USER GUIDE FOR CDG-17B SCATTERED RADIATION

CDG-09B-01-MN-10	SEP-2024

This document is applied for the following products

SKU	CDG	HW Ver.	1.0	FW Ver.	1.0
Item Code	CDG-17B	Scattered Radiation Sensor, RS485 0-20mV Output, Aluminum alloy, 0-2000W/m2			

1. Introductions

Scattering radiometer is composed of Pyranometer and shielding ring.The purpose of a shielding ring is to keep the sun's direct radiation out from sunrise to sunset.The shielding ring is composed of shielding ring, ruler,adjusting screw, bracket and chassis.The width of the shielding ring is 65mm and the diameter is 400mm. The shielding ring is fixed on the screw rod adjustment spiral of the ruler, on which the latitude scale and declination scale are engraved.The ruler and bracket shall be fixed on the chassis according to the geographical latitude of the location.It can be widely used to continuously measure the scattered radiation intensity of the sky with meteorological stations and scientific research departments.

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2. Specification

Item	Specifications
Spectral range	300～3200nm
Supply	12-24VDC
Range	0-2000W/m^2
Output	RS485 0-20mV
Sensitivity	7-14μV*W-1*m2
Iinternal resistance	350Ω
Response time	≤20s(99%)
Cosine correction	≤±7%(Solar elevation angle=10°)
Measuring angle	2π solid angle
Non-linear	≤±2%
Temperature effect	±2%(-10℃-+40℃)
Stability	≤±2%/year
Operating Temperature	-40℃-+60℃
Ingress Protection	IP65
Weight(unpacked)	2.5kg
Dimension	Ø165*120mm
Shell material	Aluminum alloy
Storage Condition	10℃-60℃@20%-90%RH

3.Working Process

The table is based on the principle of thermoelectric effect, and the induction element is a winding electroplated multi-contact thermopile, whose surface is coated with a black coating with high absorptivity. The hot contact is on the sensing surface, while the cold junction is located in the body, and the cold and hot contact generates the thermoelectric potential. In the linear range, the output signal is proportional to the solar irradiance. In order to reduce the influence of temperature, it is equipped with a temperature compensation line, in order to prevent the impact of the environment on its performance, it is used two layers of quartz glass cover, cover is ground by precision optical cold processing.

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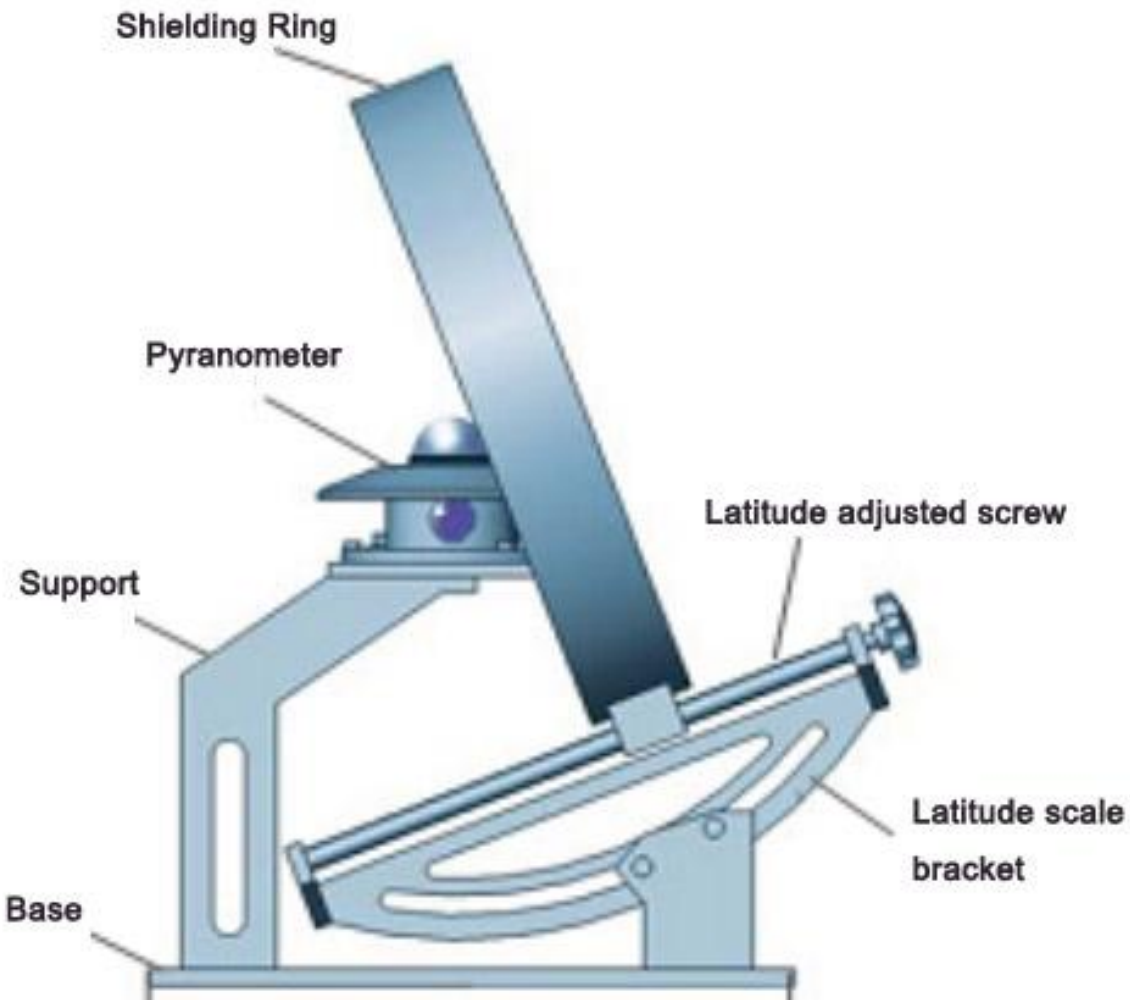
4. Electrical Connections

Cable	RS485
Red (Pin1)	V+
Yellow (Pin4)	RS485A
Black (Pin2)	V-
Green (Pin5)	RS485B

5. Installation

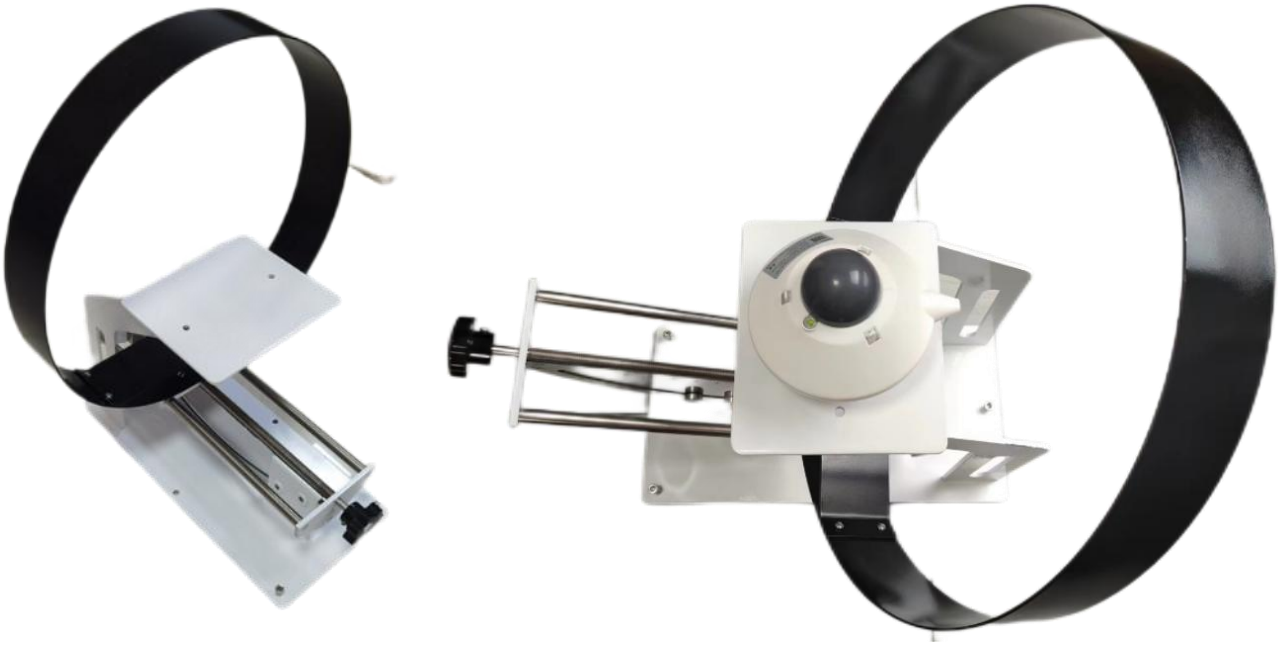


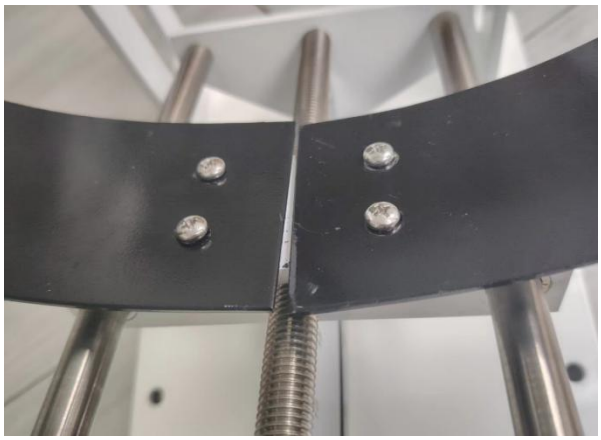
1. First installed Shielding Ring in the observatory,the of the direction and level of shielding ring is important. Therefore, must make the edge chassis when installed on the north and south, make the instrument ruler points to the north and south, (the northern hemisphere, shielding ring handle screw knob toward the north; and the southern hemisphere, south block ring screw adjusting knob handle).Then, the base plate of shielding ring is fixed on the observation bracket with bolts.

2. Fix the position of ruler according to the local geographical latitude, so that the indicated value of ruler scale is consistent with the local latitude;

3. Install the pyranometer horizontally on the platform of the shielding ring, the position should be just so that the pyranometer blackening surface of the sensing surface in the center of the shielding ring. adjust the level of the pyranometer and fix it;

4.Please keep the shielding ring clean and flexible screw rotation.If you find the screw rod with dust or rotation is not flexible, especially after wind sand, to use gasoline or alcohol to wipe the screw rod.Please take off the shielding ring with a cover if you will not use it for long time, so as to avoid the screw rod and related parts corrosion.





6.Communication Protocol（MODBUS）

Transmission mode: MODBUS-RTU,**Baud rate:** 9600bps,**Data bits:**8,**Stop bit:**1,**Check bit:**no

Slave address:the factory default is 01H (set according to the need,00H to FFH)

7.1 The 03H Function Code Example: Read Radiation Value

Host Scan Order(slave address:0x01)
01 03 00 00 00 01 840A

Slave Response
01 03 02 03 B4 91E7

Solar Radiation:(03B4)H=(984)D=948(W/m2)

7.2 The 06H Function Code Example: Modify the slave address

Host Scan Order (Changed to 01H,read and write address must be 00H):
01 06 01 00 02 09 F7

Slave Response:
01 06 01 00 02 09 F7

7. Troubleshooting

If some error occurs, such as no output or unreliable. Please disconnect the sensor first, then check if the sensor installation and connection is correct with the instruction manual.

If still not successful, please contact our company.

8. Support contacts:

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