

MS Pyranometers

- Analog Output** MS-80, MS-60, MS-40
- Current Output** MS-80A, MS-60A, MS-40A
- Digital Output** MS-80M, MS-60M, MS-40M

- MS-80** [ISO9060:2018 Class A]
- MS-60** [ISO9060:2018 Class B]
- MS-40** [ISO9060:2018 Class C]

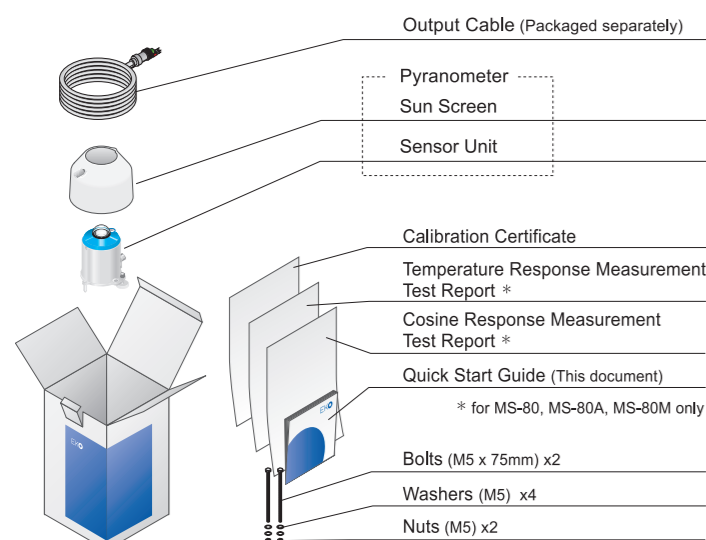
Thank you for purchasing EKO products.

This sheet provides the basic instructions for setting up your MS Pyranometer. Please refer to the **Instruction Manual** for more detailed information about each model.

Product Warranty

For warranty terms and conditions, please consult the **Instruction Manual**, EKO Instruments, or your distributor for further information. Please note: All of our products are tested to ensure that they meet their published specifications. The warranty included in the conditions of delivery is valid only if the product has been installed and used in accordance with the instructions provided in the **Instruction Manual**.

1 In the Box



First, please check the package contents. If any part is missing or damaged, please contact EKO or your EKO distributor.

- Please download the instruction manual from the EKO website.



- We recommend that you keep the original packaging for return shipping in case of recalibration or repair.

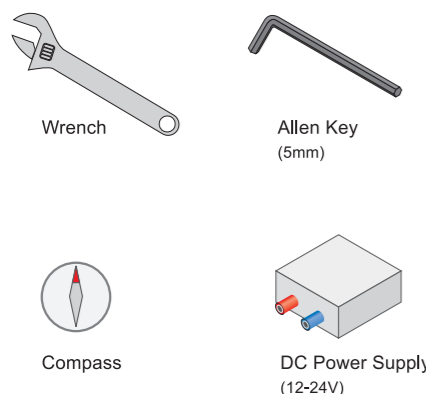
Handling Caution

- Always hold the pyranometer from the bottom when carrying
- Do not hold the sun screen part as the sensor unit may drop



2 Preparing to Install

1 Required Tools

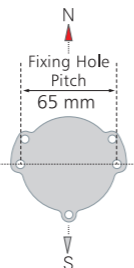


2 Location & Setup Conditions

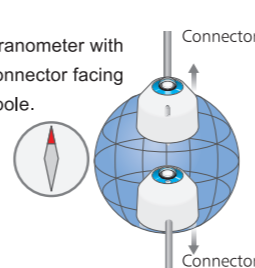
- Select a location with free horizon, without any obstructions and light reflections throughout the day.



- Orientate the Fixing Holes on the Installation Base.



- Place the pyranometer with the Cable Connector facing the nearest pole.



3 Installation

1 Mount the Pyranometer on the Installation Base

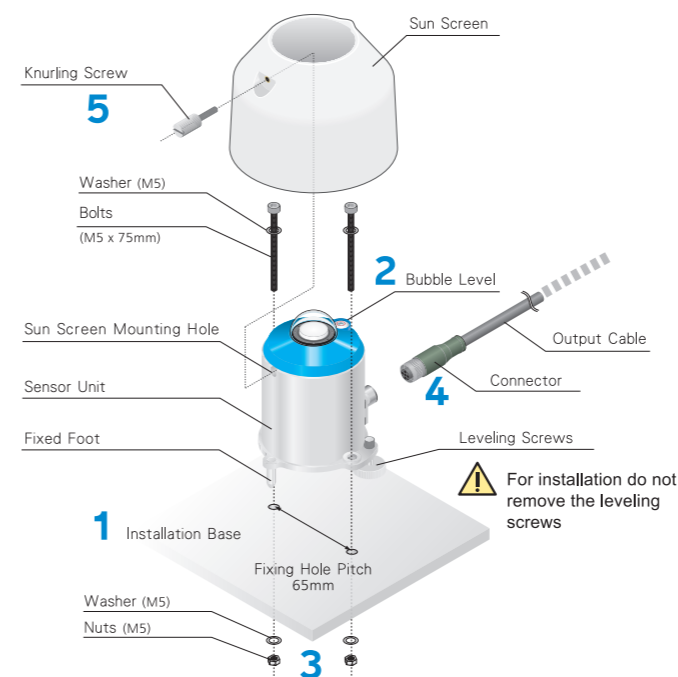
2 Level the Pyranometer



Horizontal surface: Level the pyranometer by adjusting the leveling screws.

Inclined surface: Install on an inclined surface after leveling the pyranometer by adjusting the leveling screws on a horizontal surface.

3 Fasten the Pyranometer to the Installation Base



4 Securely Insert the Output Cable Into the Sensor Unit

Insert the output cable into the connector port on the back of the sensor unit, and twist clockwise to fasten it. Make sure to tighten the connector all the way.

- If the connection is loose, water can enter the unit and cause it to malfunction. Secure the length of the cable to avoid it from being pulled loose.

Connect the power cable grounding wire to prevent electrical shocks

5 Attach the Sun Screen

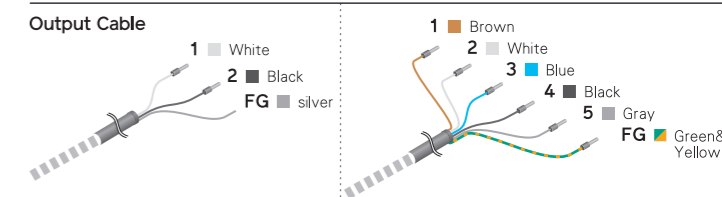
Place the sun screen in the proper position; insert the tab inside the sun screen to the groove on the sensor unit.

Fasten the knurling screw, and check that it is secure.

6 Wiring

Connect the output cable to each terminal.

- To prevent signal noise, always connect the cable shield to the measurement device common ground. Connect fuse for MS-80A, MS-80M, MS-60A, MS-60M, MS-40A and MS-40M.



Connect to	Voltage Output	Current Output	Digital Output
	MS-60 MS-40	MS-80	MS-80A MS-60A MS-40A
	MS-60M MS-40M		MS-80M MS-60M MS-40M
1	V+		
2	V- / Current(-)		
3	Data (+)		
4	Data (-)		
5	V- / Current(+)		
FG	Frame Ground Shielded Wire		

- DAQ System - Data Acquisition System
- Voltage Detector
- Current Detector
- Fuse (0.5A) - Connect in series between power supply lines.
- Earth Connection - Be sure to connect it to the ground terminal of the power supply. Otherwise, noise will be generated in the output signal and correct measurement cannot be performed.
- DC 12 - 24V - Power Supply

Digital Communication Settings
Modbus 485 RTU:
19200bps / 8bit / Even / 1 stop bit / xx *
* Last two digits of the product serial number.

- Make sure to use measurement instruments (i.e. data loggers) with an input resistance of 100MΩ or more.

Approximate Output Values

Conditions	Cloudy	Partly Cloudy	Clear
Solar Irradiance [W/m ²]	< 300	> 300	> 700
Voltage Output [mV]	< 3.0	> 3.0	> 7.0
Current Output [mA]	< 7.0	> 7.0	> 11.0

4 Measurement & Maintenance

Measurement Range

Set measurement range on the measuring instrument according to the below output range.

	Voltage Output	Current Output	Digital Output
Output Range	0 to 14 [mV]	4 to 20 [mA]	Modbus RTU [®] Electrical Specification
Measurement Range	0 to 20 [mV]	4 to 20 [mA]	EIA RS-485

Calculate Solar Irradiance

Using the following formulas, Pyranometer output value can be converted into solar irradiance.

$$I_{[W/m^2]} = \frac{E_{[\mu V]}}{S_{[\mu V/W \cdot m^2]}}$$

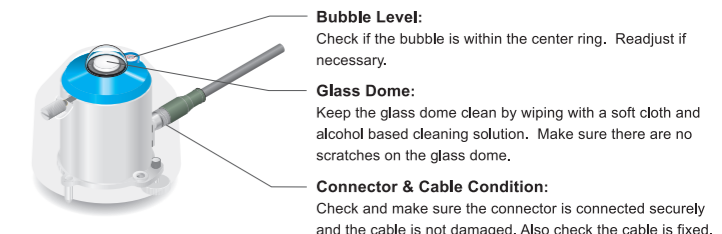
I : Solar Irradiance [W/m²]
E : Pyranometer Output Voltage [μV]
S : Sensitivity [μV/W·m⁻²]

$$I_{[W/m^2]} = (I_{out} [mA] - 4) \times 100$$

I : Solar Irradiance [W/m²]
I_{out} : Pyranometer Output Current [mA]

Conversion is not necessary as the output can be obtained as solar irradiance in W/m².

Periodic Maintenance



Recalibration & Desiccant Replacement

To maintain a proper measuring condition, it is recommended to recalibrate every 5 years* for MS-80, MS-80A and MS-80M. Please contact EKO for recalibration service. * MS-60A, MS-60M, MS-40A and MS-40M : recommended to recalibrate every 2 years.