

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

³⁾ With dynamic adaptation to low signal levels

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

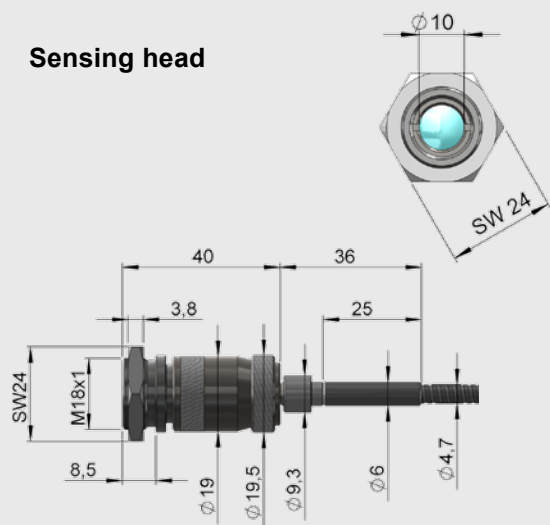
1ML CFV (D:S = 38:1)

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

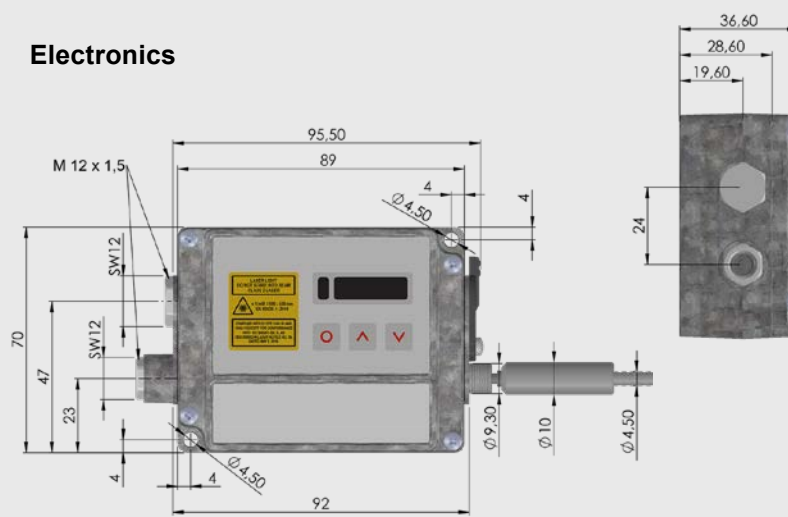
1MH / 1MH1 CFV (D:S = 100:1)

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)



Electronics



Software / App

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



Windows-software: optris CompactPlus Connect