



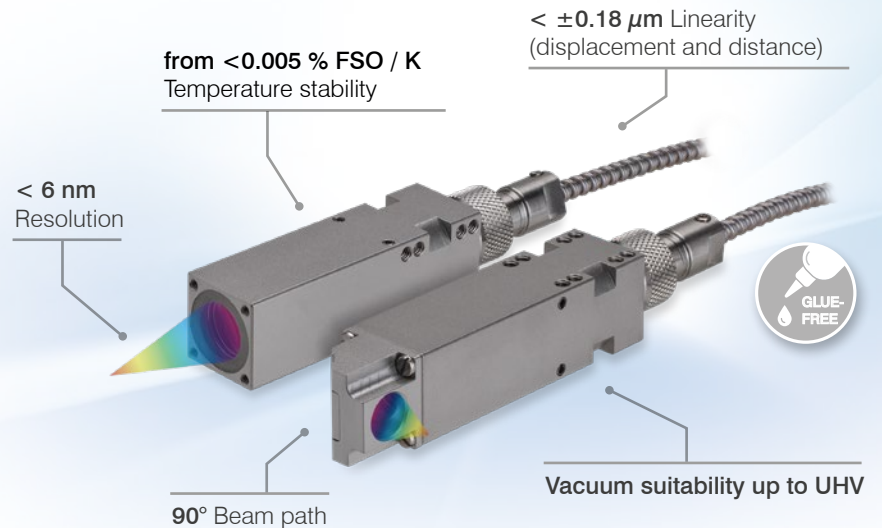
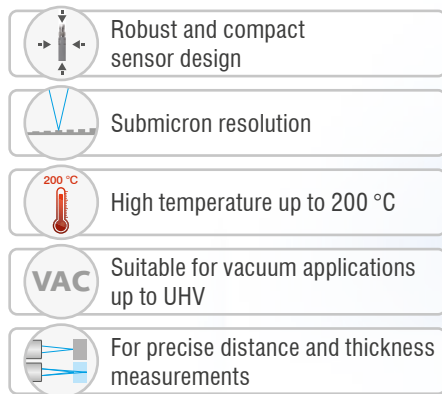
# More Precision

**confocalDT IFS2407-xHT/VAC** // Confocal high temperature sensors



# Confocal high temperature sensors for environments up to 200 °C

## confocalDT 2407-xHT/VAC



### Next generation:

#### Compact, vacuum-compatible and thermally stable up to 200 °C

The new confocal chromatic sensors set benchmarks for distance and thickness measurements in challenging environments. For the first time, the Micro-Epsilon portfolio includes optical sensors that can withstand temperatures up to 200 °C – with maximum measurement accuracy.

Thanks to their compact design, these sensors are ideal for applications with very limited installation space. The innovative HT models are available in various measuring ranges and with a 90° beam path, and can be flexibly adapted to different installation situations.

By dispensing with organic adhesives, the high-temperature sensors made of stainless steel are low outgassing and therefore ideally suited for use up to ultra-high vacuum (UHV) – the ideal choice for measurement tasks in precision machine building and the semiconductor industry.

### Maximum compatibility

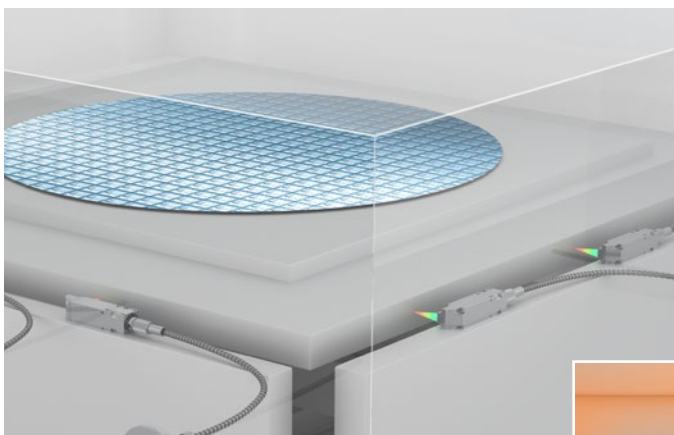
All confocalDT sensors are compatible with the IFC controllers. This enables measuring rates up to 30 kHz for fast and reliable process monitoring.

### Various application possibilities

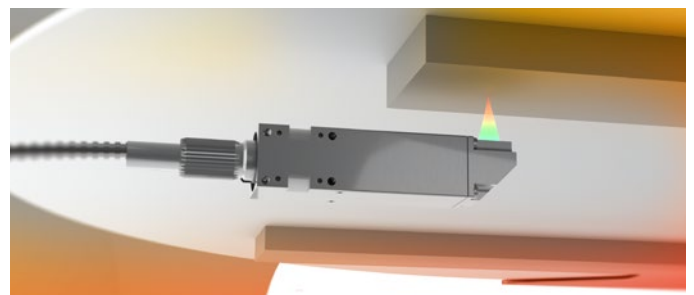
Versatile designs enable the use in different industries such as the electronics and semiconductor industries, glass industry, medical technology and machine building.

### Innovative technology

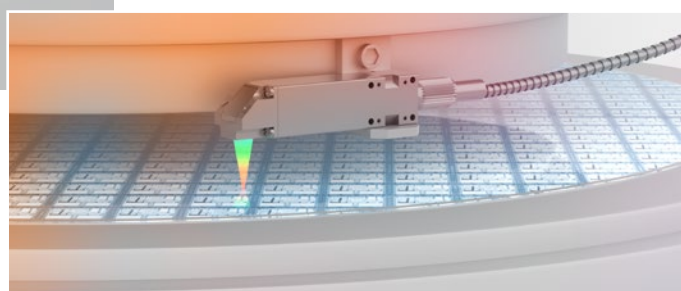
Their innovative technology enables these sensors to measure also on diffuse and strongly reflecting surfaces with highest reliability even under extremely challenging ambient conditions. The passive design of the confocalDT sensors avoids heat radiation into the environment. For vacuum applications, specially developed accessories are available.



Accurate position detection of wafer tables in vacuum



Measurement of the arm height position in vacuum



Compact 90° sensors, e.g., for wafer warpage measurements

| Model                                  |                           | IFS2407-0,8HT/VAC                                                                                                                               | IFS2407-2HT/VAC  | IFS2407/90-2HT/VAC  | IFS2407-4HT/VAC | IFS2407/90-4HT/VAC  |
|----------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------------|---------------------|
| Measuring range                        |                           | 0.8 mm                                                                                                                                          | 2 mm             |                     | 4 mm            |                     |
| Start of measuring range               | approx.                   | 5.85 mm                                                                                                                                         | 14.5 mm          | 8 mm <sup>[1]</sup> | 14.5 mm         | 8 mm <sup>[1]</sup> |
| Resolution                             | Static <sup>[2]</sup>     | < 6 nm                                                                                                                                          | < 10 nm          |                     | < 24 nm         |                     |
|                                        | Dynamic <sup>[3]</sup>    | < 45 nm                                                                                                                                         | < 90 nm          |                     | < 180 nm        |                     |
| Linearity <sup>[4]</sup>               | Displacement and distance | < ±0.18 μm                                                                                                                                      | < ±0.44 μm       |                     | < ±0.8 μm       |                     |
|                                        | Thickness                 | < ±0.36 μm                                                                                                                                      | < ±0.88 μm       |                     | < ±1.6 μm       |                     |
| Temperature stability <sup>[5]</sup>   |                           | <0.015 % FSO / K                                                                                                                                | <0.005 % FSO / K |                     | <0.01 % FSO / K |                     |
| Light spot diameter                    |                           | 11 μm                                                                                                                                           | 19 μm            |                     | 29 μm           |                     |
| Maximum measuring angle <sup>[6]</sup> |                           | ±30°                                                                                                                                            | ±12°             |                     | ±8°             |                     |
| Numerical aperture (NA)                |                           | 0.50                                                                                                                                            | 0.28             |                     | 0.19            |                     |
| Min. target thickness <sup>[7]</sup>   |                           | 0.04 mm                                                                                                                                         | 0.1 mm           |                     | 0.2 mm          |                     |
| Target material                        |                           | reflective, diffuse as well as transparent surfaces (e.g. glass)                                                                                |                  |                     |                 |                     |
| Connection                             |                           | pluggable optical fiber via FC socket, type C2404;<br>standard length 2 m; extension up to 50 m;<br>bending radius: static 30 mm, dynamic 40 mm |                  |                     |                 |                     |
| Mounting                               |                           | Clamping / screw connection via four mounting holes M2x0.4                                                                                      |                  |                     |                 |                     |
| Temperature range                      | Storage                   | -20 ... +200 °C                                                                                                                                 |                  |                     |                 |                     |
|                                        | Operation                 | +5 ... +200 °C                                                                                                                                  |                  |                     |                 |                     |
| Shock (DIN EN 60068-2-27)              |                           | 15 g / 6 ms in XY axis, 1000 shocks each                                                                                                        |                  |                     |                 |                     |
| Vibration (DIN EN 60068-2-6)           |                           | 2 g/ 20 ... 500 Hz in XY axis, 10 cycles each                                                                                                   |                  |                     |                 |                     |
| Protection class (DIN EN 60529)        |                           | IP40 (vacuum compatible)                                                                                                                        |                  |                     |                 |                     |
| Material                               |                           | Stainless steel housing, glass lenses                                                                                                           |                  |                     |                 |                     |
| Weight <sup>[8]</sup>                  |                           | approx. 40 g                                                                                                                                    | approx. 40 g     | approx. 50 g        | approx. 40 g    | approx. 50 g        |

<sup>[1]</sup> Start of measuring range measured from sensor axis

<sup>[2]</sup> Average from 2048 values at 1 kHz, in the mid of the measuring range onto optical flat

<sup>[3]</sup> RMS noise relates to mid of measuring range (1 kHz)

<sup>[4]</sup> All data at constant ambient temperature (25  $\pm$  1 °C). Measurement on plane-parallel test glass. Acceptance report is enclosed with delivery

<sup>[5]</sup> Depending on the clamping position of the sensor

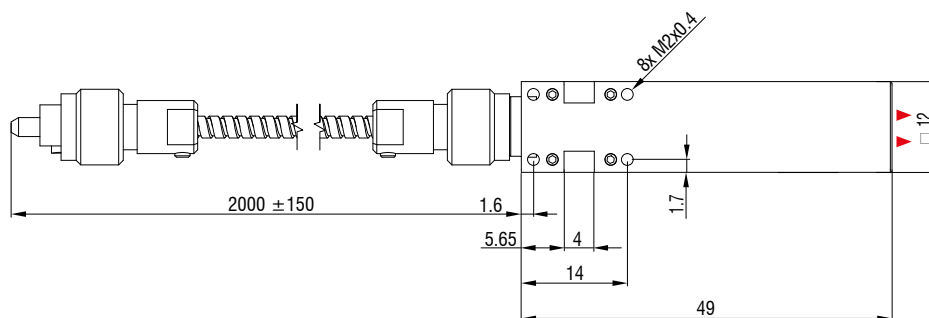
<sup>[6]</sup> Maximum sensor measuring angle up to which a usable signal can be achieved on reflective surfaces, with accuracy decreasing toward the limit values

<sup>[7]</sup> Glass sheet with refractive index  $n = 1.5$  throughout the entire measuring range. In the mid of the measuring range, also thinner layers can be measured.

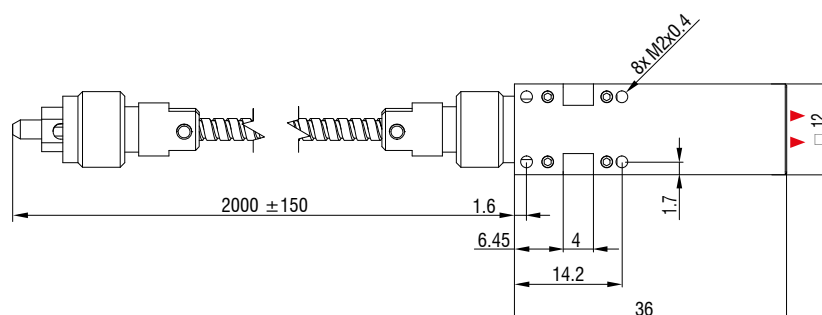
<sup>[8]</sup> Sensor weight without optical fiber

## Dimensions

### IFS2407-0,8HT/VAC

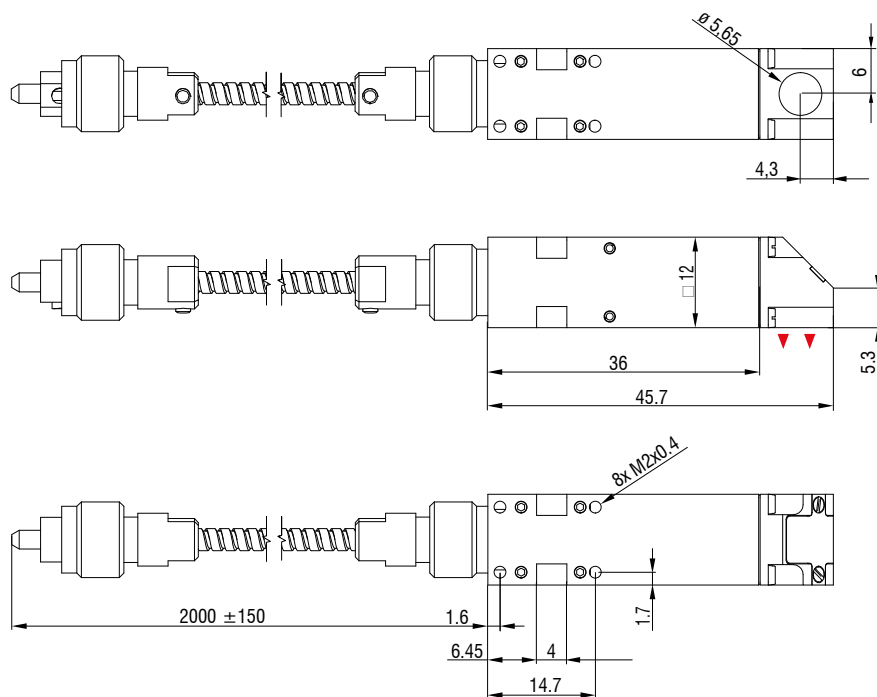


### IFS2407-2HT/VAC

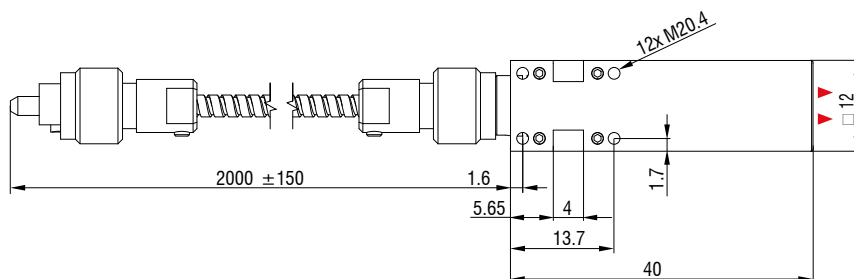


# Dimensions

## IFS2407/90-2HT/VAC



## IFS2407-4HT/VAC



## IFS2407/90-4HT/VAC

