



HUKX

Sensor
Technology

Brochure
PV module
temperature sensor

PVMT01

PVMT01

PV module temperature sensor

Pt1000 Class A, for back-of-module temperature measurement

PVMT01 is a high-accuracy back-of-module temperature sensor designed to assess PV system performance. PVMT01 allows you to estimate and correct the performance index for the temperature dependence of module efficiency.

The sensor meets the requirements of the highest-class systems for PV monitoring: IEC 61724-1 Class A. IEC suggests 3 sensors per monitoring station and requires 6 or more sensors on a PV system, depending on the system size. PVMT01 includes a Pt1000 platinum resistance thermometer in a small anodized aluminum disk and a thin, flexible 1 m cable with a connector. You can easily extend the cable using a cable with a matching connector.

Figure 1 PVMT01 PV module temperature sensor for back-of-module temperature measurement.



PVMT01: critical for PV system performance assessment

PVMT01 measures the temperature of a PV module. When assessing PV system performance, PVMT01 allows users to estimate and correct for the temperature dependence of module efficiency. PVMT01 meets or exceeds the strictest specifications for PV monitoring, as required by IEC 61724-1 for Class A systems.

PVMT01 consists of a Pt1000 Class A, connected in a 4-wire configuration for increased accuracy. The sensor is enclosed in a small anodized aluminum disk to minimize the impact on bifacial modules (IEC requires obscuring less than 10 % of the surface area of any cell). The adhesive on the sensor disk is specified for long-term outdoor use and has excellent thermal properties, including a total heat transfer coefficient larger than $500 \text{ W}/(\text{m}^2 \cdot \text{K})$, as required by IEC.

The weather-proof cable has a very small diameter, which improves measurement accuracy. The cable is also flexible, which minimizes the mechanical stress on the adhesive bond of the sensor disk to the module. PVMT01 comes with a standard cable length of 1 m, which can easily be extended using an extension cable with a matching connector. For bifacial modules, this cable should be routed between the cells, as recommended by IEC.

PVMT01 is supplied in packs of ten sensors. Each sensor comes with a cleaning alcohol wipe, two polyester tapes, and two solar edge clips to attach the cable to the edge of the PV module.

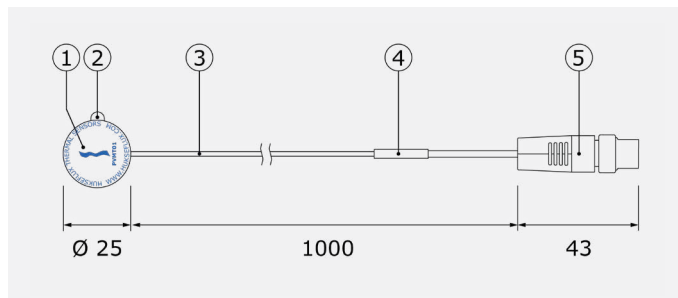


Figure 2 Overview of Hukx mounting options.

1. sensor housing
2. adhesive
3. cable; length 1 m
4. product label
5. connector

Total sensor thickness, including adhesive, is $5.8 \times 10^{-3} \text{ m}$.



Figure 3 PVMT01 installed on the rear side of a PV module. The sensors are preferably installed at the center of a cell, close to the center of the module. IEC requires 3 sensors per monitoring station

Suggested use

- long-term PV system performance monitoring
- module temperature measurement in PV prospecting

Unique features and benefits

- high measurement accuracy
- compliant with IEC 61724-1 requirements for Class A systems
- disk adhesive rated for prolonged outdoor use
- small surface area to minimize impact on bifacial modules
- thin cable for routing between cells of bifacial modules
- flexible, small diameter cable minimizes mechanical stress on the adhesive connecting the sensor to the module
- easily extendable cable
- ingress protection class: IP67

Easy installation

Installing PVMT01 is simple. The adhesive on the back of the disk is extremely strong and weather-resistant. To ensure the best bond, an IPA (isopropyl alcohol) wipe is provided to clean the surface of the panel before attachment.

Mount the sensor on the rear side of the module. IEC 61724-1 recommends selecting a location at the center of a cell, close to the center of the module. IEC requires a minimum of 3 sensors for every monitoring station and a total of 6 or more sensors per PV system, depending on the size of the system.

See also

- View our complete [product range of solar sensors](#).

Reliable operation

Once installed and connected to a measuring system, PVMT01 will reliably measure the surface temperature of the backside of the PV module. A data logger collects the data, and the 4-wire sensor connection ensures high measurement accuracy, which is not affected when the cable is extended.

Low maintenance

PVMT01 requires little maintenance. The sensor and cable should be checked regularly for damage, contamination, correct attachment to the PV panel, and proper fitting of connectors.

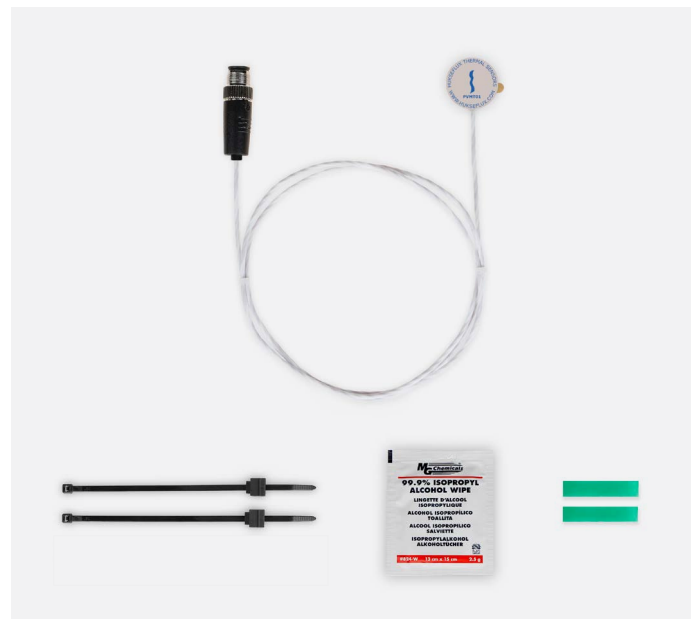


Figure 4 PVMT01 measures the PV module temperature. The Pt1000 sensor is incorporated in a small anodized aluminum disk and supplied with 2x solar clips, 2x polyester tapes, and a pre-saturated IPA wipe.

PVMT01 specifications

Temperature sensor

measurand	back-of-module
sensor type	temperature Pt1000 Class A platinum resistance thermometer (PRT)
sensor connection	4-wire
sensor housing	aluminum disk
rated operating temperature range: sensor and cable connector	-40 °C to +150 °C -40 °C to + 80 °C
measurement accuracy	$\pm (0.15 + 0.002 \cdot T)$ °C

Compliance

compliance	IEC 61724-1:2021, Class A
number of sensors required	3 per monitoring station required, minimum 6 per PV system, depending on the size of the system, as per IEC 61724-1
IP protection class	IP67

Aluminum disk

disk material	anodized aluminum
disk diameter	25×10^{-3} m
disk thickness	5.5×10^{-3} m
insulation resistance	> 2 GΩ at 1 kV as per IEC 60060-1

Adhesive

adhesive material	acrylic sticker
adhesive thickness	0.13×10^{-3} m
total heat transfer coefficient	> 500 W/(m ² ·K), as required in IEC 61724-1

Cable & connector

cable length	1 m
cable extension	to preferred length, can be extended by the user
cable diameter	2.5×10^{-3} m
connector type	4P, male M12-A connector
cable connector	4P or 5P female M12-A connector

About Hukx

Hukx is the leading innovator in solar radiation and heat flux sensor technology. We are proud to set the standard in high-accuracy measurement, and to be working at the heart of the energy transition.

Customers worldwide rely on our bestselling pyranometers and heat flux sensors. From sensor design and selection to supply and recalibration, we support you across the entire lifecycle.

Hukx is headquartered in the Netherlands, with locally owned representative sales offices in the USA, Brazil, India, China, Southeast Asia, and Japan.

Let us help you select the best sensor for your application.
Get in touch with our experts today via: info@hukx.com

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