MICRO-EPSILON

More Precision

thermoMETER // Non-contact infrared temperature sensors

Robust miniature pyrometer
thermoMETER SE

- Temperature measuring range from -40 to 1100 °C
- Short response time of 20 ms
- Voltage or two-wire current output (switchable via software)
- Open-collector output with 500 mA
- No cooling required for ambient temperatures up to 120 °C
- Best price/performance ratio – ideal for OEM series applications

Compact. Robust. Functional.

The thermoMETER SE is a miniature infrared pyrometer for measuring object temperatures up to 1100 °C and is ideal for integration into machines and systems (OEM).

The system combines the advantages of the thermoMETER FI with those of the thermoMETER UC. Since the miniature controller is housed in the cable, the space required is minimized. In addition, the detection point and evaluation are locally decoupled so that the sensor delivers precise measurement values even in environments with high temperatures and under harsh conditions.

Ready-made channel

The sensor, controller and connection cable of the thermoMETER SE are already pre-assembled. The connection is direct and quick via the open cable ends. Optionally, the system can be operated via a USB adapter and set using the sensorTOOL software.

Model			SE-SF15
Optical resolution			15:1
Measuring range [1]			-40 °C up to 600 °C (1100 °C)
Spectral range			8 to 14 μm
System accuracy [2]			±1.0 % or ±1.0 °C
Repeatability [2]			±0.5 % or ±0.5 °C
Temperature resolution (NETD) [3]			50 mK
Response time [4]			20 ms
Emissivity			0.100 to 1.100
Transmittance			0.100 to 1.100
Signal processing			Intelligent averaging, Min/Max, Hold function with threshold/hysteresis (adjustable via software)
Supply voltage			5 … 30 VDC
Max. current consumption			≤ 4 mA (voltage output) / ≤ 20 mA (2-wire current output)
Digital interface			3.3V-LVTTL or USB via programming adapter
Analog output [5]			4 ... 20 mA (two-wire current output) / 0 ... 5 V; 0 ... 10 V (voltage output) freely scalable within the measuring range
Switching output			Open collector for alarm; 500 mA
Connection			Integrated cable with open ends (ferrules); standard length 0.5 m sensor and connection cable; optional sensor cable with 3 m, 6 m or 15 m and connection cable with 3 m available
Mounting		Sensor	Direct fastening via integrated M12x1 thread or fastening using the hexagon nut included in the scope of delivery
Temperature range	Sensor	Storage	-40 ... 85 °C
		Operation	-20 ... 120 °C
	Controller	Storage	-40 ... 85 °C
		Operation	-20 ... 80 °C
Humidity			10 % RH ... 95 % RH (non-condensing)
Shock (DIN EN 60068-2-27)			50g, 11 ms, each axis
Vibration (DIN EN 60068-2-6)			3g, 11 to 200 Hz, each axis
Protection class (DIN EN 60529)		Sensor	IP65
		Controller	IP65
Material		Sensor	Stainless steel (1.4404)
Weight			approx. 20 g (sensor only)
Control and indicator elements [6]			Sensor configuration optionally possible via sensorTOOL

[1] Measuring range can optionally be extended to 1100 °C
[2] Valid for object temperatures >0 °C and for an ambient temperature of 24 °C ±2 °C; the greater value applies (ε=1)
[3] With a time constant of 200 ms and an object temperature of 200 °C
[4] 0 - 90 % energy; adjustable via software
[5] Preconfigured for current or voltage on delivery; switchable via sensorTOOL (requires USB converter); voltage scaling depending on the supply voltage
[6] Access with sensorTOOL requires USB adapter (see accessories)

Product identification

SE-	SF15-	S3-	C3-	U
				Output (preconfigured, switchable via software): U: Voltage 0 ... 5 V / 0 ... 10 V I: Current 4 ... 20 mA
			Cable length (controller - open ends): 0.5 m (standard) / 3 m	
		Cable length (sensor - controller): 0.5 m (standard) / 3 m / 6 m / 15 m		
	Focus: SF15			
Series: thermoMETER SE				

Standard Focus (in mm)								
SF15	15:1	6.5	11.5	14	18	23.5	29.5	35.5
Distance		0	100	200	300	400	500	600

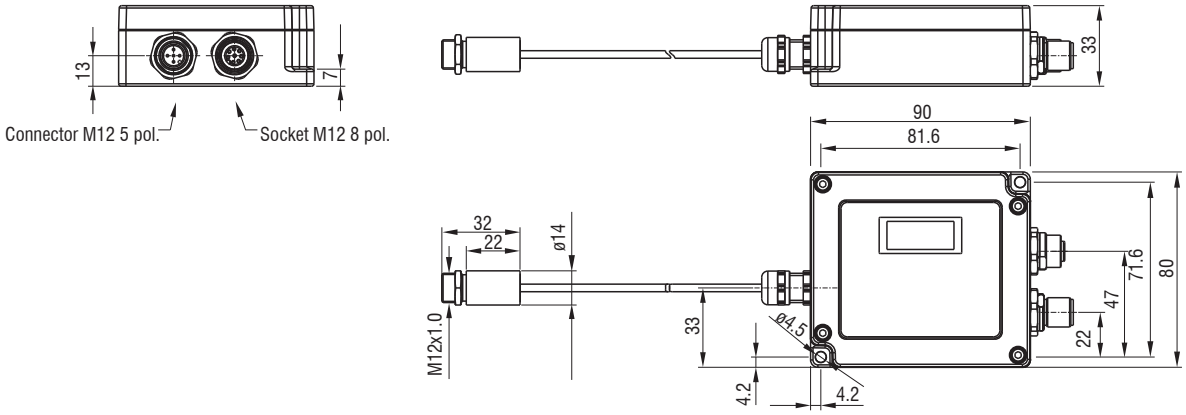
Close Focus (when using the screwable CF lens, in mm)								
CF15	15:1	6.5	3.7	0.8	4.4	8.1	11.8	15.4
Distance		0	5	10	15	20	25	30

= smallest spot size / focal point (mm)

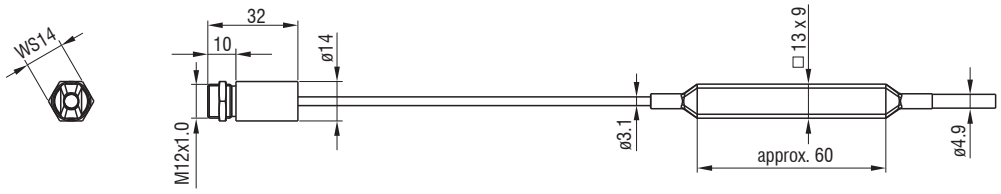
The ratio D:S (example 15:1, see table) describes the ratio Distance (distance from the front edge of the sensor to the measuring object) to Spot size (measurement spot size).

Technical drawings
thermoMETER

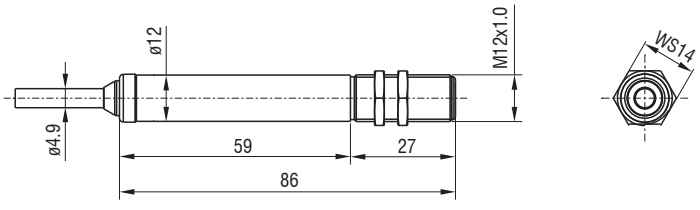
thermoMETER UC



thermoMETER SE



thermoMETER FI



(dimensions in mm, not to scale)

Connection possibilities
thermoMETER

Sensor	Cables	Type
thermoMETER FI	**Integrated cable** Length 1 m / 3 m / 8 m / 15 m	Open ends (with ferrules)

Connection possibilities and accessories	
Connection supply voltage **PS2020**	
USB programming adapter for connection to PC TM-USBA USB adapter with terminal block	
Interface module for Ethernet and EtherCAT connection IF1032	
Control / machine Analog output (voltage), open collector	

Sensor	Cables	Type
thermoMETER SE	**Sensor cable (sensor controller)** Lengths 0.5 m / 3 m / 6 m / 15 m **Connection cable** (Controller - open ends) Lengths 0.5 m / 3 m	Open ends (with ferrules)

Connection possibilities and accessories	
Connection supply voltage **PS2020**	
USB programming adapter for connection to PC TM-USBA USB adapter with terminal block	
Interface module for Ethernet and EtherCAT connection IF1032	
Control / machine Analog output (current/voltage), open collector	

Sensor	Cables	Type
thermoMETER UC 	**Digital cable: TM-DC8/x-M12** Lengths 1 m / 5 m	Open ends (with ferrules)
	Digital cable: TM-USBA-M12 Length 1.8 m	USB
	Analog cable: TM-PC5/x-M12 Lengths 1 m / 5 m	Open ends (with ferrules)

Connection possibilities and accessories	
Connection supply voltage **PS2020**	
USB programming adapter for connection to PC TM-USBA USB adapter with terminal block	
Control / machine 2x alarm relays, RS485	
Interface module for Industrial Ethernet connection IF2035-PROFINET IF2035-EIP IF2035-EtherCAT	
Connection to PC (sensorTOOL) Display & parameter setting	
Interface module for Ethernet and EtherCAT connection IF1032	
Connection supply voltage **PS2020**	
Control / machine Analog output (current/voltage)	

Accessories
thermoMETER

Mounting accessories / optical accessories / air purge collars

Art. no.	Name		FI	SE	UC
2970750	TM-DIN-UC	Rail mount adapter	⊘	⊘	✓
2970751	TM-MF-UC	Mounting fork	⊘	✓	✓
2970752	TM-APL	Air purge collar, laminar	✓	✓	✓
2970753	TM-FB	Mounting bracket	✓	✓	✓
2970754	TM-AB-UC	Mounting bracket, adjustable in 2 axes	⊘	✓	✓
2970755	TM-MB-UC	Mounting bolt with M12x1 thread and nut	⊘	✓	✓
2970756	TM-TA	Pipe adapter	✓	✓	✓
2970757	TM-T40	Reflection protection tube, length 40 mm; M12x1 external thread	✓	✓	✓
2970758	TM-T88	Reflection protection tube, length 88 mm; M12x1 external thread	✓	✓	✓
2970759	TM-T20	Reflection protection tube, length 20 mm; M12x1 external thread	✓	✓	✓
2970760	TM-MH-UC	Massive housing made from stainless steel	⊘	✓	✓
2970761	TM-FBMH-UC	Mounting bracket for solid housing	⊘	✓	✓
2970762	TM-APMH-UC	Air purge collar made from stainless steel for solid housing	⊘	✓	✓
2970763	TM-CF	Close Focus lens	✓	✓	✓
2970764	TM-PW	Protective window	✓	✓	✓
2970765	TM-AP-UC	Air purge collar (stainless steel) for lenses from D/S 15:1	⊘	⊘	✓
2970766	TM-AP2-UC	Air purge collar (stainless steel) for lenses with D/S 2:1	⊘	⊘	✓
2970767	TM-AP	Air purge collar	✓	✓	✓
2970768	TM-AP8	Air purge collar with 8 mm hose connection	✓	✓	✓
2970769	TM-MI	Right angle mirror	✓	✓	✓

Connection cables for pyrometer UC

2904051	TM-PC5/1-M12	Analog signal and supply cable 1 m
2904052	TM-PC5/5-M12	Analog signal and supply cable 5 m
2904053	TM-USBA-M12	Digital signal cable with USB converter, 1.8 m, M12 plug, USB-A plug
2904054	TM-DC8/1-M12	Digital signal cable, 1 m, M12 plug, ferrules, pre-assembled
2904055	TM-DC8/5-M12	Digital signal cable, 5 m, M12 plug, ferrules, pre-assembled

USB adapter for pyrometers UC / FI / SE

2970770	TM-USBA	USB adapter with terminal block

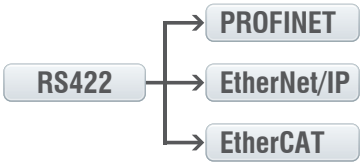
IF2035: Interface module for Industrial Ethernet connection

- Connection of RS422 or RS485 interfaces to PROFINET / Ethernet/IP / EtherCAT
- Synchronization output for RS422 sensors
- 2 network connections for different network topologies
- Data rate up to 4 MBaud
- 4-fold oversampling (with EtherCAT)
- Ideal for confined spaces due to a compact housing and DIN rail mounting

EtherCAT®

EtherNet/IP®

PROFINET®



IF1032: Interface module for Ethernet & EtherCAT connection

- Connection of analog output or RS485 to Ethernet and EtherCAT
- Web interface for data display and scaling
- CSV export

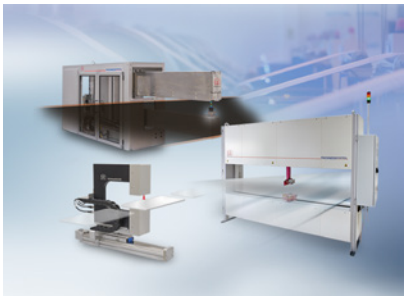
EtherCAT®

Ethernet

Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

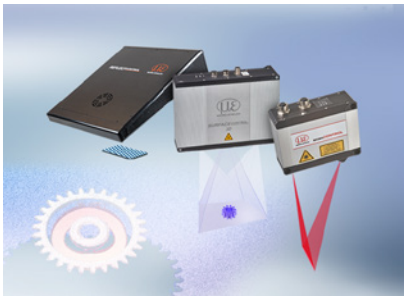
Sensors and measurement devices for non-contact temperature measurement



Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection

Modifications reserved / Y9766893-A062036LDI

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