



More Precision

thermoMETER
Non-contact IR temperature sensors





thermoMETER CTM-3XL

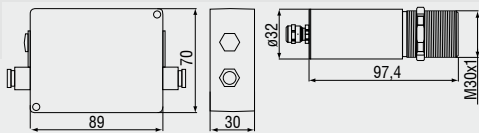
This state of the art non contact infrared temperature sensor operates with a wavelength of $2.3\mu\text{m}$. This special spectral range minimises the emissivity errors and allows readings through glass down to low temperatures of 100°C . A special filter blocks all visible light and no visible up to 1800nm , as well as the $10.6\mu\text{m}$ wavelength.

- Temperature measurement from 100°C to 1800°C
- For laser material processing, laser welding and laser soldering
- Special blocking filter against laser radiation from almost all laser diodes and solid state lasers (VIS to 1800nm and $10.6\mu\text{m}$)
- FF: Far focus optics for use with laser collimator optics
- CF: close focus optics for miniature spot size of 0.5mm
- Operation temperature up to 85°C without cooling
- Short wave length range of $2.3\mu\text{m}$ to minimise error when measuring against materials with unknown emissivity
- Measures through glass

Optical specifications thermoMETER CTM-3XL

□ = smallest spot size (mm)

Standard Focus optics															
SF100	100:1	20	19	18	17	16	15	14	12	11	13	16	20	28	38
SF300 H1/H2/H3	300:1	20	17.8	15.5	13.2	11	8.6	6.4	4.8	3.7	5.5	8.6	11.8	17	26.6
distance in mm		0	150	300	450	600	750	900	1000	1100	1200	1350	1500	1750	2200
Close Focus optics															
CF1-100	100:1	20	11	0.85	9.5	16.8	29.1	41.4	53.6	78.2	103	128	152	177	
distance in mm		0	40	85	120	150	200	250	300	400	500	600	700	800	
Close Focus optics															
CF2-100	100:1	20	14	7.7	1.5	8.7	16	23	38	52	66	81	95		
CF2-300 H1/H2/H3	300:1	20	13.5	7	0.5	7.3	14	21	34.5	48.2	61.8	75.4	89		
CF3-100	100:1	20	15.5	11	6.5	2	7.5	13	24	35	46	57	68		
CF3-300 H1/H2/H3	300:1	20	15.2	10.3	5.5	0.7	5.8	11	21.2	31.5	41.8	52.1	62.4		
distance in mm		0	50	100	150	200	250	300	400	500	600	700	800		
Close Focus optics															
CF4-100	100:1	20	18.3	16.6	14.9	13.2	11.4	9.7	8	6.3	4.5	7.3	13	19	24
CF4-300 H1/H2/H3	300:1	20	18	16	13.8	11.8	9.7	7.6	5.6	3.5	1.5	3.8	8.6	13.3	18
distance in mm		0	50	100	150	200	250	300	350	400	450	500	600	700	800



Product identification

CTM - 3 SF100XL - C3

Cable length [3m]
Focus [see optical specifications]
Spectral range [2.3 μ m]
thermoMETER CTM

Model	CTM-3SF100XL-C3	CTM-3SF300XLH1-C3	CTM-3SF300XLH2-C3	CTM-3SF300XLH3-C3
Optical resolution ¹	100:1	300:1	300:1	300:1
Temperature range ^{2,3}	100 to 600°C	150 to 1000°C	200 to 1500°C	250 to 1800°C
Spectral range	2.3 μ m			
System accuracy ^{4,5}	\pm (0.3% of reading + 2°C)			
Repeatability ⁴	\pm (0.1% of reading + 1°C)			
Temperature resolution (digital)	0.1°C			
Response time (90% signal) ⁶	1ms			
Emissivity/gain ²	0.100 to 1.100			
Transmissivity/gain ²	0.100 to 1.100			
Signal processing ²	peak hold, valley hold, average; extended hold function with threshold and hysteresis			
Certificate of calibration	optional			
Outputs/analogue	0/4 to 20mA, 0 to 5/ 10V, thermocouple J, K, alarm			
Outputs/analogue (option)	relay: 2 x 60VDC / 42VAC; 0.4A; optically isolated			
Alarm output	open-collector (24V / 50mA)			
Outputs/digital	option	USB, RS232, RS485, CAN, Profibus DP, Ethernet		
Output impedances	current output	mA max. 500 Ω (with 5 - 36VDC)		
	voltage output	mV min. 100k Ω load impedance; thermocouple 20 Ω		
Inputs	programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)			
Cable length	3m			
Power supply	8 to 36VDC; max. 100mA			
Environmental rating	IP 65 (NEMA-4)			
Ambient temperature	sensor: -40°C to 85°C controller: 0°C to 85°C			
Storage temperature	sensor: -40°C to 125°C controller: -40°C to 85°C			
Relative humidity	10 to 95%, non condensing			
Vibration	sensor	IEC 68-2-6: 3G, 11-200Hz, any axis		
Shock	sensor	IEC 68-2-27: 50G, 11ms, any axis		
Weight	sensor: 150g; controller: 420g			

¹ 90% energy

² adjustable via programming keys or software

³ target temperature > sensor temperature + 25°C

⁴ \pm ambient temperature 23 \pm 5°C

⁵ E=1, response time 1s

⁶ with dynamic adaptation at low signal levels

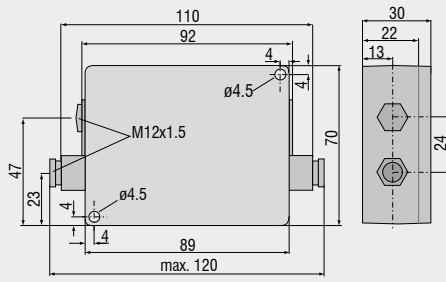
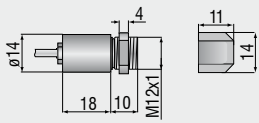
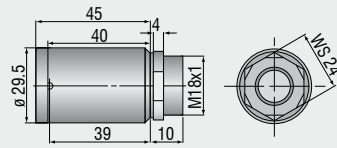
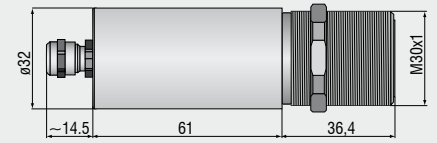
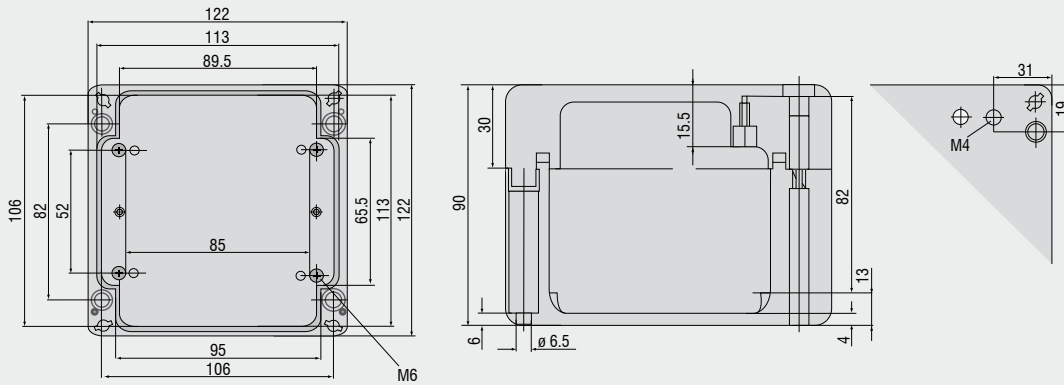
Optical specifications thermoMETER CTM-3XL

□ = smallest spot size (mm)

Far Focus optics														
FF100	100:1	20	22	24	26	28	30	32	33.4	36	42.5	58	73.5	85
FF300 H1/H2/H3	300:1	20	19	18	17	16	15	14	13.4	12	16.5	24.4	33.4	40
<i>distance in mm</i>		0	450	900	1350	1800	2250	2700	3000	3600	4000	5000	6000	6750

Accessories page 42 - 45

- ▶ Mounting bracket
- ▶ Air purge collar
- ▶ Digital-Interface kit
- ▶ Certificate of calibration

Controller**CT / CTfast / CTM1/M2/M3****CTHot / CTP7****CTM3-XL****CTex**

Mechanical accessories

Art. No.	Model	
2970203	TM-FB-CT	Mounting bracket, fixed
2970325	TM-FB2-CT	Mounting bracket, adjustable in one axis, for simultaneous assembly of CT sensor and laser-sighting-tool
2970336	TM-FBMH-CT	Mounting bracket, adjustable in one axis, for massive housing
2970204	TM-AB-CT	Mounting bracket, adjustable in 2 axes
2970205	TM-MB-CT	Mounting bolt with M12x1 thread
2970206	TM-MG-CT	Mounting fork, adjustable in 2 axes, with thread M12x1
2970207	TM-AP-CT	Air purge collar from 10:1 optics
2970335	TM-APS-CT	Air purge collar from 10:1 optics, stainless steel
2970208	TM-AP2-CT	Air purge collar for 2:1 optic
2970209	TM-APL-CT	Air purge collar, laminar
2970210	TM-APLCF-CT	Air purge collar, laminar, with integral CF-lens
2970357	TM-APLCFH-CT	Air purge collar, laminar, with integral CF-lens for M1/M2/M3/M5 sensors
2970386	TM-APMH-CT	Air purge collar, stainless steel for massive housing
2970211	TM-RAM-CT	Right angle mirror for 90°C measurements
2970212	TM-RAIL-CT	Rail mount adapter for CT controller
2970213	TM-COV-CT	Closed cover for controller
2970214	TM-MHS-CT	Massive housing, compact, stainless steel
2970215	TM-MHS-CF-CT	Massive housing, compact, stainless steel with integrated CF-lens
2970358	TM-MHSCFH-CT	Massive housing, compact, stainless steel with integrated CF-lens for M1/M2/M3/M5 sensors
2970216	TM-MHA-CT	Massive housing, compact, anodized aluminium
2970217	TM-MHACF-CT	Massive housing, compact, anodized aluminium with integrated CF-lens
2970359	TM-MHACFH-CT	Massive housing, compact, anodized aluminium with integrated CF-lens for M1/M2/M3 sensors
2970218	TM-MHB-CT	Massive housing, compact, brass
2970219	TM-MHBCF-CT	Massive housing, compact, brass with integrated CF-lens
2970360	TM-MHBCFH-CT	Massive housing, compact, brass with integrated CF-lens for M1/M2/M3/M5 sensors
2970220	TM-PT-CT	Protective tube, lang, brass
2970326	TM-PA-CT	Pipe adapter for sighting tube
2970327	TM-ST20-CT	Sighting tube, length 20mm
2970328	TM-ST40-CT	Sighting tube, length 40mm
2970329	TM-ST88-CT	Sighting tube, length 88mm
2970221	TM-LST-CT	Laser sighting tool for CT sensors incl. batteries (2xalkaline cells AA)
2970300	TM-LSTOEM-CT	OEM Laser pointing device, 635nm, rotation symmetrical, 3.5m cable
2970300.008	TM-LSTOEM-CT(008)	OEM Laser pointing device, 635nm, rotation symmetrical, 8m cable
2970222	TM-EX-CT	CTex-Kit: Accessory-Kit for use of the CT in hazardous locations according zone 1: PTB 01 ATEX 2053/ E II (1/2) G [EEx ia/ib] IIC/IIB, preassembled Ex-box without zener barriers, combinable with all standard CT SF sensors (except CTfast)

Optical accessoires

Art. No.	Model	
2970201	TM-CF-CT	CF-lens (SF sensors only)
2970202	TM-PW-CT	Protective window (SF sensors only)
2970297	TM-CFAG-CT	Lens with external thread
2970330	TM-CFH-CT	Lens for M1/M2/M3 sensors
2970331	TM-CFHAG-CT	Lens with external thread for M1/M2/M3/M5 sensors
2970299	TM-PWAG-CT	Protective window with external thread
2970332	TM-PWH-CT	Protective window for M1/M2/M3/M5 sensors
2970333	TM-PWHAG-CT	Protective window with external thread for M1/M2/M3/M5 sensors

Interfaces

Art. No.	Model	
2970223	TM-USBK-CT	USB interface kit incl. computer cable, software CompactConnect
2970224	TM-RS232K-CT	RS232 interface kit incl. computer cable, software CompactConnect
2970338	TM-RS485USBK-CT	RS485-USB-adapter, incl. PC cable, software CTconnect, terminal block, for use with TM-485B-CT
2970227	TM-CANK-CT	CAN-Bus interface for optris CT/ protocol: CANopen Presettings: module address 20 (14H), 250kBaud, 0-60°C
2970228	TM-PFBDPK-CT	Profibus-DPv1 interface for CT selectable with DIN M12 or SUB-D connection
2970229	TM-ETHNK-CT	Profibus-DPv1 interface for CT selectable with DIN M12 or SUB-D connection
2970230	TM-RI-CT	Relay interface: Two optically isolated relays, 60VDC/ 42VACRMS, 0,4A
2970226	TM-RS485B-CT	RS485 interface

Calibration

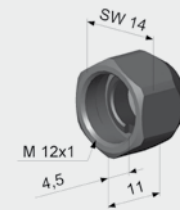
Art. No.	Model	
2970231	TM-CERT-CT	Certificate of calibration acc. ISO9001: testing procedure with defined ambient temperatures, target dimensions and distances; Test temperatures 20°C/ 100°C/ 500°C
2970310	TM-HTCERT-CT	Certificate of calibration for CTM sensors

CTM3-XL

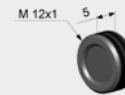
Art. No.	Model	
2970352	TM-FBXL-CT	Mounting bracket, adjustable in one axis
2970353	TM-ABXL-CT	Mounting bracket, adjustable in two axes
2970354	TM-APXL-CT	Air purge collar
2970361	TM-XLCERT-CT	Certificate of calibration



TM-FB-CT Mounting bracket, fixed



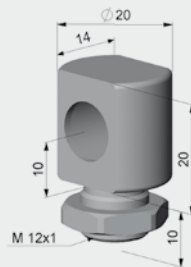
TM-CF-CT Close Focus Lens (SF sensors only)



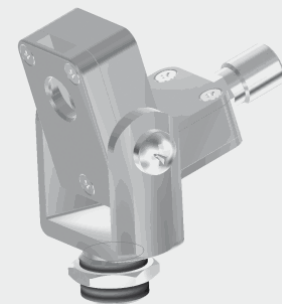
TM-CFAG-CT CF lens with external thread resp.
TM-PWAG-CT Protective window with external thread



TM-AB-CT Mounting gimble, adjustable in two axes



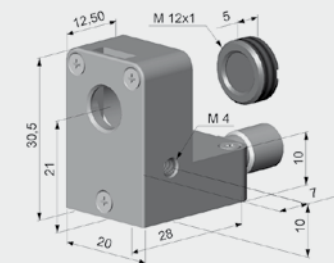
TM-MB-CT Mounting bolt with M12x1 thread adjustable



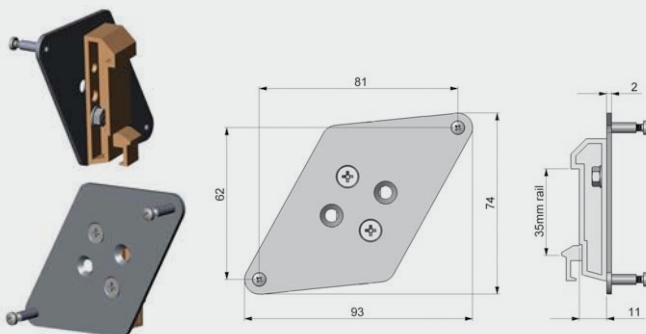
TM-APL-CT Laminar air purge collar and
TM-MG-CT Mounting fork



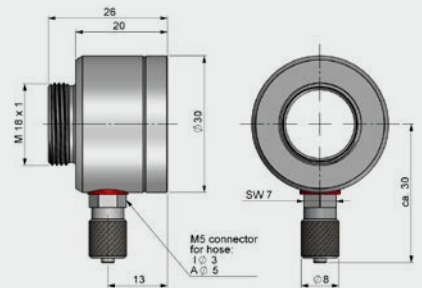
TM-MG-CT Mounting fork with M 12x1 thread adjustable in two axes



TM-APLCF-CT
CF lense/ protective window - integral
option for air purge collar



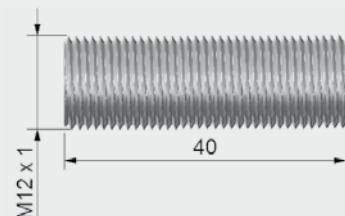
TM-RAIL-CT Rail mount adapter for controller



TM-APMH-CT Air purge collar,
stainless steel for massive housing



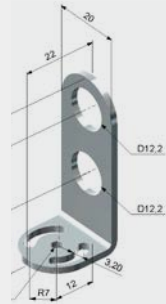
TM-PA-CT Pipe adapter for sighting tube



TM-ST40-CT Sighting tube



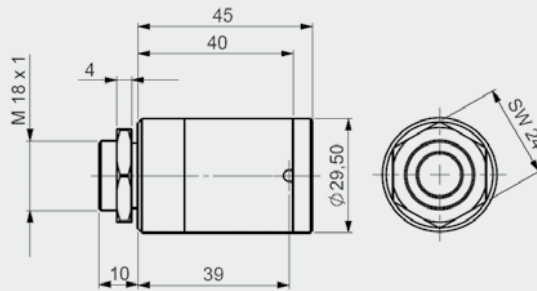
TM-LST-CT
Laser-Sighting tool



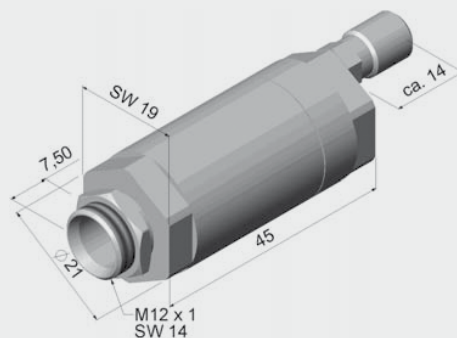
TM-FB2-CT
Laser-Sighting mounting bracket



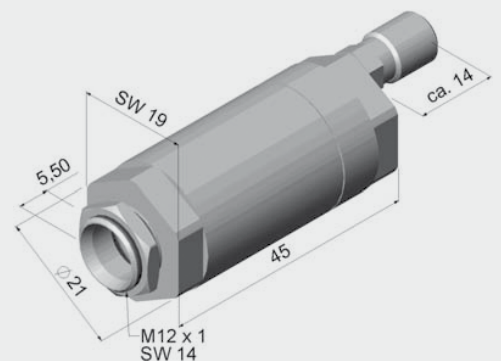
TM-RAM-CT
Right angle mirror



TM-MHS-CT Massive housing, compact, stainless steel
 TM-MHA-CT Massive housing, compact, aluminium
 TM-MHB-CT Massive housing, compact, brass



TM-AP-CT
Standard air purge collar for
10:1 / 15:1 / 22:1 optics



TM-AP2-CT
Standard air purge collar
for 2:1 optics

The lens must be kept clean at all times from dust, smoke, fumes and other contaminants in order to avoid reading errors. These effects can be reduced by using an air purge collar.

High performance sensors made by Micro-Epsilon



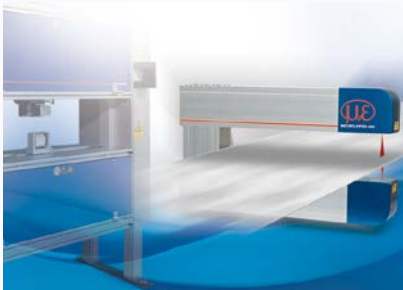
Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Measurement and inspection systems for quality assurance



Optical micrometers, fibre optic sensors and optical fibres



Colour recognition sensors, LED analysers and colour online spectrometer



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