

ring actuators

series R and RA

- motion up to 50 μm
- free inside diameter (9 mm to 14 mm)
- sub nm-resolution
- blocking force up to 4000 N
- μsec response time
- flexible epoxy insulation

applications:

- micro positioning
- laser beam steering
- scanning systems for atomic force microscopes
- piezoelectrical pumps
- fiber positioning
- laser tuning



fig.: RA 14/24 SG
with including mirror holder

Concept

Piezoelectric ring actuators consist of a large number of contacted ceramic rings. Based on their design they provide a 9 mm or 14 mm free aperture. Those make them especially suitable for integration into the laser beam line.

Ring actuators are available with housing, series RA, and without housing, series R.

The R series of actuators are not pre-loaded. For dynamic applications those Actuator have to be pre-loaded. The RA series of actuators are internally pre-loaded by a mechanical spring making them ideal for dynamic applications.

A closed loop version equipped with strain gage sensors is available as well.

Specials

A free aperture makes these actuators especially suitable for all optical applications such as laser beam steering or other mechanical components.

The ring actuators can generate large forces and can be easily integrated in experimental setups and machines. Due to their high natural frequency the ring actuators are very good suitable for scanning applications.

Actuators with housing are always delivered with mirror holder.

Mounting/Installation

To mount the actuators without housing (series R) into setups they have to be glued. They can be glued on the top and bottom only. During installation and operation please take care to avoid axial forces.

Actuators with housing (Series-RA) are equipped with threads for installation. They can also be assembled on housing directly.

Please note that the maximum tensile forces are not greater than the given pre-load. Otherwise the piezoceramic can be damaged!

**technical data:
ring actuators without casing and without preload**

series R	unit	R 12/14	R 25/14	R 50/14	R 12/20	R 25/20	R 50/20
part no.	-	P-401-00	P-402-00	P-405-00	P-403-00	P-404-00	P-406-00
motion open loop ($\pm 10\%$)*	μm	12	25	50	12	25	50
capacitance ($\pm 20\%$)**	μF	2.9	5.8	11.6	6.0	12.0	24.0
resolution open loop***	nm	0.03	0.05	0.1	0.03	0.05	0.1
stiffness	N/ μm	160	80	40	330	160	80
blocking force	N	2000	2000	2000	4000	4000	4000
voltage range	V	- 20 ... + 130					
height (H)	mm	13.5	27	54	13.5	27	54
outer diameter D2	mm	14	14	14	20	20	20
inner diameter D1	mm	9	9	9	14	14	14
weight	g	8	16	32	14	28	56

**technical data:
ring actuators with casing and with preload**

series RA	unit	RA 12/24	RA 25/24	RA 50/24	RA 12/35	RA 25/35	RA 50/35
part-no.		P-401-10	P-402-10	P-405-10	P-403-10	P-404-10	P-406-10
motion open loop ($\pm 10\%$)*	μm	12	25	50	12	25	50
capacitance ($\pm 20\%$)**	μF	2.9	5.8	11.6	6.0	12.0	24.0
resolution open loop ***	nm	0.03	0.05	0.1	0.03	0.05	0.1
resonant frequency	kHz	18	11	6	18	11	7
stiffness	N/ μm	160	80	40	330	160	80
blocking force	N	2000	2000	2000	4000	4000	4000
pre-load	N	300	300	300	500	500	500
voltage range	V	- 20 ... + 130					
connector	voltage	LEMO 0S.302					
cable length	m	1.0					
thread (t)		M12x0,5	M12x0,5	M12x0,5	M18x0,5	M18x0,5	M18x0,5
length (l)	mm	36.5	49	70.5	36.5	49	70.5
outer diameter D2	mm	24	24	24	35	35	35
inner diameter D1	mm	9	9	9	14	14	14
spanner flats	mm	20	20	20	24	24	24
weight	g	75	95	140	145	185	265
series RA with integrated measurement system	unit	RA 12/24SG	RA 25/24 SG	RA 50/24 SG	RA 12/35 SG	RA 25/35 SG	RA 50/35 SG
part-no.		P-401-11	P-402-11	P-405-11	P-403-11	P-404-11	P-406-11
motion closed loop ($\pm 0.2\%$)	μm	10	20	40	10	20	40
resolution closed loop	nm	0.5	1.0	2.0	0.5	1.0	2.0
typ. repeatability	nm	6	8	10	6	8	10
connector	voltage	LEMO 0S.302					
	sensor	LEMO 0S.304					
cable length	m	1.2					

* typical value measured with NV 40/1 CLE amplifier.

** typical value for small electrical field strength.

*** the resolution is only limited by the noise of the power amplifier and metrology.

recommended controller:

without SG feed back sensors	12V40	E-440-011
	30V300	E-460-011
with SG feed back sensors	NV40/1CLE	E-101-7X

Please pay attention to our “notes for mounting”, which are available as download on our homepage.

