Datasheet & Installation Guide
Solar Irradiation Sensor [SOZ 03]

MODEL

SOZ 03

DATASHEET

Introduction

The SOZ-03 pyranometer consists of a mono-crystalline silicon cell (50 x 50 mm²) with under special solar glass laminated therefore high UV resistance and long-term stability.

Features:

- Plain integration into the top cover of the box
- Advanced weather proof junction box made of UV resistant material with cable gland and screw-less terminal for the connection of the measuring cable
- Improved, junction box made of polycarbonate
- High precision shunt resistor directly soldered to the terminals of the cell
- 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 %
- Low long-term drift of <1% / year (experience based on the market launch of the type soz-01 in 1989)
- Optionally also available with integrated temperature sensor Pt100

Specifications

Mono crystalline Silicon Solar Cell Size	50x 50 mm²
Housing Material	UV-resistant PVC plastic
Storage Temperature	-45° to +70°C
Range	0 - 1800 W/m2 (Actual might vary, as per tag/sticker on sensor)
Output A, B, C are 3 different models	A. 4 – 20 mA B. 0 – 5 VDC C. MODBUS RTU
Power supply	7-24 V_{DC} , 2 to 5 mA
Recommended calibration interval	1 Year

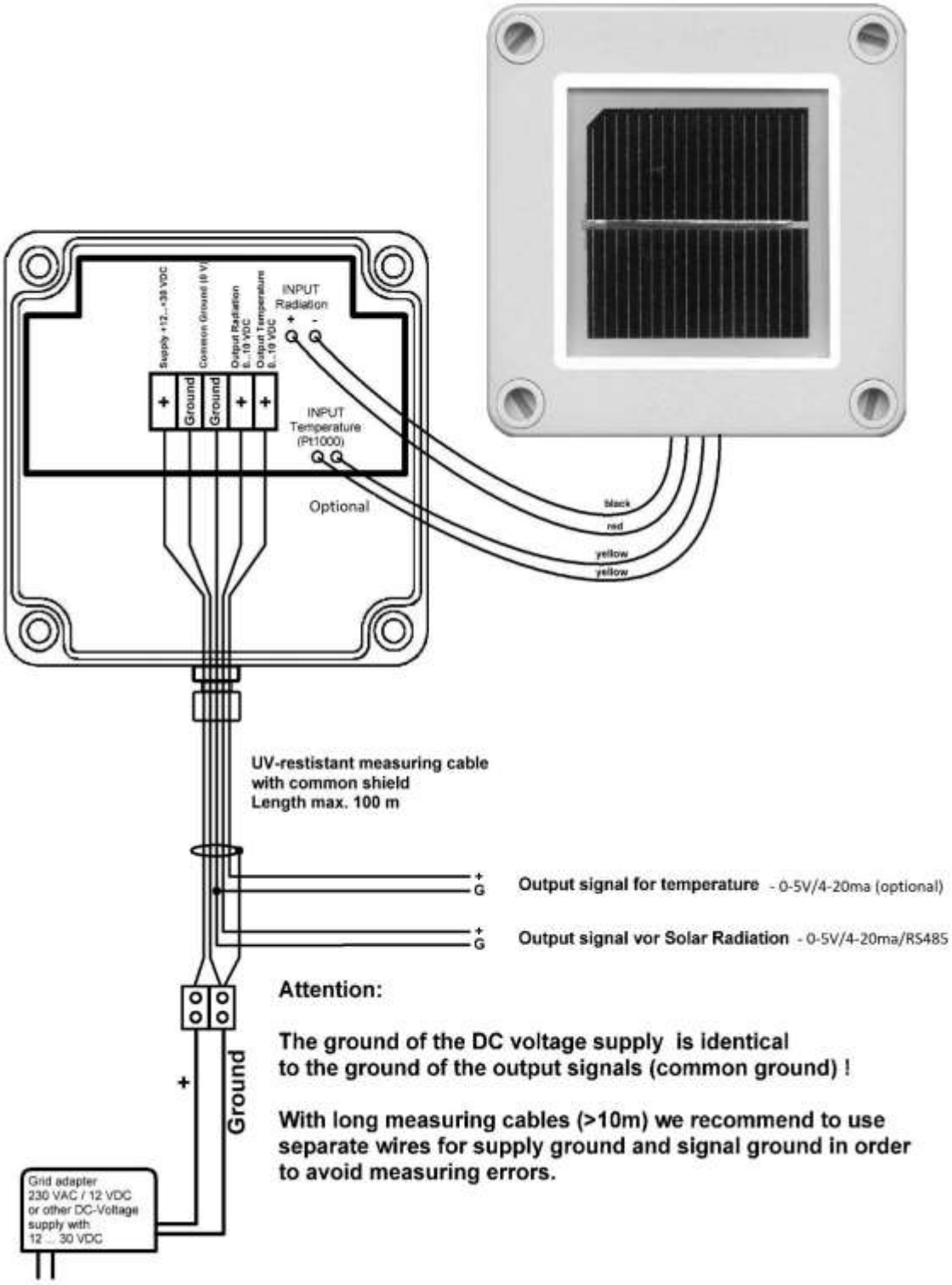
General Accuracy: NES Radiation Sensor Type SOZ-03 is better than 3% (from measuring value) in the range of 150-1200 W/m2 when the solar rays are perpendicular to the surface of the sensor and the spectrum corresponds to AM 1.5

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)

NES Mess- und Meldesysteme
Measuring Systems

NES - Mess- und Meldesysteme , Lothar Viel
Langstr. 40 , 63526 Erlensee
Tel.: 06183-901782 , Fax: 06183-901783
E-Mail: nes-viel@t-online.de, Internet: www.nes-datalogger.de

Internal Wiring Diagram



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 (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. Small errors in alignment can produce significant errors. Be certain that the sensor is mounted level.
- Mount the sensor where it will not be in a shadow. Any obstruction should be below the plane of the sensor head. If that is not possible, try to limit obstructions to below 5 degrees, where the effect will be minimal.
- If possible, avoid locating the sensors in dusty locations. Dust, pollen, and salt residue that collect on the top of the sensor can significantly degrade accuracy.
- 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
- While mounting the enclosure ensure the Gland is at the bottom and tightened fully to avoid precipitation
- 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 V_{DC} (0- 1800 W/m^2)

  Model: SOZ3 V

  Irradiance in W/m^2 = 360*Sensor Output voltage (in Volt)

  Output: 4-20mA (0-1800 W/m^2)

  Model: SOZ3 C

  Irradiance in W/m^2 = 112.5 (Output in mA - 4)

It is highly recommended that the calibration be checked annually