

## compact 1-axis translation stages

### series PZ 38 to PZ100

- accurate parallel motion by parallelogram design
- motion without mechanical play because of solid state hinges
- motion up to 100µm
- easily combined with other piezo electrical systems
- precision pin holes for accurate adjustment
- resonant frequency up to 760Hz
- available with positioning sensor



#### applications:

- fiber positioning, laser optics
- scanning systems
- micro manipulation

fig.: PZ 100

#### Concept

The series PZ 38 and PZ 100 consists of flexure hinges guided systems. Therefore these systems are ideally suited for nm-precise positioning of optic components such as mirrors and laser diodes, adjustment and mounting in semiconductor technologies and metrology applications. Based on their design they are pre-loaded and can be used dynamically.

The pattern distance of 20mm (series PZ 38) and 32mm (series PZ 100) is made for an easy mounting of additional components.

#### Specials

The systems of this series are available in vacuum and cryogenic temperature configurations.

As an option the PZ 38 and PZ 100 may come equipped with strain gage sensors and the PZ 100 as well with capacitive position sensors.

The systems can easily achieve repeatability in nm-range, depending on their configuration.

#### Mounting/Installation

The elements of the series PZ are actuators integrated with an inner lever transmission in housing. Since the lever mechanism works in both directions, excessive pressure on the top plate must be avoided. 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.

**technical data:**

<b>series PZ</b>	<b>unit</b>	<b>PZ 38</b>	<b>PZ 100</b>
part no.	-	T-102-00	T-105-00
axes	-	z	
motion open loop ( $\pm 10\%$ )*	$\mu\text{m}$	38	100
capacitance ( $\pm 20\%$ )**	$\mu\text{F}$	0.7	1.8
resolution*** open loop	nm	0.08	0.2
resonant frequency	Hz	760	660
stiffness	N/ $\mu\text{m}$	1	0.77
max. push force	N	38	77
max. pull force	N	4	8
voltage range	V	-20...130V	
connector****	voltage	- LEMO	
cable length	m	1	
min. bend radius of cable	mm	>15	
material	-	stainless steel; top and bottom plate made of anodized Al	
dimensions (l x w x h)	mm	25x25x18	40x40x20
weight	g	40	85
<b>series PZ with integrated measurement system SG-sensor</b>		<b>PZ 38 SG</b>	<b>PZ 100 SG</b>
part no.		T-102-01	T-105-01
motion closed loop ( $\pm 0,2\%$ )*	$\mu\text{m}$	32	80
integrated measurement system		strain gage	
resolution*** closed loop	nm	0.7	2.0
typ. repeatability	nm	6	10
max. push force	N	38	77
max. pull force	N	4	8
connector****	sensor	LEMO 0S.304	
cable length	m	1.2	
dimensions (l x w x h)	mm	40x40x25	40x40x20
weight	g	77	95
<b>series PZ with integrated measurement system CAP-sensor</b>		<b>PZ 38 CAP</b>	<b>PZ 100 CAP</b>
part no.		T-102-06	T-105-06
motion closed loop ( $\pm 0,2\%$ )*	$\mu\text{m}$	32	80
integrated measurement system		capacitive	
resolution*** closed loop	nm	0.7	1.0
typ. repeatability	nm	4	7
max. push force	N	38	77
max. pull force	N	4	8
connector****	sensor	LEMO 0S.650	
cable length	m	1.6	
dimensions (l x w x h)	mm	32x25x22	40x40x32
weight	g	100	140

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

\*\* typical value for small electrical field strength

\*\*\* The resolution of piezoelectrical actuators is nearly unlimited.

Only the noise of the power amplifier and metrology shows an influence.

\*\*\*\*The type of connector might be changed according to the chosen controller unit.  
Details are given in the order confirmation.

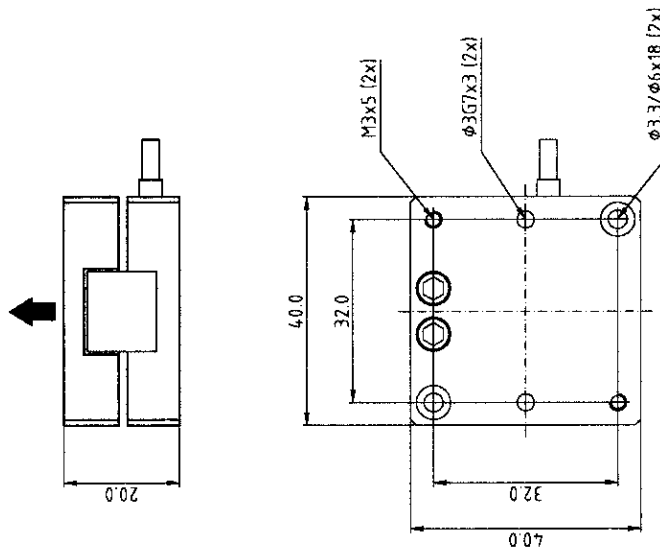
**option:**

- vacuum version
- cryogenic version
- other modification (e.g. body material) upon request

**Please pay attention to our “notes for mounting”, which are available as download on our homepage.**

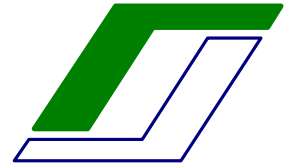
phone: +49 (3641) 66880 • fax: +49 (3641) 668866 • info@piezोजना.com • http://www.piezोजना.com





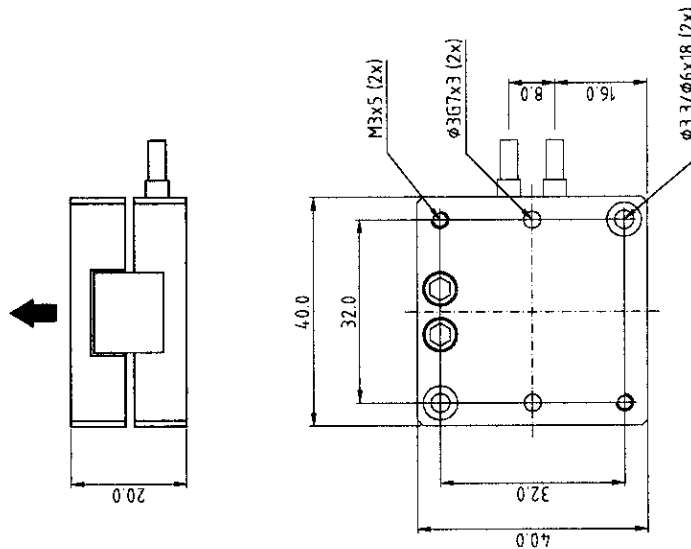
**ORIGINAL**

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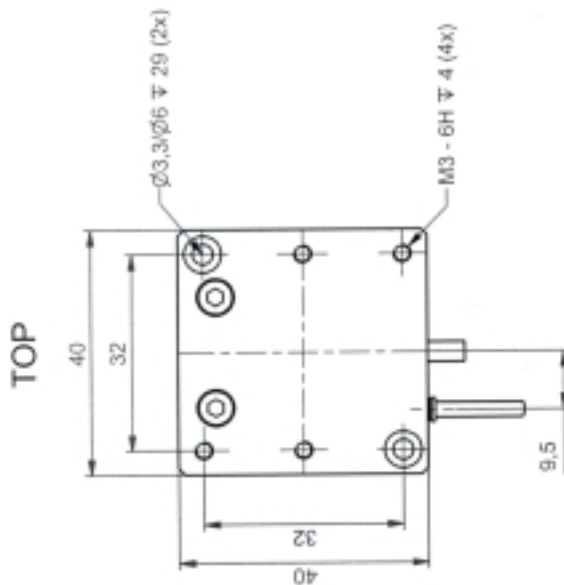
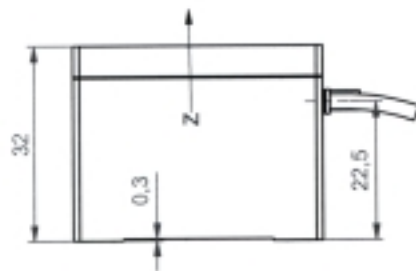
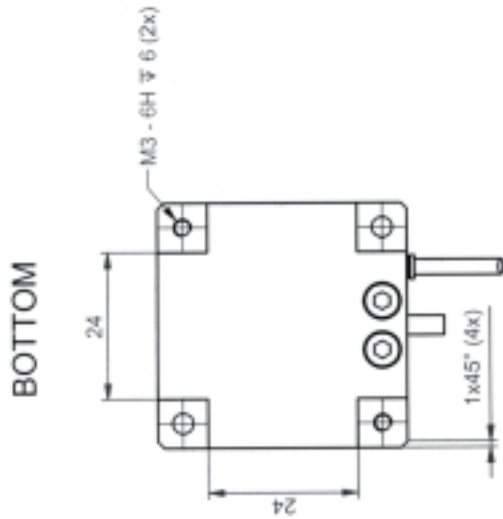


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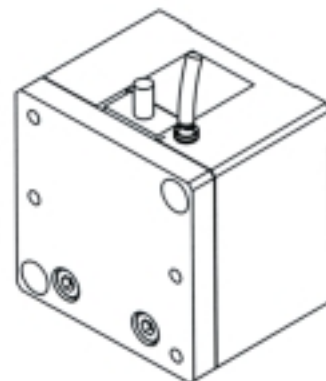
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cable length 1,8m

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			customers drawing
			piezosystem jena

**ORIGINAL**



## instructions for using piezoelectrical elements and power supplies

- Piezoelectric actuators from **piezosystem jena** are controlled by voltages up to 150V. These values can be quite hazardous. Therefore read the installation instructions carefully and only authorized personal should handle the power supply.
- After transportation, piezoelectric actuators should be allowed to adapt for approximately 2 hours to the room temperature before being switched on.
- Piezoelectric actuators are made from ceramic materials with and without metallic casings. The piezo-ceramic is a relatively brittle material. This should be noted when handling piezoelectrical actuators. All piezo-elements are sensitive to bending or shock forces.
- Due to the piezoelectric effect piezo-actuators can generate electrical charges by changing the mechanical load or the temperature or such actions described above.
- Piezoelectric actuators are able to work under high compressive forces, only actuators with pre-load can be used under tensile loads (these tensile forces must be less than the pre-load, given in the data sheet).
- Please note that the acceleration of the ceramic material (e.g., caused by fall down, discharging or high dynamic application) can cause damage to the actuator.
- Heating of the ceramic material will occur during dynamic operation and is caused by structure conditional loss processes. This may cause failure if the temperature exceeds specified values cited below.
- With increasing temperature, up to the Curie temperature (usual values approx. 140°C - 250°C), the piezoelectric effect disappears.
- Piezoelectric actuators such stacks or various tables work electrically as a capacitance. These elements are able to store electrical energy over a long period (up to some days) and the stored energy may be dangerous.
- If the actuator remains connected to the drive electronics, it is discharged within a second after shutdown and quickly reaches harmless voltage values.
- Piezo-actuators can generate voltages by warming or cooling only. The discharge potential should not be ignored due to the inner capacitance. This effect is insignificant at usual room temperature.
- Piezo-actuators from **piezosystem jena** are adjusted and glued. Any opening of the unit will cause misalignment or possible malfunction and the guarantee will be lost.
- Please contact **piezosystem jena** or your local representative, if there are any problems with your actuator or power supply.
- **Caution!** Shock forces may damage the built-in ceramic element. Please avoid such forces, and handle the units with care, otherwise the guarantee will be lost.