EKO

MS-80SH Pyranometer

MS-80SH Pyranometer [ISO9060:2018 Class A]

Thank you for purchasing the MS-80SH, an EKO S-Series Pyranometer.

This Quick Start Guide provides basic instructions to help you set up and get started. Please see the **Instruction Manual** for more detailed information about this product.
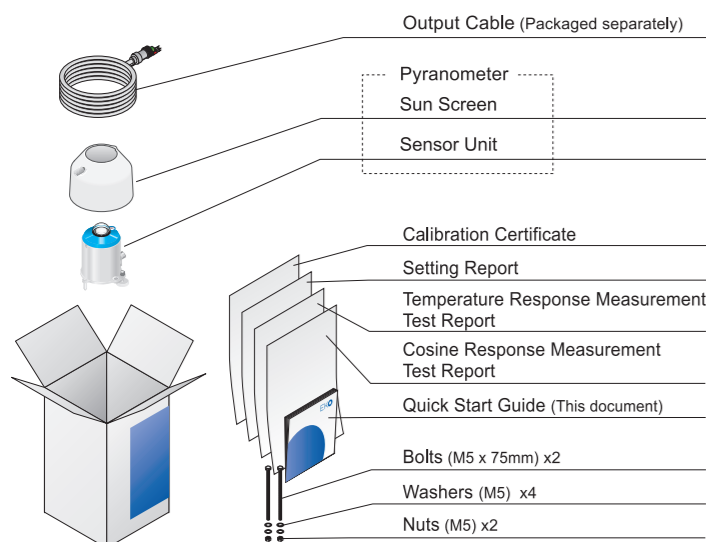
Product Warranty

Your MS-80SH Pyranometer comes with a 5-year 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

Output Cable (Packaged separately)

Pyranometer
Sun Screen
Sensor Unit

Calibration Certificate
Setting Report
Temperature Response Measurement Test Report
Cosine Response Measurement Test Report
Quick Start Guide (This document)

Bolts (M5 x 75mm) x2
Washers (M5) x4
Nuts (M5) x2

First, please check the package contents. If any part is missing or damaged, please contact EKO or your local EKO distributor.
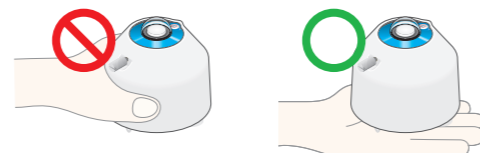
● Please download the instruction manual from the EKO website.

EKO MS-80SH

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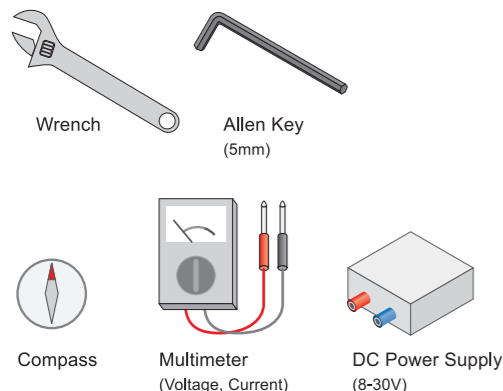
Handling Caution

⚠ Always hold the pyranometer from the bottom when carrying. Do not hold the sun screen part as the sensor unit may drop.
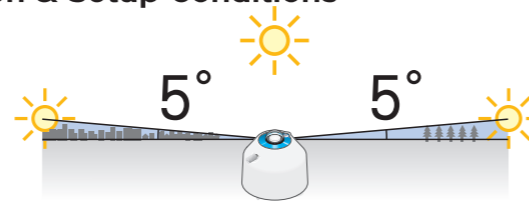
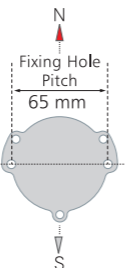# 2 Preparing to Install

1 Required Tools

Wrench
Allen Key (5mm)
Compass
Multimeter (Voltage, Current)
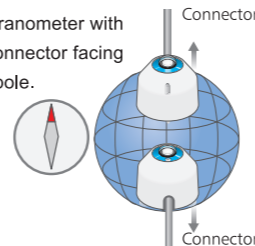DC Power Supply (8-30V)

2 Location & Setup Conditions

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

5° 5°

● Orientate the Fixing Holes on the Installation Base.

N
Fixing Hole Pitch
65 mm
S

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

Connector
Connector

3 Installation

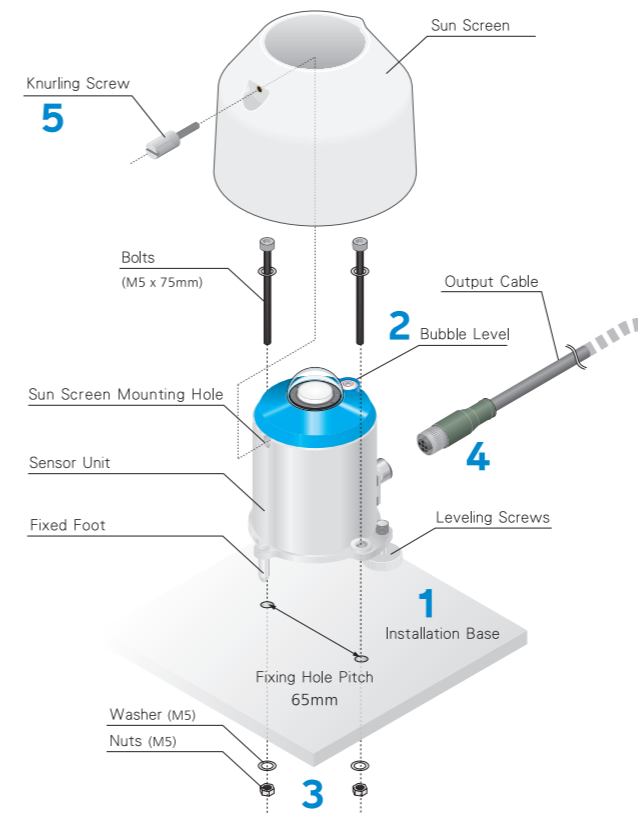## 1 Mount the Pyranometer on the Installation Base

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

⚠ For installation do not remove the leveling screws

Knurling Screw **5**
Sun Screen

Bolts (M5 x 75mm)
Output Cable
2 Bubble Level

Sun Screen Mounting Hole
Sensor Unit
Fixed Foot
Leveling Screws **4**

1 Installation Base
Fixing Hole Pitch 65mm

Washer (M5)
Nuts (M5) **3**

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 tighten it all the way. Push the connector in, and check to make sure the screw is tight.

⚠ If the connection is loose, water can enter the unit and cause it to malfuction.

— Secure the length of the cable to avoid it from being pulled loose.

⏚ Connect the FG terminal to the earth terminal of the power supply.

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

Connect to		Digital Output	
Cable		Modbus (5-30 VDC)	SDI-12 (12 VDC)
1 ■ Brown	V +		
2 □ White	V —		
3 ■ Blue	Data (+)		
4 ■ Black	Data (—)		
5 □ Gray	(No Function)		
FG Green& Yellow	Frame Ground Shielded Wire		

F : Fuse
D
E
D
F
E

6
1 ■ Brown
2 □ White
3 ■ Blue
4 ■ Black
5 □ Gray
FG Green& Yellow

D : DAQ System - Data Acquisition System
F : Fuse (0.5A) - Connect in series between power supply lines.
E : 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.

Communication Settings
Modbus RTU :
19200bps / 8bit / Even / 1 stop bit / xx *
* Last two digits of the product serial number.
SDI-12 :
1200bps / 7bit / Even / 1 stop bit / Address 0

7 Dome Heating Function Control

The heating system of the MS-80SH can be controlled via an on/off switch using our free Hibi software or Modbus RTU/SDI-12 commands.

Please note: The default setting of the heating system is 'ON'. For detailed operating instructions, see the Hibi section of this manual or the Modbus RTU/SDI-12 commands section of the full instruction manual, available online.

4 Measurement & Maintenance

Dome Heating Function

- A power supply of at least 8 VDC is required to use the dome heating function.
- The dome heating function is set to ON when the product is shipped.
- The dome heating function can be switched on and off with a simple toggle button in Hibi or by rewriting the respective registers of the Modbus RTU and SDI-12.
- On switching the dome heating function on or off it can take up to 3 hours for the dome temperature to stabilise.
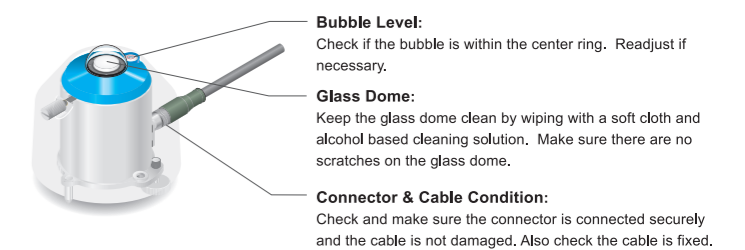
Intensity of Solar Radiation

The digital output enables direct solar radiation intensity (W/m²) to be obtained without conversion.

Approximate Output Values

Conditions	Cloudy	Partly Cloudy	Clear
Solar Irradiance [W/m²]	< 300	> 300	> 700

Periodic Maintenance

Bubble Level:
Check if the bubble is within the center ring. Readjust if necessary.

Glass Dome:
Keep the glass dome clean by wiping with a soft cloth and alcohol based cleaning solution. Make sure there are no scratches on the glass dome.

Connector & Cable Condition:
Check and make sure the connector is connected securely and the cable is not damaged. Also check the cable is fixed.

Recalibration & Desiccant Replacement

To maintain the highest levels of measurement accuracy we recommend periodic recalibration of your product (every 5-years for the MS-80SH). Please contact EKO Instruments for more information about our 'Recalibration Services'.

Thanks to the advanced design of your sensor, there is no need to change the desiccant, and attempting to change the desiccant may void your warranty.

Specifications

	MS-80SH
a : Fixing Hole Pitch	65 mm
b : Width	Φ96 mm
c : Height	101 mm
Mass	0.41 kg
Operating Temperature	-40 to 80 °C
Input Power	Modbus： 5V or 8 to 30 V DC
	SDI-12： 12 V DC
Power Consumption	Without Heating： ＜0.2 W
	With Heating： ＜1.4 W

a :
Fixing Hole Pitch

c:
Height

b:
Width
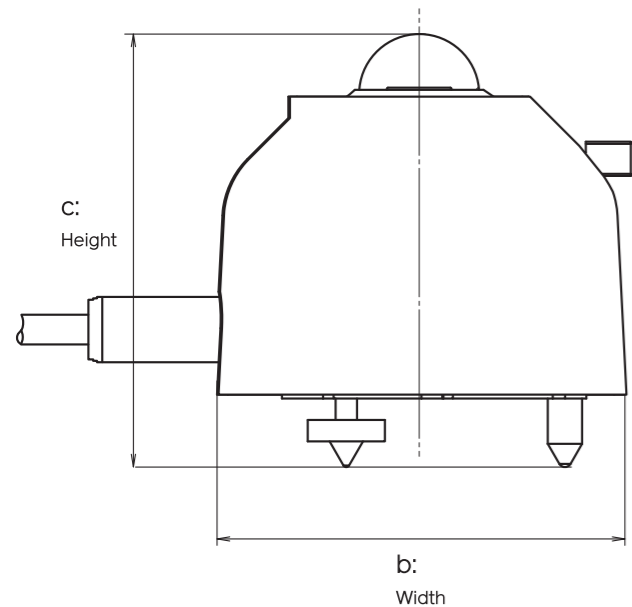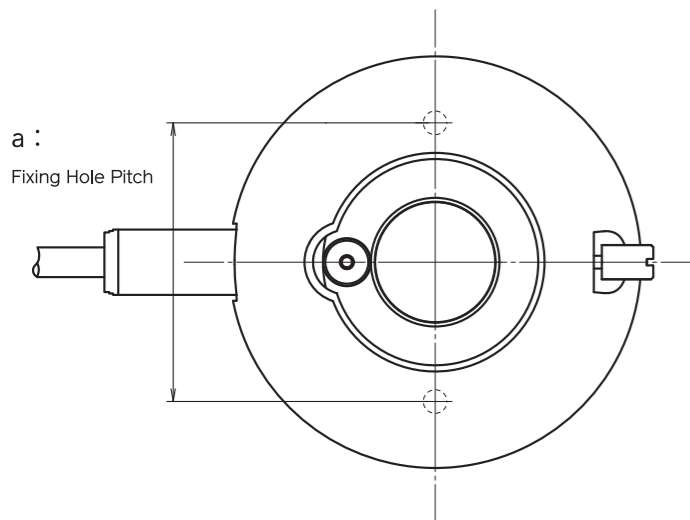
Quick Start Guide
Hibi Software

Meet Hibi

Hibi, available for Windows from the EKO website, is a free software programme designed to help you get the most from your sensor. Use Hibi to visualise detection signals, change settings, set communication parameters, check the status of your pyranometer, and rapidly troubleshoot any issues.
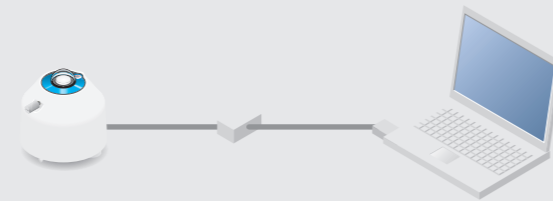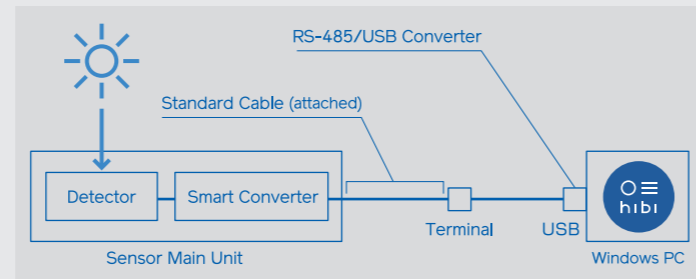
What can Hibi do?

● **Change your sensor's signal converter settings**
Manage the communication protocol and output signal settings.

● **Realtime display of measurement values and sensor conditions**
Get instant, easy to read measurement values and live information on the condition of your sensor (temperature, humitidy, tilt).

● **Record measurement data**
Measurement data can be recorded and output to CSV (comma delimited).

● **Toggle dome heating function**
The heating function can be switched on or off. The default setting is on.

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1 Preparation

1 Download

EKO MS-80S/MS-80SH/60S/40S

Download Hibi from any s-series pyranometer product page on the EKO website.

2 Install

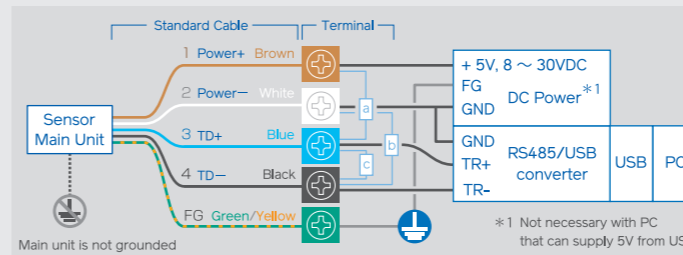Execute the installer file (.exe) and install Hibi on your PC. If a dialogue window appears during the installation process, click 'Run Anyway'.

3 Connect sensor and PC using cable

Connect 5 cable terminals as shown in the Communication Cable Wiring Diagram.

Communication Cable Wiring Diagram
How to connect to PC when using general purpose RS-485/USB cable.

a : Pull-up registor 680Ω   b : Pull-down registor 680Ω   c : Terminating registor 120Ω

Depending on the converter cable type and specifications, pull-up/pull-down resistors and a termination resistor are required. However, with the optional EKO Converter cable, additional resistors are not necessary.

4 Start up Hibi
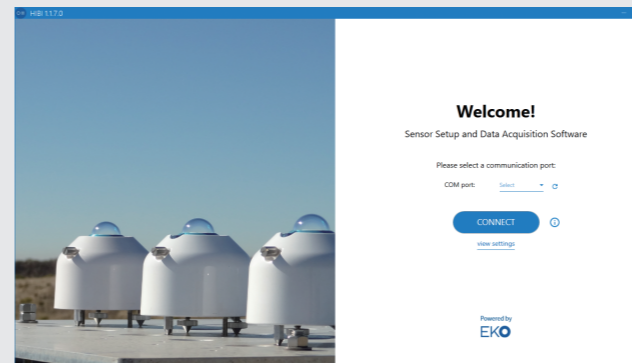
5 Reconnect Cable

To automatically connect, remove the cable from the sensor, click CONNECT, then reconnect the cable within 10 seconds.
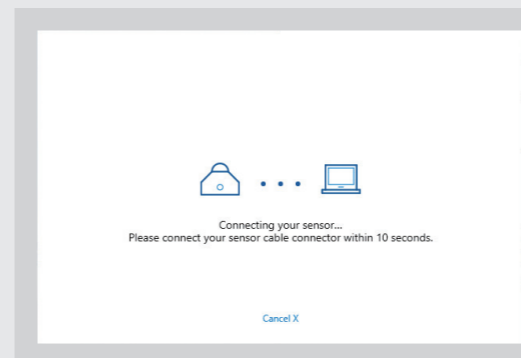
Hibi cannot operate without an established connection to the sensor.

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2 Operation

Once the connection between Hibi and the sensor is established, the Hibi dashboard will automatically load. See manual for more detailed information.

1 Dashboard

Current sensor output value is displayed in realtime.

a Irradiance (Instantaneous Value) b Internal Temperature c Internal Humidity d Tilt Angle
e Irradiance Graph f Data Logging Setting
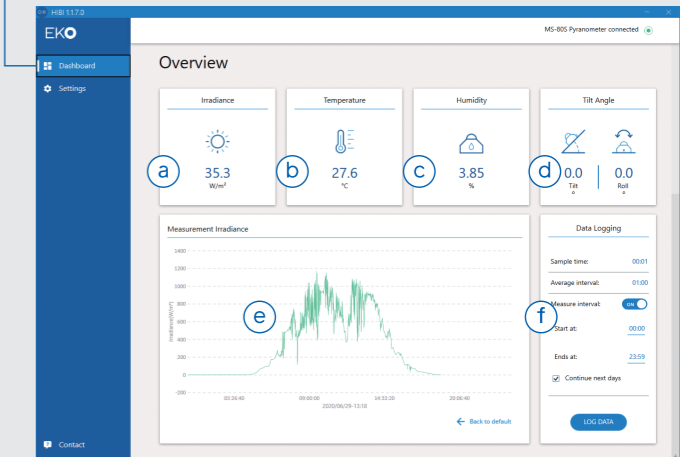
2 Settings

− **COMMUNICATION**
Communication methods can be changed [Modbus/SDI-12] (Default: Modbus)

− **SENSOR INFORMATION**
Sensor information, such as serial number and calibration value can be viewed.

− **DOME HEATING** ： Can be switched on or off (Default: ON).

− **TEMPERATURE** ： Temperature Unit [°C / °F / K] (Default: °C)

− **SENSOR POSITION** ： Tilt sensor zero-point adjustment

− **DATA FILES** ： Save location of measurement data and setting data
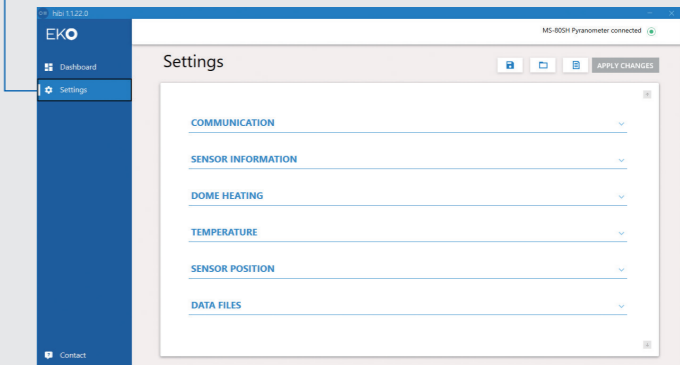
Please refer to the APPENDIX (Communication Specifications) of the instruction manual for Modbus and SDI-12 communication settings.

EKO INSTRUMENTS

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