



More Precision

thermoMETER // Non-contact infrared temperature sensors





thermoMETER CTLaserCOMBUSTION

Non-contact IR temperature sensor with laser sighting for measurements through flames and of flame gases in combustion processes from 200°C to 1450°C (optional up to 1650°C). The CTLC-4 is ideally suitable to monitor workpieces inside ovens, to measure inside chemical reactors and to inspect the brick temperature in combustion chambers.

- Measuring range 200°C to 1450°C
- Double laser marks exact spot size from 1.6mm
- Usable in all modern applications where "size of spot matters"
- Optical system 45:1 with selectable focus
- Up to 85°C ambient temperature without cooling
- Automatic laser switch-off at 50°C
- Cooling and protection accessories for harsh environmental conditions

Optical specifications thermoMETER CTLasercombustion

□ = smallest spot size / focal point (mm)

Standard Focus

| | | | | | | | | | | | | | | | | | |
|----------------|------|----|------|------|------|------|------|-----|------|------|------|------|------|------|------|--|--|
| SF45 lens | 45:1 | 20 | 20.8 | 21.7 | 22.5 | 23.4 | 24.2 | 25 | 25.9 | 26.7 | 32.5 | 38.4 | 50.1 | 61.7 | 73.4 | | |
| distance in mm | | 0 | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 | 2100 | 2400 | | |

Close Focus

| | | | | | | | | | | | | | | | | | |
|----------------|------|----|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|------|-------|
| CF1 lens | 45:1 | 20 | 9.5 | 6.9 | 1.6 | 10.9 | 26.3 | 41.7 | 57.1 | 72.6 | 88 | 103.4 | 118.9 | 134.3 | 165.1 | 196 | 226.9 |
| CF2 lens | 45:1 | 20 | 15.6 | 14.5 | 12.3 | 8.9 | 3.4 | 11.2 | 19 | 26.8 | 34.6 | 42.4 | 50.2 | 58 | 73.6 | 89.2 | 104.8 |
| CF3 lens | 45:1 | 20 | 16.9 | 16.1 | 14.6 | 12.3 | 8.4 | 4.5 | 10.6 | 16.8 | 22.9 | 29 | 35.1 | 41.3 | 53.5 | 65.8 | 78 |
| CF4 lens | 45:1 | 20 | 19.1 | 18.9 | 18.4 | 17.8 | 16.7 | 15.6 | 14.4 | 13.3 | 12.2 | 11.1 | 10 | 13.3 | 20 | 26.7 | 33.3 |
| distance in mm | | 0 | 40 | 50 | 70 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |

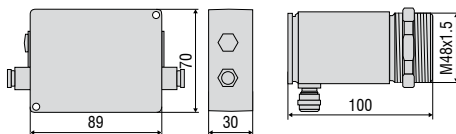
| Model | CTLC-4SF45-C3 | CTLC-2SF45-C3 | CTLC-6SF45-C3 |
|---|---|--|---|
| Optical resolution | 45:1 | 45:1 | 45:1 |
| Temperature range ¹ | 200°C to 1450°C (optional 400°C to 1650°C) | | |
| Spectral range | 3.9μm | 4.24μm | 4.64μm |
| Fields of application | through flames to monitor workpieces inside ovens, to measure inside chemical reactors, to observe the brick temperature in combustion chambers | CO ₂ flame gases in combustion processes, garbage burning or processes inside chemical reactors | CO flame gases in combustion processes, garbage burning or processes inside chemical reactors |
| System accuracy ^{3,4} | ±1% | | |
| Repeatability ³ | ±0.5% or ±0.5°C | | |
| Temperature resolution (digital) | 0.1°C | | |
| Response time (90% signal) ² | 10ms | | |
| Emissivity/gain ¹ | 0.100 to 1.100 | | |
| Transmissivity/gain ¹ | 0.100 to 1.000 | | |
| Signal processing ¹ | peak hold, valley hold, average; extended hold function with threshold and hysteresis | | |
| Outputs/analog | channel 1 | 0/4 to 20mA, 0 to 5/10V; thermocouple J, K | |
| | channel 2 | sensor temperature (-20°C to 180°C as 0 to 5V/10V), alarm output | |
| Alarm output | open collector (24V / 50A) | | |
| Optional | relays: 2 x 60VDC/42 VAC _{eff} ; 0.4A; electrically isolated | | |
| Outputs/digital | optional | USB, RS232, RS485, CAN, Profibus DP, Ethernet | |
| Output impedances | current output | mA max. 500Ω (with 8 to 36VDC) | |
| | voltage output | mV min. 100kΩ load impedance, thermocouple 20Ω | |
| Inputs | programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger | | |
| Cable length | 3m (standard), 8m, 15m | | |
| Power supply | 8 to 36VDC; max. 160mA | | |
| Laser | class II (635nm), 1mW, ON/OFF via controller or software | | |
| Protection class | IP65 (NEMA-4) | | |
| Ambient temperature | sensor: -20°C to 85°C (50°C if Laser ON); controller: 0°C to 85°C | | |
| Storage temperature | -40°C to 85°C | | |
| Relative humidity | 10 to 95%, non-condensing | | |
| Vibration | IEC 68-2-6: 3 G, 11 to 200Hz, any axis | | |
| Shock | IEC 68-2-27: 50 G, 11ms, any axis | | |
| Weight | sensor: 600g; controller: 420g | | |

¹ adjustable via programming keys or software

² with dynamic adaption at low signal levels

³ ambient temperature 23±5°C; whichever is greater; object temperature ≥ 0°C

⁴ ε = 1, response time 1s



Product identification

| | | | |
|--|---|-------|----|
| CTLC - | 4 | SF45- | C3 |
| Cable length [3m (standard) / 8m / 15m] | | | |
| Focus [SF45 / CF1 / CF2 / CF3 / CF4] | | | |
| Spectral range [4 = 3.9μm / 2 = 4.24μm / 6 = 4.64μm] | | | |
| thermoMETER CTLaserCOMBUSTION | | | |

Accessories page 20 - 21

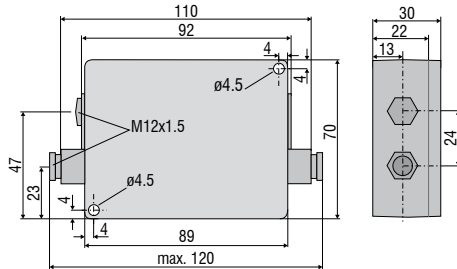
- Mounting bracket
- Air purge collar
- Rail mount adapter for controller
- Water cooled housing
- Interface kit
- Certificate of calibration



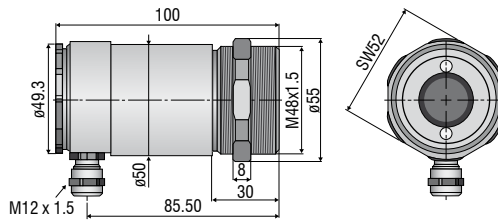
LASER LIGHT
DO NOT STARE INTO BEAM
CLASS 2 LASER
DIN EN 60825-1:2007
1mW / 630-650nm

CTLaser / CTLaserFAST / CTLaserGLASS / CTLaserM1/M2/M3/M5 / CTLaserCOMBUSTION

Controller

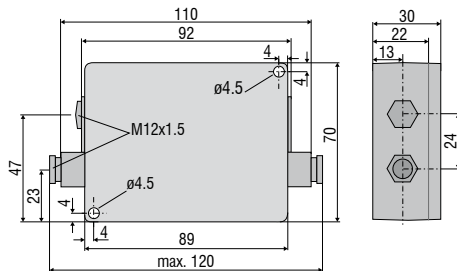


Sensor

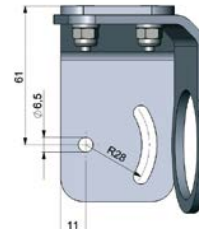
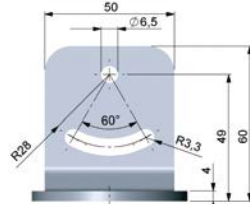
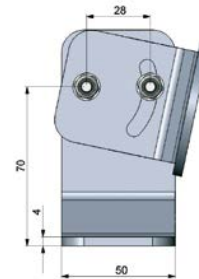
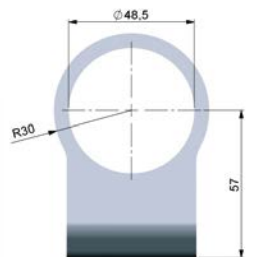
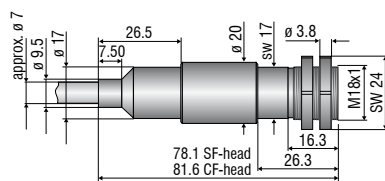


CTratioM1

Controller

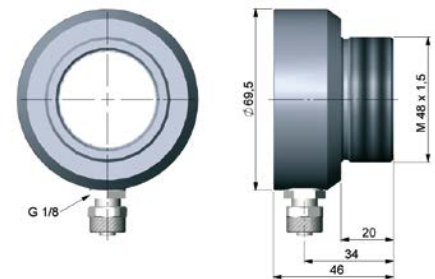
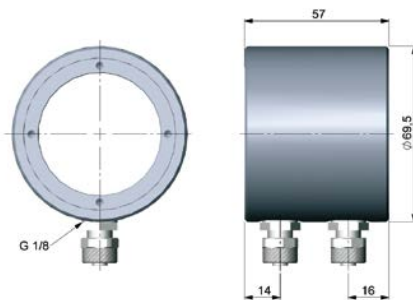


Sensor



TM-FB-CTL Mounting bracket (fixed); included in CTL scope of supply

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 M48x1.5 on 20UN-2A screw including mounting nut |

| High temperature accessories | | |
|------------------------------|---------------|---|
| Art. No. | Model | |
| 2970366 | TM-J-CTL | Cooling jacket (length 228mm, ø89mm) (conversion kit TM-CONK-CTL is required) |
| 2970374 | TM-CONK-CTL | Conversion kit for CTL on 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 | Reflection protection tube M48x1.5, 300mm length |
| 2970371 | TM-PA-CTL | Pipe adapter M48x1.5 |
| 2970372 | TM-RM-CTL | Furnace wall mount accessory for CTL (TM-MF-CTL, TM-AST300-CTL and TM-PA-CTL) |
| 2970412 | TM-PF-CTL | Pipe flange M48x1.5 for directly mounting a CTL sensor |
| 2970487 | TM-CJA-CTL | Cooling Jacket Advanced - universal cooling jacket for CSLaser, CTLaser and CTVideo / CSVideo up to 315°C |

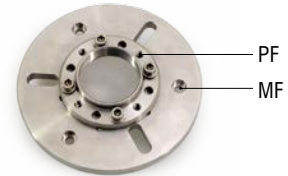
| Calibration | | |
|-------------|---------------|--|
| Art. No. | Model | |
| 2970253 | TM-CERT-CTL | Certificate of calibration |
| 2970324 | TM-HTCERT-CTL | Certificate of calibration for CTLaser M1-/M2-/M3-/M5-/G-sensors |

| Interfaces | | |
|------------|------------------|---|
| Art. No. | Model | |
| 2970245 | TM-USBK-CTL | USB interface, computer cable, CompactConnect software second cable gland for controller |
| 2970246 | TM-RS232K-CTL | 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-CTL |
| 2970248 | TM-RS485B-CTL | RS485 interface board incl. second cable gland |
| 2970249 | TM-CANK-CTL | CAN-Bus interface; protocol: CANopen Presets: module address20 (14H), 250kbaud, 0-60°C |
| 2970250 | TM-PFBDPK-CTL | Profibus-DPV1 interface with plug-in connection |
| 2970251 | TM-ETHNK-CTL | Ethernet-Kit: interface board, external Ethernet adapter, CompactConnect software, second cable gland |
| 2970252 | TM-RI-CTL | Relay interface: two electrically isolated relays, 60VDC/ 42VAC _{eff} 0.4A |

| Sensor cables and high temperature cables for CTLaser | | |
|---|---------------|--|
| Art. No. | Model | |
| 2970374 | TM-CONK-CTL | Connector-Kit for cables with connector |
| 4800254.003 | TM-CB3C-CTL | Sensor cable with connector (3m) |
| 4800254.003H | TM-CB3HC-CTL | High-temperature sensor cable (up to 180°C) with connector (3m) |
| 4800254.008 | TM-CB8C-CTL | Sensor cable with connector (8m) |
| 4800254.008H | TM-CB8HC-CTL | High-temperature sensor cable (up to 180°C) with connector (8m) |
| 4800254.015 | TM-CB15C-CTL | Sensor cable with connector (15m) |
| 4800254.015H | TM-CB15HC-CTL | High-temperature sensor cable (up to 180°C) with connector (15m) |



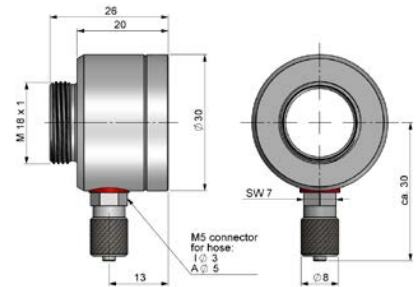
TM-J-CTL Cooling jacket (length 228mm, ø 89mm) with adjustable mounting bracket TM-JAB-CTL; suitable for ambient temperatures up to 180°C



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



TM-RM-CTL Furnace wall mount accessory for CTLaser / 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, stainless steel, adjustable in one axis |
| 2970395 | TM-AP-CTR | Air purge collar, stainless steel |
| 2970373 | TM-RM-CTR | Furnace wall mount |
| 2970351 | TM-CERT-CTR | Certificate of calibration |

Further IR temperature measurement devices from Micro-Epsilon



thermoIMAGER TIM
Compact USB thermal imaging cameras
for precise thermography



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



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