

## MIPOS 16

### *Objective Positioner/Piezo Phase Shifter for Interferometry*

#### **Concept:**

The MIPOS is specifically designed for high precision positioning of optical systems with accuracy in the sub-nanometer range. The high resolution and fast response time of the MIPOS 16 offer new possibilities, especially for white light interferometers.

Based on its unique design, which includes an aperture up to 104 mm and a stage height of down to 42 mm, the MIPOS 16 offers technical specifications that match the requirements for white light interferometry. White light interferometry has become one of the most effective 3D surface measurement methods. Piezoelectric actuators are able to significantly improve accuracy and speed due to their virtually unlimited resolution and fast response time. The MIPOS 16 can achieve a focus range of up to 16  $\mu\text{m}$  and a single step resolution of less than 0.1 nm, while operating in a voltage range between – 20 and 130 V.

The MIPOS 16 is made for integration into metrology set-ups and devices. The robust drive is equipped with a high resolution piezo based actuating system. The internal mechanical pre-load design enables the MIPOS to operate in highly dynamic environments while reducing the settling time down to microseconds.

#### **Specials:**

A key feature is the high load capability of 3 kg (7 lbs). Optical setups and components can be moved either horizontally or vertically without affecting accuracy and speed.

#### **Interfaces:**

The MIPOS 16 can be easily controlled by i.e. an analog low voltage signal. Therefore, piezosystem jena provides a variety of compatible controllers.



Image: MIPOS 16-158

#### *Product highlights:*

- 16  $\mu\text{m}$  adjustment range (open loop)
- large aperture
- high stiffness for lowest settling times
- typ. step resolution 0.04 nm
- additional load of up to 3 kg
- for 4" and 6" objectives (others upon request)
- horizontal installation recommended

#### *Applications:*

- metrology
- white light interferometry
- probe alignment
- surface scanning processes
- phase shifting

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### Technical data:

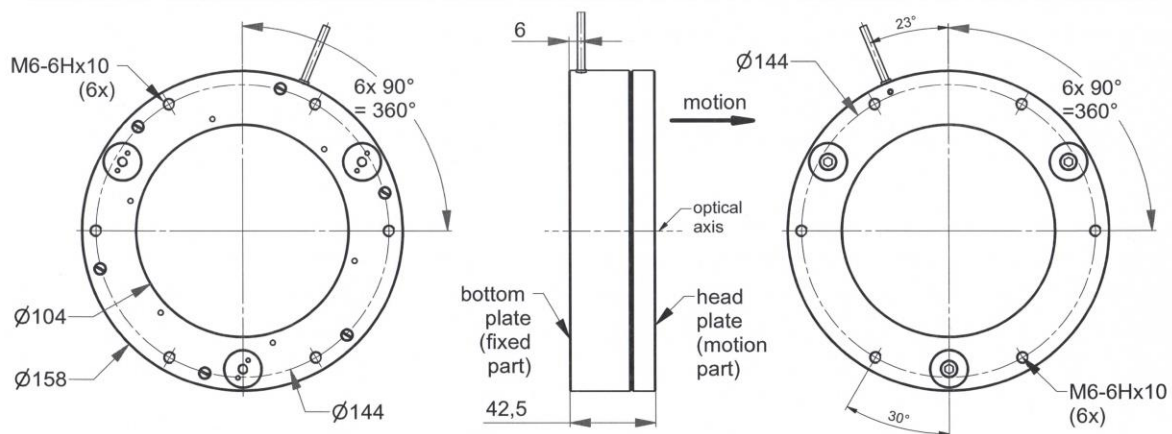
|                                                     | unit                    | MIPOS 16-158                | MIPOS 16 M85               |
|-----------------------------------------------------|-------------------------|-----------------------------|----------------------------|
| <b>part no.</b>                                     | -                       | O-309-50                    | O-309-10                   |
| <b>axis</b>                                         | -                       | Z                           | Z                          |
| <b>motion in open loop (<math>\pm 10\%</math>)*</b> | $\mu\text{m}$           | 16                          | 16                         |
| <b>capacitance (<math>\pm 20\%</math>)**</b>        | $\mu\text{F}$           | 5.4                         | 5.4                        |
| <b>integrated measurement system</b>                | -                       | none                        | none                       |
| <b>resolution open loop***</b>                      | nm                      | 0.04                        | 0.04                       |
| <b>resonant frequency</b>                           | <b>unloaded</b>         | Hz                          | 823                        |
|                                                     | <b>with load: 3000g</b> | Hz                          | 247                        |
| <b>stiffness</b>                                    | N/ $\mu\text{m}$        | 8.2                         |                            |
| <b>max. load</b>                                    | kg                      | 3 (horizontal)              |                            |
| <b>rotational error (full motion) [roll]</b>        | $\mu\text{rad}$         | < 8                         | < 8                        |
| <b>voltage range</b>                                | V                       | -20...+130                  |                            |
| <b>connector (voltage signal)</b>                   | -                       | LEMO 0S.302                 |                            |
| <b>cable length</b>                                 | m                       | 1.0                         |                            |
| <b>material</b>                                     | -                       | aluminium                   |                            |
| <b>dimensions (diameterxheight)</b>                 | mm                      | $\varnothing 158 \times 42$ | $\varnothing 93 \times 50$ |
| <b>central aperture</b>                             | mm                      | $\varnothing 104$           | $\varnothing 61$           |
| <b>weight</b>                                       | g                       | 1240                        | 300                        |

\* typical value measured with NV40/3 amplifier

\*\* typical value for small electric field strength

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

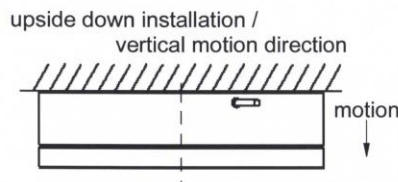
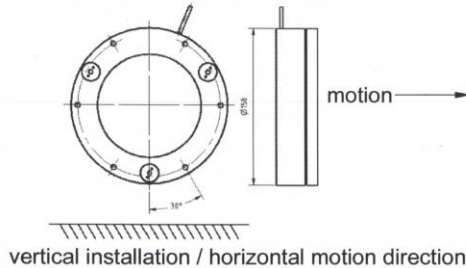
### Technical drawing MIPOS 16-158:



## MIPOS 16

### Technical information for installation and integration:

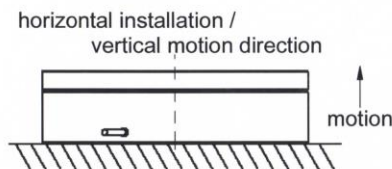
#### position of installation / identification motion direction



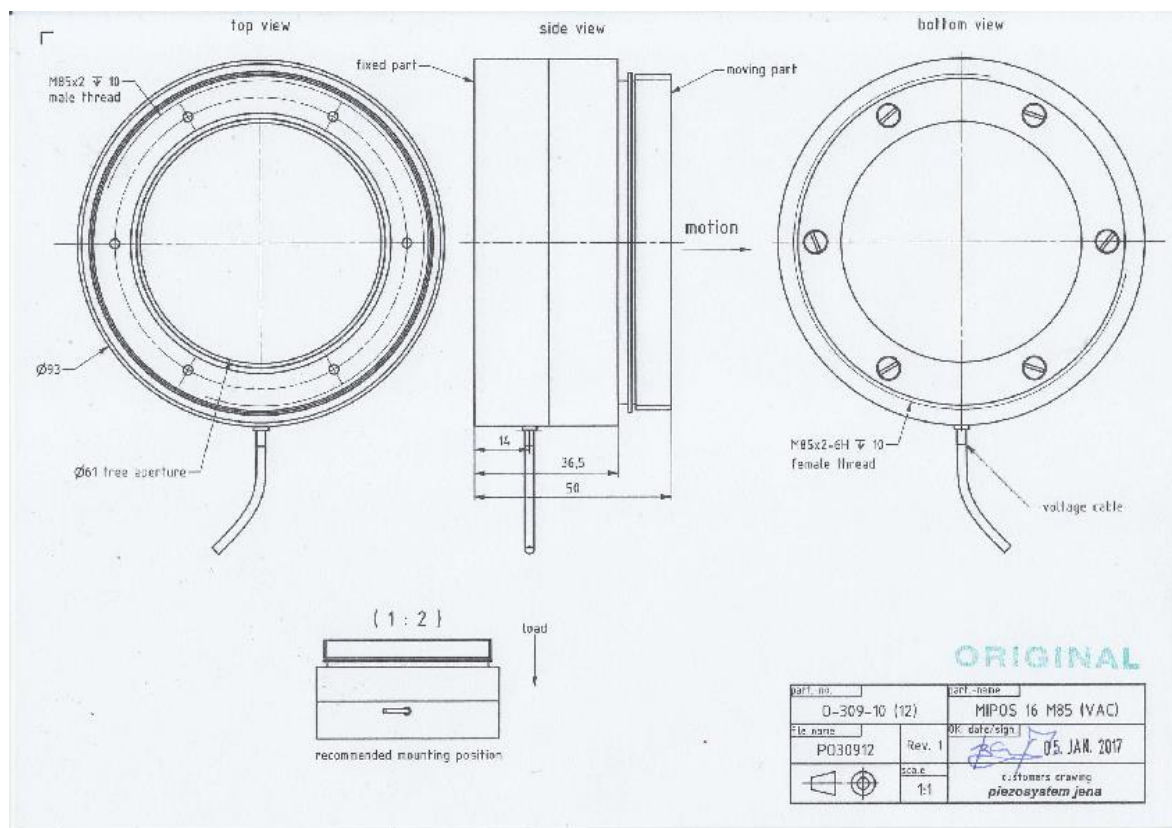
#### maximum payload for position of installation

- vertical 3kg with 150mm distance to motion plate  
4kg mounted directly on motion plate
- horizontal 5kg mounted directly on motion plate
- upside down 2kg mounted directly on motion plate

**center of mass must be aligned to the optical axis!**



### Technical drawing MIPOS 16 M85:



All MIPOS 16 models are available as vacuum versions and with different threading.

Rights reserved to change specifications as progress occurs without notice!

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