



# More Precision

**thermoMETER**  
Non-contact IR temperature sensors





### thermoMETER CTlaserM1/M2

*Innovative precision infrared temperature sensor marking the actual spot size on your measurement target at any distance with 1/1.6  $\mu\text{m}$  wavelength for metal, ceramic and shiny targets*

- Measuring range from 250°C to 2200°C
- Special short wavelength (1/1.6 $\mu\text{m}$ ) minimises errors caused by low emissivity for accurate temperature measurements on metal, shiny and ceramic targets
- Cooling and protection accessories for harsh environmental conditions
- Real mapping of the actual spot size, with automatic laser protection
- Precision optics (300:1 / 150:1) with different models for a specific focus point
- Extreme small measurement spot down to 0.45mm, only 1ms response time to capture fast events
- Up to 85°C ambient temperature without cooling
- Fully programmable instrument for enhanced signal processing and I/O control
- Separate controller with easy accessible programming keys and multi colour LCD backlit display

### Optical specifications thermoMETER CTlaser M1/M2

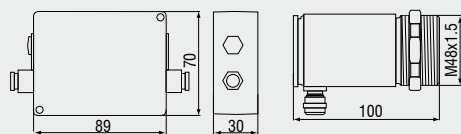
□ = smallest spot size (mm)

Standard Focus optics															
<b>1L/2L SF</b>	<b>150:1</b>	20	18.3	16.5	14.8	13	11.4	9.6	8.5	7.3	9.8	13.5	17.3	23.5	34.6
<b>1H/2H/H1 SF</b>	<b>300:1</b>	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															
<b>1L/2L CF2</b>	<b>150:1</b>	20	13.7	7.3	1	8	15	22	36	50	64	78	92		
<b>1H/2H/H1 CF2</b>	<b>300:1</b>	20	13.5	7	0.5	7.3	14	21	34.5	48.2	61.8	75.4	89		
<b>1L/2L CF3</b>	<b>150:1</b>	20	15.4	10.7	6	1.3	6.7	12	22.6	33.3	44	55	65		
<b>1H/2H/H1 CF3</b>	<b>300:1</b>	20	15.2	10.3	5.6	0.7	5.9	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															
<b>1L/2L CF4</b>	<b>150:1</b>	20	18.1	16.3	14.4	12.5	10.6	8.7	6.8	4.9	3	5.6	10.7	12.8	21
<b>1H/2H/H1 CF4</b>	<b>300:1</b>	20	18	16	13.8	11.8	9.7	7.6	5.6	3.5	1.4	3.8	8.6	13.3	18
distance in mm		0	50	100	150	200	250	300	350	400	450	500	600	700	800
Far Focus optics															
<b>1L/2L FF</b>	<b>150:1</b>	20	20.5	21	21.5	22	22.5	23	23.4	24	29	41	53.4	62.5	
<b>1H/2H/H1 FF</b>	<b>300:1</b>	20	19	18	17	16	15	14	13.4	12	16.5	24.4	33.4	40	
distance in mm		0	450	900	1350	1800	2250	2700	3000	3600	4000	5000	6000	6750	

## Product identification

CTLM - 1 L SF150 - C3

Cable length [3m Standard / 8m / 15m]  
 Focus [SF / CF2 / CF3 / CF4 / FF]  
 Temperature range [L / H / H1]  
 Spectral range [1  $\mu$ m / 1.6  $\mu$ m]  
 thermoMETER CTLaserM



Model	CTLM-1LSF150-C3	CTLM-1HSF300-C3	CTLM-1H1SF300-C3	CTLM-2LSF150-C3	CTLM-2HSF300-C3	CTLM-2H1SF300-C3
Optical resolution	150:1	300:1		150:1	300:1	
Temperature range <sup>1</sup>	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 $\mu$ m			1.6 $\mu$ m		
System accuracy <sup>2</sup>	$\pm(0.3\%$ of reading + 2°C)					
Repeatability <sup>2</sup>	$\pm(0.1\%$ of reading + 1°C)					
Temperature resolution	0.1°C	0.2°C		0.1°C	0.2°C	
Response time (90% signal) <sup>3</sup>	1ms					
Emissivity/gain <sup>1</sup>	0.100 to 1.100					
Transmissivity/gain <sup>1</sup>	0.100 to 1.000					
Signal processing <sup>1</sup>	Peak hold, valley hold, average; extended hold function with threshold and hysteresis					
Certificate of calibration	optional					
Outputs/analogue	channel 1 optional	0/4 to 20mA, 0 to 5/ 10V, thermocouple J, K relay: 2 x 60 VDC/ 42VAC <sub>eff</sub> ; 0.4A; optically isolated				
Alarm output		open-collector (24V/ 50mA)				
Outputs/digital	optional	USB, RS232, RS485, CAN, Profibus DP, Ethernet				
Output impedances	current output voltage output	mA max. 500 $\Omega$ (with 5 - 36VDC) mV min. 100k $\Omega$ load impedance thermocouple 20 $\Omega$				
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. 160mA				
Laser		class II (635nm), 1mW, ON/OFF via controller or software				
Environmental rating		IP 65 (NEMA-4)				
Ambient temperature		sensor: -20°C to 85°C (50°C if laser ON) controller: 0°C to 65°C				
Storage temperature		sensor: -40°C to 85°C controller: -40°C to 85°C				
Relative humidity		10 to 95%, non condensing				
Vibration	sensor	IEC 68-2-6: 3 G, 11-200Hz, any axis				
Shock	sensor	IEC 68-2-27: 50 G, 11ms, any axis				
Weight		sensor: 600g; controller: 420g				

<sup>1</sup> adjustable via controller or software<sup>2</sup> E=1, response time 1s;  $\pm$  ambient temperature: 23  $\pm$  5°C<sup>3</sup> with dynamic adaptation at low signal levels

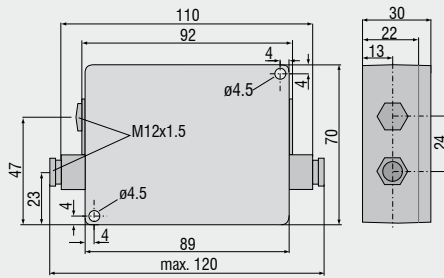
## Accessories page 22 - 23

- ▶ Mounting bracket
- ▶ Air purge collar
- ▶ Rail mount adapter for controller
- ▶ Water cooled housing
- ▶ Interface kit
- ▶ Software CompactConnect
- ▶ Certificate of calibration

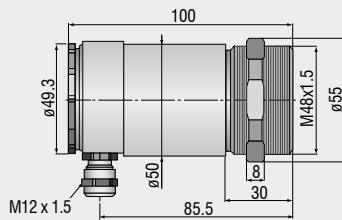


**LASER RADIATION**  
 DO NOT STARE IN THE BEAM  
 CLASS 2 LASER  
 EN60825-1:2002  
 $P \leq 1\text{mW}$ ;  $\lambda = 630\text{-}650\text{nm}$

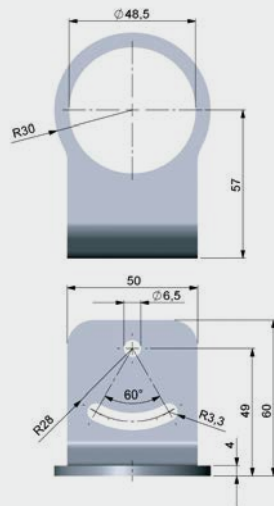
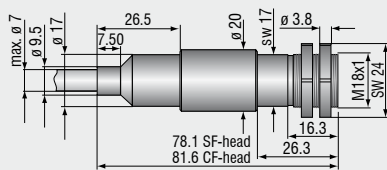
**Controller**



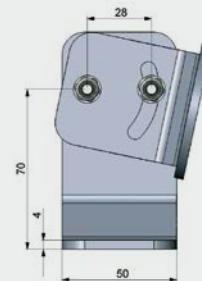
**CTLaser / CTLaserFAST / CTLaserGLASS / CTLaserM1/M2 / CTLaserM3 / CTLaserM5 / CTLaserCOMBUSTION**



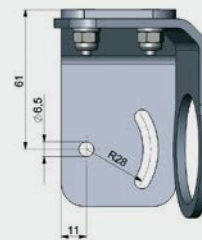
**CTratioM1**



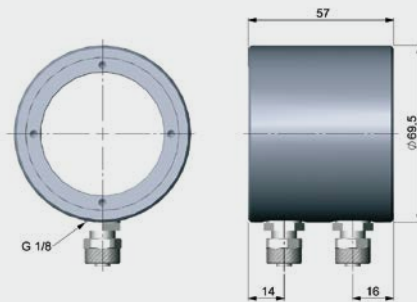
TM-FB-CTL Mounting bracket (fixed); included with CTL sensors



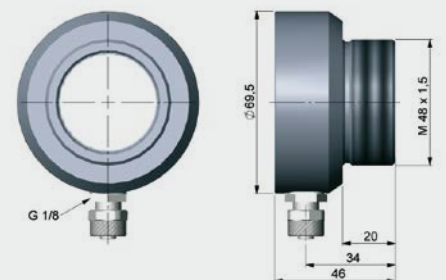
TM-AB-CTL Mounting bracket (adjustable)



TM-W-CTL Water cooled housing and air purge collar TM-AP-CTL, mounted on adjustable mounting bracket TM-AB-CTL



TM-W-CTL Water cooled housing



TM-AP-CTL Air purge collar

**Mechanical accessories**

Art. No.	Model	
2970238	TM-AB-CTL	Mounting bracket, adjustable, stainless steel
2970239	TM-AP-CTL	Air purge collar, stainless steel
2970240	TM-W-CTL	Water cooled housing, stainless steel, for ambient temperatures up to 175°C
2970241	TM-RAIL-CTL	Rail mount adapter for CTlaser controller
2970242	TM-COV-CTL	Closed cover for controller
2970243	TM-MN-CTL	Mounting nut, stainless steel (spare)
2970244	TM-FB-CTL	Mounting bracket, fixed, stainless steel (spare)
2970298	TM-A20UN-CTL	Screw adapter M48x1 on 20UN-2A screw including mounting nut

**High temperature accessories**

2970366	TM-J-CTL	Cooling jacket (length 228mm, ø89mm) (connection kit TM-CONK-CTL is required)
2970374	TM-CONK-CTL	Connection kit: sensor with axial cable exit, for integration in cooling jacket
2970368	TM-JAB-CTL	Adjustable mounting bracket for cooling jacket
2970369	TM-MF-CTL	Mounting flange M48x1.5 for TM-PF-CTL
2970370	TM-AST300-CTL	Sighting tube M48x1.5, 300 mm length
2970371	TM-PA-CTL	Pipe adapter M48x1.5
2970372	TM-RM-CTL	Furnace wall mount accessory for CTlaser (TM-MF-CTL, TM-AST300-CTL and TM-PA-CTL)
2970412	TM-PF-CTL	Pipe flange M48x1.5 for direct mounting a CTL sensor

**Calibration**

2970253	TM-CERT-CTL	Certificate of calibration
2970324	TM-HTCERT-CTL	Certificate of calibration for CTlaser M1-/M2-/M3-/M5-/G-sensors

**Interfaces**

2970245	TM-USBK-CTL	USB interface kit incl. computer cable, software CompactConnect
2970246	TM-RS232K-CTL	RS232 interface kit incl. computer cable, software CompactConnect
2970338	TM-RS485USBK-CTL	RS485-USB-adapter, incl. PC cable, RS485 board, software CTconnect, terminal block, for use with TM-485B-CTL
2970248	TM-RS485B-CTL	RS485 interface board
2970249	TM-CANK-CTL	CAN-Bus interface for optris CT/ protocol: CANopen Presettings: module address 20 (14H), 250kbaud, 0-60°C
2970250	TM-PFBDPK-CTL	Profibus-DPV1 interface for CT selectable with DIN M12 or SUB-D connection
2970251	TM-ETHNK-CTL	Ethernet-Kit: interface board, external Ethernet adapter, software CompactConnect
2970252	TM-RI-CTL	Relay interface: Two optically isolated relays, 60VDC/ 42VAC <sub>RMS</sub> , 0.4A

**Sensor cables and high temperature cables**

2970374	TM-CONK-CTL	Connector-Kit for cables with connector
4800254.003	TM-CB3C-CTL	Sensor cable with adapter (3m)
4800254.003H	TM-CB3HC-CTL	High-temperature sensor cable with adapter (3m)
4800254.008	TM-CB8C-CTL	Sensor cable with adapter (8m)
4800254.008H	TM-CB8HC-CTL	High-temperature sensor cable with adapter (8m)
4800254.015	TM-CB15C-CTL	Sensor cable with adapter (15m)
4800254.015H	TM-CB15HC-CTL	High-temperature sensor cable with adapter (15m)



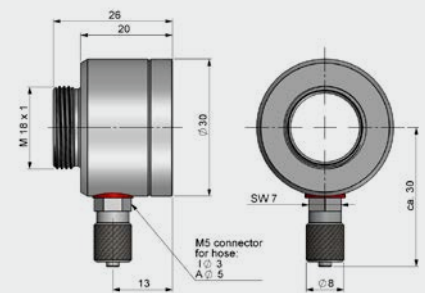
TM-J-CTL Cooling jacket (length 228mm, ø89mm) with adjustable mounting bracket TM-JAB-CTL; up to 315°C ambient temperature



TM-PF-CTL and TM-MF-CTL Mounting flange M48x1.5 for direct mounting a CTL sensor



TM-RM-CTL Furnace wall mount accessory for CTlaser / resp. CTratio: TM-MF-CTL, TM-PF-CTL, TM-AST300-CTL and TM-PA-CTL



TM-AP-CTR Air purge collar

**CTratio**

Art. No.	Model	
2970348	TM-FB-CTR	Mounting bracket, adjustable in one axis
2970395	TM-AP-CTR	Air purge collar
2970373	TM-RM-CTR	Furnace wall mount accessory for CTratio
2970351	TM-CERT-CTR	Certificate of calibration

## High performance sensors made by Micro-Epsilon



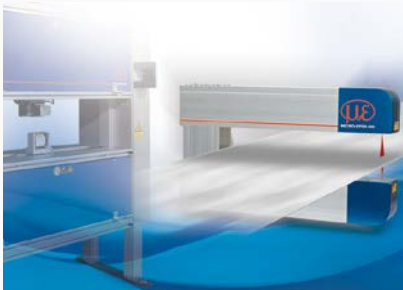
Sensors and systems for displacement and position



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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