



MS-90 Plus+ Trackerless Solar Monitoring Station

Technical Specifications

GHI measurements of the highest accuracy and lowest uncertainty with Class A pyranometer

DNI measurement with <5% uncertainty

No sun-tracker required

GPS receiver for easy setup

Digital MODBUS 485 RTU output for DNI, GHI, DHI

A cost effective system combining MS-90 and MS-80S for DNI, GHI and DHI data without sun tracker. MS-90 Plus+ is the combination of two innovative irradiance instruments from EKO: MS-90 DNI sensor and the fast response Class A pyranometer MS-80S. These two instruments are connected via a special interface box (C-Box) with a GPS receiver and an processing unit. The system accurately measures DNI and GHI and calculates Diffuse irradiance (DHI) from the measurement data and the sun position. The C-box is delivered with a 10m cable, the sensor have a 1.5m cable to connect to the C-box.

pyrheliometer.

The system provides a digital output signal (Modbus 485 RTU) and can be easily connected to various data acquisition systems in solar energy projects and meteorological stations (dataloggers, inverters, SCADA etc). It can also be connected to a PC.

The MS-90 DNI sensor has a broad spectral response (300-2500 nm) and is calibrated outdoors with a

	MS-90 Plus+
ISO 9060:2018	Class C (DNI) + Class A (GHI, DHI)
Output	DNI, GHI, DHI (MODBUS 485 RTU)
Temperature response -20°C to 40°C	+/- 5 %
Non-linearity	+/- 2.5 %
Operating temperature range	-20 - 45 °C
Wavelength range	300 - 2500 nm (50% points)
Power supply	10.5 - 12.5 VDC
Dimensions mm	350 (W) x 250 (L) x 200 (H) (Incl. optional base plate)
Weight	2.5 kg
Ingress protection IP	67
Cable length	10 m
Geographic application	Latitude (-58° to 58°) / Longitude (0° to 360°)
Power consumption	< 6 W

Options	MS-90 Plus+
Cable length	20 / 30 / 50 m
Power supply	100 to 240 VAC / 12VDC / 200 x 140 x 80mm / 2.5 kg

	MS-90
ISO 9060:2018	-
Output	0-2V (Pulse)
Temperature response -20°C to 40°C	+/- 5 %
Non-linearity	+/- 2.5 %

Operating temperature range	-20 - 45 °C
Wavelength range	300 - 2500 nm (50% points)
Power supply	10.5 - 12.5 VDC
Dimensions mm	350 (W) x 250 (L) x 200 (H) (Incl. optional base plate)
Weight	2.5 kg
Ingress protection IP	67
Cable length	10 m
Geographic application	Latitude (-58° to 58°) / Longitude (0° to 360°)
Power consumption	< 5 W

Options	MS-90
Cable length	20 / 30 / 50 m
Base plate	350 x 250 / leveling feet mm
Power supply	100 to 240 VAC / 12VDC / 200 x 140 x 80mm / 2.5 kg

	C-Box Modbus
Communication interface	RS-485 Modbus
Channels	2 units
Functions	DNI, GHI, DHI processing
Ingress protection IP	65
Operating temperature range	-40 - 80 °C
Voltage range	12V
Power consumption	< 1 W

	MS-80S
ISO 9060:2018	Class A
ISO 9060:1990	(Secondary Standard)
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%	< 0.5 Sec.
Zero off-set a) 200W/m ²	+/- 1 W/m ²
Zero off-set b) 5K/hr	+/- 1 W/m ²
Complete zero off-set c)	+/- 2 W/m ²
Non-stability change/1 year	-
Non-stability change/5 years	+/- 0.5 %
Non-linearity at 1000W/m ²	+/- 0.2 %
Directional response at 1000W/m ²	+/- 10 W/m ²
Spectral error	+/- 0.2 %
Temperature response -10°C to 40°C	+/- 0.5 %
Temperature response -20°C to 50°C	+/- 0.5 %
Tilt response at 1000W/m ²	+/- 0.2 %
Operating temperature range	-40 - 80 °C
Irradiance range	0 - 4000 W/m ²
Wavelength range	285 - 3000 nm (50% points)
Power supply	5 - 30 VDC
Power consumption	< 0.2 W
Ingress protection IP	67

Cable length	10 m
Additional signal processing errors	< 1 W/m ²

Options	MS-80S
Cable length	20 / 30 / 50 m
Ventilation unit	MV-01
Albedo mounting kit	MS-albedo Kit

Specifications are subject to change without further notice.