## Data Sheet

Subject to technical alteration
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## Application

Duct humidity and temperature sensor for all HVAC duct applications. Designed for control and monitoring applications.

## Types Available

FTK xxx RS485 Modbus          Duct sensor xxx=140/270/400 mm with RS485 Modbus Interface

## Security Advice – Caution

The installation and assembly of the device 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 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 Thermokon products contain valuable materials that should be recycled rather than disposed 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 or lowered 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.**

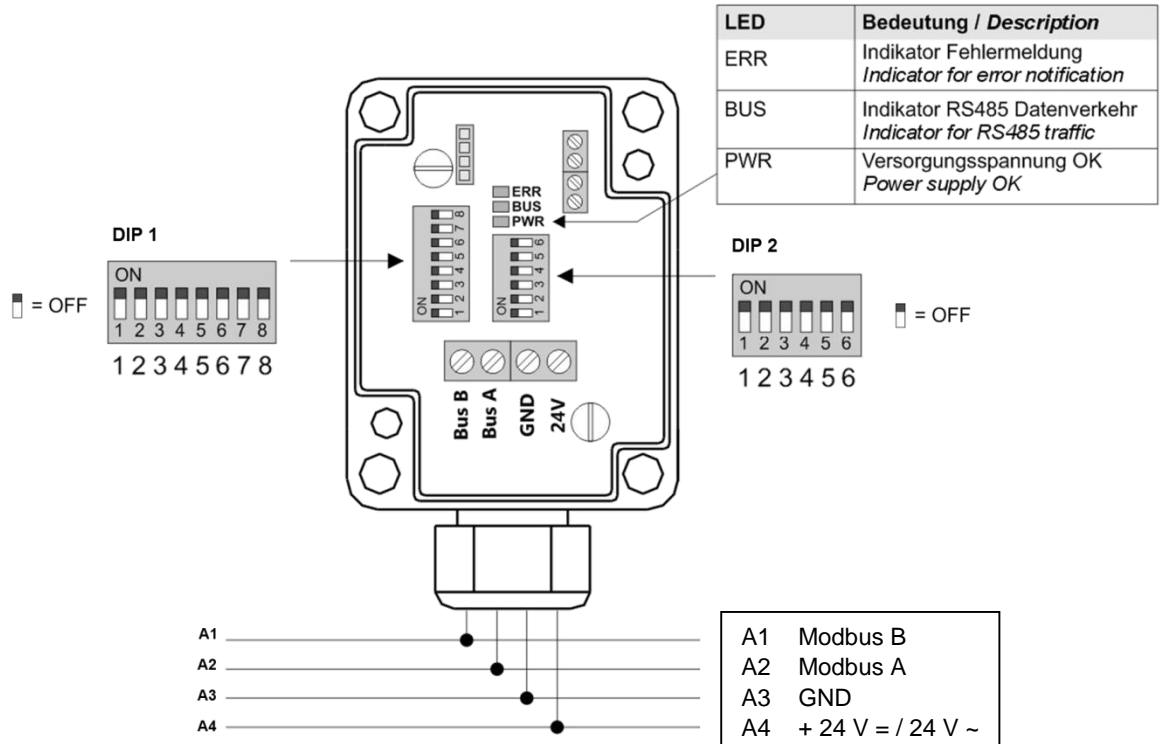## Application Notice for Humidity Sensors

**Refrain from touching the sensitive humidity sensor. Any touch of it will result in an expiration of warranty.**

Under normal environmental conditions we recommend a recalibration interval of about 1 year to maintain the indicated accuracy. At high ambient temperatures and high humidity or when using the sensor in aggressive gases, an earlier recalibration or a change of the humidity sensor can become necessary. Such recalibrations or a probable sensor change are not part of the general warranty.

## Technical Data

| | |
|---|---|
| Measuring values | Temperature, humidity |
| Network technology | RS485 Modbus (slave), Mode: RTU or ASCII, |
| | Baud rate: 9.600, 19.200 38.400 or 57.600, parity: no, even, odd, |
| | max. 32 devices per bus segment, connection via twisted pair cable (120 Ohm), |
| | e.g. Li2YCY(TP) 2x2x0.22 or similar |
| Power supply | 15..24 V = (±10%) or 24 V~ (±10%) |
| Power consumption | typ. 0,7 W (24 V =) \| 1,8 VA (24 V ~) |
| Measuring range temp | -20..+80 °C (active) |
| Scale range humidity | 0..100% rH non condensed |
| Measuring range humidity | 10..90% rH |
| Accuracy temperature | ±1 °C at 25 °C |
| Accuracy humidity | typ. ±2% at range 10..90% rH (typ. at 21 °C) |
| Enclosure | PA6, pure white |
| Protection | IP65 (mounted) according to EN 60529 |
| Cable entry | Single entry M16 for cable max. Ø=8 mm |
| Connection electrical | Terminal block max. 1.5 mm² |
| Pipe | PA6, black, Ø=19 mm, mounting length 140, 270 or 400 mm |
| Filter | Stainless steel |
| Ambient condition | -20...+70 °C, max. 85% rH non-condensed |
| Weight: | approx. 170 g |

## Terminal Connection Plan



| LED | Bedeutung / *Description* |
|-----|---------------------------|
| ERR | Indikator Fehlermeldung *Indicator for error notification* |
| BUS | Indikator RS485 Datenverkehr *Indicator for RS485 traffic* |
| PWR | Versorgungsspannung OK *Power supply OK* |

| A1 | Modbus B |
|----|----------|
| A2 | Modbus A |
| A3 | GND |
| A4 | + 24 V = / 24 V ~ |

Device Address (binary coded)

| DIP 1.1 | DIP 1.2 | DIP 1.3 | DIP 1.4 | DIP 1.5 | DIP 1.6 | DIP 1.7 | DIP 1.8 | Address | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| $2^0$ | $2^1$ | $2^2$ | $2^3$ | $2^4$ | $2^5$ | $2^6$ | $2^7$ | **Significance** | |
| ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 1 | default |
| OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | 2 | |
| ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | 3 | |
| : | : | : | : | : | : | : | : | : | |
| ON | ON | ON | ON | OFF | OFF | OFF | OFF | 15 | |
| : | : | : | : | : | : | : | : | : | |
| ON | ON | ON | OFF | ON | ON | ON | ON | 247 | |

Options

| DIP 2.1 | Modus |
|---------|-------|
| OFF | RTU |
| ON | ASCII |

| DIP 2.2 | DIP 2.1 | Baud |
|---------|---------|------|
| OFF | OFF | 9600 |
| ON | OFF | 19.200 |
| OFF | ON | 38.400 |
| ON | ON | 57.600 |

| DIP 2.4 | DIP 2,5 | Parity |
|---------|---------|--------|
| ON | OFF | even |
| OFF | ON | Odd |
| OFF | OFF | No |
| ON | ON | Not used |

| DIP 2.6 | not used |
|---------|----------|
| OFF | |
| ON | |

**When using ASCII mode, parity must be set to EVEN or ODD. „No Parity" (no) is not available in ASCII mode.**

## RS485 Modbus Register

| Data adress Input register | Function code | Description | Type |
|---------------------------|---------------|-------------|------|
| 585$_{dec}$ 0x249$_{hex}$ | 4 | Relative humidity [1/10] % | SIGNED 16 Bit |
| 587$_{dec}$ 0x24B$_{hex}$ | 4 | Temperature [1/100] °C | SIGNED 16 Bit |

Sample:  rh   = 01E2hex = 0482dec = 48,2%
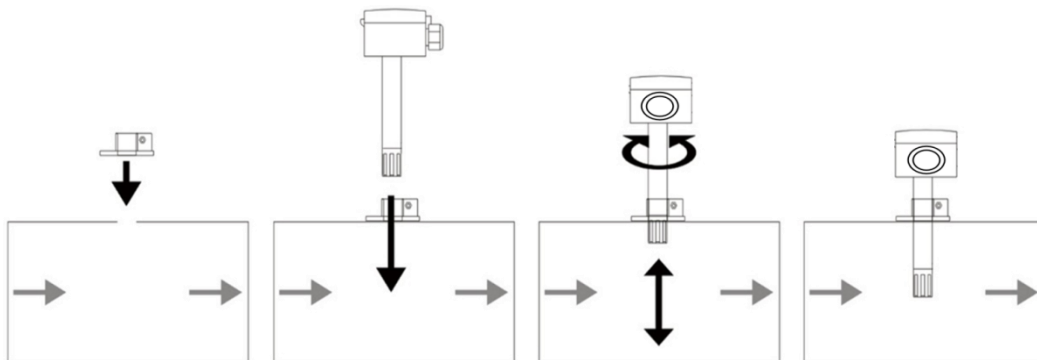            temp = 0B21hex = 2849dec = 28,49 °C

## Mounting Advices

The sensor can be mounted to the ventilation duct using a mounting flange (recommended) or directly. Maximum air speed is 10 m/s.

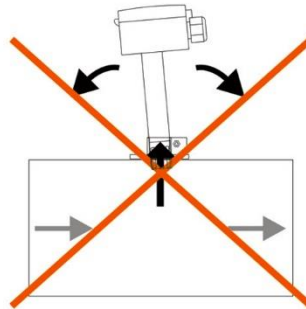**Mounting without mounting flange** (screwing sensor directly to the duct)
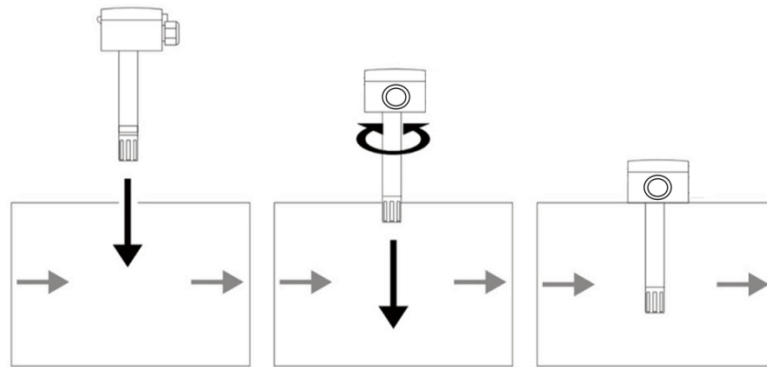
**Mounting with mounting flange** (screwing mounting flange to the duct, fixing sensor to mounting flange)

## Dismounting Advices

Unfix sensor and pull out vertically. **Do not tilt the sensor when pulling it out!**

## Application Notice

Due to air circulations, dirt and dust particles can be piled up in the course of time on the sintered filter, which is protecting the sensor. Thus, the function of the sensor can be affected.

After having dismounted the filter, it can be air-cleaned with oil-free and filtered compressed air, super-clean air or nitrogen or by washing it out with distilled water. If the filter is too dirty, it should be replaced.

## Dimensions (mm)
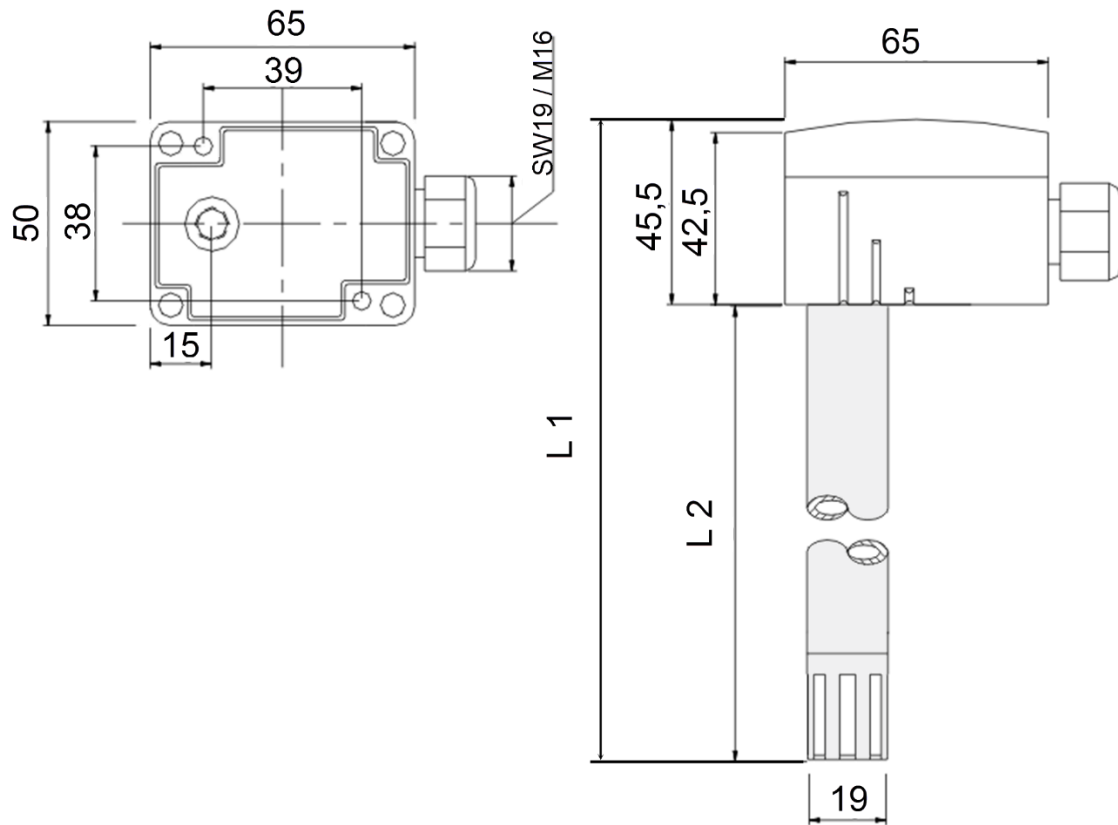


| | FTK 140 | | FTK 270 | | FTK 400 | RS485 Modbus |
|---|---|---|---|---|---|---|
| Length over all | L1 | 185,5 | / | 315,5 | / | 445,5 | mm |
| Length sensor tube | L2 | 140 | / | 270 | / | 400 | mm |

## Accessories (optional)

| | |
|---|---|
| Rawlplugs and screws (2 pcs. Each) | ArtNo. 102209 |
| Filter stainless steel, wire mesh (spare part) | ArtNo. 231169 |
| Mounting flange MF19 (TPO) | ArtNo. 527705 |