

## Product overview

Beyond these view selected models Sensortherm offers a multiplicity of pyrometers for nearly all industrial applications.

### Metis MS09, comprehensive digital signal processing pyrometer

- excellent distance ratio up to 700:1
- fast response time
- laser, sight through lens or video targeting
- focusable-, fix focus - or fiber optic available
- very wide temperature ranges 400°C- 1400°C, 550°C- 2000°C
- analog and digital interface (RS232 and RS485)
- Profibus DP interface available

### Metis MQ11, top of the line Two-Color- or Ratio Pyrometer

- very small measurement spots
- fast response time
- laser, sight through lens or video targeting
- pollution detection for windows and lenses
- focusable lens or fiber optic available
- wide temperature ranges 600°C- 1400°C, 750°C- 1800°C, 900°C- 2500°C
- analog and digital interface (RS232 and RS485)
- Profibus DP interface available

### Metis MI18, fast short wavelength pyrometer for low temperatures

- short wavelength measurement for low temperatures starting at 120°C
- high emissivity even for shiny metals
- fast response time
- laser, sight through lens or video targeting
- focusable-, fix focus - or fiber optic available
- very wide temperature ranges 120°C- 550°C, 160°C- 800°C
- analog and digital interface (RS232 and RS485)
- Profibus DP interface available

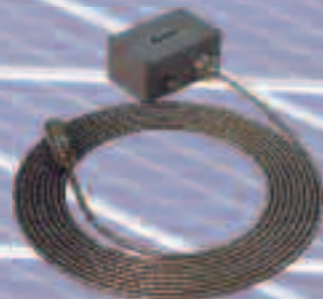


### Sirius SS09, small and compact digital pyrometer

- focusable lens
- wide temperature ranges 550°C -1400°C, 650°C- 1800°C
- laser targeting
- response time of 5ms
- analog and digital interface (RS232 and RS485)
- Profibus DP interface available

### Geminus GS09, two wire loop pyrometer

- fiber optic replacement without calibration
- wavelength 0.7-1.08µm or 1.45-1.8µm
- temperature ranges from 300°C up to 2000°C
- two wire loop connection 4-20mA
- digital interface (USB)



## Sensortherm GmbH

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# SENSOR SIHERM

Specifications subject to change without notice.  
release: 09/08

Examples of possible Metis design according to your needs



Fix focus lens



Focusable lens



Fiber optic lens

# Non-contact Temperature Measurement for the Solar Industry

fully digital and highly reliable

We help you to bring your silicon into right shape

# SENSOR SIHERM

[www.sensortherm.com](http://www.sensortherm.com)

Sensortherm has proven it's high performance in measuring and controlling non-contact temperatures through many years. More than 25 years experience in developing and manufacturing of pyrometers "made in Germany" guarantees reliability and quality.

Sensortherm offers the complete package of

- understanding your measurement task,
- consulting,
- creating a partnership,
- working out a customized solution,
- supplying,
- supporting and
- after sales service

to your satisfaction.

Benefit from our professional experience in the Solar Market

- Enhancement of your Process Control
- Improvement of your Product Quality
- Increasing of your Productivity

SPECTRAL- AND TWO-COLOR PYROMETERS for

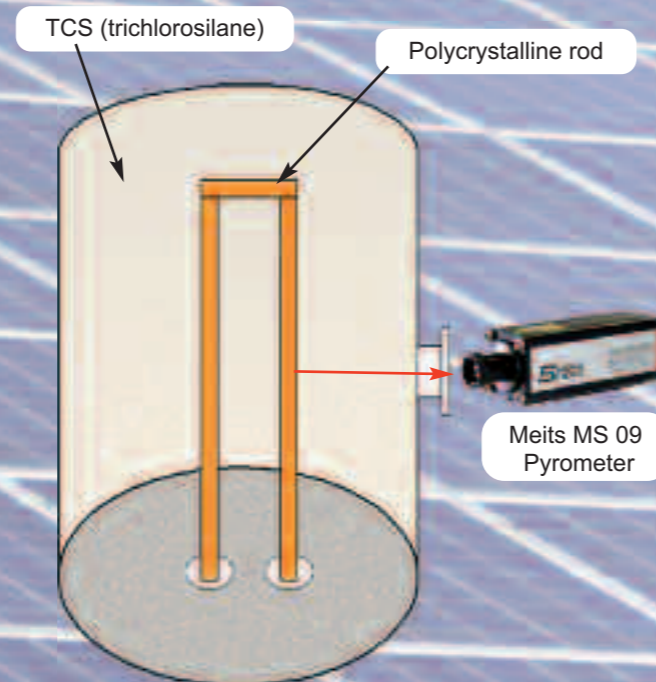
- CVD Reactor / Siemens Process
- Polycrystalline Ingot Casting
- STC to TCS recycling process in converter
- Single Crystal pulling of an Ingot / Czochralski Process
- Welding of polycrystalline Silicon Rods
- MBE Molecular Beam Epitaxy Process
- Soldering of PV Cells

### Rod temperature in CVD Reactor / Siemens Process

Temperature measurement of poly crystalline silicon rods inside the reactor. Temperatures during STC to TCS recycling process inside the converter.

Due to it's outstanding optical resolution, Metis MS pyrometer allows the correct temperature reading of a small rod even in a far distance.

The very wide measurement range of Metis MS gives you control of your process from the beginning.



**Suitable Pyrometers:**  
Metis MS09 Spectral Pyrometer

Range: 400°C to 1400°C,  
550°C to 2000°C,  
Spectralrange : 0.9µm  
Targeting: Laser, sight through lens,  
or Video

Choice of optical solutions available  
Vario-, fixfocus-, or fiber optic lens

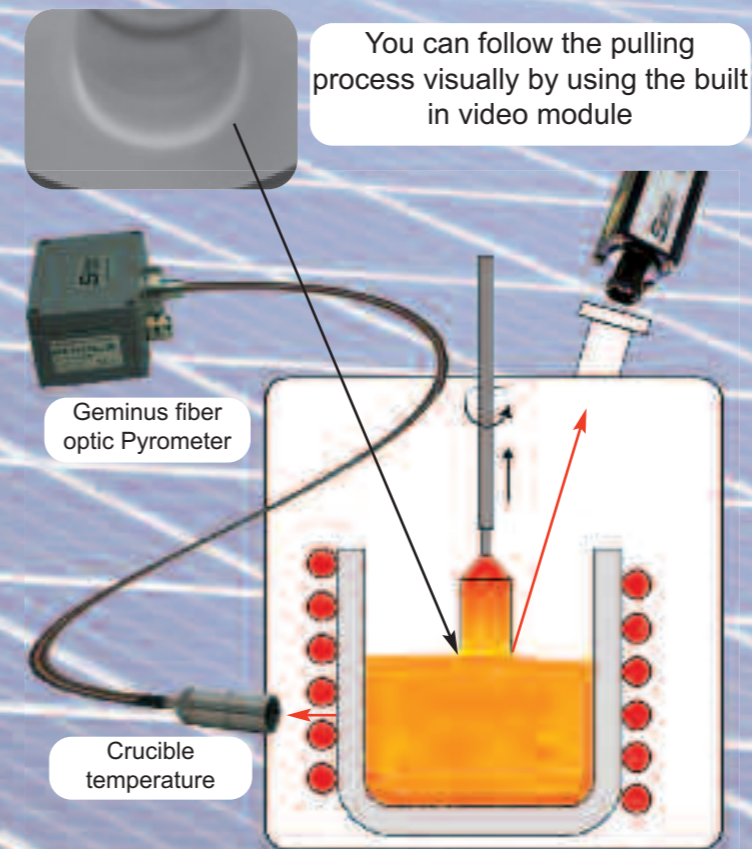
Explosion proof solutions are available

### Single Crystal pulling of an Ingot/ Czochralski Process

Melt temperature control and crucible temperature

Sensortherm's Two Color Pyrometer Metis MQ11 offers the correct temperature reading of the melt as well as the liquid to solid point.

The variable focus lens provides you smallest measurement spots by keeping flexibility. The integrated WPD (Window Pollution Detection) function will warn before the measurement will fail.



**Suitable Pyrometers:**  
Metis MQ11 Ratio Pyrometer

Range: 750°C to 1800°C  
Spectralrange: 0.75µm to 1.08µm  
Targeting: Laser, sight through lens,  
or Video

For crucible temperature:  
Sirius Pyrometer or  
Geminus Two-Wire Pyrometer with fiber optic

### Inductive-, Laser- and Resistance Soldering of PV Cells

Sensortherm's Metis MI18 series provide an extremely short exposition time. Due to the short measurement wavelength of 1.8µm it meets the requirements of measuring shiny metals at low temperatures. In combination with the program controller "Regulus" the totally controlled soldering process can be achieved.



Temperature controlled soldering point



**Suitable Pyrometers:**  
Metis MI18 with fast reaction of 1ms

Range: 120°C to 550°C  
Spectralrange: 1.8µm  
Spotsize: 0.75 mm  
Targeting: Laser, sight through lens,  
or Video

Space saving fibre optic solution available

Because of our very wide product range this is only a small selection of possible applications. Please contact our consulting staff and benefit from our application knowledge. We will be pleased to find the right solution for you.

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