More Precision

 thermoMETER // Non-contact infrared temperature sensors
Non-contact infrared pyrometer for high speed measurements

**thermoMETER CTfast**

IR temperature sensor with extremely short response time
- Measuring range from -50 °C to 975 °C
- One of the smallest infrared sensors worldwide with extremely short response times from 3 ms (50 % signal) to 6 ms (90 % signal)
- Up to 120 °C ambient temperature without cooling
- Fast and scalable analog output with intelligent real-time data processing
- Separate controller with programming keys and backlit display

**Optical specifications thermoMETER CTfast**

$\varnothing =$ smallest spot size / focal point (mm)

<table>
<thead>
<tr>
<th>Standard Focus</th>
<th>SF15</th>
<th>SF25</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15:1</td>
<td>25:1</td>
</tr>
<tr>
<td>distance in mm</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>11.6</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>16.6</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>21.7</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>26.7</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>43.3</td>
<td>24</td>
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<tr>
<td></td>
<td>51.6</td>
<td>28</td>
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<td></td>
<td>59.9</td>
<td>32</td>
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<td></td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>44</td>
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</table>

<table>
<thead>
<tr>
<th>Close Focus (with optionally available CF lens)</th>
<th>CF15</th>
<th>CF25</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15:1</td>
<td>25:1</td>
</tr>
<tr>
<td>distance in mm</td>
<td>7</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>3.9</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>0.8</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>4.7</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>8.6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>12.5</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>16.4</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>20.3</td>
<td>15.4</td>
</tr>
<tr>
<td></td>
<td>24.2</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28.5</td>
</tr>
</tbody>
</table>

<p>|                | 0    |      |
|                | 5    | 4    |
|                | 10   | 8    |
|                | 15   | 12   |
|                | 20   | 16   |
|                | 25   | 20   |
|                | 30   | 25   |
|                | 35   | 30   |
|                | 40   |      |</p>
<table>
<thead>
<tr>
<th>Model</th>
<th>CTF-SF15-C3</th>
<th>CTF-SF25-C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical resolution</td>
<td>15:1</td>
<td>25:1</td>
</tr>
<tr>
<td>Temperature range ¹)</td>
<td>-50 °C to 975 °C</td>
<td></td>
</tr>
<tr>
<td>Spectral range</td>
<td>8 to 14 µm</td>
<td></td>
</tr>
<tr>
<td>System accuracy ²)</td>
<td>±1 % or ±2 °C</td>
<td>±0.75 % or ±0.75 °C</td>
</tr>
<tr>
<td>Repeatability ²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature resolution ³)</td>
<td>0.2 °C</td>
<td>0.4 °C</td>
</tr>
<tr>
<td>Response time ³)</td>
<td>9 ms (90 %) at analog output</td>
<td>6 ms (90 %) at analog output; 3 ms (50 %) at digital output</td>
</tr>
<tr>
<td>Emissivity/gain ³)</td>
<td>0.100 to 1.100</td>
<td></td>
</tr>
<tr>
<td>Transmissivity/gain ³)</td>
<td>0.100 to 1.100</td>
<td></td>
</tr>
<tr>
<td>Signal processing ³)</td>
<td>peak hold, valley hold, average; extended hold function with threshold and hysteresis</td>
<td></td>
</tr>
<tr>
<td>Certificate of calibration</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>Outputs/analog</td>
<td>0/4 to 20 mA, 0 to 5/10 V, thermocouple J, K</td>
<td></td>
</tr>
<tr>
<td>Alarm output</td>
<td>open collector (24 V / 50 A)</td>
<td></td>
</tr>
<tr>
<td>Outputs/digital</td>
<td>standard: 0/10 V (10 mA); optional: relays 2 x 60 VDC/42 VAC; 0.4 A, electrically isolated</td>
<td></td>
</tr>
<tr>
<td>Digital Interface</td>
<td>optional USB, RS232, RS485, Modbus RTU, Profinet DP, Ethernet</td>
<td></td>
</tr>
<tr>
<td>Output impedances</td>
<td>current output mA max. 500 Q (with 8 to 36 VDC)</td>
<td>min. 100 kΩ load impedance, thermocouple 20 Q</td>
</tr>
<tr>
<td>Inputs</td>
<td>programmable functional inputs for external emissivity adjustment</td>
<td>ambient temperature compensation, trigger (reset of hold functions)</td>
</tr>
<tr>
<td>Cable length</td>
<td>1 m, 3 m (standard), 8 m, 15 m</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>8 to 36 VDC; max. 100 mA</td>
<td></td>
</tr>
<tr>
<td>Protection class</td>
<td>IP65 (NEMA-4)</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>sensor: -20 °C to 120 °C; controller: 0 °C to 85 °C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>sensor: -40 °C to 120 °C; controller: -40 °C to 85 °C</td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10 to 95 %, non-condensing</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>sensor IEC 68-2-6: 3 G, 11-200 Hz, any axis</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>sensor IEC 68-2-27: 50 G, 11 ms, any axis</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>sensor: 40 g; controller: 420 g</td>
<td></td>
</tr>
</tbody>
</table>

¹) adjustable via programming keys or software
²) ambient temperature 23 ±5 °C, whichever is greater with dynamic noise compression
³) temperature of the object ≥ 20 °C
⁴) with dynamic adaption at low signal levels
⁵) with time constant of 100 ms with adaptive averaging T_{obj} 25 °C

Product identification

<table>
<thead>
<tr>
<th>CTF</th>
<th>SF15-C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>1 m / 3 m (standard) / 8 m / 15 m</td>
</tr>
<tr>
<td>Focus</td>
<td>SF15 / SF25</td>
</tr>
</tbody>
</table>

 thermoMETER CTfast

Accessories page 40 - 43
- Ancillary CF lens
- Protective window
- Mounting bracket / mounting bolt
- Air purge collar
- Right angle mirror
- Rail mount adapter for controller
- Massive housing
- Protective tube
- Laser sighting aid
- Digital-interface kits
- Certificate of calibration
Dimensions of CT series thermoMETER

CT / CTfast / CTM1/M2/M3

CThot / CTP-3 / CTP-7

CTM3-XL

CTex
### Accessories and Software of CT series

#### Mechanical accessories

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2970203</td>
<td>TM-FB-CT</td>
<td>Mounting bracket, fixed</td>
</tr>
<tr>
<td>2970325</td>
<td>TM-FB2-CT</td>
<td>Mounting bracket, adjustable in one axis, for simultaneous assembly of CT sensor and laser sighting aid</td>
</tr>
<tr>
<td>2970336</td>
<td>TM-FBMH-CT</td>
<td>Mounting bracket, adjustable in one axis, for massive housing</td>
</tr>
<tr>
<td>2970204</td>
<td>TM-AB-CT</td>
<td>Mounting bracket, adjustable in 2 axes</td>
</tr>
<tr>
<td>2970205</td>
<td>TM-MB-CT</td>
<td>Mounting bolts with M12x1 thread</td>
</tr>
<tr>
<td>2970206</td>
<td>TM-MG-CT</td>
<td>Mounting fork, adjustable in 2 axes, with M12x1 fastening</td>
</tr>
<tr>
<td>2970207</td>
<td>TM-AP-CT</td>
<td>Air purge collar for sensors from 10:1 lens</td>
</tr>
<tr>
<td>2970208</td>
<td>TM-AP2-CT</td>
<td>Air purge collar for sensor with 2:1 lens</td>
</tr>
<tr>
<td>2970209</td>
<td>TM-APL-CT</td>
<td>Air purge collar, laminar</td>
</tr>
<tr>
<td>2970210</td>
<td>TM-APLCF-CT</td>
<td>Air purge collar, laminar with integrated auxiliary CF lens</td>
</tr>
<tr>
<td>2970357</td>
<td>TM-APLCFH-CT</td>
<td>Air purge collar, laminar with integrated auxiliary CF lens for M1/M2/M3/M5 sensors</td>
</tr>
<tr>
<td>2970358</td>
<td>TM-APMH-CT</td>
<td>Air purge collar made from stainless steel for massive housing</td>
</tr>
<tr>
<td>2970463</td>
<td>TM-TAS-CT</td>
<td>Pivot joint for CT sensors</td>
</tr>
<tr>
<td>2970211</td>
<td>TM-RAM-CT</td>
<td>Right angle mirror for measurements 90 °C to the sensor axis</td>
</tr>
<tr>
<td>2970212</td>
<td>TM-RAIL-CT</td>
<td>Rail mount adapter for CT controller</td>
</tr>
<tr>
<td>2970213</td>
<td>TM-COV-CT</td>
<td>Closed cover for controller</td>
</tr>
<tr>
<td>2970214</td>
<td>TM-MHS-CT</td>
<td>Massive housing made from stainless steel</td>
</tr>
<tr>
<td>2970215</td>
<td>TM-MHSCF-CT</td>
<td>Massive housing made from stainless steel with integrated auxiliary CF lens</td>
</tr>
<tr>
<td>2970358</td>
<td>TM-MHSCFH-CT</td>
<td>Massive housing made from stainless steel with integrated auxiliary CF lens for M1/M2/M3/M5 sensors</td>
</tr>
<tr>
<td>2970216</td>
<td>TM-MHA-CT</td>
<td>Massive housing made from anodized aluminum</td>
</tr>
<tr>
<td>2970217</td>
<td>TM-MHACF-CT</td>
<td>Massive housing made from stainless steel with integrated auxiliary CF lens</td>
</tr>
<tr>
<td>2970359</td>
<td>TM-MHACFH-CT</td>
<td>Massive housing made from anodized aluminum with integrated auxiliary CF lens for M1/M2/M3/M5 sensors</td>
</tr>
<tr>
<td>2970326</td>
<td>TM-PA-CT</td>
<td>Pipe adapter for the mounting of reflection protection tubes</td>
</tr>
<tr>
<td>2970327</td>
<td>TM-ST20-CT</td>
<td>Reflection protection tube, length 20 mm</td>
</tr>
<tr>
<td>2970328</td>
<td>TM-ST40-CT</td>
<td>Reflection protection tube, length 40 mm</td>
</tr>
<tr>
<td>2970329</td>
<td>TM-ST88-CT</td>
<td>Reflection protection tube, length 88 mm</td>
</tr>
<tr>
<td>2970221</td>
<td>TM-LST-CT</td>
<td>Laser sighting aid for CT sensors incl. batteries (2x alkaline AA)</td>
</tr>
<tr>
<td>2970300</td>
<td>TM-LSTOEM-CT</td>
<td>OEM laser sighting aid, 635 nm, 3.5 m cable, for connection to CT controller</td>
</tr>
<tr>
<td>2970300-008</td>
<td>TM-LSTOEM-CT</td>
<td>OEM laser sighting aid, 635 nm, 8 m cable, for connection to CT controller</td>
</tr>
</tbody>
</table>

#### Optical accessories

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2970201</td>
<td>TM-CF-CT</td>
<td>Ancillary CF lens (only for SF models)</td>
</tr>
<tr>
<td>2970202</td>
<td>TM-PW-CT</td>
<td>Protective window (only for SF models)</td>
</tr>
<tr>
<td>2970297</td>
<td>TM-CFAG-CT</td>
<td>Ancillary lens with external thread</td>
</tr>
<tr>
<td>2970330</td>
<td>TM-CFH-CT</td>
<td>Ancillary lens for M1/M2/M3/M5 sensors</td>
</tr>
<tr>
<td>2970331</td>
<td>TM-CFHAG-CT</td>
<td>Ancillary lens with external thread for M1/M2/M3/M5 sensors</td>
</tr>
<tr>
<td>2970299</td>
<td>TM-PWAG-CT</td>
<td>Protective window with external thread</td>
</tr>
<tr>
<td>2970332</td>
<td>TM-PWH-CT</td>
<td>Protective window for M1/M2/M3/M5 sensors</td>
</tr>
<tr>
<td>2970333</td>
<td>TM-PWHAG-CT</td>
<td>Protective window with external thread for M1/M2/M3/M5 sensors</td>
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</table>

#### Interfaces

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>2970729</td>
<td>TM-USBK-CT</td>
<td>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</td>
</tr>
<tr>
<td>2970224</td>
<td>TM-RS232K-CT</td>
<td>RS232 interface: RS232 interface, computer cable, CompactConnect software, second cable gland for controller</td>
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<tr>
<td>2970338</td>
<td>TM-RS485USBK- CTL</td>
<td>RS485-USB-adapter, incl. PC cable, CompactConnect software and CTmulti, second cable gland for use with interface board TM-RS485B-CT</td>
</tr>
<tr>
<td>2970226</td>
<td>TM-RS485B-CT</td>
<td>RS485 interface board incl. second cable gland</td>
</tr>
<tr>
<td>2970227</td>
<td>TM-CANK-CT</td>
<td>CAN-Bus interface for thermoMETER CT/ protocol: CANopen presets: module address 20 (14H), 250 kbaud, 0-60 °C</td>
</tr>
<tr>
<td>2970228</td>
<td>TM-PFBDPK-CT</td>
<td>Profibus-DPv1 interface for thermoMETER CT with plug-in connection</td>
</tr>
<tr>
<td>2970229</td>
<td>TM-ETHNK-CT</td>
<td>Ethernet-KIT: interface board, external Ethernet adapter, CompactConnect software, second cable gland</td>
</tr>
<tr>
<td>2970230</td>
<td>TM-RI-CT</td>
<td>Relay interface: two electrically isolated relays, 60 VDC/ 42 VAC, 0.4 A</td>
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#### Calibration

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>2970231</td>
<td>TM-CERT-CT</td>
<td>Certificate of calibration</td>
</tr>
<tr>
<td>2970310</td>
<td>TM-HTCERT-CT</td>
<td>Certificate of calibration for CTM sensors</td>
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#### CTM3-XL

<table>
<thead>
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<th>Art. No.</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2970352</td>
<td>TM-FBXL-CT</td>
<td>Mounting bracket, adjustable in one axis</td>
</tr>
<tr>
<td>2970353</td>
<td>TM-ABXL-CT</td>
<td>Mounting bracket, adjustable in 2 axes</td>
</tr>
<tr>
<td>2970354</td>
<td>TM-APXL-CT</td>
<td>Air purge collar, stainless steel</td>
</tr>
<tr>
<td>2970361</td>
<td>TM-XLCERT-CT</td>
<td>Certificate of calibration</td>
</tr>
</tbody>
</table>

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**themoMETER**
Accessories for CT series

**thermoMETER**

- **TM-MB-CT** Mounting bolt with M12x1 thread, adjustable in one axis
- **TM-APLCF-CT** Ancillary CF lens/protective window - integrable variant for laminar air purge collar
- **TM-APM-CT** Air purge collar made from stainless steel for massive housing
- **TM-APMH-CT** Air purge collar made from stainless steel for massive housing
- **TM-RAIL-CT** Rail mount adapter for controller
- **TM-ST40-CT** Reflection protection tube
- **TM-PA-CT** Pipe adapter for reflection protection tube
- **TM-MG-CT** Mounting fork with M12x1 thread, adjustable in two axes
- **TM-FB-CT** Mounting bracket, adjustable in one axis
- **TM-AB-CT** Mounting bracket, adjustable in two axes
- **TM-MB-CT** Mounting bolt with M12x1 thread, adjustable in one axis
- **TM-APL-CT** Air purge collar, laminar and
- **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-KF40B270-CT** KF40 Flange for CTM-1,-2,-3 with B270 window
- **TM-KF40GE-CT** KF40 Flange with Ge window
- **TM-KF40B270-CT** KF40 Flange for CTM-1,-2,-3 with B270 window
Accessories for CT series

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

- **TM-AP-CT** Standard air purge collar for 10:1 / 15:1 / 22:1 lenses
  - **TM-APS-CT** Air purge collar, stainless steel

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

- **TM-TAS-CT** Pivoted joint for CT sensors

- **TM-RAM-CT** Right angle mirror

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

- **TM-AP2-CT** Standard air purge collar for 2:1 lens

Dirt and deposit on the lens like smoke, steam and high air humidity (condensation) are avoided or reduced by using an air purge collar.
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