optris CT LT
TECHNICAL DATA

optris infrared sensing

Precise non-contact temperature measurement from –50 °C to 975 °C (–58 to 1787 °F)

Features:

- One of the smallest infrared sensors worldwide with 22:1 optical resolution
- Rugged and usable up to 180 °C (356 °F) ambient temperature without cooling
- Separate electronics with easy accessible programming keys and LCD backlit display
- Selectable analog output: 0/4 – 20 mA, 0 – 5 V, 0 – 10 V, thermocouple type K or J
- Optional USB, RS485, RS232 interface, relay outputs (2 x optically isolated), Profibus DP, Ethernet
- Installation of up to 32 sensors in one network (with RS485)
- CTex: Explosion proof version (ATEX)

General specifications

Environmental rating	IP 65 (NEMA-4)
Ambient temperature[1)]	–20 °C to 180 °C (–4 °F to 356 °F) 130 °C (266 °F) to LT02) (sensing head) 0 °C to 85 °C (32 °F to 185 °F) (electronics)
Storage temperature	–40 °C to 130 °C (–40 °F to 266 °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	Channel 1: 0/4–20 mA, 0–5/ 10 V, thermocouple J, K Channel 2: sensind head temperature (–20 °C to 180 °C (–4 °F to 356 °F) as 0 – 5 V or 0 – 10 V), alarm output
Output / alarm	24 V / 50 mA (open collector)
Optional	Relay: 2 x 60 V DC/ 42 V AC_{eff}; 0.4 A; optically isolated
Outputs / digital (optional)	USB, RS232, RS485, Profibus DP, Ethernet
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	1 m (standard), 3 m, 8 m, 15 m (3.3 ft (standard), 9.8 ft, 26.2 ft, 49.2 ft)
Power Supply	8 – 36 V DC
Current draw	Max. 100 mA

Measurement specifications

Temperature range (scalable via programming keys or software)	–50 °C to 975 °C (LT22) (–58 °F to 1787 °F) –50 °C to 600 °C (LT15) (–58 °F to 1112 °F) –50 °C to 600 °C (LT02) (–58°F to 1112 °F)
Spectral range	8 – 14 µm
Optical resolution (90 % energy)	22:1 (precision glass optics) 15:1 (precision glass optics) 2:1 (with flat front window)
CF-lens (optional)	0.6 mm @ 10 mm (with LT22) (0.02 in @ 0.4 in) 0.8 mm @ 10 mm (with LT15) (0.03 in @ 0.4 in) 2.5 mm @ 23 mm (with LT02) (0.1 in @ 0.9 in)
System accuracy[2),3)] (at ambient temp. 23 ±5 °C) (73 ±9 °F)	±1 % or ±1 °C (±1 % or ±1.8 °F)
Repeatability[2),3)] (at ambient temp. 23 ±5 °C) (73 ±9 °F)	±0.5 % or ±0.5 °C (±0.5 % or ±0.9 °F)
Temperature resolution (display)	0.1 K
NETD[3),4)]	0.05 K (LT22 / LT15) 0.1 K (LT02)
Response time	150 ms (95 %)
Emissivity/ Gain (adjustable via programming keys or software)	0.100 – 1.100
Transmissivity/ Gain (adjustable via programming keys or software)	0.100 – 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 Compact Connect

[1)] The LCD displays capacity may be limited at ambient temperatures below 0 °C.
[2)] Whichever is greater
[3)] At object temperatures >0 °C (> 32 °F), ε = 1
[4)] At time constant 200 ms and T_{Obj} 25 °C (77 °F)

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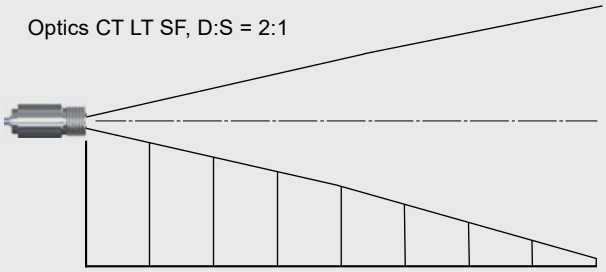
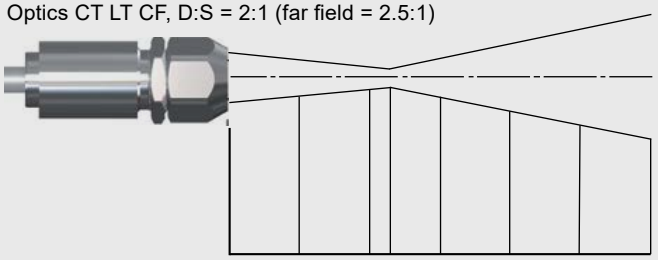
Optical specifications

Optics CT LT SF, D:S = 2:1



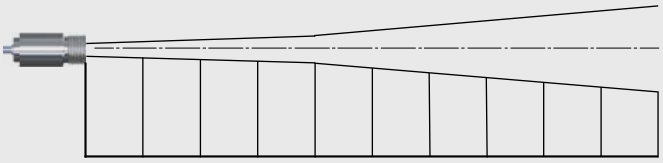
S	5 (0.20)	53.8 (2.12)	102.5 (4.04)	151.3 (5.96)	200 (7.87)	251.3 (9.89)	302.5 (11.9)	353.8 (13.9)	405 (15.9)	mm (in)
D	0 (0)	100 (3.94)	200 (7.87)	300 (11.8)	400 (15.6)	500 (19.7)	600 (23.6)	700 (27.6)	800 (31.5)	mm (in)

Optics CT LT CF, D:S = 2:1 (far field = 2.5:1)



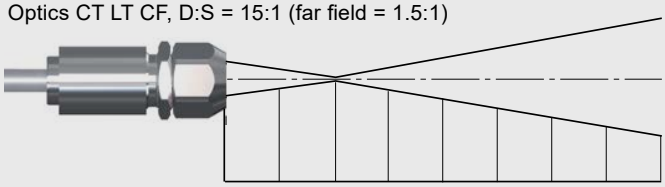
S	7 (0.28)	5 (0.20)	3.1 (0.12)	2.5 (0.10)	5.4 (0.21)	9.5 (0.37)	13.7 (0.54)	17.8 (0.70) mm (in)
D	0 (0)	10 (0.39)	20 (0.79)	23 (0.91)	30 (1.18)	40 (1.57)	50 (1.97)	60 (2.36) mm (in)

Optics CT LT SF, D:S = 15:1



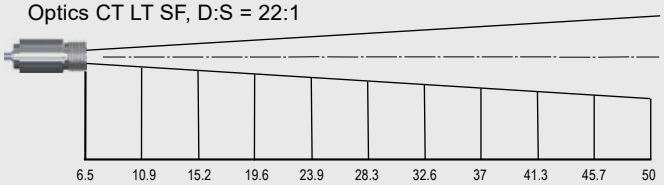
S	6.5 (0.26)	11.6 (0,46)	16.6 (0.65)	21.7 (0.85)	26.7 (1.05)	35 (1.38)	43.3 (1.70)	51.6 (2.04)	59.9 (2.36)	68.2 (2.69)	76.5 (3.01) (mm)
D	0 (0)	100 (3.94)	200 (7.87)	300 (11.8)	400 (15.7)	500 (19.7)	600 (23.6)	700 (27.6)	800 (31.5)	900 (35.4)	1000 (39.4) (mm)

Optics CT LT CF, D:S = 15:1 (far field = 1.5:1)



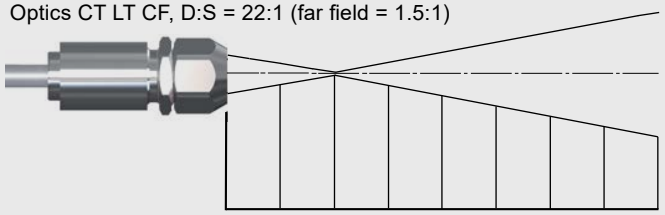
S	7 (0.28)	4 (0.16)	0.8 (0.03)	4.7 (0.19)	8.6 (0.34)	12.5 (0.49)	16.4 (0.65)	20.3 (0.80)	24.2 (0.95) mm (in)
D	0 (0.0)	5 (0.20)	10 (0.39)	15 (0.59)	20 (0.79)	25 (0.98)	30 (1.18)	35 (1.38)	40 (1.57) mm (in)

Optics CT LT SF, D:S = 22:1



S	6.5 (0.26)	10.9 (0.43)	15.2 (15.2)	19.6 (0.77)	23.9 (0.94)	28.3 (1.11)	32.6 (1.28)	37 (1.46)	41.3 (1.63)	45.7 (1.80)	50 (1.97) mm (in)
D	0 (0)	110 (4.33)	220 (8.66)	330 (13.0)	440 (17.3)	550 (21.7)	660 (26.0)	770 (30.3)	880 (34.6)	990 (39.0)	1100 (43.3) mm (in)

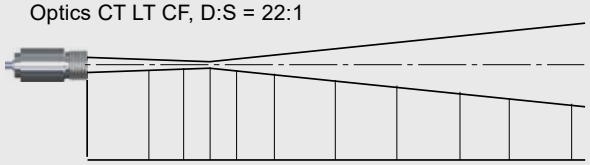
Optics CT LT CF, D:S = 22:1 (far field = 1.5:1)



S	7 (0.28)	3.8 (0.15)	0.6 (0.02)	4.4 (0.17)	8.2 (0.32)	12 (0.47)	15.8 (0.62)	19.6 (0.77)	23.4 (0.92) mm (in)
D	0 (0)	5 (0.20)	10 (0.39)	15 (0.59)	20 (0.79)	25 (0.98)	30 (1.18)	35 (1.38)	40 (1.57) mm (in)

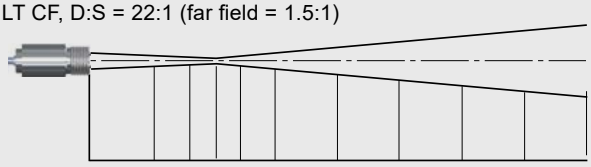
Versions with built-in CF lenses

Optics CT LT CF, D:S = 22:1



S	6.5 (0.26)	5 (0.20)	4 (0.16)	3.4 (0.13)	5.4 (0.21)	8.4 (0.33)	13.3 (0.52)	18.3 (0.72)	23.2 (0.92)	28.2 (1.11)	33.1 (1.30) mm (in)
D	0 (0)	25 (0.98)	40 (1.57)	50 (1.97)	60 (2.36)	75 (2.95)	100 (3.94)	125 (4.92)	150 (5.91)	175 (6.89)	200 (7.87) mm (in)

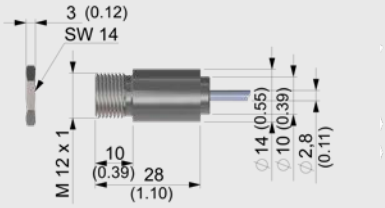
Optics CT LT CF, D:S = 22:1 (far field = 1.5:1)



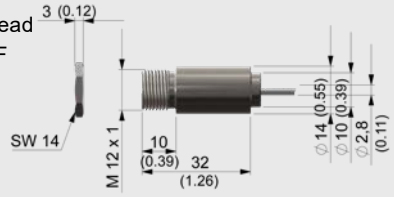
S	6.5 (0.26)	4.4 (0.17)	3.2 (0.13)	2.3 (0.09)	4.1 (0.16)	6.7 (0.26)	11.1 (0.44)	15.5 (0.61)	19.9 (0.78)	24.3 (0.96)	28.7 (1.13) mm (in)
D	0 (0)	25 (0.98)	40 (1.57)	50 (1.97)	60 (2.36)	75 (2.95)	100 (3.94)	125 (4.92)	150 (5.91)	175 (6.89)	200 (7.87) mm (in)

Dimensions

Sensing head (standard)



Sensing head (built-in CF lenses)



Electronics