

P-820 Preloaded Piezo Actuators

For Light and Medium Loads



P-820.10 and P-820.30 piezo actuators

- Outstanding Lifetime Due to PICMA® Piezo Ceramic Stacks
- Travel Range to 45 μm
- Pushing Forces to 50 N
- Pulling Forces to 10 N
- Sub-Millisecond Response, Sub-Nanometer Resolution
- Versions with Ball Tip

The P-820 series piezo translators are high resolution linear actuators for static and dynamic applications. They provide sub-millisecond response and sub-nanometer resolution.

Design

These actuators consist of a friction-free, preloaded monolithic piezo ceramic stack integrated in a stainless steel housing.

Ceramic Insulated Piezo Actuators Provide Long Lifetime

The highest possible reliability is assured by employing the award-winning PICMA® multi-

layer piezo actuators. PICMA® actuators are the only actuators on the market with a ceramic-only insulation, which makes them resistant to ambient humidity and leakage-current failures. They are thus far superior

to conventional actuators in reliability and lifetime.

Mounting

Mounting is at the foot, with push/pull forces of less than 3 N, the actuator can be held by clamping the case. The versions with ball tip decouple torque and off-center forces from the piezo ceramic. Read details in Mounting and Handling Guidelines (s. p. 1-67).

Accessories

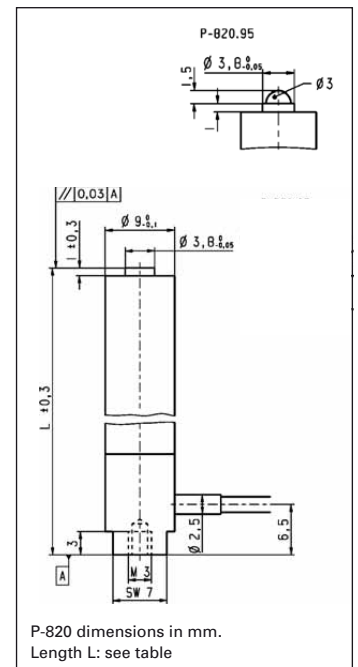
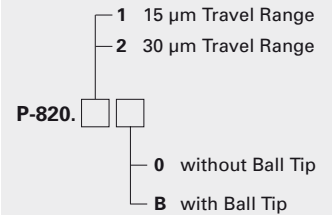
To provide magnetic coupling, the P-176.30 magnetic adapter can be glued on (only for versions without ball tip). P-176.30 Magnetic Adapter For extensions, adapter cables and connectors, see "Accessories" in the piezo electronics chapter (s. p. 2-168 ff).

Piezo Drivers, Controllers & Amplifiers

High-resolution amplifiers and servo-control electronics, both digital and analog, are described in the "Piezo Drivers / Servo Controllers" (s. p. 2-99 ff) section.

Ordering Information

Preloaded Piezo Actuator, 50/10 N


 P-820 dimensions in mm.
Length L: see table

Technical Data

Model	P-820.10 P-820.1B	P-820.20 P-820.2B	P-820.30 P-820.3B	Units
Displacement at 0 to 100 V	15	30	45	$\mu\text{m} \pm 20\%$
*Resolution	0.15	0.3	0.45	nm
**Static large-signal stiffness	13	7	4	$\text{N}/\mu\text{m} \pm 20\%$
Push/pull force capacity	50 / 10	50 / 10	50 / 10	N
Max. torque limit (on tip)	0.08	0.08	0.08	Nm
Electrical capacitance	0.3	0.7	1.0	$\mu\text{F} \pm 20\%$
Dynamic operating current coefficient (DOCC)	3.0	3.0	3.0	$\mu\text{A} / (\text{Hz} \cdot \mu\text{m})$
Unloaded resonant frequency f_0	22	15	12	$\text{kHz} \pm 20\%$
Operating temperature	-20 to +80	-20 to +80	-20 to +80	$^{\circ}\text{C}$
Mass	8	11	14	$\text{g} \pm 5\%$
Material: case, end pieces	N-S	N-S	N-S	
Length L	26	44	62	$\text{mm} \pm 0.3$

*The resolution of piezo actuators is not limited by stiction or friction. Value given is noise equivalent motion with E-503 amplifier (p. 2-146)

**Dynamic small-signal stiffness is ~ 30% higher
Voltage connection: LEMO FFA.00.250. Coaxial cable, RG 178, 1 m.

Recommended amplifiers / controllers

One channel: E-610 controller / amplifier (p. 2-110)

Modular system E-500 (p. 2-142) with amplifier module E-503 (multi-channel) (p. 2-146)

Multi-channel: E-663 amplifier (p. 2-136)

Application Examples

- Static and dynamic precision positioning
- Fiber positioning
- Laser tuning
- Nanotechnology