

nanoX 200 series

High speed piezo translation stages

concept:

The one-axis linear positioning stages *nanoX 200* are a development within the ultra-fast *nanoX®*-line. Due to FEA-optimization these stages achieve the highest dynamical performance and excellent guiding accuracy even under high loads.

The positioning stages of the *nanoX 200 series* are temperature compensated – while changing the environmental temperature the stage keeps its position.

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*.

mounting:

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



image: nanoX 200

product highlights:

- 240µm range of motion
- highest dynamical performance
- excellent guidance accuracy
- 0.4 nm resolution
- Ø 3mm central aperture
- vacuum and cryogenic versions available
- body material variations of invar, superinvar, aluminium or titanium available
- external sensor preamplifier optional

applications:

- machine tools
- laser optics
- life science
- scanning systems

nanoX 200 series

technical data:

series nanoX	unit	nanoX 200	nanoX 200 SG	nanoX 200 CAP
part no.	-	T-106-20	T-106-21	T-106-26
axes	-		x	
motion open loop ($\pm 10\%$)*	μm	240		240
motion closed loop ($\pm 0,2\%$)*	μm	-		200
capacitance ($\pm 20\%$ **)	μF		2x2.6	
integrated measurement system	-	-	SG	capacitive
resolution***	open loop	nm	0.4	
	closed loop	nm	4	1
typ. repeatability	nm	-	50	10
typ. non-linearity	%	-	0.1	0.02
resonant frequency	Hz		700	
	additional load = 50g	Hz	600	
	additional load = 100g	Hz	400	
	additional load = 300g	Hz	250	
stiffness	N/ μm		1.1	
max. push/pull force open loop	N		100/100	
max. push/pull force closed loop ****	N	-		100/100
max. load	N		100	
lateral force limit	N		100	
rotational error	x/y/z μrad		5/5/5	
voltage range	V		-20 ... +130	
connector	voltage	-	ODU Serie L 3pol.	
	sensor	-	LEMO 0S.304	LEMO 0S.650
cable length	m	1	1.2	1.6
material	-	stainless steel/aluminium		
dimensions (l x w x h)	mm	52 x 52 x 22	52 x 70 x 22	
central aperture	mm		$\emptyset 3$	
weight	g	175	190	300

* typical value measured with 30V300 nanoX amplifier

** typical value for small electrical field strength

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

****max. force, with which the system operates in closed loop within the specification



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nanoX 200 series

recommended configurations:

actuator	nanoX 200	T-106-20
amplifier/controller	30V300 nanoX	E-468-011
actuator	nanoX 200 SG	T-106-21
amplifier/controller	ENV 40 SG nanoX	E-248-100
power supply unit	ENT 40/20	E-103-13
PC-interface	EDA 4	E-202-40
casing for all modules	42 TE	E-103-97
actuator	nanoX 200 CAP digital	T-106-26D
amplifier/controller	EVD 50 CL	E-720-300
casing for d-Drive		E-751-000

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NanoX 400

High speed positioner

Concept:

The **NanoX400** linear stage is a development within our ultrafast **NanoX®-line**. It provides a long positioning and scanning range as well as a central aperture. Due to FEA-optimization of these stages you meet highest dynamical performance and excellent guiding accuracy. This is accomplished even with high mass loads in a compact package. Our optimization also incorporates excellent temperature compensation properties. The sophisticated monolithic guidance design of the solid flexure hinges means the trajectory is free of mechanical play and friction. The **NanoX400** is also available with strain gauge or capacitive measurement systems.

Specials:

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

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

Mounting:

The raster tapped and thru holes allow easy integration of the **NanoX400** into any application or mechanical setup.



Image: NanoX 400

Product highlights:

- travel range 480/400 µm open/closed loop
- sub-nm resolution
- highest dynamical performance
- excellent guidance accuracy
- central aperture of \varnothing 3 mm

Application examples:

- automation
- laser optics
- life science
- scanning systems

Options:

- vacuum version
- cryogenic version
- special materials

NanoX 400

Technical data

	Unit	NanoX 400	NanoX 400 SG	NanoX 400 CAP
Part no.	-	T-108-20	T-108-21	T-108-26
axis	-	X		
motion open loop ($\pm 20\%$)*	μm	480		
motion closed loop ($\pm 0.2\%$)*	μm	-	400	
capacitance ($\pm 20\%$ **)	μF	10.2		
feedback sensor	-	-	strain gauge	capacitive
resolution open loop***	nm	0.8	0.8	0.8
resolution closed loop****	nm	-	8	2
typ. repeatability	nm	-	80	20
typ. non-linearity	%	-	0.1	0.02
resonant frequency	Hz	400		
additional load 50 g	Hz	300		
additional load 100 g	Hz	250		
additional load 300 g	Hz	150		
stiffness	N/ μm	0.4		
max. push/pull force open loop	N	100/100		
max. push pull force closed loop	N	-	16/16	
max. load	N	50		
lateral force limit	N	100		
rotational error	μrad	5 (about all axes)		
dimensions w x h x d	mm	52 x 32 x 52		52 x 32 x 70
central aperture	mm	$\varnothing 3$		
voltage range	V	-20 ... +130		
connector	voltage	-	ODU series L 3 pol.	
	sensor	-	LEMO 0S.304	LEMO 0S.650
temperature range	$^{\circ}\text{C}$	-20 ... +80		
material	-	stainless steel/aluminum		
weight	g	250	270	370

* typical value measured with ENV40 nanoX amplifier

** typical value for small electric field strength

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

**** max. force, with which the system operates in closed loop within the specification



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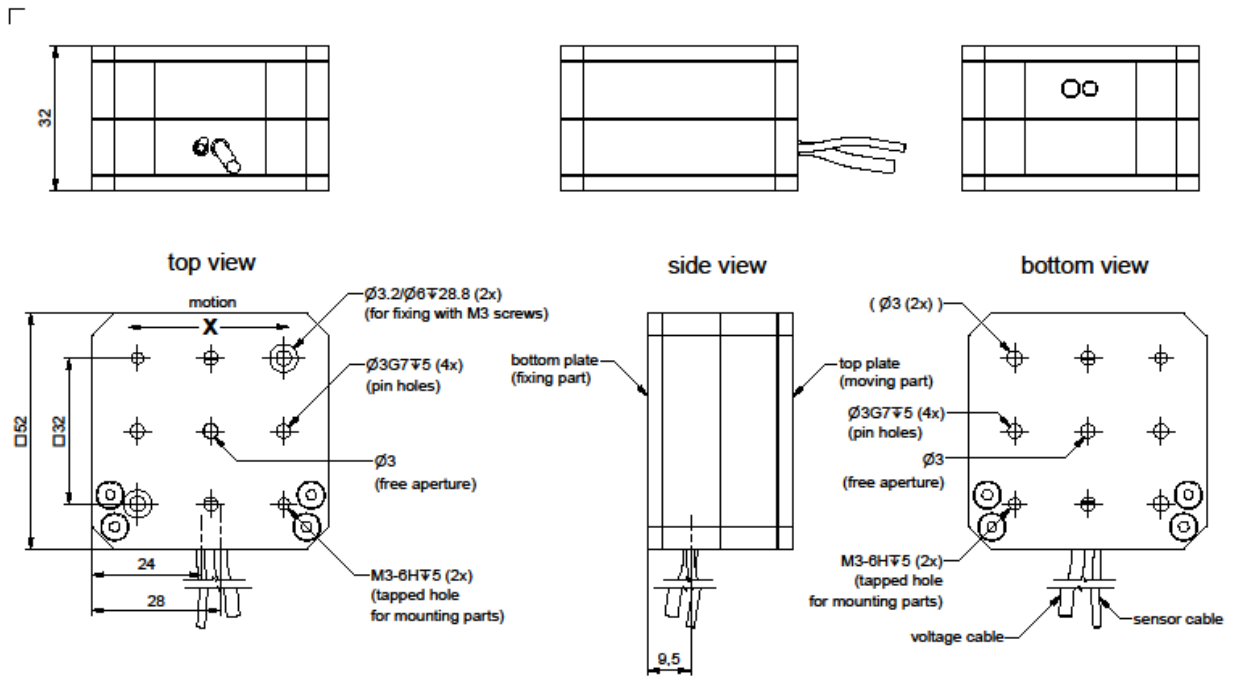
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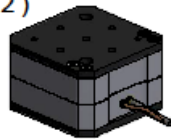
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NanoX 400

Drawing NanoX 400 (SG)



model (1 : 2)



open loop version without sensor cable, standard cable length 1m
closed loop version with standard cable length 1.2m (EXT/DIG 2m)

unit [mm]
pin hole tolerance ± 0.02
tapped hole tolerance ± 0.05

part-no.	T-108-2x	part-name	nanoX 400 (SG)
file name	PT10821	OK: date/sign	
		scale	1:1
		customers drawing piezosystem jena	



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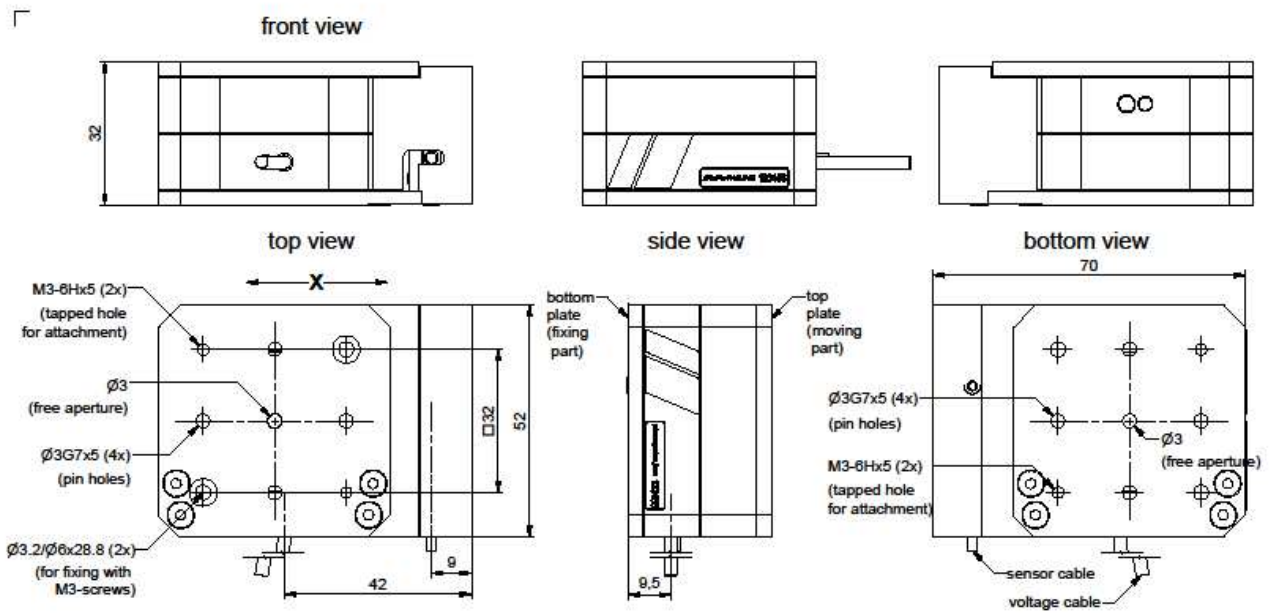


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NanoX 400

Drawing NanoX 400 CAP



model 1:1



standard cable length 1.6m (EXT/DIG 2m)

unit [mm]
pin hole tolerance ± 0.02
tapped hole tolerance ± 0.05

part-no.	T-108-26	part-name	nanoX 400 CAP
file name	PT10826ÄZ1	OK: date/sign.	
	rev.02	scale	1:1
		customers drawing piezosystem jena	

nanoSX 800

High speed piezo translation stage

Concept:

The **nanoSX 800** one axis translation stage offers a large travel range, a central aperture and temperature compensation in a compact design. Trajectory trueness even at higher loads and appropriate stiffness are major advantages compared to competitive systems available on the market. The **nanoSX 800** is also available with a capacitive measurement system.

Specials:

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

An optional external sensor preamplifier (version "EXTERN"/"DIGITAL", E respectively D at the end of the part number) offers independence from cable length.

Mounting:

The raster tapped and thru holes allow easy integration of the **nanoSX 800** into any application or mechanical setup.



Image: nanoSX 800

Product highlights:

- travel range of 900/800 μm open/closed loop
- 12.5 mm central aperture
- sub-nm resolution
- excellent trajectory trueness
- high load capability

Application examples:

- nano positioning
- scanning
- microscopy
- surface analysis
- metrology
- alignment

Options:

- vacuum version
- cryogenic version
- special materials

nanoSX 800

Technical data

	Unit	nanoSX 800	nanoSX 800 CAP EXTERN	nanoSX 800 CAP DIGITAL
Part no.	-	T-128-00	T-125-06E	T-128-06D
axis	-	X		
motion open loop ($\pm 10\%$)*	μm	900		
motion closed loop ($\pm 0.2\%$)*	μm	-	800	
capacitance ($\pm 20\%$ **)	μF	2x7		
feedback sensor	-	-	capacitive	
resolution***	nm	1.6	4	
typ. repeatability	nm	-	40	
typ. non-linearity	%	-	0.02	
resonant frequency X/Y/Z	Hz	330/600/800	210/500/700	210/500/700
additional load 50 g	Hz	230	145	
additional load 100 g	Hz	200	135	
additional load 300 g	Hz	135	95	
stiffness X/Y/Z	N/ μm	0.2/2.5/2.5		
max. push/pull force	N	100/100		
max. load	N	50		
rotational error	μrad	5 (about all axes)		
voltage range	V	-20 ... +130		
connector	voltage	-	ODU	ODU 3 pin
	sensor	-	-	ODU 4 pin
material	-	stainless steel/aluminum		
dimensions w x h x d	mm	60x20x60	60x30x75	
central aperture	mm	$\varnothing 12.5$		
weight	g	300	410	

* typical value measured with 30V300 nanoX amplifier

** typical value for small signal electrical field strength

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



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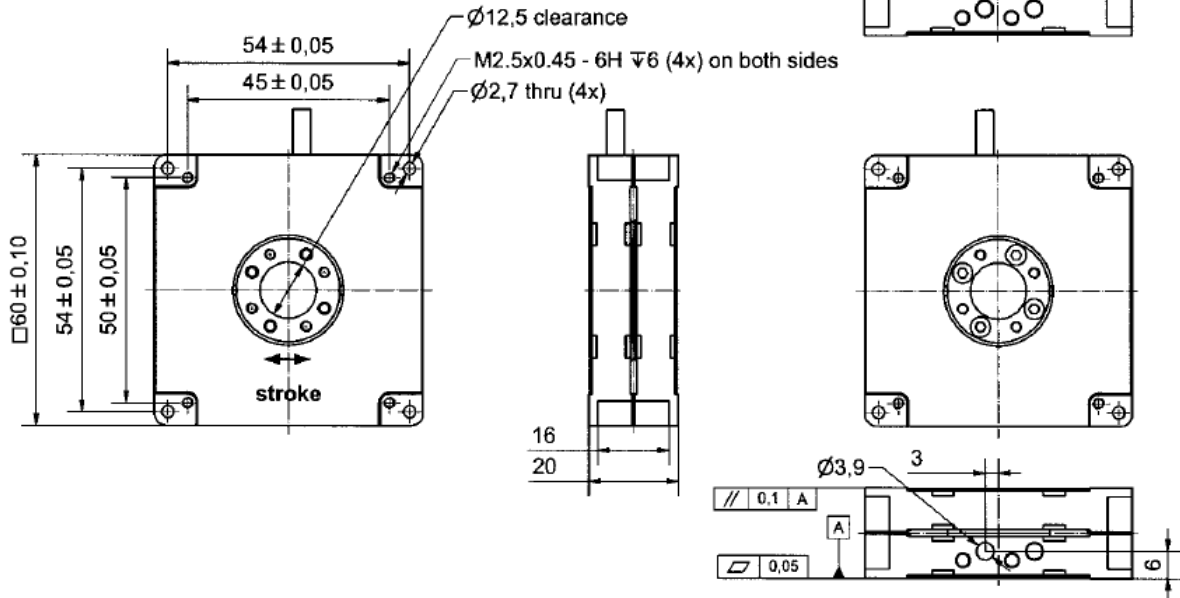
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nanoSX 800

Drawing nanoSX 800



Drawing nanoSX 800 CAP

