

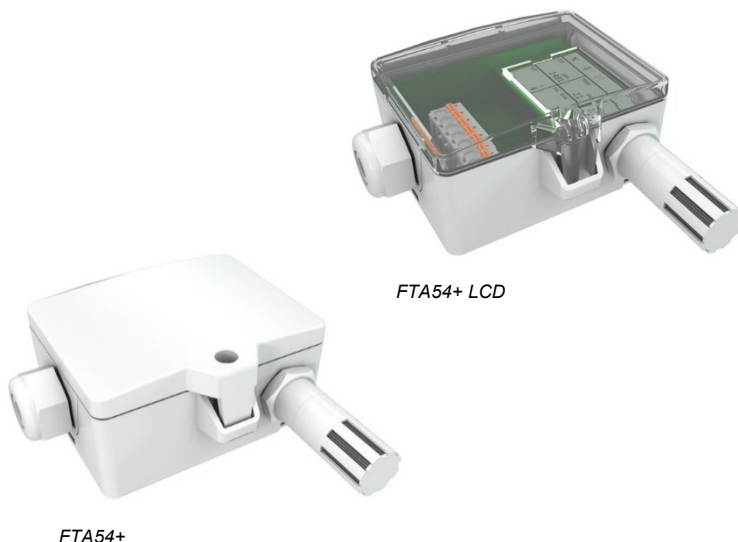
# FTA54+ (LCD) RS485 Modbus

Outdoor sensor for relative humidity and temperature

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

## Datasheet

Subject to technical alteration  
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FTA54+ LCD

FTA54+

The following illustrations show the version with LCD

## » 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 (changeable using Thermokon USEapp). LCD models with RGB background light have a transparent cover. Display configuration and threshold values for colour changes can be parameterized via Thermokon USEapp. A mounting flange and fixing material are included in delivery.

## » TYPES AVAILABLE

Outdoor sensor optional with display temperature + humidity – BUS

- FTA54+ (LCD) 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

## » PRODUCT TESTING AND CERTIFICATION



### Declaration of conformity

The declaration of conformity of the products are available on our website  
<https://www.thermokon.de/direct/en-gb/categories/fta54plus>

## » NOTES ON DISPOSAL



The crossed-out wheellie 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](http://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 ( $\pm 0,2$  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.**

## » APPLICATION NOTICE FOR HUMIDITY SENSORS

At regular environmental condition, it is recommended to calibrate the sensor annually to check the compliance with the accuracy required in the application. The following conditions can damage the sensor element or lead in long term to loss of the specified accuracy:

- Mechanical stress
- Contamination (e.g. dust / fingerprints)
- Aggressive chemicals
- Ambient conditions (e.g. condensation on measuring element)



**Do not touch the sensor elements!**

**Re-calibration or exchange of the sensor element 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, RTU, half-duplex, baud rate 9.600, 19.200, 38.400 or 57600, parity: none (2 stopbits), even or odd (1 stopbit), <b>Fail-safe Biasing required</b>	
Power supply	15..35 V = or 19..29 V ~ SELV <i>With alternating voltage, the correct polarity must be ensured</i>	
Power consumption	max. 2,5 W (24 V =)   4,3 VA (24 V ~)	
Measuring range temp.	-20..+80 °C (default setting), optionally configurable via Thermokon USEapp	
Measuring range humidity	0..100% rH non-condensing, optionally configurable 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)	
Display (optional)	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	Mainboard removable plug-in terminal, max. 2,5 mm <sup>2</sup>	Plug-in card removable plug-in terminal, max. 1,5 mm <sup>2</sup>
Pipe	PC, pure white	
Filter	stainless steel wire mesh	
Ambient condition	-20..+70 °C, short term condensation	

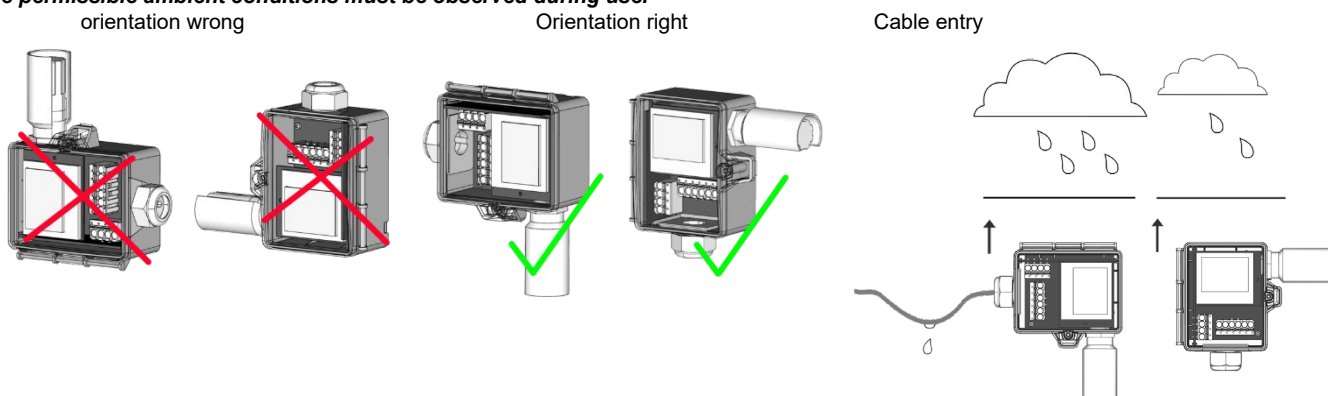
*When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected and all "negative" operating voltage input terminals (-) (=reference potential) are connected (in-phase connection of 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 may cause damage to it. Therefore, pay attention to correct wiring.**

## » MOUNTING ADVICES

When installing outdoors, avoid direct sunlight and disturbing heat sources. If necessary, use sun or rain protection.

**Cable entry from below or from the side. If cable entry is from the side, lay a loop so that precipitation can drain off in a defined manner. The permissible ambient conditions must be observed during use.**



Regardless of the direction of the compass, the outdoor sensor should not be installed in the following locations:

- on chimneys, under roofs, canopies or balconies
- in the immediate vicinity of an exhaust air opening
- above, below or next to windows and doors

## » 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.

## » APPLICATION NOTICE

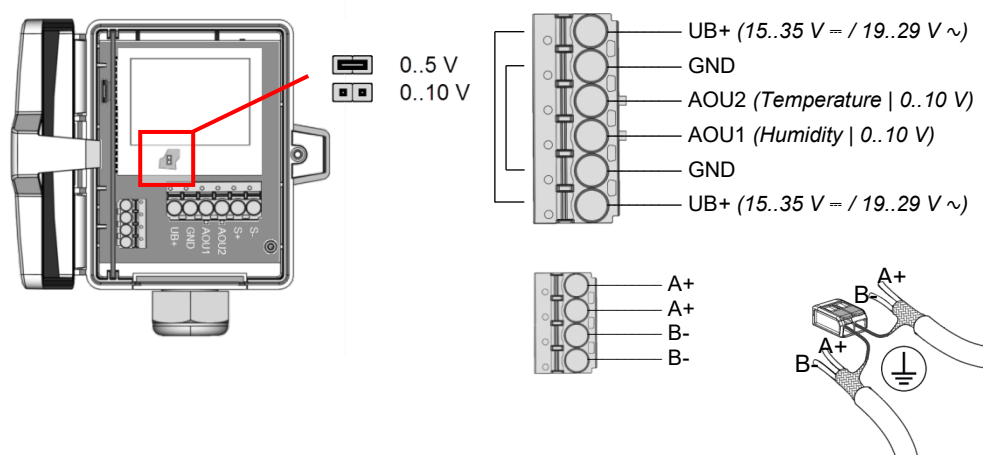


After a certain time, dirt in the air can collect on the filter and then adversely affect the operation of the sensor. Under normal ambient condition an annual maintenance is recommended. Rinse the filter after cleaning with distilled water and dry it using clean oil-free air or nitrogen. Extremely contaminated filters should be replaced. At extreme ambient conditions, e.g. corrosive gases, the humidity sensor may have to be changed.

## » 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.

### FTA54+ (LCD) RS485



Looped through power supply, valid from 03.08.2020 (20216)

» DIP SWITCHES, PLUG-IN CARD

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.

\* factory default settings

Termination 120 Ω

ON

1

ON

1

Not active\*

active

Baud

ON

2

3

ON

2

3

9600\*

19200

ON

2

3

ON

2

3

38400

57600

Switch1

ON

ON

ON

ON

ON

Switch2

ON

ON

ON

ON

ON

Modbus address

ON

1

2

3

4

5

ON=2<sup>0</sup> (1)\*

ON

1

2

3

4

5

ON=2<sup>1</sup> (2)

ON

1

2

3

4

5

ON=2<sup>2</sup> (4)

ON

1

2

3

4

5

ON=2<sup>3</sup> (8)

ON

1

2

3

4

5

ON=2<sup>4</sup> (16)

Sample address: 26

ON

1

2

3

4

5

Parity

ON

4

5

none\*

(2-stopbits)

ON

4

5

even

(1-stopbit)

ON

4

5

odd

(1-stopbit)

ON

4

5

none

(1-stopbit)

Address	Access	Description	Resolution / Unit
1	R	relative humidity	0.1 %rF

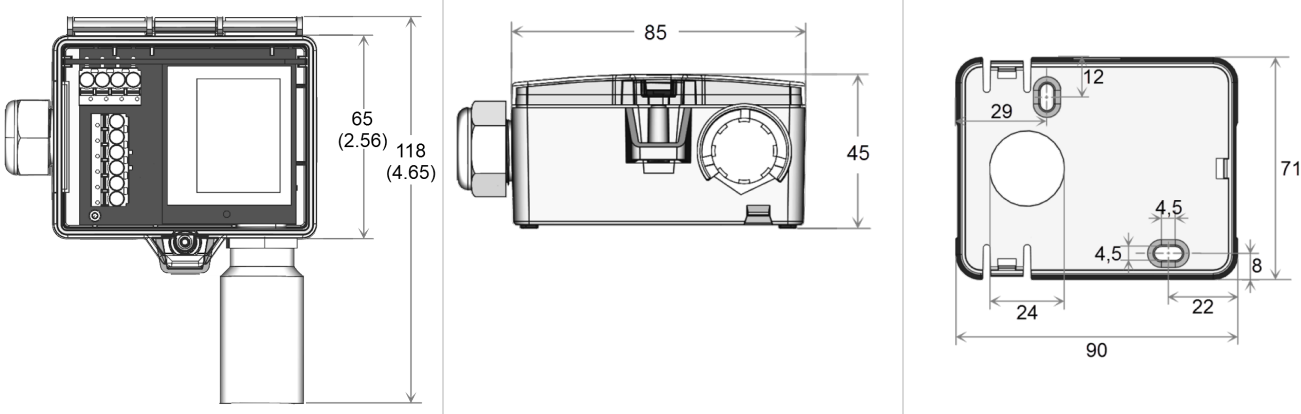
Adress	Access	Description	Resolution / Unit					
			Register 400= 1			Register 400= 2		
0	R	Temperature	SI	0.1	°C	Imperial	0.1	°F
2	R	Absolute humidity	SI	0.01	g/m³	Imperial	0.01	Gr/ft³
3	R	Enthalpy	SI	0.1	kJ/kg	Imperial	0.1	BTU/lb
4	R	Dew point	SI	0.1	°C	Imperial	0.1	°F

Available measured values are type-dependent.



**Modbus addresses:**  
USE-RS485 Modbus Interface  
A detailed description of the Modbus addresses can be found under the following link: → [Download](#)

» DIMENSIONS MM (IN.)



» ACCESSORIES (INCLUDED IN DELIVERY)

Rain protection  
Mounting base  
Mounting kit universal  
• Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 670715  
Item No. 631228  
Item No. 698511

» ACCESSORIES (OPTIONAL)

Filter stainless steel, wire mesh  
  
RS485 Biasing Adapter  
USB RS485 Modbus RTU Logger  
USB Interface RS485 (incl. driver CD)

Item No. 231169  
  
Item No. 811378  
Item No. 809917  
Item No. 668293