friction.
*** Dynamic small-signal stiffness is approx. 30 % higher.
Voltage connection: LEMO FFA.00.250. Coaxial cable RG 178, 1 m.
Sensor connection: LEMO FFA.05.304. Cable, 1 m.
Housing / tip material: Stainless steel.
Vacuum versions to 10⁻⁶ hPa are available under the following ordering number: P-843.x0V.
All specifications based on room temperature (22 °C ±3 °C).
Drawings / Images

<table>
<thead>
<tr>
<th>Model</th>
<th>Travel range</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-842.10 / P-843.10</td>
<td>15 μm</td>
<td>37 mm</td>
</tr>
<tr>
<td>P-842.20 / P-843.20</td>
<td>30 μm</td>
<td>55 mm</td>
</tr>
<tr>
<td>P-842.30 / P-843.30</td>
<td>45 μm</td>
<td>73 mm</td>
</tr>
<tr>
<td>P-842.40 / P-843.40</td>
<td>60 μm</td>
<td>91 mm</td>
</tr>
<tr>
<td>P-842.60 / P-843.60</td>
<td>90 μm</td>
<td>127 mm</td>
</tr>
</tbody>
</table>

P-842 / P-843, dimensions in mm. Sensor included only with P-843.
Ordering Information

Actuators with sensor

P-843.10
Preloaded piezo actuator, 15 µm travel range, 800 N / 300 N, strain gauge sensor

P-843.20
Preloaded piezo actuator, 30 µm travel range, 800 N / 300 N, strain gauge sensor

P-843.30
Preloaded piezo actuator, 45 µm travel range, 800 N / 300 N, strain gauge sensor

P-843.40
Preloaded piezo actuator, 60 µm travel range, 800 N / 300 N, strain gauge sensor

P-843.60
Preloaded piezo actuator, 90 µm travel range, 800 N / 300 N, strain gauge sensor

Actuators with sensor, vacuum compatible

P-843.10V
Preloaded piezo actuator, 15 µm travel range, 800 N / 300 N, strain gauge sensor, vacuum compatible to 10^-6 hPa

P-843.20V
Preloaded piezo actuator, 30 µm travel range, 800 N / 300 N, strain gauge sensor, vacuum compatible to 10^-6 hPa

P-843.30V
Preloaded piezo actuator, 45 µm travel range, 800 N / 300 N, strain gauge sensor, vacuum compatible to 10^-6 hPa

P-843.40V
Preloaded piezo actuator, 60 µm travel range, 800 N / 300 N, strain gauge sensor, vacuum compatible to 10^-6 hPa

P-843.60V
Preloaded piezo actuator, 90 µm travel range, 800 N / 300 N, strain gauge sensor, vacuum compatible to 10^-6 hPa

Actuators without position sensor available under P-842.