MICRO-EPSILON

More Precision

thermoMETER // Non-contact infrared temperature sensors

thermoMETER CTM1/M2

Miniaturized temperature sensor with 1.0 und 1.6μm measuring wavelength

- Measuring range from 250°C to 2200°C
- Up to 125°C ambient temperature without cooling
- For metal processing such as welding, soldering, forming, sintering and for measurements of metal oxides and ceramics
- Extended compensation for measuring errors using short measuring wavelength (e.g. with emissivity changes or misadjustment)
- High compatibility with electromagnetic fields e.g. with induction welding
- Compact sensor for installation in confined spaces
- Selectable and scalable analog output, optional digital interfaces

Optical specifications thermoMETER CTM1/M2
□ =smallest spot size / focal point (mm)

Standard Focus										
1SF40/2SF40	40:1	6.5	10.7	14.9	19.1	23.3	27.4	31.6	35.8	40
1SF75/2SF75	75:1	6.5	8.4	10.2	12.1	13.9	15.8	17.6	19.5	21.3
distance in mm		0	200	400	600	800	1000	1200	1400	1600
Close Focus (integrated CF lens)										
1CF40/2CF40	40:1	6.5	4.4	2.7	6	10.2	14.4	18.6	22.8	27
1CF75/2CF75	75:1	6.5	3.8	1.5	4.4	8	11.7	15.3	19	22.6
distance in mm		0	60	110	150	200	250	300	350	400

Model	CTM-1SF40-C3	CTM-1SF75-C3	CTM-1SF75H1-C3	CTM-2SF40-C3	CTM-2SF75-C3	CTM-2SF75H1-C3
Optical resolution	40:1	75:1		40:1	75:1	
Temperature range [1]	485 to 1050°C	650 to 1800°C	800 to 2200°C	250 to 800°C	385 to 1600°C	490 to 2000°C
Spectral range	1.0µm			1.6µm		
System accuracy [2,3]	±(0.3% of reading +2°C)					
Repeatability [2]	±(0.1% of reading +1°C)					
Temperature resolution	0.1°C					
Response time [4]	1ms (90%)					
Emissivity/gain [1]	0.100 to 1.100					
Transmissivity/gain [1]	0.100 to 1.100					
Signal processing [1]	peak hold, valley hold, average; extended hold function with threshold and hysteresis					
Certificate of calibration	optional					
Outputs/analog channel 1	0/4 to 20mA, 0 to 5/10V, thermocouple J, K					
Outputs/analog optional	relays: 2 x 60VDC/42 VAC$_{eff}$; 0.4A; electrically isolated					
Alarm output	open collector (24V / 50A)					
Outputs/digital optional	USB, RS232, RS485, CAN, Profibus DP, Ethernet					
Output impedances current output	mA max. 500Ω (with 8 to 36VDC)					
Output impedances voltage output	min. 100kΩ load impedance, thermocouple 20Ω					
Inputs	programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)					
Cable length	3m (standard), 8m, 15m					
Power supply	8 to 36VDC; max. 100mA					
Protection class	IP65 (NEMA-4)					
Ambient temperature voltage output	-20°C to 100°C			-20°C to 125°C		
Ambient temperature controller	0°C to 85°C					
Storage temperature voltage output	-40°C to 100°C			-40°C to 125°C		
Storage temperature controller	-40°C to 85°C					
Relative humidity	10 to 95%, non-condensing					
Vibration voltage output	IEC 68-2-6: 3 G, 11 to 200Hz, any axis					
Shock voltage output	IEC 68-2-27: 50 G, 11ms, any axis					
Weight	sensor: 40g; controller: 420g					

[1] adjustable via programming keys or software
[2] ambient temperature: 23±5°C
[3] ε=1, response time 1s
[4] with dynamic adaption at low signal levels
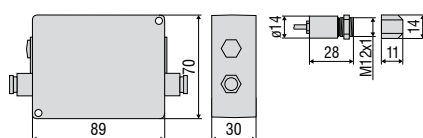
Product identification

CTM-	1	SF40-	C3
			Cable length [3m (standard) / 8m / 15m]
		Focus [SF40 / SF75 / CF40 / CF75]	
	Spectral range [1=1µm / 2=1.6µm]		
thermoMETER CTM			

Accessories page 40 - 43

- Protective window
- Mounting bracket / mounting bolt
- Air purge collar
- Right angle mirror

- Rail mount adapter for controller
- Massive housing
- Protective tube
- Laser sighting aid
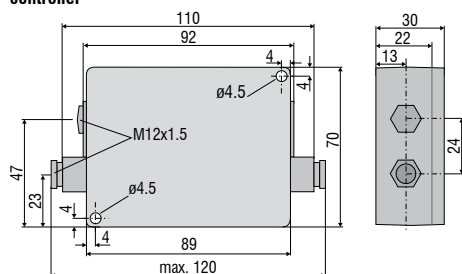
- Digital-interface kits
- Certificate of calibration

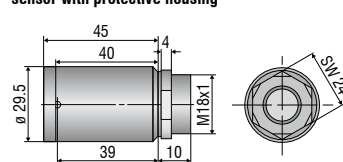## CT / CTfast / CTM1/M2/M3

controller

ancillary CF lens (optional)
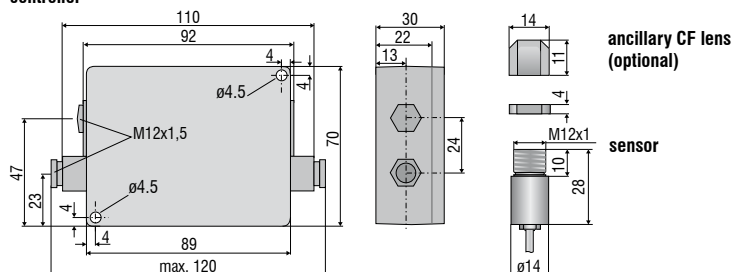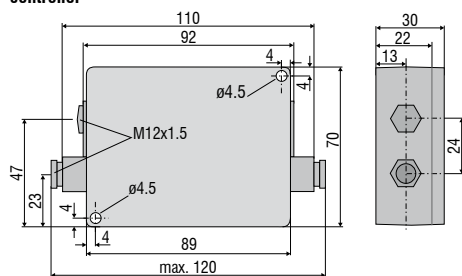
sensor

CThot / CTP-3 / CTP-7

controller

sensor with protective housing

CTM3-XL

controller

sensor
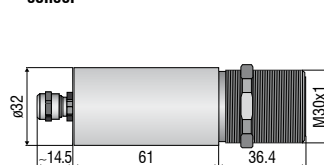
CTex
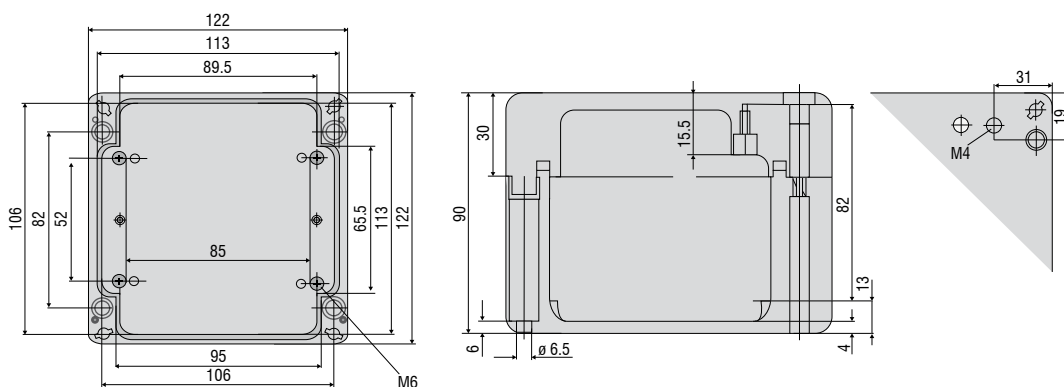
Mechanical accessories

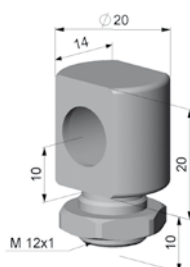| Art. No.	Model	
2970203	TM-FB-CT	Mounting bracket, fixed
2970325	TM-FB2-CT	Mounting bracket, adjustable in one axis, for simultaneous assembly of CT sensor and laser sighting aid
2970336	TM-FBMH-CT	Mounting bracket, adjustable in one axis, for massive housing
2970204	TM-AB-CT	Mounting bracket, adjustable in 2 axes
2970205	TM-MB-CT	Mounting bolts with M12x1 thread
2970206	TM-MG-CT	Mounting fork, adjustable in 2 axes, with M12x1 fastening
2970207	TM-AP-CT	Air purge collar for sensors from 10:1 lens
2970335	TM-APS-CT	Air purge collar for sensors from 10:1 lens made from stainless steel
2970208	TM-AP2-CT	Air purge collar for sensor with 2:1 lens
2970209	TM-APL-CT	Air purge collar, laminar
2970210	TM-APLCF-CT	Air purge collar, laminar with integrated ancillary CF lens
2970357	TM-APLCFH-CT	Air purge collar, laminar with integrated ancillary CF lens for M1/M2/M3/M5 sensors
2970386	TM-APMH-CT	Air purge collar made from stainless steel for massive housing
2970211	TM-RAM-CT	Right angle mirror for measurements 90°C to the sensor axis
2970212	TM-RAIL-CT	Rail mount adapter for CT controller
2970213	TM-COV-CT	Closed cover for controller
2970214	TM-MHS-CT	Massive housing made from stainless steel
2970215	TM-MHSCF-CT	Massive housing made from stainless steel with integrated ancillary CF lens
2970358	TM-MHSCFH-CT	Massive housing made from stainless steel with integrated ancillary CF lens for M1/M2/M3/M5 sensors
2970216	TM-MHA-CT	Massive housing made from anodized aluminum
2970217	TM-MHACF-CT	Massive housing made from stainless steel with integrated ancillary CF lens
2970359	TM-MHACFH-CT	Massive housing made from anodized aluminum with integrated ancillary CF lens for M1/M2/M3/M5 sensors
2970218	TM-MHB-CT	Massive housing made from brass
2970219	TM-MHBCF-CT	Massive housing made from brass with integrated ancillary CF lens
2970360	TM-MHBCFH-CT	Massive housing made from brass with integrated ancillary CF lens for M1/M2/M3/M5 sensors
2970220	TM-PT-CT	Protective tube made from brass
2970326	TM-PA-CT	Pipe adapter for the mounting of reflection protection tubes
2970327	TM-ST20-CT	Reflection protection tube, length 20mm
2970328	TM-ST40-CT	Reflection protection tube, length 40mm
2970329	TM-ST88-CT	Reflection protection tube, length 88mm
2970221	TM-LST-CT	Laser sighting aid for CT sensors incl. batteries (2xAlkaline AA)
2970300	TM-LSTOEM-CT	OEM laser sighting aid, 635nm, 3.5m cable, for connection to CT controller
2970300.008	TM-LSTOEM-CT(008)	OEM laser sighting aid, 635nm, 8m cable, for connection to CT controller
2970222	TM-EX-CT	Accessories kit for using CT in Ex areas (Zone 1: PTB 01 ATEX 2053/ E II (1/2) G [EEx ia/ib] IIC/IIB), pre-assembled EX box, without Zener barriers, applicable in combination with CT sensors (except for CTfast)

Optical accessories

Art. No.	Model	
2970201	TM-CF-CT	Ancillary CF lens (only for SF models)
2970202	TM-PW-CT	Protective window (only for SF models)
2970297	TM-CFAG-CT	Ancillary lens with external thread
2970330	TM-CFH-CT	Ancillary lens for M1/M2/M3/M5 sensors
2970331	TM-CFHAG-CT	Ancillary 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: USB interface, USB cable, CompactConnect software, second cable gland for controller
2970224	TM-RS232K-CT	RS232 interface: RS232 interface, computer cable, CompactConnect software, second cable gland for controller
2970338	TM-RS485USBK-CTL	RS485-USB-adapter, incl. PC cable, Compact-Connect software and CTmulti, second cable gland for use with interface board TM-RS485B-CT
2970226	TM-RS485B-CT	RS485 interface board incl. second cable gland
2970227	TM-CANK-CT	CAN-Bus interface for thermoMETER CT/ protocol: CANopen presets: module address 20 (14H), 250kBaud, 0-60°C
2970228	TM-PFBDPK-CT	Profibus-DPv1 interface for thermoMETER CT with plug-in connection
2970229	TM-ETHNK-CT	Ethernet-Kit: interface board, external Ethernet adapter, CompactConnect software, second cable gland
2970230	TM-RI-CT	Relay interface: two electrically isolated relays, 60VDC/ 42VAC$_{eff}$, 0.4A

Calibration

Art. No.	Model	
2970231	TM-CERT-CT	Certificate of calibration
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 2 axes
2970354	TM-APXL-CT	Air purge collar, stainless steel
2970361	TM-XLCERT-CT	Certificate of calibration

TM-FB-CT Mounting bracket, adjustable in one axis

TM-CF-CT Ancillary CF lens (only for SF models)

TM-CFAG-CT Ancillary CF lens with external thread
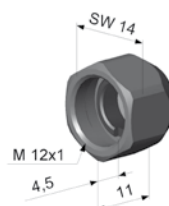TM-PWAG-CT Protective window with external thread
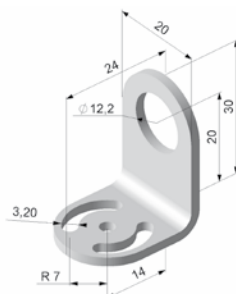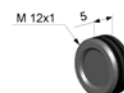
TM-AB-CT Mounting bracket, adjustable in two axes

TM-MB-CT mounting bolt with M12x1 thread adjustable in one axis

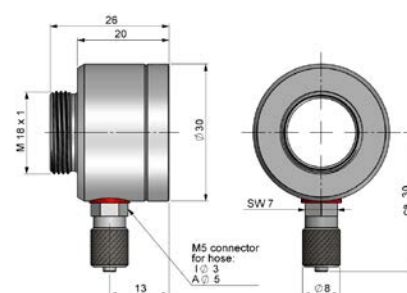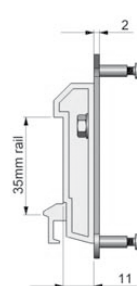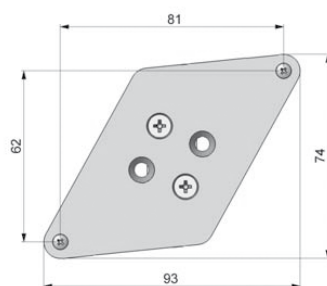TM-APL-CT Air purge collar, laminar and
TM-MG-CT Mounting fork
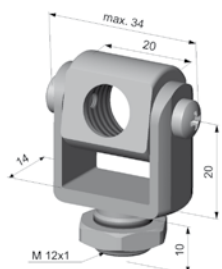
TM-MG-CT Mounting fork with M12x1 thread, adjustable in two axes
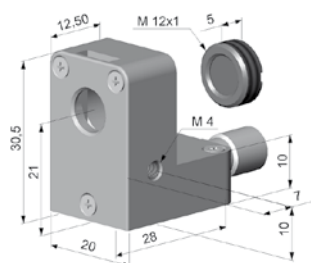
TM-APLCF-CT
Ancillary CF lens/protective window - integrable variant for laminar air purge collar

TM-RAIL-CT rail mount adapter for controller

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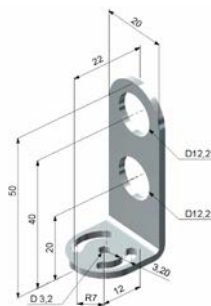Air purge collar made from stainless steel for massive housing

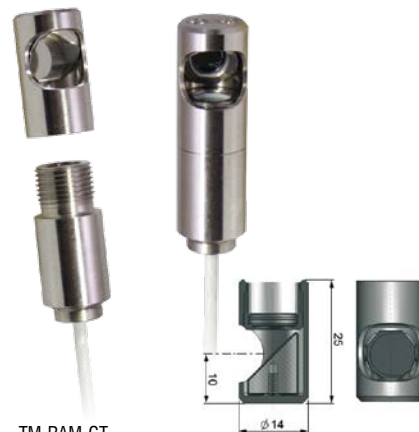TM-PA-CT Pipe adapter for reflection protection tube
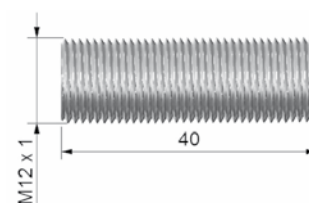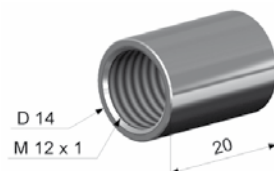
TM-ST40-CT Reflection protection tube

TM-LST-CT Laser sighting aid, battery-operated
(2x Alkaline AA), for alignment of CT sensors
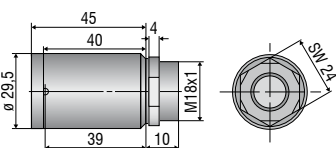(dimensions identical to CT sensor)

TM-FB2-CT
Mounting bracket for sensor and laser sighting aid
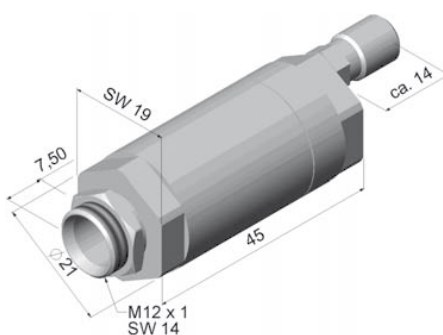
TM-RAM-CT
Right angle mirror

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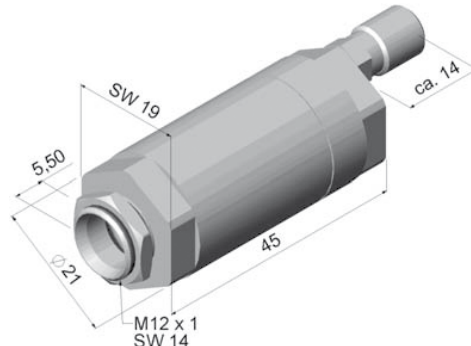TM-MHB-CT Massive housing, brass

TM-TAS-CT Pivoted joint for CT sensors

Dirt and deposit on the lens like smoke, steam and high air
humidity (condensation) are avoided or reduced by using
an air purge collar.

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

TM-APS-CT
Air purge collar, stainless steel

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

Further IR temperature measurement devices from Micro-Epsilon

thermoIMAGER TIM
Compact USB thermal imaging cameras for precise thermography

thermoMETER CTVideo/CSVideo
Infrared temperature sensors with crosshair laser sighting and video output

thermoMETER Handheld
Innovative handheld pyrometer with laser sighting for inspection and maintenance