Silicon Irradiance Sensor Si-V-10TC S68120

- **Build as solar module - easily comparable to energy yield and system performance of PV systems**
- **Optional cell temperature as alternative to directly measured module temperature**

Description

Silicon irradiance sensors show a cost-effective, but rugged and reliable solution for the measurement of irradiance, especially for the monitoring of PV systems. Based on the construction of the sensor element corresponding to a PV module they are ideal as reference for the monitoring of PV systems. Especially the spectral response comparable to PV modules as well as the similar inclination error (incident angle modifier) allow an exact analysis of PV energy yields using Si sensor data.

Mode of operation

A silicon solar cell can be used as an irradiance sensor, because the short-circuit current is proportional to the irradiance. The sensor is build out of a monocrystalline Si solar cell connected to a shunt. Due to the low resistance of the shunt the cell operates next to short-circuit.

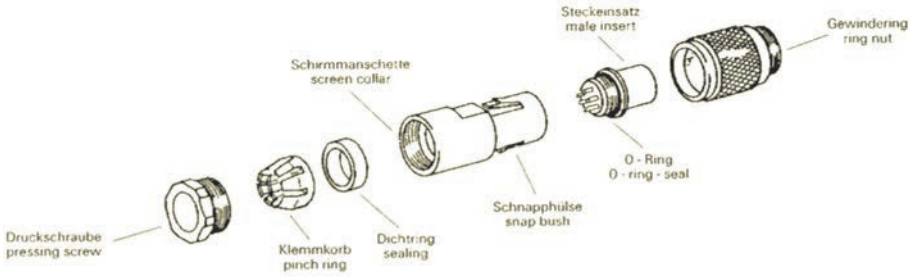
To minimize influences of temperature to the measuring signal the sensor has an active temperature compensation via a temperature sensor laminated to the back surface of the solar cell.

All sensors are calibrated in artificial sunlight against a reference cell calibrated at the Physikalisch-Technische Bundesanstalt (PTB, National Metrology Institute of Germany).

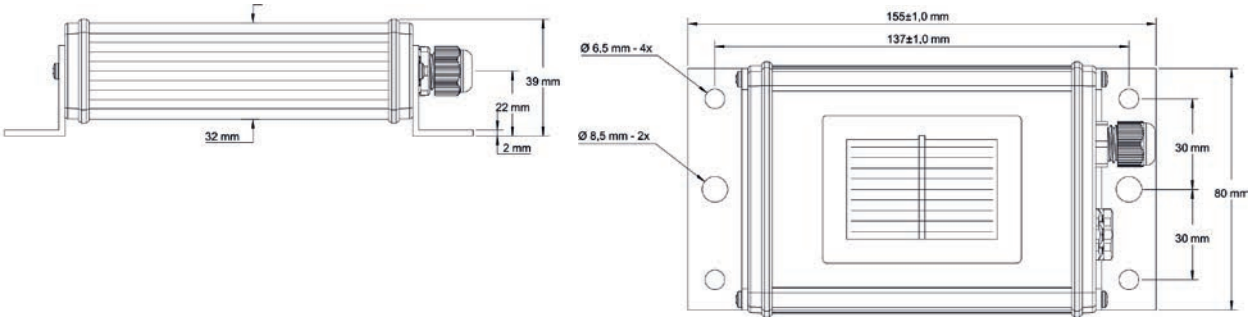
Mechanical Construction

The solar cell is embedded in Ethylen-Vinyl-Acetat (EVA) between glass and Tedlar. The laminated cell is integrated into a case of powder-coated aluminium. Therefore the sensor construction is comparable to a standard PV module. The electrical connection is realized by a 3m cable or a water proof (IP67) connector.

Mounting of Plug



Dimensional Drawing



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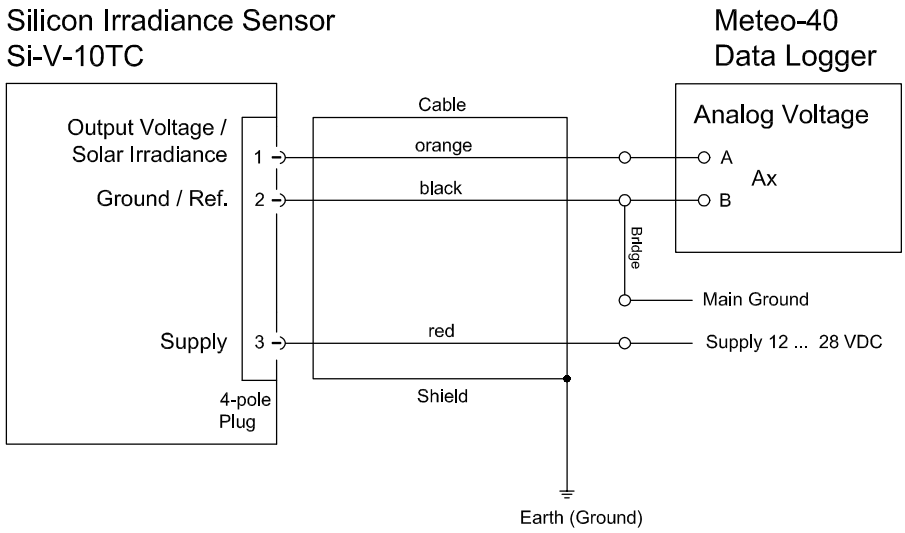
Specifications

Characteristic	
Solar cell	Monocrystalline silicon (50 x 33 mm)
Measurement uncertainty	± 5 W/m² ±2.5% of reading valid for temperature compensation, spectrum AM 1.5 and vertical light beam
Response time (99%)	0.15 s
Offset	2 W/m²
Non-Linearity	0.10 % typ. measurement uncertainty
Temperature dependance	0.40 % typ. measurement uncertainty @ -35 ... 80 °C
Power supply	24 VDC (12 ... 28 VDC), typ. < 1 mA power consumption
Load impedance	min. 10 kΩ
Output signal	0 ... 10 V @ 0 ... 1500 W/m²
Electrical connections	3 m shielded cable, LiYC11Y 4 x 0.14 mm², UV- and temperature resistant
Operating temperature	-35...+80°C
Housing material	Powder-coated aluminium, IP 65
Dimensions / Weight	155 x 85 x 39 mm / approx. 350 g
Sensor Connection	4-pole plug
Manufacturer	Ingenieurbüro Mencke & Tegtmeyer GmbH

Sensor Connection to Ammonit Meteo-40 Data Logger

Sensor	Plug Pin No.	Wire Colour Sensor Cable	Meteo-40 Analog Voltage
Solar irradiance	1	orange	Ax
Supply	3	red	12 ... 28 VDC
Ground	2	black (strong wire)	Bx (Main Ground)

Cable type: LiYC11Y 4 x 0.14 mm² (cable length: 3m)
Connect the shield logger-sided to Ground (GND)



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