



**Precise non-contact
temperature measurement of
metal from 30 °C to 1850 °C
(86 °F to 3362 °F)**



Features:

- Miniaturized Infrared Thermometer with 2.3 µm spectral range for measurements of metals, of secondary metal processing, metal oxides and ceramic materials
- Very small sensing head of 14 mm (0.6 in) diameter and 28 mm (1.1 in) length fits everywhere and is usable up to 85 °C (185 °F) ambient temperature without cooling
- Temperature measuring ranges from 30 °C to 1850 °C (86 °F to 3362 °F) and very fast exposure time of 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 range	–20 °C to 85 °C (–4 °F to 185 °F) (sensing head) –20 °C to 85 °C (–4 °F to 185 °F) (electronics)
Storage temperature	–40 °C to 125 °C (–40 °F to 257 °F) (sensing head) –40 °C to 85 °C (–40 °F to 185 °F) (electronics)
Relative humidity	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 (1.4 oz) (sensing head) 420 g (14.8 oz) (electronics)

Electrical Specifications

Outputs / analog	0/4–20 mA, 0–5/10 V, thermocouple K, alarm
Output / 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 (9.8 ft) (standard), 8 m (26.25 ft), 15 m (49.21 ft)
Power supply	8–36 V DC / 1.2 W

Measurement specifications

Temperature ranges (scalable via programming keys or software / App)	30 °C ... 350 °C (3MXL) (86 °F ... 662 °F) 50 °C ... 475 °C (3ML) (122 °F ... 887 °F) 100 °C ... 600 °C (3MH) (212 °F ... 1112 °F) 150 °C ... 1000 °C (3MH1) (302 °F ... 1832 °F) 200 °C ... 1500 °C (3MH2) (392 °F ... 2732 °F) 250 °C ... 1850 °C (3MH3) (482 °F ... 3362 °F)
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Spectral range	2.3 µm
Optical resolution (90 % energy)	12:1 (3MXL) 22:1 (3ML) 33:1 (3MH) 75:1 (3MH1 / 3MH2 / 3MH3)
Measurement uncertainty ^{2), 3), 4), 7}	± 1.5 °C [2.7 °F] (3MXL / 3ML / 3MH) ± (0.3% of reading + 1.5 °C [2.7 °F]) (3MH1 / 3MH2 / 3MH3)
Repeatability ^{4), 5), 6), 7)}	± 0.25 °C [0.45 °F] (3MXL / 3ML / 3MH / 3MH2 / 3MH3) ± 0.6 °C [1.08 °F] (3MH1)
Temperature coefficient ^{2), 3), 4)}	± 0.01 K/K (3MH2 / 3MH3) ± 0.05 K/K (3MH) ± 0.08 K/K (3MXL / 3ML / 3MH1)
NETD (typically) ^{4), 5), 6), 7)}	70 mK (3MH3) 85 mK (3MXL) 95 mK (3MH / 3MH2) 105 mK (3ML) 200 mK (3MH1)
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 func- tion 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

²⁾ Whichever is greater

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

Technical drawing of a shaft assembly. The drawing shows a shaft with a threaded section on the left and a smooth section on the right. The dimensions and tolerances are as follows:

- Threaded section: M 12 x 1
- Threaded section length: 10 (0.39)
- Threaded section diameter: 12 (0.47)
- Threaded section tolerance: (1.10)
- Smooth section length: 28 (1.10)
- Smooth section diameter: $\varnothing 14$ (0.55)
- Smooth section tolerance: (0.39)
- Smooth section diameter: $\varnothing 12$ (0.47)
- Smooth section tolerance: (0.11)
- Smooth section diameter: $\varnothing 10$ (0.39)
- Smooth section tolerance: (0.11)
- Smooth section diameter: $\varnothing 8$ (0.31)
- Smooth section tolerance: (0.11)
- Smooth section diameter: $\varnothing 6$ (0.24)
- Smooth section tolerance: (0.11)
- Smooth section diameter: $\varnothing 4$ (0.16)
- Smooth section tolerance: (0.11)
- Smooth section diameter: $\varnothing 2$ (0.08)
- Smooth section tolerance: (0.11)

Technical drawing of a 1/2" NPT x 1" M female adapter. The drawing shows a side view of the adapter with dimensions in inches and millimeters. Key dimensions include: overall length 3 (0.12), thread length 10 (0.39), total length 32 (1.26), and diameters of 1.4 (0.55), 1.0 (0.39), and 0.8 (0.11). The adapter is labeled "SW 14" and "M 1/2 x 1".

Electronics

M 12 x 1,5

24

23

4

4

4

70

89

92

122

Ø 4,5

SW 14

SW 12

30

16

13

22

27

optris CTi