



# More Precision

**confocalDT** // Confocal chromatic measuring system





**Robust sensors for various applications**



**One-sided thickness measurement**



**Distance measurement**



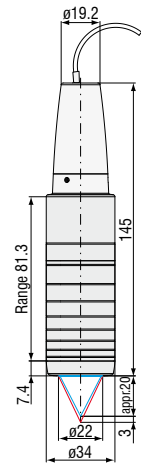
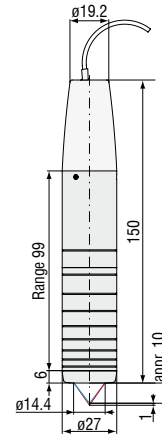
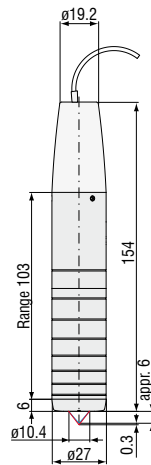
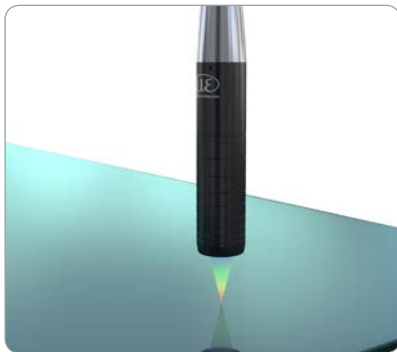
**Extremely small spot size**



**Submicrometer resolution**



**Passive design without electronic components**



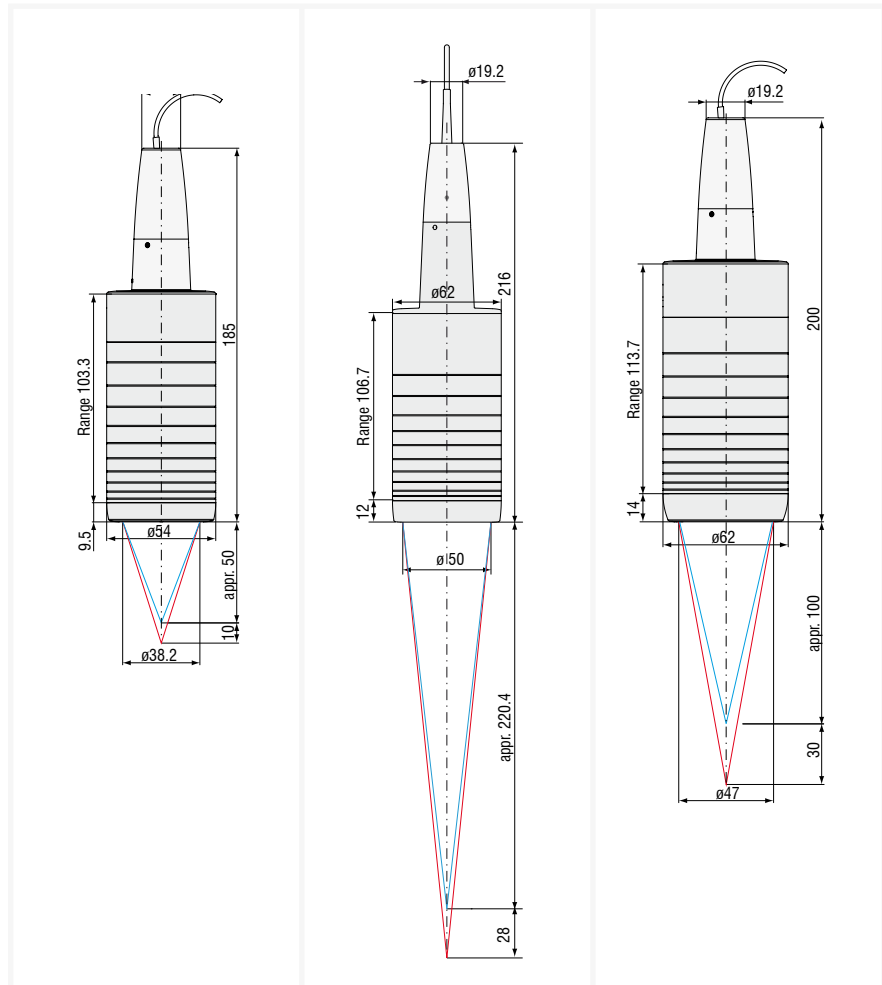
Sensor model	IFS2405-0.3	IFS 2405-1	IFS 2405-3
Measuring range	0.3mm	1mm	3mm
Start of measuring range	approx. 6mm	10mm	20mm
Numerical aperture	0.60	0.55	0.45
Light spot diameter	6 $\mu$ m	8 $\mu$ m	9 $\mu$ m
Linearity (displacement and distance measurement)	$\leq \pm 0.15\mu$ m	$\leq \pm 0.25\mu$ m	$\leq \pm 0.75\mu$ m
Linearity (thickness measurement)	$\leq \pm 0.3\mu$ m	$\leq \pm 0.5\mu$ m	$\leq \pm 1.5\mu$ m
Resolution <sup>1)</sup>	10nm	28nm	36nm
Weight	140g	125g	225g
Max. tilt <sup>2)</sup>	$\pm 34^\circ$	$\pm 30^\circ$	$\pm 24^\circ$
Protection class	IP65, front operated		
Temperature range	Operation	+5 ... +70°C	
	Storage	-20 ... +70°C	
Connection	pluggable sensor cable via FC socket, standard length 3m; extension 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 $\pm$ 2°C) against optical flat; specifications can change when measuring different materials.

<sup>1)</sup> Average from 512 values at 1kHz, near to the midrange

<sup>2)</sup> Maximum sensor tilt angle that produces a usable signal on a reflecting surface, near to the midrange



Sensor model	IFS 2405-10	IFS 2405-28	IFS 2405-30
Measuring range	10mm	28mm	30mm
Start of measuring range	approx. 50mm	220mm	100mm
Numerical aperture	0.30	0.10	0.20
Light spot diameter	16 $\mu$ m	60 $\mu$ m	50 $\mu$ m
Linearity (displacement and distance measurement)	$\leq \pm 2.5\mu$ m	$\leq \pm 7\mu$ m	$\leq \pm 7.5\mu$ m
Linearity (thickness measurement)	$\leq \pm 5\mu$ m	$\leq \pm 14\mu$ m	$\leq \pm 15\mu$ m
Resolution <sup>1)</sup>	60nm	250nm	180nm
Weight	500g	750g	730g
Max. tilt <sup>2)</sup>	$\pm 17^\circ$	$\pm 5^\circ$	$\pm 9^\circ$
Protection class	IP65, front operated		
Temperature range	Operation	+5 ... +70°C	
	Storage	-20 ... +70°C	
Connection	pluggable sensor cable via FC socket, standard length 3m; extension 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 $\pm$ 2°C) against optical flat; specifications can change when measuring different materials.

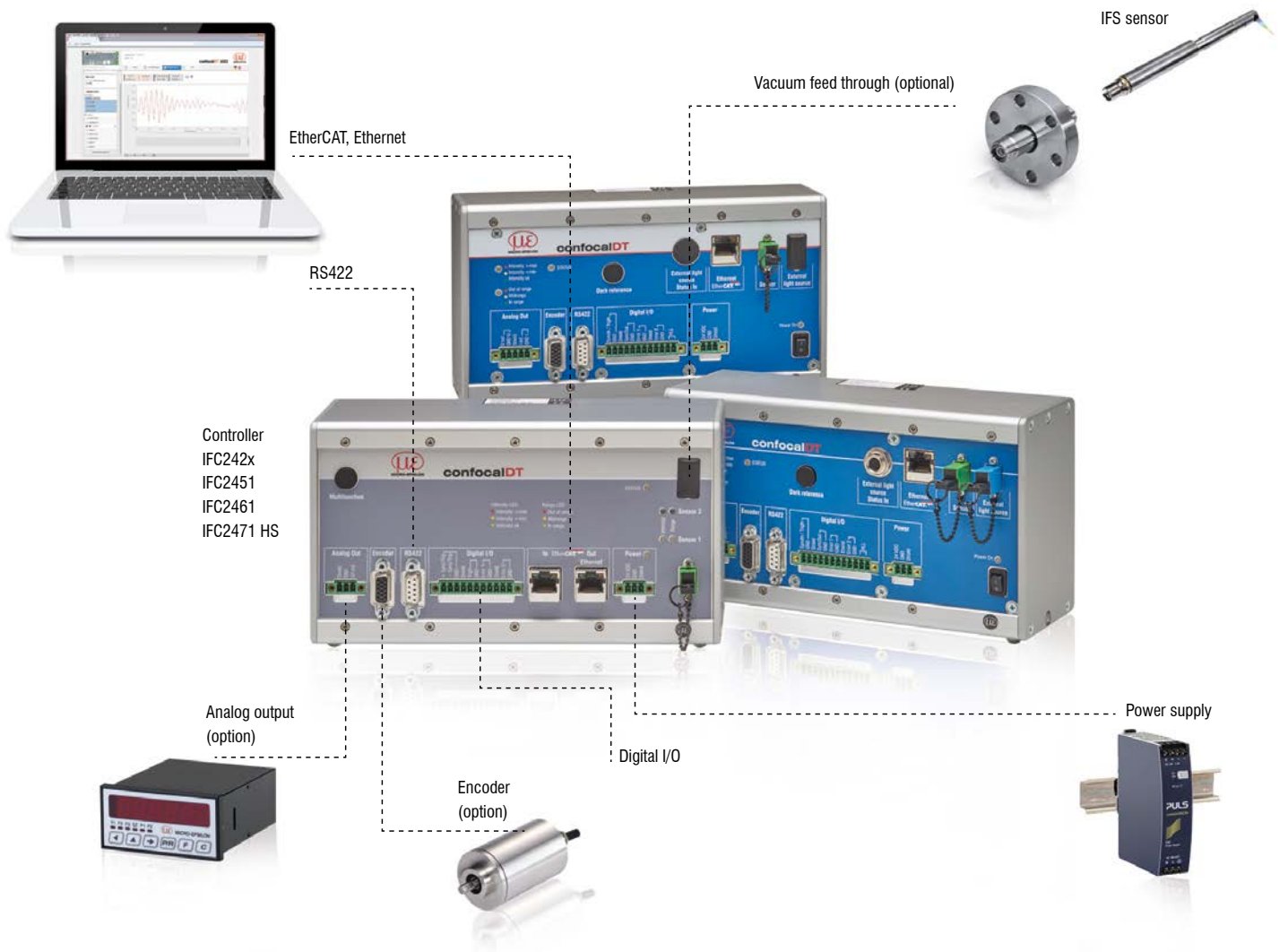
<sup>1)</sup> Average from 512 values at 1kHz, near to the midrange

<sup>2)</sup> 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

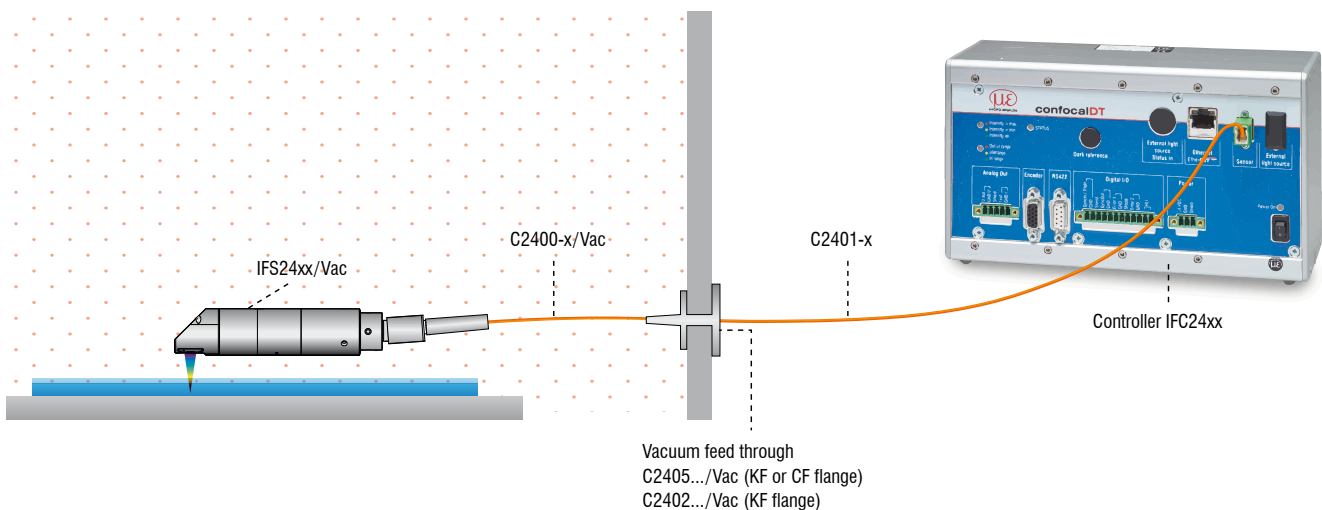
Application examples are often found where the standard versions of the sensors and the controller are performing at their limits. To facilitate such special tasks it is possible to customize the sensor design and to adjust the controller accordingly. Common requests for modifications include changes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



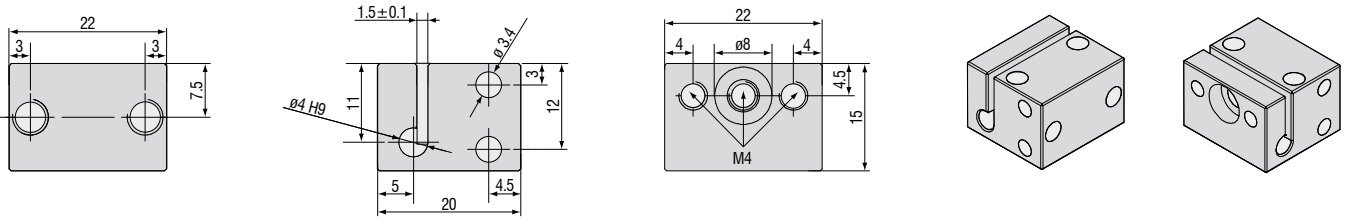
### Possible modifications

- 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

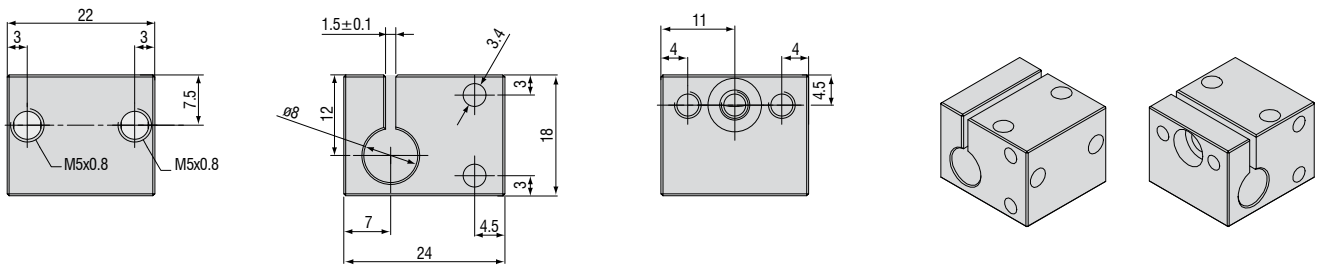
### Vacuum setup



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

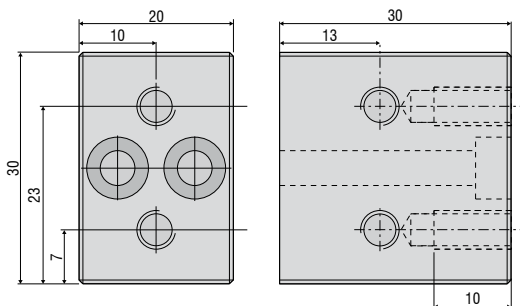


**Accessories: mounting adapter**  
MA2403 for sensors 2403

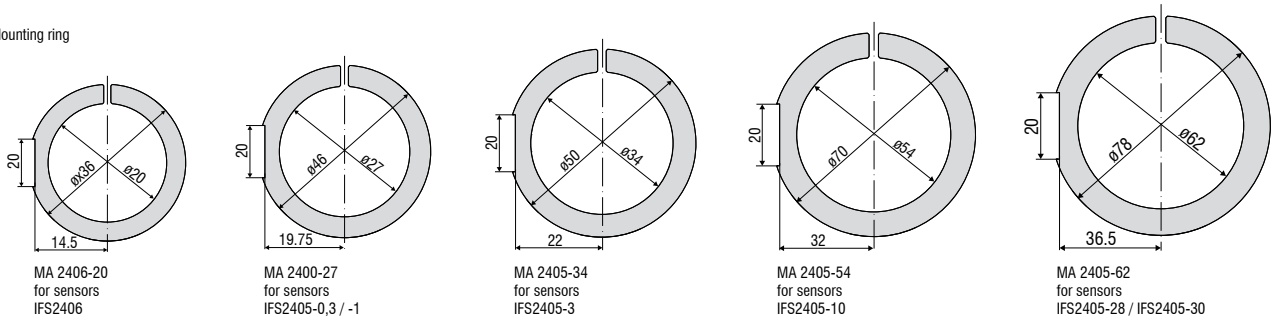


**Accessories: mounting adapter**  
MA2400 for sensors IFS2405/IFS2406 (consisting of a mounting block and a mounting ring)

Mounting block



Mounting ring



## 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  $26\mu\text{m}$  (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

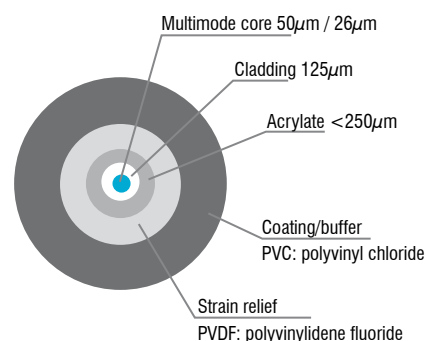
### Other accessories

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

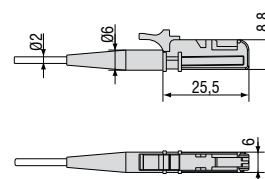
### Optical fiber

Temperature range :  $-50^{\circ}\text{C}$  to  $90^{\circ}\text{C}$

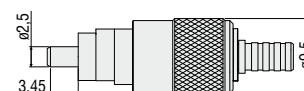
Bending radius: 30/40mm



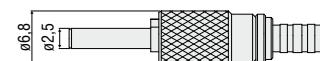
### E2000/APC standard connector



### 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