

Precise non-contact temperature measurement of metal from 30 °C to 1850 °C



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 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 1850 °C 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 ... 85 °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, 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 k Ω 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)	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) 250 °C ... 1850 °C (3MH3)
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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 (3MXL / 3ML / 3MH) $\pm (0.3\% \text{ of reading} + 1.5 \text{ °C})$ (3MH1 / 3MH2 / 3MH3)
Repeatability ^{4), 5), 6), 7)}	± 0.25 K (3MXL / 3ML / 3MH / 3MH2 / 3MH3) ± 0.6 K (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 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

²⁾ Whichever is greater

³⁾ Response time = 200 ms (90%)

⁴⁾ $\varepsilon = 1.000$

⁵⁾ $T_{obj} = T_{min} + 50$ °C

⁶⁾ Response time = 1 ms (90%)

⁷⁾ at ambient temperature (23 ± 5) °C

