

## multi dimensional translation stage

### PXY 201

- wide range of sub-nm step motion
- integrated capacitive direct metrology
- excellent trajectory trueness
- 30x30 mm<sup>2</sup> clearance
- high load capability
- internal damping system
- advanced reliability and robustness

#### applications:

- nanopositioning
- micro scanning
- scanning microscopy
- surface analysis
- metrology and alignment

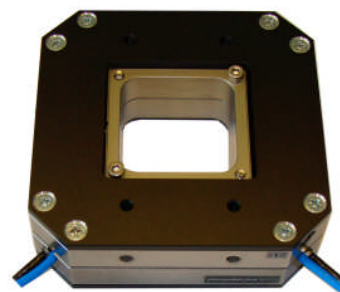


fig.: PXY 201 CAP

#### Concept

**piezosystemjena** introduces an XY plane nanopositioning and microscanning stage featuring a wide center clearance.

Its offered travel and scanning range is controlled by a direct measuring high resolution metrology.

Outstanding trajectory trueness even at higher loads and appropriate stiffness are major advantages.

Vacuum and cryogenic performances are available on demand as well, body material variations of invar, superinvar, aluminum or titanium too.

#### Specials

The PXY 201 CAP and PXY 201 CAP DIG are equipped with an integrated direct measuring high resolution capacitive feedback sensor. In combination with the complementary amplifier/controller from **piezosystemjena** any creep and hysteresis are avoided. Furthermore supreme position stability, linearity, repeatability and accuracy are achieved. **piezosystemjena** digital amplifier/controllers in closed loop operation additionally feature in-situ and dynamic set up of PID parameters, slew rate and notch-filter bandwidth. So you can match the electrical parameters depending on the current load scenario and, through trial and error, optimize the performance during system operation.

Because of the frame design of the guidance the stage is very robust against high loads and lateral mishandling too.

#### Mounting/Installation

The center symmetric tapped hole raster within bottom and top plate allows easy mounting of the nanopositioning and microscanning stage to the ground and parts on it. Its robustness causes no need of additional mounting tools.

**Technical Data:**

| series                              | unit                   | PXY 201                  | PXY 201 CAP       | PXY 201 CAP DIG   |
|-------------------------------------|------------------------|--------------------------|-------------------|-------------------|
| part. no.                           | -                      | <b>T-228-00</b>          | <b>T-228-06</b>   | <b>T-228-06D</b>  |
| axis                                | -                      | X, Y                     | X, Y              | X, Y              |
| motion open loop ( $\pm 10\%$ )*    | $\mu\text{m}$          | 250                      | 250               | 250               |
| motion closed loop ( $\pm 0,2\%$ )* | $\mu\text{m}$          | 200                      | 200               | 200               |
| capacitance ( $\pm 20\%$ )**        | $\mu\text{F}$          | 2 x 3.5                  | 2 x 3.5           | 2 x 3.5           |
| feedback sensor                     | -                      | -                        | capacitive        | capacitive        |
| resolution***                       | nm                     | 0.35                     | 1                 | 1                 |
| free aperture                       | $\text{mm}^2$          | 30 x 30                  | 30 x 30           | 30 x 30           |
| typ. repeatability                  | nm                     | -                        | $\pm 10$          | $\pm 10$          |
| typ. nonlinearity                   | %                      | -                        | 0.02              | 0.02              |
| max. load                           | N                      | 100                      | 100               | 100               |
| push/pull force capacity            | N                      | 100 / 20                 | 10 / 10           | 10 / 10           |
| resonant frequency (X/Y/Z)          | Hz                     | 220 / 170 / 1000         | 220 / 170 / 1000  | 220 / 170 / 1000  |
| additional load = 50g               | Hz                     | 165 / 135                | 165 / 135         | 165 / 135         |
| additional load = 100g              | Hz                     | 145 / 120                | 145 / 120         | 145 / 120         |
| additional load = 300g              | Hz                     | 110 / 100                | 110 / 100         | 110 / 100         |
| stiffness                           | $\text{N}/\mu\text{m}$ | 0.35 / 0.35 / 5.0        | 0.35 / 0.35 / 5.0 | 0.35 / 0.35 / 5.0 |
| rotational error                    | roll                   | $\mu\text{rad}$          | 3                 | 3                 |
|                                     | pitch                  | $\mu\text{rad}$          | 3                 | 3                 |
|                                     | yaw                    | $\mu\text{rad}$          | 3                 | 3                 |
| dimensions (l x w x h)              | $\text{mm}^3$          | 3                        | 3                 | 3                 |
| voltage range                       | V                      | -20...130                | -20...130         | -20...130         |
| connector                           | voltage                | -                        | LEMO              | LEMO              |
|                                     | sensor                 | -                        | -                 | LEMO              |
| temperature range                   | $^{\circ}\text{C}$     | -20 ... +80              |                   |                   |
| material                            | -                      | stainless steel/aluminum |                   |                   |
| weight                              | g                      | 300                      | 370               | 370               |

\* typical value measured with NV 40/3 amplifier

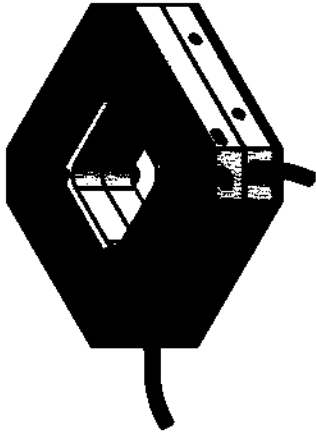
\*\* typical value for small electrical field strength

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

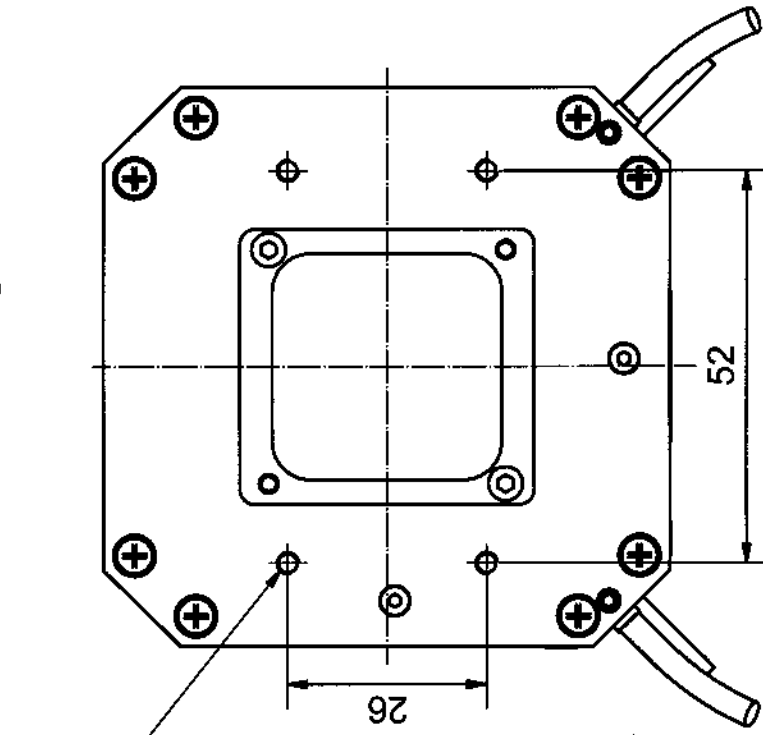
**recommended configurations:**

|                        |                                |                   |
|------------------------|--------------------------------|-------------------|
| actuator               | <b>PXY 201</b>                 | T-228-00          |
| amplifier / controller | <b>NV 40/3</b>                 | E-101-20          |
| actuator               | <b>PXY 201 CAP DIG</b>         | T-228-06D         |
| amplifier / controller | <b>NV 40/3 CLE</b>             | E-101-23          |
| actuator               | <b>PXY 201 CAP</b>             | T-228-06          |
| amplifier / controller | <b>ENT 40/20 (230V / 115V)</b> | E-103-13/E-103-14 |
|                        | <b>2 x ENV 40 CAP</b>          | E-103-60          |
| casing                 | <b>63 TE housing 19"</b>       | E-103-90          |
| actuator               | <b>PXY 201 CAP DIG</b>         | T-128-06D         |
| amplifier / controller | <b>2 x 30DV50</b>              | E-754-300         |

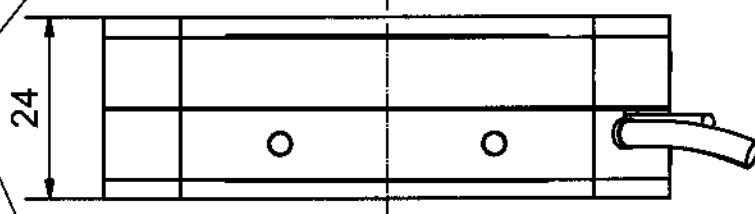
**Please pay attention to our "notes for mounting", which are available as download on our homepage.**



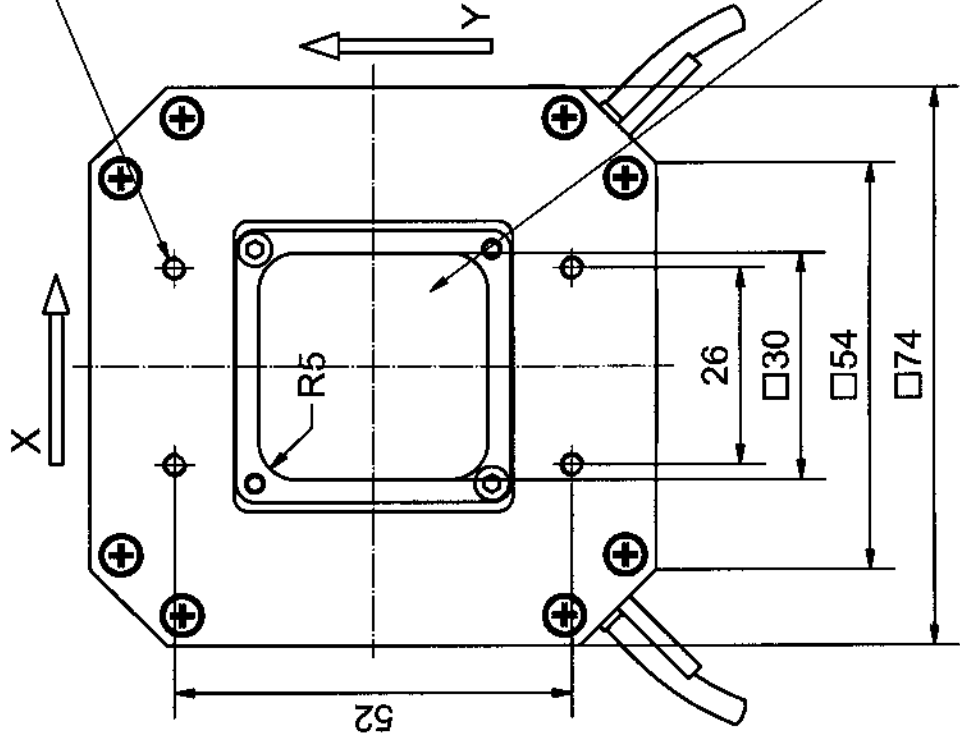
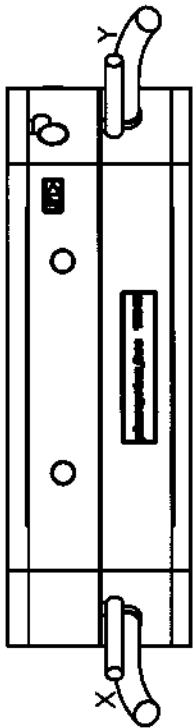
M3-6HV 4.5 (4x)




**ORIGINAL**



clearance 30x30mm<sup>2</sup>



|   |           |                   |                  |
|---|-----------|-------------------|------------------|
| part.-no.   | T-228-06  | part.-name        | PXY 201 CAP      |
| file name   | PT 228 06 | OK: date/sign.    | 06.01.2006       |
|  | scale     | customers drawing | piezosystem jena |
|   |           | 1:1               |                  |