

Pyranometer EKO MS-80S

S64180/S64185

- ISO 9060:2018 Class A
- ISO 9060:1990 Secondary Standard
- Fast response time < 1s @ 95%
- Exceptional long-term stability $\pm 0.5\%$ /5 years
- Two different ways to connect with Meteo-40 plus data logger:
 1. Analog Voltage: 0 ... 10 mV via shunt resistor
 2. Modbus RTU via RS-485



The MS-80S Secondary Standard pyranometer was inspired by the combination of latest technologies and state-of-the-art thermopile sensors, enabling a breakthrough in unprecedented low zero-offset behaviour and fast sensor response. The compact sensor with single dome, based on a isolated thermopile detector and Quartz diffusor is immune to offsets. The optional heater and ventilator are recommended, particularly over areas impacted by dew, frost, snow, and dust.

Analog Current Output

The built-in converter is able to output 0 ... 10 mA to cover the irradiance range of 0 ... 1 600 W/m². The current ranges can be converted easily via external shunt resistor into voltage ranges. Due to ultra-low temperature dependency and its linearity characteristics, the converter guarantees optimal sensor performance throughout the year.

Digital Signal Output: Modbus RTU

The MS-80S comprises a two-wire RS-485 interface. To have access to data Modbus RTU protocol is implemented in the sensor. This can be configured and read out directly by Ammonit Meteo-40 plus data logger.

The MS-80S pyranometers are manufactured in a consistent way followed by strict quality inspection and performance evaluation. EKO provides an unique calibration compliant to the international standards defined by ISO/IEC17025/9847. The sensor has a 5 years warranty with a 5 years re-calibration interval recommended and it is no longer necessary to change the desiccant.

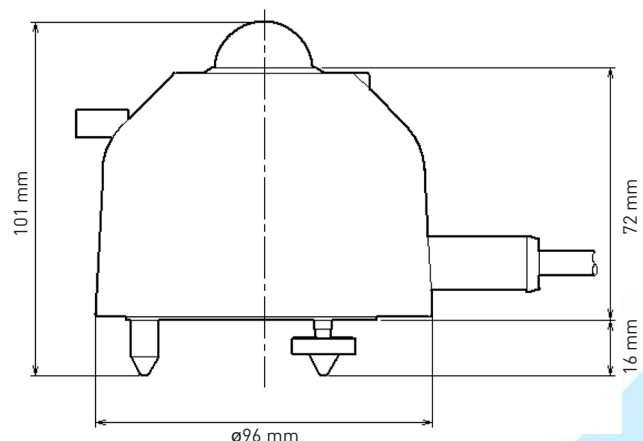
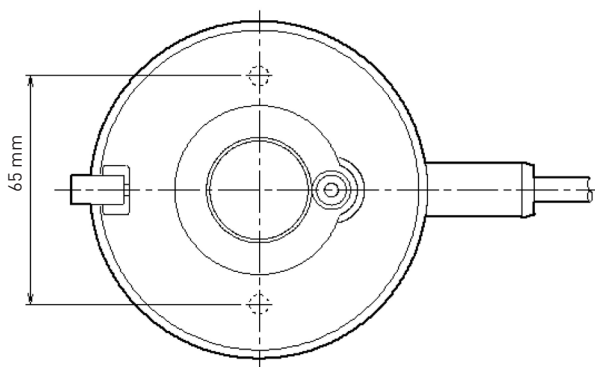
Calculation of Solar Irradiance

Current range: 0 ... 10 mA with Shunt $R_{sh} = 100\ \Omega$

$$\begin{aligned} \text{Slope} &= \frac{1\,600 \frac{W}{m^2}}{1\,V} \\ &= 1\,600 \frac{W}{V \cdot m^2} \end{aligned}$$

$$\text{Offset} = 0 \frac{W}{m^2}$$

Dimensional drawing



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Specifications

	Current Output 0 ... 10 mA	Modbus RTU via RS485
	S64180	S64185
Classification	ISO 9060:2018 Class A + IEC 17025 calibration ISO 9060:1990 Secondary Standard	
Typical Sensitivity	10 $\mu\text{V}/\text{W}/\text{m}^2$	
Wavelength range	285 ... 3 000 nm	
Max. operational irradiance	4 000 W/m^2	
Response time (95%)	< 0.5 s	
Zero offset		
(a) 200 W/m^2	$\pm 1 \text{ W}/\text{m}^2$	
(b) 5 k/hr	$\pm 1 \text{ W}/\text{m}^2$	
(c) complete	$\pm 2 \text{ W}/\text{m}^2$	
Non-stability change/5 years	$\pm 0.5\%$	
Non-linearity at 1 000 W/m^2	$\pm 0.2\%$	
Directional response at 1 000 W/m^2	$\pm 10 \text{ W}/\text{m}^2$	
Spectral error	$\pm 0.2\%$	
Temperature response -10°C ... +40°C	$\pm 0.5\%$	
Temperature response -20°C ... +50°C	$\pm 0.5\%$	
Tilt response @ 1 000 W/m^2	$\pm 0.2\%$	
Operating temperature range	-40 ... +80 °C	
Power supply	5 ... 30 VDC	
Power consumption	<0.2 W	
Cable length	10 m	
Protection class	IP67	
Warranty	5 years	
Manufacturer	EKO Instruments	
Accessory	Precision Shunt 100 Ω	M83570
	MV-01 ventilator / heater (Order-No. S64060)	

Delivery includes IEC 17025 calibration certificate.

Connecting EKO MS-80S to Ammonit Meteo-40 plus data loggers

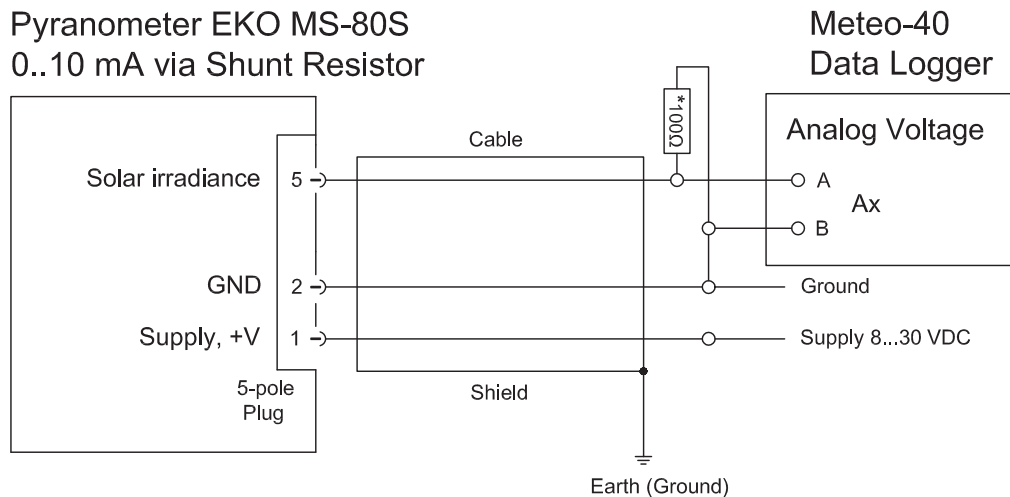
Sensor	EKO Wire Color	Meteo-40 RS-485 Master	Sensor Supply	
0 ... 10 mA (-)	white		AVx B	(shunt)
0 ... 10 mA (+)	grey		AVx A	
RS-485 (+)	blue	B+		
RS-485 (-)	black	A-		
RS-485 GND	white		GND	
Supply	brown		12 V DC	
GND	white		GND	

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Analog Voltage (0 ... 10 mA via Shunt Resistor)



- * Pmin = 2 W Tol. max. 1%
- 1 V @ 10 mA
- Voltage-Range M-40 +/- 1V

Modbus RTU via RS-485

