VFG54+ RS485 Modbus

Contact temperature sensor

thermokon®

HOME OF SENSOR TECHNOLOGY

Datasheet

USEapp ✓

Application

Duct/Immersion sensor for measurement of air temperature and other gaseous mediums for HVAC applications (e.g. supply and exhaust ducts) with pocket Ø=6 mm. Can be used as an immersion temperature sensor combined with a thermowell pocket.

Types Available

Contact sensors temperature – active RS485 Modbus

VFG54+ RS485 Modbus

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 (±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 a trimming potentiometer on the sensor board.

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

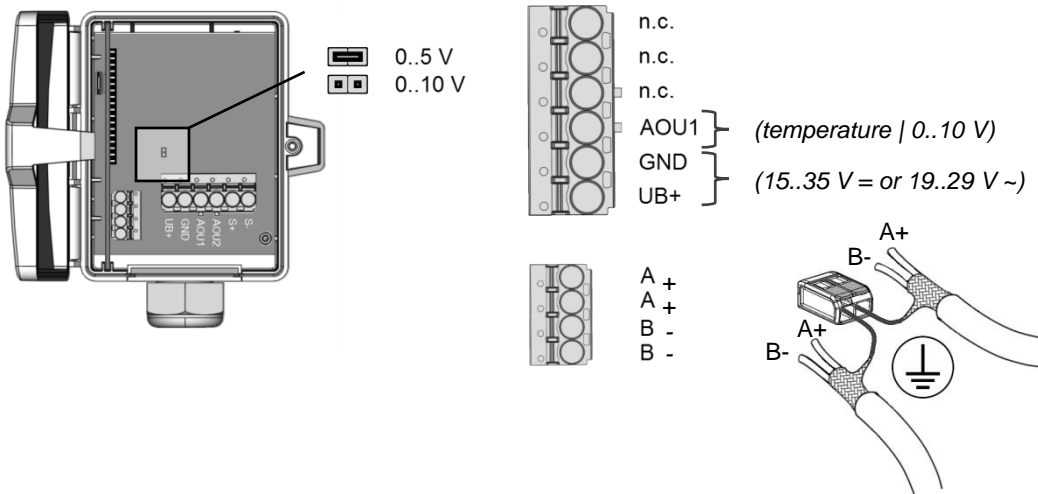| Measuring values	temperature
Output voltage	0..10 V or 0..5 V, min load 10kΩ (live-zero configuration via Thermokon USEapp)
Network technology	RS485 Modbus
Power supply	15..35 V = or 19..29 V ~
Power consumption	max. 2,5 W (24 V =) | max. 4,3 VA (24 V ~)
Measuring range temp.	-20..+80 °C (default setting), optionally configured via Thermokon USEapp
Accuracy temperature	±0,5 K (typ. at 21 °C)
Display	LCD 29x35 mm with RGB backlight
Enclosure	enclosure USE-M, PC, pure white, with removable cable entry
Protection	IP65 according to EN 60529
Cable entry	M25 for cable max. Ø=7 mm, seal insert for fourfold cable entry
Connection electrical	removable plug-in terminal, max. 2,5 mm²
Modbus clamp	removable plug-in terminal, max. 1,5 mm²
Pocket	brass, spring loaded sensor
Ambient condition enclosure	-20..+70 °C, max. 85% rH short term condensation
Mounting	installation possible in or across the direction of the pipe

Mounting Advices

The device is fixed using the tightening strap. Use contact fluid for better heat transfer between sensor and measuring medium. To avoid permeation of condensate, mount the sensor on top of the tube, if possible. The installation is possible in or across the direction of the pipe.
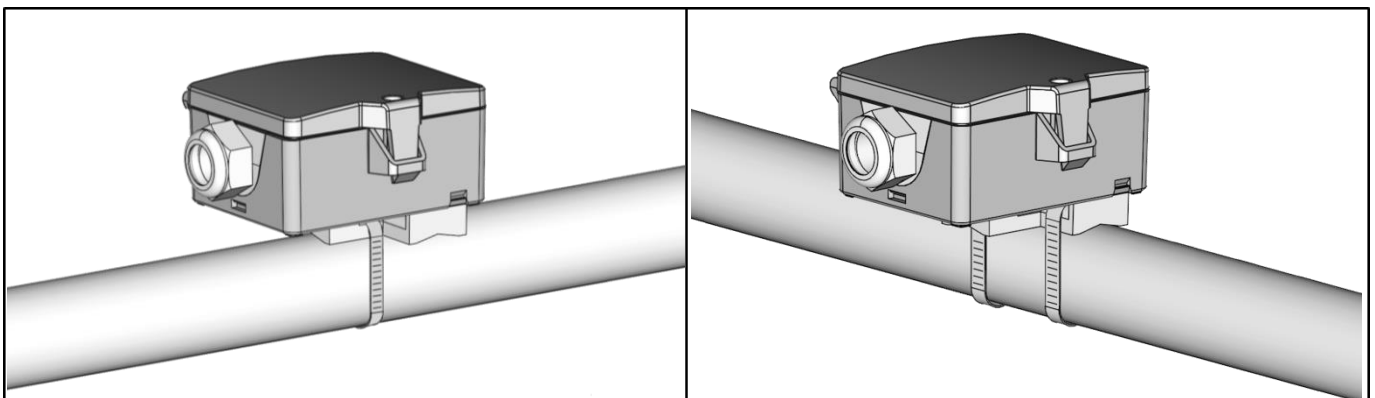
Connection Plan

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

VFG54+ **RS485 Modbus**

0..5 V
0..10 V

n.c.
n.c.
n.c.
AOU1 } *(temperature | 0..10 V)*
GND }
UB+ } *(15..35 V = or 19..29 V ~)*

A +
A +
B -
B -

A+
B-
A+
B-

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.
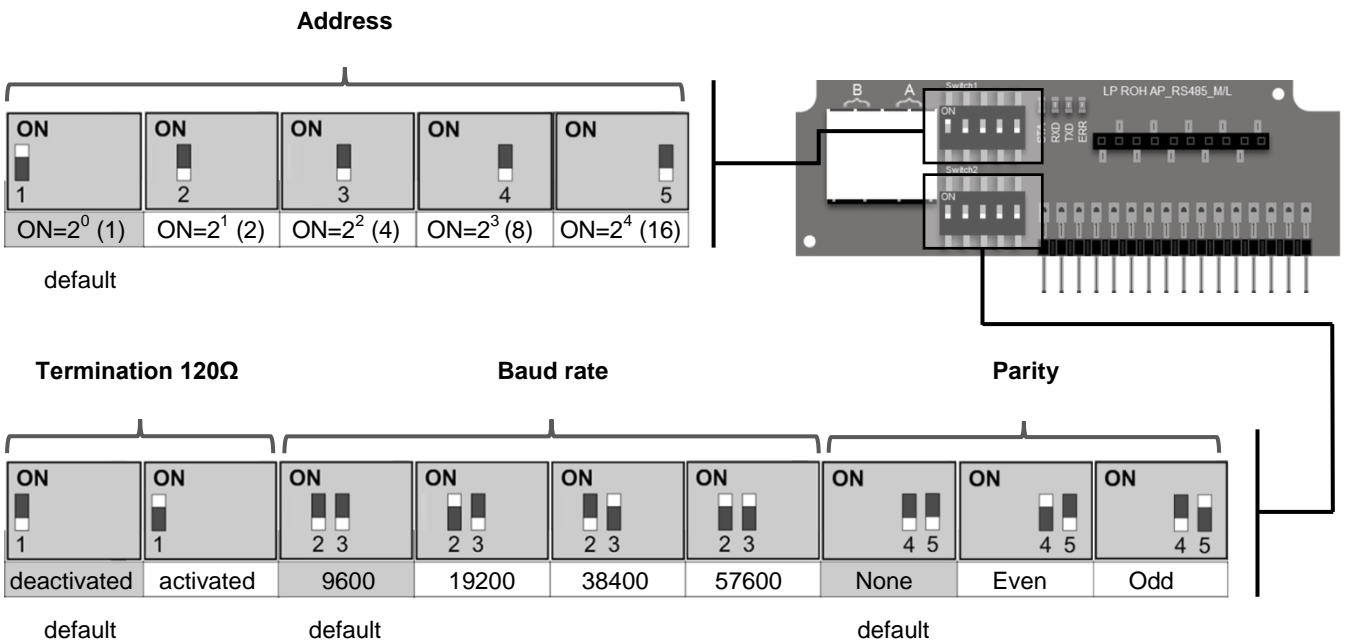
Modbus addresses:
USE-RS485 Modbus Interface

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

Address

ON	ON	ON	ON	ON
1	2	3	4	5
ON=2^0 (1)	ON=2^1 (2)	ON=2^2 (4)	ON=2^3 (8)	ON=2^4 (16)

default

Termination 120Ω **Baud rate** **Parity**

ON	ON	ON	ON	ON	ON	ON	ON	ON
1	1	2 3	2 3	2 3	2 3	4 5	4 5	4 5
deactivated	activated	9600	19200	38400	57600	None	Even	Odd

default default default

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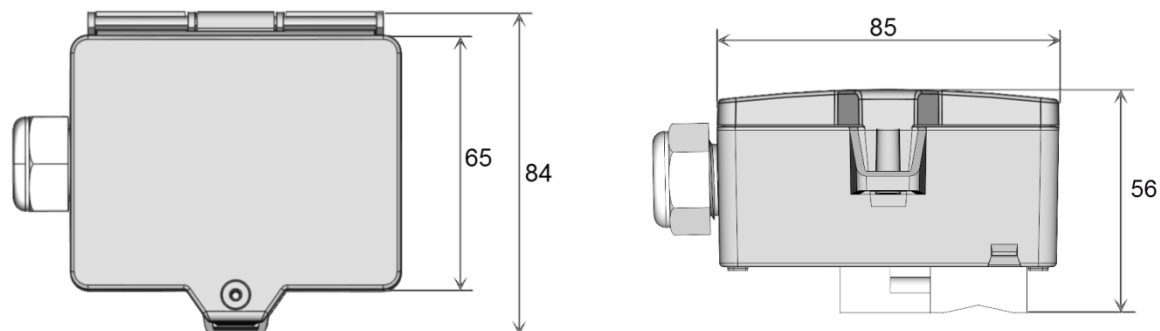
Application-specific reconfiguration of the devices can be carried out using the Thermokon USEapp. The configuration is carried out in the voltage-supplied state.

The configuration-app and the app description can be found in the download area of our webpage.

→ **Download (APK-file for Android)**

Dimensions (mm)

Accessories (included in delivery)

Mounting kit 4   Item No. 674140
• Cable entry M25 • Wago twofold terminal • Cover screw • 2 Screws (countersunk head)

Accessories (optional)

Bluetooth dongle	Item No. 668262
Tension clamp for pipes Ø up to 110 mm with contact fluid	Item No. 658911
Tension clamp for pipes Ø up to 250 mm with contact fluid	Item No. 648103
Tightening strap PA for pipes Ø up to 100 mm with contact fluid	Item No. 668071
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	Item No. 641364