



# More Precision

**thermoMETER** // Non-contact infrared temperature sensors





### thermoMETER CTM3

Miniaturized temperature sensor with  $2.3 \mu\text{m}$  measuring wavelength for measurements from  $50 \text{ }^\circ\text{C}$

- Measuring range from  $50 \text{ }^\circ\text{C}$  to  $1800 \text{ }^\circ\text{C}$
- Up to  $85 \text{ }^\circ\text{C}$  ambient temperature without cooling
- For metal and composite processing
- 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 CTM3

□ = smallest spot size / focal point (mm)

##### Standard Focus

|                |      |     |      |      |      |      |      |      |      |      |  |
|----------------|------|-----|------|------|------|------|------|------|------|------|--|
| 3SF22          | 22:1 | 6.5 | 14.4 | 22.3 | 30.2 | 38.1 | 46   | 55.1 | 65.4 | 75.7 |  |
| 3SF33          | 33:1 | 6.5 | 11.8 | 17   | 22.3 | 27.5 | 32.8 | 38   | 43.3 | 48.5 |  |
| 3SF75H1/H2/H3  | 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)

|                |      |     |     |     |     |     |      |      |      |      |      |
|----------------|------|-----|-----|-----|-----|-----|------|------|------|------|------|
| 3CF22          | 22:1 | 6.5 | 6   | 5.4 | 5   | 9.2 | 14.4 | 19.6 | 24.9 | 30.1 | 35.3 |
| 3CF33          | 33:1 | 6.5 | 5.4 | 4.2 | 3.4 | 7   | 11.5 | 16   | 20.5 | 25   | 29.5 |
| distance in mm |      | 0   | 40  | 80  | 110 | 150 | 200  | 250  | 300  | 350  | 400  |

##### Close Focus (integrated CF lens)

|                |      |     |     |     |     |     |      |      |     |      |  |
|----------------|------|-----|-----|-----|-----|-----|------|------|-----|------|--|
| 3CF75H1/H2/H3  | 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-3SF22-C3  | CTM-3SF33-C3   | CTM-3SF75H1-C3 | CTM-3SF75H2-C3 | CTM-3SF75H3-C3 |
|-------------------------------------|---|--|----------------|----------------|----------------|
| Optical resolution <sup>1)</sup>    | 22:1  | 33:1   | 75:1           | 75:1           | 75:1           |
| Temperature range <sup>2), 3)</sup> | 50 to 400 °C  | 100 to 600 °C  | 150 to 1000 °C | 200 to 1500 °C | 250 to 1800 °C |
| Spectral range                      | 2.3 μm  |  |                |                |                |
| System accuracy <sup>4), 5)</sup>   | ±(0.3 % of reading + 2 °C)  |  |                |                |                |
| Repeatability <sup>4)</sup>         | ±(0.1 % of reading + 1 °C)  |  |                |                |                |
| Temperature resolution (digital)    | 0.1 °C  |  |                |                |                |
| Response time <sup>6)</sup>         | 1 ms (90 %)   |  |                |                |                |
| Emissivity/gain <sup>2)</sup>       | 0.100 to 1.100  |  |                |                |                |
| Transmissivity <sup>2)</sup>        | 0.100 to 1.100  |  |                |                |                |
| Signal processing <sup>2)</sup>     | peak hold, valley hold, average; extended hold function with threshold and hysteresis |  |                |                |                |
| Certificate of calibration          | optional  |  |                |                |                |
| Outputs/analog                      | channel 1   | 0/4 to 20 mA, 0 to 5/10 V, thermocouple J, K   |                |                |                |
| Outputs/analog                      | optional  | relays: 2 x 60 VDC/42 VAC <sub>eff</sub> ; 0.4 A; electrically isolated  |                |                |                |
| Alarm output                        |   | open collector (24 V / 50 A)   |                |                |                |
| Outputs/digital                     | optional  | USB, RS232, RS485, Modbus RTU, 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: 40 g; controller: 420 g  |                |                |                |

<sup>1)</sup> 90 % energy

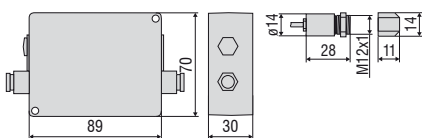
<sup>2)</sup> adjustable via programming keys or software

<sup>3)</sup> target temperature > sensor temperature + 25 °C

<sup>4)</sup> ambient temperature: 23 ± 5 °C

<sup>5)</sup> ε=1, response time 1 s

<sup>6)</sup> with dynamic adaption at low signal levels



### Product identification

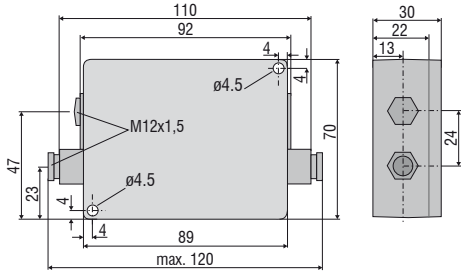
|                 |   |   |    |
|-----------------|---|---|----|
| CTM-            | 3 | SF22-   | C3 |
|                 |   | Cable length [3 m]                              |    |
|                 |   | Focus [SF22 / SF33 / SF75 / CF22 / CF33 / CF75] |    |
|                 |   | Spectral range [2.3 μm]                         |    |
| thermoMETER CTM |   |   |    |

### Accessories page 40 - 43

- Protective window
- Rail mount adapter for controller
- Mounting bracket / mounting bolt
- Massive housing
- Air purge collar
- Protective tube
- Right angle mirror
- Laser sighting aid
- Digital-interface kits
- Certificate of calibration

**CT / CTfast / CTM1/M2/M3**

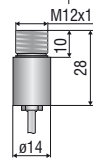
**controller**



**ancillary CF lens (optional)**

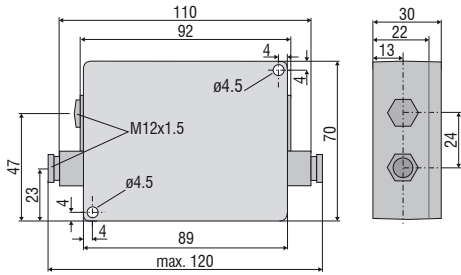


**sensor**

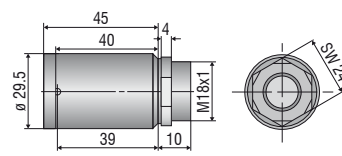


**CThot / CTP-3 / CTP-7**

**controller**

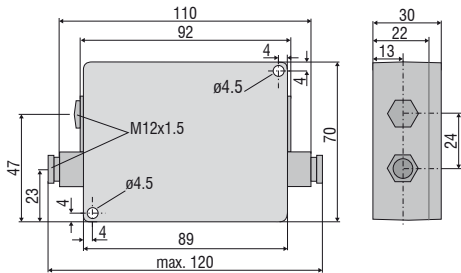


**sensor with protective housing**

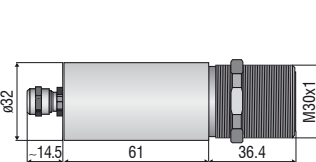


**CTM3-XL**

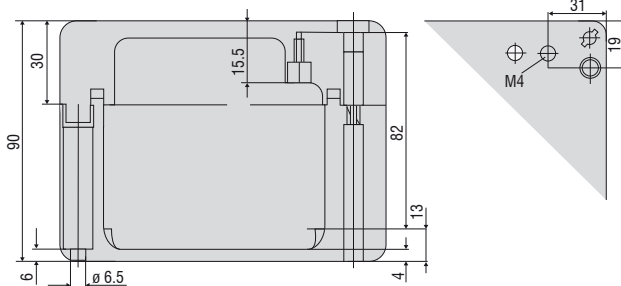
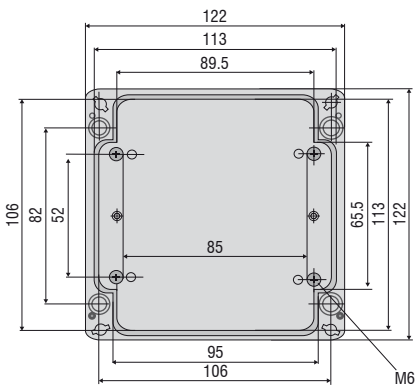
**controller**



**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  |
| 2970463                | TM-TAS-CT         | Pivoted joint for CT sensors  |
| 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-MHSFC-CT       | Massive housing made from stainless steel with integrated ancillary CF lens                             |
| 2970358                | TM-MHSFCFH-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   |
| 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                              |

| 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 |

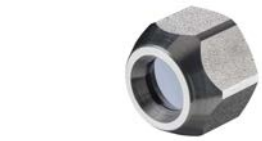
| Interfaces |                  |   |
|------------|------------------|---|
| Art. No.   | Model            |   |
| 2970729    | TM-USBK-CT       | USB-Interface-board, cable with Micro-USB plug and adapter for USB-C and USB-A, CompactConnect software (as download), Quick reference, second cable gland 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 <sub>eff</sub> , 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-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 axisTM-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-KF40GE-CT KF40 Flange with Ge window  
TM-KF40B270-CT KF40 Flange for CTM-1,-2,-3  
with B270 windowTM-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)



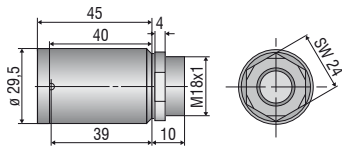
TM-FB2-CT  
Mounting bracket for sensor and laser sighting aid



TM-RAM-CT  
Right angle mirror



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



TM-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

## Infrared thermal imagers from Micro-Epsilon



### thermoIMAGER TIM Compact thermal imaging cameras for industrial temperature monitoring

- Temperature range from -20 °C to 2450 °C
- Ideal for OEM
- Real-time thermography using license-free software
- Protective housing for harsh environments
- Special variants for the glass, metal and plastics industries