SILICON SOLAR RADIATION SENSOR TYPE SOZ 03

INTRODUCTION

The SOZ-03 pyranometer consists of a mono-crystalline silicon cell (50 x 50 mm ²) with special solar glass. The pyranometer is laminated, hence high UV-resistance and long-term stability.

Features:

- Plain integration into the top cover of the box
- Advanced weatherproof junction box made of UV resistant material with cable gland and screw-less terminal for the connection of the measuring cable
- High precision shunt resistor directly soldered to the terminals of the cell
- Linear output signal in the range 0...1500 W/m²
- Individual calibration of each sensors in the natural sunlight close to AM 1,5 spectrum by means of a compatible calibrated reference cell
- Accuracy of monthly sums compared to a W.M.O. class 1 Pyranometer (e.g. CMP 11) according to ISO 9060: better ±5 %
- Very small drift of <0.3 / year (experience since 1989)
- Integrated signal amplifier with output signal 4...20 mA Loop powered 2wire

Specifications

- Mono crystalline or poly crystalline Silicon Solar Cell (50x 50 mm²)
- Housing Material : UV-resistant PVC plastic
- Storage Temperature : -45° to +70°C
- Range : 0 to 1500 W/m2
- Output 4-20 ma
- Power supply : 7...30 VDC / max. 5 mA
- Drift : Small drift of <0.3 / year

General Accuracy : NES Radiation Sensor Type SOZ-03 is better than 3% (from measuring value) in the range of 150-1200 W/m2 when the solar rays are perpendicular to the surface of the sensor and the spectrum corresponds to AM 1,5.

For all other central European conditions and installations with an inclination of 45° (±20°) directed to the south (±45°) the accuracy of the monthly sums of the solar radiation is better than +-5% compared to an world class 1 pyrometer (W.M.O. first class , ISO 9060) (e.g Kipp&Zonen CMP11).

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INSTALLATION

- Pyranometer is to be mounted in an easy-to-reach location in order to clean the dome it 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

Read this manual before beginning the installation to be sure you have everything you need.

- Wrench or pliers
- Wire cutters and stripper
- Multimeter
- 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 RECOMENDATION

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. (Drill it on the top of the panel)
- Pyranometer is to be located far from any kind of obstruction, which might reflect sunlight (or sun shadow) onto the pyranometer itself.

MOUNTING

- 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

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 – 4-20ma (0- 1500 w/m2)

It is highly recommended that the calibration be checked annually

SENSOR MAINTENANCE

- 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