

microscope objective / lens positioning system

nanoMIPOS 400

- 400µm focusing range and sub-nm step width
- max. lens diameter 39mm
- temperature compensated
- shortest settling times due to high stiffness
- universal use by thread adapter
- optional integrated capacitive feedback sensor
- applicable for standard and inverse microscopy

applications:

- surface scanning and analysis
- AFM microscopy
- biotechnology (e.g. cell scanning)
- beam focusing for printing processes
- semiconductor test equipment



fig.: nanoMIPOS 400 CAP

| Concept | Specials | Mounting/Installation |
|---|---|---|
| <p>The nanoMIPOS 400 offers a nano positioning and scanning range up to 400µm in open loop operation as well as 320µm in closed loop. The system can be assembled with objectives of up to 39mm diameter.</p> <p>The sophisticated monolithic guidance design consisting of solid flexure hinges means the trajectory is free of mechanical play and friction – a feature of all piezosystem jena stages. The advanced nanoMIPOS 400 design is FEA optimized to show an outstanding minimum of lateral and rotational components as well as excellent guidance accuracy while offering robustness against off center and lateral loads.</p> <p>To avoid drift and hysteresis, the nanoMIPOS 400 can be equipped with a capacitive measurement system. In combination with the piezosystem jena controller the system offers in closed loop operation high stability, linearity, repeatability and accuracy.</p> | <p>The nanoMIPOS 400 design is temperature compensated, while changing the environmental temperature the stage keeps its position. Because of the bidirectional gear design, guidance and preload are separated. With this nanoX design the system offers equal and highest set and reset forces. This is essential for nanoscan applications that require short settling times and minimized overshooting.</p> <p>The nanoMIPOS 400 is suited for upside down use in inverted microscopes. Parfocal tube extensions for each threading type are available as an accessory.</p> <p>Vacuum, cryogenic or nonmagnetic versions are available on demand.</p> | <ol style="list-style-type: none"> 1. Screw the objective into the MIPOS 2. Screw the Flex-Adapter into the microscope 3. Clamp the MIPOS on the Flex-Adapter using the attachment screw <p>Spacer rings to compensate the extended optical path are available and flex adapters for all common threads.</p> |

technical data:

| series nanoMIPOS | | unit | nanoMIPOS 400 | nanoMIPOS 400 CAP |
|-------------------------------------|------------------|------------------|----------------------------|-------------------|
| part no. for thread ... | M25x0.75 | - | O-543-00 | O-543-06 |
| | W0.8x1/36" (RMS) | - | O-544-00 | O-544-06 |
| | M26x0.75 | - | O-545-00 | O-545-06 |
| | M27x0.75 | - | O-546-00 | O-546-06 |
| | M32x0.75 | - | O-547-00 | O-547-06 |
| axis | | - | Z | |
| motion open loop ($\pm 10\%$)* | | μm | 400 | |
| motion closed loop ($\pm 0,2\%$)* | | μm | - | 320 |
| capacitance ($\pm 20\%$)** | | μF | 6 | |
| integrated measurement system | | - | - | capacitive |
| resolution open loop*** | | nm | 0.8 | |
| resolution closed loop*** | | nm | - | 1 |
| typ. repeatability | | nm | - | 10 |
| resonant frequency | | Hz | 300 | |
| additional load = 80g | | Hz | 250 | |
| additional load = 100g | | Hz | 220 | |
| additional load = 300g | | Hz | 140 | |
| stiffness | | N/ μm | 0.3 | |
| blocking force | | N | 120 | |
| max. load | | N | 10 | 10 |
| rotational error | | μrad | <5 | |
| voltage range | | V | -20 ... +130 | |
| connector**** | voltage | - | ODU series L 3pin | |
| | sensor | - | - | LEMO 0S.650 |
| cable length | | m | 1 | 1.6 |
| min. bend radius of cable | | mm | >15 | |
| material | | - | stainless steel / aluminum | |
| dimensions (l x w x h) | | mm^3 | 65 x 45 x 40 | |
| weight | | g | 300 | 315 |
| max. lens diameter | | mm | 39 | |
| max. lens weight | | kg | 1 | |
| option for standard microscopes | | - | yes | |
| option for inverse microscopes | | - | yes | |

* typical value measured with 30V300 nanoX amplifier

** typical value for small electrical field strength

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

****in combination with a digital controller unit the system comes with a Sub-D 15 connector.

The part number is extended by the suffix "D".

recommended configurations:

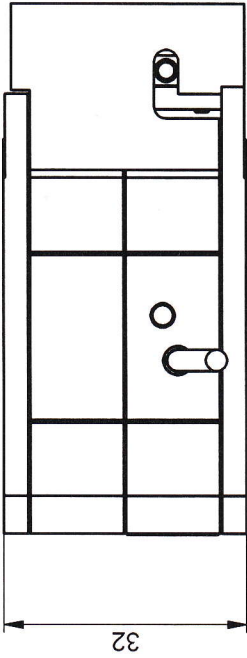
| | | |
|----------------------|----------------------------------|-----------|
| actuator | nanoMIPOS 400 CAP digital | O-543-06D |
| amplifier/controller | 30DV50 | E-754-000 |

**The series of micro lens and objective positioning systems MIPOS offers a travel range from 20 μm up to 500 μm in z-axis. Available for standard and inverted microscopes
More details under „z-axis-lens-positioning“ www.piezojena.com .**

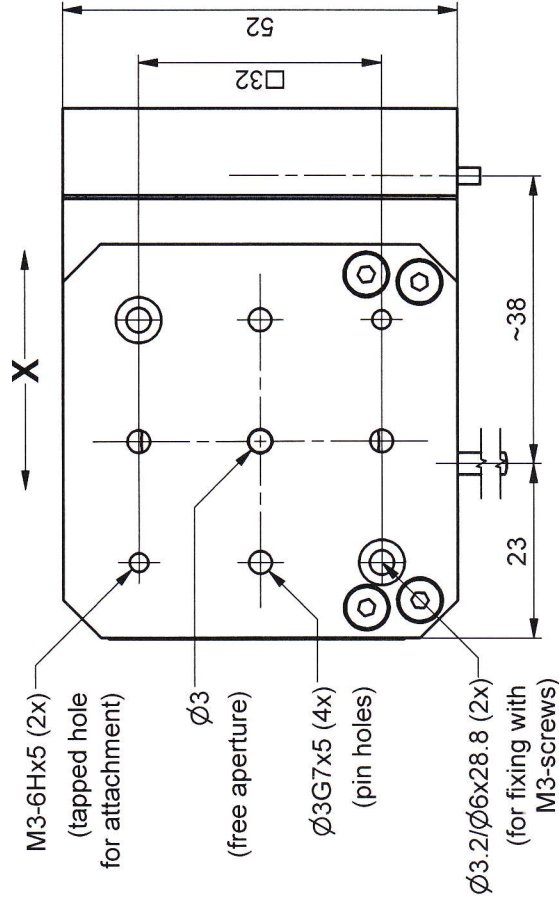
Additional microscopy stages for XY axes available under “series-PXY-AP” www.piezojena.com

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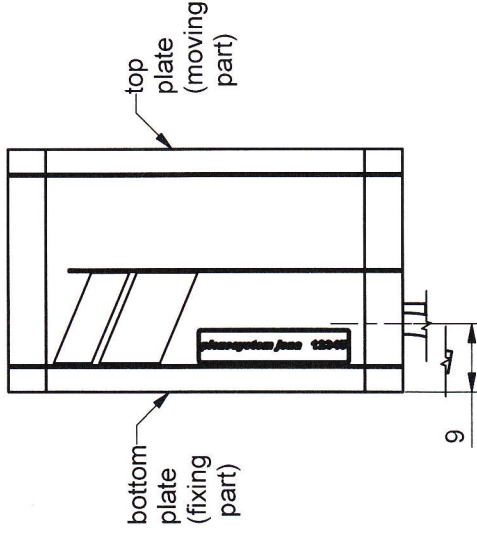
front view



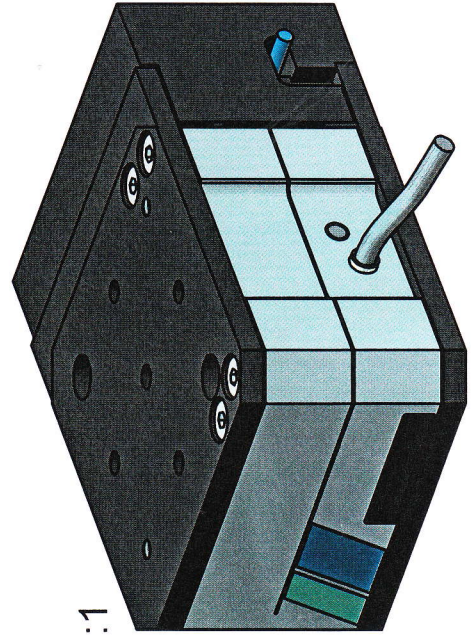
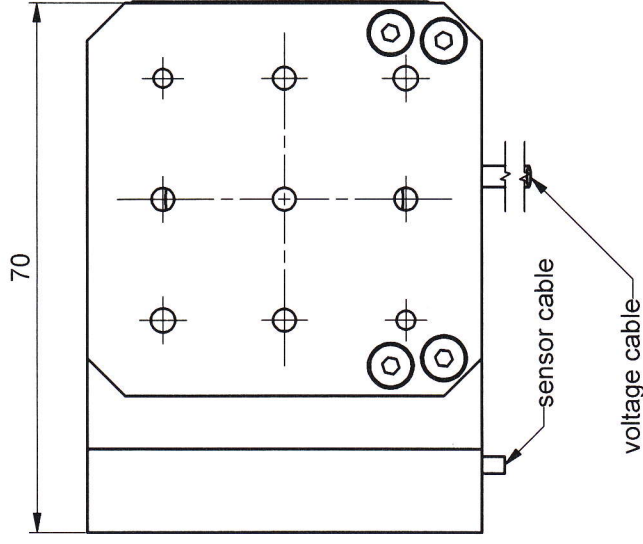
top view



side view



bottom view



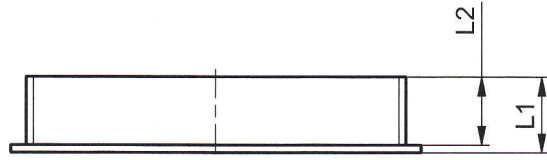
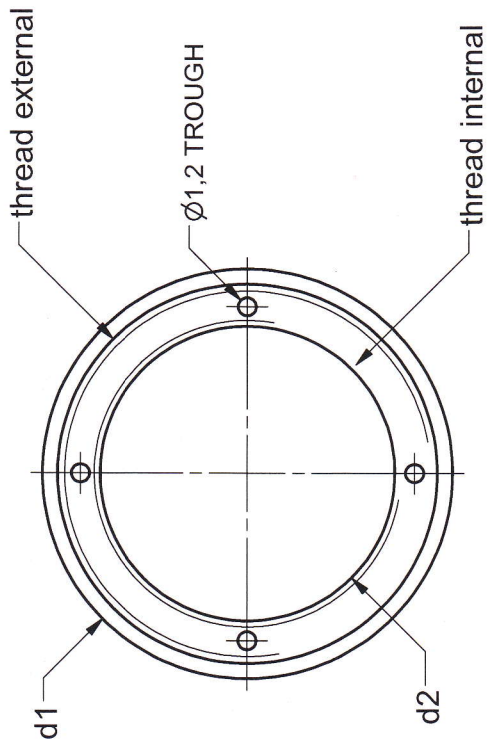
ORIGINAL

standard cable length 1.6m (EXT/DIG 2m)

| | | | |
|-----------|--|----------------|---------------|
| part.-no. | T-108-26 | part.-name | nanoX 400 CAP |
| file name | PT10826 | OK: date/sign. | 13. AUG 2011 |
| | rev.01 | scale | 1:1 |
| | customers drawing piezosystem jena | | |

unit [mm]
 pin hole tolerance ± 0.02
 tapped hole tolerance ± 0.05

options adapter thread rings for series MIPOS



| part. no. | thread external / thread internal | d1 | d2 | L1 [mm] | L2 [mm] |
|-----------|-----------------------------------|----|------|---------|---------|
| O-303-05 | M26x0.75/W0.8x1/36" (RMS) | 25 | 19,4 | 5 | 4,5 |
| O-303-06 | M26x1/W0.8x1/36" (RMS) | 28 | 19,4 | 5 | 4,5 |
| O-303-07 | M32x0.75/M25x0.75 | 35 | 24 | 5,5 | 5 |
| O-303-09 | M27x0.75/W0.8x1/36" (RMS) | 29 | 19,4 | 5 | 4,5 |
| O-303-10 | M25x0.75/W0.8x1/36" (RMS) | 27 | 19,4 | 5 | 4,5 |
| O-304-07 | M32x0.75/W0.8x1/36" (RMS) | 35 | 19,4 | 5,5 | 5 |
| O-305-07 | M32x0.75/M26x0.75 | 35 | 25 | 5,5 | 5 |
| O-306-07 | M32x0.75/M27x0.75 | 35 | 26 | 5,5 | 5 |
| O-307-07 | M32x0.75/M26x1/36" | 35 | 25 | 5,5 | 5 |

all options listed **ORIGINAL**

| | | | |
|-----------|----------|----------------|--|
| part.-no. | O-30X-YZ | part.-name | adapter thread rings MIPOS |
| file name | PO30XYZ | OK: date/sign. | 18. AUG. 2011 |
| | | scale | 1:1 |
| | | | customers drawing piezosystem jena |