Datasheet & Installation Guide
Dynalab Silicon Pyranometer [DWR 8102M]

Internet of Things

Solar Energy

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MODEL

DWR 8102M

DATASHEET

Introduction

Dynalab Silicon Pyranometer model No. DWR 8102M uses a Silicon Photovoltaic cell for measurement of incoming Solar Radiation on a flat surface. The response of this sensor is limited to a wavelength band of approx 400 to 1100 Nanometers. However, most of the solar radiation reaching the surface of the earth falls within this wavelength band and if calibrated against a precision blackbody pyranometer this type of pyranometer can be used to acquire reasonably accurate values of incident Solar radiation especially on clear days. For use in studies in Agricultural Meteorology and Solar energy conversion using photo voltaic devices this model is adequate.

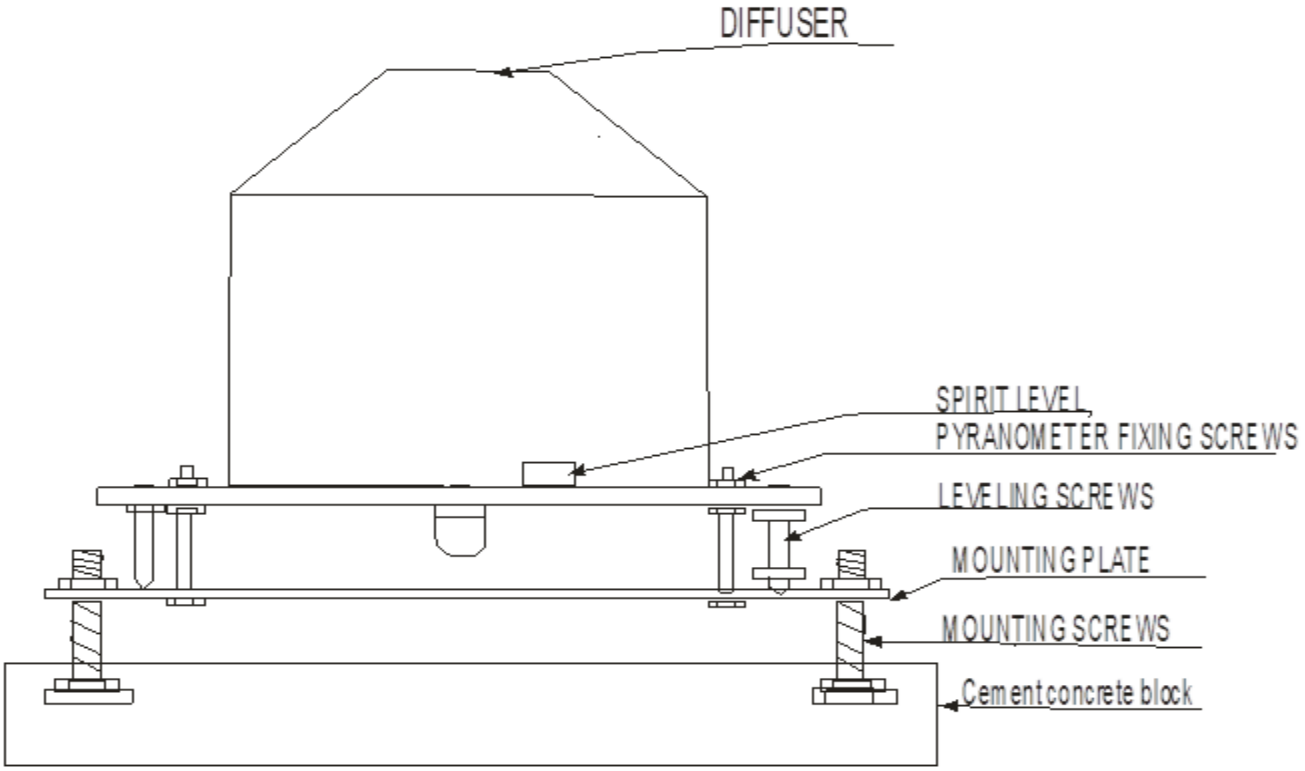
The sensor is mounted under a milky white diffuser positioned in such a way as to give good cosine response.

The device is calibrated against a secondary standard thermopile type pyranometer.

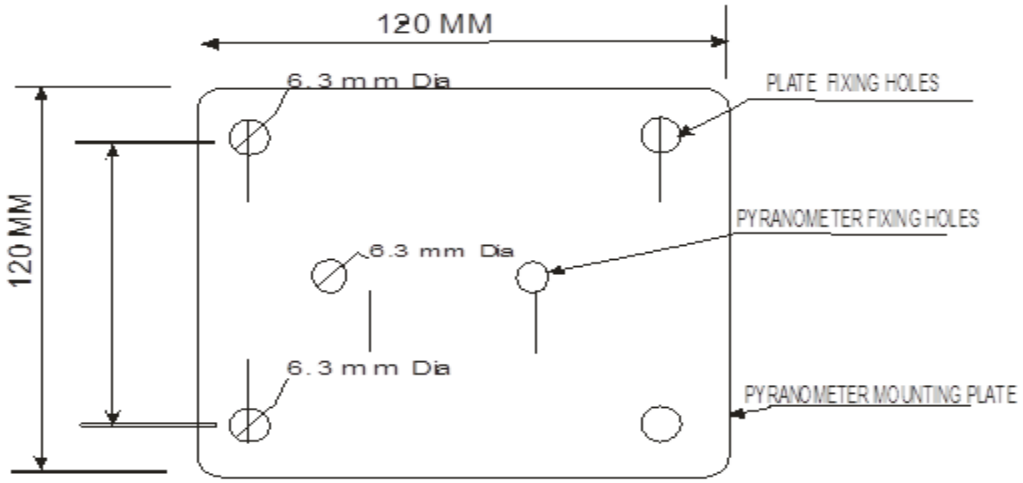
Specifications

Brand	Dynalabs
Model No.	DWR 8102M
Sensing	Silicon Photo voltaic cell
Wavelength range	400 to 1100 nano meters
Measurement range	0 to 2000 watts / Sq. Meter
Accuracy	+ 3% of reading on clear cloudless days
Output	A. 0 to 5 VDC (0- 2000 W/m2) B. MODBUS RTU
Input Operating Voltage	12 V DC
Mechanical	Aluminum body with leveling screws and spirit level

SCHEMATIC



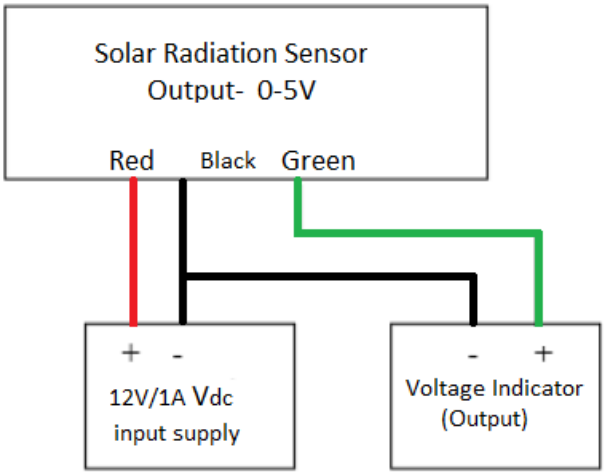
SILICON PYRANOMETER RADIATION SENSOR INSTALLATION



SENSOR MOUNTING PLATE DETAILS

The solar radiation sensor is installed on the top of the pillar (or cement platform) & leveled with the help of the sprit level & the leveling screws.

Wiring Diagram for sensor with 0-5V Output



INSTALLATION

Guidelines

The following guidelines are recommended while installation of a pyranometer:

- Pyranometer is to be mounted in an easy-to-reach location in order to clean the dome regularly and carry out maintenance. At the same time, make sure that no buildings, constructions, trees or obstructions exceed the horizontal plane where the pyranometer lies. If this is not possible, select a site where obstructions in the path of the sun from sunrise to sunset do not exceed 5 degrees of elevation. N.B The presence of obstructions on the horizon line affects significantly the measurement of direct irradiance
- Pyranometer is to be located far from any kind of obstruction, which might reflect sunlight (or sun shadow) onto the pyranometer itself.
- The sunlight sensor must be installed at the same azimuth and tilt angle than the PV array.

Tools and Materials Needed

Please make sure you have all the necessary material as mentioned below:

- Wrench or pliers
- Wire cutters and stripper
- Multi meter
- Drill with 3/16 in drill bit (4.7 mm) to drill pilot holes
- Adjustable wrench or 11/32 in. wrench and 7/16 in
- Electrical Tapes to cover the wire

Location Recommendation

Use the following guidelines to determine the best location for mounting the Solar Radiation Sensor:

- The sunlight sensor must be installed at the same azimuth and tilt angle than the PV array
- Pyranometer is to be located far from any kind of obstruction, which might reflect sunlight (or sun shadow) onto the pyranometer itself.

Mounting

- Using the spirit level on the sensor as a guide, adjust the sensor until it is level by tightening or loosening the screws.
- Final leveling of the sensor(s) should be done with the ISS mounted in its operating location
- Ensure that the cables are free of crimps. Secure them to the support tubes with the provided cable ties so that they will not fray in the wind.
- Shade the sensor and make sure the reading changes
- If necessary, adjust the position of the sensor by tightening or loosening the leveling screws. When pointed directly at the sun, the shadows from the alignment fins should appear as shown in the illustration below:

Example Installations

Calibration

- If using Modbus sensor then the Pyranometer is factory calibrated.
- If using analog output senor then use the following info to calibrate.
  Output: 0 - 5 VDC (0- 2000 w/m2)
  Irradiance in W/m2 = 400*Output voltage (in Volt) measured by the voltmeter

It is highly recommended that the calibration be checked annually

Connection Diagram

A. For ANALOG output connections, please search for '*Installation Guide – Analog Sensors*' on: www.trackso.in/documentation
B. For MODBUS output connections, please search for '*Installation Guide – MODBUS Sensors*' on: www.trackso.in/documentation

Sensor Maintenance

- The effectiveness of the radiation shield will be reduced if the surfaces of the shield are dirty. Wipe the surfaces of the shield with a damp cloth to remove dirt and dust. You can wash it using water and standard papers for lens, and if necessary using pure ETHYL alcohol. After using alcohol, clean again the dome with water only.
- Due to the sensitivity of ultraviolet and solar radiation sensors, it is common practice for manufacturers to recommend recalibration after a period of time. You can get approximately 3% drift per year on the readings from these sensors. For applications demanding higher accuracy, the sensors should be calibrated once every year.

Disclaimer

This sensor is a low-cost alternative to the Class 1/Class 2 sensors of the same type. Since this sensor fall under no class, there will be some variation in the real vs. expected values. If you wish to minimise the error/deviation in output values, we recommend that you purchase Class 1/Class 2 sensor.

Please note, we do not manufacture the sensor but only sell them along with our TrackSo IoT service. We do not guarantee the output/performance of the sensor.

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