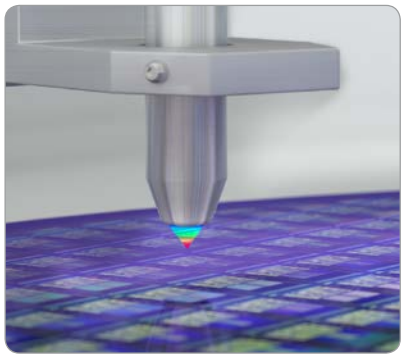
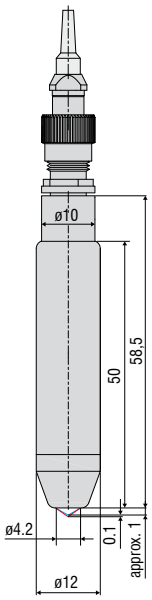
MICRO-EPSILON

# More Precision

## confocalDT // Confocal chromatic measuring system

- Compact sensor design ø12 mm
- Submicrometer resolution
- One-sided thickness measurement
- Distance measurement
- Extremely small spot size
- Large tilt angle

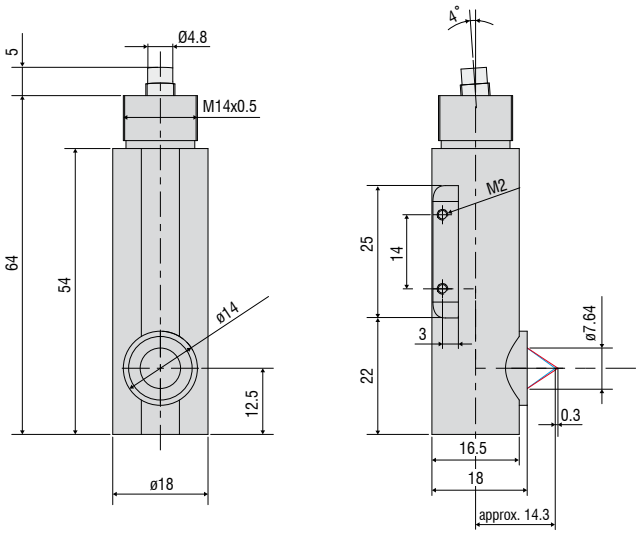





Dimensions in mm, not to scale

| Model | | IFS2407-0.1 | IFS2407-0.1(001) |
|---|---|---|---|
| Measuring range | | 0.1 mm | |
| Start of measuring range | approx. | 1 mm | |
| Resolution [1] | | 3 nm | |
| Linearity [2] | Displacement and distance | < ± 0.05 µm | |
| | Thickness | < ± 0.1 µm | |
| Light spot diameter | | 3 µm | 4 µm |
| Max. tilt angle [3] | | ± 48° | |
| Numerical aperture | | 0.8 | 0.7 |
| Connection | | pluggable optical fiber via FC socket, standard length 3 m; extension up to 50 m; bending radius: static 30 mm; dynamic 40 mm | |
| Mounting | | Mounting holes (2x M2) | |
| Temperature range | Storage | -20 … +70 °C | |
| | Operation | +5 … +70 °C | |
| Shock (DIN-EN 60068-2-29) | | 15 g / 6 ms in XY axes / 1000 shocks per axis | |
| Vibration (DIN-EN 60068-2-6) | | 2 g / 20 Hz … 500 Hz in XY axes / 10 cycles per axis | |
| Protection class (DIN-EN 60529) | | IP65, front operated | |
| Material | | stainless steel housing, glass lenses | |
| Weight | | 36 g | |
| Special feature | | high numerical aperture | light-intensive model |

[1] Average from 512 values at 1 kHz, near to the midrange onto optical flat
[2] All data at constant ambient temperature (25±1 °C) against optical flat; specifications can change when measuring different materials.
[3] Maximum sensor tilt angle that produces a usable signal on reflecting surfaces. The accuracy decreases when approaching the limit values.




Dimensions in mm, not to scale

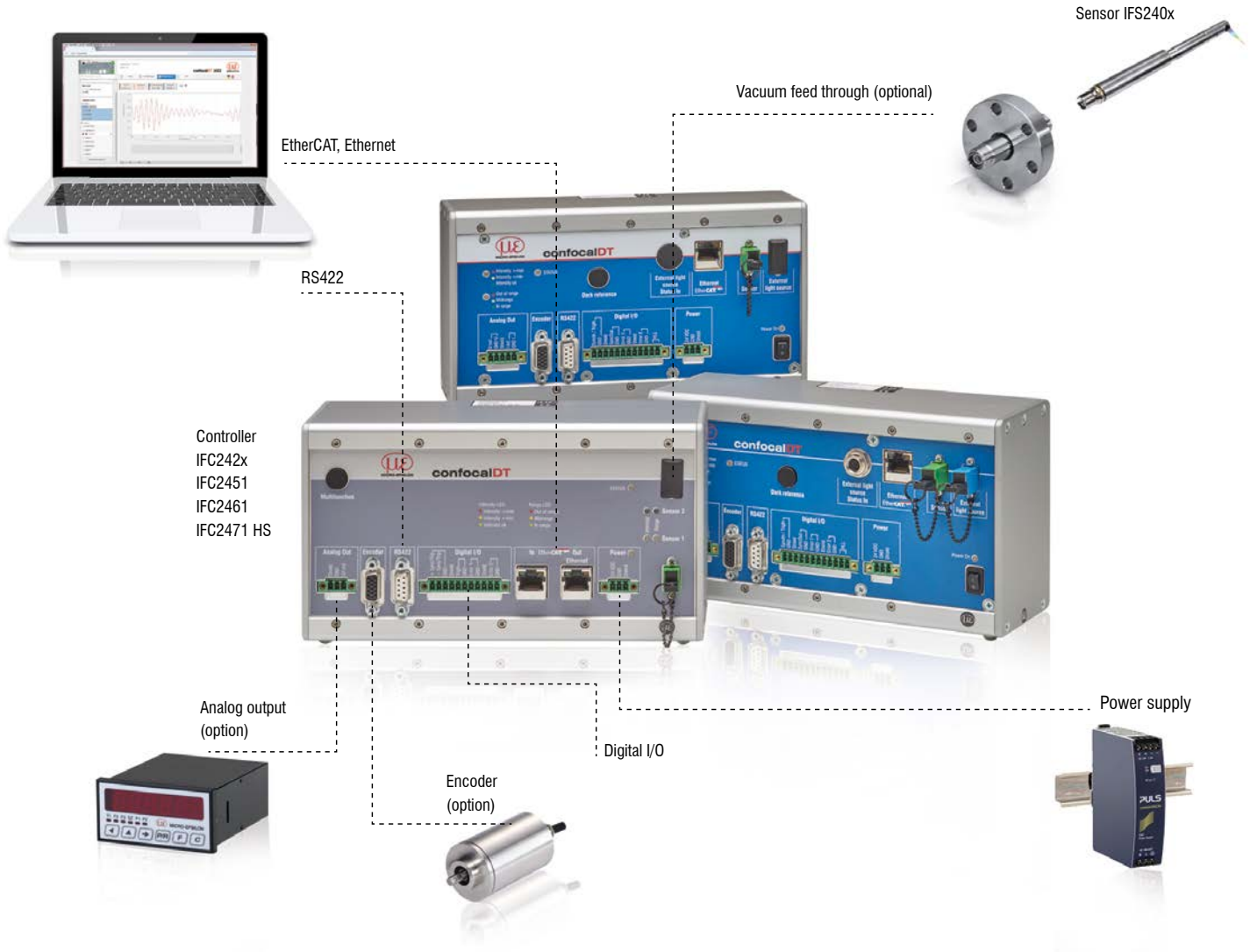
| Model | | IFS2407/90-0,3 |
|---|---|---|
| Measuring range | | 0.3 mm |
| Start of measuring range | approx. | 14.3 mm [4] |
| Resolution [1] | | 10 nm |
| Linearity [2] | Displacement and distance | < ± 0.15 µm |
| | Thickness | < ± 0.3 µm |
| Light spot diameter | | 6 µm |
| Max. tilt angle [3] | | ± 27° |
| Numerical aperture | | 0.5 |
| Connection | | pluggable optical fiber via FC socket, type C2407-x; standard length 3 m; extension up to 50 m; bending radius: static 30 mm; dynamic 40 mm |
| Mounting | | Mounting holes (2x M2) |
| Temperature range | Storage | -20…+70 °C |
| | Operation | +5…+70 °C |
| Shock (DIN-EN 60068-2-29) | | 15 g / 6 ms in XY axes / 1000 shocks per axis |
| Vibration (DIN-EN 60068-2-6) | | 2 g / 20 Hz … 500 Hz in XY axes / 10 cycles per axis |
| Protection class (DIN-EN 60529) | | IP65, front operated |
| Material | | Aluminum housing, glass lenses |
| Weight | | 30 g |

[1] Average from 512 values at 1 kHz, near to the midrange onto optical flat
[2] All data at constant ambient temperature (25±1 °C) against optical flat; specifications can change when measuring different materials.
[3] Maximum sensor tilt angle that produces a usable signal on reflecting surfaces. The accuracy decreases when approaching the limit values.
[4] Start of measuring range measured from sensor axis.

## System design

**The confocalDT system consists of:**

- Sensor IFS240x
- Controller IFC24xx
- Fiber optic cable C24xx



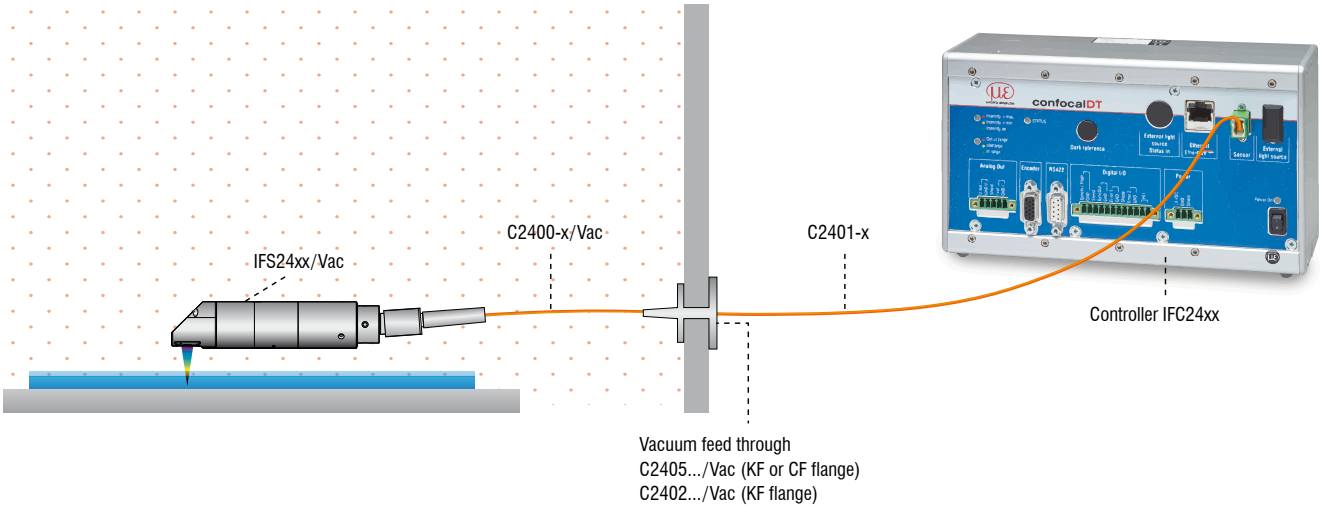
**Customer-specific modifications**

Application examples are often found where the standard versions of the sensors and the controllers are performing at their limits. To facilitate such special tasks it is possible to customize the sensor design and to adjust the controller accordingly. Common requests for modifications include changes in design, mounting options, customized cable lengths and modified measuring ranges.

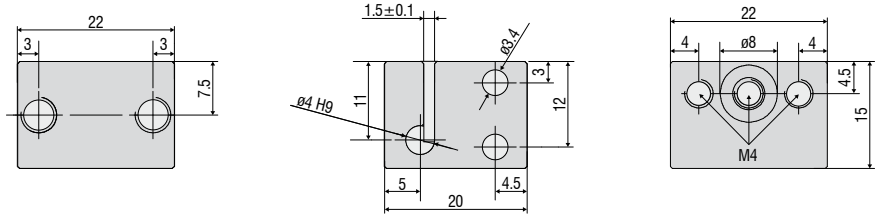
**Possible modifications**

- Sensors with connector
- Cable length
- Vacuum suitability up to UHV
- Specific lengths
- Customer-specific mounting options
- Optical filter for ambient light compensation
- Housing material
- Measuring range / Offset distance

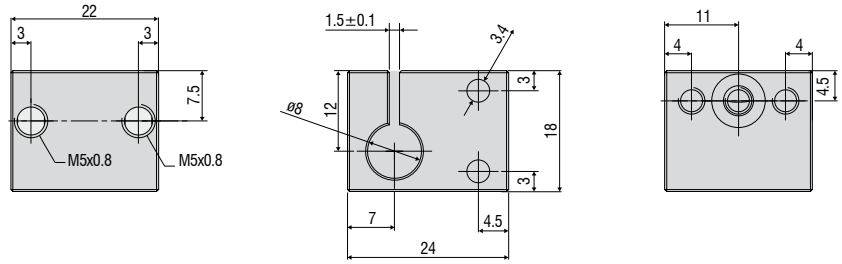
## Vacuum setup



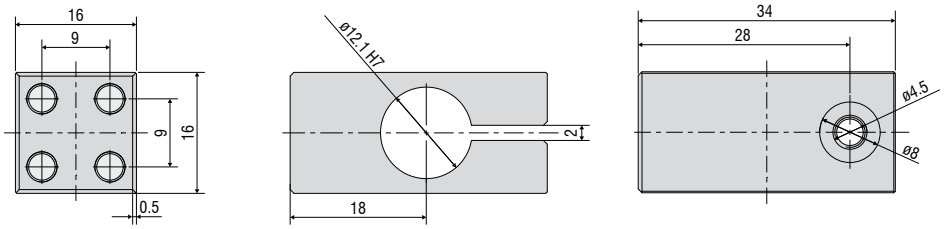
**Accessories: mounting adapter**
MA2402 for sensors 2402




**Accessories: mounting adapter**
MA2403 for sensors 2403

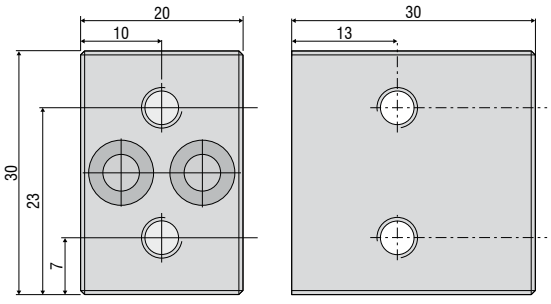



**Accessories: mounting adapter**
MA2404-12 for sensors IFS2404-2

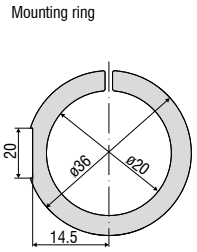



**Accessories: mounting adapter**
MA2400 for sensors IFS2405/IFS2406 (consisting of a mounting block and a mounting ring)

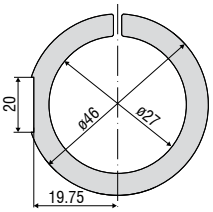
Mounting block



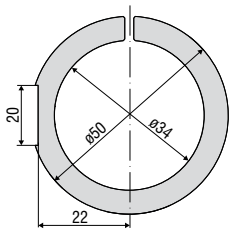

Mounting ring



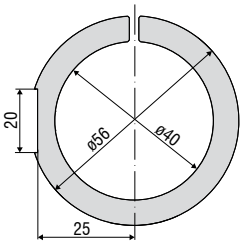

MA 2406-20
for sensors
IFS2406



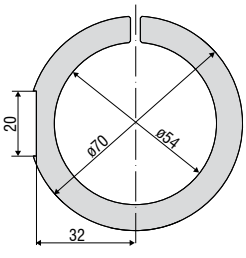

MA 2400-27
for sensors
IFS2405-0,3 / -1



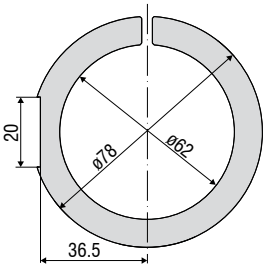

MA 2405-34
for sensors
IFS2405-3




MA 2405-40
for sensors
IFS 2405-6




MA 2405-54
for sensors
IFS2405-10




MA 2405-62
for sensors
IFS2405-28 / IFS2405-30

## Accessories

### Software

| | |
|---|---|
| IFD24n1-Tool | Free demo software tool included |

### Accessories light source

| | |
|---|---|
| IFL2422/LE | Lamp module for IFC2422 |
| IFL24x1/LED | Lamp module for IFC24x1 |
| IFL2451/LED(003) | Lamp module for IFC2451(003) |

### Cable extension for sensors

| | |
|---|---|
| CE2402 | Cable with 2x E2000/APC connectors |
| CE2402-x | Extension for optical fiber (3 m, 10 m,13 m, 30 m, 50 m) |
| CE2402-x/PT | Extension for optical fiber with protection tube for mechanical stress (3 m, 10 m, customer-specific length up to 50 m) |

### Cable for IFS2404 sensors

| | |
|---|---|
| C2404-x (01) | Optical fiber core diameter 20 µm (2 m) |

### Cables for IFS2405/IFS2406/2407-0,1 sensors

| | |
|---|---|
| C2401 | Cable with FC/APC and E2000/APC connectors |
| C2401-x | Optical fiber (3 m, 5 m, 10 m, customer-specific length up to 50 m) |
| C2401/PT-x | Optical fiber with protection tube for mechanical stress (3 m, 5 m, 10 m, customer-specific length up to 50 m) |
| C2401-x (01) | Optical fiber core diameter 26 µm (3 m, 5 m, 15 m) |
| C2401-x(10) | Drag-chain suitable optical fiber (3 m, 5 m, 10 m) |
| C2400 | Cable with 2x FC/APC connectors |
| C2400-x | Optical fiber (3 m, 5 m, 10 m, customer-specific length up to 50 m) |
| C2400/PT-x | Optical fiber with protection tube for mechanical stress (3 m, 5 m, 10 m, customer-specific length up to 50 m) |
| C2400/PT-x-Vac | Optical fiber with protection tube suitable for use in vacuum (3 m, 5 m, 10 m, customer-specific length up to 50 m) |

### Cable for IFS2407/90-0,3 sensors

| | |
|---|---|
| C2407-x | Optical fiber with DIN connector and E2000/APC (2 m, 5 m) |

### Vacuum feed through

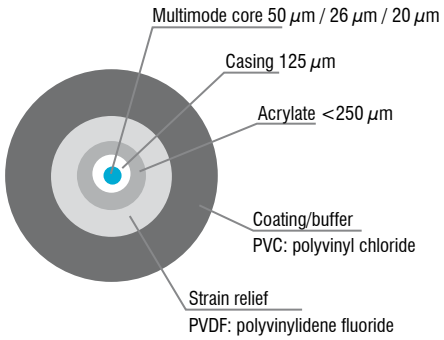
| | |
|---|---|
| C2402/Vac/KF16 | Vacuum feed through with optical fiber, 1 channel, vacuum side FC/APC non-vacuum side E2000/APC, clamping flange KF 16 |
| C2405/Vac/1/KF16 | Vacuum feed through on both sides FC/APC socket, 1 channel, clamping flange type KF 16 |
| C2405/Vac/1/CF16 | Vacuum feed through on both sides FC/APC socket, 1 channel, flange type CF 16 |
| C2405/Vac/6/CF63 | Vacuum feed through FC/APC socket, 6 channels, flange type CF 63 |

### Other accessories

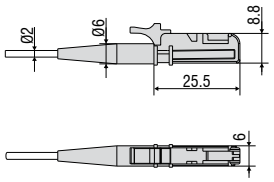
| | |
|---|---|
| SC2471-x/USB/IND | Connector cable IFC2451/61/71, 3 m, 10 m, 20 m |
| SC2471-x/IF2008 | Connector cable IFC2451/61/71-IF2008, 3 m, 10 m, 20 m |
| PS2020 | Power supply 24V / 2.5A |
| EC2471-3/OE | Encoder cable, 3m |

### Optical fiber

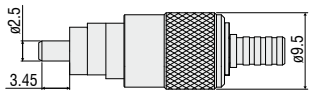
Temperature range : -50°C to 90°C
Bending radius: 30/40 mm



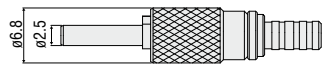

### E2000/APC standard connector




### FC/APC standard connector




### DIN connector



## Sensors and Systems from Micro-Epsilon

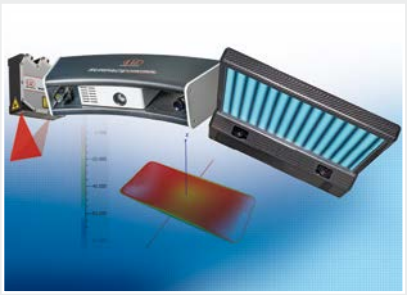
Sensors and systems for displacement, distance and position

Sensors and measurement devices for non-contact temperature measurement

Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection

Modifications reserved / Y9761149-P021059GKE

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