

## C5 Series Preloaded Piezo Actuator



### Features

- 1000N thrust
- Piezoelectric ceramics with lifetime of one billion cycles
- Sub-nanometer resolution
- Simple structure, compact size
- Vacuum compatible up to  $10^{-5}$  Pa
- Integrated spherical end cap

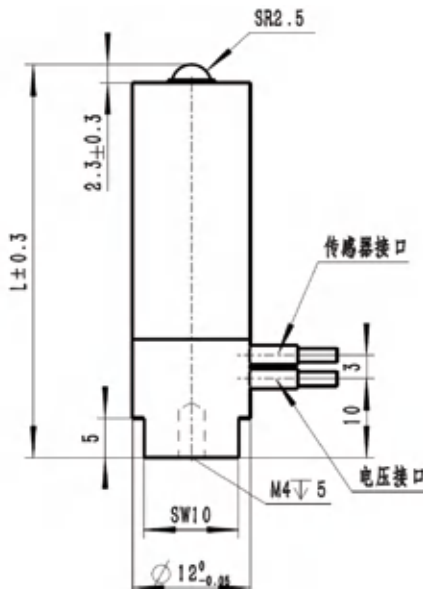
### Description

Preloaded Piezo Actuator is an armored device for Piezo Stack Actuator, which plays a role in stack protection and easy installation. At the same time, the actuator applies pre-pressure to the piezoelectric ceramic internally, providing a certain amount of tension and adjustment of displacement output. Preloaded Piezo Actuator can be internally integrated with strain gauges to achieve closed-loop control.

### Applications

- Static and dynamic precision positioning
- Optical fibre positioning adjustment
- Laser tuning
- Micro-nano technology

### Interface Definition



Option	L
PAPL-C5-18N/S/NU/SU	32
PAPL-C5-36N/S/NU/SU	50
PAPL-C5-54N/S/NU/SU	68
PAPL-C5-72N/S/NU/SU	86
PAPL-C5-90N/S/NU/SU	104
PAPL-C5-108N/S/NU/SU	122

Default spherical end caps, other end caps can be customized.

## Technical Specifications

	PAPL-C5-18N	PAPL-C5-36N	PAPL-C5-54N	PAPL-C5-60N	PAPL-C5-90N	PAPL-C5-108N	Unit	Tolerance
Travel range at 150V*	18	36	54	72	90	108	μm	±20%
Electrical capacitance**	1.5	3	4.5	6	7.5	9	μF	±20%
Open loop resolution	0.18	0.36	0.54	0.72	0.9	1.08	nm	Typical value
Integrated sensor	SGS							
Closed loop resolution***	0.36	0.72	1.08	1.44	1.8	2.16	nm	Typical value
Resonant frequency	18	14	10	8.5	7	6	kHz	±20%
Stiffness	57	27	19	15	12	10	N/μm	±20%
Push force****	1000	1000	1000	1000	1000	1000	N	Max. value
Pull force	150	150	150	150	150	150	N	Max. value
Operating voltage	-20~150						V	
Operating temperature range	-20~80						°C	
Voltage connection	LEMO FFA.00.250							
Sensor connection	LEMO FFA.0S.304							
Cable length	1.5						m	±0.02 m

\* Displacement output under no load

\*\* Capacitance test conditions: ambient temperature environment, 1Vpp, 1kHz

\*\*\* Closed-loop parameters applicable only to the closed-loop version of the piezoelectric preload actuator

\*\*\*\* Thrust test: drive voltage range 0 to 150V

Other specifications can be customized on request.

## Customization Information

C5 series Preloaded Piezo Actuator, open-loop version

Option	Description
PAPL-C5-18N	C5 series Preloaded Piezo Actuator, effective travel 18μm, open-loop.
PAPL-C5-36N	C5 series Preloaded Piezo Actuator, effective travel 36μm, open-loop.
PAPL-C5-54N	C5 series Preloaded Piezo Actuator, effective travel 54μm, open-loop.
PAPL-C5-60N	C5 series Preloaded Piezo Actuator, effective travel 60μm, open-loop.
PAPL-C5-90N	C5 series Preloaded Piezo Actuator, effective travel 90μm, open-loop.
PAPL-C5-108N	C5 series Preloaded Piezo Actuator, effective travel 108μm, open-loop.

C5 series Preloaded Piezo Actuator, strain gauge closed-loop

Option	Description
PAPL-C5-18S	C5 series Preloaded Piezo Actuator, effective travel 18μm, strain gauge closed-loop.
PAPL-C5-36S	C5 series Preloaded Piezo Actuator, effective travel 36μm, strain gauge closed-loop.
PAPL-C5-54S	C5 series Preloaded Piezo Actuator, effective travel 54μm, strain gauge closed-loop.
PAPL-C5-60S	C5 series Preloaded Piezo Actuator, effective travel 60μm, strain gauge closed-loop.
PAPL-C5-90S	C5 series Preloaded Piezo Actuator, effective travel 90μm, strain gauge closed-loop.
PAPL-C5-108S	C5 series Preloaded Piezo Actuator, effective travel 108μm, strain gauge closed-loop.

C5 series Preloaded Piezo Actuator, open-loop, vacuum compatible version

Option	Description
PAPL-C5-18NU	C5 series Preloaded Piezo Actuator, effective travel 18μm, open-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-36NU	C5 series Preloaded Piezo Actuator, effective travel 36μm, open-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-54NU	C5 series Preloaded Piezo Actuator, effective travel 54μm, open-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-60NU	C5 series Preloaded Piezo Actuator, effective travel 72μm, open-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-90NU	C5 series Preloaded Piezo Actuator, effective travel 90μm, open-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-108NU	C5 series Preloaded Piezo Actuator, effective travel 108μm, open-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.

C5 series Preloaded Piezo Actuator, strain gauge closed-loop, vacuum compatible version

Option	Description
PAPL-C5-18SU	C5 series Preloaded Piezo Actuator, effective travel 18μm, strain gauge closed-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-36SU	C5 series Preloaded Piezo Actuator, effective travel 36μm, strain gauge closed-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-54SU	C5 series Preloaded Piezo Actuator, effective travel 54μm, strain gauge closed-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-60SU	C5 series Preloaded Piezo Actuator, effective travel 72μm, strain gauge closed-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-90SU	C5 series Preloaded Piezo Actuator, effective travel 90μm, strain gauge closed-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.
PAPL-C5-108SU	C5 series Preloaded Piezo Actuator, effective travel 108μm, strain gauge closed-loop, vacuum compatible up to 10 <sup>-5</sup> Pa.