More Precision

thermoMETER // Non-contact infrared temperature sensors
thermoMETER CTLaserM5

Non-contact IR temperature sensor with laser sighting for exact temperature measurement of molten metals

• Measuring range from 1000°C to 2000°C
• Short measuring wavelength of 525nm minimizes errors due to emissivity uncertainty and misadjustment
• Response time of 1ms
• Double laser marks the exact spot size from 1mm
• For metal processing and measurements of metal oxides and ceramics
• Optical resolution 150:1 with selectable focus
• Up to 85°C ambient temperature without cooling, automatic laser switch-off at 50°C
• Selectable and scalable analog output, optional digital interfaces

Optical specifications thermoMETER CTLaserM5

\[ \text{smallest spot size} / \text{focal point (mm)} \]

| Standard Focus | 1L/2L SF | 150:1 | 20 | 18.3 | 16.5 | 14.8 | 13.1 | 11.3 | 9.6 | 8.5 | 7.3 | 9.8 | 13.5 | 17.2 | 23.4 | 29.6 |
|----------------|----------|-------|----|------|------|------|------|------|-----|-----|-----|------|------|------|------|
| distance in mm | 0        | 150   | 300| 450  | 600  | 750  | 900  | 1000 | 1100| 1200| 1350| 1500 | 1750 | 2000 |

<table>
<thead>
<tr>
<th>Far Focus</th>
<th>1L/2L FF</th>
<th>150:1</th>
<th>20</th>
<th>20.5</th>
<th>21</th>
<th>21.5</th>
<th>22</th>
<th>22.5</th>
<th>23</th>
<th>23.3</th>
<th>24</th>
<th>28.9</th>
<th>41.1</th>
<th>53.3</th>
<th>62.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>distance in mm</td>
<td>0</td>
<td>450</td>
<td>900</td>
<td>1350</td>
<td>1800</td>
<td>2250</td>
<td>2700</td>
<td>3000</td>
<td>3600</td>
<td>4000</td>
<td>5000</td>
<td>6000</td>
<td>6750</td>
<td></td>
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### Model

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical resolution</td>
<td>150:1</td>
</tr>
<tr>
<td>Temperature range</td>
<td>1000 to 2000°C</td>
</tr>
<tr>
<td>Spectral range</td>
<td>525nm</td>
</tr>
<tr>
<td>System accuracy (^2)</td>
<td>±1% of reading (≤ 1100°C)</td>
</tr>
<tr>
<td>Repeatability (^2)</td>
<td>±0.5% of reading (≤ 1100°C)</td>
</tr>
<tr>
<td>Temperature resolution</td>
<td>0.2°C</td>
</tr>
<tr>
<td>Response time (90% signal) (^3)</td>
<td>1ms</td>
</tr>
<tr>
<td>Emissivity/gain (^1)</td>
<td>0.100 to 1.100</td>
</tr>
<tr>
<td>Transmissivity/gain (^1)</td>
<td>0.100 to 1.000</td>
</tr>
<tr>
<td>Signal processing (^1)</td>
<td>peak hold, valley hold, average; extended hold function with threshold and hysteresis</td>
</tr>
<tr>
<td>Certificate of calibration</td>
<td>optional</td>
</tr>
<tr>
<td>Outputs/analog channel (^1)</td>
<td>0/4 to 20mA, 0 to 5/10V, thermocouple J, K</td>
</tr>
<tr>
<td>Outputs/analog optional</td>
<td>relays: 2 x 60VDC/42 VAC, 0.4A; electrically isolated</td>
</tr>
<tr>
<td>Alarm output</td>
<td>open collector (24V / 50A)</td>
</tr>
<tr>
<td>Outputs/digital optional</td>
<td>USB, RS232, RS485, CAN, Proflbus DP, Ethernet</td>
</tr>
<tr>
<td>Output impedances Current</td>
<td>mA max. 500Ω (with 5 - 36VDC)</td>
</tr>
<tr>
<td>Output impedances Voltage</td>
<td>mV min. 100kΩ load impedance; thermocouple 20Ω</td>
</tr>
<tr>
<td>Inputs</td>
<td>programmable functional inputs for external emissivity adjustment</td>
</tr>
<tr>
<td></td>
<td>ambient temperature compensation, trigger (reset of hold functions)</td>
</tr>
<tr>
<td>Cable length</td>
<td>3m (standard), 8m, 15m</td>
</tr>
<tr>
<td>Power supply</td>
<td>8 to 36VDC; max. 160mA</td>
</tr>
<tr>
<td>Laser</td>
<td>class II (635nm), 1mW, ON/OFF via controller or software</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP65 (NEMA-4)</td>
</tr>
<tr>
<td>Ambient temperature sensor</td>
<td>-20°C to 85°C (50°C if Laser ON); controller: 0°C to 85°C</td>
</tr>
<tr>
<td>Storage temperature sensor</td>
<td>-40°C to 85°C controller: -40°C to 85°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10 to 95%, non-condensing</td>
</tr>
<tr>
<td>Vibration sensor</td>
<td>IEC 68-2-6: 3 G, 11-200Hz, any axis</td>
</tr>
<tr>
<td>Shock sensor</td>
<td>IEC 68-2-27: 50 G, 11ms, any axis</td>
</tr>
<tr>
<td>Weight</td>
<td>sensor: 600g; controller: 420g</td>
</tr>
</tbody>
</table>

\(^1\) adjustable via controller or software  
\(^2\) \(\varepsilon=1\), response time 1s; ambient temperature: 23±5°C  
\(^3\) with dynamic adaption at low signal levels

### Accessories page 20 - 21
- Mounting bracket
- Air purge collar
- Rail mount adapter for controller
- Water cooled housing
- Interface kit
- Certificate of calibration

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**Product identification**

<table>
<thead>
<tr>
<th>Model</th>
<th>CTLM-5SF150-C3</th>
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</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>[3m (standard) / 8m / 15m]</td>
</tr>
<tr>
<td>Focus</td>
<td>SF / FF</td>
</tr>
<tr>
<td>Spectral range</td>
<td>525nm</td>
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**LASER LIGHT**

DO NOT STARE INTO BEAM

CLASS 2 LASER

DIN EN 60825-1:2007
1mW / 630-650nm
Dimensions of CTratioM1 / CTLaser series

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

CTratioM1

Controller

Sensor

sensor

Controller

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Mechanical accessories

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<tr>
<th>Art. No.</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>2970238</td>
<td>TM-AB-CTL Mounting bracket, adjustable, stainless steel</td>
</tr>
<tr>
<td>2970239</td>
<td>TM-AP-CTL Air purge collar, stainless steel</td>
</tr>
<tr>
<td>2970240</td>
<td>TM-W-CTL Water cooled housing, stainless steel, for ambient temperatures up to 175°C</td>
</tr>
<tr>
<td>2970241</td>
<td>TM-RAIL-CTL Rail mount adapter for CTLaser controller</td>
</tr>
<tr>
<td>2970242</td>
<td>TM-COV-CTL Closed cover for controller</td>
</tr>
<tr>
<td>2970243</td>
<td>TM-MN-CTL Mounting nut, stainless steel (spare)</td>
</tr>
<tr>
<td>2970244</td>
<td>TM-FB-CTL Mounting bracket, fixed, stainless steel (spare)</td>
</tr>
<tr>
<td>2970298</td>
<td>TM-A20UN-CTL Screw adapter M48x1.5 on 20UN-2A screw including mounting nut</td>
</tr>
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High temperature accessories

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<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>2970366</td>
<td>TM-J-CTL Cooling jacket (length 228mm, ø 89mm) (conversion kit TM-CONK-CTL is required)</td>
</tr>
<tr>
<td>2970374</td>
<td>TM-CONK-CTL Conversion kit for CTL on axial cable exit, for integration in cooling jacket</td>
</tr>
<tr>
<td>2970368</td>
<td>TM-JAB-CTL Adjustable mounting bracket for cooling jacket</td>
</tr>
<tr>
<td>2970369</td>
<td>TM-MF-CTL Mounting flange M48x1.5 for TM-PF-CTL</td>
</tr>
<tr>
<td>2970370</td>
<td>TM-AST300-CTL Reflection protection tube M48x1.5, 300mm length</td>
</tr>
<tr>
<td>2970371</td>
<td>TM-PA-CTL Pipe adapter M48x1.5</td>
</tr>
<tr>
<td>2970372</td>
<td>TM-RM-CTL Furnace wall mount accessory for CTL (TM-MF-CTL, TM-AST300-CTL and TM-PA-CTL)</td>
</tr>
<tr>
<td>2970412</td>
<td>TM-PF-CTL Pipe flange M48x1.5 for directly mounting a CTL sensor</td>
</tr>
<tr>
<td>2970487</td>
<td>TM-CJA-CTL Cooling Jacket Advanced - universal cooling jacket for CSLaser, CTLaser and CTVideo / CSVideo up to 315°C</td>
</tr>
</tbody>
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Calibration

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
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<tbody>
<tr>
<td>2970253</td>
<td>TM-CERT-CTL Certificate of calibration</td>
</tr>
<tr>
<td>2970324</td>
<td>TM-HTCERT-CTL Certificate of calibration for CTLaser M1-/M2-/M3-/M5-/G-sensors</td>
</tr>
</tbody>
</table>

Interfaces

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>2970245</td>
<td>TM-USBK-CTL USB interface, computer cable, CompactConnect software</td>
</tr>
<tr>
<td>2970246</td>
<td>TM-RS232K-CTL RS232 interface, computer cable, CompactConnect software, second cable gland for controller</td>
</tr>
<tr>
<td>2970338</td>
<td>TM-RS485USBK-CTL RS485-USB-adapter, incl. PC cable, CompactConnect software and CMTmult, second cable gland for use with interface board TM-RS485B-CTL</td>
</tr>
<tr>
<td>2970248</td>
<td>TM-RS485B-CTL RS485 interface board incl. second cable gland</td>
</tr>
<tr>
<td>2970249</td>
<td>TM-CANK-CTL CAN-Bus interface; protocol: CANopen presets: module address20 (14H), 256kBaud, 0-60°C</td>
</tr>
<tr>
<td>2970250</td>
<td>TM-PFBDPK-CTL Profinbus-DP/V1 interface with plug-in connection</td>
</tr>
<tr>
<td>2970251</td>
<td>TM-ETHNK-CTL Ethernet-Kit; interface board, external Ethernet adapter, CompactConnect software, second cable gland Relay interface: two electrically isolated relays, 60VDC/ 42VAC, 0.4A</td>
</tr>
<tr>
<td>2970252</td>
<td>TM-Ri-CTL Relay interface: two electrically isolated relays, 60VDC/ 42VAC, 0.4A</td>
</tr>
</tbody>
</table>

Sensor cables and high temperature cables for CTLaser

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>4800254.003</td>
<td>TM-CB3C-CTL Sensor cable with connector (3m)</td>
</tr>
<tr>
<td>4800254.003H</td>
<td>TM-CB3HC-CTL High-temperature sensor cable (up to 180°C) with connector (3m)</td>
</tr>
<tr>
<td>4800254.008</td>
<td>TM-CB8C-CTL Sensor cable with connector (8m)</td>
</tr>
<tr>
<td>4800254.008H</td>
<td>TM-CB8HC-CTL High-temperature sensor cable (up to 180°C) with connector (8m)</td>
</tr>
<tr>
<td>4800254.015</td>
<td>TM-CB15C-CTL Sensor cable with connector (15m)</td>
</tr>
<tr>
<td>4800254.015H</td>
<td>TM-CB15HC-CTL High-temperature sensor cable (up to 180°C) with connector (15m)</td>
</tr>
</tbody>
</table>

CTratio

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>2970348</td>
<td>TM-FB-CTR Mounting bracket, stainless steel, adjustable in one axis</td>
</tr>
<tr>
<td>2970395</td>
<td>TM-AP-CTR Air purge collar, stainless steel</td>
</tr>
<tr>
<td>2970351</td>
<td>TM-CERT-CTR Certificate of calibration</td>
</tr>
</tbody>
</table>
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