

## PXY 100

### *compact 2-axes translation stages*

#### **Concept:**

The systems of the series PXY 100 are ideally suited for nm-precise positioning of optic components such as mirrors and laser diodes, adjustment and mounting in semiconductor technologies and electronics, and applications in measurement technologies and quality assurance as well as microbiology.

The series PXY 100 consist of piezo electrical actuator in stage design with a solid top and bottom plate for easily integration in optical setups. The monolithic flexure hinges design offers high precision motion range, high stiffness and in due of this excellent dynamical performance for extremely fast and accurate positioning tasks

#### **Specials:**

With the use of a control signal, the X and Y-axis can be controlled separately. The axis are located orthogonal to each other and the direction of motion is show by small markings on the stage. As an option they may come equipped with strain gage or capacitive position sensors, depending on the system configuration, to achieve very accurate repeatability in the low nanometer range. The systems of this series are available in vacuum and cryogenic temperature configurations.

#### **Interfaces:**

The elements of the series PXY are actuators integrated with an inner lever transmission in housing. Since the lever mechanism works in both directions, pulling forces between bottom and top plate need to be avoided, as they could damage the stage. The stage is fixed to a base plate.

Components can be mounted on the top plate by two threaded diagonal holes and can be accurately affixed using the precise pin holes.



image: PXY 100 CAP Vacuum

#### *Product highlights:*

- accurate parallel motion
- up to 100µm motion range
- without mechanical play
- easily combined with other piezo electrical systems
- precision pin holes for accurate adjustment
- high dynamic range

#### *Applications:*

- fiber positioning
- 2D-scanning systems
- beam alignment
- semiconductor
- micro manipulation

## PXY 100

### Technical data:

linear positioning stage	unit	PXY 100	PXY 100 SG	PXY 100 CAP
<b>part no.</b>		T-203-00	T-203-01	T-203-06
<b>axis</b>	-	X,Y	X,Y	X,Y
<b>motion in open(<math>\pm 10\%</math>)/closed loop (<math>\pm 0.2\%</math>)*</b>	$\mu\text{m}$	100/ -	100/80	100/80
<b>capacitance per axis (<math>\pm 20\%</math>)**</b>	$\mu\text{F}$	1.8	1.8	1.8
<b>resolution (open/closed loop)***</b>	nm	0.2/ -	0.2/2	0.2/1
<b>integrated measurement system</b>	-	-	strain gage	capacitive
<b>typ. repeatability</b>	nm	-	$\pm 2$	$\pm 8$
<b>typ. non-linearity</b>	%	-	0.02	0.08
<b>resonant frequency x/y (unloaded)</b>	Hz	340/480	340/480	340/480
<b>max. push/pull forces</b>	N in x	110/11	110/11	110/11
	N in y	95/10	95/10	95/10
<b>stiffness x/y</b>	N/ $\mu\text{m}$	1.1/0.95	1.1/0.95	1.1/0.95
<b>voltage range</b>	V	-20...130V	-20...130V	-20...130V
<b>connector (additional variation please see table below) ****</b>	-	LEMO 0S.302	LEMO 0S.302/ LEMO 0S.304	LEMO 0S.302/ LEMO 0S.650
<b>cable length</b>	m	1	1.2	1.6
<b>min. bend radius of cable</b>	mm	15	15	15
<b>temperature range</b>	$^{\circ}\text{C}$	-20 $^{\circ}\text{C}$ ... +80 $^{\circ}\text{C}$	-20 $^{\circ}\text{C}$ ... +80 $^{\circ}\text{C}$	-20 $^{\circ}\text{C}$ ... +80 $^{\circ}\text{C}$
<b>material</b>	-	aluminum/stainless steel		
<b>dimensions (LxWxH)</b>	mm	40x40x20	60x60x21	65x65x20
<b>weight</b>	g	102	175	300

\* typical value measured with NV 40/3 amplifier (closed loop: NV 40/3 CLE amplifier )

\*\* typical value for small electrical field strength

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

\*\*\*\* additional connectors configuration examples please see table blow

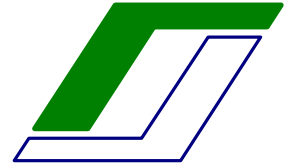
Product name	Description	Specials	Part. No Suffix.
PXY 100 CAP Digital	Version for digital controller series d-Drive and 30DV50 in combination with additional functionalities: Interchangeability, ASI, ASC	Connector Sub-D 15	T-203-06D
PXY 100 SG Extern	Version with sensor pre-amplifier for the use with „CLE“ amplifier units and with the additional functionalities: Interchangeability, ASI	Connector Sensor: ODU 4pin	T-203-01E

Rights reserved to change specifications as progress occurs without notice!

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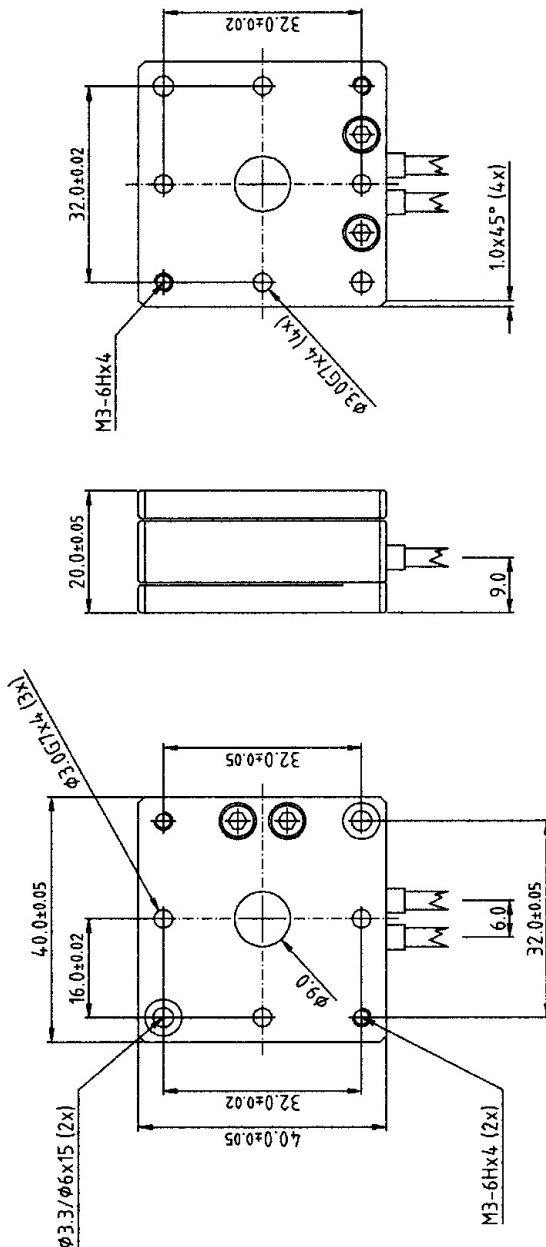
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COMPETENCE  
IN PRECISION

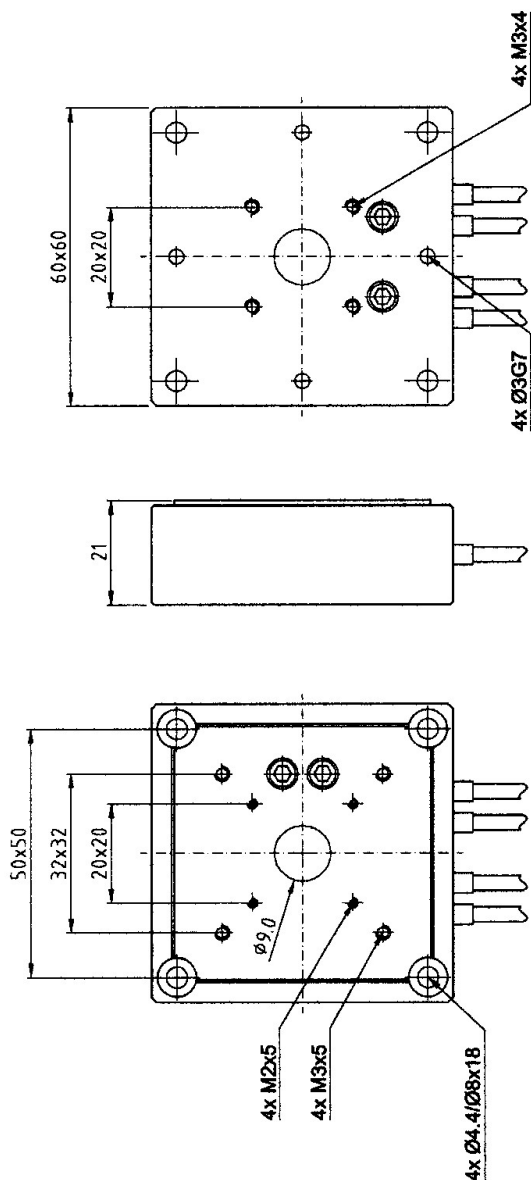
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COMPETENCE  
IN PRECISION

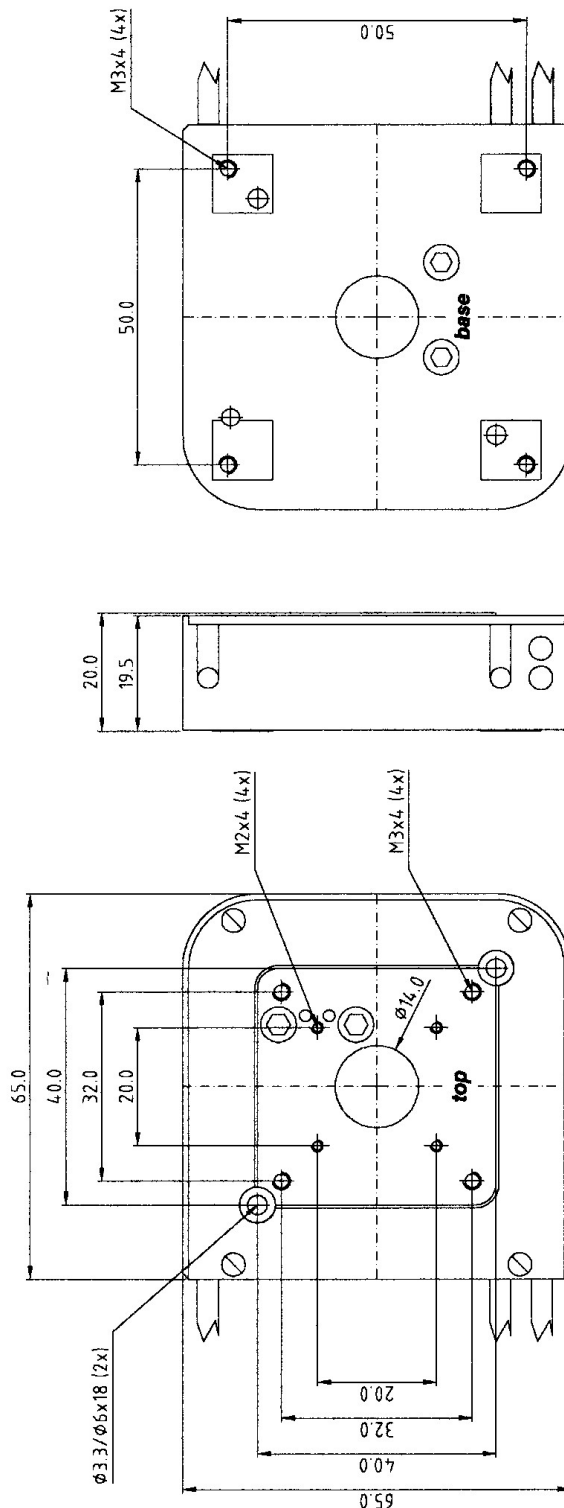


ORIGINAL

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COMPETENCE  
IN PRECISION



**ORIGINAL**

part-no.	part-name
T-203-06	PXY100-CAP
date	OK / Sign.
30. NOV. 2000	<i>[Signature]</i>
file name	customers drawing
PT20306	piezosystem jena



## **Notes for mounting and use of piezo electrically driven positioning stages**

Piezo electrically driven positioning stages are built for high precision positioning. Please handle careful. Especially for mounting other parts on the top plate. Please avoid torque forces when fastening screws in order to avoid damage to the actuator. Please avoid tensile forces greater than the given pre-load!

Please note, for standard actuators and actuators equipped with strain gauge sensors, the tolerance of the open loop motion is -10% to +40%. The tolerance of the capacitance is +/- 20%. The closed loop travel is 80% of the open loop travel. The resolution is only limited by the noise of the amplifier, and all given resolution values are based on measurements with the E-103-18 amplifier.

Standard calibration will be done without any load on the actuator. On customer request, defined loads (up to the max. load) can be calibrated during manufacturing once to optimize a system. Additional calibration has to be paid by the customer. The standard cable length is 1m. The vacuum and cryogenic version cable length of the actuator is 0.6m. The extension cable length outside the vacuum chamber is 1.2m.

The total cable length of actuators equipped with strain gauge feed back sensors is 1m.

Actuators equipped with strain gauge feed back sensors and external pre-amplifier – please see added “E” on the part number - have a total cable length of 2m. A signal pre-amplifier box is in line with the cable 0.3m behind the actuator. The size of the cable box is BxHxL=12x16x45mm.

Actuators equipped with capacitive feed back sensors have a total cable length of 2m. A signal pre-amplifier box is in line with the cable 0.3m behind the actuator. The size of the cable box is (BxHxL=55x12x105mm).

## **For further question please ask us!**

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