

# FTK+ RS485 Modbus

Duct sensor for humidity and temperature

**thermokon**<sup>®</sup>  
HOME OF SENSOR TECHNOLOGY

## Datasheet

Subject to technical alteration  
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## Application

Duct sensor for measuring humidity and temperature in gaseous media of heating, ventilation and air-conditioning systems. In delivery condition, the sensor is designed for measuring temperature and relative humidity. Alternatively the output can be set to absolute humidity, enthalpy or dew point (depending on the model, changeable via jumper or using Thermokon USEapp). LCD models with RGB background light have a transparent cover. Display configuration and threshold values for color changes can be parameterized via Thermokon USEapp. A mounting flange and fixing material are included in delivery.

## Types Available

### Duct humidity sensor with display temperature + humidity – active RS485 Modbus

FTK+ 140 LCD RS485 Modbus incl. MF20

FTK+ 270 LCD RS485 Modbus incl. MF20

FTK+ 400 LCD RS485 Modbus incl. MF20

## 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 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.**

## Application Notice for Humidity Sensors

**Refrain from touching the sensitive humidity sensor/element. Touching the sensitive surface will void warranty.**

For standard environmental conditions re-calibration is recommended once a year to maintain the specified accuracy.

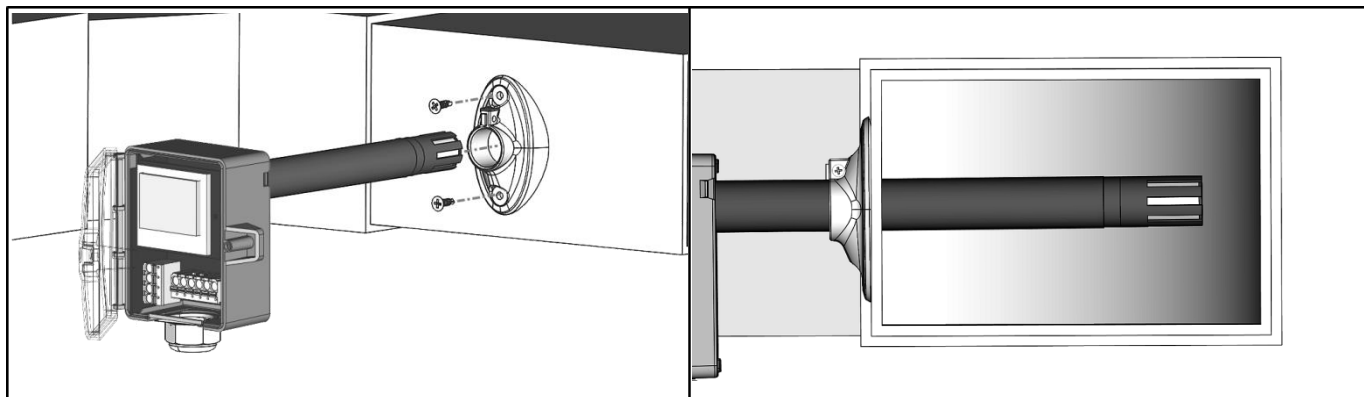
When exposed to high ambient temperature and/or high levels of humidity or presence of aggressive gases (i.e. chlorine, ozone, ammonia) the sensor element may be affected and re-calibration may be required sooner than specified. Re-calibration and deterioration of the humidity sensor due to environmental conditions are not subject of the general warranty.

## Technical Data

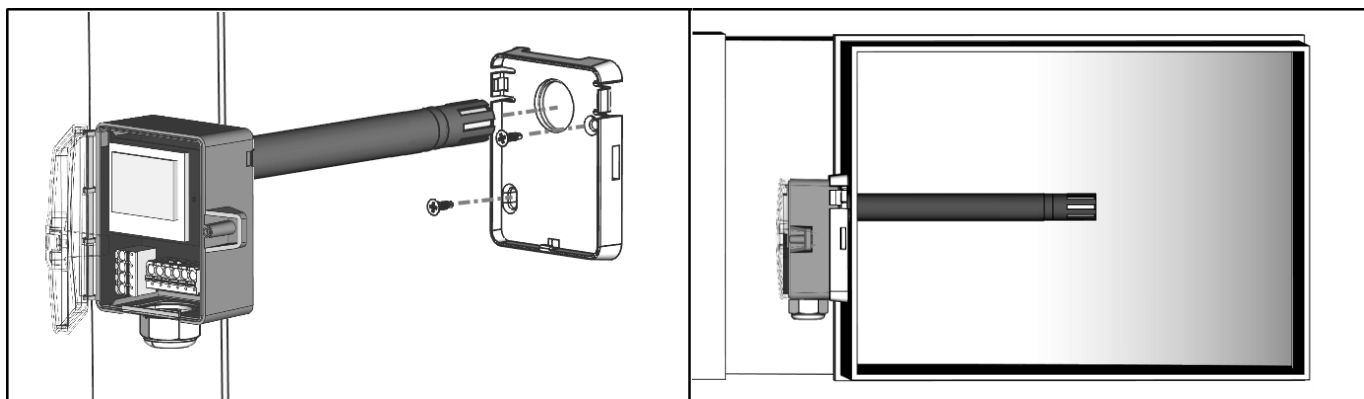
Measuring values	temperature, humidity (humidity output configurable)
Output voltage	2x 0..10 V or 0..5 V, min. load 10 k $\Omega$ (live-zero configuration via Thermokon USEapp)
Network technology	RS485 Modbus
Power supply	15..35 V = or 19..29 V ~
Power consumption	max. 0,4 W (24 V =)   0,8 VA (24 V ~)
Measuring range temp.	-20..+80 °C (default setting), optionally configured via Thermokon USEapp
Measuring range humidity	0..100% rH non-condensing, optionally configured via Thermokon USEapp (enthalpy, absolute humidity, dew point)
Accuracy temperature	$\pm 0,3$ K (typ. at 21 °C)
Accuracy humidity	$\pm 2\%$ between 10..90% rH (typ. at 21 °C)
Air speed	max. 12 m/s
Display	LCD 29x35 mm with RGB backlight
Enclosure	enclosure USE-M, PC, pure white, cover PC, transparent, with removable cable entry
Protection	IP65 according to EN 60529
Cable entry	M25 for cable max. $\varnothing=7$ mm, seal insert for fourfold cable entry
Connection electrical	removable plug-in terminal, max. 2,5 mm <sup>2</sup> Modbus clamp removable plug-in terminal, max. 1,5 mm <sup>2</sup>
Pipe	PA6, black, $\varnothing=19,5$ mm, length=140   270   400 mm
Filter	stainless steel wire mesh
Ambient condition	-20..+70 °C, short term condensation

## Mounting Advices

The sensor can be mounted on the ventilation duct by means of the mounting flange MF20 TPO (optional with mounting base).



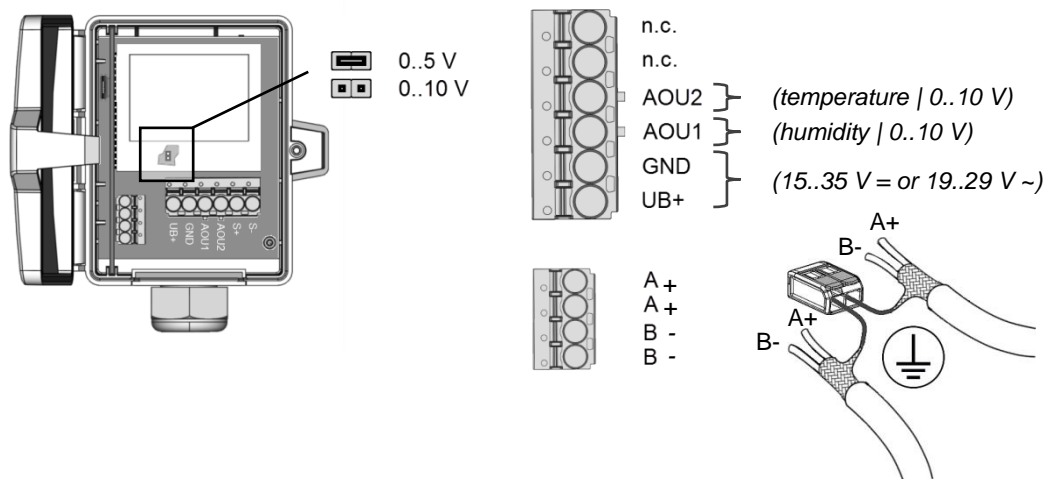
optional:



## 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.

### FTK+ LCD RS485 Modbus



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.

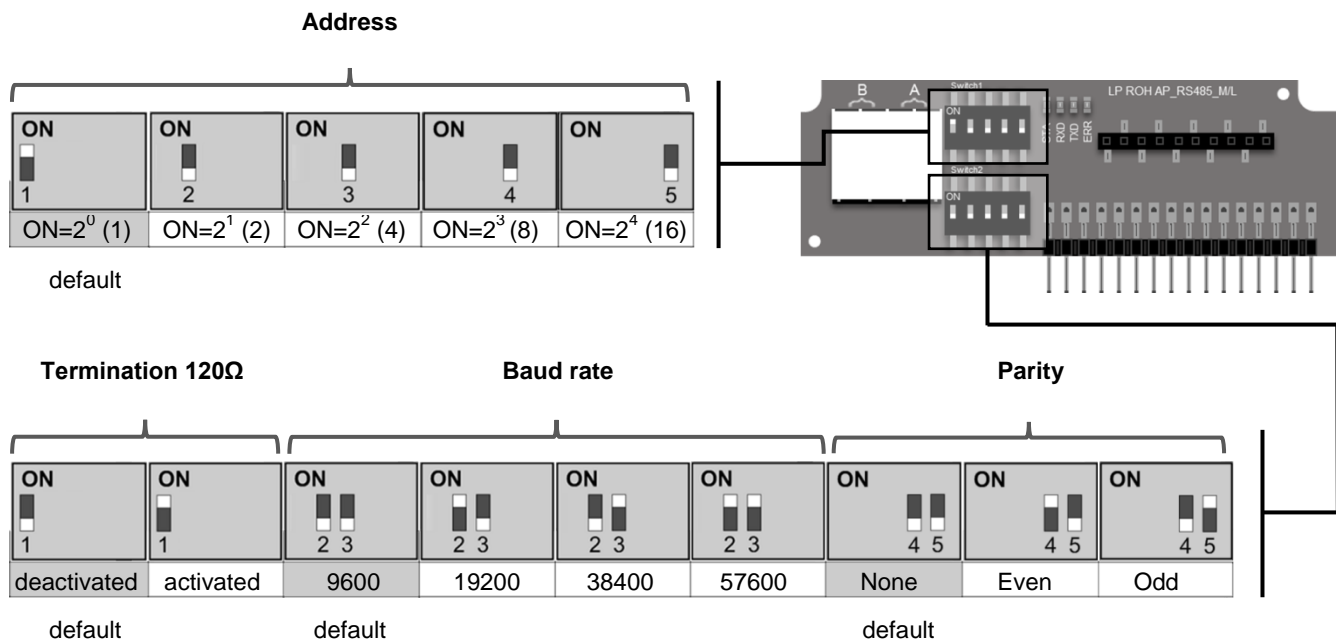


#### Modbus addresses:

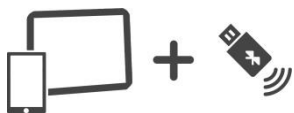
USE-RS485 Modbus Interface

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

→ [Download](#)



## 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.

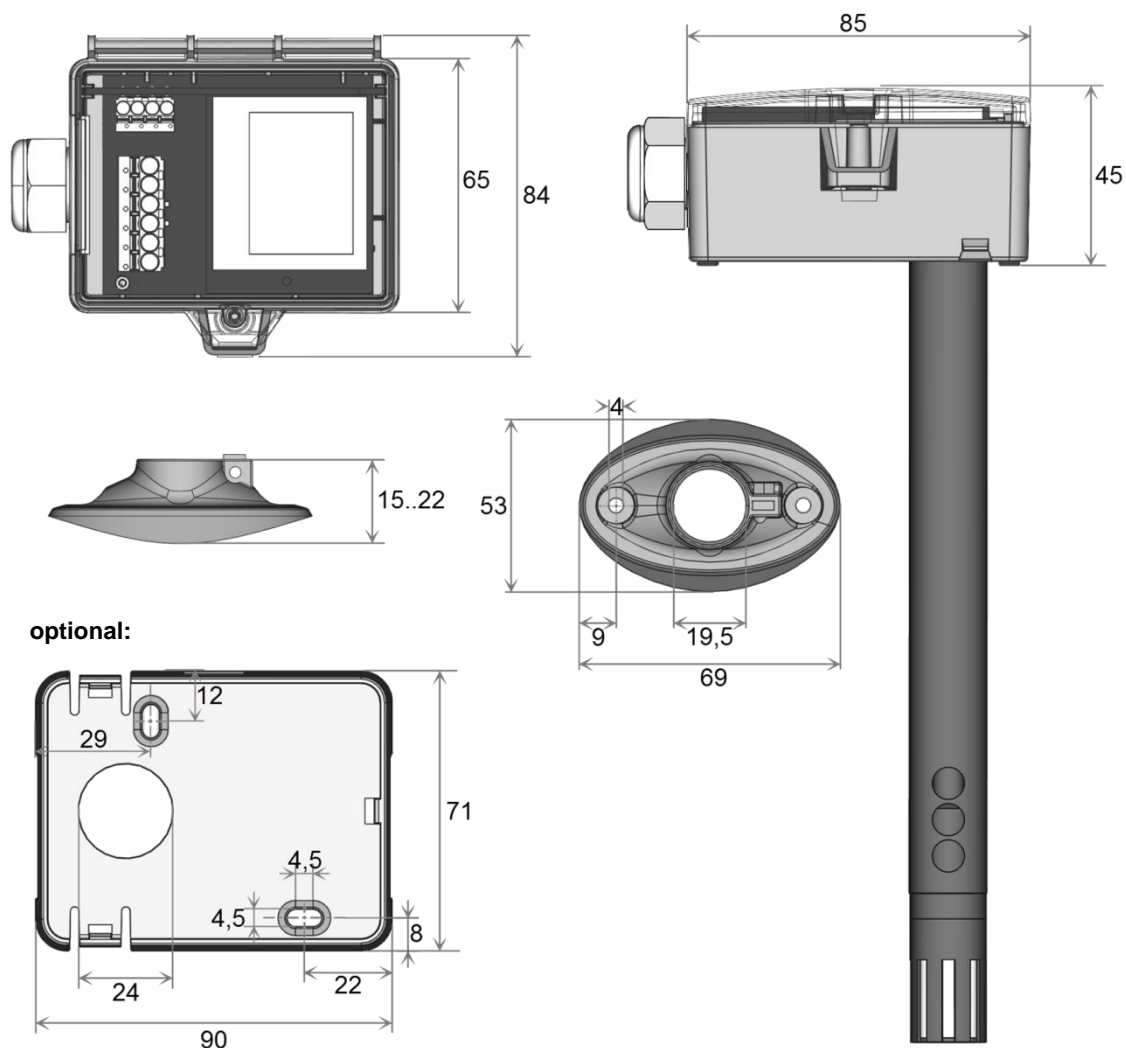
Application-specific reconfiguration of the devices can be carried out using the Thermokon USEapp. The configuration is carried out in the voltage-supplied state.



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 flange MF20 TPO  
 Mounting kit 4  
 • Cable entry M25 • Wago twofold terminal • Cover screw • 2 Screws (countersunk head)

Item No. 612562  
 Item No. 674140

## Accessories (optional)

Mounting base  
 Filter stainless steel, wire mesh

Item No. 631228  
 Item No. 231169