

microscope objective / lens positioning system

MIPOS 20

- 20µm focusing range
- compact design
- high resonant frequency
- easy to mount on microscopes
- universal use by Flex-Adapter
- optionally feedback sensor

applications

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



fig.: MIPOS 20

| Concept | Specials | Mounting/Installation |
|--|--|---|
| <p>The systems of the MIPOS 20 series offer a nano positioning and scanning range up to 20µm in open loop operation, as well as 16µm in closed loop. They can be assembled with objectives that have a diameter of up to 35mm.</p> <p>The successful parallelogram design of <i>piezosystem jena</i> guarantees high parallel motion without influencing the optical path.</p> <p>The positioning repeatability can be guaranteed by an integrated measurement system.</p> <p>The design with integrated pre-load of the actuator offers the following advantages:</p> <ul style="list-style-type: none"> • high resonant frequency • highly parallel motion <p>Based on these features, fast scanning applications can be accurately realized with the shortest settling times.</p> | <p>Adapter thread rings for the nose piece are available separately. They allow for fast mounting and exchanging of the MIPOS system on the microscope. Other objectives no longer need to be removed.</p> <p>These Flex-Adapters are available for all standard microscopes, and allow the MIPOS 20 series to be universally applicable.</p> <p>Parfocal tube extensions for each threading type are available as an accessory.</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 MIPOS | | unit | MIPOS 20 | MIPOS 20 SG |
|-------------------------------------|------------------|------------------|-----------------|-------------|
| part no. for thread ... | M25x0.75 | - | O-383-00 | O-383-01 |
| | W0.8x1/36" (RMS) | - | O-384-00 | O-384-01 |
| | M26x0.75 | - | O-385-00 | O-385-01 |
| | M27x0.75 | - | O-386-00 | O-386-01 |
| axis | | - | z | |
| motion open loop ($\pm 10\%$)* | | μm | 20 | |
| motion closed loop ($\pm 0.2\%$)* | | μm | - | 16 |
| capacitance ($\pm 20\%$)** | | μF | 0.7 | |
| integrated measurement system | | - | - | strain gage |
| resolution open loop*** | | nm | 0.04 | |
| resolution closed loop*** | | nm | - | 1 |
| typ. repeatability | | nm | - | 5 |
| resonant frequency | | Hz | 950 | |
| additional load = 80g | | Hz | 520 | |
| additional load = 105g | | Hz | 450 | |
| additional load = 300g | | Hz | 240 | |
| stiffness | | N/ μm | 4.0 | |
| rotational error (full motion) | | μrad | <5 | |
| voltage range | | V | -20 ... +130 | |
| connector**** | voltage | - | LEMO 0S.302 | |
| | sensor | - | - | LEMO 0S.304 |
| cable length | | m | 1.0 | 1.2 |
| min. bend radius of cable | | mm | >15 | |
| material | | - | stainless steel | |
| dimensions (l x w x h) | | mm | 54 x 32 x 32.5 | |
| weight | | g | 95 | 115 |
| max. lens diameter | | mm | 35 | |
| max. lens weight | | g | 300 | |
| option for standard microscopes | | - | yes | yes |
| option for inverse microscopes | | - | no | no |

* 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.

**** 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".

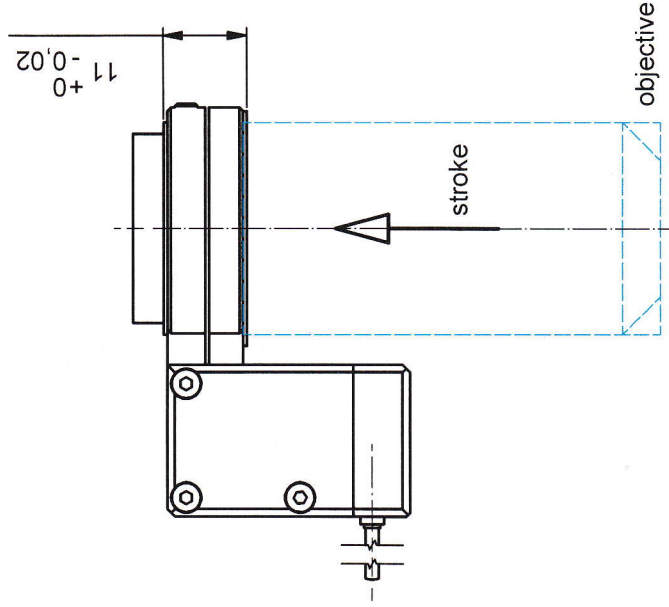
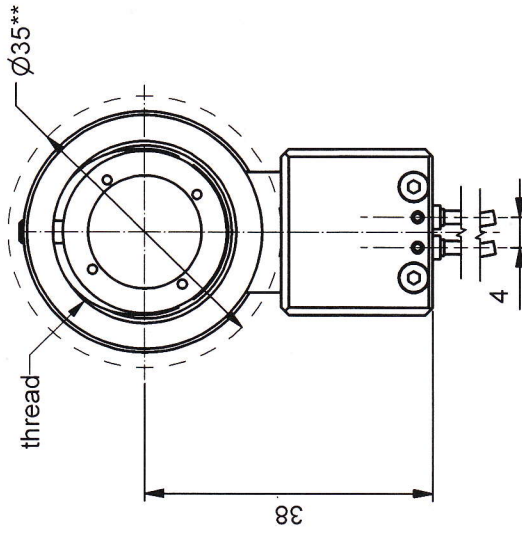
recommended configurations:

| | | |
|----------------------|--------------------|-----------|
| actuator | MIPOS 20 SG | O-383-01E |
| amplifier/controller | NV 40/1 CLE | E-101-73 |

**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 .**

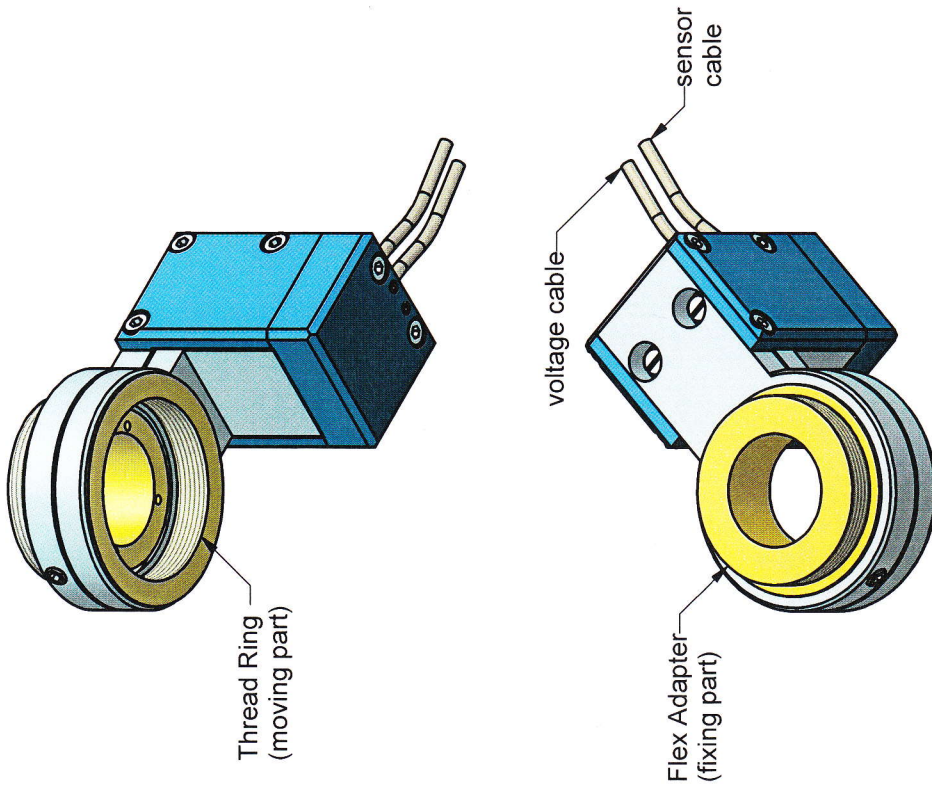
Additional microscopy stages for XY axes available under “series-PXY-AP” www.piezojena.com

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sorts of threads

| part.-no. | sorts of threads |
|-----------|------------------|
| O-383-01 | M25x0.75 |
| O-384-01 | RMS |
| O-385-01 | M26x0.75 |
| O-386-01 | M27x0.75 |
| O-387-01 | M26x1/36" |



ORIGINAL

** : max. objective-Ø 35mm
standard cable length 1,2m (EXT/DIG 2m)

drawing also valid for O-38x-00
(without sensor cable / standard cable length 1m)

| | | |
|-----------|-------------|-------------------|
| part.-no. | part.-name | OK: date/sign. |
| O-38x-01 | Mipos 20 SG | 11. AUG. 2011 |
| file name | rev.01 | customers drawing |
| PO38301 | scale | piezosystem jena |
| | 1:1 | |

accessories series MIPOS

quick objective-lens changing by FLEX-adapter

Screw the Flex-adapter into the microscope nosepiece. Put up the MIPOS onto the Flex-adapter and by fastening the screw the MIPOS is easy fixed.

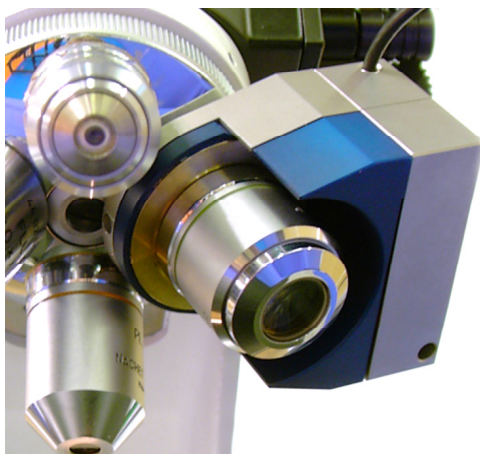
Mounting this system on the microscope is very easy. You screw the Flex-Adapter thread-ring into the microscope and mount the MIPOS on this ring with a clamping-screw.

Due to the small size, none of the other threads beside the MIPOS are blocked. The necessary screw driver and the handling instructions are included in the shipment.

Please note, the Flex-Adapter for the thread type of the MIPOS you ordered will be included in the shipment.



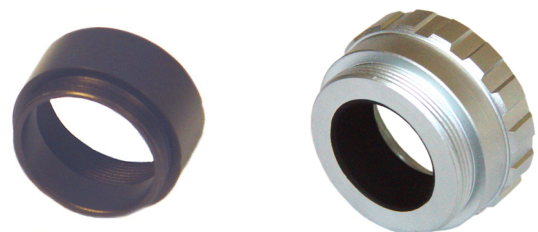
pic.: flex-adapter Art.Nr. O-30x-11
(x= thread type dependents)



pic.: MIPOS 5 mounted on a microscope

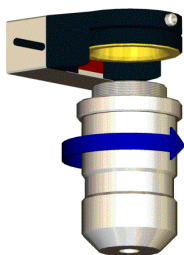
spacer ring

To eliminate the additional length by the different micro lenses caused by the MIPOS, piezosystem jena offers a wide range of spacer rings. By using the spacer ring all micro lenses working on the same level. No focus adjustment will be needed by turning the nosepiece. Spacer rings available in different threads sizes.

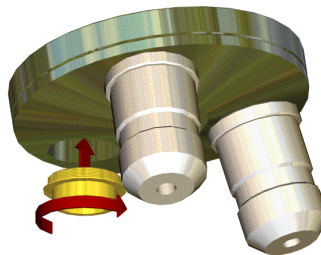


pic.: Spacer rings for micro lens
part.no. O-30x-21
(x= thread type dependents)

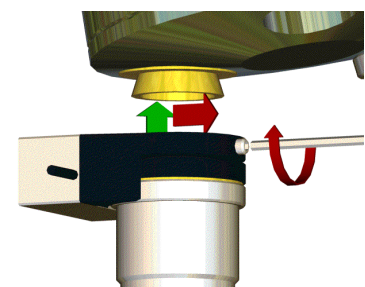
mounting instruction



1.) Screw your objective – lens into the MIPOS

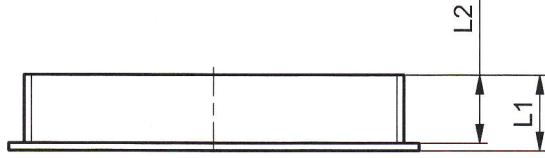
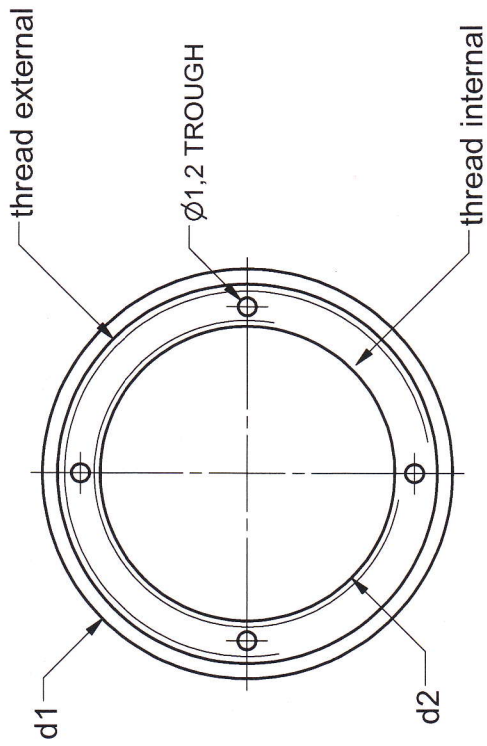


2.) Screw the Flex-Adapter in the nosepiece of your microscope



3.) Set up the MIPOS on the Flex-Adapter and fasten the screw

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 |