

Datasheet

Subject to technical alteration
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Application

Immersion sensor with hinged lid enclosure USE complete and integrated thermowell pocket for temperature measurement of gases and liquids in pipework applications. Sensor is especially designed for fast processes. Ideal for e.g. hot tap water process when a very fast feedback is needed for a pleasant control result.

Types Available

Immersion sensor temperature – active RS485 Modbus

SFK02+ FR RS485 Modbus 050.04
SFK02+ FR RS485 Modbus 100.06/04
SFK02+ FR RS485 Modbus 200.06/04

Optional mounting length 50/100/200/300 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

Notes on Disposal



As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

Build-up of Self-Heating by Electrical Dissipative Power

Temperature 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 ($\pm 0,2$ V) this is normally done by adding or reducing a constant offset value. As Thermokon transducers work with a variable operating voltage, only one operating voltage can be taken into consideration, for reasons of production engineering. Transducers $0..10$ V / $4..20$ mA have a standard setting at an operating voltage of 24 V =. That means, that at this voltage, the expected measuring error of the output signal will be the least. For other operating voltages, the offset error will be increased by a changing power loss of the sensor electronics. If a re-calibration should become necessary later directly on the sensor, this can be done by means of the USEapp software and an optional Bluetooth interface.

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

Technical Data

Measuring values	temperature	
Output voltage	0..10 V or 0..5 V, min load 10k Ω (live-zero configuration via Thermokon USEapp)	
Network technology	RS485 Modbus, RTU, half-duplex, baud rate 9.600, 19.200, 38.400 or 57600, parity: none (2 stopbits), even or odd (1 stopbit)	
Power supply	15..35 V = or 19..29 V ~	
Power consumption	max. 2,3 W (24 V =) max. 4,3 VA (24 V ~)	
Output signal range temp. *Scaling analogue output	-20..+80 °C (default setting), 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	electronic enclosure -35..+70 °C
Accuracy temperature	$\pm 0,5$ K (typ. at 21 °C) , time constant: $T_{63\%}$ 2,5 s	
Enclosure	enclosure USE-M, PC, pure white, with removable cable entry	
Protection	IP65 according to EN 60529	
Cable entry	M25, for wire max. $\varnothing=7$ mm, seal insert for fourfold cable entry	
Connection electrical	Mainboard removable plug-in terminal, max. 2,5 mm ²	Plug-in card removable plug-in terminal, max. 1,5 mm ²
Pocket	stainless steel V4A, $\varnothing=6$ 4 mm, mounting length: 50 100 200 300 mm, thread R 1/2" max. operating pressure 10 bar	
Ambient condition	max. 85% rH short term condensation	

Configuration



The Thermokon bluetooth dongle with micro-USB is required for communication between USEapp and USE-M / USE L (Item No.: 668262). Commercial bluetooth dongles are not compatible.



Application-specific reconfiguration of the devices can be carried out using the Thermokon USEapp. The configuration is carried out in the voltage-supplied state.



The configuration-app and the app description can be found in the Google Play Store or in the Apple App Store.

Application notice



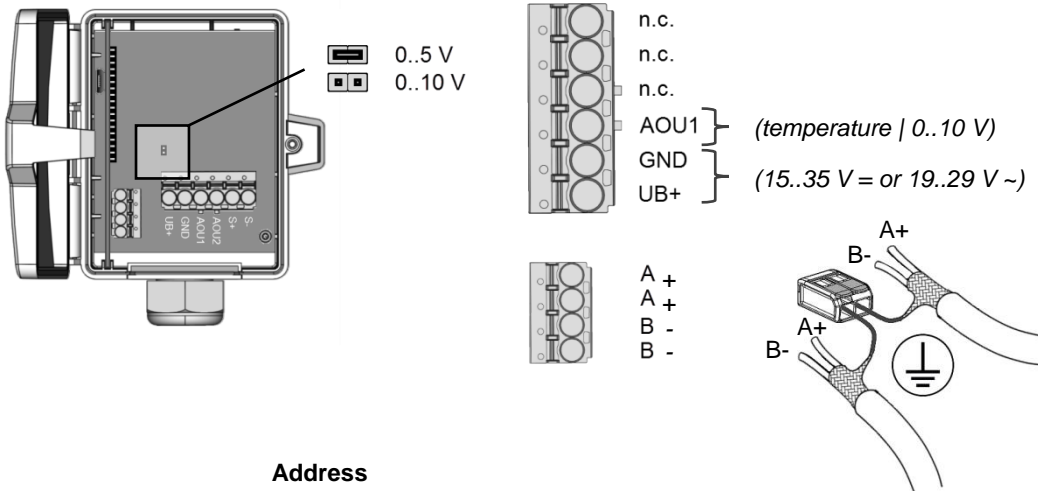
The housing cover must be completely closed in order to ensure the accuracy and reproducibility of the measured values during a test or service log via USEapp.

The Bluetooth dongle snaps into the socket easily. When removing, please fix the plug-in card (option PCB) so that it is not unintentionally pulled out.

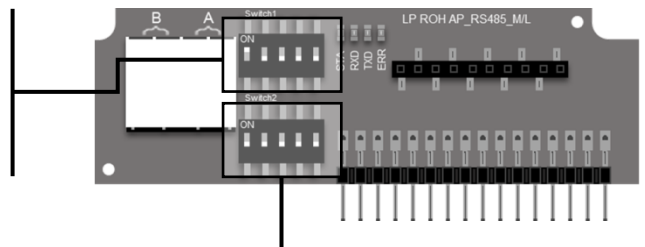
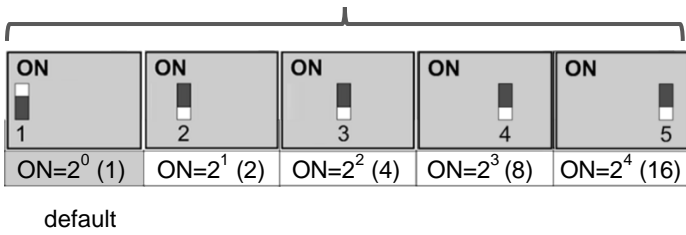
Connection Plan

If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown.

SFK02+ FR LCD RS485 Modbus



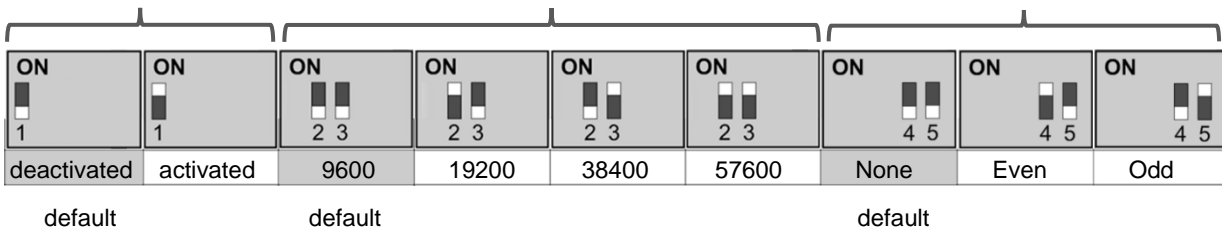
Address



Termination 120Ω

Baud rate

Parity



Register 400 = 1 (unit SI)

Address	Access	Description	Resolution / Unit		
			SI	0.1	°C
0	R	Temperatur			

Register 400 = 2 (unit Imperial)

Address	Access	Description	Resolution / Unit		
			Imperial	0.1	°F
0	R	Temperatur			

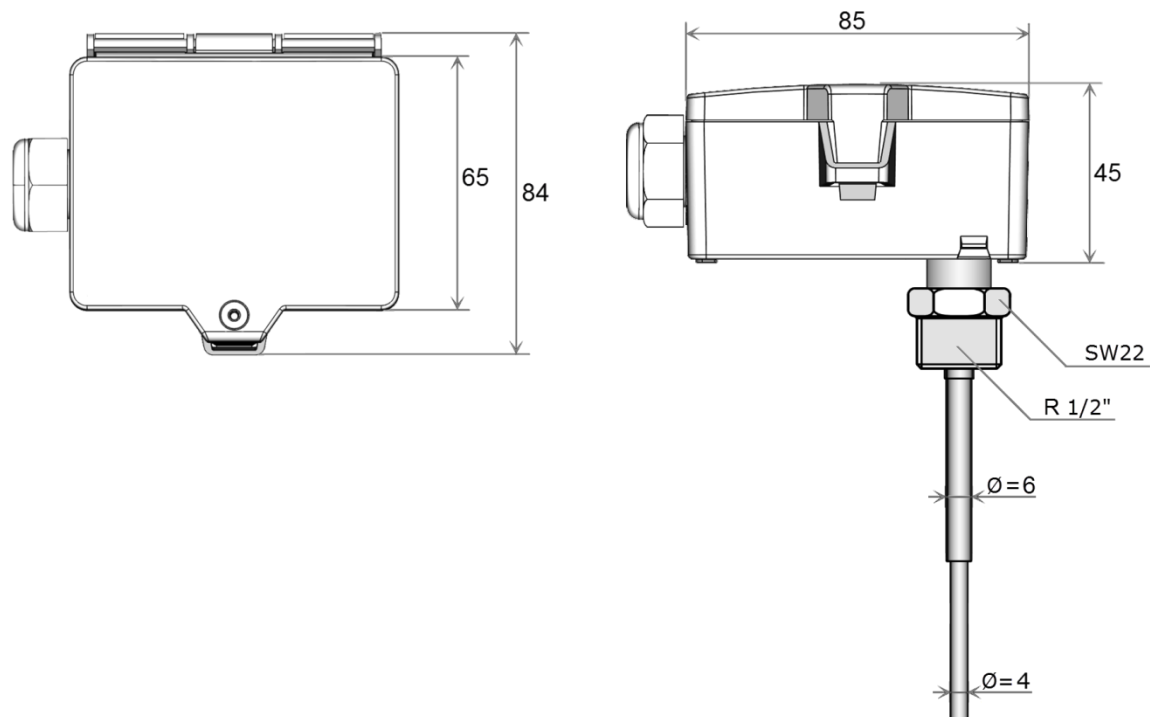
The modbus address of the device is set in the range of 1 ... 31 (binary encoded) using a 5-pole DIP switch. With address 0 via DIP, an extended address range (32..247) is available via USEapp.

**Modbus addresses:**

USE-RS485 Modbus Interface

A detailed description of the Modbus addresses can be found under the following link:

→ [Download](#)

Dimensions (mm)**Accessories (included in delivery)**

Mounting kit universal

• Cover screw + screw cover • 2 Rawplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 698511

Accessories (optional)

Bluetooth dongle

Item No. 668262