Sirius SS09 / SI16

Small and Easy to Install Radiation Pyrometers

1-channel pyrometers for non-contact temperature measurement in the short wavelength range, primarily for measurements on metals, bare and shiny materials, ceramics and graphite.
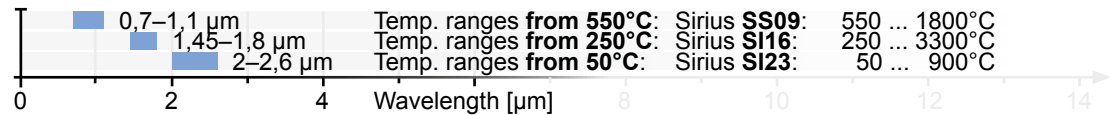
- ■ **2 wavelength ranges available for temperature ranges from 250 or 550°C**
- ■ **Temperature sub range adjustable in order to increase the accuracy of the analog output**
- ■ **Full digital signal processing with low uncertainty**
- ■ **Fast data acquisition with a response time of only 5 ms**
- ■ **Different optics selectable with small spot sizes from 1.3 mm**
- ■ **Laser target marking for precise alignment to the measuring object**
- ■ **Green LED power indicator**
- ■ **Switchable analog output 0 / 4-20 mA and serial interface RS232 or RS485**
- ■ **Easy device configuration via interface using the supplied software**

Small, Easy to Install, Short-Wave

The pyrometers of series **Sirius** offers an extensive equipment combined with a high-quality internal side, despite its small size. The fully digital signal processing ensures the highest accuracy even at low emissivity levels, the adjustment to different measuring distances allows to find the smallest spot size or the optimum installation location.

The models SS09 and SI16 differ in their spectral ranges and thus to their measuring ranges. With their short-wave spectral ranges preferably very good measurements at high emissivity of metals, ceramics or graphite can be done. For metal measurements, the shortest possible spectral range for a precise measurement is advantageous. Due to technical reasons the beginning of a temperature range may be limited, to a higher starting temperature therefore a model must be selected with a slightly higher spectral range, e.g. longer wavelength.
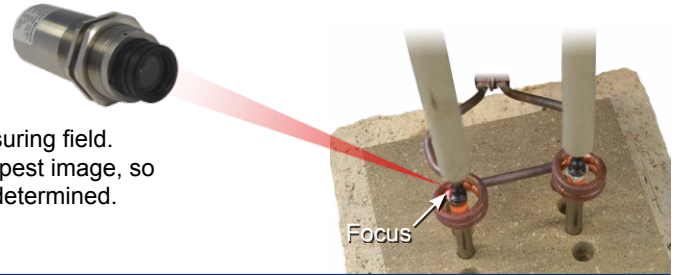
Comparison of wavelength ranges of all Sirius models			
0,7–1,1 µm	Temp. ranges **from 550°C**:	Sirius **SS09**:	550 ... 1800°C
1,45–1,8 µm	Temp. ranges **from 250°C**:	Sirius **SI16**:	250 ... 3300°C
2–2,6 µm	Temp. ranges **from 50°C**:	Sirius **SI23**:	50 ... 900°C

Wavelength [µm] 0 2 4 8 10 12 14

Sighting Method Laser Targeting Light

Sighting is used to pinpoint the location of the measured target.

Laser targeting uses a red laser dot showing the center of the measuring field.
At the focus point, the laser dot is the smallest and provides the sharpest image, so that the measuring distance for the smallest spot size can be easily determined.
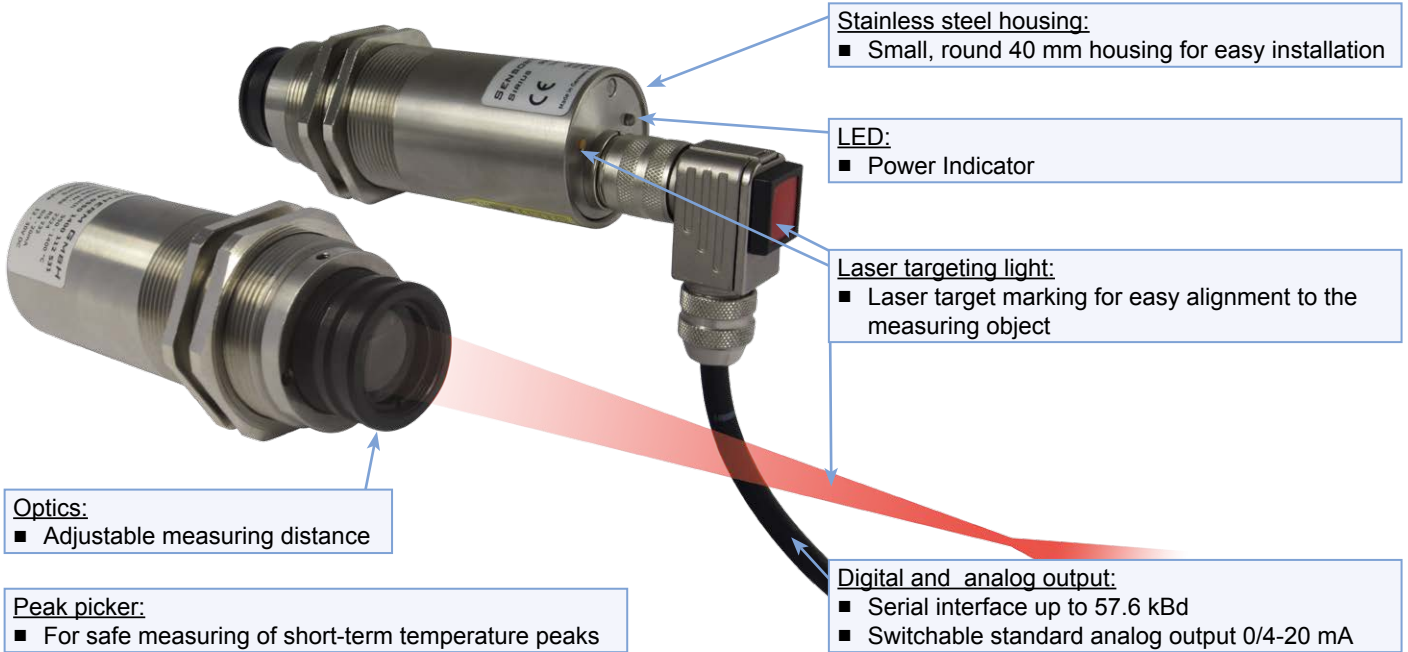
Focus

Technical Data

Model	SS09	SI16
Temperature ranges	550 – 1400°C 650 – 1800°C	250 – 1000°C 300 – 1300°C 350 – 1800°C
Temp. sub ranges	Any temperature sub-range adjustable within the temperature range (minimum span 50°C)	
Spectral range	0.7–1.1 µm	1.45–1.8 µm
Detector	Silicon	InGaAs
Response time t_{90}	5 ms, adjustable up to 10 s	
Exposure time	2.5 ms	
Uncertainty ($\varepsilon = 1$, $t_{90} = 1s$, $T_A = 23°C$)	0.5% of reading in °C + 1°C	
Repeatability ($\varepsilon = 1$, $t_{90} = 1s$, $T_A = 23°C$)	0.1% of reading in °C + 1 K	
Emissivity ε	20–100%	
Analog output	0/4–20 mA, switchable, isolated, max. load: 500 Ω.	
Serial interface	Optional RS232 or RS485 (addressable), baud rate 1.2 up to 57.6 kBd, Resolution 0.1°C or 0.1°F	
Peak picker	Automatic hold mode or manual time settings to clear (reset)	
Parameter settings	Via serial interface and PC software *SensorTools* or via self-compiled communication program: Emissivity, temperature sub range, settings for peak picker, device address (with RS485), baud rate, response time, selecting analog output 0/4–20 mA, °C/°F.	
Power requirement	24 V DC (12–30 V DC), max. 1 VA	
Isolation	Voltage supply, analog output and serial interface are galvanically isolated from each other	
Sighting	Laser targeting light (red, λ=650 nm, P< 1 mW, class II to IEC 60825-1)	
Ambient temperature	0–70°C (The laser targeting light is deactivated at a device temperature from 60°C to prevent its overheating)	
Storage temperature	-20–85°C	
Relative humidity	No condensing conditions	
Housing / protection class	Stainless steel, IP65 to DIN 40 050 with connector	
Weight	650 g	
CE label	According to EU directives for electromagnetic immunity	

Reference Numbers

SS09; SI16: Specify with temperature range, serial interface RS23 or RS485 and optics A0, B0 or C0

Note: *SensorTools* software is included in scope of delivery,
connection cables are not included in scope of delivery and have to be ordered separately.

Features

Stainless steel housing:
- Small, round 40 mm housing for easy installation

LED:
- Power Indicator

Laser targeting light:
- Laser target marking for easy alignment to the measuring object

Optics:
- Adjustable measuring distance

Peak picker:
- For safe measuring of short-term temperature peaks

Digital and analog output:
- Serial interface up to 57.6 kBd
- Switchable standard analog output 0/4-20 mA

Optics

The following tables show the optical data of the different device types. For reliable measurement the measurement object should be at least as large as the spot size.

The pyrometer can be used at distances other than its' focal distance, however the spot size is generally larger and therefore the target size must be larger. The aperture in this case indicates the size of the measuring field next to the optics' lens.

| Optics	Measuring distance a [mm]	Spot size M [mm]		Aperture Ø D [mm]
		SI16 250–1000°C	**SS09** and **SI16** all other temp. ranges	
OP09-A0	170 mm	1.7 mm	1.3 mm	
	200 mm	1.9 mm	1.4 mm	
	245 mm	2 mm	1.5 mm	
OP09-B0	260 mm	2.1 mm	1.6 mm	14 mm
	400 mm	3.3 mm	2.5 mm	
	500 mm	4.3 mm	3.2 mm	
OP09-C0	480 mm	4 mm	3 mm	
	1000 mm	8 mm	6 mm	
	2000 mm	14.5 mm	11 mm	

Focusable Optics

1. Loosen locking screws
2. Adjust measuring distance
3. Fix locking screws

Adjustable optics for smallest possible spot size diameter:
- **SS09 and SI16:** continuously focusable within the optics limits

The pyrometer must be properly aligned to the measurement object to detect the temperature correctly. In the focus point of the lens (focal distance) the spot size diameter is smallest. Measurements out of the focus distance are also possible (in front of or behind the focus distance) to determine the average temperature of a bigger spot.


Measuring distance

Aperture Ø

Spot size Ø
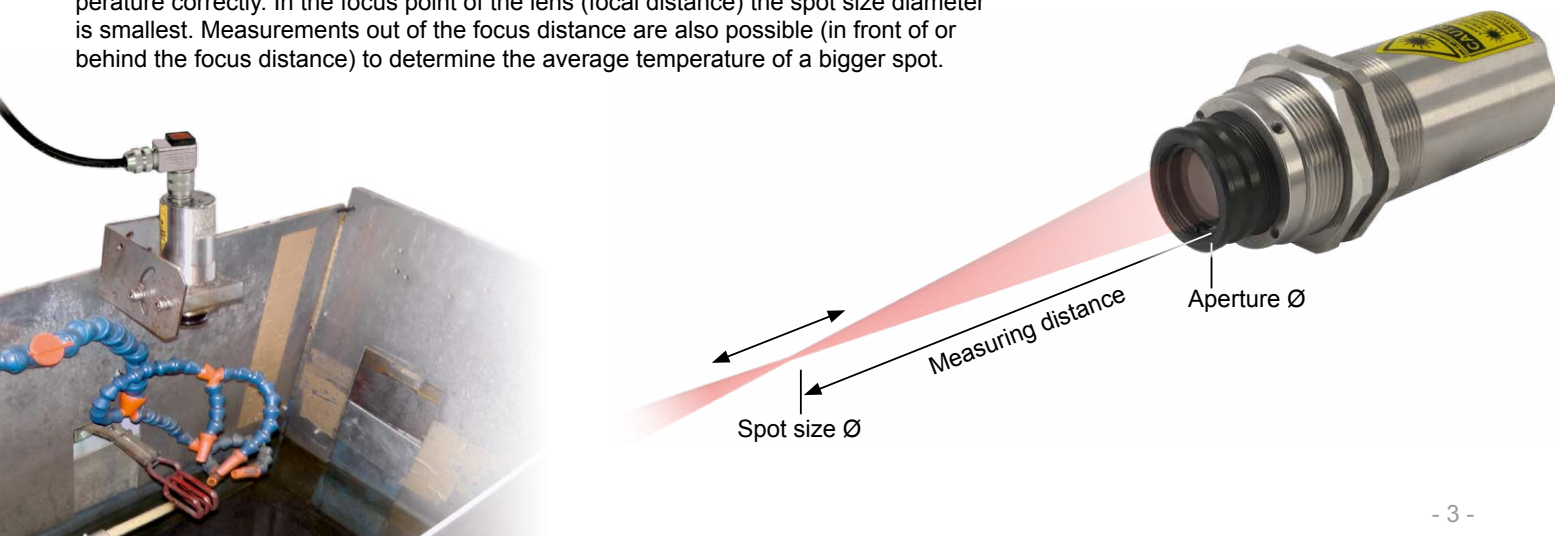
SensorTools Software

The PC software *SensorTools* is our standard software for:

- Measurement display
- Measured value recording
- Processing the results
- Display devices inside temperature
- Changing pyrometer parameters

Program functions:

- Change pyrometer parameters
- Direct measurement data playback
- Adapt recording mode to computer performance
- Export measured values in csv files
- Record interval setting for adapted data size
- External start and stop of recording measured values (via control input on the pyrometer)
- Switch laser targeting light on and off
- Back time recording of measured values after control pulse or extend recording at recording stop
- Create a service file or parameter file with all device and software settings for remote diagnostics
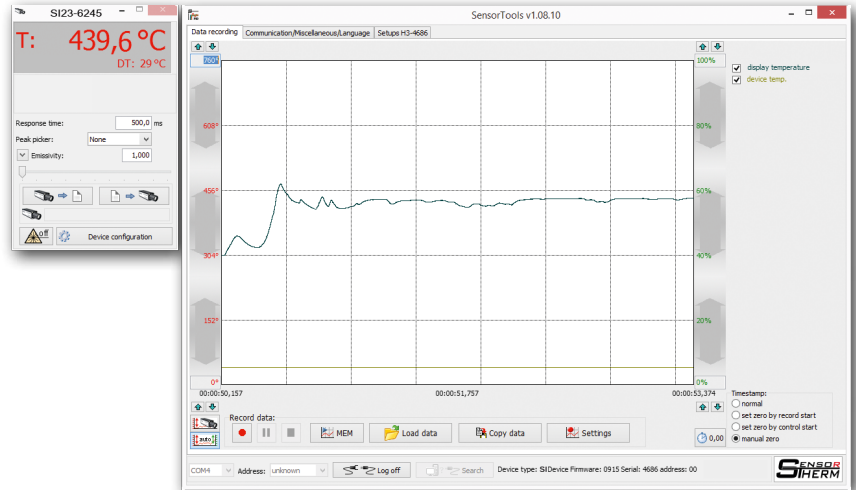

Recommended Accessories

HA11	Adjustable mounting bracket (stainless steel)
KG60-01	Aluminum water cooling jacket
HA10	Adjustable mounting bracket for cooling jacket
HA22	Ball and socket swivel mount for cooling jacket
BL11	Air purge
AL11 / AL43	Connection cable, 14-wire (available in 5 m steps) with right angle connector / straight connector
AL10	Connection cable, 14-wire (available in 5 m steps) with right angle connector and laser targeting light button
AU11 / AU10 / AU43	Connection cable with interface converter RS232<->USB with right angle connector / laser targeting light button / straight connector
AV11 / AV10 / AV43	Connection cable with interface converter RS485<->USB with right angle connector / laser targeting light button / straight connector
IF00-00	LED digital indicator for remote adjustment of IR sensor parameters
Regulus RD / RF	PID program controller as bench top model / for panel mounting
NG12 / 20	Power supplies 24 V DC: DIN rail power supply 1.3 A / desktop power supply 2.5 A

Dimensions

Dimensions in mm

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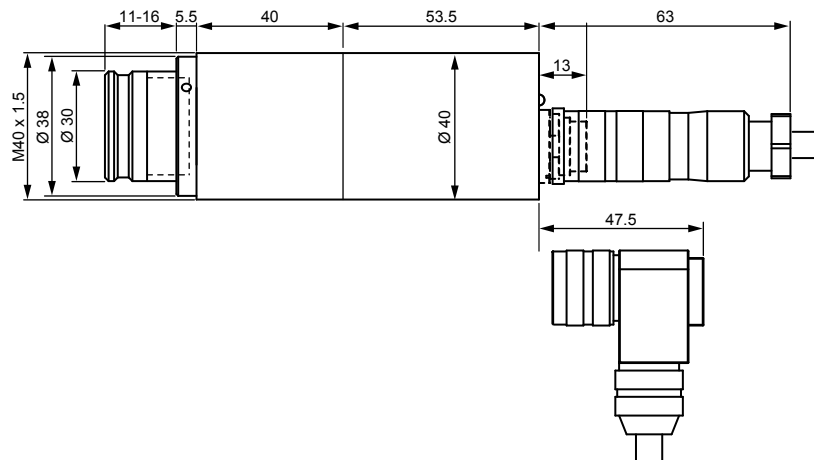
Sensortherm reserves the right to make changes in scope of technical progress or further developments.

Sensortherm-Datasheet_Sirius_SS09_SI16 (July 23, 2015)