tekmar

PRODUCT AND PRICE INFORMATION 2023

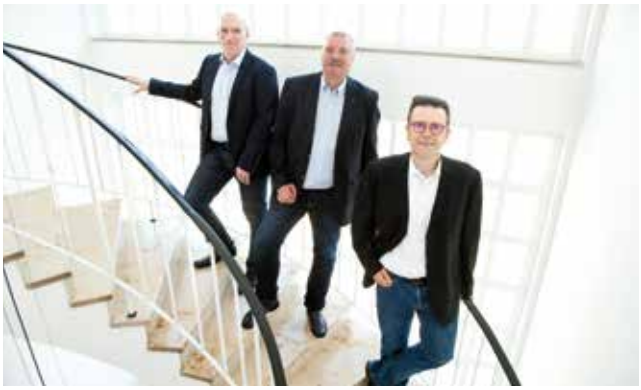
SYSTEMS FOR FROST PROTECTION AND TEMPERATURE CONTROL

CONTENTS

Picture credits:
Title: #195511022, © OFC Pictures, fotolia.com;
Page 3: #101672975, © wollertz, fotolia.com;
Page 5: #77707793, © fotoman1962, fotolia.com; #196027596, © lapandr, fotolia.com; #50736195, © tab62, fotolia.com; #187286461, © Parilov, fotolia.com;
Page 7: #191771319, © bjphotographs, fotolia.com;
Page 15: #185338390, © Nataliia, fotolia.com;
Page 27: #116852502, © chalabala, fotolia.com; #191296703, © haiderose, fotolia.com;
Page 37: #194353153, © auremar, fotolia.com

ALL PRICES STATED ARE NET TRADE PRICES

60 YEARS OF QUALITY AND EXPERIENCE



The management team at tekmar (from left to right): Thomas Beye, Sales Director, Dr Eberhard Fries, CEO, Andreas Weeber, CEO

tekmar Regelsysteme offers a systematic product portfolio for frost protection and temperature control applications. With its history spanning 60 years, the company has developed into a leading solution provider in Europe. Today, tekmar is the only manufacturer to offer ice and snow detectors with two different measuring procedures to achieve the best match for the respective task.

tekmar systems for frost protection and temperature control excel in particular through their low maintenance requirements, high degree of reliability and long service life.

DURABILITY AND SAFETY

In many areas of application, the one-time procurement costs of the frost protection and temperature control systems do not represent the most critical aspects in terms of long-term profitability. The key factor is actually the security of not having to replace components installed below asphalt, concrete floors or in inaccessible locations shortly after their original installation due to corrosion or damage. Thanks to high-grade materials and and intelligently conceived design, tekmar frost protection and temperature control systems guarantee both a long service life and low maintenance requirements. For example, only microbe-resistant and longitudinally watertight cables as well as corrosion-resistant brass are used for outdoor components throughout the entire product group.

HIGHEST QUALITY AND RELIABILITY

TEKMAR STANDS FOR **TRADITION** AND **EXPERTISE**

THREE SYSTEMS FOR OPTIMUM ECONOMIC USE

The frost protection and temperature control product area at tekmar is divided into three groups:

– Plain temperature controllers
– Ice detectors system 73
– Ice detectors system 50

Thanks to the large selection of modular products that can be combined with each other within the product group, an optimum and cost-effective solution can be found for every application.

In addition to temperature, ice detector systems from tekmar also measure moisture using combined sensors. This makes them particularly energy-efficient, as heating is only activated when there is water, ice or snow present.

Two different sensor types guarantee applicability of the system in all areas. The modular extendibility allows the units to be matched to a very wide range of requirements, while also facilitating extensive additional functionality such as cloud functions and connections to the central building control system.

TEKMAR TEMPERATURE CONTROLLERS

Temperature controllers from tekmar measure the temperature only and then activate the area to be heated or cooled as and when necessary.

Typical areas of application are:

– Gutter heaters, pipe trace heaters and electrical underfloor heating in both indoor and outdoor building technology
– Small outdoor heaters
– Frost-protection and lane heaters in cold stores
– General cooling applications
– Complex control tasks involving dual or interdependent control loops, proportional controllers

TEKMAR ICE DETECTOR SYSTEM 73

Ice detector system 73 is an all-rounder available as a single-channel or multi-channel system, optionally with connection to a data cloud or a central building control system, that impresses with its flexibility and maintenance-free operation.

Typical areas of application are:

– Mid-sized and large outdoor heaters with electrical or water-based heating, for example for entrances, parking areas, paths
– Roof areas and their borders, such as gutters and downpipes
– Special cases such as satellite dishes, sewage treatment plants, railway tracks, etc.

TEKMAR ICE DETECTOR SYSTEM 50

Ice detector system 50 is the optimum unit for outdoor applications with special requirements in terms of measuring sensitivity and reaction.

Typical areas of application are:

– Large outdoor areas and particularly sensitive areas, such as helicopter landing pads

AUTOMATE YOUR WINTER SERVICE

THREE SYSTEMS OFFER **SOLUTIONS**

TEMPERATURE CONTROLLERS

The temperature controllers offer solutions for control tasks in general heating and cooling applications, as well as for gutter and pipe trace heaters. Various controller versions support frost-protection and general temperature control functionality. A comprehensive range of accessories with various sensors and installation kits to meet virtually any requirement guarantees optimum use throughout.

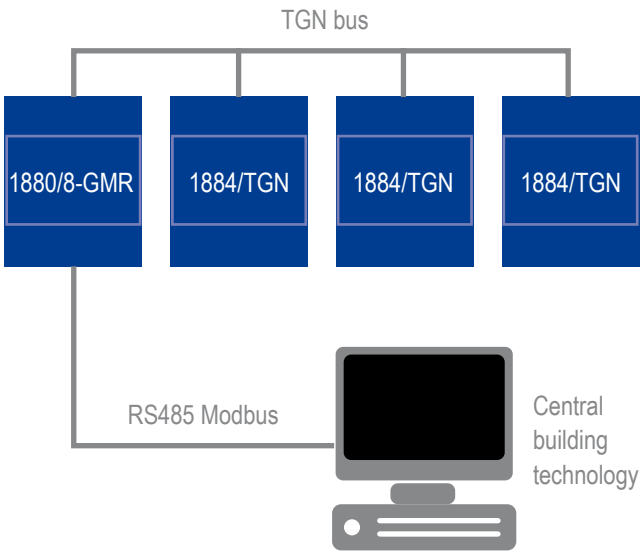
FROST-PROTECTION CONTROLLERS

The frost-protection controllers are used for gutter heaters, pipe trace heaters, small outdoor heaters with limited heating output and general applications in the field of frost protection.

– Gutter controller 9573 can be positioned directly in the wet area (such as a gutter), requiring no installation. Connection is made through an earthed plug. The controller then only needs to have a heating tape added.

– Frost-protection controller 1893 offers easy operation via two rotary adjusters. Even complex special tasks can be performed via further parameter settings. The switching load is 20 A at 230 VAC, which is around 25% higher than comparable products. Optional versions with an additional relay for alarm messages or a second heating circuit are also available.

MULTI-CHANNEL SYSTEM WITH THREE FOUR-CHANNEL CONTROLLERS AND MODBUS GATEWAY TO THE CENTRAL BUILDING CONTROL SYSTEM



UNIVERSAL TEMPERATURE CONTROLLERS

The universal temperature controllers (UTR) can be used for all types of heating and cooling applications. Apart from the standard functions of a two-point controller with one, two or four channels, configurations with twin controller (one sensor, two setpoints) and slave controller (two sensors, two setpoints) are also possible. These units can, for example, be used for applications with two heating/cooling stages, combined heating and cooling systems or controller/limiter systems.

The UTR-Series encompasses configurable controllers with illuminated touchscreen graphic display and various hardware equipment. In addition to the three basic applications of single controller, twin controller and slave controller, a large number of parameters and options can be set in each application.

The menu is available in multiple languages and employs a three-stage password system, so any unauthorised operation of the controllers can be restricted or prevented altogether.

– Universal temperature controller 1883 allows switching loads up to 20 A and can optionally be equipped with an additional relay (3 A).

– Universal temperature controllers 1882 and 1884 are controllers with two or four output relays that can be used as one-channel to four-channel controllers. The standard controllers have an additional signal relay for alarm messages, whereas the type 1884/TGN can be connected to the central building control system via a Modbus gateway instead.

TEMPERATURE SENSORS

Temperature sensor 3154 is the sensor for special applications, suitable for use outdoors or embedded in the ground without any need for additional protection. It is the perfect companion for all temperature controllers from tekmar. The corrosion-resistant brass housing is IP68-compliant, has a has a threaded stud for attaching the sensor and is connected to the controller via a microbe-resistant, longitudinally watertight cable.

LOW INVESTMENT, HIGH DEGREE OF RELIABILITY

THE **TEMPERATURE CONTROLLERS**

TEMPERATURE CONTROLLERS

FROST PROTECTION

Controllers for keeping gutters free of ice or controlling pipe trace heaters. The controller must be equipped with a heating tape and is then ready for use right away thanks to its earthed connector. It can be positioned directly in the wet area (such as a gutter), so no further installation is required.

FUNCTIONS

- Integrated temperature sensor
- Internal temperature compensation
- Switching hysteresis: ± 1.5 K
- Switching delay: 30 minutes
- Minimum ON time: 30 minutes
- Heater shutdown when dropping below the lower switching point (optional)
- Self-test on system start

TECHNICAL SPECIFICATIONS

- Nominal voltage: 230 VAC, 50 Hz
- Voltage range: 195 VAC to 253 VAC
- Switching capacity: 2000 W at nominal voltage
- Ambient temperature: -25 °C to +50 °C
- Protection: IP 67 (as per EN 60529)
- Supply cable: 3 x 1.5 mm² H07RN-F, length 3 m, cast-on earthing pin plug
- Upper and lower switching point, see versions in table below

MODEL	VERSIONS	DOCUMENTATION	NET PRICE	PG
9573-DTR	Switching point +5 °C / -15 °C	On request		
9573-DTR+5-20	Switching point +5 °C / -20 °C			
9573-DTR+5-10	Switching point +5 °C / -10 °C			
9573-RBH+3	Switching point +3 °C / ---			

FROST PROTECTION TEMPERATURE CONTROLLER

Controller 1893 excels through its ease of operation and wide range of potential applications. It has been designed for frost protection applications and includes two user programmes for keeping areas free of ice (setpoint/limit controller) and for pipe trace heaters (setpoint/alarm value controller). The temperature controller can handle switching loads of up to 20 A at 230 VAC and an additional relay is available as an option. A signal relay can be used to report malfunctions, for example to a central building control system.

Examples of use: Gutter heaters, pipe trace heaters, small outdoor areas.

FUNCTIONS

- The application is determined via the connection of the sensor
- Setpoint/limit value controller (activation temperature -5 °C to +10 °C, deactivation temperature 0 °C to -20 °C)
- Setpoint/alarm value controller (setpoint 0 °C to 60 °C, alarm at 1 K to 10 K below setpoint or “OFF”)
- Further parameters can, if necessary, be changed using the parameter definition function

INPUTS

- 1x temperature sensor (tekmar series 31 and 30 sensor type)

OUTPUTS

- 1x power relay (N/O contact) 20 A, 230 VAC
- 1x signal relay (changeover contact) 1 A, 30 VDC (SELV)
- 1x additional relay 3 A, 230 VAC, optional as N/O or N/C contact, see versions in table below

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 1.5 VA
- 3HP (horizontal pitch) device for DIN rail mounting with two rotary adjusters and two LEDs

ACCESSORIES

- Temperature sensor 3131
- Temperature sensor 3115
- Temperature sensor 3154

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1893-FGA	Standard controller	ME-1893-FGA		
1893/R-FGA	with additional relay as N/C contact, floating			
1893/L-FGA	with additional relay as N/O contact, L switched			

UNIVERSAL TEMPERATURE CONTROLLER 20 A

The 1883-UTR universal temperature controller is a versatile controller for general use in the field of temperature control and can easily be operated using the touchscreen graphic display. It has comprehensive configuration options with three applications (individual controller, twin controller and slave controller), each with a dedicated range of optional settings. All applications can be set either to heating or cooling operation. The controller can handle switching loads of up to 20 A at 230 VAC and an additional relay is available as an option. The controller can be used for multiple functions and stands out thanks to its wide range of configuration options. A signal relay can be used to report malfunctions, for example to a central building control system.

Examples of use: Frost-protection heating, lane heating, applications with two-stage heating installation or heating installation plus limitation, etc.

FUNCTIONS

- Can be set up as:
  - Individual controller: Two-point controller with adjustable hysteresis for heating and cooling mode
  - Twin controller: Twin two-point controller with one sensor and two setpoints. The first setpoint is for the main circuit, while the second is for another heating circuit or used as an alarm function
  - Slave controller: Two downstream two-point controllers with two sensors. The first sensor is used to enable the system, while the second is used to control the heating or cooling element, for example in a controller/limiter combination
- Adjustment range: Setpoint -50 °C to +300 °C
- Menu navigation in multiple languages and three-stage password protection
- Proportional operation (for complex control tasks involving dual or interdependent control loops)
- 2x operating hours counters

INPUTS

- 2x temperature sensors (sensor types: tekmar series 31 and 30, Pt1000, KTY81-210, Schlüter UNI, DEVI 25-15k, OJ 25-12k, OJ 25-10k)

OUTPUTS

- 1x power relay (N/O contact) 20 A, 230 VAC
- 1x signal relay (changeover contact) 1 A, 30 VDC (SELV)
- 1x additional relay 3 A, 230 VAC, potential free contact or normally closed contact (N/C) as secondary relay for mains L1

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 3 VA
- 3HP (horizontal pitch) device for DIN rail mounting with illuminated touchscreen graphic display and USB port

ACCESSORIES

- Temperature sensor 3131
- Temperature sensor 3115
- Temperature sensor 3154

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1883-UTR	Standard controller	ME-188~234-UTR		
1883/R-UTR	with additional relay as N/C contact, floating			
1883/A-UTR	with additional relay as N/O contact, floating			
1883/L-UTR	with additional relay as N/O contact, L switched			

UNIVERSAL TEMPERATURE CONTROLLER (MULTI-CHANNEL)

Universal temperature controllers 1882-UTR and 1884-UTR are versatile controllers for virtually any application in the field of temperature control and are easy to operate via the touchscreen graphic display. The controllers have three configuration options with extensive applications (individual controller, twin controller and slave controller), each with a dedicated range of function options. All applications can be set both to heating and cooling operation. The controllers excel through their comprehensive configurability and the ability to control two to four loops at the same time. A signal relay or the TGN bus can be used to report malfunctions, for example to a central building control system. The type 1884/TGN-UTR allows complete remote control via the Modbus gateway.

Examples of use: Frost-protection heating, lane heating, applications with two-stage heating installation or heating installation plus limitation, general cooling applications, etc.

FUNCTIONS

- Can be set up as:
  - Individual controller: Two-point controller with adjustable hysteresis for heating and cooling mode
  - Twin controller: Twin two-point controller with one sensor and two setpoints. The first setpoint is for the main circuit, while the second is for another heating circuit or used as an alarm function
  - Slave controller: Two downstream two-point controllers with two sensors. The first sensor is used to enable the system, while the second is used to control the heating or cooling element, for example as a controller/limiter combination
- Adjustment range: Setpoint -50 °C to +300 °C
- Menu navigation in multiple languages and three-stage password protection
- Proportional operation (for complex control tasks involving dual or interdependent control loops)
- 2x operating hours counters
- Connection of the 1884/TGN-UTR to a central building control system via a Modbus gateway

INPUTS

- 2x or 4x temperature sensors (sensor types: tekmar series 31 and 30, Pt1000, KTY81-210, Schlüter UNI, DEVI 25-15k, OJ 25-12k, OJ 25-10k)

OUTPUTS

- 2x or 4x power relays (N/O contacts), each 5 A, 230 VAC
- 1x signal relay (changeover contact) 1 A, 30 VDC (SELV, only 1882/84-UTR)

COMMUNICATION

- TGN bus (only 1884/TGN) for connection to the Modbus gateway 1880/8-GMR

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 2 VA
- 3HP (horizontal pitch) device for DIN rail mounting with illuminated touchscreen graphic display and USB port

ACCESSORIES

- Temperature sensor 3131
- Temperature sensor 3115
- Temperature sensor 3154
- Modbus gateway 1880/8-GMR (only for 1884/TGN-UTR)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1882-UTR	2x power relays, 1x signalling relay	ME-188~234-UTR		
1884-UTR	4x power relays, 1x signalling relay			
1884/T-UTR	4x power relays, TGN bus			

MODBUS GATEWAY

The series 18 Modbus gateway is used to connect a Modbus RTU system (RS485) to the series 18 TGN network, whereby the Modbus registers can be set to match the type of devices connected. Alongside the standard applications from tekmar, OEM applications can also be implemented.

On the Modbus, the gateway behaves as a slave and operates as a proxy server from the perspective of the Modbus master by buffering all values to and from the tekmar devices (control values, measured values) and making them available on the Modbus in real time.

FUNCTIONS

- Read operations of the Modbus master are served from the internal memory, which is updated at regular intervals via synchronisation with the devices
- In the case of a Modbus message, the control values are initially saved in the internal memory during write operations and then sent to the respective device at the next possible opportunity
- Parameter RS485: Transfer rate 4800/9600/19,200, parity odd/even/none, stop bits 1/2

SPECIFICATIONS

- MODBUS Application Protocol Specification V1.1b3 (dated 26th April 2012)
- MODBUS over Serial Line V1.02 (dated 20th December 2006)

COMMUNICATION

- TGN bus to the control unit (COM protocol)
- RS485 interface (Modbus, RTU protocol)

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 3 VA
- 3HP (horizontal pitch) device for DIN rail mounting with illuminated touchscreen graphic display and USB port

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1880/8-GMR		MB-1880-D85-GMR		

UNIVERSAL TEMPERATURE SENSOR

Universally deployable sensor with plastic sleeve for temperature measurement in predominantly dry areas. Outdoor installation only with protective tube (plastic or steel tube for applications with higher loads), for example in the concrete slab. The protective tube must be fully closed (as per IP 68). Outdoor installation without a protective tube is not permitted, as the material cannot guarantee watertightness.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Sensor sleeve dimensions: D 6.2 mm, L 29 mm
- Cable connection: Axial
- Connection cable: H03-VV-F 2 x 0.5 mm²
- Temperature range: -30 °C to +70 °C
- Protection: IP 65 (outdoor use only with protective tube)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3131/2M	Connection cable 2 m	M-MES-Sensorik		
3131/4M	Connection cable 4 m			
3131/6M	Connection cable 6 m			
3131/20M	Connection cable 20 m			
3131/50M	Connection cable 50 m			
3131/100M	Connection cable 100 m			

AIR TEMPERATURE SENSOR

Sensor in a two-part plastic housing for recording the air temperature. Installation on an external wall but away from direct solar radiation.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Dimensions: W 42 mm, H 64 mm, D 27 mm
- Connection: 2x screw terminals, 1.5 mm²
- Temperature range: -30 °C to +70 °C
- Protection: IP 44

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3115		M-MES-Sensorik		

OUTDOOR TEMPERATURE SENSOR

Weather-resistant sensor for measuring temperature values in gutters and other outdoor areas. Can be used outdoors or in the ground without the need for any additional protection. Rod-shaped design with axial cable outlet and threaded bolt for fixing in position.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Dimensions: D 12 mm, L 50 mm, M6 thread
- Cable connection: Axial
- Connection cable: LiYw11Y, 4 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +80 °C
- Protection: IP 68

ACCESSORIES

- Ground sleeve 3307
- Sensor cable 91111 (sold by the metre)
- Connecting sleeve 79156

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3154/6M	Connection cable 6 m	M-MES-Sensorik		
3154/20M	Connection cable 20 m			
3154/50M	Connection cable 50 m			

GROUND SLEEVE FOR TEMPERATURE SENSOR 3154

Ground sleeve with brass cover for installation of sensor 3154 flush with the surface in an outdoor area (travel lane, etc.)

TECHNICAL SPECIFICATIONS

- Material: Brass
- Dimensions: D 68 mm, H 72 mm
- Load capacity: 28 kN (based on DIN EN 60598-2-12)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3307		M-MES-Sensorik		

ICE DETECTOR SYSTEM 73

Ice detector system 73 is an all-round system for all applications to keep areas free of ice and snow. It is not only flexible, maintenance-free and affordable, but also modular so that it can be extended to create a multi-channel system, as well as being cloud or central building control system-compatible.

CONTROL UNITS AND SYSTEMS

All control units of system 73 are easy to install and commission. They excel through intelligent factory default settings and a clearly structured commissioning function. The sensors and the control units can be freely combined with one another, allowing the system to be optimally matched to the application conditions. All control units are designed to work with one combined sensor and one heating circuit each.

Entry-level units 1871 and 1872 offer optimum price-performance for small ice prevention systems for use in gutters or outdoor areas. With the focus on a singular application and the ability to set the temperature and moisture setpoints through two rotary adjusters, commissioning is completed in just a few minutes. For special applications, a configuration function provides access to additional parameters.

Basic unit 1873 can be used in all applications both as a standalone device and as the basis for putting together an ice detector system with multiple channels and communication to the central building control system or the tekmar TAV server. The hardware includes an output relay with a switching capacity load of 16 A, an alarm relay that can be used either for mains or for safety extra low voltage (SELV), as well as an illuminated touch-screen graphic display with a menu that is available in multiple languages and adapts automatically to the respective configuration. An optional air temperature sensor can be used for preheating or basic operating mode. In just a few steps, the system can be configured to meet the requirements of the respective installation. Comprehensive function options such as multi-channel configurations, remote control, preheating and basic operating mode, as well as a weekly and holiday programme can be used as and when necessary. A multi-stage password system prevents unauthorised operation of the equipment. The heating circuit monitoring system detects interruptions in the heating circuit and malfunctions of the heating circuit relay.

A **single-channel system** comprises a basic unit with a combined sensor and a heating circuit. It can be extended with an Internet gateway, connected to the TAV server from tekmar, or a Modbus gateway, connected to the central building control system. This facilitates remote control, as well as monitoring and maintenance of the most important functions via the platform-independent user portal of the TAV server or the command centre of the central building control system.

The Internet gateway and its online connection to the TAV server offer completely new opportunities for monitoring and controlling an ice and snow detector system. These functions are easy to use with any smart device, computer or laptop and a standard Internet browser. The most important settings and measured data of all channels of a system are therefore available online. By setting the location, the system is also provided with a local weather forecast via the gateway. This then allows a significantly faster reaction to changes in weather. Ice detector system 73 is therefore the first commercially available ice and snow detector system that can be remote monitored and make use of future predictions to guarantee optimum operation.

System 73 can, if necessary, be extended with **expansion unit 1875** to create a **multi-channel system** with up to eight sensors and heating circuits. The heating circuits can be assigned to up to four different zones, which each have a separate preheating and basic operating mode, as well as separate weekly and holiday programmes. The sensors in a zone can be linked to create a signal circuit in which one of the sensors activates all heating circuits of the channels belonging to the respective zone. The multi-channel system can of course also be extended with an Internet or Modbus gateway, so remote control, monitoring and maintenance can be performed via the central building control system command centre or the frontend of the TAV server. For additional operational control, the system employs two operating hours counters per heating circuit and can be extended to include an energy consumption meter.

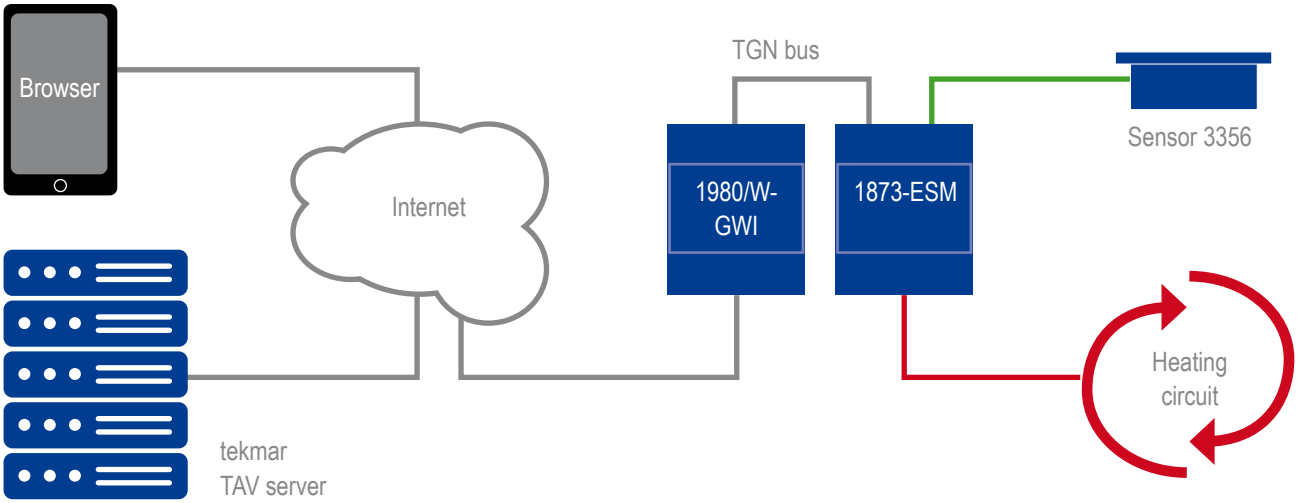
MAINTENANCE-FREE OPERATION, ROBUST RANGE

ICE AND SNOW DETECTOR **SYSTEM 73**

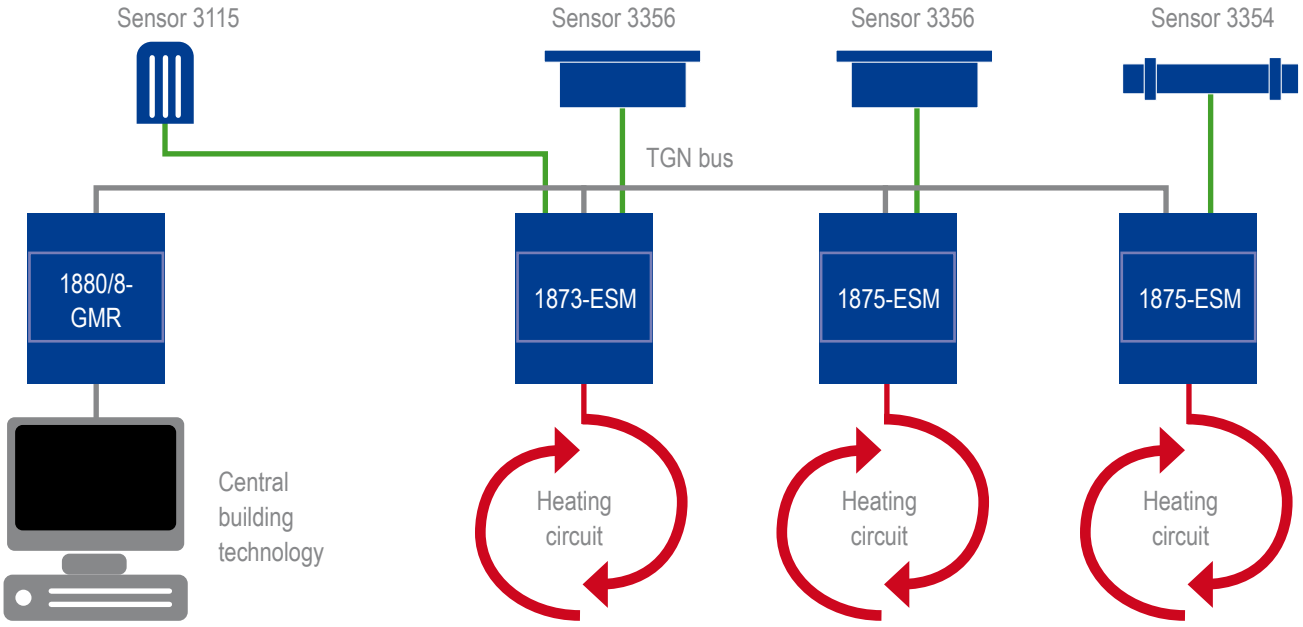
SENSORS

The sensors of system 73 use a measuring principle that is based on the thermal capacity of the sensor surface and the water located on it, potentially in the form of ice or snow, which was developed by tekmar and has already been proven over many years. Only one sensor is required to record both the moisture and temperature here, which makes the installation extremely easy and affordable. In special application cases, the system can be extended to include ground or air temperature sensors. System 73 offers two sensor types: **Sensor 3356** is ideal for installation in outdoor areas such as roads, lanes, paths or stairs. Due to its construction with axial cable connection, **sensor 3354** can for example be fitted in gutters and on roof areas. Both sensors excel through their compact and robust design, which is achieved through use of a housing made of high-grade, corrosion resistant brass and a microbe-resistant, longitudinally watertight cable. An extensive portfolio of accessories for installing and attaching the sensors secures compliance with a very wide range of requirements, while also optimising installation and maintenance costs.

SINGLE-CHANNEL OUTDOOR SYSTEM WITH INTERNET GATEWAY TO THE TEKMAR TAV SERVER



COMBINED THREE-CHANNEL SYSTEM WITH AIR TEMPERATURE SENSOR FOR PREHEATING OUTDOOR AREAS AND MODBUS GATEWAY TO THE CENTRAL BUILDING CONTROL SYSTEM



SYSTEM 73

ICE AND SNOW DETECTOR (BASIC UNIT)

Ice and snow detector 1873 is a single-channel basic unit that can be used for all applications in the field of ice and snow detection. With expansion unit 1875 and the 1980 gateways, it can be extended to create multifunctional systems with up to eight sensor/heating channels and Internet/central building control system connection.

Set-up and operation are both performed using an illuminated touchscreen graphic display, via which the other units in a system can also be parameterized. The multilingual menu with three-stage password protection automatically adapts to the respective configuration selected (standalone unit, gateway system or multi-channel system).

Alongside the basic functions of the ice detector channel, the 1873 has a zone management system, with which the unit's own channel and the ice detector channels of the expansion units can be centrally controlled in up to four zones via optional functions.

A comprehensive alarm management system checks both the internal device functions and those of the connected sensors. In addition to this, the function of the heating relay and of a downstream contactor can be monitored.

ICE DETECTOR CHANNEL FUNCTIONS

- Control and monitoring by one sensor and one heating output
- Continuous monitoring of the temperature in the heated area
- Activation of moisture measurement if the temperature drops below the activation temperature
- Start of minimum heating time when exceeding the moisture threshold on the sensor, alternatively via an external signal at the control input
- Heater shutdown below the lower deactivation temperature
- Optional basic operating mode for preheating an outdoor area

ZONE MANAGEMENT FUNCTIONS

- Free assignment of an ice detector channel to one of the four zones, function options can be activated separately for each zone:
  - Weekly programme for automatic operating mode setting
  - Preheating mode with air temperature sensor for preheating all heating surfaces within a zone
- Channel linking for interconnecting all sensors in a zone
- Joint holiday programme for all zones

ALARM MANAGEMENT FUNCTIONS

- Monitoring of all ice and snow detectors and their sensors in a system
- Alarm function that can be deactivated per zone
- Adjustable alarm delay
- Forwarding an alarm via the signalling relay and/or a gateway

INPUTS

- 1x System 73 temperature and moisture sensor
- 1x Series 31 temperature sensor
- 1x SELV control input
- 1x 230 VAC control input

OUTPUTS

- 1x 16 A power relay, 230 VAC
- 1x signalling relay (changeover contact) 2 A, max. 230 VAC, for low voltage or SELV applications

COMMUNICATION

- TGN bus (tekmar device network)

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 12 VA
- Real-time clock with three days of power reserve
- 3HP (horizontal pitch) device for DIN rail mounting with illuminated touchscreen graphic display and USB port

ACCESSORIES

- Temperature and moisture sensor 3354
- Temperature and moisture sensor 3356
- Temperature sensors 3154, 3115, 3131
- Expansion unit 1875-ESM
- Internet gateway 1980/W-GWI
- Modbus gateway 1880/8-GMR

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1873-ESM		ME-1873~5-ESM ME-1873E-ESM K-1873E-ESM		

ICE AND SNOW DETECTOR EXPANSION UNIT

In connection with an 1873 basic unit, expansion unit 1875 allows modular multi-channel systems with up to eight ice detector channels to be created. The touchscreen graphic display of the 1873 is also used to set up and operate the 1875.
The ice detector channel of the 1875 can be integrated into the zone management system of the 1873 and can therefore participate in all control functions within a system. This also applies to alarm management and the gateway functions to the Internet or to the central building control system.

ICE DETECTOR CHANNEL FUNCTIONS

- Control and monitoring by one sensor and one heating output
- Continuous monitoring of the temperature in the heated area
- Activation of moisture measurement if the temperature drops below the activation temperature
- Start of minimum heating time when exceeding the moisture threshold on the sensor, alternatively via an external signal at the control input
- Heater shutdown below the lower deactivation temperature
- Optional basic operating mode for preheating an outdoor area

INPUTS

- 1x System 73 temperature and moisture sensor
- 1x SELV control input
- 1x 230 VAC control input

OUTPUTS

- 1x 16 A power relay, 230 VAC

COMMUNICATION

- TGN bus (tekmar device network)

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 12 VA
- 3HP (horizontal pitch) device for DIN rail mounting with LED and USB port

ACCESSORIES

- Temperature and moisture sensor 3354
- Temperature and moisture sensor 3356

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1875-ESM		ME-1875~5-ESM		

ICE AND SNOW DETECTOR (INDIVIDUAL UNITS)

As entry-level models, these two ice and snow detectors are ideal for controlling small systems with one temperature and moisture sensor and one heating circuit. Uncomplicated commissioning is achieved using just two rotary adjusters for the activation temperature and the moisture threshold. Further function parameters such as the lower deactivation temperature, minimum heating and post-heating time can be set up via a parameter setting mode. Two three-colour LEDs are used for status display.
Model 1871 with sensor 3354 is ideal for use with gutter heaters, while model 1872 with sensor 3356 is ideal for small to medium-sized electrical outdoor systems.

FUNCTIONS

- Control system and monitoring by one sensor and one heating output
- Continuous monitoring of the temperature in the heated area
- Activation of moisture measurement if the temperature drops below the activation temperature
- Start of minimum heating time when exceeding the moisture threshold on the sensor, alternatively via an external signal at the control input
- Heater shutdown below the lower deactivation temperature

INPUTS

- 1x System 73 temperature and moisture sensor
- 1x 230 VAC control input

OUTPUTS

- 1x 16 A power relay, 230 VAC

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 12 VA
- 3HP (horizontal pitch) device for DIN rail mounting with two rotary adjusters and two LEDs

ACCESSORIES

- Temperature and moisture sensor 3354 (only 1871)
- Temperature and moisture sensor 3356 (only 1872)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1871-ESM	for sensor 3354 (gutter)	ME-1871~2-ESM and		
1872-ESM	for sensor 3356 (outdoor area)	K-1871~2-ESM		

INTERNET GATEWAY

The compact gateway of series 19 is the innovation in the ice and snow detector segment. For the first time, thanks to the gateway, an ice and snow detector system can process a weather forecast and notify the customer of its status, as well as being configured (most important settings) and operated remotely. The gateway is used to connect the ice and snow detector and its expansion units to the tekmar TAV server* on the Internet.

With a comercially available router the gateway can be connected either via LAN or WLAN via Internet to the TAV Server.

FUNCTIONS
- Supports automatic configuration via DHCP and also manual setting of the IP addresses
- WLAN can be set up conveniently via the gateway's web interface (requires a PC)
- Distribution and temporary storage of all significant parameters, data records and control values
- Connection to the tekmar TAV server*

INPUTS
- S0 for digital electricity meter

COMMUNICATION
- Ethernet connection (RJ45)
- WLAN-UFL antenna socket
- TGN bus

TECHNICAL SPECIFICATIONS
- Supply 230 VAC, 50 Hz, max. 5 VA
- 3HP (horizontal pitch) device for DIN rail mounting with LED and USB port
  Ethernet 802.3 10/100 Mbit
  WLAN 2.4GHz IEEE 802.11b/g/n

ACCESSORIES
- WLAN antenna 9681

* Using the complete scope of the tekmar TAV server requires a service contract, which incurs additional costs.

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1980/W-GWI	Connection via WLAN connection or LAN cable	MB-1980~W~LAN-GWI		

WLAN ANTENNA

Radio antenna for WLAN gateway with magnetic mount and pivoting antenna rod.

TECHNICAL SPECIFICATIONS
- Dimensions: D 50 mm, H 220 mm
- Frequency band: 2450 MHz
- Connection cable: 3 m
- Plug-in connector: RP-SMA

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
9681		MB-1980~W~LAN-GWI		

TAV SERVER ACCOUNT

The functions of the Internet gateway are used via an account on the tekmar TAV server (tekmar system management). Thanks to a platform-independent HTML5 app, the user portal of the TAV server can be accessed using any smart device, tablet or PC.

With the Premium package, users can perform both remote monitoring and remote operation of the entire system. With the installer portal, any installer who has for example been commissioned within the scope of a maintenance contract can also gain remote access to the system.

PREMIUM PACKAGE:

- Remote operation of the entire system via the user portal with an HTML browser and smartphone, tablet or PC
- Control data per channel: Operating mode, activation temperature, moisture threshold, minimum heating time, zone assignment, start command for minimum heating time
- Measured data per channel: Temperature, moisture, condition, heating circuit output, operating hours 1/2, if applicable air temperature
- Time control: Weekly programme for operating modes per zone, holiday programme for the entire system
- Local weather report, a precise geo ID can be set interactively in the user portal
- Requires user contract (account free of charge in the first year, then as stated in price list)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
V_SAPREMIUM_MES	Premium package (per gateway)			

MODBUS GATEWAY

The series 18 Modbus gateway is used to connect a Modbus RTU system (RS485) to the TGN network of a system comprising series 18 units, whereby the Modbus registers can be set to match the type of devices connected. Alongside the standard applications from tekmar, OEM applications can also be implemented.

On the Modbus, the gateway behaves like a slave and operates as a proxy server from the perspective of the Modbus master by buffering all values to and from the tekmar devices (control values, measured values) and making them available on the Modbus in real time.

FUNCTIONS

- Read operations of the Modbus master are served from the internal memory, which is updated at regular intervals via synchronisation with the devices
- In the case of a Modbus message, the control values are initially saved in the internal memory during write operations and then sent to the respective device at the next possible opportunity
- Parameter RS485: Transfer rate 4800/9600/19,200, parity odd/even/none, stop bits 1/2

SPECIFICATIONS

- MODBUS Application Protocol Specification V1.1b3 (dated 26th April 2012)
- MODBUS over Serial Line V1.02 (dated 20th December 2006)

COMMUNICATION

- TGN bus to the control unit (COM protocol)
- RS485 interface (Modbus, RTU protocol)

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 2 VA
- 3HP (horizontal pitch) device for DIN rail mounting with illuminated touchscreen graphic display and USB port

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1880/8-GMR		MB-1880-D85-GMR		

ICE AND SNOW DETECTOR 1773 (DISCONTINUED MODEL)

Ice and snow detector for connecting one or two temperature and moisture sensors. Both sensor inputs can be configured for temperature measurement or for combined measurement (moisture and temperature). A display and three menu buttons are used to execute the functions and monitor all parameters and measured values. There is an LED for displaying the current operating status and an alarm output for forwarding information on a sensor issue or malfunction.

FUNCTIONS

- Continuous monitoring of the temperature in the heated area
- Activation of moisture measurement if the temperature drops below the activation temperature
- Start of minimum heating time when exceeding the moisture threshold on the sensor
- Heater shutdown below the lower deactivation temperature
- Optional air temperature sensor for basic operating mode

INPUTS

- 2x System 73 temperature and moisture sensors
- 1x Series 31 temperature sensor can optionally be used instead of a temperature and moisture sensor

OUTPUTS

- 1x 6 A power relay, 230 VAC
- 1x 24 VDC alarm output, SELV

COMMUNICATION

- TUV interface for data logging and software update

TECHNICAL SPECIFICATIONS

- Supply 230 VAC, 50 Hz, max. 12 VA
- 6HP (horizontal pitch) device for DIN rail mounting with LCD display and three function buttons

ACCESSORIES

- Temperature and moisture sensor 3354
- Temperature and moisture sensor 3356
- Temperature sensor 3154
- Temperature sensor 3115
- Temperature sensor 3131

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1773-ESM		D194		

COUPLING RELAY FOR 1773

Coupling relay for forwarding the alarm message of the 1773 control unit to devices with 230 V supply or for potential-free control of SELV inputs.

TECHNICAL SPECIFICATIONS

- Nominal voltage 24 VDC, SELV
- Relay output (changeover contact) 6 A, 230 VAC, can also be used as SELV relay
- 3HP (horizontal pitch) device for DIN rail mounting with monitoring LED

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
T1798		D194		

AXIAL TEMPERATURE AND MOISTURE SENSOR

Rod-shaped sensor for combined measurement of temperature and moisture values in gutters and neighbouring areas, such as flat roofs and downpipes, yet also for special applications such as satellite dishes, sewage treatment plants or railway tracks. Robust version made of brass, fully encapsulated. Extremely compact design with axial cable outlet and threaded bolt for fixing in position.

TECHNICAL SPECIFICATIONS

- Dimensions: D 12 mm without support rings, L 105 mm, M6 thread (including plastic nut and plain washers)
- Cable connection: Axial
- Connection cable: LiYw11Y, 4 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +80 °C
- Temperature range for moisture measurement: -20 °C to +30 °C
- Protection: IP 68

MATCHING CONTROL UNITS

- 1873-ESM
- 1875-ESM
- 1871-ESM
- 1773-ESM

ACCESSORIES

- Mounting plate 79145, 79146
- Sensor cable 91111 (sold by the metre)
- Connecting sleeve 79156

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3354/6M	Connection cable length 6 m	M-MES-335~46-DE		
3354/10M	Connection cable length 10 m			
3354/20M	Connection cable length 20 m			
3354/30M	Connection cable length 30 m			
3354/50M	Connection cable length 50 m			

MOUNTING PLATE FOR SENSOR 3354

Mounting plate for sensor 3354 with sensor height adjustment above the mounting surface. The mounting plate can be matched to the mounting location by bending and then attached by gluing or soldering, alternatively also with screws.

Two material versions are available for suitable material combinations in gutter and flat roof applications.

TECHNICAL SPECIFICATIONS

- Dimensions: W 80 mm, L 132 mm
- Material: Zinc or copper, see version in table below

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
79145	Zinc	M-MES-335~46-DE		
79146	Copper			

TEMPERATURE AND MOISTURE SENSOR (SURFACE UNIT)

Ground sensor for combined measurement of temperature and moisture values in outdoor areas with foot or vehicle traffic. Robust version made of brass, fully encapsulated. Very low installation height, so particularly well suited to staircases, terraces, etc. The connection cable can either exit downward or to the side.

TECHNICAL SPECIFICATIONS

- Dimensions: D 68 mm, H 31 mm (cable routing to the side) or 65 mm (cable routing downward)
- Cable connection: To the side or downward
- Load capacity: 20 kN (based on DIN EN 60598-2-12)
- Connection cable: LiYw11Y, 4 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +75 °C
- Temperature range for moisture measurement: -20 °C to +30 °C

MATCHING CONTROL UNITS

- 1873-ESM
- 1875-ESM
- 1872-ESM
- 1773-ESM

ACCESSORIES

- Ground sleeve 71917
- Sleeve adapter 71921
- Sensor cable 91111 (sold by the metre)
- Connecting sleeve 79156
- Protective cover 71001

Note: Standard deliveries comprise a set, including 71917 ground sleeve, see versions in table below

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3356/1M	Connection cable 1 m, set with sleeve 71917	M-MES-335~46-DE		
3356/6M	Connection cable 6 m, set with sleeve 71917			
3356/10M	Connection cable 10 m, set with sleeve 71917			
3356/20M	Connection cable 20 m, set with sleeve 71917			
3356/25M	Connection cable 25 m, set with sleeve 71917			
3356/50M	Connection cable 50 m, set with sleeve 71917			
3356/1M-E	Connection cable 1 m, only sensor			
3356/6M-E	Connection cable 6 m, only sensor			
3356/10M-E	Connection cable 10 m, only sensor			
3356/20M-E	Connection cable 20 m, only sensor			
3356/25M-E	Connection cable 25 m,only sensor			
3356/50M-E	Connection cable 50 m, only sensor			

GROUND SLEEVE FOR SENSOR 3356

Brass ground sleeve for installation of sensor 3356 flush with the surface in an outdoor area (travel lane, etc.)

TECHNICAL SPECIFICATIONS

- Dimensions: D 68 mm, H 67 mm (72 mm with sensor 71917)
- Dimensions: D 68 mm, H 50 mm (55 mm with sensor 71928, flat version for mastic asphalt)
- Load capacity: 20 kN (based on DIN EN 60598-2-12)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
71917	H 67 mm	M-MES-335~46-DE		
71928	H 50 mm			

PROTECTIVE COVER FOR SENSOR 3356

Cover made of aluminium for covering ground sleeve 71917 during installation. Sturdy version for multiple uses.

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
71001		M-MES-335~46-DE		

SLEEVE ADAPTER FOR SENSOR 3356

The sleeve adapter ring made of brass allows a 3356 sensor to be installed in ground sleeve 71348. When switching from system 50 to system 73, installed ground sleeves can then continue to be used.

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
71921		M-MES-Sensorik		

OUTDOOR TEMPERATURE SENSOR

Weather-resistant sensor for measuring temperature values in gutters and other outdoor areas. Can be used outdoors or in the ground without the need for any further protective measures. Rod-shaped design with axial cable outlet and threaded bolt for fixing in position.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Dimensions: D 12 mm, L 50 mm, M6 thread
- Cable connection: Axial
- Connection cable: LiYw11Y, 4 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +80 °C
- Protection: IP 68

ACCESSORIES

- Ground sleeve 3307
- Sensor cable 91111 (sold by the metre)
- Connecting sleeve 79156

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3154/6M	Connection cable 6 m	M-MES-Sensorik		
3154/20M	Connection cable 20 m			
3154/50M	Connection cable 50 m			

GROUND SLEEVE FOR SENSOR 3154

Ground sleeve with brass cover for installation of sensor 3154 flush with the surface in an outdoor area (travel lane, etc.)

TECHNICAL SPECIFICATIONS

- Material: Brass
- Dimensions: D 68 mm, H 72 mm
- Load capacity: 20 kN (based on DIN EN 60598-2-12)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3307		M-MES-Sensorik		

AIR TEMPERATURE SENSOR

Sensor in a two-part plastic housing for recording the air temperature. Installation on an external wall but away from direct solar radiation.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Dimensions: W 42 mm, H 64 mm, D 27 mm
- Connection: 2x screw terminals, 1.5 mm²
- Temperature range: -30 °C to +70 °C
- Protection: IP 44

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3115		M-MES-Sensorik		

UNIVERSAL TEMPERATURE SENSOR

Universally deployable sensor with plastic sleeve for temperature measurement in predominantly dry areas. Outdoor installation only with protective tube (plastic or steel tube for applications with higher loads), for example in the concrete slab. The protective tube must be fully closed (as per IP 68). Outdoor installation without a protective tube is not permitted, as the material cannot guarantee watertightness.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Sensor sleeve dimensions: D 6.2 mm, L 29 mm
- Cable connection: Axial
- Connection cable: H03-VV-F 2 x 0.5 mm²
- Temperature range: -30 °C to +70 °C
- Protection: IP 65 (outdoor use only with protective tube)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3131/2M	Connection cable 2 m	M-MES-Sensorik		
3131/4M	Connection cable 4 m			
3131/6M	Connection cable 6 m			
3131/20M	Connection cable 20 m			
3131/50M	Connection cable 50 m			
3131/100M	Connection cable 100 m			

SENSOR CABLE (SOLD BY THE METRE)

Original tekmar sensor cable (four-core) for sensor types 3354, 3356 and 3154 for extending the existing cable outdoors.

TECHNICAL SPECIFICATIONS

- Type LiYw11Y, 4 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
91111		M-MES-Sensorik		

CONNECTING SLEEVE FOR CABLE EXTENSIONS

Sealable connecting sleeve for extending a sensor cable outdoors. The tekmar sensor cable or, if a larger conductor cross-section is required, a technically equivalent cable type should be used when extending cables.

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
79156		M-MES-Sensorik		

ICE DETECTOR SYSTEM 50

At the end of the 1960s, company founder and engineer H. Freundlieb developed an ice detector system with precision that is still valid today and formed the basis for System 50. Costs were not a priority for Freundlieb, who instead focused on measured results, reliability and robustness. We still build this system today – the sensors are the same as the original, but evaluation is now performed by a modern, processor-controlled unit. However, the principle of measuring both temperature and moisture with just one sensor has remained – with a degree of accuracy and efficiency that no other ice detector system can match to this day. Ice detector system 50 is the specialist system. It meets the strictest requirements in terms of sensitivity and speed in the field of outdoor heating.

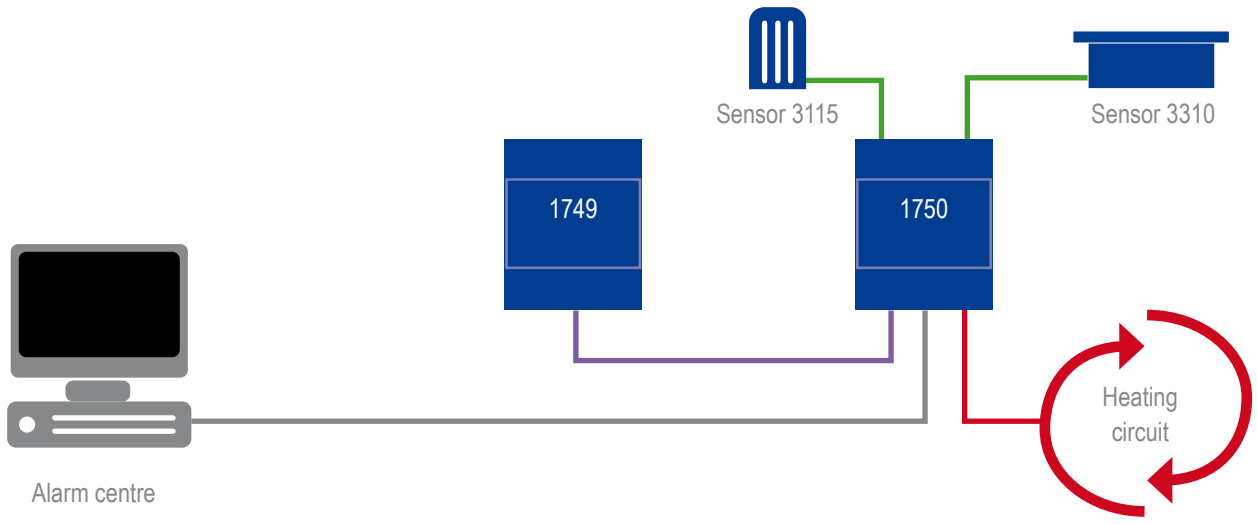
CONTROL UNIT

Control unit 1750 has an illuminated line display with three softkeys and is designed as a device for DIN rail mounting. Power is supplied via a 24 V network or the 230 V power supply unit 1749 that is available as an accessory. Four easy-to-operate rotary adjusters are provided for setting the parameters. In connection with the sensors of system 50, temperature and moisture limits can be set optimally for the respective application case. An optional second temperature sensor employs a second temperature threshold to facilitate use of supporting functions, such as the circulating pump for water-based systems. Error messages can be forwarded to a higher-level system via an alarm relay.

SENSORS

The sensors of system 50 use a measuring principle that is based on the conductivity of the water present on the sensor's measuring area, whereby snow and ice are melted for measurement (in contrast to the measuring procedure of system 73). Thanks to use of a special evaluation procedure, the measurement of temperature and moisture can be performed with just a single sensor. This measuring principle was developed by tekmar and has already been proven over many years. System 50 offers three different sensor types for installation in outdoor areas that differ in terms of the location and type of cable connection. All sensors have a compact and robust construction with a housing made of corrosion resistant brass and a special microbe-resistant, longitudinally watertight cable. The detachable connection version employs a MIL-standard plug system that has demonstrated extreme robustness and many years with no leaks. A comprehensive selection of accessories for installation of the sensors allows for the greatest possible range of applications.

OUTDOOR SYSTEM WITH AIR TEMPERATURE SENSOR AND ALARM FORWARDING



FAST RESPONSE, ULTIMATE SAFETY

ICE AND SNOW DETECTOR
SYSTEM 50

SYSTEM 50

ICE AND SNOW DETECTOR

Ice and snow detector for connecting a temperature and moisture sensor, as well as an optional temperature sensor. Function set-up and checking of all parameters and measured values via four rotary adjusters (three of which are hidden after installation), an LCD display and three menu buttons. Alarm output for forwarding malfunctions.

Power supply unit 1749 can be used as the supply.

FUNCTIONS

- Control and monitoring by one sensor and one heating output
- Continuous monitoring of the temperature in the heated area
- Activation of moisture measurement if the temperature drops below the activation temperature
- Start of minimum heating time when exceeding the moisture threshold on the sensor
- Heater shutdown below the lower deactivation temperature

INPUTS

- 1x System 50 temperature and moisture sensor
- 1x Series 31 temperature sensor

OUTPUTS

- Switching output 1: 230 VAC, max. 6 A
- Switching output 2: 230 VAC, max. 3 A
- Alarm output: 230 VAC, max. 3 A

TECHNICAL SPECIFICATIONS

- Supply 24 VAC, 50 Hz, max. 10 VA
- 6HP (horizontal pitch) device for DIN rail mounting with LCD display,
  4x rotary adjusters and 3x function buttons

ACCESSORIES

- Temperature and moisture sensor 3310
- Temperature and moisture sensor 3311
- Temperature and moisture sensor 3312
- Temperature sensors 3131, 3115, 3154
- Power supply unit 1749

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1750-ESM		D174		

POWER SUPPLY FOR ICE AND SNOW DETECTOR

Power supply unit for supplying ice and snow detector 1750 from the 230 V mains.

TECHNICAL SPECIFICATIONS

- Nominal voltage: 230 VAC, 50 Hz, max. 12 VA
- Output: 24 VAC, max. 10.5 VA
- 3HP (horizontal pitch) device for DIN rail mounting

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
1749		D174		

TEMPERATURE AND MOISTURE SENSOR 3310

Ground sensor for combined measurement of moisture and temperature values in outdoor areas with foot or vehicle traffic. Robust version made of brass, fully encapsulated.
Very low height thanks to lateral cable connection, so particularly well suited to stairs, terraces, etc.

TECHNICAL SPECIFICATIONS

- Dimensions: D 87 mm (without connection cable), H 45 mm
- Cable connection: Lateral
- Load capacity: 20 kN (based on DIN EN 60598-2-12)
- Connection cable: LiYw11Y, 5 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +80 °C
- Temperature range for moisture measurement: -25 °C to +20 °C
- Protection: IP 68

MATCHING CONTROL UNITS

- 1750-ESM

ACCESSORIES

- Sensor cable 91029 (sold by the metre)
- Connecting sleeve 79156

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3310-6M	Connection cable 6 m	M-MES-Sensorik		
310-20M	Connection cable 20 m			
310-50M	Connection cable 50 m			

TEMPERATURE AND MOISTURE SENSOR 3312

Ground sensor for combined measurement of moisture and temperature values in outdoor areas with foot or vehicle traffic. Robust version made of brass, fully encapsulated. Cable connection from below.

TECHNICAL SPECIFICATIONS

- Dimensions: D 87 mm, H 45 mm (H 86 mm with cable)
- Cable connection: From below
- Load capacity: 20 kN (based on DIN EN 60598-2-12)
- Connection cable: LiYw11Y, 5 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +80 °C
- Temperature range for moisture measurement: -25 °C to +20 °C
- Protection: IP 68

MATCHING CONTROL UNITS

- 1750-ESM

ACCESSORIES

- Ground sleeve 71348
- Protective cover 71002
- Sensor cable 91029 (sold by the metre)
- Connecting sleeve 79156

Note: Standard deliveries comprise a set, including ground sleeve 71348, see versions in table below

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3312/6M	Connection cable 6 m, set with sleeve	M-MES-Sensorik		
3312/20M	Connection cable 20 m, set with sleeve			
3312/50M	Connection cable 50 m, set with sleeve			
3312/6M-E	Connection cable 6 m, sensor only			
3312/20M-E	Connection cable 20 m, sensor only			
3312/50M-E	Connection cable 50 m, sensor only			

TEMPERATURE AND MOISTURE SENSOR 3311

Ground sensor for combined measurement of moisture and temperature values in outdoor areas with foot or vehicle traffic. Robust version made of brass, fully encapsulated. Cable connection via plug/bayonet connector from below.

TECHNICAL SPECIFICATIONS

- Dimensions: D 87 mm, H 45 mm (H 90 mm with connection cable)
- Cable connection: From below
- Socket type: Plug/bayonet connector in line with the MIL Standard
- Load capacity: 20 kN (based on DIN EN 60598-2-12)
- Temperature range: -30 °C to +80 °C
- Temperature range for moisture measurement: -25 °C to +20 °C
- Protection: IP 68 (only with accompanying connection cable 3306)

MATCHING CONTROL UNITS

- 1750-ESM

ACCESSORIES

- Supply cable with plug/bayonet connector 3306
- Ground sleeve 71348
- Protective cover 71002
- Sensor cable 91029 (sold by the metre)
- Connecting sleeve 79156

Note: Standard deliveries comprise a set, including ground sleeve 71348, see versions in table below

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3311	Sensor in a set with sleeve	M-MES-Sensorik		
3311-E	Sensor only			

SUPPLY CABLE FOR SENSOR 3311

Supply cable with plug/bayonet connector for sensor 3311

TECHNICAL SPECIFICATIONS

- Connector type: Plug/bayonet connector in line with the MIL Standard
- Cable type: LiYw11Y, 5 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Protection: IP 68 (only with sensor 3311)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3306/20M	Length 20 m	M-MES-Sensorik		

GROUND SLEEVE FOR SENSORS 3311/3312

Brass sleeve for installation of sensors 3311 and 3312 flush with the surface in an outdoor area (travel lane, etc.)

TECHNICAL SPECIFICATIONS

- Dimensions: D 87 mm, H 100 mm
- Load capacity: 20 kN (based on DIN EN 60598-2-12)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
71348		M-MES-Sensorik		

PROTECTIVE COVER FOR SENSOR 3311/3312

Cover made of aluminium for covering ground sleeve 71348 during installation. Sturdy version for multiple uses.

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
71002		M-MES-Sensorik		

OUTDOOR TEMPERATURE SENSOR

Weather-resistant sensor for measuring temperature values in gutters and other outdoor areas. Can be used outdoors or in the ground without the need for any further protective measures. Rod-shaped design with axial cable outlet and threaded bolt for fixing in position.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Dimensions: D 12 mm, L 50 mm, M6 thread
- Cable connection: Axial
- Connection cable: LiYw11Y, 5 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight
- Temperature range: -30 °C to +80 °C
- Protection: IP 68

ACCESSORIES

- Ground sleeve 3307
- Sensor cable 91111 (sold by the metre)
- Connecting sleeve 79156

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3154/6M	Connection cable 6 m	M-MES-Sensorik		
3154/20M	Connection cable 20 m			
3154/50M	Connection cable 50 m			

GROUND SLEEVE FOR SENSOR 3154

Ground sleeve with brass cover for installation of sensor 3154 flush with the surface in an outdoor area (travel lane, etc.)

TECHNICAL SPECIFICATIONS

- Material: Brass
- Dimensions: D 68 mm, H 72 mm
- Load capacity: 28 kN (based on DIN EN 60598-2-12)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3307		M-MES-Sensorik		

AIR TEMPERATURE SENSOR

Sensor in the two-part plastic housing for recording the air temperature. Installation on an external wall but away from direct solar radiation.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Dimensions: W 42 mm, H 64 mm, D 27 mm
- Connection: 2x screw terminals 1.5 mm²
- Temperature range: -30 °C to +70 °C
- Protection: IP 44

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3115		M-MES-Sensorik		

UNIVERSAL TEMPERATURE SENSOR

Universally deployable sensor with plastic sleeve for temperature measurement in predominantly dry areas. Outdoor installation only with protective tube (plastic or steel tube for applications with higher loads), for example in the concrete slab. The protective tube must be fully closed (as per IP 68). Outdoor installation without a protective tube is not permitted, as the material cannot guarantee watertightness.

TECHNICAL SPECIFICATIONS

- Sensor type: tekmar series 31 (DIN EN 50350)
- Sensor sleeve dimensions: D 6.2 mm, L 29 mm
- Cable connection: Axial
- Connection cable: H03-VV-F 2 x 0.5 mm²
- Temperature range: -30 °C to +70 °C
- Protection: IP 65 (outdoor use only with protective tube)

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
3131/2M	Connection cable 2 m	M-MES-Sensorik		
3131/4M	Connection cable 4 m			
3131/6M	Connection cable 6 m			
3131/20M	Connection cable 20 m			
3131/50M	Connection cable 50 m			
3131/100M	Connection cable 100 m			

SENSOR CABLE (SOLD BY THE METRE)

Original tekmar sensor cable (five-core) for sensors 3310, 3312 and connection cable 3306 for extending the available cable outdoors.

TECHNICAL SPECIFICATIONS

- Type LiYw11Y, 5 x 0.5 mm², microbe-resistant and oil-resistant, longitudinally watertight

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
91029				

CONNECTING SLEEVE FOR CABLE EXTENSIONS

Sealable connecting sleeve for extending a sensor cable outdoors. The tekmar sensor cable or, if a larger conductor cross-section is required, a technically equivalent cable type should be used when extending cables.

MODEL	VERSION	DOCUMENTATION	NET PRICE	PG
79156		M-MES-Sensorik		

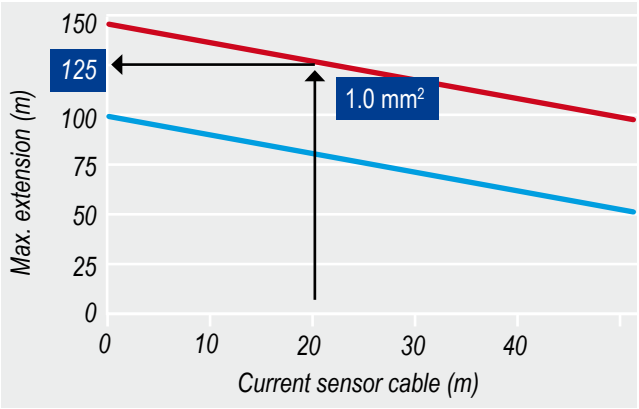
VERSATILE DEPLOYMENTS, EASY INSTALLATION

TECHNICAL NOTES

EXTENDING THE SENSOR SUPPLY CABLE

The supply cable of the sensor that is connected as standard can, if necessary, be extended. The connection to the extension cable should preferably be made in a location that is protected from the weather, for example inside the building. If this is not possible, a connecting sleeve approved for outdoor use and a suitable cable type must always be used.

If extending the cable, the maximum lengths stated in the diagrams (based on the conductor cross-section) must not be exceeded, as correct functioning cannot otherwise be guaranteed.



The process for determining the maximum permissible extension of the sensor cable has four steps:

1. Determine the sensor type and locate a suitable diagram (e.g. 3354, compare diagram on page 35).

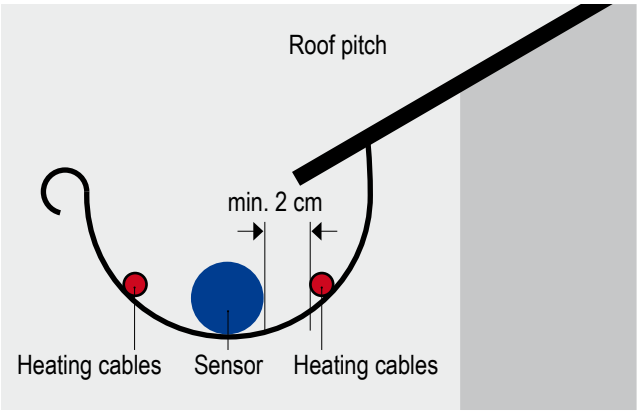
2. On the horizontal axis, determine the length of the original cable already connected to the sensor (e.g. 20 m).

3. Move upward until the line of the planned type for the extension cable is reached (e.g. 1.0 mm²).

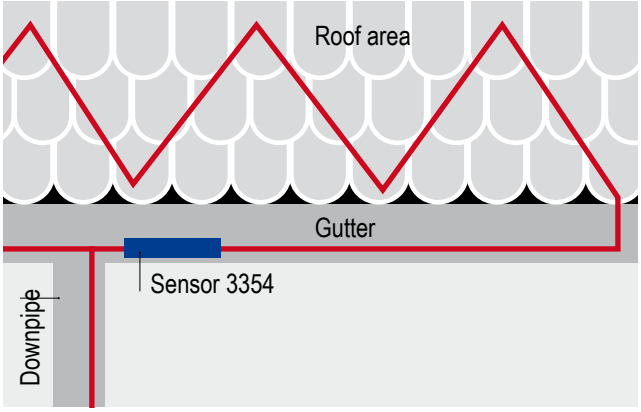
4. Move to the left and read off the maximum permitted length of the extension cable on the vertical axis (result in our example here: Max. 125 m).

INSTALLATION OF SENSOR 3354

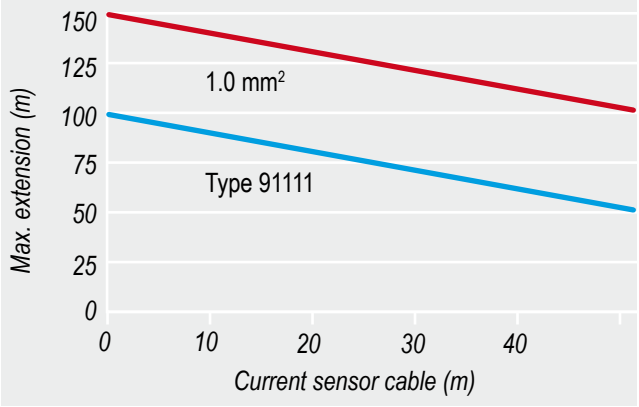
When installing in gutters, sensor 3354 is fitted in such a way that melt water running off the roof pitches can drain over the sensor. In gutters or on flat roofs, the sensor should be positioned near the downpipe or drain.



Installation in the gutter



Position of the sensor in the guttering

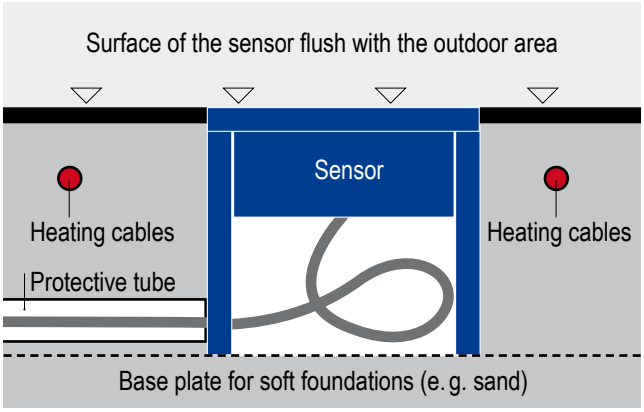


Extension of the sensor cable

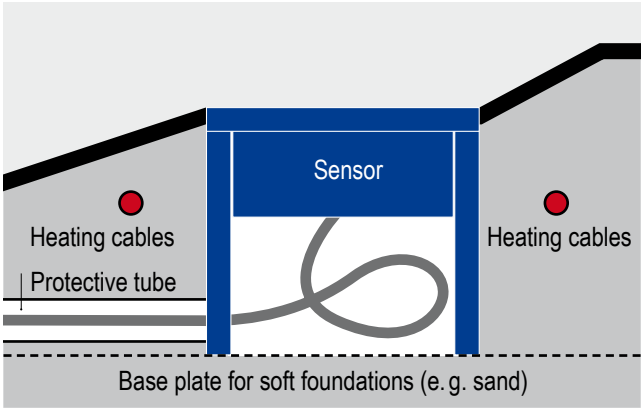
INSTALLATION OF SENSOR 3356

The optimum sensor mounting location is where the critical features in terms of temperature undershoot and moisture initially occur in the outdoor area. It is not a good idea to install the sensor in tracks, shaded areas, near hot air outlets in underground car parks, etc. A protective tube should generally be installed for the sensor supply cable. This offers key benefits, not only for new installations but also when replacing existing units. The combined temperature and moisture sensors need to be fitted within the area to be monitored and heated. It is important for the surface of the sensor to sit horizontally here and be flush with the surrounding surface. If the area to be monitored has a slope, the sensor must be installed in such a way that it`s surface should sits horizontally, so that snow or melt water can collect there. The sensor must not protrude from the surrounding surface. Instead, it should rather sit a bit lower. Important note, it must be assured the draining water ca flow over it.

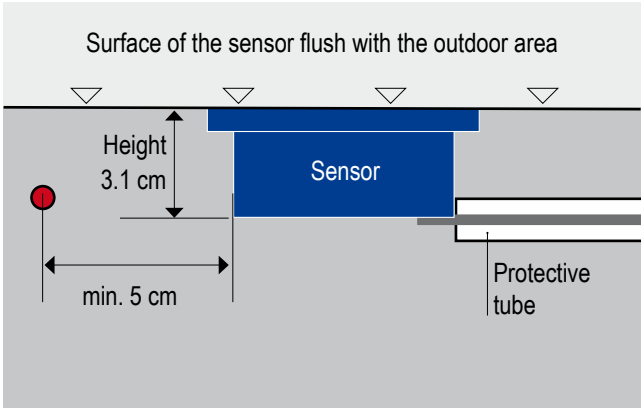
If the area only permits a low installation depth, the sensor can be used without a ground sleeve, with the cable being guided laterally. The necessary height is then just 31 mm.



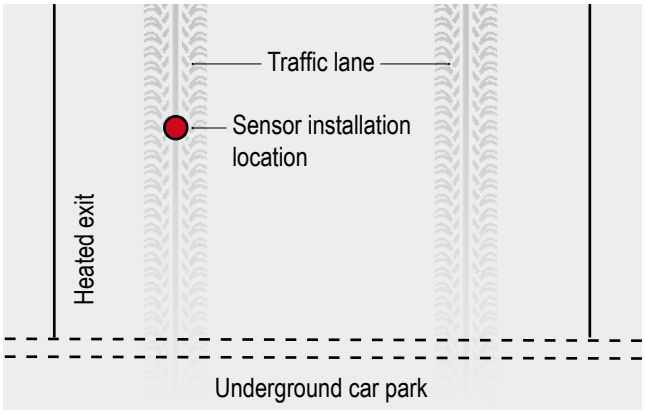
Installation with ground sleeve in flat outdoor areas



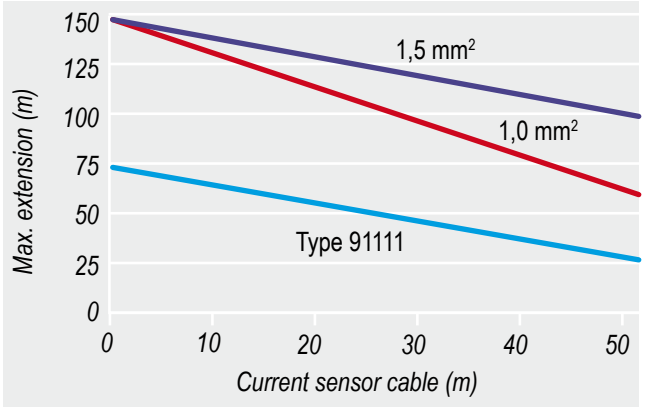
Installation with ground sleeve in outdoor areas with slopes



Installation without ground sleeve in low outdoor areas



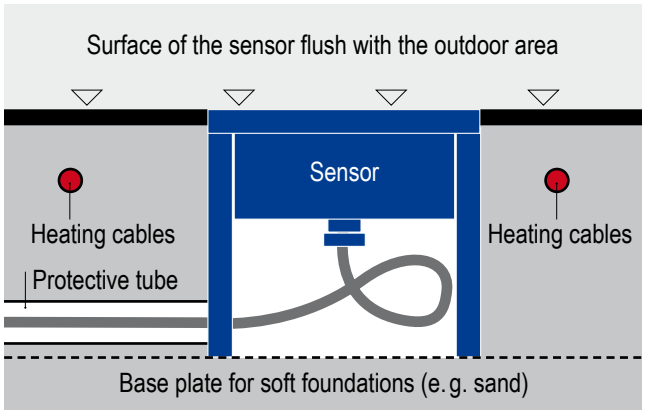
Installation in roads (preferred in traffic lanes)



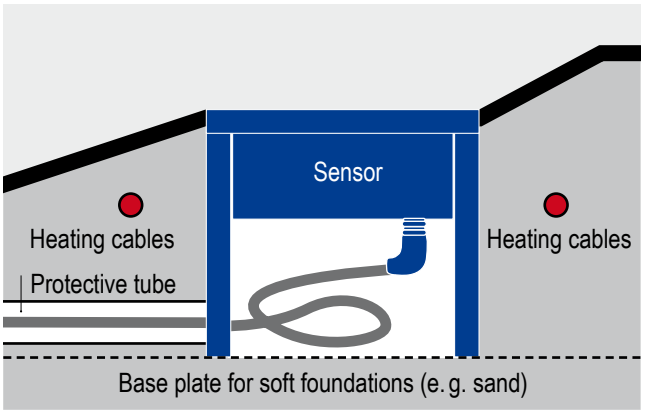
Extension of the sensor cable

INSTALLATION OF TEMPERATURE AND MOISTURE SENSORS 3310, 3311 AND 3312

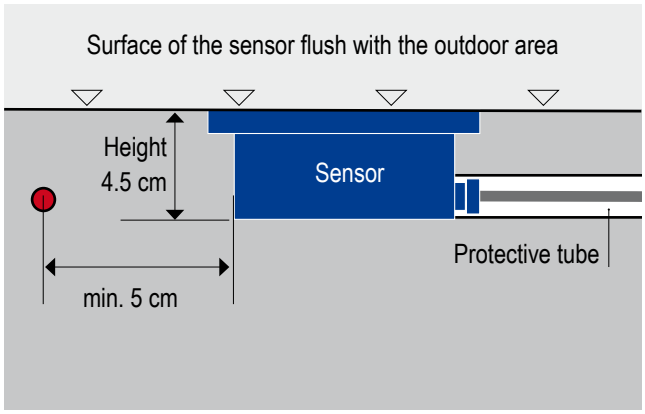
The optimum sensor mounting location is where the critical features in terms of temperature undershoot and moisture initially occur in the outdoor area. It is not a good idea to install the sensor in tracks, shaded areas, near hot air outlets in underground car parks, etc. A protective tube should generally be installed for the sensor supply cable. This offers key benefits, not only for new installations but also when replacing existing units. The combined temperature and moisture sensors need to be fitted within the area to be monitored and heated. It is important for the surface of the sensor to sit horizontally here and be flush with the surrounding surface. If the area to be monitored has a slope, the sensor must be installed in such a way that the surface sits horizontally, so that snow or melt water can collect there. A sensor surface that tracks the contours of a slope will lead to incorrect moisture detection. The sensor must not protrude from the surrounding surface. Instead, it should rather sit a bit lower, so that draining water collects there.



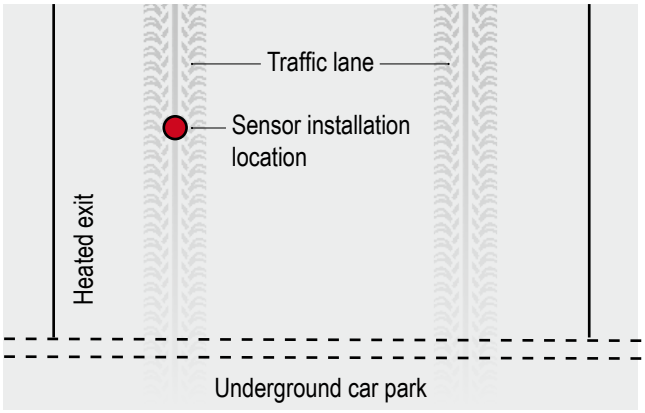
Installation with ground sleeve in flat outdoor areas



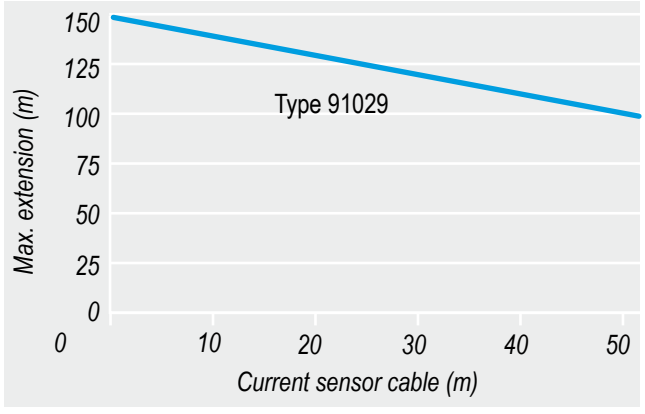
Installation with ground sleeve in outdoor areas with slopes



Installation without ground sleeve in low outdoor areas



Installation in roads (preferred in traffic lanes)

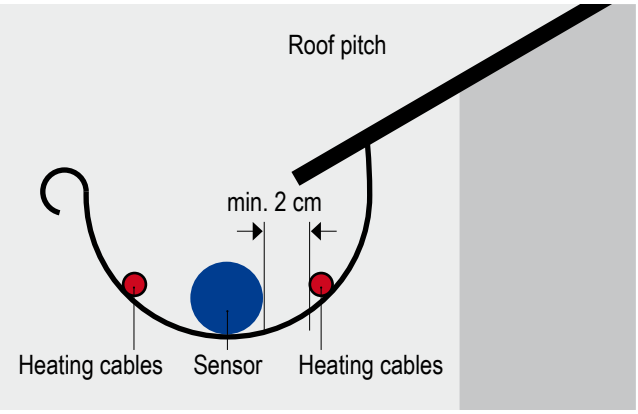


Extension of the sensor cable

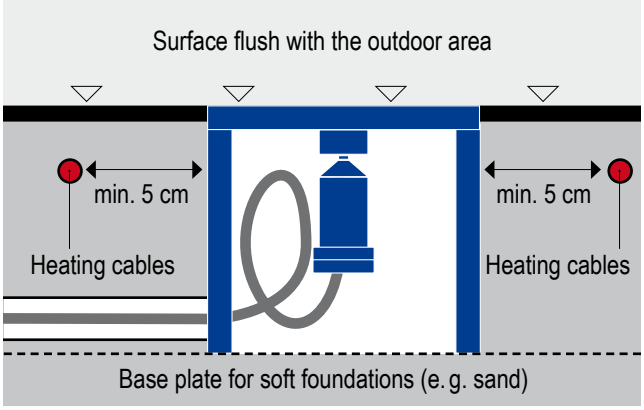
If the area only permits a low installation depth, sensor 3310 can be used (without a ground sleeve and with lateral cable entry). The height is then just 45 mm.

INSTALLATION OF TEMPERATURE SENSOR 3154 (OUTDOORS)

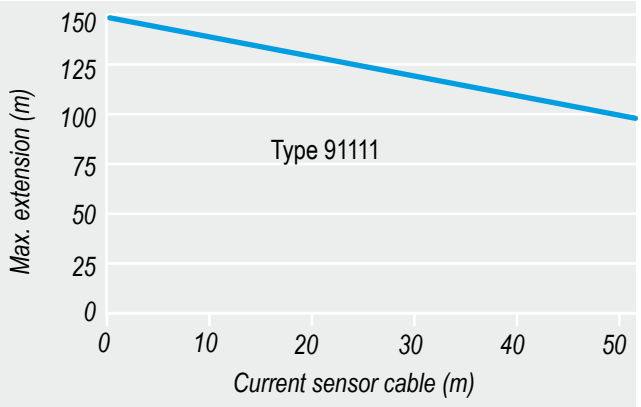
The rod-shaped sensor with fully encapsulated, robust design made of brass is suitable for measuring temperature values in gutters, outdoor areas and other areas at risk of frost. It has also been tried and tested in applications with satellite dishes and railway points. Extremely compact design with axial cable connection and threaded bolt for fixing in position.



Installation in gutters



Installation with ground sleeve in outdoor areas

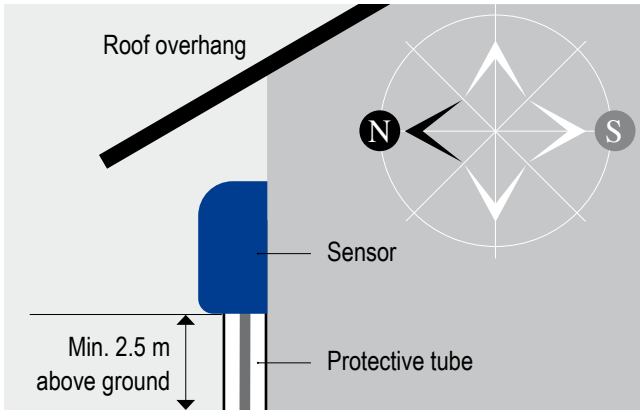


Extension of the sensor cable

INSTALLATION OF TEMPERATURE SENSOR 3115 (AIR)

Sensor type 3115 is designed to record outdoor temperatures. To this end, the sensor housing should be fitted to an external wall at a height of approximately 2.5 m above the ground. The installation location should be protected from direct solar radiation and inclement weather, e. g. below a roof overhang. It is important to ensure that there are no heat sources or building openings in the direct vicinity. Installation should ideally be on a north-facing wall.

The sensor must be installed in such a way that the cable enters from below, as this is the only way to ensure compliance with the defined protection class. The cable can be routed in a protective tube on the wall or passed directly from the sensor through the wall and then routed internally. The maximum cable length is 100 m.



Installation on an external wall

tekmar Regelsysteme GmbH
Möllneyer Ufer 17
45257 Essen, Germany

Tel. + 49 (0) 201 486 11 0
Fax + 49 (0) 201 486 11 11

mail@tekmar.de
www.tekmar.de

3/2023