

## Series PA

### Stack Type Actuators

#### Concept:

The PA series actuators are based on stack type actuators made by using multilayer technology. The PA series stack type actuators are internally pre-loaded by a mechanical spring, making them ideal for dynamic applications.

The ability to generate a large force, and be subjected to high mass loading, make them particularly useful for machine tools and dynamic scanning systems. These actuators have a uniform diameter of 14 mm.

#### Mounting:

Actuators should be fastened with screws or clamps on the bottom plate of the actuator. During the installation and use, it is important not to subject the actuator tip to non-axial forces. The actuator head is available in two versions, round head piece for standard version and flat head piece with M3 thread on demand.

#### Configuration:

Please choose the suitable stroke, head piece, feedback and electrical interface to your application or ask our sales.



Image: Piezo Actuator Series PA

#### Product Highlights:

- Excellent dynamic properties due to high resonant frequencies
- Integrated mechanical preload
- Tensile forces up to 150 N
- Motion up to 140  $\mu\text{m}$  (larger ranges of motion on demand)
- High stiffness of up to 190 N/ $\mu\text{m}$
- Vacuum and low temperature versions on request
- Flat or round head pieces available

#### Applications:

- Nanopositioning
- Scanning microscopy
- Micromanipulation
- Microinjection
- Optical adjustment
- Laser fine tuning
- Mirror adjustment
- Mirror positioning
- Vibration generation and cancellation

## Series PA

### Technical Data:

Series PA	Unit	PA 8/14	PA 16/14	PA 25/14	PA 35/14	PA 45/14	PA 50/14	PA 60/14	PA 70/14	PA 80/14	PA 90/14	PA 100/14	
<b>Part No.</b>	-	B-201-00	B-202-00	B-203-00	B-204-00	B-205-00	B-206-00	B-207-00	B-208-00	B-209-00	B-210-00	B-211-00	
<b>Motion (-10/+20%)</b>	µm	10	20	30	40	50	60	70	80	90	100	110	
<b>Capacitance (±20%)<sup>(1)</sup></b>	µF	0.8	1.8	2.6	3.6	4.4	5.4	6.2	7.2	8.0	9.0	9.8	
<b>Resolution<sup>(2)</sup></b>	nm	0.02	0.04	0.06	0.08	0.10	0.12	0.15	0.17	0.19	0.21	0.23	
<b>Series PA SG with Integrated Strain Gauge Measurement System</b>		<b>PA 8/14 SG</b>	<b>PA 16/14 SG</b>	<b>PA 25/14 SG</b>	<b>PA 35/14 SG</b>	<b>PA 45/14 SG</b>	<b>PA 50/14 SG</b>	<b>PA 60/14 SG</b>	<b>PA 70/14 SG</b>	<b>PA 80/14 SG</b>	<b>PA 90/14 SG</b>	<b>PA 100/14 SG</b>	
<b>Part No.</b>	-	B-201-01	B-202-01	B-203-01	B-204-01	B-205-01	B-206-01	B-207-01	B-208-01	B-209-01	B-210-01	B-211-01	
<b>Motion (±0.2%)</b>	µm	8	16	24	32	40	48	56	64	72	80	88	
<b>Integrated Measurement System</b>	-	SG											
<b>Resolution in Closed Loop</b>	nm	0.1	0.3	0.5	0.7	0.9	1.0	1.3	1.6	1.8	2.0	2.2	
<b>Typ. Repeatability</b>	nm	1.2	1.2	1.4	1.5	1.5	2	1.6	2.3	3.6	2.6	6.7	
<b>Series PA und PA SG</b>													
<b>Resonance Frequency</b>	kHz	40	22	15	12	8.8	8	7	6	5.2	4	4.4	
<b>Stiffness</b>	N/µm	85	43	28	21	17	14	12	11	9	9	8	
<b>Blocking Force</b>	N	850											
<b>Preload</b>	N	150											
<b>Operating Voltage</b>	V	-20 ... +130											
<b>Connector/Voltage</b>	-	LEMO/ODU											
<b>Cable Length</b>	m	1											
<b>Dimensions</b>	<b>Housing Length</b>	mm	26	35	44	53	62	71	80	89	98	107	116
	<b>Total Length</b>	mm	28	37	46	55	64	73	82	91	100	109	118
	<b>Diameter</b>	mm	Ø 14										

<sup>(1)</sup> Typical value for small electrical field strength

<sup>(2)</sup> Resolution is limited only by the noise of control signal.

## Series PA

Series PA	Unit	PA 105/14	PA 110/14	PA 120/14	
Part No.	-	B-212-00	B-213-00	B-214-00	
Motion (-10/+20%)	µm	120	130	140	
Capacitance (±20%) <sup>(1)</sup>	µF	10.8	11.6	12.6	
Resolution <sup>(2)</sup>	nm	0.25	0.27	0.29	
Series PA SG with Integrated Strain Gauge Measurement System		PA 105/14 SG	PA 110/14 SG	PA 120/14 SG	
Part No.	-	B-212-01	B-213-01	B-214-01	
Motion (±0.2%)	µm	96	104	112	
Integrated Measurement System	-	SG			
Resolution in Closed Loop	nm	2.4	2.6	2.8	
Typ. Repeatability	nm	9	12	12	
Series PA und PA SG					
Resonance Frequency	kHz	4	3.8	3	
Stiffness	N/µm	7	7	6	
Blocking Force	N	850			
Preload	N	150			
Operating Voltage	V	-20 ... +130			
Connector/ Voltage	-	LEMO / ODU / Sub-D			
Cable Length	m	1			
Dimensions	Housing Length	mm	125	134	143
	Total Length	mm	127	136	145
	Diameter	mm	Ø 14		

## Series PA

### Standard:

- Head piece round: part-no. B-299-66
- Additional part-no. for needed cable will added by our sales, depending from the requested electronic

### Options:

- Head piece M3 thread: part-no. B-299-65  
(Please use the spanner flat to fix the actuator head during installations over M3 screw.)
- Vacuum and low temperature application on request

### Drawings:

