Preloaded Piezo Actuators

For High Loads and Forces

P-842

- Outstanding lifetime due to PICMA® piezo actuators
- Travel range to 90 µm
- Push force capacity to 800 N
- Pull force capacity to 300 N
- Microsecond response
- 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-842.10</th>
<th>P-842.20</th>
<th>P-842.30</th>
<th>P-842.40</th>
<th>P-842.60</th>
<th>Unit</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel range at 0 to 100 V</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>90</td>
<td>µm</td>
<td>±20 %</td>
</tr>
<tr>
<td>Resolution*</td>
<td>0.15</td>
<td>0.3</td>
<td>0.45</td>
<td>0.6</td>
<td>0.9</td>
<td>nm</td>
<td>±20 %</td>
</tr>
<tr>
<td>Static large-signal stiffness**</td>
<td>57</td>
<td>27</td>
<td>19</td>
<td>15</td>
<td>10</td>
<td>N/µm</td>
<td>±20 %</td>
</tr>
<tr>
<td>Push force capacity</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Pull force capacity</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Torque on tip</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>Resolution*</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>Resonant frequency $f_0$ (no load)</td>
<td>18</td>
<td>14</td>
<td>10</td>
<td>8.5</td>
<td>6</td>
<td>kHz</td>
<td>±20 %</td>
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<tr>
<td>Operating temperature range</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>Mass without cable</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>Length</td>
<td>37</td>
<td>55</td>
<td>73</td>
<td>91</td>
<td>127</td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

* 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.

Housing / tip material: Stainless steel.

Vacuum versions to $10^{-6}$ hPa are available under the following ordering number: P-842.x0V.

All specifications based on room temperature ($22 ^\circ C \pm 3 ^\circ C$).
P-842 / P-843, dimensions in mm. Sensor included only with P-843.
Ordering Information

Actuators without sensor

**P-842.10**
Preloaded piezo actuator, 15 µm travel range, 800 N / 300 N

**P-842.20**
Preloaded piezo actuator, 30 µm travel range, 800 N / 300 N

**P-842.30**
Preloaded piezo actuator, 45 µm travel range, 800 N / 300 N

**P-842.40**
Preloaded piezo actuator, 60 µm travel range, 800 N / 300 N

**P-842.60**
Preloaded piezo actuator, 90 µm travel range, 800 N / 300 N

Actuators without sensor, vacuum-compatible

**P-842.10V**
Preloaded piezo actuator, 15 µm travel range, 800 N / 300 N, vacuum compatible to $10^{-6}$ hPa

**P-842.20V**
Preloaded piezo actuator, 30 µm travel range, 800 N / 300 N, vacuum compatible to $10^{-6}$ hPa

**P-842.30V**
Preloaded piezo actuator, 45 µm travel range, 800 N / 300 N, vacuum compatible to $10^{-6}$ hPa

**P-842.40V**
Preloaded piezo actuator, 60 µm travel range, 800 N / 300 N, vacuum compatible to $10^{-6}$ hPa

**P-842.60V**
Preloaded piezo actuator, 90 µm travel range, 800 N / 300 N, vacuum compatible to $10^{-6}$ hPa

Actuators with position sensor available under **P-843**.