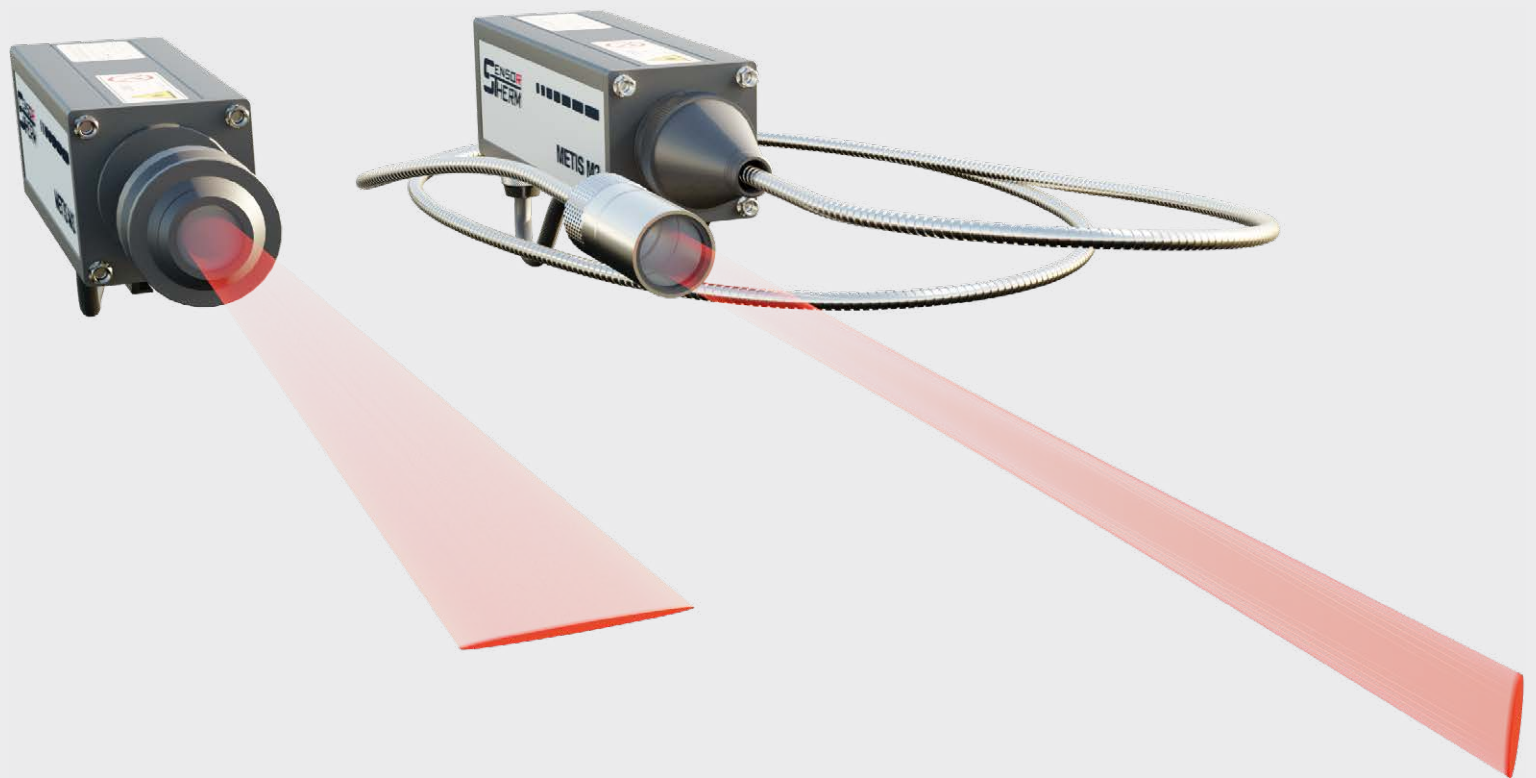


METIS with Line Optics

For 2-color pyrometers METIS M311 / M322



2-color pyrometer with line optics for non-contact temperature measurement

- **Line optics** with a long measuring field especially for measurements
 - of thin moving wires
 - pouring stream applications
- **2-color pyrometers with short-wave spectral ranges** for measurements on metals, bare materials, ceramics, graphite and many more
- **2-color pyrometers** measure through polluting window, dust, smoke or objects that are smaller than the pyrometer's spot size

Temperature ranges

from 300 – 1000°C (572°F)
to 1000 – 3300°C (5972°F)

Response time / Exposure time

< 1 ms
< 0.5 ms

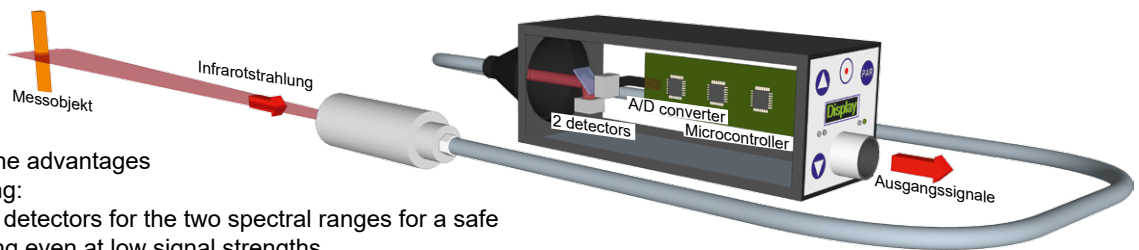
Smallest possible spot size

Variable measuring line length

Digital, Precise, Versatile

2-color pyrometers of the M3 series are fast and high-precision measuring instruments that combine modern 2-color technology with the advantages of digital signal processing:

- 2 separate measuring detectors for the two spectral ranges for a safe measurement recording even at low signal strengths
- Digital microcontroller signal processing for 100% reproducibility of displayed readings
- IR signal monitoring, used for warning of optic or window contamination

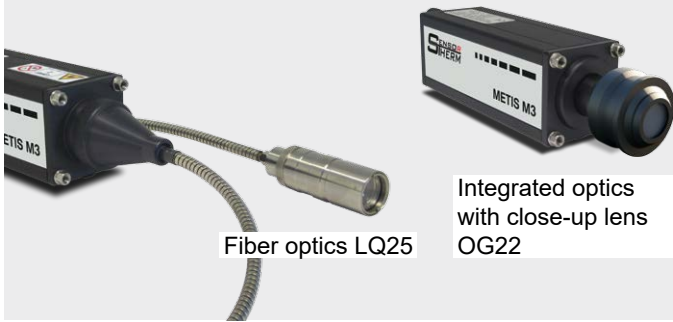


Technical Data

Model	M311			M322		
Temperature ranges	600–1400°C 650–1500°C 750–1800°C	800–2100°C 900–2500°C 1000–3000°C *)	1100–3300°C *)	300–1000°C 350–1300°C 400–1600°C	500–1800°C 600–2300°C 800–3000°C *)	1000–3300°C *)
Temp. sub ranges	Any temperature sub-range adjustable within the temperature range (minimum span 50°C)					
Spectral range	Channel 1: 0.93–1.1 µm / channel 2: 0.75–0.93 µm *) Channel 1: 0.99 µm / channel 2: 0.87 µm			Channel 1: 1.65–1.8 µm / ch. 2: 1.45–1.65 µm *) Channel 1: 1.64 µm / channel 2: 1.4 µm		
Detector	2 x Silicon			2 x InGaAs		
Response time t_{90}	< 1 ms (with dynamical adaptation at low signal levels), adjustable up to 10 s					
Exposure time	< 0.5 ms					
Uncertainty ($\epsilon = 1$, $t_{90} = 1$ s, $T_A = 23^\circ\text{C}$)	Full-scale value $\leq 2500^\circ\text{C}$: 0.4% of meas.value in $^\circ\text{C}+2\text{K}$ Full-scale value $> 2500^\circ\text{C}$: 0.6% of meas.value in $^\circ\text{C}$			0.6% of measured value in $^\circ\text{C}+2\text{K}$		
Repeatability ($\epsilon = 1$, $t_{90} = 1$ s, $T_A = 23^\circ\text{C}$)	0.1% of measured value in $^\circ\text{C} + 1$ K					
Temperature coefficient	Deviations from 23°C: from 10°C to 60°C: 0.04%/K; from 0 to 10°C and 60 to 80°C: 0.06%/K					
2 analog outputs	0 or 4–20 mA, max. load: 500 Ω, resolution 0.0015% of the (adjusted) temperature (sub) range (16 Bit). Output 1: output of the measured temperature, output 2 adjustable: 2-color or 1-color temperature (optionally of channel 1 or 2), device temperature, control output (devices with PID controller). Outputs can be set within or outside the temperature range.					
Serial interface	RS232 (4.8–115.2 kBd) or RS485 (4.8–921.6 kBd), switchable. Resolution 0.1°C/°F					
Inputs / outputs	12-pin connector: 3 configurable connectors (digital input, output or one analog input) 17-pin connector: 4 digital inputs, 2 digital outputs, 1 analog input. <ul style="list-style-type: none"> ■ Digital inputs (via supply voltage): laser targeting light on/off, clearing of peak picker, PID controller start, load a set of parameters, trigger input for start / stop of measured value recording. ■ Digital outputs (12-pin devices: max. 50 mA, 17-pin devices: max. 100 mA): limit switch, exceeding the beginning of temperature range, device measuring readiness, device over-temperature, signal strength too low. Devices with PID controller: controller active, control process within limits, control process finished. ■ Analog input (12-pin: 0–20 mA, 17-pin: 0–10 V): analog adjustment of emissivity slope, focus distance (devices with motorized focus) or setpoint (devices with PID controller). 					
PROFIBUS PROFINET	optional for 12-pin devices	Supports PROFIBUS DP-V0 (and DP-V1) according to IEC61158 type 3 Supports PROFINET-RT and IRT according to specification 2.3. Pre-certified, supports class A, B and C functionalities				
Ethernet		Compliant with IEEE802.3/802.3u (Fast Ethernet) and ISO 802-3/IEEE 802.3 (10BASE-T)				
Display (only 12-pin devices)		Dot Matrix, green-yellow, 128x32 dots, 5.6 mm high, for temperature display (resolution 0.1°C / °F) or parameter settings				
Device parameters	Temperature sub range, response time (<1 ms–10s), emissivity slope (0.800–1.200), peak picker (clear settings: automatic, time clear, externally), device address (00–97), baud rate (RS232: 4.8–115.2 kBd / RS485: 4.8–921,6 kBd), analog outputs (0 or 4–20 mA), interface (RS232/RS485), temperature unit (°C/°F), device menu language (only 12-pin devices: English/German), focus distance (motorized focus devices)					
Power requirement	24 V DC (18–30 V DC), max. 6 VA; protected against reverse polarity					
Isolation	Voltage supply, analog outputs and serial interface are galvanically isolated from each other					
Sighting	Laser targeting light (red, $\lambda=650$ nm, $P < 1$ mW, laser class 2 according to IEC 60825-1)					
Ambient temperature	0 to 80°C (32 to 176°F), fiber optic devices on optics side: -20 to 250°C (-4 to 482°F)					
Storage temperature	-20 to 85°C (-4 to 185°F)					
Relative humidity	Non-condensing conditions					
Housing / protection class	Aluminum / IP65 (with plugged in connector)					
Weight	650 g					
CE label	According to EU directives					

Optics / Device Versions / Features

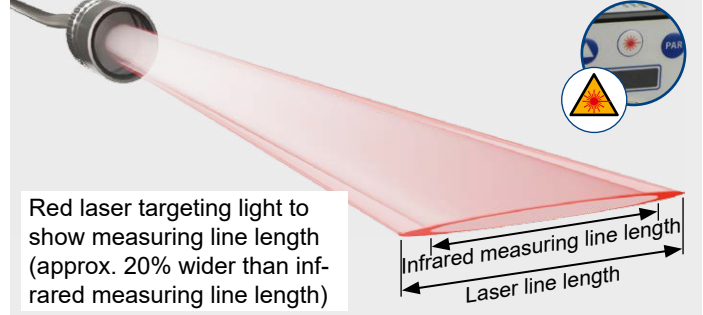
Line optics



Fiber optics LQ25

Integrated optics with close-up lens OG22

Sighting method



Red laser targeting light to show measuring line length (approx. 20% wider than infrared measuring line length)

Infrared measuring line length
Laser line length

Connections / Equipment options

All devices with

- 2 analog outputs
- RS232 / RS485 interface (switchable)
- With 12-pin connector: with display, adjustment keys and LED's for displaying operational readiness and active switching outputs, 3 configurable inputs / outputs, optional with integrated PID controller or with Profinet, Profibus or Ethernet.
- With 17-pin connection: 4 digital inputs, 2 digital outputs, 1 analog input, PID controller



Ambient temperature



All models are optimized for **changing ambient or housing temperatures** between 0 and 80°C (32 and 176°F), **on the fiber optics up to 250°C.**

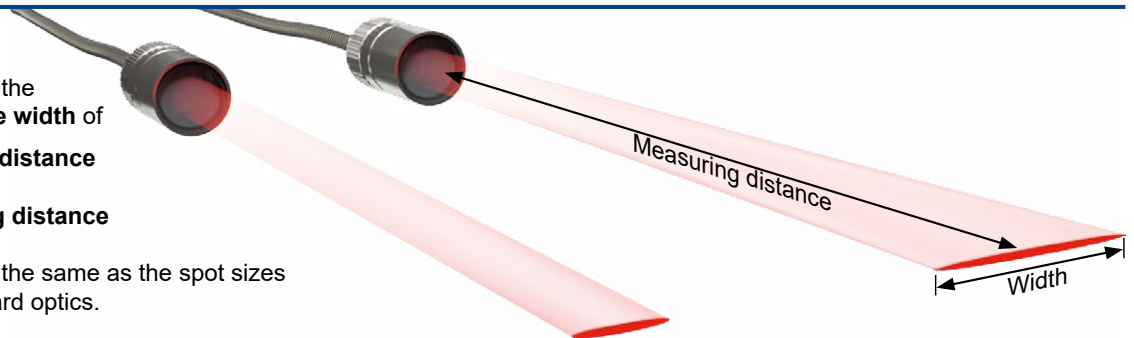
Influences due to temperature fluctuations are continuously digitally compensated.

Optics Data

The line lenses are set at the factory so that a **spot size width** of

- 5% of the measuring distance
 - or
 - 12% of the measuring distance
- results.

The spot size heights are the same as the spot sizes of the devices with standard optics.



Optics:	5% line optics		12% line optics	
	Fiber optics	Close-up lens for devices with integrated optics	Fiber optics	Close-up lens for devices with integrated optics
Designation:	LQ2505D1	OG22G1	LQ2512D1	OG22G2
Measuring distance a [mm]	Spot size width [mm]			
240	12		29	
340	17		41	
500	25		60	
700	35		84	
1000	50		120	
2000	100		240	
3000	150		360	
Aperture D:	13 mm	16 mm (FSC ≤ 1400°C); 8 mm (FSC > 1400°C)	13 mm	16 mm (FSC ≤ 1400°C); 8 mm (FSC > 1400°C)

FSC = Full scale temperature value

The values in the tables are exemplary, intermediate values can be interpolated.

Typical Applications



Pouring stream measurements

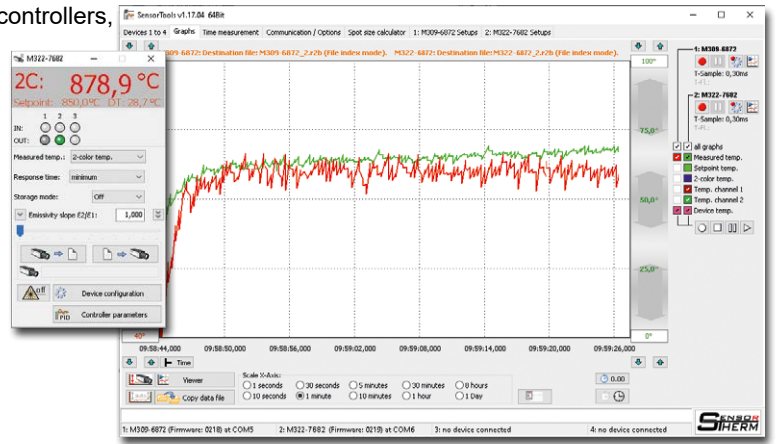


Measurements during wire production

SensorTools Software (included in delivery)

Communication and evaluation software for all pyrometers, controllers, digital displays and calibration sources.

- Measured value display, graphically and numerically.
2-color temperature + 1-color temperature display simultaneously and device temperature
- Measured value recording incl. parameters
- View and compare up to 4 measurement data files simultaneously in the *SensorTools Viewer*
- Make all device settings
- Special recording settings: externally start / stop, retroactive or extended recording via signal input
- Print or save pyrometer settings, or transfer settings to other devices or export to csv files
- Switch on / off laser targeting light



Accessories (selection)

Pyrometer assembly

Mounting bracket for pyrometers: HA10

Ball joint bracket for pyrometers: HA20

Mounting bracket for fiber optics: LQ25: HA14



Protection

Water cooling housing (aluminum): KG10

Air purge unit: BL12

Mounting bracket: HA12

Heavy ball joint bracket: HA22

Air purge units:
for devices with integrated optics: BL11

for devices with fiber optics: BL80



Connection cable

12-pin: with angled plug / straight: AL11 / 43

17-pin: only straight plug: AS54

Optional: with interface converter, integrated or via sub-D adapter (all cables available in 5m increments)



Electrical

Pyrometer connection kit, ready made: Wiring-Box



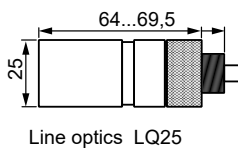
DIN rail power supply 24 V / 1.6 A: NG12

Interface converter RS485 to USB: DK5485

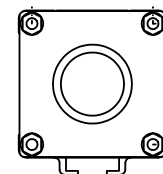
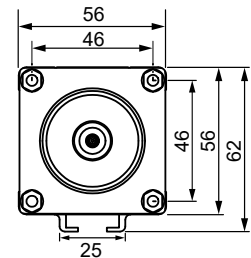
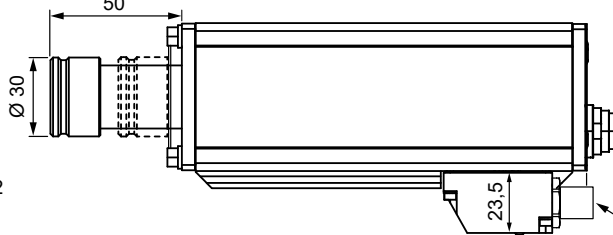
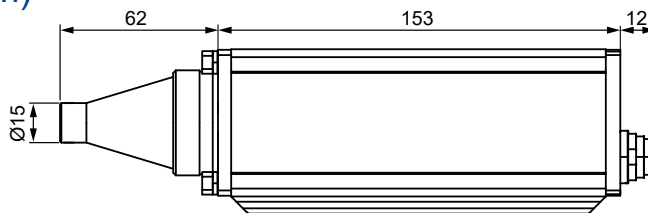
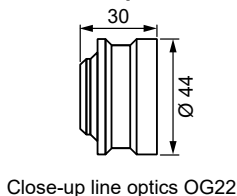


Dimensions (in mm)

Fiber optics



Manual focusable optics



Devices with Profibus / Profinet / Ethernet

Ordering Specifications

Pyrometer model: Each must be specified with 12- or 17-pin connector, temperature range, optics type (5% close-up line optics OG22G1 or 12% close-up line optics OG22G2 or 5% fiber line optics LQ2505D1 or 12% fiber line optics LQ2512D1) and fiber optic length (between 2.5 and 30 m available, in 2.5 m increments).

Scope of delivery: Device, close-up line optics or fiber line optics and fiber optic devices with 2.5 m fiber length, each additional 2.5 m for an extra charge), works certificate, operating manual, *SensorTools* software.
Connection cables are not included in the scope of delivery and must be ordered separately.

Sensortherm reserves the right to make changes in scope of technical progress or further developments.

Sensortherm-Datasheet_Metis_M311_M322_Line-optics (Jan. 24, 2024)

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