# TF25+ (LCD) RS485 BACnet MS/TP

Cable temperature sensor

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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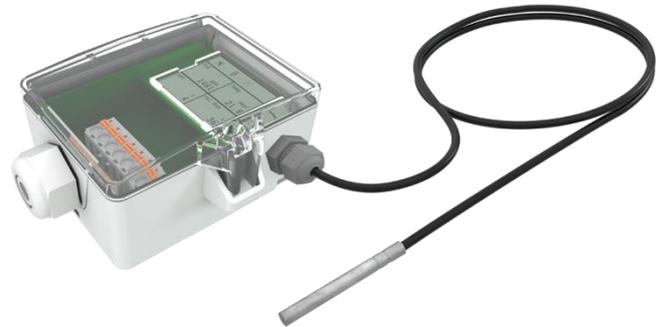
»APPLICATION

Cable sensor for temperature measurement in HVAC applications. In conjunction with a Thermowell pocket suitable for temperature measurement in duct applications. Designed for control and monitoring applications.

»TYPES AVAILABLE

Cable sensors -50..+160 °C – active RS485 BACnet MS/TP
- TF25+ RS485 BACnet T160 050.06 L1000
- TF25+ RS485 BACnet T160 100.06 L1000

mounting length 50/100/150/200/250 mm

»SECURITY ADVICE – CAUTION

The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with
- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

»PRODUCT TESTING AND CERTIFICATION

CE

Declaration of conformity
The declaration of conformity of the products can be found on our website
https://www.thermokon.de/direct/en-gb/categories/tf25plus

»NOTES ON DISPOSAL

The crossed-out wheelie bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: www.thermokon.com

»BUILD-UP OF SELF-HEATING BY ELECTRICAL DISSIPATIVE POWER

Sensors with electronic components always have a dissipative power, which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power has to be considered when measuring temperature. In case of a fixed operating voltage (±0,2 V) this is normally done by adding or reducing a constant offset value.

Thermokon transducers can be operated with variable operating voltages. The transducers are set at the factory with a reference operating voltage of 24 V =.

At this voltage, the expected measuring error of the output signal will be the least. Other operating voltages, can cause a measurement deviation changing power loss of the sensor electronics.

A recalibration can be carried out directly on the unit or via a software variable (app or bus).

Remark: Occurring draught leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

»USE ENCLOSURE WITH UV AND WEATHER RESISTANCE

After some time, outdoor mounted plastics can lose their color and quality. Therefore, all USE housings are made of special white polycarbonate (PC). The light-stable colorants and additives are used to achieve optimum protection of the polymer while maintaining color stability. The titanium dioxide used is specially developed for polycarbonate and offers excellent UV protection through the reflection of the entire light spectrum including the UV component by 340 nm. This effectively counteracts the otherwise occurring photochemical polymer degradation. The colors stay full for a long time without fading. The material is also resistant to cold and frost.

»TECHNICAL DATA

|	
Measuring values	temperature
Output voltage	0..10 V or 0..5 V, min load 10kΩ (live-zero configuration via Thermokon USEapp)
Network technology	RS485 BACnet MS/TP, **Fail-safe Biasing required**
Power supply	15..35 V = or 19..29 V ~ SELV *With alternating voltage, the correct polarity must be ensured*
Power consumption	max. 2,3 W (24 V =) | max. 4,3 VA (24 V ~)
Output signal range temp. **Scaling analogue output*	default setting: -20..+80 °C selectable from 8 temperature ranges -50..+50 | -20..+80 | -15..+35 | -10..+120 | 0..+50 | 0..+100 | 0..+160 | 0..+250 °C, optionally configurable via Thermokon USEapp
Operating temperature range ** Max. permissible operating temperature*	**sensor pocket** -50..+160 °C optional -50..+250 °C (T250)	**enclosure** -35..+70 °C	**mounting base** -35..+90 °C
Accuracy temperature	±0,5 K (typ. at 21 °C)
Enclosure	enclosure USE-M, PC, pure white, with removable cable entry
Protection	**enclosure** IP65 according to EN 60529	**sensor pocket** IP65 according to EN 60529, SI-Protection, 16-point pressed, optional, Rolled: IP67 according to EN 60529 with SI-Protection
Cable entry	M25, for wire max. Ø=7 mm, seal insert for fourfold cable entry
Connection electrical	**Mainboard** removable plug-in terminal, max. 2,5 mm²	**Plug-in card** removable plug-in terminal, max. 1,5 mm²
Pocket	stainless steel V4A, Ø=6 mm, mounting length: 50 | 100 | 150 | 200 | 250 mm, tension spring (optional)
Ambient condition	max. 85% rH short term condensation
Notes	PE connection wire available (please request)

When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected and all "negative" operating voltage input terminals (-) (=reference potential) are connected (in-phase connection of field devices).In the case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device.
The consequential short-circuit current flowing through this field my cause damage to it. Therefore, pay attention to correct wiring.

»CONNECTION PLAN

If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown. To change the output voltage range (default 0..10 V to 0..5 V) via jumper, the display must be removed from the board first.

TF25+ (LCD) **RS485**

UB+ *(15..35 V ⎓ / 19..29 V ∼)*
GND
n.c.
AOU1 *(Temperature | 0..10 V)*
GND
UB+ *(15..35 V ⎓ / 19..29 V ∼)*

Looped through power supply, valid from 03.08.2020 (20216)

A+
A+
B-
B-

0..5 V
0..10 V
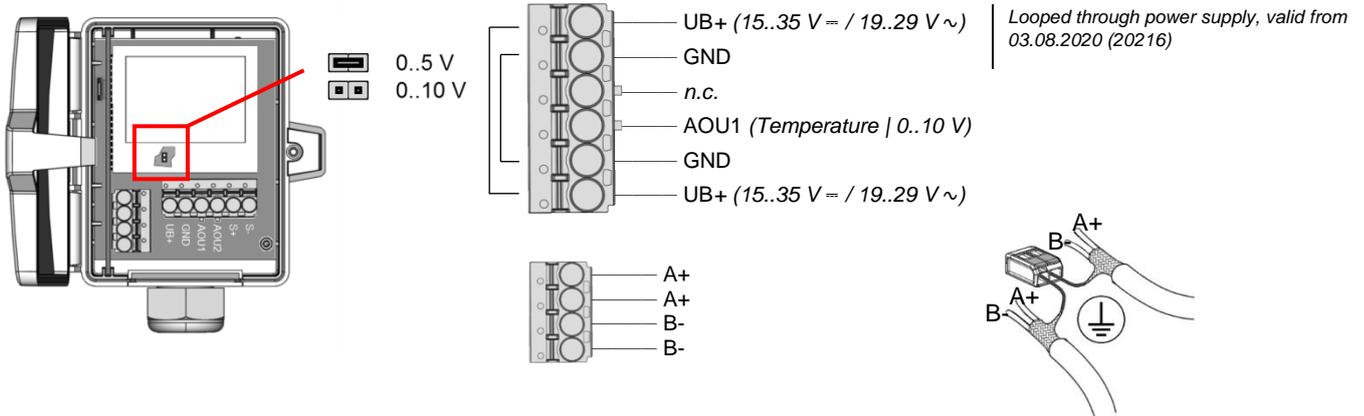
»DIP SWITCHES, PLUG-IN CARD

The BACnet address of the device is set binary coded in the range of 1 ... 127 via 7 dip-switches. (the address 0 is reserved and cannot be selected).

*factory default settings

Termination 120 Ω
Not active* | active

Baud
9600* | 19200
38400 | 76800

BACnet adress
ON=2^0 (1)* | ON=2^1 (2) | ON=2^2 (4) | ON=2^3 (8) | ON=2^4 (16)
ON=2^5 (32) | ON=2^6 (64)

Adress-Bsp.:
2+8+16+32+64=122
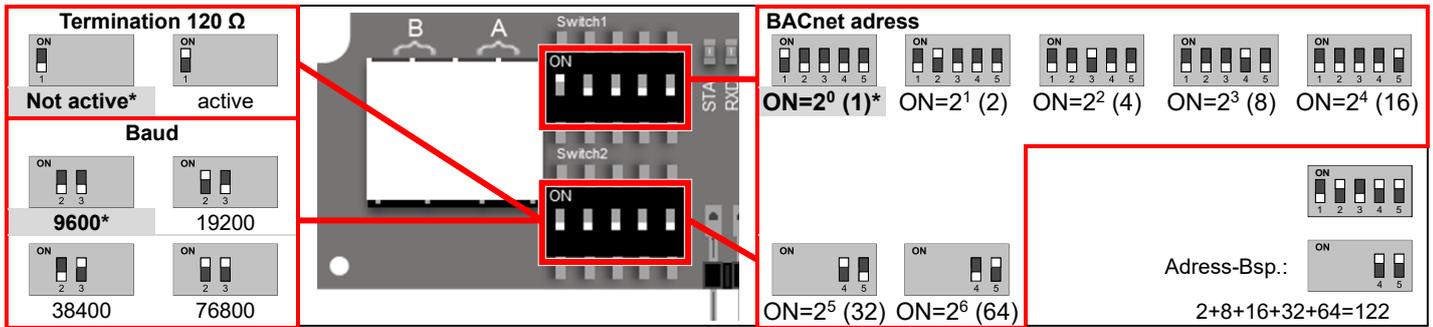
Address	Access	Description	Object AV-38 = 1 (Unit SI)		Object AV-38 = 2 (Unit Imperial)	
			COV increment / Unit		**COV increment / Unit**	
AI-0	R	Temperature 1	0..+250 °C	°C	0..+480 °F	°F

BACnet Objects, PICS and BIBBs:
USE-RS485 BACnet interface
A detailed description of the BACnet interface can be found at the following link: **Download**

»DIMENSIONS (MM)

Waterproof rolled

16-point pressed

with tension spring (optional)
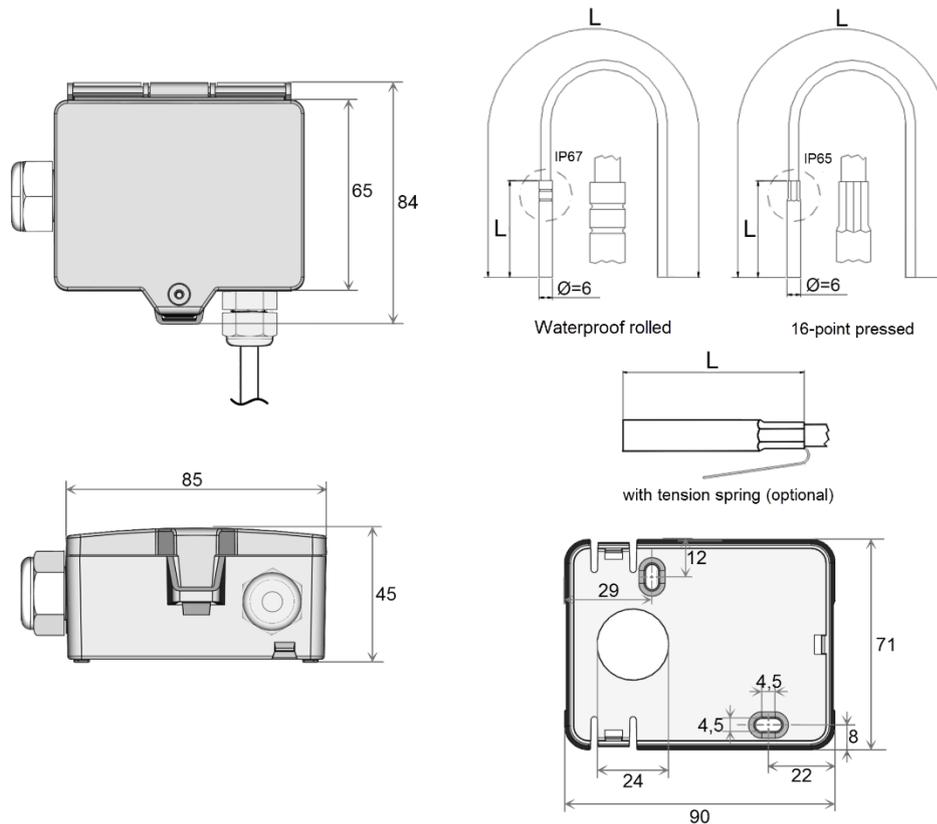
»ACCESSORIES (INCLUDED IN DELIVERY)

Mounting base   Item No. 631228
Mounting kit universal   Item No. 698511
• Cover screw + screw cover• 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

»ACCESSORIES (OPTIONAL)

RS485 Biasing Adapter   Item No. 811378
Bluetooth dongle   Item No. 668262

Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)   Item No. 641364
Mounting flange MF6DS   Item No. 669016
KL6VA – Compression fittings G 1/4" for Ø=6 mm with cutting ring VA, stainless steel   Item No. 103213
Mounting flange MF6 (brass)   Item No. 003407

Thermowell pockets stainless steel / brass for sensors with pocket Ø=6 mm

length	50 mm	100 mm	150 mm
THMSDS	610995	611008	611015
THVADS	611152	611817	611824

MS-thermowell pocket (brass, suitable up to 16 bar) type THMSDS <xx>.
VA-thermowell pocket (stainless steel, suitable up to 40 bar) type THVADS <xx>.