

Rugged fiber-optic ratio thermometer for non-contact temperature measurement from 450 °C to 3000 °C



Features:

- Adjustable focus from 150 mm to infinity with excellent optical resolution up to 100:1
- Laser sighting for real spot size indication at any distance - green laser for best visibility on glowing objects
- Smart Ratio Mode (SRM) - for demanding applications with adaptive slope requirements
- Rugged, electrically isolated sensing head and fiber-optic for ambient temperatures up to 315 °C without cooling
- Two 0/4-20 mA analog outputs (optional isolated)
- Fast measurement with 1 ms response time

General specifications

| | |
|--|--|
| Environmental rating | IP 65 (NEMA-4) |
| Ambient temperature sensing head + fiber cable electronics | -20 ... 200 °C (optional to 315 °C) 0 ... 60 °C |
| Storage temperature sensing head + fiber cable electronics | -40 ... 200 °C -40 ... 85 °C |
| Relative humidity | 10 – 95 %, non-condensing |
| Vibration (sensor) | IEC 60068-2-6 (sinus shaped), IEC 60068-2-64 (broad band noise) |
| Shock (sensor) | IEC 60068-2-27 (25G and 50G) |
| Weight | 210 g (fiber cable [3 m] with head) 420 g (electronics) |

Electrical specifications

| | |
|-------------------------------|--|
| Outputs analog | 2x 0/4-20 mA (12 bit) / optional: 2x 0/4-20 mA (16 bit) isolated |
| Output impedances | max. 500 Ω (with 8 – 30 V DC) |
| Relay Output (optional) | 2 x 60 V DC / 42 V AC _{eff} ; 0.4 A; optically isolated |
| Digital Interface | USB (Micro-USB, USB-C and USB-A cable included) |
| Digital Interfaces (optional) | RS232, RS485, Ethernet, Modbus RTU |
| I/O-Pins | Three programmable in-/outputs; selectable as alarm output (open collector 24 V/1 A), input for triggered signal output and peakhold function or as analog input for external emissivity or slope adjustment |
| Fiber cable length | 3 m (standard), 8 m, 15 m |
| Power supply | 8 – 30 V DC or USB powered ¹⁾ |
| Power consumption | Max. 5 W |
| Aiming laser | Laser 520 nm, <1 mW, ON/OFF via electronic box or software / App |

Measurement specifications

| Temperature range | 1-Channel | 2-Channel |
|---|--|---|
| | 450 ... 1400 °C 650 ... 2000 °C 900 ... 3000 °C | 525 ... 1400 °C (1ML) 700 ... 2000 °C (1MH) 1000 ... 3000 °C (1MH1) |
| Spectral range | 0.8 – 1.1 μm | |
| Optical resolution (90 % energy) | 38:1 (1ML) 100:1 (1MH / 1MH1) | |
| Vario focus | 150 mm to infinity, infinitely adjustable | |
| System accuracy ²⁾ (at ambient temp. 23 ±5 °C) | ±(0.5 % of reading +2 °C) | |
| Repeatability ²⁾ (at ambient temp. 23 ±5 °C) | ±0.3 % of reading | |
| Temperature resolution | 0.1 K | |
| Response time (90 % signal) ³⁾ | 1 ms – 10 s | |
| Slope (adjustable via programming keys or analog input) | 0.700 – 1.300 | |
| Emissivity (adjustable via programming keys or analog input) | 0.050 – 1.000 | |
| Signal processing (parameter adjustable via programming keys or software / App, respectively) | 1 color / 2 color mode; attenuation monitoring / alarms; peak hold, valley hold, average; extended hold function with threshold and hysteresis | |
| Software / App | optris CompactPlus Connect / IRmobile App | |

¹⁾ USB powered unit works only in digital communication mode

²⁾ ε = 1, response time 1 s; no attenuation / Specification valid for 5 - 95% of measurement range

³⁾ With dynamic adaptation to low signal levels

optris CTratio 1M

Optical parameters

The vario optics of the CTratio allows a smooth focusing of the optics to the desired distance.

The following tables show examples of measurement distances and the corresponding measurement spot sizes

The sensors are available in two versions:

Standard-focus vario optics (SFV):
adjustable 300 mm till infinity

Close-focus vario optics (CFV):
adjustable 150 mm till 350 mm

Alternatively you can use the [optris Spot size calculator](#) or the [optris optic calculator app](#).

1ML SFV (D:S = 38:1)

| | | | | | | | | | |
|----------------------|----|-----|------|------|------|------|------|------|-------|
| Spot size | mm | 7.9 | 13.2 | 19.7 | 26.3 | 39.5 | 52.6 | 65.8 | 131.6 |
| Measurement distance | mm | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 |

1MH / 1MH1 SFV (D:S = 100:1)

| | | | | | | | | | |
|----------------------|----|-----|-----|-----|------|------|------|------|------|
| Spot size | mm | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 50 |
| Measurement distance | mm | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 5000 |

1ML CFV (D:S = 38:1)

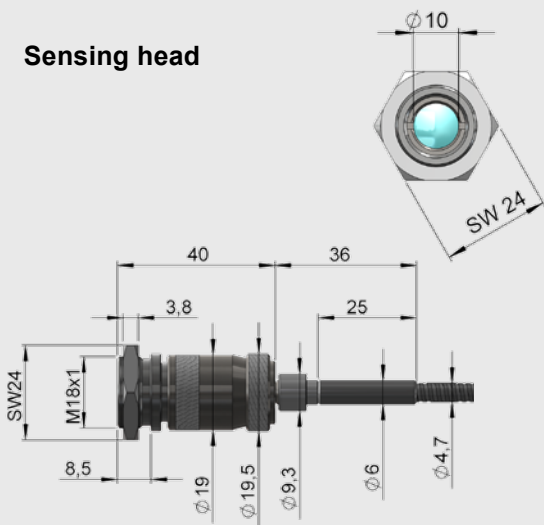
| | | | | | | | | | | |
|----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Spot size | mm | 3.9 | 4.6 | 5.2 | 5.9 | 6.6 | 7.2 | 7.9 | 8.6 | 9.2 |
| Measurement distance | mm | 150 | 175 | 200 | 225 | 250 | 275 | 300 | 325 | 350 |

1MH / 1MH1 CFV (D:S = 100:1)

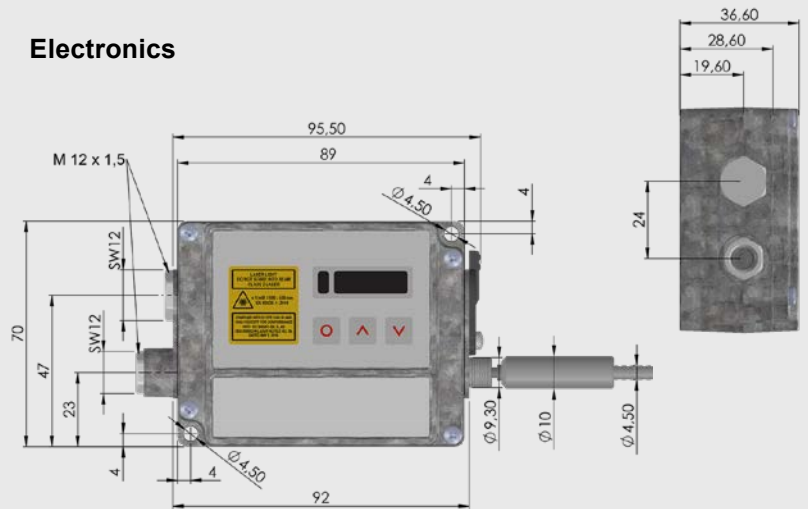
| | | | | | | | | | | |
|----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Spot size | mm | 1.5 | 1.8 | 2.0 | 2.3 | 2.5 | 2.8 | 3.0 | 3.3 | 3.5 |
| Measurement distance | mm | 150 | 175 | 200 | 225 | 250 | 275 | 300 | 325 | 350 |

Dimensions (in mm)

Sensing head

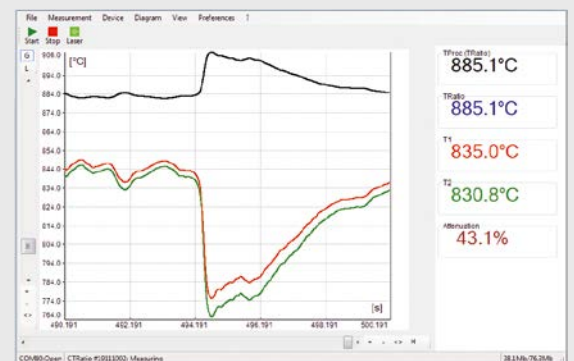


Electronics



Software / App

The built-in USB interface allows an easy programming via IRmobile Android app.



Windows-software: optris CompactPlus Connect