



More Precision

thermoMETER // Non-contact infrared temperature sensors





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

□ = smallest spot size / focal point (mm)

| Standard Focus | | | | | | | | | | | | | | | |
|----------------|-------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2H SF | 300:1 | 12 | 10.9 | 9.7 | 8.6 | 7.5 | 6.3 | 5.2 | 4.5 | 3.7 | 5.1 | 7.3 | 9.4 | 13 | 19.4 |
| 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 | 34.6 |
| distance in mm | | 0 | 150 | 300 | 450 | 600 | 750 | 900 | 1000 | 1100 | 1200 | 1350 | 1500 | 1750 | 2200 |
| Close Focus | | | | | | | | | | | | | | | |
| 2H CF2 | 300:1 | 12 | 8.2 | 4.3 | 0.5 | 4.7 | 8.8 | 13 | 17.2 | 21.3 | 25.5 | 29.7 | 38 | 46.3 | 54.7 |
| 2L CF2 | 150:1 | 20 | 13.7 | 7.3 | 1 | 8 | 15 | 22 | 29 | 36 | 43 | 50 | 64 | 78 | 92 |
| 2H CF3 | 300:1 | 12 | 9.2 | 6.4 | 3.5 | 0.7 | 3.9 | 7 | 10.2 | 13.4 | 16.6 | 19.8 | 26.1 | 32.4 | 38.8 |
| 2L CF3 | 150:1 | 20 | 15.3 | 10.7 | 6 | 1.3 | 6.6 | 12 | 17.3 | 22.6 | 27.9 | 33.3 | 43.9 | 54.6 | 65.2 |
| 2H CF4 | 300:1 | 12 | 10.8 | 9.7 | 8.5 | 7.3 | 6.2 | 5 | 3.8 | 2.7 | 1.5 | 3 | 6 | 9 | 12 |
| 2L CF4 | 150:1 | 20 | 18.1 | 16.2 | 14.3 | 12.4 | 10.6 | 8.7 | 6.8 | 4.9 | 3 | 5.6 | 10.7 | 15.8 | 20.9 |
| distance in mm | | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
| Far Focus | | | | | | | | | | | | | | | |
| 2H FF | 300:1 | 20 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 14.7 | 21.3 | 28 | 33 | |
| 2L FF | 150:1 | 20 | 20.5 | 21 | 21.5 | 22 | 22.5 | 23 | 23.3 | 24 | 28.9 | 41.1 | 53.3 | 62.5 | |
| distance in mm | | 0 | 450 | 900 | 1350 | 1800 | 2250 | 2700 | 3000 | 3600 | 4000 | 5000 | 6000 | 6750 | |

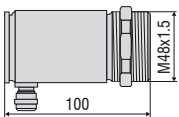
| Model | CSL-SF50 | CSLHS-SF50 | CSLM-2LSF150 | CSLM-2HSF300 |
|------------------------------------|---|------------------|--|-------------------|
| Optical resolution | 50:1 | | 150:1 | 300:1 |
| Temperature range ¹⁾ | -30 °C to 1000 °C | -20 °C to 150 °C | 250 °C to 800 °C | 385 °C to 1600 °C |
| Spectral range | 8 to 14 μm | | 1.6 μm | |
| System accuracy ³⁾ | ±1 % or ±1 °C | | ±(0.3 % of reading + 1 °C) ⁴⁾ | |
| Repeatability ³⁾ | ±0.5 % or ±0.5 °C | | ±(0.1 % of reading + 1 °C) ⁴⁾ | |
| Temperature resolution | 0.1 °C | 0.025 °C | 0.1 °C | |
| Response time (90 % signal) | 150 ms | | 10 ms | |
| Emissivity/gain ¹⁾ | 0.100 to 1.100 | | | |
| IR window correction ²⁾ | 0.100 to 1.100 | | | |
| Signal processing ²⁾ | 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) | | | |
| Outputs/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 | | | |
| Shock | IEC 68-2-27: 50 G, 11 ms, 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 [H] | | | |
| Spectral range [1.6 μm] | | | |
| thermoMETER CSLaserM | | | |

Optical specifications thermoMETER CSLaser CSL-SF50 und CSLHS-SF50

□ = smallest spot size / focal point (mm)

| Standard Focus | | | | | | | | | | | | | | | | | |
|----------------|------|----|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|------|-------|
| SF50 lens | 50:1 | 20 | 20.5 | 21 | 21.5 | 22 | 22.5 | 23 | 23.5 | 24 | 29.5 | 35 | 46 | 57 | 68 | | |
| distance in mm | | 0 | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 | 2100 | 2400 | | |
| Close Focus | | | | | | | | | | | | | | | | | |
| CF1 lens | 50:1 | 20 | 9.4 | 6.7 | 1.4 | 10.6 | 25.9 | 41.1 | 56.4 | 71.7 | 87 | 102.3 | 117.6 | 132.9 | 163.4 | 194 | 224.6 |
| CF2 lens | 50:1 | 20 | 15.5 | 14.3 | 12.1 | 8.7 | 3 | 10.7 | 18.3 | 26 | 33.7 | 41.3 | 49 | 56.7 | 72 | 87.3 | 102.7 |
| CF3 lens | 50:1 | 20 | 16.8 | 16 | 14.4 | 12 | 8 | 4 | 10 | 16 | 22 | 28 | 34 | 40 | 52 | 64 | 76 |
| CF4 lens | 50:1 | 20 | 19 | 18.8 | 18.3 | 17.6 | 16.3 | 15.1 | 13.9 | 12.7 | 11.4 | 10.2 | 9 | 12.2 | 18.7 | 25.1 | 31.6 |
| distance in mm | | 0 | 40 | 50 | 70 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |

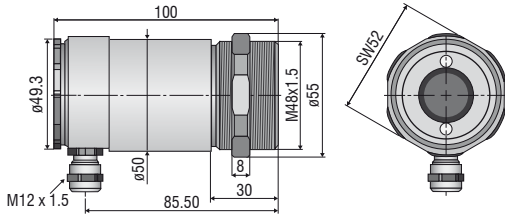
Accessories page 54 - 55

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



CSLaser

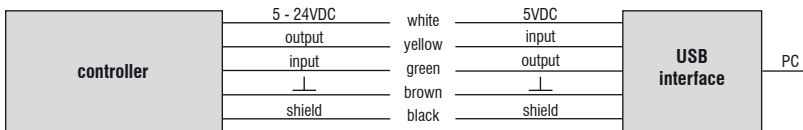
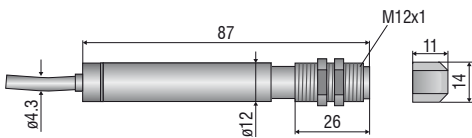
sensor



CS

sensor with integrated controller

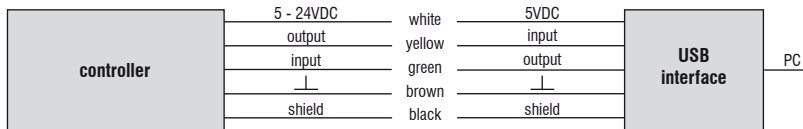
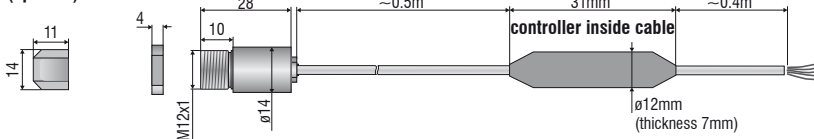
ancillary CF lens (optional)



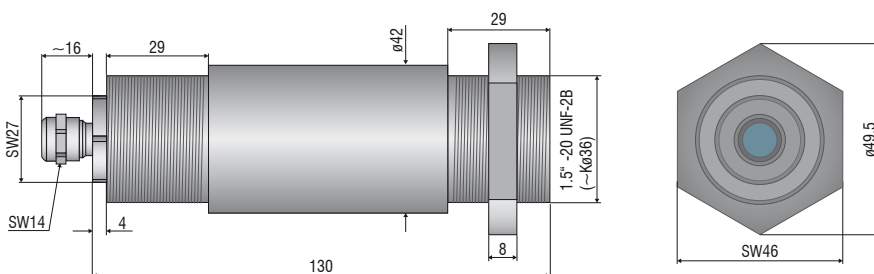
CSmicro / CSmicro 2W

ancillary CF lens (optional)

sensor



CX



Mechanical accessories CS / CSmicro / CSmicro 2W

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

Optical accessories CS / CSmicro / CSmicro 2W

| | | |
|---------|----------|---------------------------------|
| 2970277 | TM-CF-CS | Ancillary CF lens for CS models |
| 2970278 | Aluminum | Protective window for CS models |

Calibration CS / CSmicro / CSmicro 2W

| | | |
|---------|------------|----------------------------|
| 2970288 | TM-CERT-CS | Certificate of calibration |
|---------|------------|----------------------------|

Mechanical accessories CX

| Art. No. | Model | |
|----------|----------|--|
| 2970307 | TM-AP-CX | Air purge collar, aluminum (anodized) |
| 2970321 | TM-FB-CX | Mounting bracket, adjustable in 1 axis, stainless steel |
| 2970322 | TM-AB-CX | Mounting bracket, adjustable, in 2 axes, stainless steel |

Optical accessories CX

| | | |
|---------|----------|---------------------------------|
| 2970302 | TM-CF-CX | Ancillary CF lens for CX models |
| 2970303 | TM-PW-CX | Protective window for CX models |

Calibration CX

| | | |
|---------|------------|----------------------------|
| 2970323 | TM-CERT-CX | Certificate of calibration |
|---------|------------|----------------------------|



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-APL-CS Air purge collar, laminar
TM-MG-CS Mounting fork



TM-AP-CX Air purge collar for CX sensors



TM-CF-CX Ancillary CF lens, TM-PW-CX Protective window



TM-RAM-CS Right angle mirror

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