

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



Features:

- Adjustable focus from 300 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
- Rugged, electrically isolated sensing head and fiber-optic for ambient temperatures up to 315 °C without cooling
- Two 0/4-20 mA analog outputs (isolated optional)
- 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
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	300 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)	0.800 – 1.200	
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 Ratio 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 for the standard focus vario optics (SFV) adjustable in the range of 300 mm till infinity.

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

1ML (D:S = 38:1)

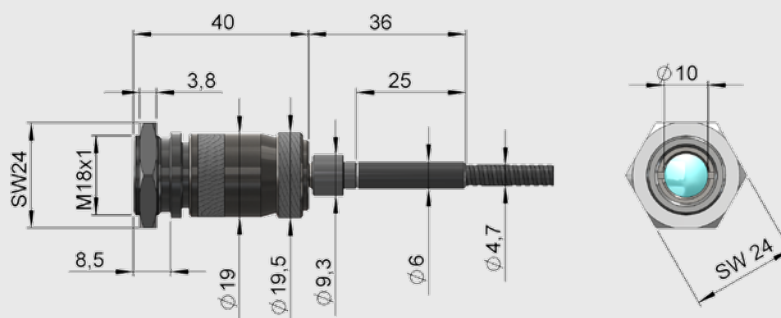
Spot size	mm	7,9	13,2	19,7	26,3	39,5	52,6	65,8	131,6
Measurement distance	mm	300	500	750	1000	1500	2000	2500	5000

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

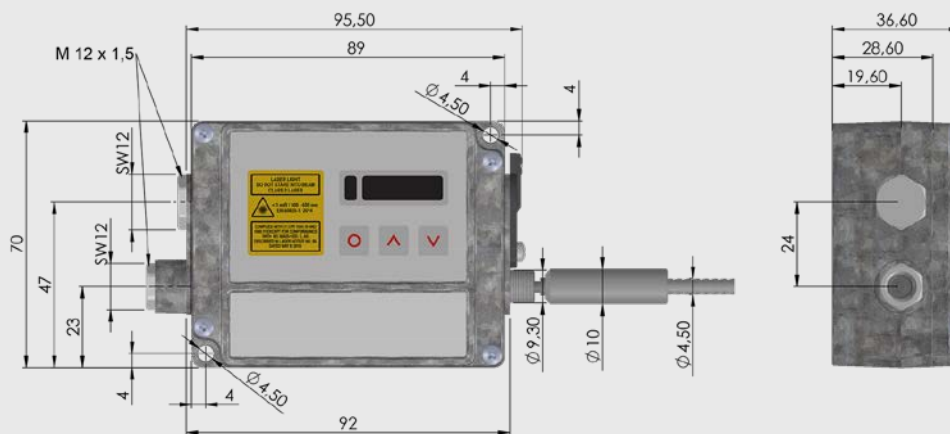
Spot size	mm	3	5	7,5	10	15	20	25	50
Measurement distance	mm	300	500	750	1000	1500	2000	2500	5000

Dimensions (in mm)

Sensing head



Electronics



Software / App

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



Windows-software: optris Ratio Connect