

Tmodul

Module Temperature Sensor with Platinum Resistance



Short Description

Our module and surface temperature sensors come equipped with 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).

If required, the sensors can be ordered with an inspection certificate 3.1 as per DIN EN 10204.

Technical Data

Type	Tmodul
Sensor Element	Pt100 Class B as per EN 60751
Sensor Housing	Silicone Rubber Patch, 40 mm x 13 mm x 5 mm
Sensor Cable	AWG30, Length: 2 m, PTFE coated, 4 wire PTFE coated
Weight	Approx. 35 g
Operating Condition	-50 to + 150 °C (see below Installation Instruction)
Customs Tariff Number	90 25 19 00

Tmodul

Module Temperature Sensor with Platinum Resistance

Safety Instructions

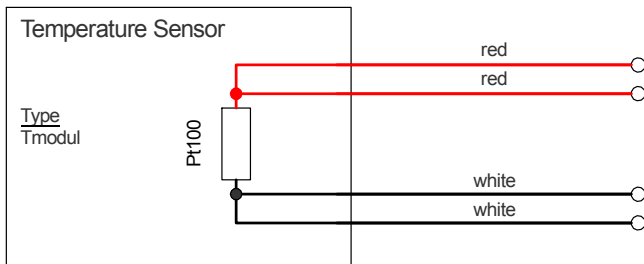
The installation and assembly of electrical equipment must be carried out by electrically qualified persons. The sensor may not be used with equipment whose direct or indirect purpose is to prevent human death or injury, or whose operation poses a risk to humans, animals or property.

Electrical Connection

The sensors are designed for safety extra-low voltage (SELV) operation.

For keeping the accuracy of the sensor a 4-wire measurement is strongly recommended.

Due to the self-heating, the wire current affects the accuracy of the measurement. Thus, the same should not exceed 1 mA.



Installation Instructions

If mounted outdoors, avoid direct exposure to sunlight and rain to the sensor housing (rubber patch). If necessary, provide protection from the sun and rain.

The sensor element is mounted by gluing the rubber patch directly to the measurement surface. The surface must be dry, clean and degreased. It is also recommended using an extra fixing with silicone or Sikaflex, particularly for module temperature above 75°C.

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

The sensors should be checked once a year for damage, contamination and correct fitting.

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.

Tm-Pt1000

Module Temperature Sensor with Platinum Resistance



Short Description

Our module and surface temperature sensors come equipped with 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).

If required, the sensors can be ordered with an inspection certificate 3.1 as per DIN EN 10204.

Technical Data

Types	Tm-Pt1000
Sensor Element	Pt1000 Class A as per EN 60751
Sensor Housing	Self-Adhesive Aluminium Block, 35 mm x 12 mm x 6 mm
Sensor Cable	Length: 3 m, PUR coated, shielded (LiHC11Y, 2 x 0,25 mm ²)
Weight	Approx. 70 g
Operating Condition	-40 to +90 °C (see below Installation Instruction)
Customs Tariff Number	90 25 19 00

Tm-Pt1000

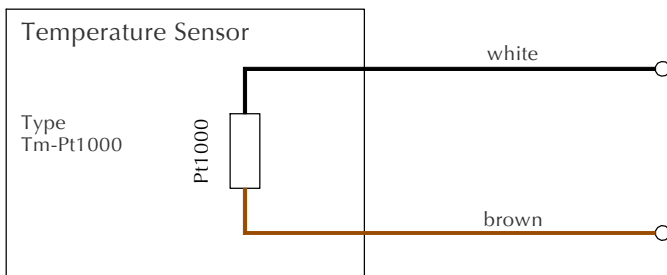
Module Temperature Sensor with Platinum Resistance

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. For keeping the accuracy of the sensor a 4-wire measurement is strongly recommended. Due to the self-heating, the wire current affects the accuracy of the measurement. Thus, the same should not exceed 0.1 mA.



Installation Instructions

If mounted outdoors, avoid direct exposure to sunlight and rain to the sensor housing (Aluminium block). If necessary, provide protection from the sun and rain.

The sensor element is mounted by gluing the Aluminium block directly to the measurement surface. The surface must be dry, clean and degreased. It is also recommended using an extra fixing with silicon or Sikaflex, particularly for module temperature above 75°C.

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

The sensors should be checked once a year for damage, contamination and correct fitting.

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.

Tm-Pt1000-box

Module Temperatur Sensor with Platinum Resistance and Connection Box



Short Description

Our module and surface temperature sensors come equipped with 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).

Additional the sensor Tm-Pt1000-Box is equipped with a Aluminium case and connection clamps inside. The sensor can be connected in four wire technique.

If required, the sensors can be ordered with an inspection certificate 3.1 as per DIN EN 10204.

Technical Data

Type	Tm-Pt1000-box
Sensor Element	Pt1000 Class A as per EN 60751
Sensor Housing	Self adhesive Aluminium Block, 35 mm x 12 mm x 6 mm
Sensor Cable	Length: 3 m, PUR coated, shielded (LiHC11Y, 2 x 0,25 mm ²)
Case Material	Powder Coated Aluminium
Case Dimension / Protection Level	64 mm x 58 mm x 34 mm / IP 67
Weight	appr. 240 g
Operating Condition	Sensor Element -40 to +90°C / Case -40 to + 80°C
Customs Number	90 25 19 20

Tm-Pt1000-box

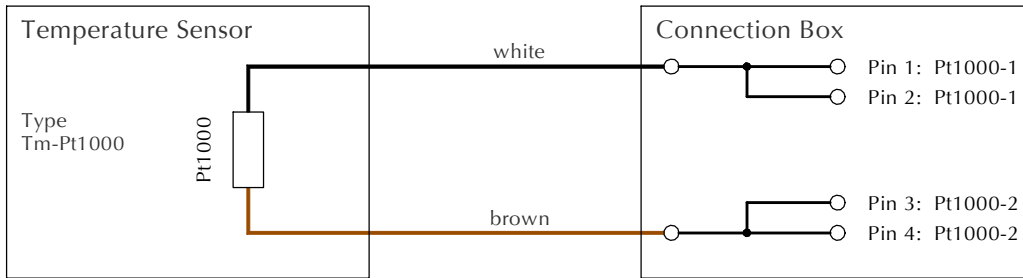
Module Temperature Sensor with Platinum Resistance and Connection box

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. For keeping the accuracy of the sensor a 4 wire measurement is strongly recommended. Due to the selfheating, the wire current affects the accuracy of the measurement. Thus, the same should not exceed 0.1 mA.



Installation Instructions

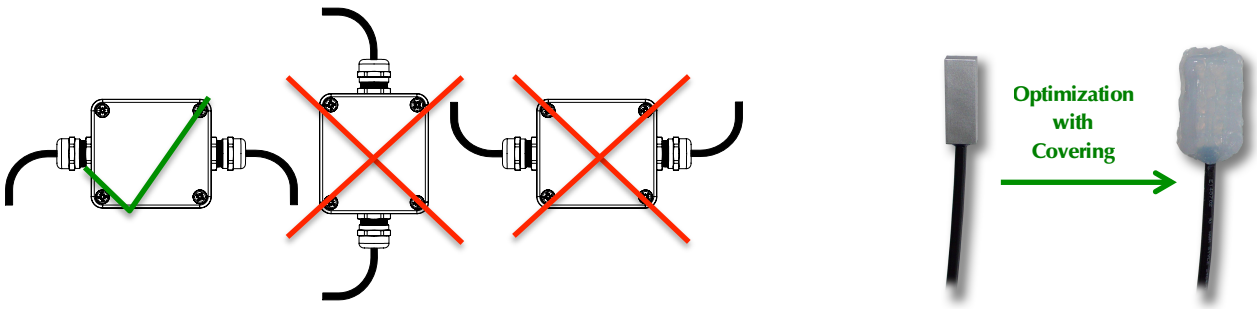
If mounted outdoors, avoid direct exposure to sunlight and rain to the sensor housing (Aluminium block). If necessary, provide protection from the sun and rain.

The through holes of the Aluminium case 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.

The sensor element is mounted by glueing the aluminium block directly to the measurement surface. The surface must be dry, clean and degreased. It is also recommended using an extra fixing with silicon or Sikaflex, particularly for module temperature above 75°C.

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

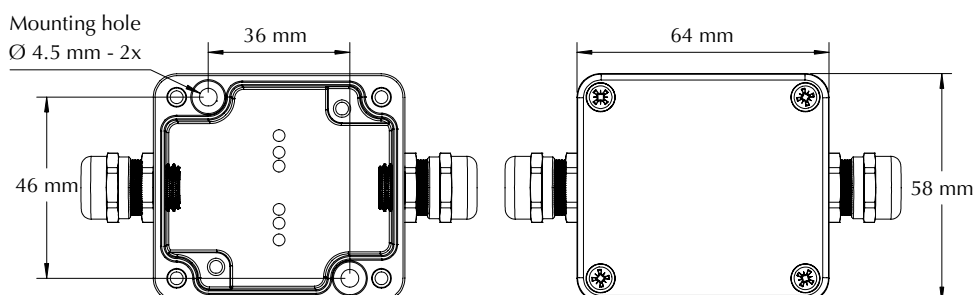
The sensor cable needs a cable grip close to the sensor housing.



Maintenance

The sensors should be checked once a year for damage, contamination and correct fitting.

Drawing



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 Aluminium 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).

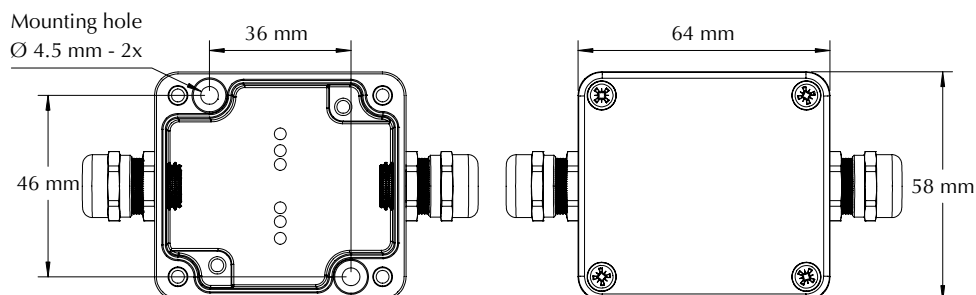
All sensors are shipped with a calibration protocol for the measuring amplifier.

If required, the sensors can be ordered with an inspection certificate 3.1 as per DIN EN 10204.

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 k Ω	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 Aluminium Block, 35 mm x 12 mm x 6 mm	
Sensor Cable	Length: 3 m, PUR coated, shielded (LiHC11Y, 2 x 0.25 mm ²)	
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 mm ²)	
Customs Number	90 25 19 00	

Drawing



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

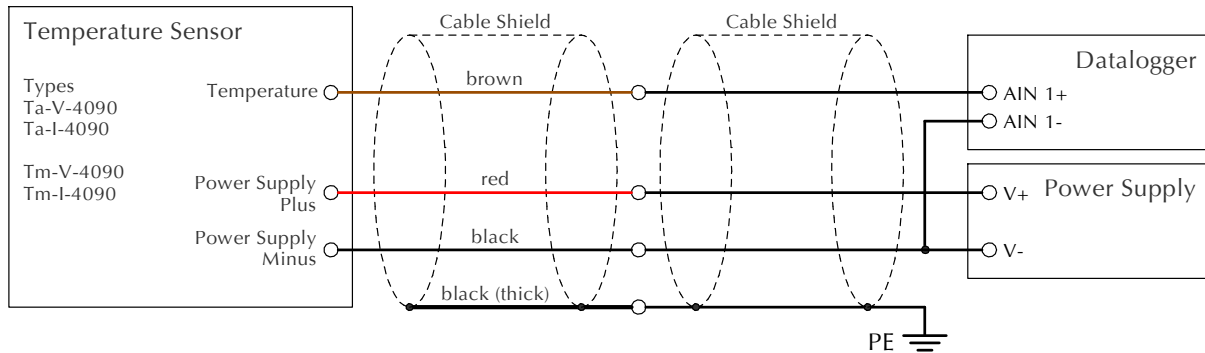
Safety Instructions

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 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

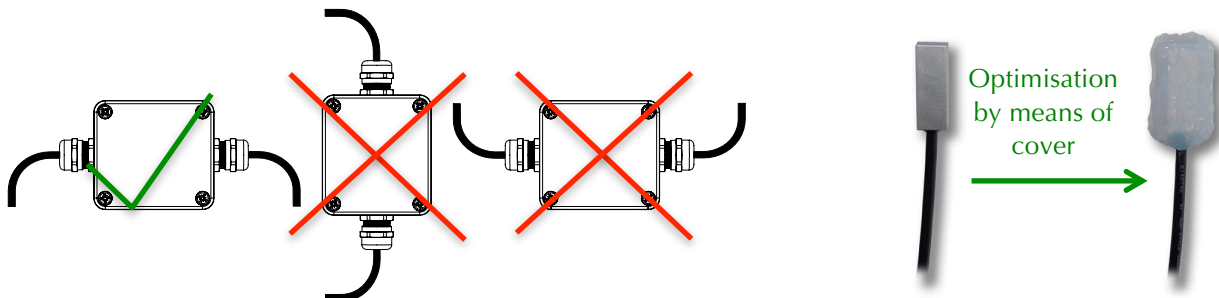
If mounted outdoors, avoid direct exposure to sunlight and rain to the sensor housing (Aluminium block) and sensor case. If necessary, provide protection from the sun and rain.

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.

The sensor element is mounted by gluing the Aluminium block directly to the measurement surface. The surface must be dry, clean and degreased. It is also recommended using an extra fixing with silicone or Sikaflex, particularly for module temperature above 75°C.

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

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



Maintenance

The sensors should be checked once a year for damage, contamination and correct fitting.

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.

Tm-RS485-MB / Tm-RS485-MT

Module Temperature Sensor with RS485 Interface



Short Description

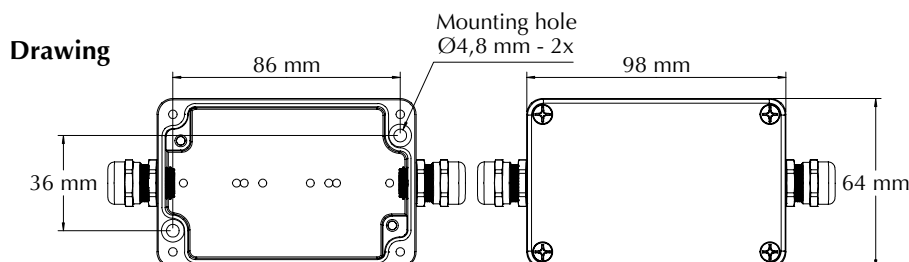
Our module and surface temperature sensors come equipped with a stable Aluminium housing and a robust weatherproof cable. Thanks to the use of top quality components the sensors achieve very high accuracy and are ideal for use in field environments (PV module temperature).

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

If required, the sensors can be ordered with an inspection certificate 3.1 as per DIN EN 10204.

Technical Data

Type	Tm-RS485-MB	Tm-RS485-MT
Interface	RS485	
Protocol	MODBUS	MT
Measuring Range	-40 to +90°C	
Uncertainty (-40 to +90°C)	1 K	
Supply Voltage	24 VDC (10 to 28 VDC)	
Current	Typical 25 mA at 24 VDC	
Galvanic Isolation	1000 VDC between RS485 and Voltage Supply	
Sensor Element	Pt1000 Class A as per EN 60751	
Sensor Housing	Self adhesive Aluminium Block, 35 mm x 12 mm x 6 mm	
Sensor Cable	Length: 3 m, PUR coated, shielded (LiHC11Y, 2 x 0,25 mm ²)	
Case Material	Powder Coated Aluminium	
Case Dimension / Protection Level	98 mm x 64 mm x 34 mm / IP 67	
Weight	approx. 500 g	
Operating Condition	Sensor Element -40 to +90°C (see below Installation Instruction) Case -40 to + 80°C	
Sensor Connection	Length: 6 m, PUR coated, shielded (2/Y-FC11Y, 4 x 0.14 mm ²)	
Customs Tariff Number	90 25 19 00	



Tm-RS485-MB / Tm-RS485-MT

Module Temperature Sensor with RS485 Interface

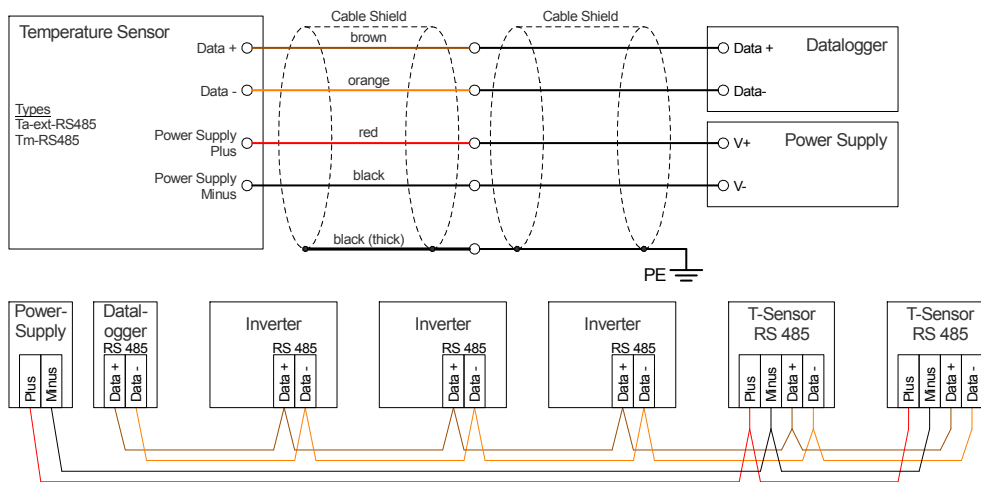
Safety Instructions

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 cable shield shall be connected to the PE during installation.

WARNING: Connecting the supply voltage to the signal lines will damage the device.



Modbus Note: All bus participants with Modbus protocol (RTU) identical Modbus parameters but different address.

Maximum additional cable length for sensors with 6 m connection cable at voltage supply of 24 VDC / 12 VDC

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
300m / 50m	600m / 100m	800m / 150m	1000m / 200m	1000m / 300m	1000m / 400m	1000m / 650m

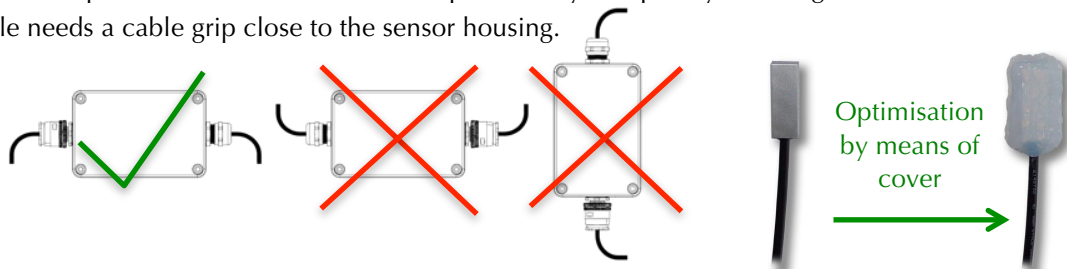
Installation Instructions

The sensor element is mounted by gluing the Aluminium block directly to the measurement surface. The surface must be dry, clean and degreased. It is also recommended using an extra fixing with silicon or Sikaflex, particularly for module temperature above 75°C. If mounted outdoors, avoid direct exposure to sunlight and rain to the sensor housing (Aluminium block). If necessary, provide protection from the sun and rain.

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 optimised by completely covering the sensor element.

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



Maintenance

The sensors should be checked once a year for damage, contamination and correct fitting.

A recalibration of the sensor is recommend after approx. 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.