optris CTi 1M
TECHNICAL DATA

TR instruments

optris infrared measurements

Precise non-contact temperature measurement of metal from 350 °C to 2200 °C

Features:

- Miniaturized Infrared Thermometer with 1.0 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 125 °C ambient temperature without cooling
- Temperature ranges from 350 °C to 2200 °C, measuring spots up from 1.5 mm and exposure times up from 110 µs
- Short measuring wave length of 1.0 µm reduces error of temperature readings on surfaces with low or unknown emissivity

General Specifications	
Environmental rating	IP 65 (NEMA-4)
Operating temperature range [1]	–20 °C ... 125 °C (sensing head) –20 °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)
Relay outputs (optional)	Relay: 2 x 60 V DC/ 42 V AC_{RMS}; 0.4 A; optically isolated
Digital interfaces	built-in USB-interface, Optional: EtherNet/IP, Profinet, EtherCAT, Ethernet TCP/IP / Modbus TCP, Modbus RTU, RS485, RS232 or relay outputs (2 x optically isolated)
Output impedances	mA max. 500 Ω (with 8 – 36 V DC) mV min. 100 kΩ load impedance thermocouple 20 Ω
I/O Pins (3x)	flexible programming as in- or output: external emissivity adjustment, ambient temperature compensation, uncommitted value, trigger (reset of hold functions), alarm output (open collector 24 V / 50 mA)
Cable length	3 m (standard), 8 m, 15 m
Power supply	8 – 36 V DC / 1.2 W
Measurement Specifications	
Temperature ranges (scalable via programming keys or software / App)	350 °C ... 800 °C (1MXL) 485 °C ... 1150 °C (1ML) 650 °C ... 1850 °C (1MH) 800 °C ... 2200 °C (1MH1)

Spectral range	1.0 µm
Optical resolution (90 % energy)	15:1 (1MXL) 40:1 (1ML) 75:1 (1MH / 1MH1)
Measurement uncertainty [3), 4), 7)]	± 2.0 °C (1MXL) ± (0.3% of reading +1.5 °C) (1ML / 1MH) ± (0.3% of reading +2 °C) (1MH1)
Repeatability [4), 5), 6), 7)]	± 1.4 K (1MXL) ± 1.0 K (1ML) ± 0.5 K (1MH / 1MH1)
Temperature coefficient [3), 4)]	± 0.1 K/K (1MXL / 1ML) ± 0.15 K/K (1MH / 1MH1)
NETD (typically) [4), 5), 6), 7)]	typically: 600 mK (1MXL) typically: 330 mK (1ML) typically: 220 mK (1MH) typically: 160 mK (1MH1)
Temperature resolution (display)	0.1 K
Exposure time (90%)	110 µs
Response time (90%)	320 µs
Emissivity / Gain (adjustable via programming keys or software / App)	0.05...1.100
Transmissivity / Gain (adjustable via programming keys or software / App)	0.05...1.100
Signal processing (parameter adjustable via programming keys or software / App)	Peak hold, valley hold, average; extended hold functions with threshold and hysteresis
Software / App	optris CompactPlus Connect / IRmobile App

[1] The LCD display capacity may be limited at ambient temperatures below 0 °C
[3] Response time = 200 ms (90%)
[4] ε = 1.000
[5] Tobj = Tmin + 50 °C
[6] Response time = 1 ms (90%)
[7] at ambient temperature (23 ± 5) °C

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Měřicí přístroje a systémy

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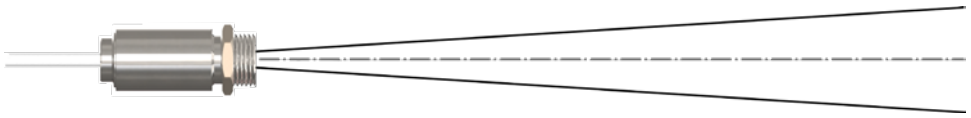
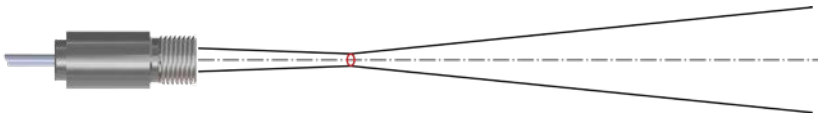
Optical specifications - Standard Focus (SF)



Device	D:S	Optical values											
		0	100	200	300	400	500	600	700	800	900	1000	Distance (mm)
1MXL	15:1	6.5	11.5	16.6	21.6	26.6	35.0	43.3	51.5	59.8	68.1	76.4	Spotsize (mm)
		0	200	400	600	800	1000	1200	1400	1600	1800	2000	Distance (mm)
1ML	40:1	6.5	10.7	14.9	19.1	23.3	27.4	31.6	35.8	40.0	45.8	51.6	Spotsize (mm)
1MH/1MH1	75:1	6.5	8.4	10.2	12.1	13.9	31.6	17.6	19.5	21.3	24.8	28.3	Spotsize (mm)

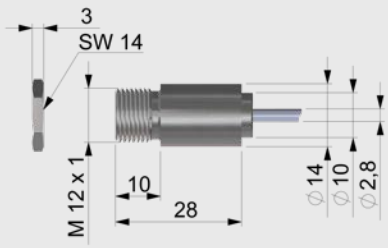
Optical specifications - Close Focus (CF)



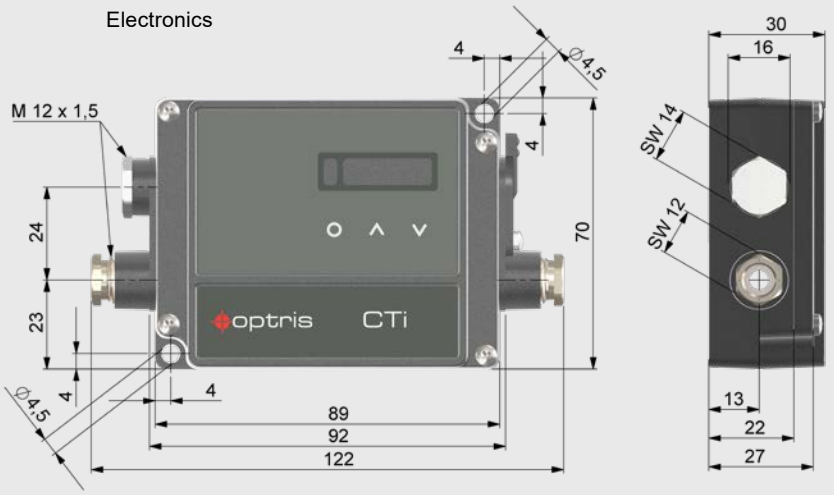
Device	D:S	Optical values										
		0	40	80	110	150	200	250	300	350	400	Distance (mm)
1MXL	15:1	6.5	6.8	7.1	7.3	12.4	18.7	24.9	31.2	37.5	43.8	Spotsize (mm)
1ML	40:1	6.5	5.1	3.8	2.8	6.1	10.3	14.5	18.7	22.9	27.1	Spotsize (mm)
1MH/1MH1	75:1	6.5	4.7	2.8	1.5	4.4	8.0	11.6	15.2	18.8	22.5	Spotsize (mm)

Dimensions

Sensing head

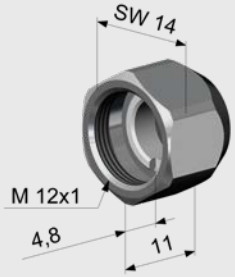


Electronics

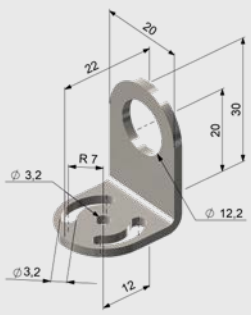


Accessories (examples)

CF-lens
(ACCTCFHT)



Mounting bracket, fixed
(ACCTFB)



Air purge collar with integrated CF-lens
(ACCTAPLCFHT)