

xy – piezo scanner

PXY 16 line

- 16 x 16 μm^2 positioning / scanning range
- parallel high resolution capacitive metrology
- 0.04 nm resolution
- excellent guidance accuracy
- parallel kinematics
- large $\text{Ø}66\text{mm}$ clearance
- advanced robustness and reliability

applications:

- fast scanning tasks as well as nanopositioning and adjustment in the wide field of scanning microscopy, image processing, semiconductor, automation etc..



fig.: PXY 16 ENV

Concept

The PXY 16 two axes low voltage linear stage offers a scanning and positioning range of 16 x 16 μm^2 . The large central aperture allows for a wide range of optical applications.

The FEA optimized parallel kinematics results in an equal and independent behavior of the active axes and provides higher stiffness and responsiveness than a conventional construction. Therefore you meet very high dynamical performance and excellent trajectory accuracy, even with high mass loads.

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

Piezoactuators 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 piezoactuators 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:

	unit	PXY 16 ENV	PXY 16 CAP	PXY 16 CAP extern	PXY 16 CAP digital
part no.	-	S-644-00	S-644-06	S-644-06E	S-644-06D
axes	-	X and Y			
stroke open loop ($\pm 10\%$)*	μm	16			
closed loop ($\pm 0,2\%$)*	μm	-	12		
electrical capacitance ($\pm 20\%$)**	μF	3.6 per axis			
feedback sensor	-	w/o	capacitive		
resolution*** open loop	nm	0.04	0.04		
closed loop	nm	-	1		
typ. repeatability	nm	-	5		
typ. nonlinearity	%	-	0.02		
resonant frequency add. mass = 10g	Hz	335			
add. mass = 130g	Hz	325			
add. mass = 360g	Hz	305			
add. mass = 540g	Hz	285			
stiffness (x / y / z)	N/ μm	10 / 10 / 15			
max. push / pull force open loop	N	200 / 50			
closed loop****	N	20 / 20			
max. load	N	50			
max. lateral force	N	20			
rotational error	x, y, z	μrad 5 / 5 / 5			
dimensions (l x w x h)	mm ³	98 x 98 x 20	104 x 104 x 20		
clearance	mm	$\varnothing 66$			
voltage range	V	-20 ... +130			
connector	voltage	-	LEMO 0S.302		d-sub
	sensor	-	LEMO 0S.650	ODU.4pol	
cable length	m	1.0	1.6	2.0	2.0
min. cable bending radius	mm	>15			
temperature range	$^{\circ}\text{C}$	-20 ... +80			
material	-	stainless steel			
total mass	g	725	900		

* measured with 30V300 CLE

** typical small signal strength behavior

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

**** maximum load that allows operation in closed loop order

recommended configuration:

stage	1 x	PXY 16 CAP digital	S-644-06D
amplifier/controller	1 x	NV 40/3 CLE	E-101-23
stage	1 x	PXY 16 CAP	S-644-06
amplifier/controller	2 x	ENV 300 CAP	E-270-600
power supply	1 x	ENT 400 (230V / 115V)	E-103-33 / 34
computer interface	1 x	EDA 4	E-202-40
case	1 x	case 19" / 84 TE	E-103-100
stage	1 x	PXY 16 CAP digital	S-644-06D
amplifier/controller	2 x	EVD 50	E-720-911
case	1 x	d-Drive case with EDS2 interface	E-751-000

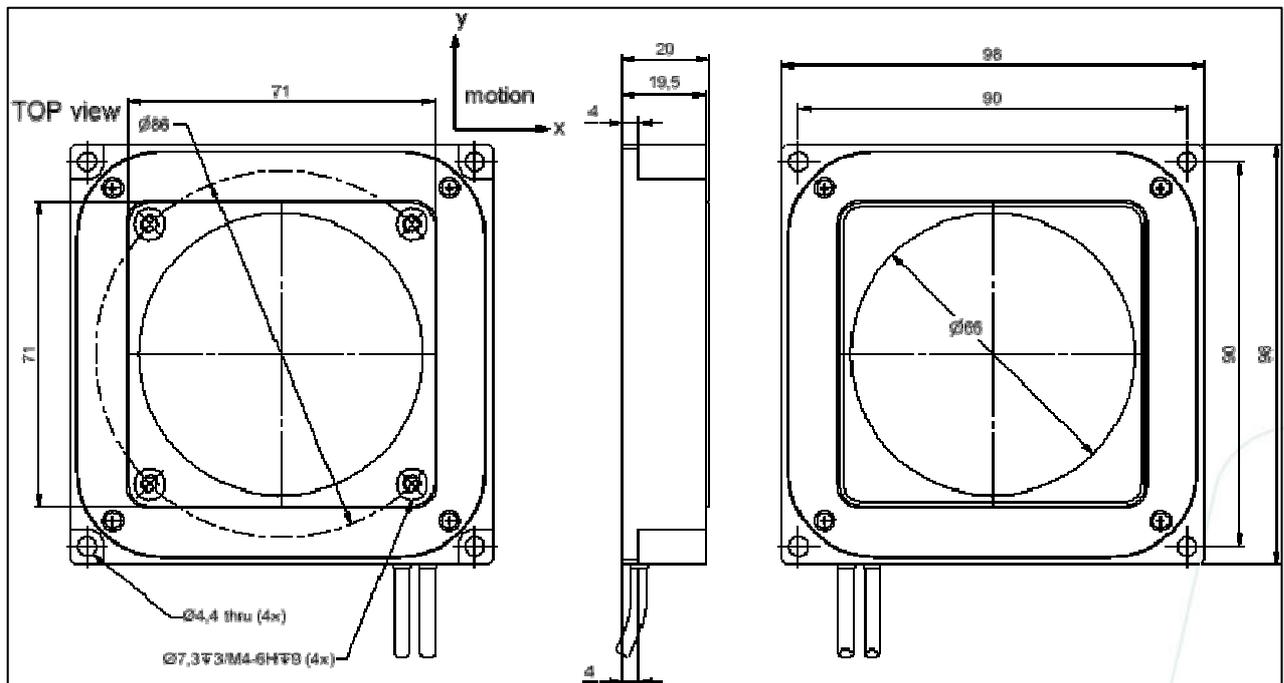


fig.: PXY 16 ENV

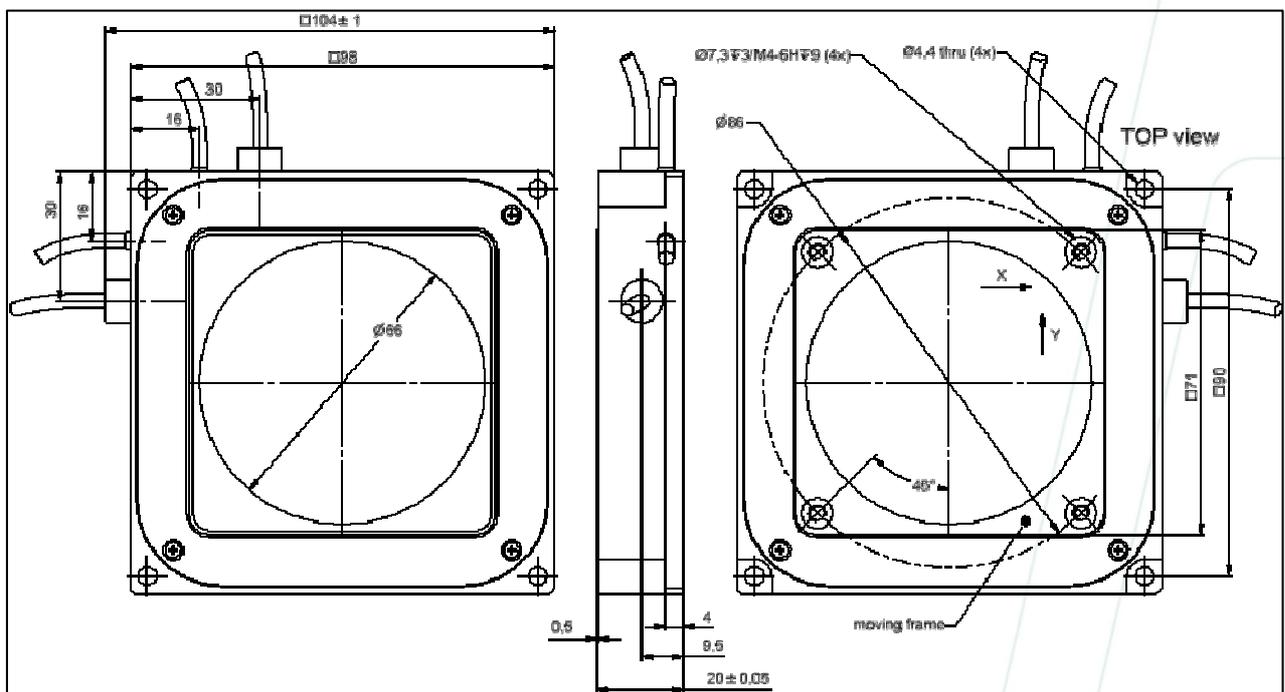


fig.: PXY 16 CAP / PXY 16 CAP extern / PXY 16 CAP digital

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