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

P-845
- Outstanding lifetime due to PICMA® piezo actuators
- Travel range to 90 µm
- Push force capacity to 3000 N
- Pull force capacity to 700 N
- Microsecond response
- Subnanometer resolution
- Vacuum versions, optional water-resistant housing

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-845.10</th>
<th>P-845.20</th>
<th>P-845.30</th>
<th>P-845.40</th>
<th>P-845.60</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></td>
</tr>
<tr>
<td>Sensor*</td>
<td>SGS</td>
<td>SGS</td>
<td>SGS</td>
<td>SGS</td>
<td>SGS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution**</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></td>
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<tr>
<td>Static large-signal stiffness***</td>
<td>225</td>
<td>107</td>
<td>75</td>
<td>57</td>
<td>38</td>
<td>N/µm</td>
<td>±20 %</td>
</tr>
<tr>
<td>Push force capacity</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Pull force capacity</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Torque on tip</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Nm</td>
<td>max.</td>
</tr>
<tr>
<td>Electrical capacitance</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td>24</td>
<td>36</td>
<td>µF</td>
<td>±20 %</td>
</tr>
<tr>
<td>Resonant frequency $f_0$ (no load)</td>
<td>16</td>
<td>12</td>
<td>9</td>
<td>7.5</td>
<td>5.5</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>
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<tr>
<td>Mass without cable</td>
<td>84</td>
<td>108</td>
<td>132</td>
<td>156</td>
<td>204</td>
<td>g</td>
<td>±5 %</td>
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<tr>
<td>Length L</td>
<td>47</td>
<td>65</td>
<td>83</td>
<td>101</td>
<td>137</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-845.x0V.
All specifications based on room temperature (22 °C ±3 °C).
P-844 / P-845, Dimensions in mm. Sensor included only with P-845.
Ordering Information

Actuators with sensor

**P-845.10**
Preloaded piezo actuator, 15 µm travel range, 3000 N / 700 N, strain gauge sensor

**P-845.20**
Preloaded piezo actuator, 30 µm travel range, 3000 N / 700 N, strain gauge sensor

**P-845.30**
Preloaded piezo actuator, 45 µm travel range, 3000 N / 700 N, strain gauge sensor

**P-845.40**
Preloaded piezo actuator, 60 µm travel range, 3000 N / 700 N, strain gauge sensor

**P-845.60**
Preloaded piezo actuator, 90 µm travel range, 3000 N / 700 N, strain gauge sensor

Actuators with sensor, vacuum compatible

**P-845.10V**
Preloaded piezo actuator, 15 µm travel range, 3000 N / 700 N, strain gauge sensor, vacuum compatible to 10⁻⁶ hPa

**P-845.20V**
Preloaded piezo actuator, 30 µm travel range, 3000 N / 700 N, strain gauge sensor, vacuum compatible to 10⁻⁶ hPa

**P-845.30V**
Preloaded piezo actuator, 45 µm travel range, 3000 N / 700 N, strain gauge sensor, vacuum compatible to 10⁻⁶ hPa

**P-845.40V**
Preloaded piezo actuator, 60 µm travel range, 3000 N / 700 N, strain gauge sensor, vacuum compatible to 10⁻⁶ hPa

**P-845.60V**
Preloaded piezo actuator, 90 µm travel range, 3000 N / 700 N, strain gauge sensor, vacuum compatible to 10⁻⁶ hPa