



# More Precision

**thermoMETER** // Non-contact infrared temperature sensors





### thermoMETER CSLaser

Miniature IR sensor with integrated controller and laser sighting

- Measuring range from -30 to 1600 °C, measuring fields from 0.5 mm and response times from 10 ms
- Optical resolution up to 300:1 with selectable focus settings
- Double laser sighting with 2 rays for exact measuring field marking and focusing
- Scalable 4-20 mA two-wire analog output and simultaneous alarm output
- Optional USB interface and software for programming
- Emissivity directly adjustable via rotary controller or software
- Protection against short circuit and polarity change
- Up to 85 °C ambient temperature without cooling
- Automatic laser switch-off at 50 °C
- Extensive supply voltage range: 5 - 28 VDC

#### Optical specifications thermoMETER CSLaser

□ = smallest spot size / focal point (mm)

Standard Focus															
2H SF	300:1	12	10.9	9.7	8.6	7.5	6.3	5.2	4.5	3.7	5.1	7.3	9.4	13	19.4
2L SF	150:1	20	18.3	16.5	14.8	13.1	11.3	9.6	8.5	7.3	9.8	13.5	17.2	23.4	34.6
	distance in mm	0	150	300	450	600	750	900	1000	1100	1200	1350	1500	1750	2200
Close Focus															
2H CF2	300:1	12	8.2	4.3	0.5	4.7	8.8	13	17.2	21.3	25.5	29.7	38	46.3	54.7
2L CF2	150:1	20	13.7	7.3	1	8	15	22	29	36	43	50	64	78	92
2H CF3	300:1	12	9.2	6.4	3.5	0.7	3.9	7	10.2	13.4	16.6	19.8	26.1	32.4	38.8
2L CF3	150:1	20	15.3	10.7	6	1.3	6.6	12	17.3	22.6	27.9	33.3	43.9	54.6	65.2
2H CF4	300:1	12	10.8	9.7	8.5	7.3	6.2	5	3.8	2.7	1.5	3	6	9	12
2L CF4	150:1	20	18.1	16.2	14.3	12.4	10.6	8.7	6.8	4.9	3	5.6	10.7	15.8	20.9
	distance in mm	0	50	100	150	200	250	300	350	400	450	500	600	700	800
Far Focus															
2H FF	300:1	20	12	12	12	12	12	12	12	12	14.7	21.3	28	33	
2L FF	150:1	20	20.5	21	21.5	22	22.5	23	23.3	24	28.9	41.1	53.3	62.5	
	distance in mm	0	450	900	1350	1800	2250	2700	3000	3600	4000	5000	6000	6750	

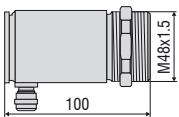
Model	CSL-SF50	CSLHS-SF50	CSLM-2LSF150	CSLM-2HSF300
Optical resolution	50:1		150:1	300:1
Temperature range <sup>1)</sup>	-30 °C to 1000 °C	-20 °C to 150 °C	250 °C to 800 °C	385 °C to 1600 °C
Spectral range	8 to 14 μm		1.6 μm	
System accuracy <sup>3)</sup>	±1 % or ±1 °C		±(0.3 % of reading + 1 °C) <sup>4)</sup>	
Repeatability <sup>3)</sup>	±0.5 % or ±0.5 °C		±(0.1 % of reading + 1 °C) <sup>4)</sup>	
Temperature resolution	0.1 °C	0.025 °C	0.1 °C	
Response time (90 % signal)	150 ms		10 ms	
Emissivity/gain <sup>1)</sup>	0.100 to 1.100			
IR window correction <sup>2)</sup>	0.100 to 1.100			
Signal processing <sup>2)</sup>	peak hold, valley hold, average; extended hold function with threshold and hysteresis			
Outputs/analog	4 to 20 mA			
Output/alarms	0 to 30 V / 500 mA (open collector)			
Outputs/digital (optional)	mono-/bidirectional, 9.6 kBaud, 0/3 V level, USB			
Output/impedance	max. 1000 Ω (depends on supply voltage)			
Power consumption (only laser)	45 mA at 5 V / 20 mA at 12 V / 12 mA at 24 V			
Power supply	5 to 28 VDC			
Laser	class II, (635 nm), 1 mW, ON/OFF via software			
Protection class	IP65 (NEMA-4)			
Ambient temperature	-20 °C to 85 °C (50 °C if Laser ON)			
Storage temperature	-40 °C to 85 °C			
Relative humidity	10 to 95 %, non-condensing			
Vibration	IEC 68-2-6: 3 G, 11 to 200 Hz, any axis			
Shock	IEC 68-2-27: 50 G, 11 ms, any axis			
Weight	600 g			

<sup>1)</sup> adjustable via sensor or software

<sup>2)</sup> adjustable via software

<sup>3)</sup> ambient temperature 23 ± 5 °C; whichever is greater; ambient temperature ≥ 0 °C

<sup>4)</sup> ε = 1, response time 1 s



**Product identification**

CSL -	SF50
Focus [SF50 / CF1 / CF2 / CF3 / CF4]	
thermoMETER CSLaser	

**Product identification**

CSLM -	2	H	SF300
Focus [SF300 / CF1 / CF2 / CF3 / CF4]			
Temperature range [H]			
Spectral range [1.6 μm]			
thermoMETER CSLaserM			

**Optical specifications thermoMETER CSLaser CSL-SF50 und CSLHS-SF50**

□ = smallest spot size / focal point (mm)

Standard Focus																	
SF50 lens	50:1	20	20.5	21	21.5	22	22.5	23	23.5	24	29.5	35	46	57	68		
distance in mm		0	150	300	450	600	750	900	1050	1200	1350	1500	1800	2100	2400		
Close Focus																	
CF1 lens	50:1	20	9.4	6.7	1.4	10.6	25.9	41.1	56.4	71.7	87	102.3	117.6	132.9	163.4	194	224.6
CF2 lens	50:1	20	15.5	14.3	12.1	8.7	3	10.7	18.3	26	33.7	41.3	49	56.7	72	87.3	102.7
CF3 lens	50:1	20	16.8	16	14.4	12	8	4	10	16	22	28	34	40	52	64	76
CF4 lens	50:1	20	19	18.8	18.3	17.6	16.3	15.1	13.9	12.7	11.4	10.2	9	12.2	18.7	25.1	31.6
distance in mm		0	40	50	70	100	150	200	250	300	350	400	450	500	600	700	800

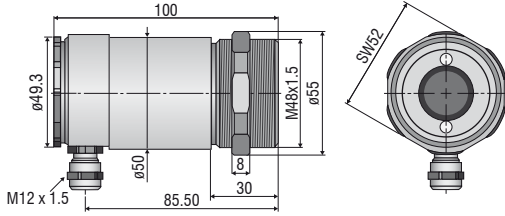
**Accessories page 54 - 55**

- Mounting bracket
- Air purge collar
- Rail mount adapter for controller
- Water cooled housing
- Certificate of calibration
- USB kit (TM-USBK-CS) p.55



**CSLaser**

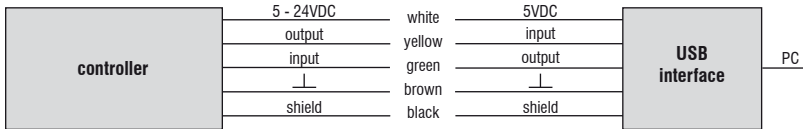
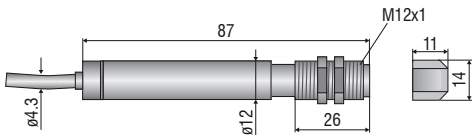
sensor



**CS**

sensor with integrated controller

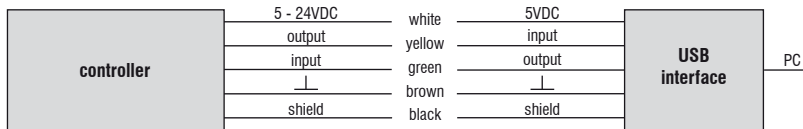
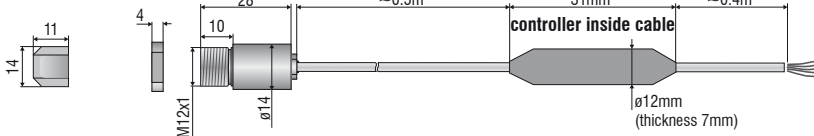
ancillary CF lens (optional)



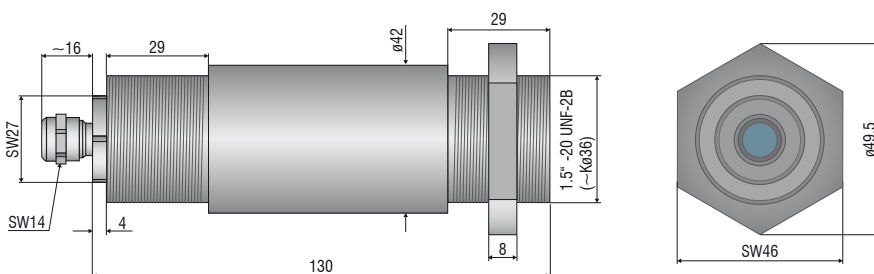
**CSmicro / CSmicro 2W**

ancillary CF lens (optional)

sensor



**CX**



**Mechanical accessories CS / CSmicro / CSmicro 2W**

Art. No.	Model	
2970279	Emissivity	Mounting bracket, fixed
2970280	TM-AB-CS	Mounting bracket, adjustable
2970281	TM-MB-CS	Mounting bolts with M12x1 thread
2970282	TM-MG-CS	Mounting fork, adjustable in 2 axes, with M12x1 fastening
2970283	TM-AP-CS	Air purge collar for 10:1 sensors
2970284	TM-APL-CS	Air purge collar, laminar
2970285	TM-APLCF-CS	Air purge collar, laminar with integrated ancillary CF lens
2970286	TM-RAM-CS	Right angle mirror for measurements 90 °C to the sensor axis
2970718	TM-USBK-CS	USB kit: USB programming adapter, CompactConnect software (as download)

**Optical accessories CS / CSmicro / CSmicro 2W**

2970277	TM-CF-CS	Ancillary CF lens for CS models
2970278	Aluminum	Protective window for CS models

**Calibration CS / CSmicro / CSmicro 2W**

2970288	TM-CERT-CS	Certificate of calibration
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**Mechanical accessories CX**

Art. No.	Model	
2970307	TM-AP-CX	Air purge collar, aluminum (anodized)
2970321	TM-FB-CX	Mounting bracket, adjustable in 1 axis, stainless steel
2970322	TM-AB-CX	Mounting bracket, adjustable, in 2 axes, stainless steel

**Optical accessories CX**

2970302	TM-CF-CX	Ancillary CF lens for CX models
2970303	TM-PW-CX	Protective window for CX models

**Calibration CX**

2970323	TM-CERT-CX	Certificate of calibration
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TM-FB-CS mounting bracket, fixed



TM-MG-CS Mounting fork with M12x1 thread, adjustable in two axes



TM-CF-CS Ancillary CF lens (only for LT models)



TM-AP-CS Air purge collar for 10:1 sensors



TM-MB-CS Mounting bolts with M12x1 thread adjustable in one axis



TM-APL-CS Air purge collar, laminar



TM-APLCF-CS Air purge collar, laminar with integrated ancillary CF lens



TM-APL-CS Air purge collar, laminar  
TM-MG-CS Mounting fork



TM-AP-CX Air purge collar for CX sensors



TM-CF-CX Ancillary CF lens, TM-PW-CX Protective window



TM-RAM-CS Right angle mirror

## Infrared thermal imagers from Micro-Epsilon



### thermoIMAGER TIM Compact thermal imaging cameras for industrial temperature monitoring

- Temperature range from -20 °C to 2450 °C
- Ideal for OEM
- Real-time thermography using license-free software
- Protective housing for harsh environments
- Special variants for the glass, metal and plastics industries