More Precision

thermoMETER // Non-contact infrared temperature sensors
Two-wire infrared pyrometer with laser sighting and integrated controller

thermoMETER CSLaser

Miniature IR sensor with integrated controller and laser sighting

- Measuring range from -30 to 1600 °C, measuring fields from 0.5 mm and response times from 10 ms
- Optical resolution up to 300:1 with selectable focus settings
- Double laser sighting with 2 rays for exact measuring field marking and focusing
- Scalable 4-20 mA two-wire analog output and simultaneous alarm output
- Optional USB interface and software for programming
- Emissivity directly adjustable via rotary controller or software
- Protection against short circuit and polarity change
- Up to 85 °C ambient temperature without cooling
- Automatic laser switch-off at 50 °C
- Extensive supply voltage range: 5 - 28 VDC

Optical specifications thermoMETER CSLaser

| Standard Focus | 2H SF | 300:1 | 12 | 10.9 | 9.7 | 8.6 | 7.5 | 6.3 | 5.2 | 4.5 | 3.7 | 3.1 | 2.7 | 2.3 | 2.1 | 1.9 | 1.7 | 1.5 | 1.3 | 1.1 | 0.9 | 0.7 | 0.5 | 0.3 | 0.1 |
|----------------|------|-------|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                | 2L SF | 150:1 | 20 | 18.3 | 16.5 | 14.8 | 13.1 | 11.3 | 9.6 | 8.5 | 7.3 | 6.8 | 6.3 | 5.8 | 5.4 | 5.0 | 4.6 | 4.2 | 3.8 | 3.4 | 3.0 | 2.6 | 2.2 | 1.8 | 1.4 | 1.0 |
| distance in mm | 0     | 150   | 300 | 450  | 600 | 750 | 900 | 1000 | 1100 | 1200 | 1350 | 1500 | 1750 | 2200 |

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<tr>
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<th>2H CF2</th>
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<th>4.3</th>
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<th>17.2</th>
<th>21.3</th>
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</table>
Model | CSL-SF50 | CSLHS-SF50 | CSLM-2LSF150 | CSLM-2HSF300
--- | --- | --- | --- | ---
Optical resolution | 50:1 | 150:1 | 300:1 | 
Temperature range | -30 °C to 1000 °C | -20 °C to 150 °C | 250 °C to 800 °C | 385 °C to 1600 °C |
Spectral range | 8 to 14 µm | 1.6 µm | | |
System accuracy | ± 1 % or ± 1 °C | ± 0.3 % of reading + 1 °C | | |
Repeatability | ± 0.5 % or ± 0.5 °C | ± 0.1 % of reading + 1 °C | | |
Temperature resolution | 0.1 °C | 0.025 °C | 0.1 °C | |
Response time (90 % signal) | 150 ms | | 10 ms | |
Emissivity/gain | 0 to 1.100 | | | |
IR window correction | 0 to 1.100 | | | |
Signal processing | peak hold, valley hold, average; extended hold function with threshold and hysteresis | | | |
Outputs/analog | 4 to 20 mA | | | |
Output/alarms | 0 to 30 V / 500 mA (open collector) | | | |
Output/digital (optional) | mono-/bidirectional, 9.6 kBaud, 0/3 V level, USB | | | |
Output/impedance | max. 1000 Ω (depends on supply voltage) | | | |
Power consumption (only laser) | 45 mA at 5 V / 20 mA at 12 V / 12 mA at 24 V | | | |
Power supply | 5 to 28 VDC | | | |
Laser | class II, (635 nm), 1 mW, ON/OFF via software | | | |
Protection class | IP65 (NEMA-4) | | | |
Ambient temperature | -20 °C to 85 °C (50 °C if Laser ON) | | | |
Storage temperature | -40 °C to 85 °C | | | |
Relative humidity | 10 to 95 %, non-condensing | | | |
Vibration | IEC 68-2-6: 3 G, 11 to 200 Hz, any axis | | | |
Weight | 600 g | | | |

1) adjustable via sensor or software
2) adjustable via software
3) ambient temperature 23 ±5 °C, whichever is greater; ambient temperature ≥ 0 °C
4) ε = 1, response time 1 s

**Product identification**

**CSL - SF50**
- Focus [SF50 / CF1 / CF2 / CF3 / CF4]
- thermoMETER CSLaser

**Product identification**

**CSLM - 2 H SF300**
- Focus [SF300 / CF1 / CF2 / CF3 / CF4]
- Temperature range [°C]
- Spectral range [1.6 µm]
- thermoMETER CSLaserM

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**Optical specifications** thermoMETER CSLaser CSL-SF50 und CSLHS-SF50

- **Standard Focus**
  - SF50 lens: 50:1
  - Focus: [SF50 / CF1 / CF2 / CF3 / CF4]
  - Spectral range: 8 to 14 µm

- **Close Focus**
  - CF1 lens: 50:1
  - Focus: [SF50 / CF1 / CF2 / CF3 / CF4]
  - Spectral range: 1.6 µm

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**Accessories page 54 - 55**
- Mounting bracket
- Air purge collar
- Rail mount adapter for controller
- Water cooled housing
- Certificate of calibration
- USB kit (TM-USBK-CS) p.55
Dimensions of CS series

CS

CS Laser

Sensor

CS

Sensor with integrated controller

Ancillary CF lens (optional)

CS Micro / CS Micro 2W

Sensor

Ancillary CF lens (optional)

Controller inside cable

CX

Sensor

Dimensions of Components:

- CSLaser
- CS
- CS Micro / CS Micro 2W
- CX
## Accessories and software CS series

### Mechanical accessories CS / CSmicro / CSmicro 2W

<table>
<thead>
<tr>
<th>Art. No.</th>
<th>Model</th>
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<tbody>
<tr>
<td>2970279</td>
<td>Emissivity Mounting bracket, fixed</td>
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<tr>
<td>2970280</td>
<td>TM-AB-CS Mounting bracket, adjustable</td>
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<tr>
<td>2970281</td>
<td>TM-MB-CS Mounting bolts with M12x1 thread</td>
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<tr>
<td>2970282</td>
<td>TM-MG-CS Mounting fork, adjustable in 2 axes, with M12x1 fastening</td>
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<tr>
<td>2970283</td>
<td>TM-AP-CS Air purge collar for 10:1 sensors</td>
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<td>2970284</td>
<td>TM-APL-CS Air purge collar, laminar</td>
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<tr>
<td>2970285</td>
<td>TM-APLCF-CS Air purge collar, laminar with integrated ancillary CF lens</td>
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<tr>
<td>2970286</td>
<td>TM-RAM-CS Right angle mirror for measurements 90 °C to the sensor axis</td>
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<tr>
<td>2970718</td>
<td>TM-USBK-CS USB kit: USB programming adapter, CompactConnect software (as download)</td>
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### Optical accessories CS / CSmicro / CSmicro 2W

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<th>Art. No.</th>
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<tbody>
<tr>
<td>2970277</td>
<td>TM-CF-CS Ancillary CF lens for CS models</td>
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<tr>
<td>2970278</td>
<td>Aluminum Protective window for CS models</td>
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### Calibration CS / CSmicro / CSmicro 2W

<table>
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<th>Art. No.</th>
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<tr>
<td>2970288</td>
<td>TM-CERT-CS Certificate of calibration</td>
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### Mechanical accessories CX

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<tbody>
<tr>
<td>2970307</td>
<td>TM-AP-CX Air purge collar, aluminum (anodized)</td>
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<tr>
<td>2970321</td>
<td>TM-FB-CX Mounting bracket, adjustable in 1 axis, stainless steel</td>
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<tr>
<td>2970322</td>
<td>TM-AB-CX Mounting bracket, adjustable in 2 axes, stainless steel</td>
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### Optical accessories CX

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<td>2970302</td>
<td>TM-CF-CX Ancillary CF lens for CX models</td>
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<td>2970303</td>
<td>TM-PW-CX Protective window for CX models</td>
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### Calibration CX

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<tbody>
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**Visual Elements:**

- TM-FB-CS mounting bracket, fixed
- TM-MG-CS Mounting fork with M12x1 thread, adjustable in two axes
- TM-CF-CS Ancillary CF lens (only for LT models)
- TM-AP-CS Air purge collar for 10:1 sensors
- TM-MB-CS Mounting bolts with M12x1 thread adjustable in one axis
- TM-APL-CS Air purge collar, laminar
- TM-APLCF-CS Air purge collar, laminar with integrated ancillary CF lens
- TM-RAM-CS Right angle mirror for measurements 90 °C to the sensor axis
- TM-APL-CS Air purge collar, laminar
- TM-MG-CS Mounting fork
- TM-AP-CS Air purge collar for 10:1 sensors
- TM-CF-CS Ancillary CF lens
- TM-PW-CX Protective window for CX models
- TM-RAM-CS Right angle mirror for measurements 90 °C to the sensor axis
Infrared thermal imagers from Micro-Epsilon

thermoMAGER 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