

high speed piezo translation stages

nanoSX 800 line

- 900µm 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 800 CAP

Concept

The nanoSX800 line one axis translation stage offers a large stroke, a central aperture 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 digital amplifier/controller from piezosystem jena allows additional feature in-situ and dynamical set up of PID-parameters, slew rate and notch filter band width. The mechanical resonance can be found using the built in wobble generator. The notch filter set up eliminates undesired frequencies from the output voltage, such as the stage's resonant frequency.

So you easy can adapt the set up depending on the current load scenario and optimize the performance of the system.

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 800	nanoSX 800 CAP EXTERN	nanoSX 800 CAP DIGITAL
part. no.	-	T-128-00	T-128-06E	T-128-06D
axis	-	x	x	x
motion open loop ($\pm 10\%$)*	μm	900	900	900
motion closed loop ($\pm 0.2\%$)*	μm	-	800	800
capacitance ($\pm 20\%$ **)	μF	2x7	2x7	2x7
integrated measurement system	-	-	capacitive	capacitive
resolution***	nm	1.2	1	1
typ. repeatability	nm	-	40	40
typ. nonlinearity	%	-	0.02	0.02
resonant frequency (X/Y/Z)	Hz	330/ 600 / 800	210 / 500 / 700	210 / 500 / 700
additional load = 50g	Hz	230	145	145
additional load = 100g	Hz	200	135	135
additional load = 300g	Hz	135	95	95
stiffness (X/Y/Z)	N/ μm	0.2 / 2.5 / 2.5	0.2 / 2.5 / 2.5	0.2 / 2.5 / 2.5
push/pull force capacity	N	100 / 100	100/100	100/100
max. load	N	50	50	50
rotational error	roll	μrad	5	5
	pitch	μrad	5	5
	yaw	μrad	5	5
voltage range	V	-20...+130	-20...+130	-20...+130
connector	voltage	-	ODU	ODU 3pin
	sensor	-	-	ODU 4pin
material	-	stainless steel / aluminum		
dimensions (l x w x h)	mm	60 x 60 x 20	60 x 75 x 30	60 x 75 x 30
central aperture	mm	$\varnothing 12.5$	$\varnothing 12.5$	$\varnothing 12.5$
weight	g	300	410	410

* typical value measured with 30V300nanoX amplifier

** typical value for small electrical field strength

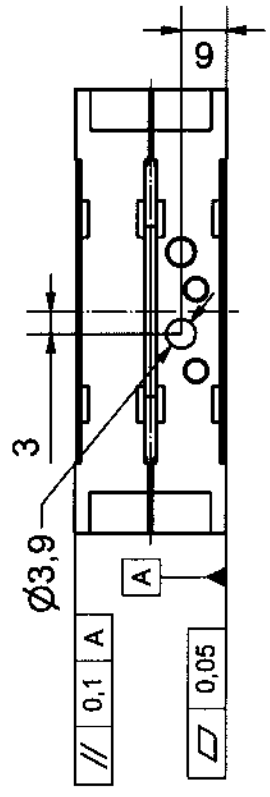
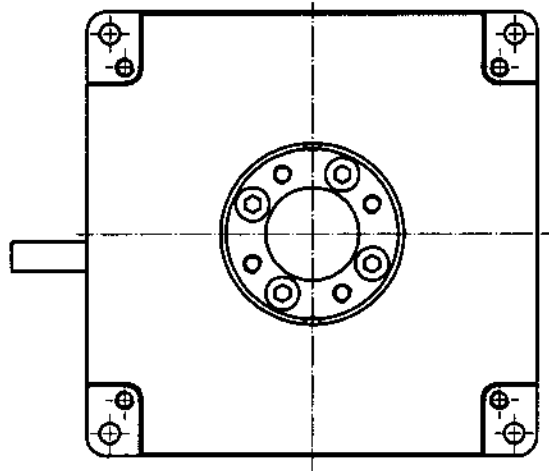
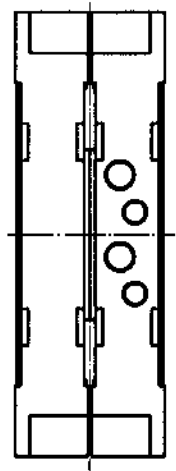
*** The resolution is only limited by the noise of the power amplifier and metrology.

recommended configurations:

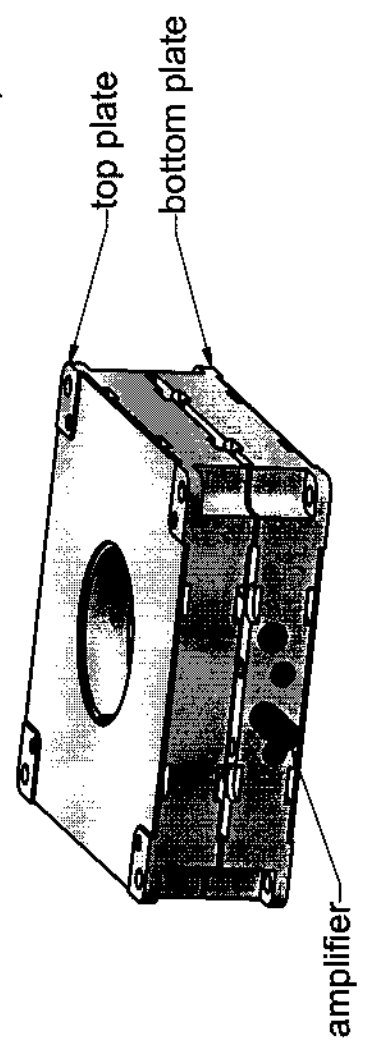
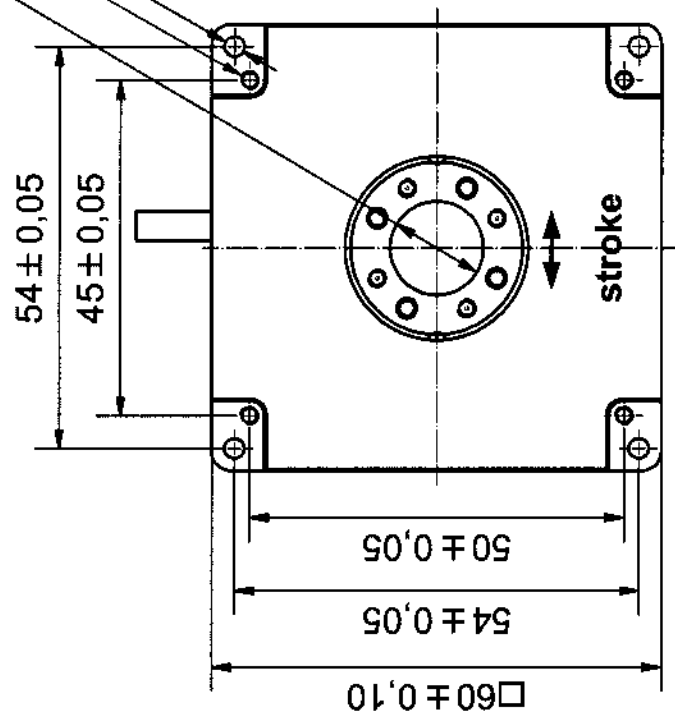
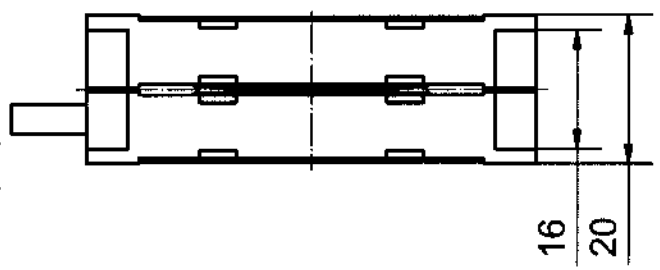
actuator amplifier / controller	nanoSX 800 2 x 30V300 nanoX	T-128-00 E-468-011
actuator amplifier / controller	nanoSX 800 CAP extern* 2 x 30V300 nanoX CLE	T-128-06E E-468-111
	*identical to nanoSX 800 CAP, except the external sensor amplifier between stage and controller	
actuator amplifier / controller casing	nanoSX 800 CAP ENT 40/20 (230V / 115V) 63 TE housing 19"	T-128-06 E-103-13/E-103-14 E-103-90
actuator amplifier	nanoSX 800 CAP DIG 30DV50	T-128-06D E-754-300

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

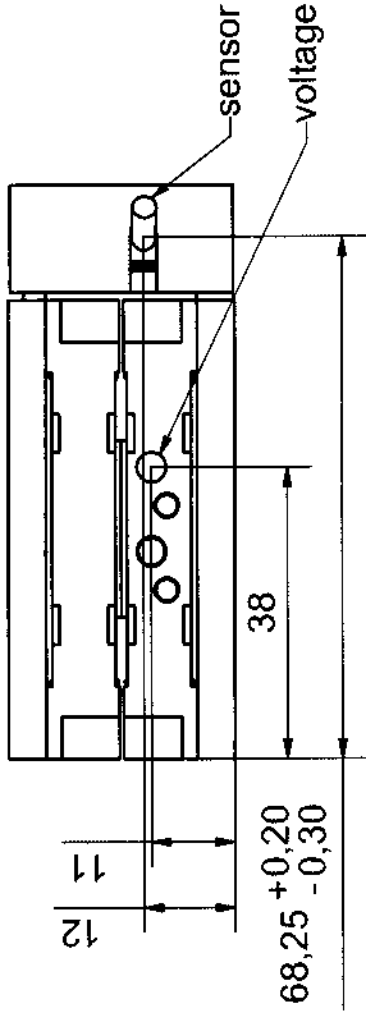
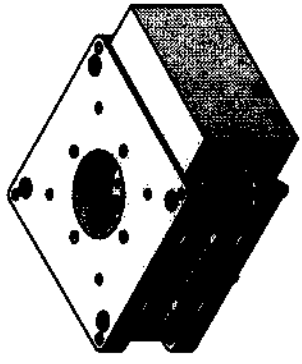
ORIGINAL



$\phi 12,5$ clearance
 M2.5x0.45 - 6H $\nabla 6$ (4x) on both sides
 $\phi 2,7$ thru (4x)



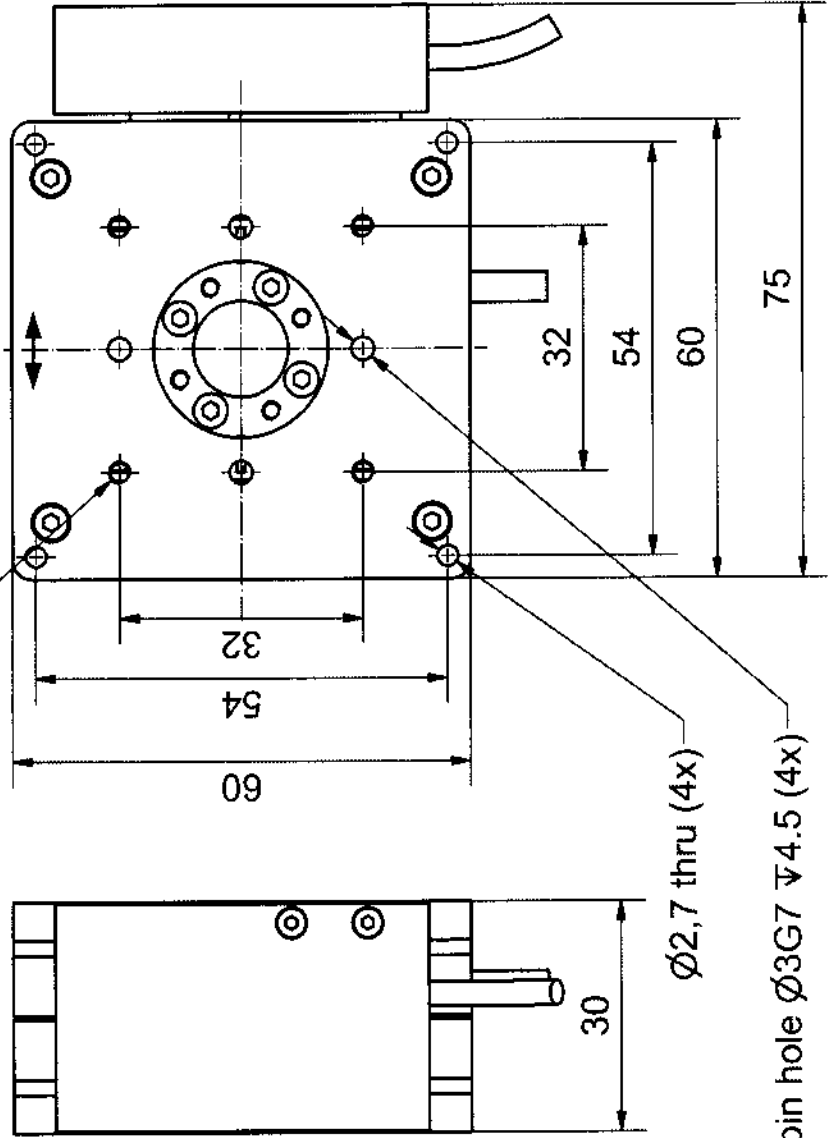
part.-no.	T-128-00	part.-name	nanoSX800
file name		OK: date/sign.	18. JULI 2005
		scale	1:1
		customers drawing	plezsystem jena



top view

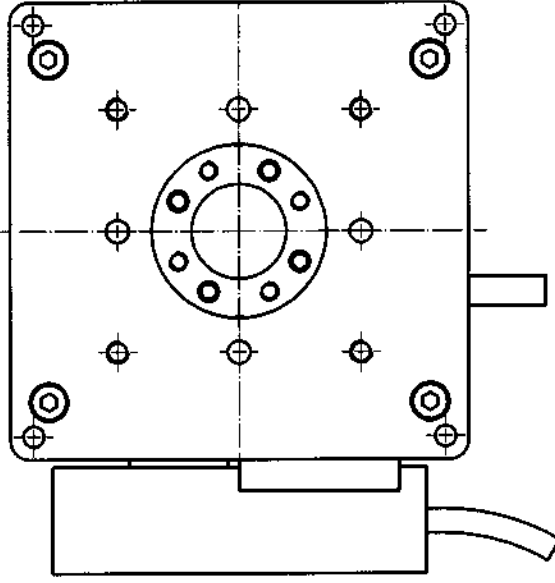
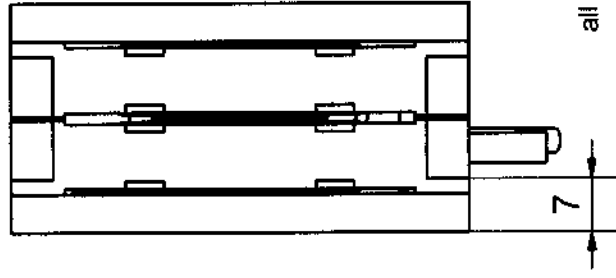
tapped hole M3 - 6H ∇ 4.5 (4x)

stroke



\varnothing 2,7 thru (4x)

pin hole \varnothing 3G7 ∇ 4.5 (4x)



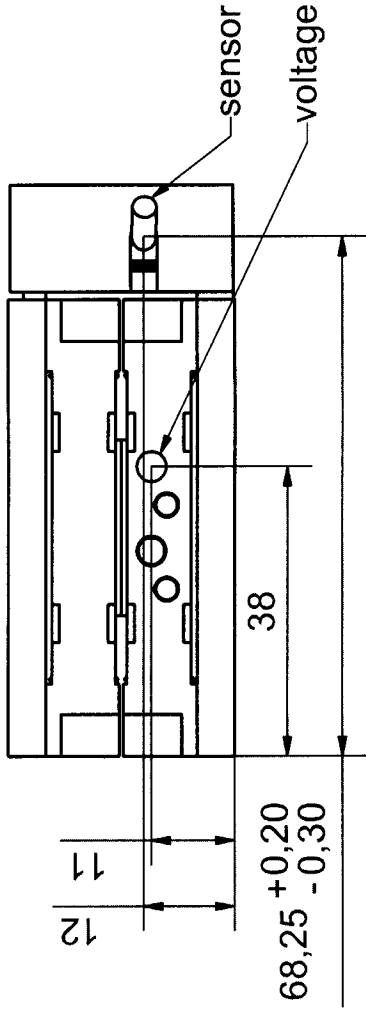
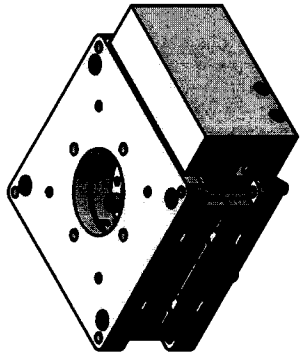
all dimension in [mm]

orientation tolerance of tapped holes ± 0.05

orientation tolerance of pin holes ± 0.02

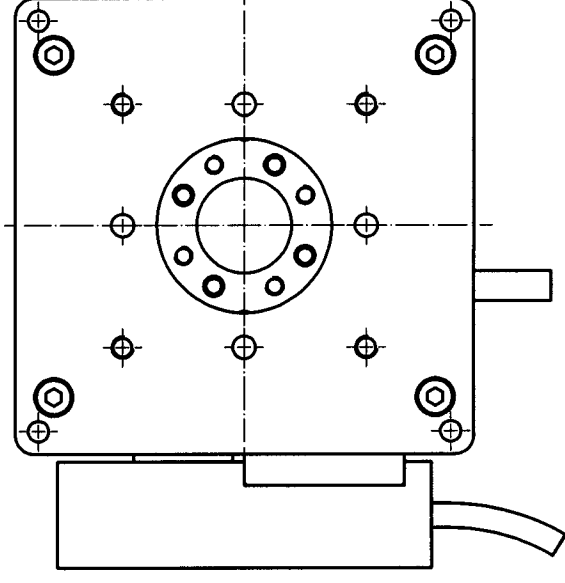
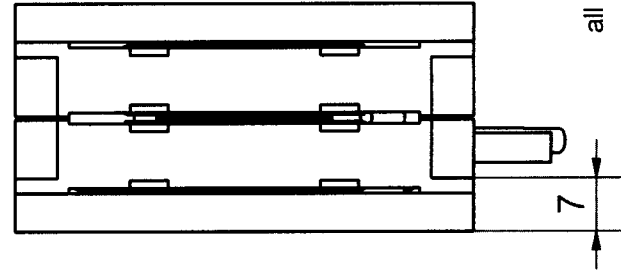
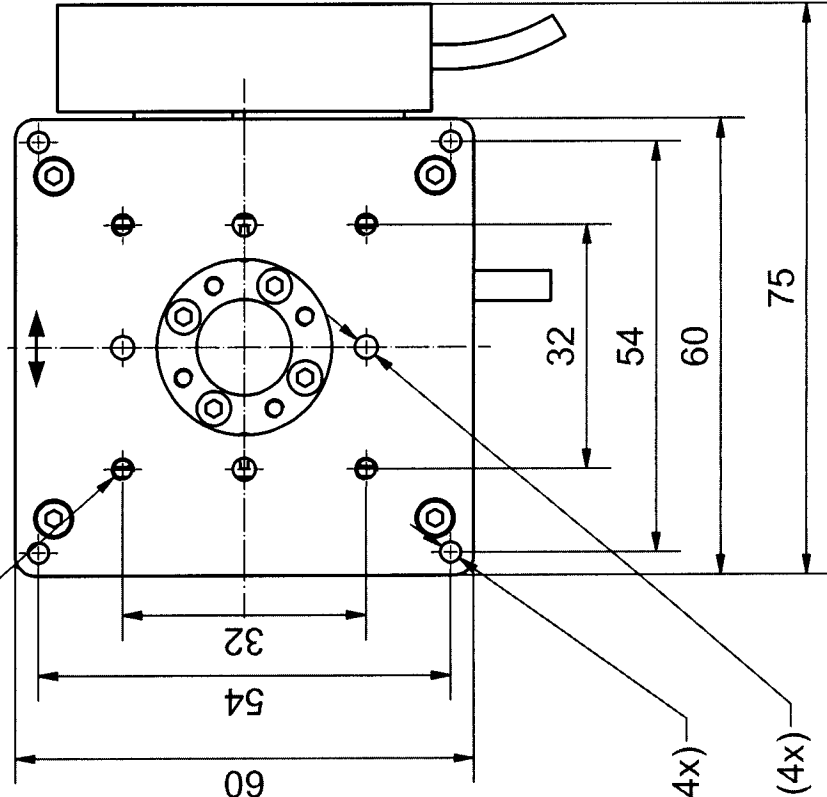
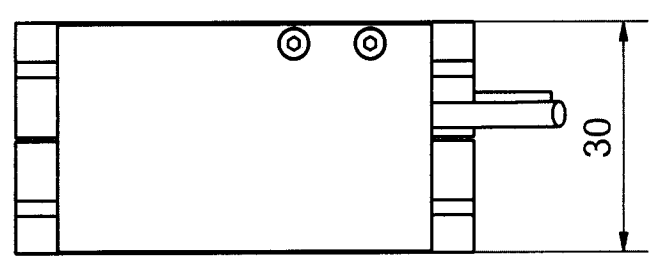
part.-no.	T-128-06	part.-name	nanosX800CAP
file name	PT12806	OK: date/sign.	05. MAI 2006 / 19
		scale	1:1
		customers drawing	
			piezosystem jena

ORIGINAL



tapped hole M3 - 6H ∇ 4.5 (4x)

stroke



all dimension in [mm]
 orientation tolerance of tapped holes ± 0.05
 orientation tolerance of pin holes ± 0.02

$\text{\O}2,7$ thru (4x)

pin hole $\text{\O}3G7 \nabla 4.5$ (4x)

part-no.	T-128-06D	part-name	nanoSX800CAP digital
file name	PT12806D	OK: date/sign.	
		scale	1:1
		customers drawing	piezosystem jena