

Silicon Irradiance Sensor MT

Order-No: P 6349

- Measurement of solar irradiance
- Silicon solar cell usable as irradiance sensor
- Powder coated aluminium case
- Solar cell embedded in Ethylen-Vinyl-Acetat (EVA)
- "T" silicon sensors can measure solar irradiance and temperature of solar cell
- Solar cell: Monocrystalline Silicon (50 x 33mm)
- Operating temperature: – 20 °C to 70 °C
- Very reliable and rugged sensor



General Information

Mode of operation:

A silicon solar cell can be used as an irradiance sensor, because the short-circuit current is proportional to irradiance. Our sensors are built out of a monocrystalline solar cell connected to a shunt. Due to the low resistance of the shunt the cell operates next to short-circuit. The temperature coefficient of the short-circuit current creates a small error. Therefore all of our silicon sensors with the extension „TC“ have an active temperature compensation, which reduces this error by factor 20. The compensation is realized by using a specific temperature sensor laminated to the rear side of the solar cell. The electronic circuit integrated for this compensation has a very low power consumption. The current consumption of the Si-01TC out of the internal Lithium battery is only about 15 µA. Our silicon sensors are manufactured in different types with an internal or external power supply, with different output signals and with an optional sensor output for the cell temperature. All sensors are calibrated in simulated sunlight against a reference cell of the same type. The reference cell is periodically calibrated against a reference cell calibrated by Fraunhofer ISE, Freiburg.

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 that of a standard PV module. The electrical connection is realized by a 3m cable or a water proof (IP67) connector.

Optional Temperature Measurement:

Additionally to the irradiance measurement our silicon sensors with the extension “-T” are able to measure the temperature of the solar cell. Therefore a temperature sensor is mounted to the rear side of the cell to detect the correct cell temperature.

Specials:

The Si-01TC can be used for direct reading of irradiance via a digital voltmeter because of its internal Lithium battery and the calibration factor of 1 V per 1000 W/m².

Specification Silicon Irradiance Sensor MT: P6349

Solar cell	Monocrystalline Silicon (50 mm x 33 mm)
Accuracy at 25° C	± 1.5 ° C
Current shunt	0,1 Ω (TC = 20 ppm / K) with 1 V and 20 mA output 0,12 Ω (TC = 20 ppm / K) with 10 V output
Error temperature compensation	Compared to pyranometer within operating range -20...+70°C and vertical beam of irradiance: ± 5 %
Non Linearity of electric circuit	± 0.3 % from reading for 50 to 1300 W/sqm
Non-Linearity	± 0.5° C
Error	± 2.0° C
Electrical connections	Cable length 3m, diameter, 3.5...5mm, Protection mode IP67
Operating temperature	-20...+70°C
Housing material	powder coated aluminium, IP 65
Dimensions	145 x 86 x 39 mm
Weight	approx. 340g
Manufacturer	Ingenieurbüro Mencke & Tegtmeyer GmbH

Extend of Supply	Silicon sensor with shielded cable, 0.14 sq mm, UV- and temperature resistant
	Ready made cable of the requested length
	Version with waterproof connector (Si-01TC always with connector)