

## microscope objective / lens positioning system

### MIPOS 250

- 250µm focusing range
- compact design
- high resonant frequency
- easy to attach on microscopes
- flexible use by Flex-Adapter
- optionally integrated measurement system

#### applications:

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

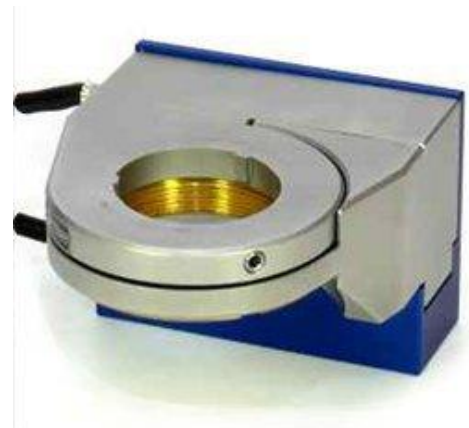


fig.: MIPOS 250

| Concept  | Specials  | Mounting/Installation   |
|--|---|---|
| <p>The systems in the MIPOS 250 series offer a nano positioning and scanning range up to 250µm in open loop operation, as well as 200µm in closed loop. They can be assembled with objectives that have up to a 40mm diameter.</p> <p>The successful parallelogram design of <b>piezosystem jena</b> 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"> <li>• high resonant frequency</li> <li>• highly parallel motion</li> <li>• upside-down version for inverted microscopes</li> </ul> <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 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"> <li>1. Screw the objective into the MIPOS</li> <li>2. Screw the Flex-Adapter into the microscope</li> <li>3. Clamp the MIPOS on the Flex-Adapter using the attachment screw</li> </ol> <p>Spacer rings to compensate the extended optical path are available and flex adapters for all common threads.</p> |

**technical datas:**

| series MIPOS                        |                  | unit            | MIPOS 250    | MIPOS 250 SG | MIPOS 250 CAP |
|-------------------------------------|------------------|-----------------|--------------|--------------|---------------|
| part no.<br>for<br>thread ...       | M25x0.75         | -               | O-370-00     | O-370-01     | O-370-06      |
|                                     | W0.8x1/36" (RMS) | -               | O-374-00     | O-374-01     | O-374-06      |
|                                     | M26x0.75         | -               | O-375-00     | O-375-01     | O-375-06      |
|                                     | M27x0.75         | -               | O-376-00     | O-376-01     | O-376-06      |
|                                     | M32x0.75         | -               | O-377-00     | O-377-01     | O-377-06      |
| axis                                | -                | z               |              |              |               |
| motion open loop ( $\pm 10\%$ )*    | $\mu\text{m}$    | 250             |              |              |               |
| motion closed loop ( $\pm 0,2\%$ )* | $\mu\text{m}$    | -               | 200          |              |               |
| capacitance ( $\pm 20\%$ )**        | $\mu\text{F}$    | 10.2            |              |              |               |
| integrated measurement system       | -                | -               | strain gage  | capacitive   |               |
| resolution open loop***             | nm               | 0.5             |              |              |               |
| resolution closed loop***           | nm               | -               | 5.0          | 1.0          |               |
| typ. repeatability                  | nm               | -               | 9            | 8            |               |
| resonant frequency                  | Hz               | 320             |              |              |               |
| additional load = 80g               | Hz               | 250             |              |              |               |
| additional load = 105g              | Hz               | 230             |              |              |               |
| additional load = 300g              | Hz               | 155             |              |              |               |
| stiffness                           | N/ $\mu\text{m}$ | 0.4             |              |              |               |
| rotational error (full motion)      | $\mu\text{rad}$  | <10             |              |              | <6            |
| voltage range                       | V                | -20...+130      |              |              |               |
| connector                           | voltage          | -               | LEMO 0S 302  |              |               |
|                                     | sensor           | -               | -            | LEMO 0S 304  | LEMO 0S.650   |
| cable length                        | m                | 1.0             | 1.2          | 1.6          |               |
| min. bend radius of cable           | mm               | >15             |              |              |               |
| material                            | -                | stainless steel |              |              |               |
| dimensions (l x w x h)              | mm               | 60.7x50x23.5    | 60.5x50x35.3 | 60.2x50x34.5 |               |
| weight                              | g                | 255             | 255          | 350          |               |
| max. lens diameter                  | mm               | 40              |              |              |               |
| max. lens weight                    | g                | 500             |              |              |               |
| option for standard microscopes     | -                | yes             | yes          | yes          |               |
| option for inverse microscopes      | -                | yes             | yes          | yes          |               |

\* typical value measured with 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".

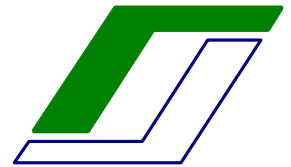
**recommended configuration:**

|                      |                     |           |
|----------------------|---------------------|-----------|
| actuator             | <b>MIPOS 250 SG</b> | O-37X-01E |
| amplifier/controller | <b>NV 40/1 CLE</b>  | E-101-73  |

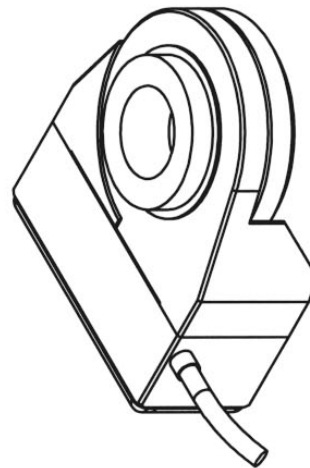
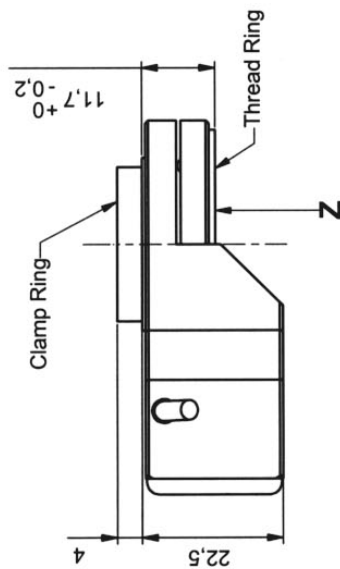
**The series of micro lens and objective positioning systems MIPOS offers a travel range from 20 $\mu\text{m}$  up to 500 $\mu\text{m}$  in z-axis. Available for standard and inverted microscopes  
 More details under „z-axis-lens-positioning“ [www.piezojena.com](http://www.piezojena.com) .**

**Additional microscopy stages for XY axes available under “series-PXY-AP” [www.piezojena.com](http://www.piezojena.com)**

Rights reserved to change specifications as progress occurs without notice!



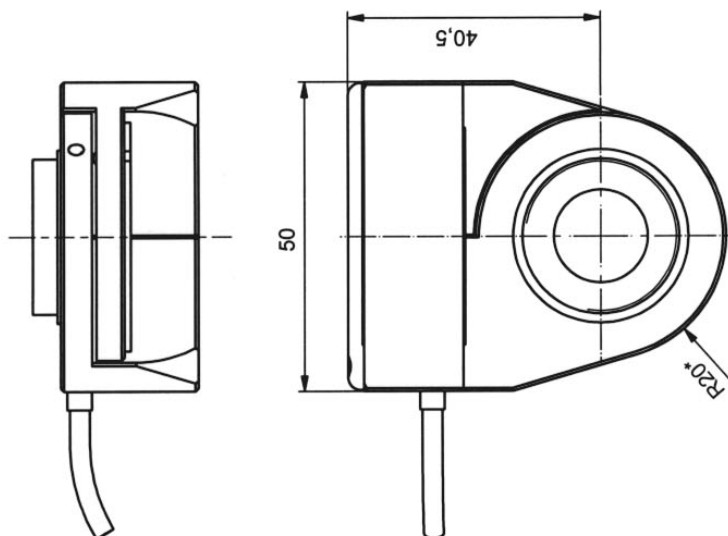
**COMPETENCE  
IN PRECISION**

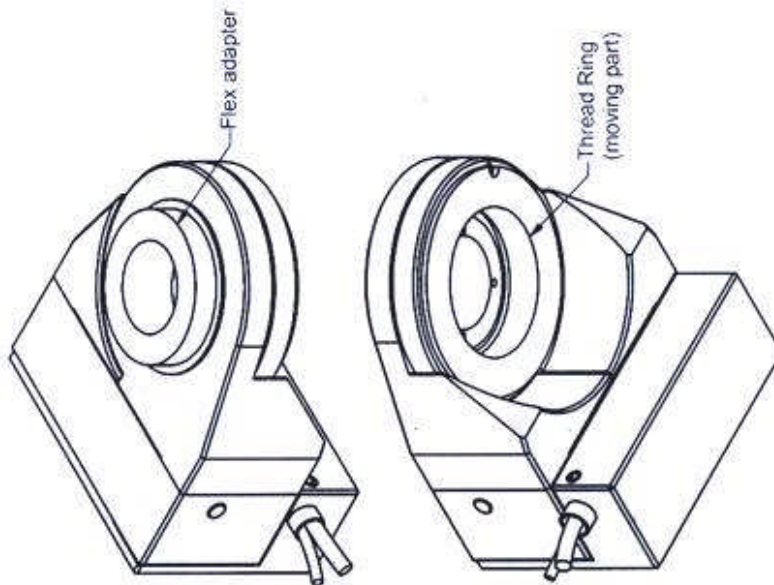


**ORIGINAL**

\*: max- Objective-φ

|           |          |                                       |                                  |
|-----------|----------|---------------------------------------|----------------------------------|
| part-no.  | O-370-00 | part-name                             | Mipos 250                        |
| file name | PO37000  | OK: date/sign.                        | 23. APR. 2004 <i>[Signature]</i> |
|           |          | Rev.                                  | 1                                |
|           |          | scale                                 | 1:1                              |
|           |          | customers drawing<br>piezosystem jena |                                  |





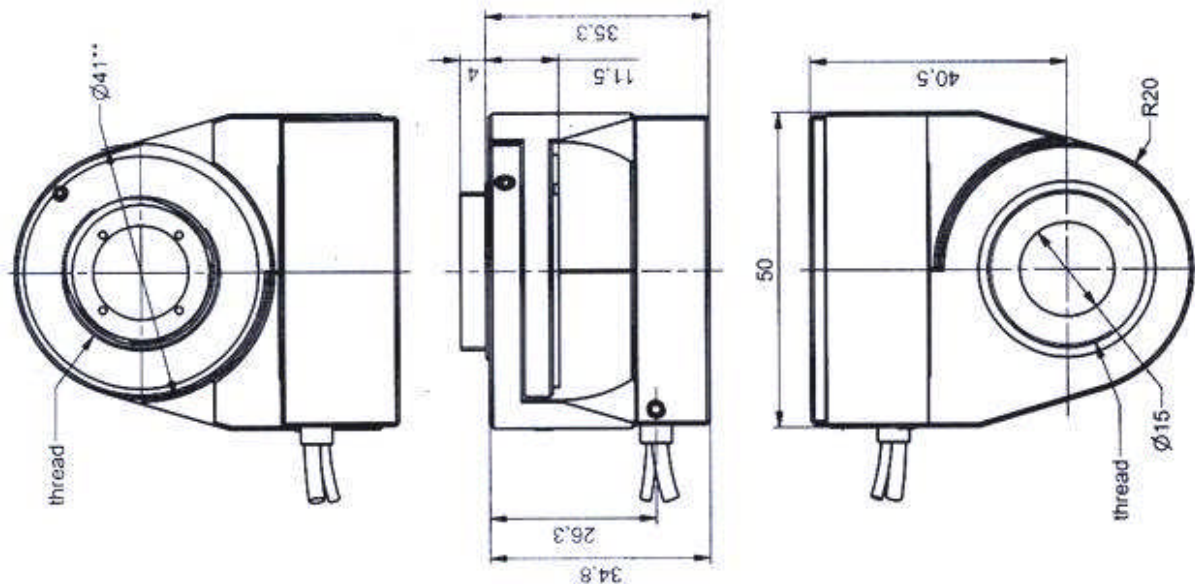
\*\*; max. objective- $\phi$  40mm  
Standard cable length 1,2m (EXT/DIG 2m)

|           |           |                   |                  |
|-----------|-----------|-------------------|------------------|
| part-no   | O-37x-xxY | part-name         | Mipos 250 SG     |
| file name | PO37001   | OK-date/sign      | 11. JAN. 2007    |
|           |           | scale             | 1:1              |
|           |           | customers drawing | piezosystem jena |

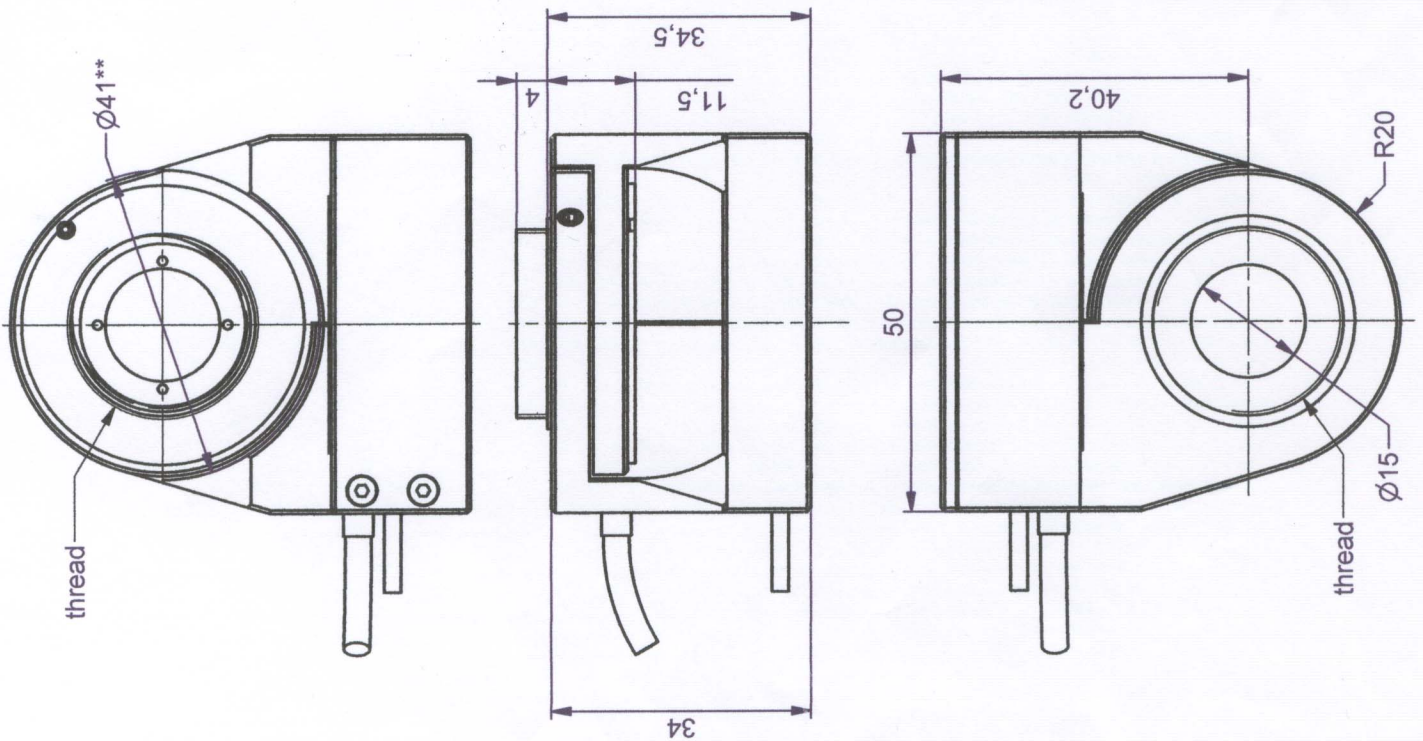
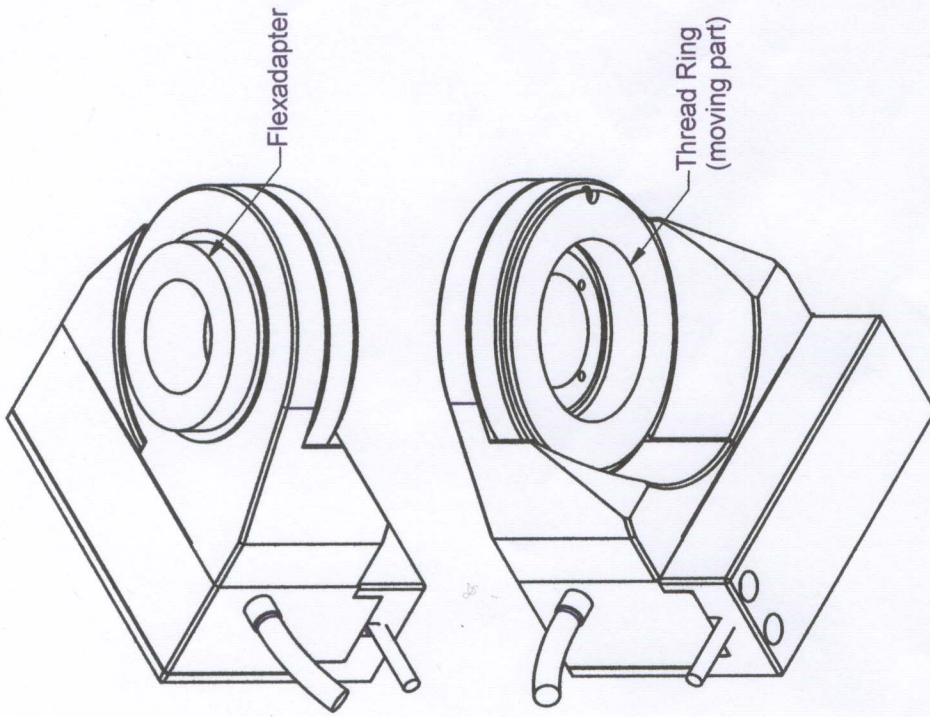
**sorts of threads**

|           |                  |
|-----------|------------------|
| part.-no. | sorts of threads |
| O-370-xxY | M25x0.75         |
| O-374-xxY | RMS              |
| O-375-xxY | M26x0.75         |
| O-376-xxY | M27x0.75         |
| O-377-xxY | M32x0.75         |
| O-378-xxY | M26x1/36"        |

**ORIGINAL**



**ORIGINAL**



\*\* : max. objective- $\varnothing$  40mm  
 Standard cable length 1,6m (EXT/DIG 2m)

REV 1:  
 > change of height from 37,5mm to 34,5mm  
 > new capacitive sensor with blue cable

part.-no. sorts of threads

|           |           |
|-----------|-----------|
| O-370-xxY | M25x0.75  |
| O-374-xxY | RMS       |
| O-375-xxY | M26x0.75  |
| O-376-xxY | M27x0.75  |
| O-377-xxY | M32x0.75  |
| O-378-xxY | M26x1/36" |

|           |           |                |                   |
|-----------|-----------|----------------|-------------------|
| part.-no. | O-37x-xxY | part.-name     | Mipos 250 CAP     |
| file name | PO37006   | OK: date/sign. | 27. NOV. 2007     |
|           | REV 1     | scale          | 1:1               |
|           |           |                | customers drawing |
|           |           |                | piezosystem jena  |

## 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.

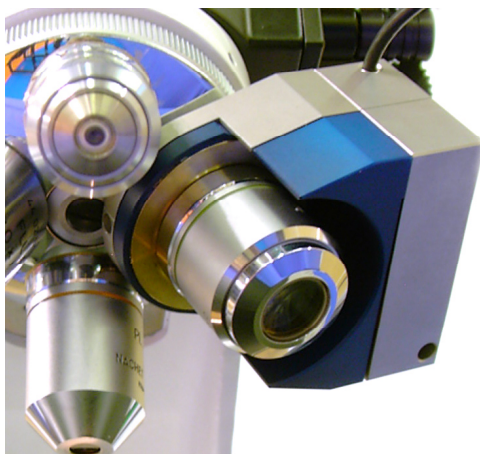
Mounting this system on the microscope is very easy. You screw the Flex-Adapter thread-ring into the microscope and mount the MIPOS on this ring with a clamping-screw.

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.



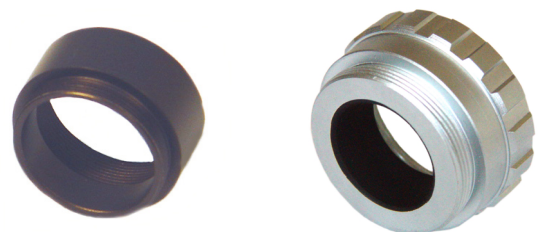
pic.: flex-adapter Art.Nr. O-30x-11  
(x= thread type dependents)



pic.: MIPOS 5 mounted on a microscope

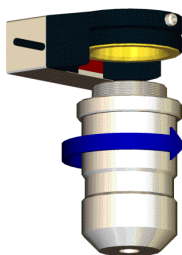
### spacer ring

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.

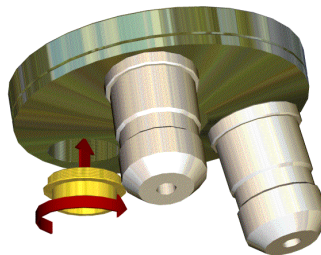


pic.: Spacer rings for micro lens  
part.no. O-30x-21  
(x= thread type dependents)

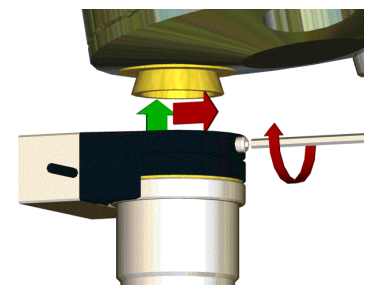
## mounting instruction



1.) Screw your objective – lens into the MIPOS

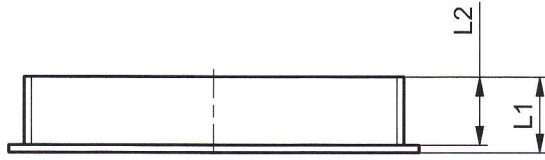
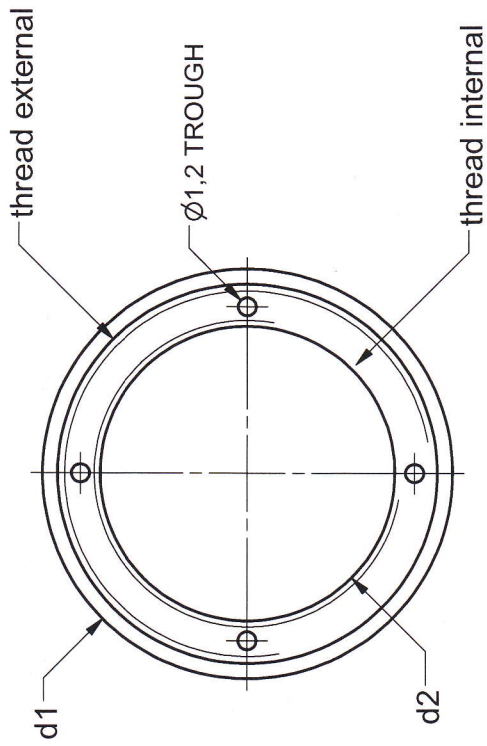


2.) Screw the Flex-Adapter in the nosepiece of your microscope



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           |