

nanoSXY 400

High speed XY piezo positioner

Concept:

The **nanoSXY 400 stages** have been developed for fast and precise positioning of optical and mechanical components. These systems are specially optimized for very high z-axis stiffness. The special parallel kinematics of the actuator guarantees guidance accuracy at its best.

The FEA designed actuating system, which is based on a hinge flexure design guarantees motion without mechanical play. Overshooting is actively minimized with controllable set and reset forces.

While fully loaded, defined positions can be achieved within a few milli-seconds making these stages an excellent choice for high speed scans used in industrial applications. The **nanoSXY 400** is also available with a capacitive measurement system.

Specials:

The **nanoSXY 400** is temperature compensated, so the stage keeps its position if the surrounding temperature changes.

The bi-directional gear design makes the system very robust and makes it non-sensitive against external forces.

Vacuum and cryogenic versions are available on demand as well as body material variations of invar, super invar, aluminum or titanium.

Mounting:

For stage mounting there are 4 tapped holes and 4 through holes available on the bottom of the actuator. On the top side of the stage the tapped holes and through holes can be used to mount components.



Image: nanoSXY 400CAP

Product highlights:

- travel range 400/320 μm open/closed loop
- excellent guidance accuracy
- high Z-axis stiffness
- central aperture of \varnothing 12.5 mm

Application examples:

- nano positioning
- material research
- microscopy
- semiconductor test equipment

Options:

- vacuum version
- cryogenic version
- special materials

nanoSXY 400

Technical data

| | Unit | nanoSXY 400 | nanoSXY 400 CAP |
|-------------------------------------|------------------|--------------------------|--------------------|
| Part no. | - | T-224-00 | T-224-06 |
| axes | - | | X,Y |
| motion open loop ($\pm 10\%$)* | μm | | 400 |
| motion closed loop ($\pm 0.2\%$)* | μm | - | 320 |
| capacitance** | μF | | 3.6 |
| feedback sensor | - | - | capacitive |
| resolution | open loop*** | | 0.8 |
| | closed loop*** | - | 1 |
| typ. repeatability | nm | - | 9 |
| resonant frequency X/Y/Z | Hz | 300/450/800 | 280/380/800 |
| additional load 50 g X/Y | Hz | 230/350 | 215/250 |
| additional load 100 g X/Y | Hz | 190/280 | 180/200 |
| additional load 300 g X/Y | Hz | 125/130 | 120/125 |
| stiffness X/Y/Z | N/ μm | | 0.35/0.35/2.5 |
| max. push/pull force | N | | 75/75 |
| max. load | N | | 50 |
| rotational error | μrad | | 5 (about all axes) |
| dimensions (L x W x H) | mm | 60x60x20 | 60 x 82 x 30 |
| central aperture | mm | | $\varnothing 12.5$ |
| voltage range | V | | -20 ... +130 |
| connector | voltage | - | ODU L3 pin |
| | sensor | - | LEMO 05.605 |
| material | - | stainless steel/aluminum | |
| weight | g | 300 | 410 |

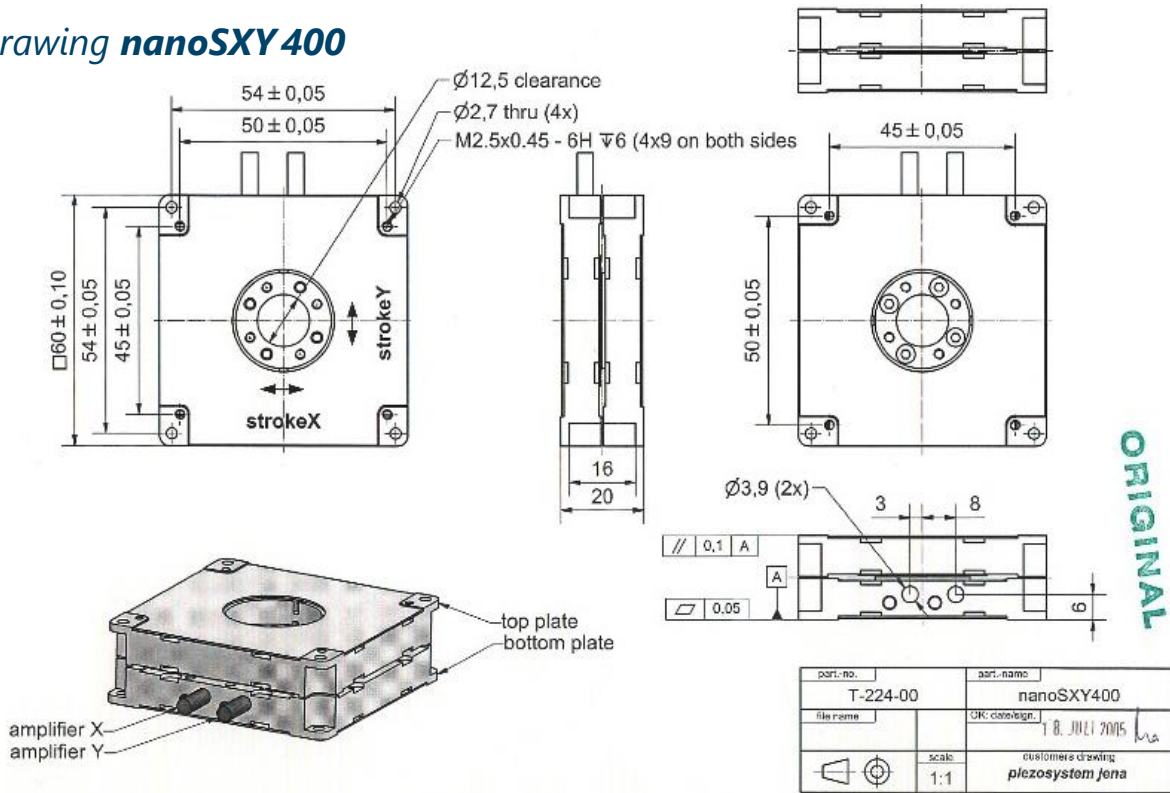
* typical value measured with 30V300 nanoX amplifier

** typical value for small electrical field strength

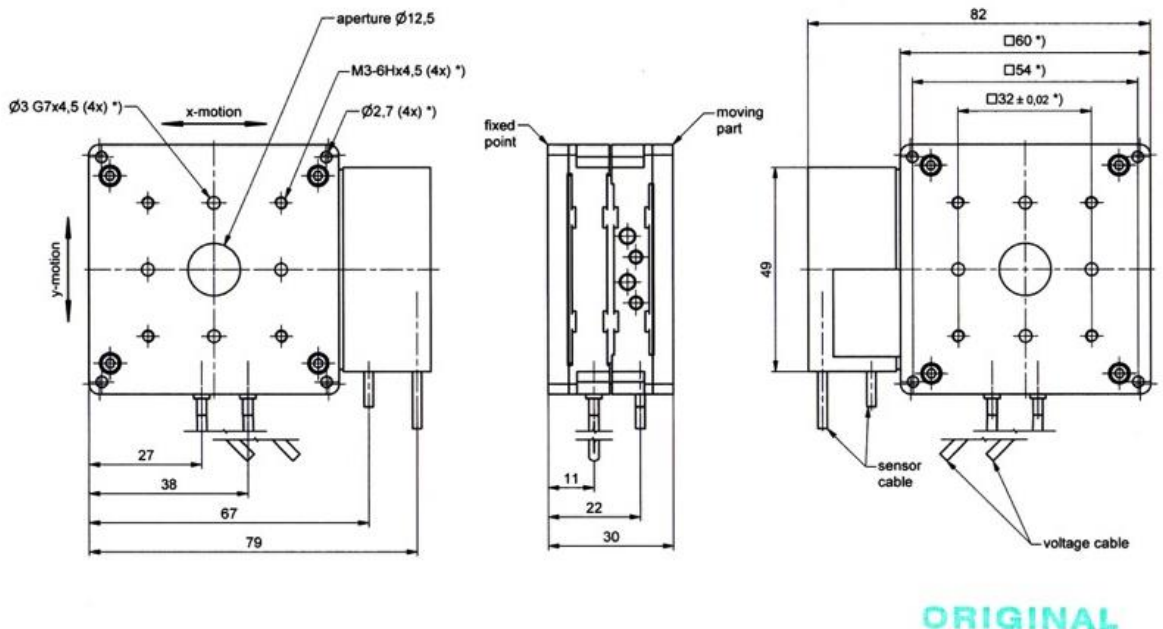
*** The resolution is only limited by the noise of the amplifier and metrology.

nanoSXY 400

Drawing nanoSXY 400



Drawing nanoSXY 400 CAP



*) ... on both sides
standard cable length: 1600mm

rev.01 design review of mechanical interface
rev.02 design review of capacitive sensor heads
rev.03 design review of wiring

| | | | |
|-----------|----------------|----------------|---------------------------------------|
| part-no. | T-224-06 (D,E) | part-name | nanoSXY 400 CAP |
| file name | PT22406 | OK: date/sign. | 10. FEB 2018 <i>Ma</i> |
| | | scale | customers drawing piezosystem jena |
| | | 1:1 | |

