Tm-V-4090 and Tm-I-4090

Module Temperature Sensor with analog Output

Short Description

Our module and surface temperature sensors come equipped with a stable Aluminum housing and a robust weatherproof cable. Thanks to the use of top quality components the sensors achieve very high accuracy and are ideal for use in industrial and field environments (PV module temperature).

All sensors are shipped with a calibration protocol for the measuring amplifier.

The sensors comply to all requirements as per IEC 61724-1 and are suitable for bifacial modules.

Technical Data

Type	Tm-V-4090	Tm-I-4090
Output Signal	0 to 10 V at -40 to +90°C	4 to 20 mA at -40 to +90°C
Uncertainty (-40 to +80°C)	1 K	1 K
Load	min. 100 kΩ	max. 400 Ω
Current	approx. 2 mA	max. 25 mA
Voltage Supply	12 to 28 VDC	
Sensor Element	Pt1000 Class A as per EN 60751	
Sensor Housing	Self-Adhesive Aluminum Block, 35 mm x 12 mm x 6 mm	
Sensor Cable (Pt1000)	Length: 3 m, PUR coated, shielded (LiYC11Y, 2 x 0.25 mm²)	
Case Material	Powder Coated Aluminium	
Case Dimension / Protection Level	64 mm x 58 mm x 34 mm / IP 67	
Weight	approx. 350 g	
Operating Condition	Sensor Element -40 to +90°C (see below Installation Instruction) Case -40 to + 80°C	
Connection Cable	Length: 3 m, PUR coated, shielded (LiYC11Y, 4 x 0.14 mm²)	
Customs Tariff Number / HS Code	90 25 19 00	

Drawing
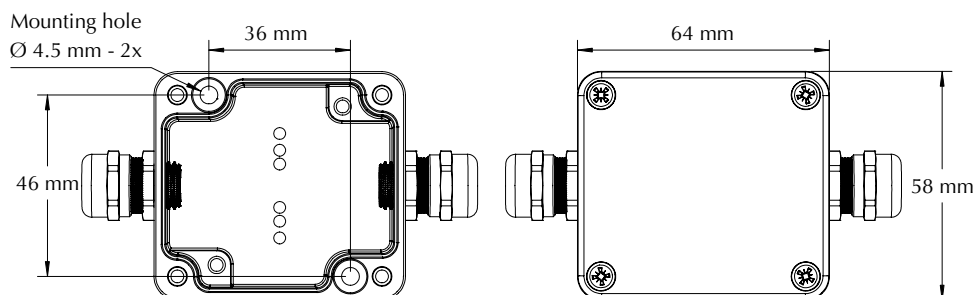
Tm-V-4090 and Tm-I-4090
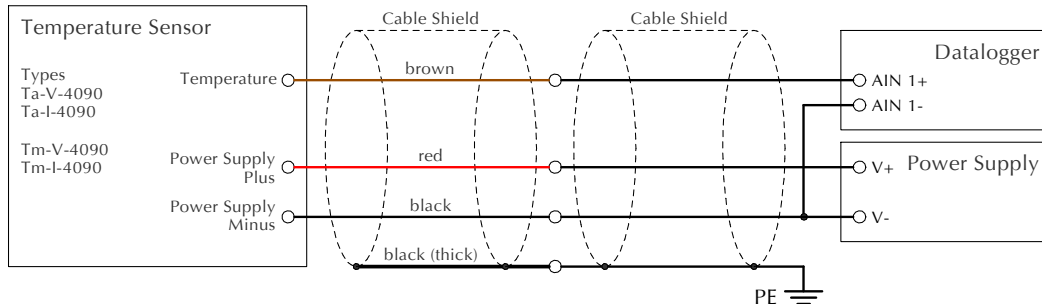## Module Temperature Sensor

Safety Instructions

The installation and assembly of electrical equipment must be carried out by electrically qualified persons.
The sensor may not be used with equipment whose direct or indirect purpose is to prevent human death or injury, or whose operation poses a risk to humans, animals or property.

Electrical Connection

The sensors are designed for **safety extra-low voltage (SELV)** operation. The maximum power of the voltage supply is 50 VA(„Class 2 limited power").
The cable shield shall be connected to the PE during installation.
WARNING: Connecting the supply voltage to the signal lines will damage the device.

Maximum Additional Cable Length of Temperature Sensors with 3 m Connection Cable

Sensor Type	Cable Cross Section						
	0.14 mm^2	0.25 mm^2	0.34 mm^2	0.5 mm^2	0.75 mm^2	1.0 mm^2	1.5 mm^2
Tm-V-4090	30 m	50 m	70 m	100 m	100 m	100 m	100 m
Tm-I-4090	200 m	200 m	200 m	200 m	200 m	200 m	200 m

Note: For Tm-I-4090 maximum internal resistance of data logger 200 Ω.

Installation Instructions

The sensor element is mounted by gluing the Aluminum block directly to the measurement surface. The surface must be dry, clean and degreased. Cleaning should NOT be done with glass cleaner, as some glass cleaners contain additives to prevent soiling after cleaning and these additives also prevent adhesion. Isopropyl Alcohol or Ethanol is recommended for cleaning. It is also recommended using an extra fixing with silicone or Sikaflex, particularly for module temperature above 75°C. If mounted outdoors, avoid direct exposure to sunlight and rain to the sensor housing (Aluminum block) and sensor case. If necessary, provide protection from the sun and rain.

Optimization by means of cover

The through holes used to fix the sensor to a stable and suitable surface shall be accessible when the housing is opened. The tightening torque of the case cover is 180 Ncm.

Note: The module temperature measurement can be optimized by completely covering the sensor element.

The sensor cable needs a cable grip close to the sensor housing.
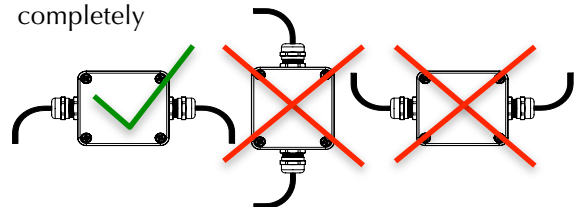
Maintenance

Scope of the regularly check (at least every 2 years): Cleaning, external damage, mechanical fastening, cable laying and any damage to the cable.
Should damage be found that degrades the function or safety, the sensor is to be replaced.
A recalibration is recommended at least every 3 years.

User information

The sensor is designed for the measurement of a surface temperature. The warranty is for 1 year from the date of the invoice for the intended use. M&T does not accept any liability for possible losses or damage due to the incorrect usage of the sensor. Liability for consequential damages is excluded.