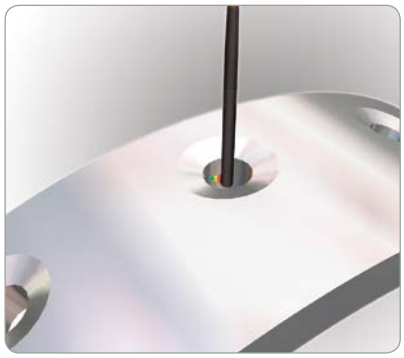
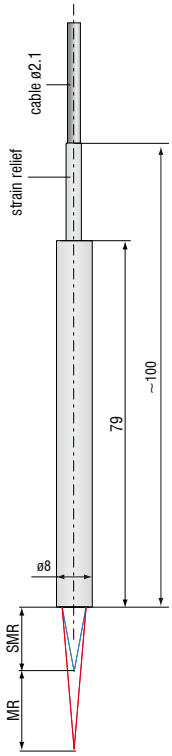
MICRO-EPSILON

More Precision

confocalDT // Confocal chromatic measuring system

- **Hybrid sensors ø8mm with axial or radial (90°) measuring direction**
- **Submicrometer resolution**
- **One-sided thickness measurement**
- **Distance measurement**
- **Extremely small spot size**
- **Passive design without electronic components**

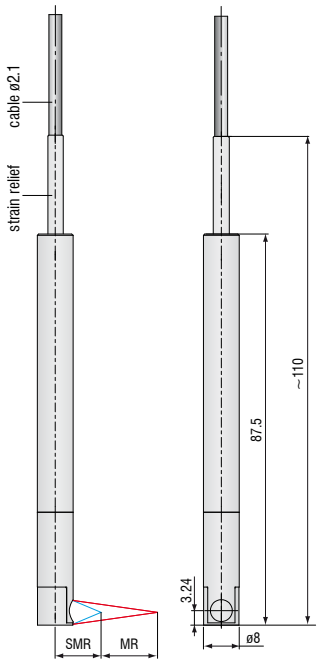




Mechanical tolerances ±0.1mm
MR = measuring range
SMR = start of measuring range
Dimensions in mm.

Sensor model		IFS 2403-0,4	IFS 2403-1,5	IFS 2403-4	IFS 2403-10
Measuring range		400µm	1.5mm	4mm	10mm
Start of measuring range	approx.	2.5mm	8.0mm	14.7mm	11mm
Numerical aperture		0.5	0.3	0.15	0.15
Light spot diameter		9µm	15µm	28µm	56µm
Linearity (displacement and distance measurement)		≤±0.3µm	≤±1.2µm	≤±3µm	≤±20µm
Linearity (thickness measurement)		≤±0.6µm	≤±2.4µm	≤±6µm	≤±40µm
Resolution [1]		16nm	60nm	100nm	250nm
Weight		25g			
Max. tilt [2]		±20°	±16°	±6°	±6°
Protection class		IP64, front operated			
Temperature range	Operation	+5 ... +70°C			
	Storage	-30 ... +70°C			
Connection		integral cable 2m; option up to 50m; bending radius: static 30mm; dynamic 40mm			
Shock		15g, 6ms			
Vibration		2g / 10 Hz ... 500Hz			

FSO = Full Scale Output
All data at constant ambient temperature (25±2°C) against optical flat; specifications can change when measuring different materials.
[1] Average from 512 values
[2] Maximum sensor tilt angle that produces a usable signal on a reflecting surface, near to the midrange



Mechanical tolerances ±0.1mm
MR = measuring range
SMR = start of measuring range
Dimensions in mm.

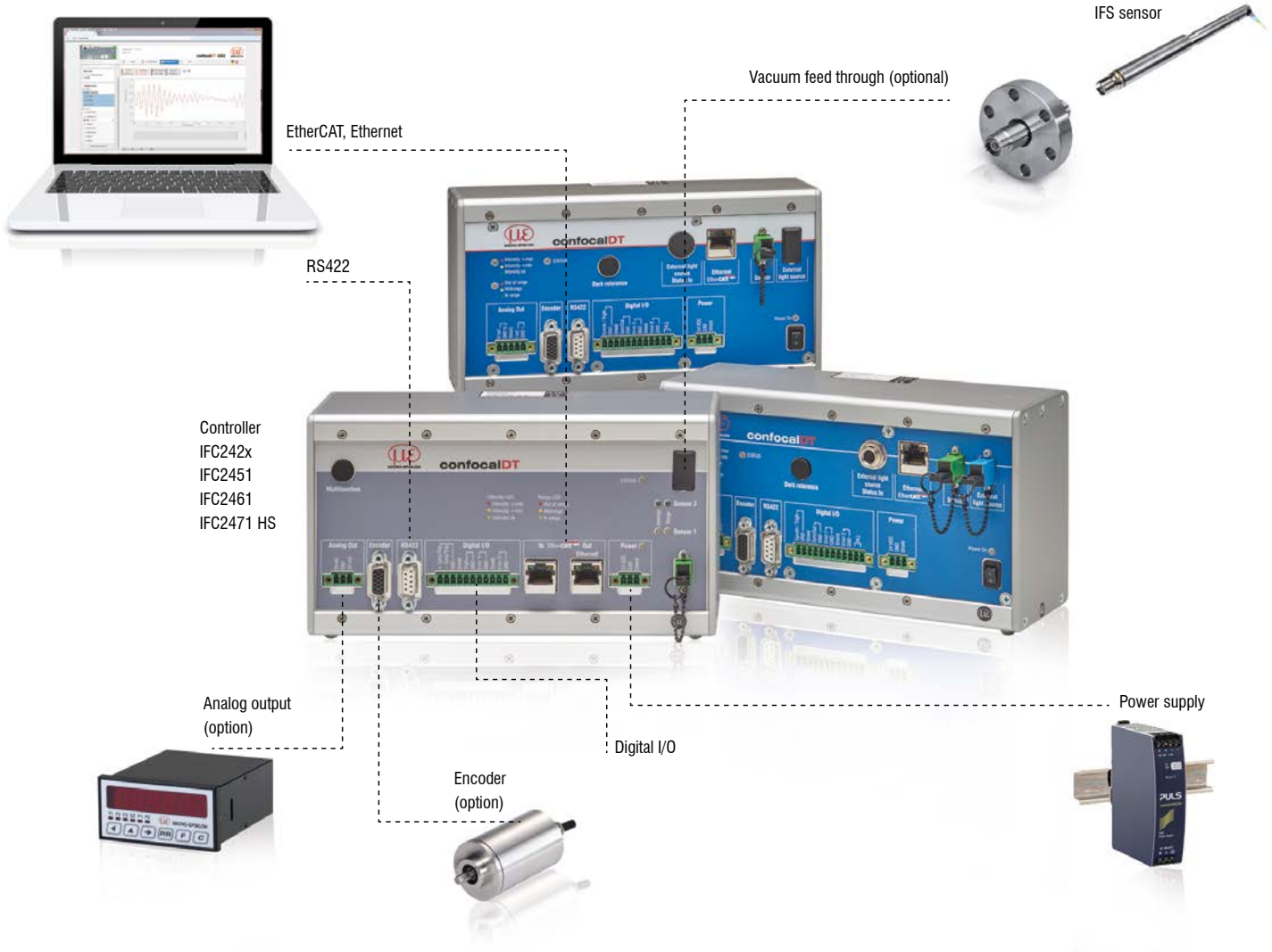
Sensor model		IFS 2403/90-1,5	IFS 2403/90-4	IFS 2403/90-10
Measuring range		1.5mm	4mm	10mm
Start of measuring range	approx.	4.9mm [1]	12mm [1]	8.6mm [1]
Numerical aperture		0.3	0.15	0.15
Light spot diameter		15µm	28µm	56µm
Linearity (displacement and distance measurement)		≤ ±1.2µm	≤ ±3µm	≤ ±20µm
Linearity (thickness measurement)		≤ ±2.4µm	≤ ±6µm	≤ ±40µm
Resolution [2]		60nm	100nm	250nm
Weight		25g		
Max. tilt [3]		±16°	±6°	±6°
Protection class		IP40		
Temperature range	Operation	+5 ... +70°C		
	Storage	-30 ... +70°C		
Connection		integral cable 2m; option up to 50m; bending radius: static 30mm; dynamic 40mm		
Shock		15g, 6ms		
Vibration		2g / 10Hz ... 500Hz		

FSO = Full Scale Output
All data at constant ambient temperature (25±2°C) against optical flat; specifications can change when measuring different materials.
[1] Start of measuring range measured from sensor axis
[2] Average from 512 values
[3] Maximum sensor tilt angle that produces a usable signal on a reflecting surface, near to the midrange

System design

The confocalDT system consists of:

- Sensor IFS240x
- Controller IFC24xx
- Fiber-optic cable



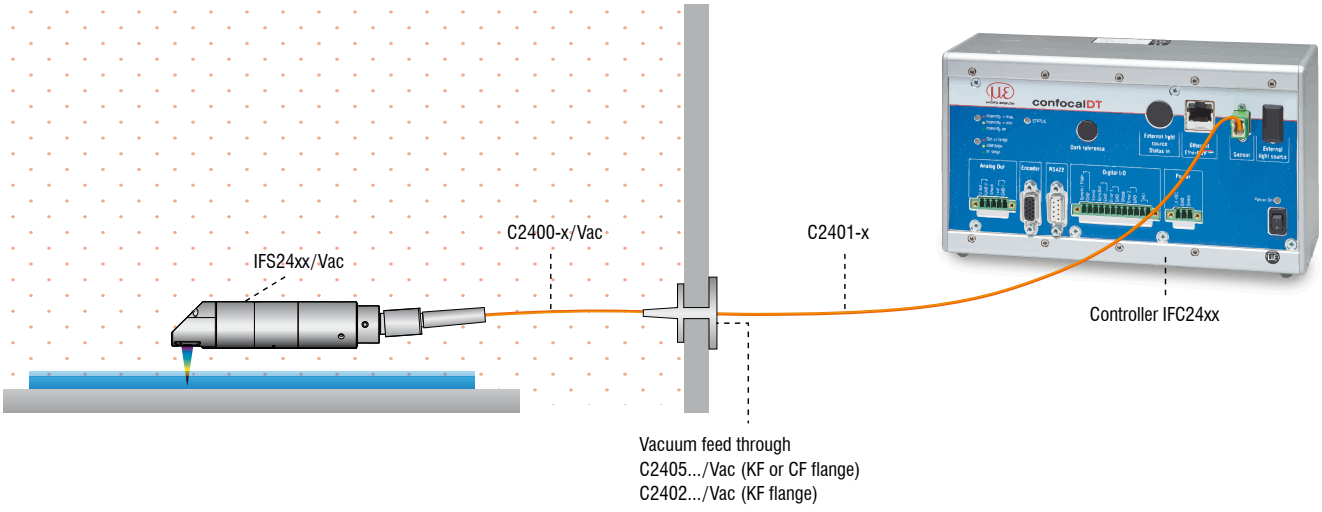
Customer-specific modifications

Application examples are often found where the standard versions of the sensors and the controller 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.

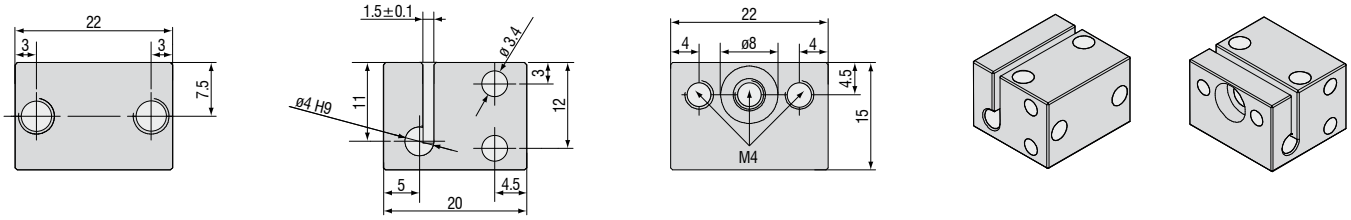
Possible modifications

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

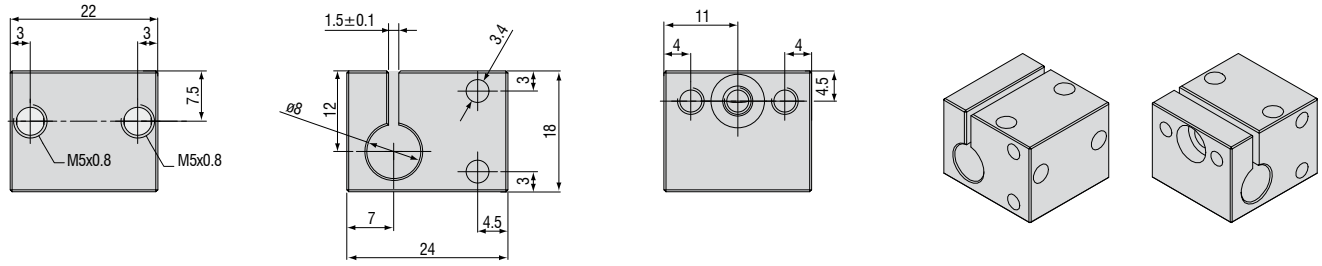
Vacuum setup



Accessories: mounting adapter
MA2402 for sensors 2402

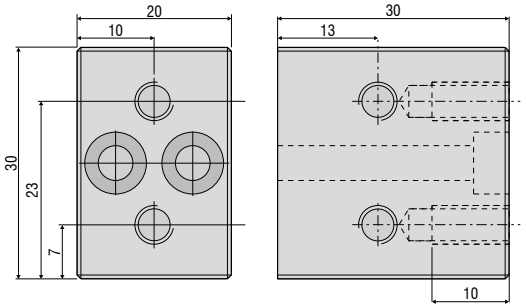


Accessories: mounting adapter
MA2403 for sensors 2403

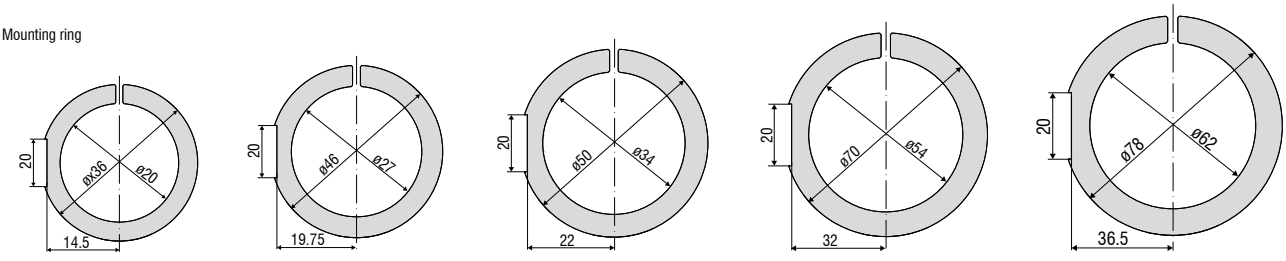


Accessories: mounting adapter
MA2400 for sensors IFS2405/IFS2406 (consisting of a mounting block and a mounting ring)

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 2405-54
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)

Cables for IFS2402/IFS2403 sensors

CE2402 cable with 2x E2000/APC connectors

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

Cables for IFS2405/IFS2406 sensors

C2401 cable with FC/APC and E2000/APC connectors

C2401-x	Optical fiber (3m, 5m, 10m, customer-specific length up to 50m)
C2401/PT-x	Optical fiber with protection tube for mechanical stress (3m, 5m, 10m, customer-specific length up to 50m)
C2401-x (01)	Optical fiber core diameter 26µm (3m, 5m, 15m)
C2401-x(10)	Drag-chain suitable optical fiber (3m, 5m, 10m)

C2400 cable with 2x FC/APC connectors

C2400-x	Optical fiber (3m, 5m, 10m, customer-specific length up to 50m)
C2400/PT-x	Optical fiber with protection tube for mechanical stress (3m, 5m, 10m, customer-specific length up to 50m)
C2400/PT-x-Vac	Optical fiber with protection tube suitable for use in vacuum (3m, 5m, 10m, customer-specific length up to 50m)

Cable for IFS2407 sensors

C2404-x	Optical fiber with DIN connector and E2000/APC (2m, 5m)

Vacuum feed through

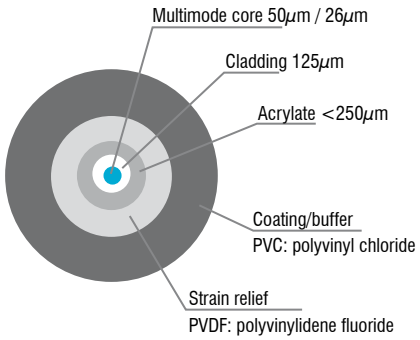
C2402/Vac/KF16	Vacuum feed through with optical fiber, 1 channel, vacuum side FC/APC non-vacuum side E2000/APC, clamping flange KF 16
C2405/Vac/1/KF16	Vacuum feed through on both sides FC/APC socket, 1 channel, clamping flange type KF 16
C2405/Vac/1/CF16	Vacuum feed through on both sides FC/APC socket,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

Other accessories

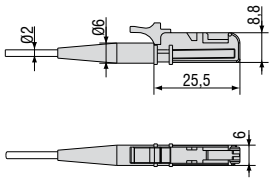
SC2471-x/USB/IND	Connector cable IFC2451/61/71, 3m, 10m, 20m
SC2471-x/IF2008	Connector cable IFC2451/61/71-IF2008, 3m, 10m, 20m
PS2020	Power supply 24V / 2.5A
EC2471-3/OE	Encoder cable, 3m

Optical fiber

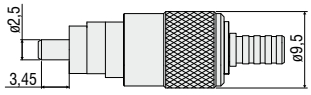
Temperature range : -50°C to 90°C
Bending radius: 30/40mm



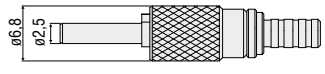
E2000/APC standard connector



FC/APC standard connector



DIN connector



High performance sensors made by Micro-Epsilon

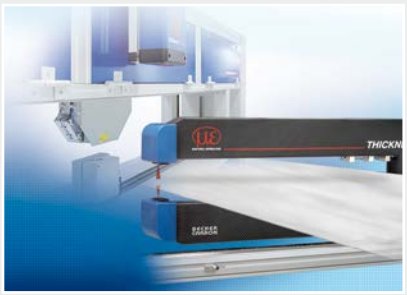
Sensors and systems for displacement and position

Sensors and measurement devices for non-contact temperature measurement

2D/3D profile sensors (laser scanner)

Optical micrometers, fiber optic sensors and fiber optics

Color recognition sensors, LED analyzers and color inline spectrometer



Measurement and inspection systems

Modifications reserved / Y9761149-O011048GKE

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