



**SCIENCE
GATE**
Your Automation Partner



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More Precision

thermoMETER // Non-contact infrared temperature sensors





thermoMETER CTM-3XL

IR sensor for measurements in laser processing, laser welding and laser soldering

- Measuring range from 100 °C to 1800 °C
- Up to 85 °C ambient temperature without cooling
- Special blocking filter against laser radiation of all conventional diode, semiconductor and CO₂ lasers (from VIS to 1800 nm with 10.6 μm)
- Far Focus version for use with laser collimators
- Measuring wavelength of 2.3 μm minimizes errors due to emissivity uncertainty and misadjustment
- Sensor measures through glass lenses/sight glasses

Optical specifications thermoMETER CTM-3XL

□ = smallest spot size / focal point (mm)

Standard Focus

SF100	100:1	20	18.8	17.5	16.3	15.1	13.9	12.6	11.8	11	13.8	18	22.3	29.3	42
SF300 H1/H2/H3	300:1	20	17.8	15.6	13.3	11.1	8.9	6.7	5.2	3.7	5.9	9.1	12.3	17.7	27.4
distance in mm		0	150	300	450	600	750	900	1000	1100	1200	1350	1500	1750	2200

Close Focus

CF1-100	100:1	20	11	0.9	9.5	16.9	29.2	41.5	53.8	78.4	102.9	127.5	152.1	176.7	
distance in mm		0	40	85	120	150	200	250	300	400	500	600	700	800	

Close Focus

CF2-100	100:1	20	13.8	7.7	1.5	8.7	15.8	23	37.3	51.7	66	80.3	94.7		
CF2-300 H1/H2/H3	300:1	20	13.5	7	0.5	7.3	14.2	21	34.7	48.3	62	75.7	89.3		
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	10.4	5.5	0.7	5.9	11	21.4	31.8	42.1	52.5	62.8		
distance in mm		0	50	100	150	200	250	300	400	500	600	700	800		

Close Focus

CF4-100	100:1	20	18.3	16.6	14.8	13.1	11.4	9.7	7.9	6.2	4.5	7.2	12.7	18.1	23.6
CF4-300 H1/H2/H3	300:1	20	17.9	15.9	13.8	11.8	9.7	7.7	5.6	3.6	1.5	3.9	8.7	13.4	18.2
distance in mm		0	50	100	150	200	250	300	350	400	450	500	600	700	800

Far Focus

FF100	100:1	20	22	24	26	28	30	32	33.3	36	42.2	57.8	73.3	85	
FF300 H1/H2/H3	300:1	20	19	18	17	16	15	14	13.3	12	15.6	24.4	33.3	40	
distance in mm		0	450	900	1350	1800	2250	2700	3000	3600	4000	5000	6000	6750	

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 μm			
System accuracy ^{4), 5)}	±(0.3 % of reading + 2 °C)			
Repeatability ⁴⁾	±(0.1 % of reading + 1 °C)			
Temperature resolution (digital)	0.1 °C			
Response time ⁶⁾	1 ms (90 %)			
Emissivity/gain ²⁾	0.100 to 1.100			
Transmissivity 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/analog	0/4 to 20 mA, 0 to 5/10 V, thermocouple J, K; alarm			
Outputs/analog optional	relays: 2 x 60 VDC/42 VAC _{eff} ; 0.4 A; electrically isolated			
Alarm output	open collector (24 V / 50 A)			
Outputs/digital optional	USB, RS232, RS485, CAN, Profibus DP, Ethernet			
Output impedances	current output	mA max. 500 Ω (with 8 to 36 VDC)		
	voltage output	min. 100 kΩ load impedance, thermocouple 20 Ω		
Inputs	programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)			
Cable length	3 m			
Power supply	8 to 36 VDC; max. 100 mA			
Protection class	IP65 (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: 3 G, 11 to 200 Hz, any axis			
Shock sensor	IEC 68-2-27: 50 G, 11 ms, any axis			
Weight	sensor: 150 g; controller: 420 g			

¹⁾ 90 % energy

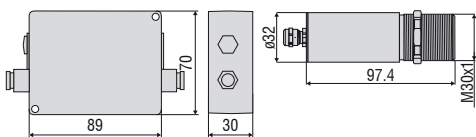
²⁾ adjustable via programming keys or software

³⁾ target temperature > sensor temperature + 25 °C

⁴⁾ ambient temperature: 23 ± 5 °C

⁵⁾ ε=1, response time 1 s

⁶⁾ with dynamic adaption at low signal levels



Product identification

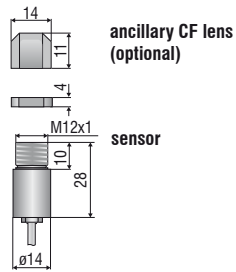
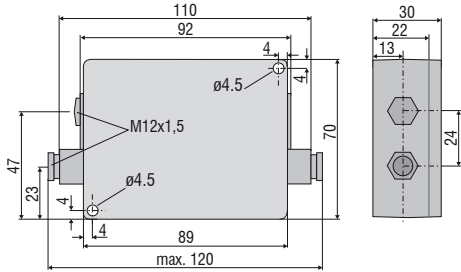
CTM-	3	SF100XL-	C3
		Cable length [3 m]	
		Focus [SF100 / SF300 / CF1 / CF2 / CF3 / CF4 / FF]	
		Spectral range [2.3 μm]	
thermoMETER CTM			

Accessories page 40 - 43

- Mounting bracket
- Air purge collar
- Digital-interface kits
- Certificate of calibration

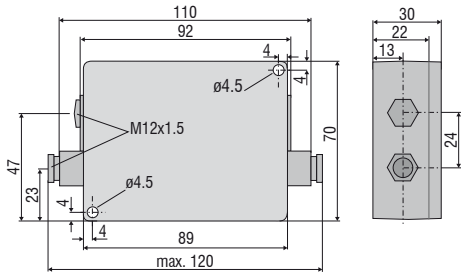
CT / CTfast / CTM1/M2/M3

controller

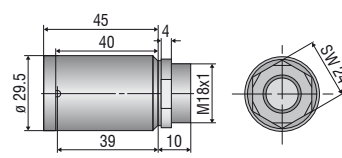


CThot / CTP-3 / CTP-7

controller

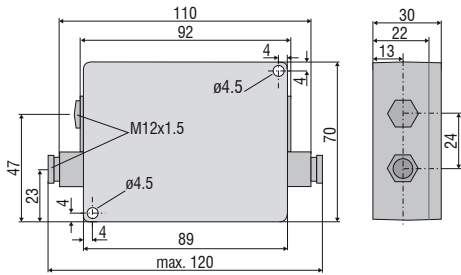


sensor with protective housing

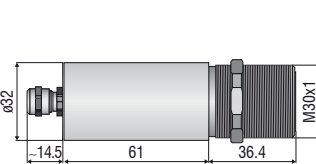


CTM3-XL

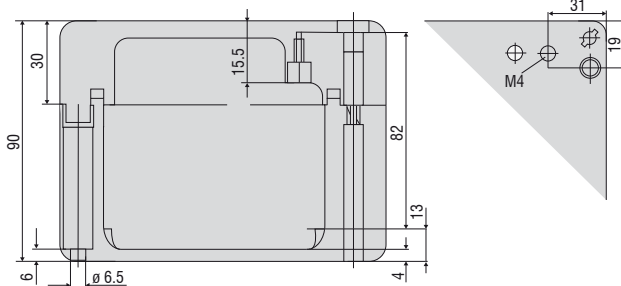
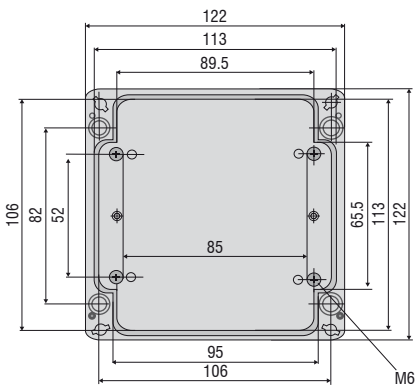
controller



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 20 mm
2970328	TM-ST40-CT	Reflection protection tube, length 40 mm
2970329	TM-ST88-CT	Reflection protection tube, length 88 mm
2970221	TM-LST-CT	Laser sighting aid for CT sensors incl. batteries (2xAlkaline AA)
2970300	TM-LSTOEM-CT	OEM laser sighting aid, 635 nm, 3.5 m cable, for connection to CT controller
2970300.008	TM-LSTOEM-CT(008)	OEM laser sighting aid, 635 nm, 8 m 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

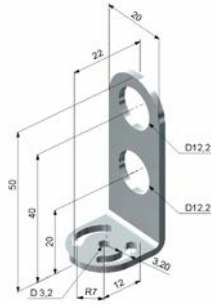
Interfaces		
Art. No.	Model	
2970223	TM-USBK-CT	USB interface kit: USB interface, USB cable, CompactConnect software, second cable gland for controller
2970224	TM-RS232K-CT	RS232 interface: RS232 interface, computer cable, CompactConnect software, second cable gland for controller
2970338	TM-RS485USBK-CTL	RS485-USB-adapter, incl. PC cable, CompactConnect 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), 250 kBaud, 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, 60 VDC/ 42 VAC _{eff} , 0.4 A

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



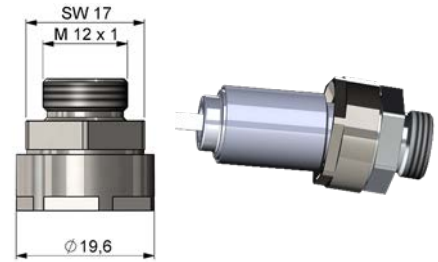
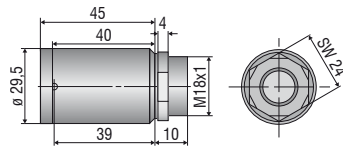
TM-FB2-CT Mounting bracket for sensor and laser sighting aid



TM-RAM-CT Right angle mirror



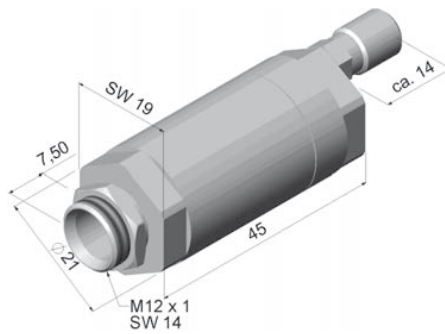
TM-MHS-CT Massive housing, stainless steel
 TM-MHA-CT Massive housing, aluminum
 TM-MHB-CT Massive housing, brass



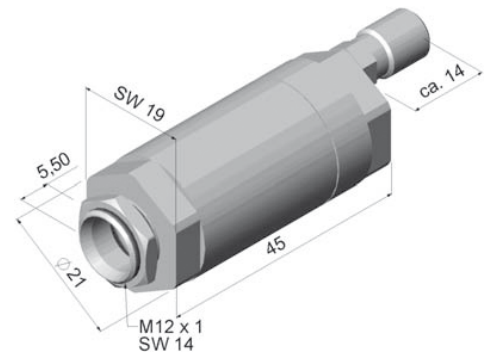
TM-TAS-CT Pivoted joint for CT sensors



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