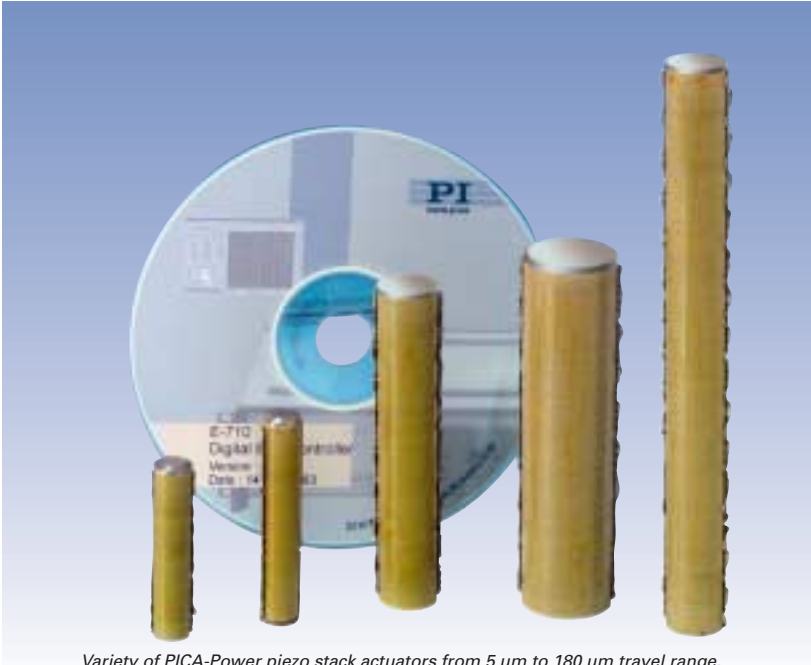


P-007.xxP  
P-056.xxP

## PICA-Power High-Level Dynamics Piezo Actuators

>> Click <http://www.pi.ws/fwd/Piezo-Actuator> for the Latest Specs on these Products



Variety of PICA-Power piezo stack actuators from 5  $\mu\text{m}$  to 180  $\mu\text{m}$  travel range.

### Application Examples

- NanoPositioning
- Active vibration damping and cancellation
- High-load positioning
- Precision machining
- Semiconductor manufacturing and testing
- Laser tuning
- Switching
- Smart structures (adaptronics)

- **Operating Temperature to 150 °C**
- **Temperature Sensor PT1000 applied**
- **High Load Capacity to 80 kN**
- **Large Cross-Sections (to 56 mm Diameter)**
- **Extreme Reliability >10<sup>9</sup> Cycles**
- **Sub-Nanometer Resolution / Sub-Millisecond Settling Time**
- **Ultra-High-Vacuum-Compatible Versions to 10<sup>-9</sup> hPa**
- **Non-Magnetic Versions**

PICA-Power-series piezoceramic stack actuators are offered in a large variety of standard shapes and sizes, with additional custom designs to suit any application. Based on the PIC 255 material, these actuators are especially well-suited for industrial, high-level dynamic applications.

### Extra-High Reliability for High-Level Dynamics, High-Temperature Applications

PICA-Power actuators are optimized for high-temperature working conditions and high-duty-cycle dynamic applications. With our extensive applications knowledge, gained over several decades, we know how to build performance that does not come at the price of reliability. All materials used are specifically matched for robustness and lifetime. Endurance tests on PICA-Power actuators prove consistent performance, even after billions (1,000,000,000) of cycles.

### Flexibility: PI Ceramic's Strength

All manufacturing processes at PI Ceramic are set up for maximum flexibility. Should our standard actuators not fit your application, let us provide you with a custom design. Our engineers will work with you to find the optimum solution for your application at a very attractive price, even for small quantities. Some of our custom capabilities are listed below:

- Custom Materials
- Custom Voltage Ranges
- Custom Geometries (Circular, Rectangular, Triangular, Layer Thickness ...)
- Custom Displacement
- Custom Load / Force Ranges
- Custom Flat or Spherical Endplates (alumina, glass, sapphire, ...)
- Extra-Tight Length Tolerances
- Custom-Molded Versions
- Integrated Piezoelectric Sensors

- Custom UHV Versions (10<sup>-9</sup> hPa)
- Clear Aperture Available

### Short Leadtime for Standard & Custom Designs

Because all piezoelectric materials used in PICA-Power actuators are manufactured at PI Ceramic, leadtimes are short and quality is outstanding. All standard and custom PICA-Power actuators are delivered with performance test sheets.

### Amplifiers, Drivers & Controllers

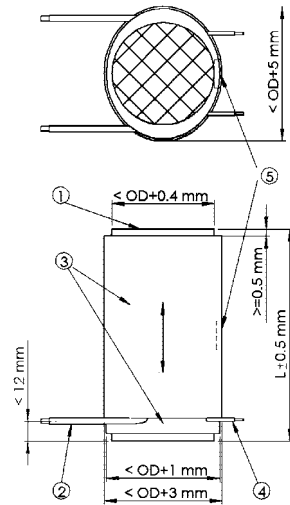
PI offers a wide range of piezo control electronics (see page 28 and [www.pi.ws](http://www.pi.ws)), from low-power drivers to the ultra-high-performance E-480 power amplifier delivering 2000 W of dynamic power (see PI catalog).

For closed-loop positioning applications, a variety of analog and digital controllers is also available. The modular E-500 system (see PI catalog) can be upgraded from an amplifier to a servo-controller and offers a variety of computer interfaces.

Of course, PI also designs custom amplifiers and controllers.



PICA-Power actuators are available with cross sections to 56 mm!



- ① stainless steel interface (both sides) with a center hole ( $D2.1 \pm 0.05 \text{ mm}$ ,  $\nabla 0.5 \text{ mm}$ , can be used for alignment)
- ② PTFE insulated wires for high voltage control (red max. 1000 V / black GND, length  $> 100 \text{ mm}$ ,  $D < 1.2 \text{ mm}$ )
- ③ shrink tube
- ④ temperature sensor wires (PTFE insulated, yellow/yellow, length  $> 100 \text{ mm}$ ,  $D < 0.7 \text{ mm}$ )
- ⑤ temperature sensor PT 1000 (centered)

PICA-Power actuator dimensions, see technical data table for further information.

## Technical Data / Ordering Numbers

Ordering Number	Displacement [ $\mu\text{m}$ -10/+20%]	Diameter D [mm]	Length L [mm $\pm 0.5$ ]	Blocking force [N]	Stiffness [N/ $\mu\text{m}$ ]	Capacitance [nF $\pm 20\%$ ]	Resonant Frequency [kHz]
P-010.00P	5	10	9	1200	240	17	129
P-010.10P	15	10	18	1800	120	46	64
P-010.20P	30	10	31	2100	68	90	37
P-010.40P	60	10	58	2200	37	180	20
P-010.80P	120	10	111	2300	19	370	10
P-016.10P	15	16	18	4500	300	130	64
P-016.20P	30	16	31	5400	180	250	37
P-016.40P	60	16	58	5600	94	510	20
P-016.80P	120	16	111	5900	49	1000	10
P-016.90P	180	16	163	6000	33	1600	7
P-025.10P	15	25	20	9900	660	320	58
P-025.20P	30	25	33	12000	400	630	35
P-025.40P	60	25	60	13000	220	1300	19
P-025.80P	120	25	113	14000	120	2600	10
P-025.90P	180	25	165	14000	80	4000	7
P-035.10P	15	35	21	18000	1200	530	55
P-035.20P	30	35	34	23000	760	1200	34
P-035.40P	60	35	61	26000	430	2500	19
P-035.80P	120	35	114	28000	230	5200	10
P-035.90P	180	35	166	29000	160	7800	7
P-045.20P	30	45	36	36000	1200	2100	32
P-045.40P	60	45	63	41000	680	4300	18
P-045.80P	120	45	116	44000	370	8800	10
P-045.90P	180	45	169	45000	250	13000	7
P-056.20P	30	56	36	54000	1800	3300	32
P-056.40P	60	56	63	66000	1100	6700	18
P-056.80P	120	56	116	68000	570	14000	10
P-056.90P	180	56	169	70000	390	21000	7

Unloaded (longitudinal) resonant frequency measured at  $1 V_{pp}$ , capacitance at  $1 V_{pp}$ , 1 kHz. Blocking force at 1000 V.

Standard PZT ceramic type: PIC 255 (see page 40)

Operating voltage range: 0 to 1000 V

Operating temperature range: -20 to +150 °C

Standard mechanical interface (top & bottom): steel plates, 0.5 to 2 mm thick (depends on model)

Standard electrical interfaces: PTFE insulated wires, pigtail length 100 mm

Available options: integrated piezo sensor or strain gauge sensors, non-magnetic, UHV, etc.

Other specifications on request.

Specifications subject to change without notice.



Custom preloaded PICA-Power piezo actuator with forced-air cooling.