P-842 · P-843 · P-844 · P-845

Preloaded Piezo Actuators (LVPZT) with Sensor Option

P-844 piezo actuators (battery for size comparison)

- **Travel Range to 90 µm**
- **Pushing Forces to 3000 N**
- **Preloaded for Pulling Forces to 700 N**
- **Sub-ms Response**
- **Sub-nm Resolution**
- **Options: Vacuum Versions, Water-Resistant Case**

P-842, P-843, P-844 and P-845 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 multilayer piezoceramic stack protected by a stainless steel case.

The high preload gives these actuators outstanding properties for dynamic applications (e.g. precision machining, active damping, etc.) and push-pull applications.

Mounting

Mounting is at the foot, although with push/pull forces of less than 100 N, the actuator can be held by clamping the case. The P-176.50 / P-176.60 flexible tips can be installed to decouple the ceramic from bending forces (see page 1-45). For more mounting guidelines, see page 1-48.

High Accuracy in Closed-Loop Operation

The P-842 and P-844 are designed for open-loop positioning tasks. The P-843 and P-845 versions are equipped with integrated high-resolution SGS position sensors and offer high-accuracy, closed-loop operation (for more information, see the "Tutorial: Piezoelectrics in Positioning," Section 4).

Options:

P-703.20

High-vacuum option, p. 1-44.

Application Examples

- Static and dynamic precision positioning
- Disk drive testing equipment
- Optics
- Metrology / interferometry
- Active structures (Adaptronics)
- Precision engineering / micromechanisms
- Adaptive mechanics
- Active vibration control
- Switching applications
- Laser tuning

For more examples, see page 1-5

Technical Data and Product Order Numbers

Order number	Travel range (open-loop) for 0 to 100 V [µm] ±20%	Travel range (closed-loop) [µm]	Integrated position sensor*	Resolution closed-loop / open-loop [nm]**	Static large-signal stiffness [N/µm] ±20%***
P-842.10	15	-	-	- / 0.15	57
P-842.20	30	-	-	- / 0.3	27
P-842.30	45	-	-	- / 0.45	19
P-842.40	60	-	-	- / 0.6	15
P-842.60	90	-	-	- / 0.9	10
P-843.10	15	15	SGS	0.3 / 0.15	57
P-843.20	30	30	SGS	0.6 / 0.3	27
P-843.30	45	45	SGS	0.9 / 0.45	19
P-843.40	60	60	SGS	1.2 / 0.6	15
P-843.60	90	90	SGS	1.8 / 0.9	10
P-844.10	15	-	-	- / 0.15	225
P-844.20	30	-	-	- / 0.3	107
P-844.30	45	-	-	- / 0.45	75
P-844.40	60	-	-	- / 0.6	57
P-844.60	90	-	-	- / 0.9	38
P-845.10	15	15	SGS	0.3 / 0.15	225
P-845.20	30	30	SGS	0.6 / 0.3	107
P-845.30	45	45	SGS	0.9 / 0.45	75
P-845.40	60	60	SGS	1.2 / 0.6	57
P-845.60	90	90	SGS	1.8 / 0.9	38
Notes see page 1-46	A2	A5	B	C1	D1

Accessories

P-176.50

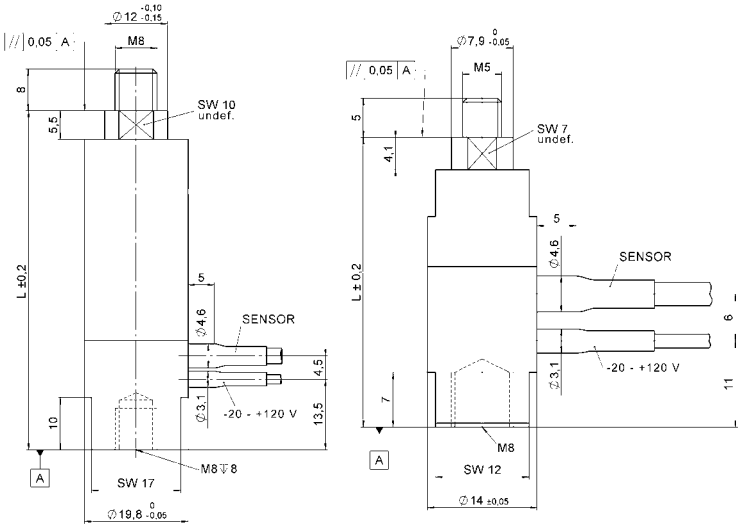
Flexible tip for P-842 / P-843, see p. 1-45

P-176.60

Flexible tip for P-844 / P-845, see p. 1-45
Extension cables with connectors: see pp. 6-55 *ff.*

Note

High-resolution amplifiers and servo-control electronics, both digital and analog, are described in the "Piezo Drivers & Nanopositioning Controllers" section, page 6-8 *ff.*



P-844, P-845 dimensions in mm; length = L, see table for value; max. torque at tip: 1 Nm.

P-842, P-843 dimensions in mm; length = L, see table for value; max. torque at tip: 0.35 Nm.

Push/pull force capacity [N]	Electrical capacitance [µF] ±20%	Dynamic operating current coefficient [µA / (Hz x µm)]	Resonant frequency (unloaded) [kHz] ±20%	Weight without cable [g] ±5%	Length L [mm]	Recommended amplifier/controller (codes explained p. 1-3)
800 / 300	1.5	12.5	18	31	37	C, G
800 / 300	3.0	12.5	14	42	55	C, G
800 / 300	4.5	12.5	10	53	73	C, G
800 / 300	6.0	12.5	8.5	64	91	C, G
800 / 300	9.0	12.5	6	86	127	C, G
800 / 300	1.5	12.5	18	31	37	D, H
800 / 300	3.0	12.5	14	42	55	D, H
800 / 300	4.5	12.5	10	53	73	D, H
800 / 300	6.0	12.5	8.5	64	91	D, H
800 / 300	9.0	12.5	6	86	127	D, H
3000 / 700	6.0	50	16	84	47	C, G
3000 / 700	12.0	50	12	108	65	C, G
3000 / 700	18.0	50	9	132	83	C, G
3000 / 700	24.0	50	7.5	156	101	C, G
3000 / 700	36.0	50	5.5	204	137	C, G
3000 / 700	6.0	50	16	84	47	D, H
3000 / 700	12.0	50	12	108	65	D, H
3000 / 700	18.0	50	9	132	83	D, H
3000 / 700	24.0	50	7.5	156	101	D, H
3000 / 700	36.0	50	5.5	204	137	D, H
D3	F1	F2	G2	K		

Voltage connection: LEMO FFA.00.250; 1 m coaxial cable, RG 178, teflon insulation.
Sensor connection: LEMO FFA.0S.304; 1 m coaxial cable with PUR insulation.
Temperature range: -40 to 80 °C.
Case / end pieces: non-magnetic steel

* SGS versions can attain closed-loop linearity up to 0.15% and are shipped with performance reports.
** The resolution of piezo actuators is not limited by stiction or friction. Value given is noise equivalent motion with E-503 amplifier.
*** Dynamic smallsignal stiffness is ~30% higher.