

Non-contact temperature measurement from 100 °C to 1800 °C (212 °F to 3272 °F) of laser material processing

Features:

- New infrared thermometer for laser material processing, laser welding and laser soldering
- Special blocking filter against laser radiation of most of all diode lasers and solid state lasers (VIS to 1800 nm and 10.6 μm)
- Far focus version for use with laser collimator optics
- Usable up to 85 °C (185 °F) ambient temperature without cooling
- 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) front mountable at vacuum processes (up to 10 ⁻³ mbar)
Ambient temperature ¹⁾	-40 °C ... 85 °C (sensing head) (-40 °F ... 185 °F [sensing head]) -20 °C ... 85 °C (electronics) (-4 °F ... 185 °F [electronics])
Storage temperature	-40 °C ... 125 °C (sensing head) (-4 °F ... 257 °F [sensing head]) -40 °C ... 85 °C (electronics) (-40 °F ... 185 °F [electronics])
Relative humidity	10 – 95 %, non condensing
Vibration	IEC 68-2-6: 3 G, 11 – 200 Hz, any axis
Shock	IEC 68-2-27: 50 G, 11 ms, any axis
Weight	150 g (5.3 oz) (sensing head) 420 g (14.8 oz) (electronics)

Electrical specifications

Output / analog	0/4 – 20 mA, 0 – 5/ 10 V, thermocouple J, K, alarm
Output / alarm	24 V / 50 mA (open collector)
Optional	Relay: 2 x 60 V DC/ 42 V AC _{eff} ; 0.4 A; optically isolated
Output / digital	USB, RS232, RS485, CAN, Profibus DP, Ethernet (optional)
Output impedances	mA max. 500 Ω (with 8 – 36 V DC) mV min. 100 kΩ load impedance, thermocouple 20 Ω
Cable length	3 m (9.8 ft)
Current draw (laser)	Max. 100 mA
Power supply	8 – 36 V DC

Measurement specifications

Temperature ranges ²⁾ (scalable via programming keys or software)	100 °C ... 600 °C (212 °F ... 1112 °F) (3MH) 150 °C ... 1000 °C (302 °F ... 1832 °F) (3MH1) 200 °C ... 1500 °C (392 °F ... 2732 °F) (3MH2) 250 °C ... 1800 °C (482 °F ... 3272 °F) (3MH3)
Spectral range	2.3 μm
Optical resolution (90 % energy)	100:1 (3MH) 300:1 (3MH1 – 3MH3)
System accuracy ³⁾ (at ambient temp. 23 ± 5 °C) (at ambient tem. 73 ± 41 °F)	±(0.3 % of reading + 2 °C) (±[0.3 % of reading + 3.6 °F])
Repeatability (at ambient temp. 23 ± 5 °C) (at ambient tem. 73 ± 41 °F)	±(0.1 % of reading + 1 °C) (±[0.1 % of reading + 1.8 °F])
Temperature resolution	0.1 K
Exposure time ⁴⁾ (90 % signal)	1 ms
Emissivity/ Gain (adjustable via sensor or software)	0.100 – 1.100
IR window correction (adjustable via software)	0.100 – 1.000
Signal processing (parameter adjustable via software)	Peak hold, valley hold, average; extended hold function with threshold and hysteresis
Software	optris® Compact Connect

¹⁾ The functioning of the LCD Display may be limited in ambient temperatures below 0 °C

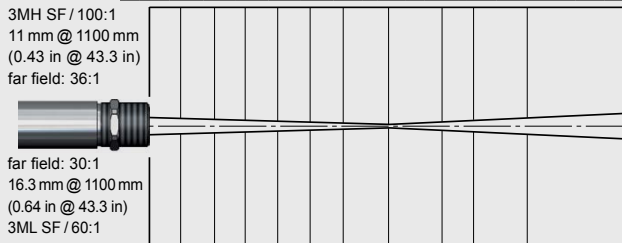
²⁾ $T_{object} > T_{sensing head} + 25 °C (77 °F)$

³⁾ $\epsilon = 1$, Response time 1 s

⁴⁾ With dynamic adaptation at low signal levels

Optical parameter

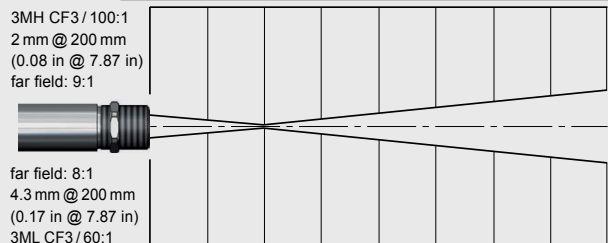
20 19 18 17 16 15 14 11 16 20 28 38 mm
 S (0.79) (0.75) (0.71) (0.67) (0.63) (0.59) (0.55) (0.43) (0.63) (0.79) (1.10) (1.50) (in)



20 20 20 20 20 19 19 18.3 25 30 40 53 mm
 S (0.79) (0.79) (0.79) (0.79) (0.79) (0.75) (0.75) (0.72) (0.98) (1.18) (1.57) (2.09) (in)

D 0 150 300 450 600 750 900 1100 1350 1500 1750 2000 mm
 (0) (5.91) (11.8) (17.7) (23.6) (29.5) (35.4) (43.3) (53.1) (59.0) (68.9) (78.7) (in)

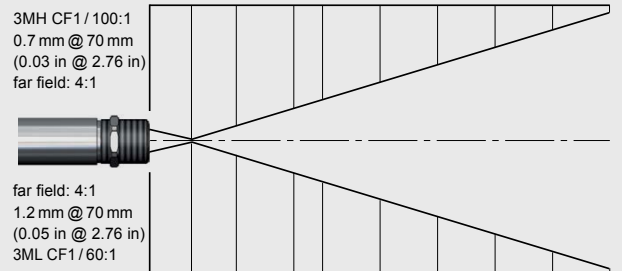
20 11 2 13 24 35 46 57 68 mm
 S (0.79) (0.43) (0.08) (0.51) (0.94) (1.38) (1.81) (2.24) (2.68) (in)



20 11.7 3.4 15.1 27 39 51 62 74 mm
 S (0.79) (0.46) (0.13) (0.59) (1.06) (1.54) (2.01) (2.44) (2.91) (in)

D 0 100 200 300 400 500 600 700 800 mm
 (0) (3.94) (7.87) (11.8) (15.7) (19.7) (23.6) (27.6) (31.5) (in)

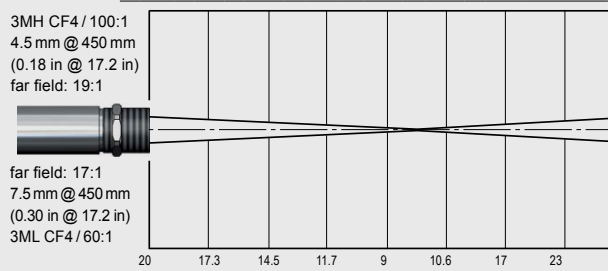
20 0.85 16.8 41.4 53.6 78.2 103 128 152 177 mm
 S (0.79) (0.03) (0.66) (1.63) (2.11) (3.08) (4.06) (5.04) (5.98) (6.97) (in)



20 1.4 17.8 43 56 81 106 132 157 182 mm
 S (0.79) (0.06) (0.70) (1.7) (2.17) (3.19) (4.17) (5.20) (6.18) (7.17) (in)

D 0 85 150 250 300 400 500 600 700 800 mm
 (0) (3.35) (5.91) (9.84) (11.8) (15.7) (19.7) (23.6) (27.6) (31.5) (in)

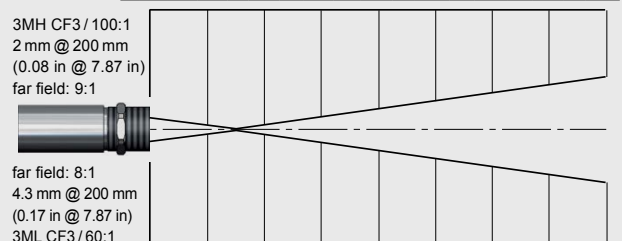
20 16.6 13.2 9.7 6.3 7.3 13 19 24 mm
 S (0.79) (0.65) (0.52) (0.38) (0.25) (0.29) (0.51) (0.75) (0.94) (in)



20 17.3 14.5 11.7 9 10.6 17 23 29 mm
 S (0.79) (0.68) (0.57) (0.46) (0.35) (0.42) (0.67) (0.91) (1.14) (in)

D 0 100 200 300 400 500 600 700 800 mm
 (0) (3.94) (7.87) (11.8) (15.7) (19.7) (23.6) (27.6) (31.5) (in)

20 7.7 8.7 23 38 52 66 81 95 mm
 S (0.79) (0.30) (0.34) (0.91) (1.50) (2.05) (2.60) (3.19) (3.74) (in)



20 8.4 10 25 40 55 70 85 100 mm
 S (0.79) (0.33) (0.39) (0.98) (1.6) (2.17) (2.76) (3.35) (3.94) (in)

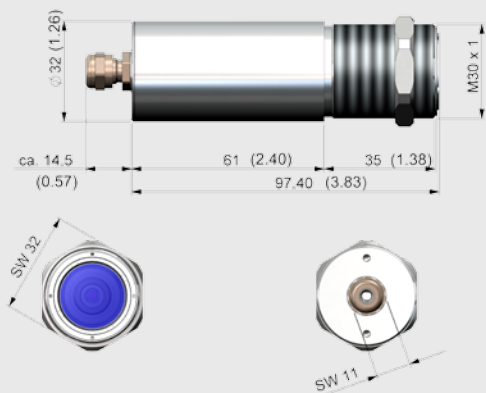
D 0 100 200 300 400 500 600 700 800 mm
 (0) (3.94) (7.87) (11.8) (15.7) (19.7) (23.6) (27.6) (31.5) (in)

Further optics, D:S = 300:1

... SF	3.7 mm @ 1100 mm (0.15 in @ 43.3 in)
... CF2	0.5 mm @ 150 mm (0.02 in @ 5.91 in)
... CF3	0.7 mm @ 200 mm (0.03 in @ 7.87 in)
... CF4	1.5 mm @ 450 mm (0.06 in @ 17.7 in)
... FF	12 mm @ 3600 mm (0.47 in @ 141 in)

Dimensions

Sensing head



Electronics

