



More Precision

thermoMETER // Non-contact IR temperature sensors





thermoMETER CTLaserM1/M2

Non-contact IR temperature sensor with laser sighting for metal processing

- Measuring range 250°C up to 2200°C
- 1μm/1.6μm measuring wavelength for accurate temperature measurements in difficult emissivity conditions
- Response time of 1ms
- Double laser marks exact spot size from 0.45mm
- For metal processing and measurements of metal oxides and ceramics
- Optical resolution 300:1 and 150:1 with selectable focus
- Up to 85°C ambient temperature without cooling, automatic laser switch-off at 50°C, up to 315°C with water cooled housing
- Selectable and scalable analog output, optional digital interfaces

Optical specifications thermoMETER CTLaserM1/M2

□ = smallest spot size (mm)

Standard Focus

| | | | | | | | | | | | | | | | |
|---------------|-------|----|------|------|------|-----|------|-----|------|------|------|------|------|------|------|
| 1L/2L SF | 150:1 | 20 | 18.3 | 16.5 | 14.8 | 13 | 11.4 | 9.6 | 8.5 | 7.3 | 9.8 | 13.5 | 17.3 | 23.5 | 30 |
| 1H/2H/H1 SF | 300:1 | 12 | 10.9 | 9.8 | 8.6 | 7.5 | 6.3 | 5.2 | 4.5 | 3.7 | 5.1 | 7.3 | 9.4 | 13 | 16.6 |
| distance (mm) | | 0 | 150 | 300 | 450 | 600 | 750 | 900 | 1000 | 1100 | 1200 | 1350 | 1500 | 1750 | 2000 |

Close Focus

| | | | | | | | | | | | | | | | |
|---------------|-------|----|------|------|-----|-----|-----|-----|------|------|------|------|------|--|--|
| 1L/2L CF2 | 150:1 | 20 | 13.7 | 7.3 | 1 | 8 | 15 | 22 | 36 | 50 | 64 | 78 | 92 | | |
| 1H/2H/H1 CF2 | 300:1 | 12 | 8.2 | 4.4 | 0.5 | 4.6 | 8.9 | 13 | 21.4 | 30 | 38 | 46.4 | 54.8 | | |
| 1L/2L CF3 | 150:1 | 20 | 15.4 | 10.7 | 6 | 1.3 | 6.7 | 12 | 22.6 | 33.3 | 44 | 55 | 65 | | |
| 1H/2H/H1 CF3 | 300:1 | 12 | 9.2 | 6.4 | 3.6 | 0.7 | 3.9 | 7.1 | 13.4 | 19.8 | 26.1 | 32.5 | 38.8 | | |
| distance (mm) | | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 400 | 500 | 600 | 700 | 800 | | |

Close Focus

| | | | | | | | | | | | | | | | |
|---------------|-------|----|------|------|------|------|------|-----|-----|-----|-----|-----|------|------|-----|
| 1L/2L CF4 | 150:1 | 20 | 18.1 | 16.3 | 14.4 | 12.5 | 10.6 | 8.7 | 6.8 | 4.9 | 3 | 5.6 | 10.7 | 15.8 | 21 |
| 1H/2H/H1 CF4 | 300:1 | 12 | 10.9 | 9.7 | 8.5 | 7.4 | 6.2 | 5 | 3.9 | 2.7 | 1.5 | 3 | 6 | 9 | 12 |
| distance (mm) | | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |

Far Focus

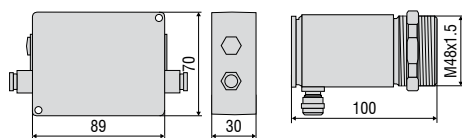
| | | | | | | | | | | | | | | | |
|---------------|-------|----|------|-----|------|------|------|------|------|------|------|------|------|------|--|
| 1L/2L FF | 150:1 | 20 | 20.5 | 21 | 21.5 | 22 | 22.5 | 23 | 23.4 | 24 | 29 | 41 | 53.4 | 62.5 | |
| 1H/2H/H1 FF | 300:1 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 14.7 | 21.3 | 28 | 33 | |
| distance (mm) | | 0 | 450 | 900 | 1350 | 1800 | 2250 | 2700 | 3000 | 3600 | 4000 | 5000 | 6000 | 6750 | |

| 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 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 | 1µm | | | 1.6µm | | |
| System accuracy ² | ±(0.3% of reading + 2°C) | | | | | |
| Repeatability ² | ±(0.1% of reading + 1°C) | | | | | |
| Temperature resolution | 0.1°C | 0.2°C | | 0.1°C | 0.2°C | |
| Response time (90% signal) ³ | 1ms | | | | | |
| 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 | | | | | |
| Certificate of calibration | optional | | | | | |
| Outputs/analog | channel 1 | 0/4 to 20mA, 0 to 5/10V, thermocouple J, K | | | | |
| Outputs/analog | optional | relay: 2 x 60VDC / 42VAC; 0.4A; electrically isolated | | | | |
| Alarm output | | open - collector (24V/ 50mA) | | | | |
| Outputs/digital | optional | USB, RS232, RS485, CAN, Profibus DP, Ethernet | | | | |
| Output impedances | current output | mA max. 500Ω (with 5 - 36VDC) | | | | |
| | voltage output | mV 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. 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 with Laser ON) controller: 0°C to 85°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 | | | | |

¹ Adjustable via controller or software

² ε = 1, response time 1s; at ambient temperature: 23 ± 5°C

³ with dynamic adaption at low signal levels



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 [1µm / 1.6µm] | |
| thermoMETER CTLaserM | | | | |

Accessories page 20 - 21

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



| 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 for CTLaser | | |
|--|---------------|---|
| 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 |

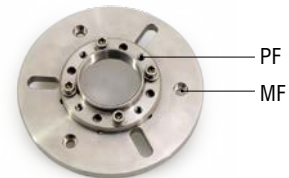
| Calibration | | |
|-------------|---------------|--|
| 2970253 | TM-CERT-CTL | Certificate of calibration |
| 2970324 | TM-HTCERT-CTL | Certificate of calibration for CTLaser M1-/M2-/M3-/M5-/G-sensors |

| Interfaces | | |
|------------|------------------|---|
| 2970245 | TM-USBK-CTL | USB interface, computer cable, software CompactConnect second cable gland for controller |
| 2970246 | TM-RS232K-CTL | RS232 interface, computer cable, software CompactConnect second cable gland for controller |
| 2970338 | TM-RS485USBK-CTL | RS485-USB-adapter, incl. PC cable, Software CompactConnect 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 Presettings: module address20 (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, 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 | | |
|---|---------------|--|
| 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 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) |



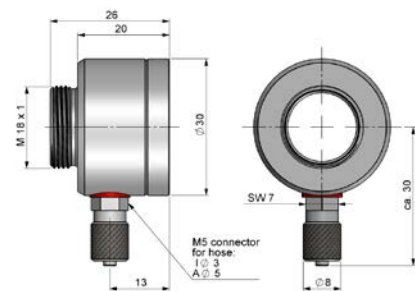
TM-J-CTL cooling jacket (length 228mm, ø 89mm) with adjustable mounting bracket TM-JAB-CTL; suitable for ambient temperatures up to 180°C



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, stainless steel |
| 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/CSVVideo
IR temperature sensors with crosshair laser
sighting and video output



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