

high speed piezo translation stages

nanoSX 400 line

- 450µm travel range in X
- integrated capacitive direct metrology
- excellent trajectory trueness
- 12.5 mm central aperture
- high load capability
- advanced reliability and robustness

applications:

- nanopositioning
- micro scanning
- scanning microscopy
- surface analysis
- metrology and alignment



fig.: nanoSX 400

Concept

The nanoSX400 line one axis translation stage offers a large stroke, a central clearance and temperature compensation in a compact package. Trajectory trueness even at higher loads and appropriate stiffness are major advantages compared to competitive systems available on the market.

Vacuum and cryogenic versions are available on demand as well as body material variations of invar, superinvar, aluminum or titanium.

An optional external sensor preamplifier (version "extern" / "digital") offers independence from cable length.

Specials

The highest positioning accuracy, stability, linearity and reproducibility are achieved in closed loop operation when used in combination with the high resolution capacitive direct measuring feedback system from **piezosystem jena**.

The threading holes in the stage center offer a wide range of possible stage configurations.

By combination of two systems nanoSX 400 easily a nanoSXY 400 combination or a long travel range nanoSX 800 system can be created.

Mounting/Installation

Piezo actuators generate a pressure force to effect the resulting motion based on a solid state phenomena. The resolution is only limited by the noise of the amplifier and metrology. Such devices are neither affected by magnetic fields nor do they produce them. In cryogenic environments they function down to almost zero Kelvin. There is an associated decrease in the extension behavior. In vacuum conditions piezo actuators can be used at pressure below 10Pa. They should not be operated in the pressure range from 10Pa to 10kPa due to the greatly reduced dielectric breakdown strength of air.

The raster tapped and thru holes allow easy integration of the stage into any application or mechanical setup.

technical data:

series nanoSX	unit	nanoSX 400	nanoSX 400 CAP EXTERN	nanoSX 400 CAP DIGITAL
part. no.	-	T-124-00	T-124-06 / (E)	T-124-06D
axis	-	x	x	x
motion open loop ($\pm 10\%$)*	μm	450	450	450
motion closed loop ($\pm 0,2\%$)*	μm	-	350	350
capacitance ($\pm 20\%$ **)	μF	2x3.5	2x3.5	2x3.5
integrated measurement system	-	-	capacitive	capacitive
resolution***	nm	0.6	1	1
typ. repeatability	nm	-	20	20
typ. nonlinearity	%	-	0.02	0.02
resonant frequency (X/Y/Z)	Hz	450/ 3000 / 3000	400 / 2500 / 2500	400 / 2500 / 2500
additional load = 50g	Hz	350	300	300
additional load = 100g	Hz	280	260	260
additional load = 300g	Hz	130	125	125
stiffness	N/ μm	0.35 / 5.0 / 5.0	0.35 / 5.0 / 5.0	0.35 / 5.0 / 5.0
push/pull force capacity	N	100/100	100/100	100/100
max. load	N	100	100	100
rotational error	roll	μrad	3	3
	pitch	μrad	3	3
	yaw	μrad	3	3
voltage range	V	-20...+130	-20...+130	-20...+130
connector	voltage	-	ODU 3pin	ODU 3pin
	sensor	-	-	ODU 4pin
material	-	stainless steel / aluminum		
dimensions (l x w x h)	mm	60 x 60 x 10	60 x 75 x 20	60 x 75 x 20
central aperture	mm	$\varnothing 12.5$	$\varnothing 12.5$	$\varnothing 12.5$
weight	g	150	260	260

* typical value measured with 30V300nanoX amplifier

** typical value for small electrical field strength

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

recommended configurations:

actuator amplifier / controller	nanoSX 400 2 x 30V300 nanoX	T-124-00 E-468-011
actuator amplifier / controller	nanoSX 400 CAP extern* 2 x 30V300 nanoX CLE	T-128-04E E-468-111
*identical to nanoSX 400 CAP, except the external sensor amplifier between stage and controller inside the cable extension.		
actuator amplifier / controller casing	nanoSX 400 CAP ENT 40/20 (230V / 115V) 63 TE housing 19"	T-124-06 E-103-13/E-103-14 E-103-90
actuator amplifier	nanoSX 400 CAP DIG 30DV50	T-124-06D E-754-300

Pay attention please to the "handling instructions" you can download from our homepage.