



## MS-57S Pyrheliometer

### Technical Specifications

ISO 9060:2018 Class A (First Class)

"Fast response" and "Spectrally flat"

Ultra fast <0.2s response detector

Smart interface: (MODBUS 485 RTU, SDI-12, 4-20mA, 0-10mA / (0-1V with external optional 100Ω precision shunt resistor)

Diagnostic functions (relative humidity, temperature, tilt angle)

The new MS-57S pyrheliometer is a unique pyrheliometer compliant to the "Fast response" and "Spectrally flat" sub-category under ISO9060:2018 Class A. The pyrheliometer is a breakthrough in unprecedented low thermal offset behavior and fast thermopile response (< 0.2s / 95%). MS-57S pyrheliometer is a direct normal incidence (DNI) solar irradiance sensor. Also known as a pyrheliometer, it is used as a reference sensor for routine operation on a Solar Tracker. The all-weather MS-57S is responsive to solar irradiance in the spectral range from 200 - 4000nm and works under the most extreme conditions in a temperature range from -40°C - 80°C. The integrated low power window heater can prevent dew deposition or frost on the outside window.

The MS-57S includes a state-of-the-art thermopile sensor, a new internal diagnostics system, and 4-channel smart interface. The internal diagnostics system offers users visibility over internal temperature, humidity, tilt and roll angle; helping to ensure optimum

performance without the need for regular physical checks; while the 4-channel smart signal transducer allows the MS-80S to easily connect to any analogue or digital measuring system, giving users a choice with Modbus 485 RTU, and SDI-12 for digital output; alongside 4-20mA, and 0-10mA (0-1V) analogue options.

The digital output options also enable users to connect with a standard laptop and 'Hibi'; a new, custom-built programme developed by EKO, giving real-time access to the internal diagnostics, custom settings, and data on irradiance, humidity, internal temperature and tilt angle from the sensor.

Each MS-57S is calibrated outdoors and tested at EKO upon manufacture against EKO's reference sensors, which are fully traceable to the WRR (World Radiometric Reference). The recommended period of recalibration can be extended to 5 years, which is typically 2 years for other sensor models in the market.

The long-term stability of the sensor responsivity is less than 0.5% in a period of 5 years which makes it unique.

The MS-57S pyrheliometers are manufactured in a consistent way followed by strict quality inspection and performance evaluation. For each sensor the temperature dependency are measured and validated through a measurement report that comes with the sensor. EKO provides a unique outdoors calibration compliant to the international standards defined by ISO/IEC17025/9059. As an option we offer a calibration indoor under controlled conditions (Ambient temperature, Irradiance @ 1000W/m<sup>2</sup>).

	<b>MS-57S</b>
ISO 9060:2018	Class A
ISO 9060:2018	First Class
Sub-category "Spectrally flat"	Compliant
Sub-category "Fast response"	Compliant
Output	(MODBUS 485 RTU, SDI-12, 4-20mA, configurable 0-10mA / 0-1V with external optional 100Ω precision shunt resistor)
Response time 95%	< 0.2 Sec.
Zero off-set a) 200W/m <sup>2</sup>	0 W/m <sup>2</sup>
Zero off-set b) 5K/hr	< 1 W/m <sup>2</sup>
Complete zero off-set c)	< 1 W/m <sup>2</sup>
Non-stability change/1 year	-
Non-stability change/5 years	< 0.5 %
Non-linearity at 1000W/m <sup>2</sup>	< 0.2 %
Spectral error	+/- 0.2 %
Temperature response -10°C + 40°C	-
Temperature response -20°C to 50°C	+/- 0.5 %
Tilt response at 1000W/m <sup>2</sup>	< 0.2 %
Sensitivity	Approx. 7 μV/W/m <sup>2</sup>
Impedance	< 15000 Ω
Operating temperature range	-40 - 80 °C
Irradiance range	0 - 4000 W/m <sup>2</sup>
Wavelength range	200 - 4000 nm (50% points)
Power supply	5 - 30 VDC
Power consumption	< 0.2 W

<b>Ingress protection IP</b>	67
<b>Cable length</b>	10 m
<b>Additional signal processing errors</b>	< 1 W/m <sup>2</sup>

<b>Options</b>	<b>MS-57S</b>
<b>Cable length</b>	20 / 30 m

Specifications are subject to change without further notice.