

Precise non-contact temperature measurement of metal from 30 °C to 1500 °C



Features:

- Miniaturized Infrared Thermometer with 2.3 µm wave length range for measurements of metals, of secondary metal processing, metal oxides and ceramic materials
- Very small sensing head of 14 mm diameter and 28 mm length fits everywhere and is usable up to 85 °C ambient temperature without cooling
- Temperature measuring ranges from 30 °C to 1500 °C and exposure times starting from 110 µs
- Short wave length range of 2.3 µm to reduce error of reading with measurements on materials with unknown emissivity

General Specifications

Environmental rating	IP 65 (NEMA-4)
Operating temperature	-20 °C ... 85 °C (sensing head) 0 °C ... 85 °C (electronics)
Storage temperature	-40 °C ... 125 °C (sensing head) -40 °C ... 85 °C (electronics)
Operating air humidity range	10 ... 95 %, non-condensing
Vibration (sensor)	IEC 60068-2-6 (sinus shaped) IEC 60068-2-64 (broadband noise)
Shock (sensor)	IEC 60068-2-27 (25G and 50G)
Weight	40 g (sensing head) 420 g (electronics)

Electrical Specifications

Outputs / analog	0/4 – 20 mA, 0 – 5/10 V, thermocouple K, alarm
Outputs / alarm	24 V/ 50 mA (open collector)
Optional	Relay: 2 x 60 V DC/ 42 V AC _{eff} ; 0.4 A; optically isolated
Digital interfaces	built-in USB-interface, Optional: USB, RS232, RS485, EtherNet/IP, Profinet, Ethernet TCP/IP, Modbus TCP, Modbus RTU
Output impedances	mA max. 500 Ω (with 8 – 36 V DC) mV min. 100 kΩ load impedance thermocouple 20 Ω
Inputs	Programmable functional inputs for external emissivity adjustment, ambient temperature compensation, trigger (reset of hold functions)
Cable length	3 m (standard), 8 m, 15 m
Power Supply	8 – 36 V DC
Current draw	Max. 100 mA

Measurement Specifications

Temperature ranges (scalable via programming keys or software)	30 °C ... 350 °C (3MXL) 50 °C ... 475 °C (3ML) 100 °C ... 600 °C (3MH) 150 °C ... 1000 °C (3MH1) 200 °C ... 1500 °C (3MH2)
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Spectral ranges	2.3 µm
Optical resolution (90 % energy)	12:1 (3MXL) 22:1 (3ML) 33:1 (3MH) 75:1 (3MH1 / 3MH2)
Short-term stability ^{2), 3)}	typically: 0.09 K/h typically: 0.10 K/h typically: 0.13 K/h typically: 0.25 K/h
Temperature coefficient ^{1), 2), 3)}	± 0,01 K/K (3MH2) ± 0,05 K/K (3MH) ± 0,08 K/K (3MXL / 3ML / 3MH1)
measurement uncertainty	± 1,5 °C (3MXL / 3ML / 3MH) ± (1,5 °C + 0,3%) (3MH1 / 3MH2)
NEDT ³⁾	typically: 85 mK (3MXL) typically: 95 mK (3ML) typically: 105 mK (3MH / 3MH2) typically: 200 mK (3MH1)
System accuracy ¹⁾ (at ambient temp. 23 ± 5 °C)	±(0.3 % of reading + 2 °C)
Repeatability (at ambient temp. 23 ± 5 °C)	±(0.1 % of reading + 1 °C)
Temperature resolution	0.1 K
Exposure time ²⁾	110 µs
Response time	320 µs
Emissivity / Gain (adjustable via programming keys or software)	0.05...1.100
Transmissivity / Gain (adjustable via programming keys or software)	0.05...1.100
Signal processing (parameter adjustable via programming keys or software, respectively)	Peak hold, valley hold, average; extended hold function with threshold and hysteresis
Software	optris CompactPlus Connect / IRmobile

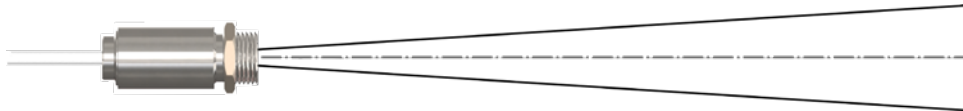
¹⁾ ε = 1, response time 1 s

²⁾ With dynamic adaptation at low signal levels

³⁾ Specification valid at T_{object} ≥ start of measurement range + 50 °C

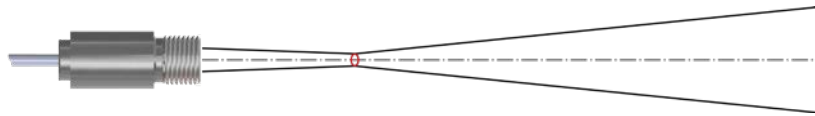
optris CTi 3M

Optical specifications - Standard Focus (SF)



Device	D:S	Optical values												
		0	100	200	300	400	500	600	700	800	900	1000	Distance (mm)	
3MXL	12:1	6.5	13.2	19.9	26.6	33.3	43.3	53.3	63.2	73.2	83.1	93.1	Spotsize (mm)	
		0	100	200	300	400	500	600	700	800	900	1000	1100	Distance (mm)
3ML	22:1	6.5	10.5	14.4	18.4	22.3	26.3	30.2	34.2	38.1	42.1	46.0	50.0	Spotsize (mm)
		0	200	400	600	800	1000	1200	1400	1600	1800	2000	Distance (mm)	
3MH	33:1	6.5	11.8	17	22.3	27.5	32.8	38.1	43.3	48.5	53.8	60.3	Spotsize (mm)	
3MH1/ 3MH2	75:1	6.5	8.4	10.3	12.5	13.9	15.8	17.6	19.5	21.3	24.8	28.3	Spotsize (mm)	

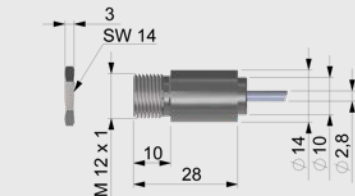
Optical specifications - Close Focus (CF)



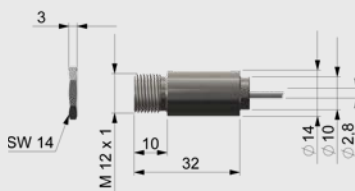
Device	D:S	Optical values										
		0	15	30	50	75	100	125	150	175	200	Distance (mm)
3MXL CF1	12:1	6.5	4.5	2.5	8.5	16	23.5	31	38.5	46	53.5	Spotsize (mm)
3ML CF 1	22:1	6.5	3.9	1.4	6.6	13.2	19.7	26.3	32.8	39.4	45.9	Spotsize (mm)
3MH CF 1	33:1	6.5	3.8	1	6	23.3	18.5	24.8	31	37.3	43.5	Spotsize (mm)
		0	40	80	110	150	200	250	300	350	400	Distance (mm)
3MXL CF	12:1	6.5	7.5	8.4	9.2	14.9	22.0	29.1	36.2	43.3	50.5	Spotsize (mm)
3ML CF	22:1	6.5	6.0	5.4	5	9.2	14.4	19.6	24.9	30.1	35.3	Spotsize (mm)
3MH CF	33:1	6.5	5.3	4.2	3.3	6.9	11.4	15.8	20.3	24.8	29.3	Spotsize (mm)
3MH1/ 3MH2	75:1	6.5	4.7	2.8	1.5	4.4	8	11.6	15.2	18.8	22.5	Spotsize (mm)

Dimensions

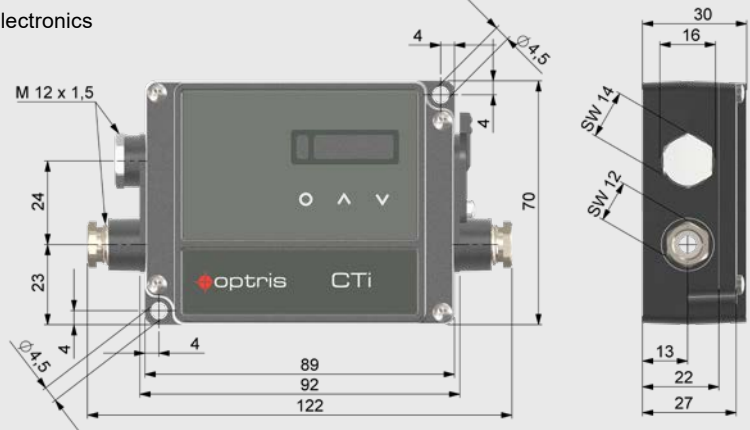
Sensing head
(standard)



Sensing head
(built-in
CF lens)

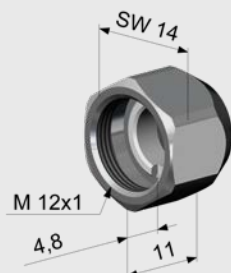


Electronics

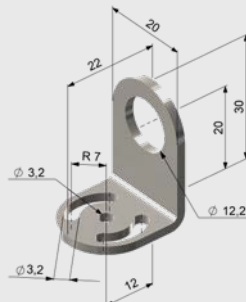


Accessories (examples)

CF-lens
(ACCTCFHT)



Mounting bracket, fixed
(ACCTFB)



Air purge collar with integrated CF-lens
(ACCTAPLCFHT)

