

FTVAA - display

FTVAA

Technical data	
Power supply	24Vac/dc for 0-10Vdc variant 15 ... 36Vdc for 4-20mA variant, RL depending on working resistance
Sensors	Digital humidity sensor with integrated temperature sensor, dew-proof, small hysteresis, high long-term stability $\pm 1\%$ per year
Sensor protection	<b>Metal sinter filter</b> , exchangeable
Humidity	
Measuring range, humidity	<b>Multi-range switching with 8 switchable measuring ranges</b> (see table) 0 ... 100 % r. H. (standard)
Operating range, humidity	10 ... 95 % r. H.
Deviation, humidity	$\pm 3\%$ r. H. (40 ... 60 %); at + 20 °C, otherwise $\pm 5\%$ r.H. Deviations of other outputs are resulting from the deviations of humidity and temperature.
Output 1, humidity	0 - 10 Vdc (see table) 4 ... 20 mA (see table)
Temperature	
Measuring range, temperature	<b>Multi-range switching with 4 switchable measuring ranges</b> (see table) 0 ...+50 °C (standard); - 20 ...+80 °C; - 35 ...+75 °C; - 35 ...+35 °C
Operating range, temperature	0 ...+ 50 °C electric components - 20 ...+70 °C sensors
Deviation, temperature	$\pm 0,5$ K (0 ...+ 50 °C); at + 20 °C, otherwise $\pm 1$ K
Output 2, temperature	0 - 10 V at U variant (see table) 4 ...20 mA at I variant (see table)
Ambient temperature	Storage - 25 ...+60 °C, operation -5 ...+ 55 °C
Electrical connection	4 - wire connection at 0-10Vdc 3 - wire connection at 4-20mA (transmitter) 0.14 - 1.5 mm <sup>2</sup> , via terminal screws on circuit board

### Features

- Multi-functional sensors offer ideal features
- Functional and user-friendly concept
- High levels of accuracy
- Just one device for numerous measurement
- 8 Multi-range switching of different humidity
- 4 Switchable measuring ranges of temperature

### Applications

- medical technology
- refrigeration
- air conditioning
- clean room technology
- The sensors are appropriate for wall mounting or for duct installation.

The universal humidity sensors are used to determine diverse characteristic variables in humidity measurement.

The instrument measures relative humidity and the temperature of the ambient air. From these measurements, the different characteristic variables are internally calculated.

There are two versions

- 010 with two outputs of 0...10 V.
- 420 with two outputs of 4 ... 20 mA.

In model 4-20mA the output variables for the outputs can be defined via DIP switches.

Relative humidity [% r.H.], absolute humidity [g/m<sup>3</sup>], mixture ratio [g / kg], dew point temperature [°C], or enthalpy [kJ/kg] (while neglecting the atmospheric air pressure) are alternatives selectable for output 1.

At output 2, four different measuring ranges for ambient temperature [°C] can be selected.

Ex-factory condition (default) for output 1 is relative humidity 0 ...100 % r.H., for output 2 temperature measuring range 0 ... 50 °C.

Because of the different configuration alternatives provided, numerous measurement and control tasks can be solved by means of just one device. These devices are to be operated in pollutant-free non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors.

Ordering Codes	
Type	Humidity Sensors
FTVAA-420	4-20mA
FTVAA-010	0-10Vdc
FTVAA-420D	4-20mA, with display
FTVAA-010D	4-20mA, with display
Optional FTVAA sup	Supplement for other ranges
VSG	Sunshade and weather protection



Enclosure	Plastic, polyamide, 30 % glass-globe-reinforced, with quick-locking screws (slotted / Phillips head combination), colour pure white (similar RAL 9010), enclosure cover for display is transparent!
Dimensions enclosure	FTVAA: 108 x 70 x 73.5 mm
Cable gland	M 16 x 1.5 , including strain relief, exchangeable, max. inner diameter 10,4 mm
Protective tube	<b>Stainless steel</b> , Ø 16 mm, FTVAA: nominal length NL = 60 mm
Protection class	III (according to EN 60 730)
Protection type	IP 65 (according to EN 60 529)
Standards	CE conformity, electromagnetic compatibility according to EN 61 326 + A1 + A2, EMC directive 2004 / 108 / EC
Optional	<b>Display</b> , cutout ca. 36 x15 mm (W x H), for displaying actual temperature and actual humidity

### General Notes

- This device may only be used in pollutant-free non-precipitating air without above-atmospheric or below-atmospheric pressure at the sensor element.
- On outdoor and duct sensors, the sinter filter of the sensor element protects the humidity sensor against potential dust exposure. In case of pollution / contamination, this filter should be cleaned on a regular basis.
- Dust and pollution falsify measurement results and are to be avoided. Slight pollution and dust sediments can be removed by using compressed air.
- Touching the humidity element is under any circumstances to be avoided, as that would result in considerable mismeasurements.
- In case of pollution, we recommend cleaning and recalibration in the factory.
- In any case, the sensor must not get in contact with chemicals or other cleaning agents.
- The relative humidity of 0 ...100 % is indicated by an output signal of 0 -10 V or 4 ... 20 mA. The device operating range covers 10 ... 95 % r. H. Outside of that range, mismeasurements or increased deviations may occur.
- When several sensors (0 -10 V) are connected to one voltage supply of 24 Vac correct polarity must be regarded as otherwise the alternating voltage source may be short-circuited.
- The voltage outputs are short-circuit proof. Applying overvoltage or voltage supply to the voltage output will destroy the device.
- If this device is operated beyond the specified range, all warranty claims are forfeited.

In addition, the following points are to be observed:

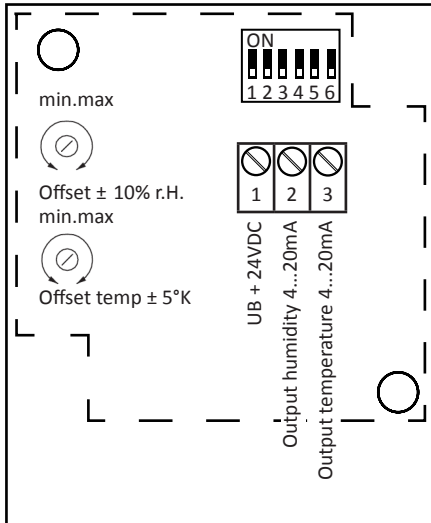
- These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!
- Devices must only be connected to safety extra-low voltage and under dead-voltage condition. To avoid damages and errors the device (e.g. by voltage induction) shielded cables are to be used, laying parallel with current-carrying lines is to be avoided, and EMC directives are to be observed.
- This device shall only be used for its intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The purchaser has to adhere to the building and safety regulations and has to prevent perils of any kind.
- No warranties or liabilities will be assumed for defects and damages arising from improper use of this device.
- Consequential damages caused by a fault in this device are excluded from warranty or liability.
- These devices must be installed by authorised specialists only.
- The technical data and connecting conditions of the mounting and operating instructions delivered together with the device are exclusively valid.

Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products.

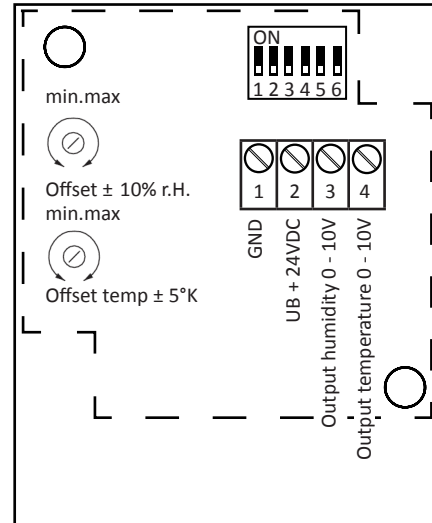
- In case of any modifications made by the user, all warranty claims are forfeited.
- This device must not be installed close to heat sources (e.g. radiators) or be exposed to their heat flow. Direct sun irradiation or heat irradiation by similar sources (powerful lamps, halogen spotlights) must absolutely be avoided.
- Operating this device close to other devices that do not comply with EMC directives may influence functionality.
- This device must not be used for monitoring applications, which solely serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.
- Dimensions of enclosures or enclosure accessories may show slight tolerances on the specifications provided in these instructions.
- Modifications of these records are not permitted.
- In case of a complaint, only complete devices returned in original packing will be accepted.
- **These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!**

### Mounting and Installation

Schematic diagram



Schematic diagram



DIP 1/2  
Temperature

DIP 3/4/5  
Humidity  
range

(r.H) = relative humidity in %



0...50°C  
Default



r.H. 0...100%  
Default



ABS: 0...80g/m<sup>3</sup>

(MR) = moisture ratio in g/kg



-20...80°C



MR: 0...50g/kg



DEW: 0...50°C

(ABS) = absolute humidity in g/m<sup>3</sup>



-35...75°C



MR: 0...80g/kg



DEW: -20...80°C

(DEW) = dew point in °C



-35...35°C



ABS: 0...50g/m<sup>3</sup>



ENT.: 0...85 kJ/kg

Type	Measuring Range Humidity (switchable)		Temperature (switchable)	Output Humidity	Temperature
<b>FTVAK-420</b> <b>FTVAA-420</b>	0 ... 100 % r. H. 0 ... 50 g / kg 0 ... 80 g / kg 0 ... 50 g / m <sup>3</sup> 0 ... 80 g / m <sup>3</sup> 0 ... + 50 °C - 20 ... + 80 °C 0 ... 80 kJ / kg	(standard) (MR) (MR) (ABS) (ABS) (DEW) (DEW) (ENT.)	0 ... + 50 °C (standard) - 20 ... + 80 °C - 35 ... + 75 °C - 35 ... + 35 °C	4...20 mA	4...20 mA
<b>FTVAK-010</b> <b>FTVAA-010</b>	0 ... 100 % r. H. 0 ... 50 g / kg 0 ... 80 g / kg 0 ... 50 g / m <sup>3</sup> 0 ... 80 g / m <sup>3</sup> 0 ... + 50 °C - 20 ... + 80 °C 0 ... 80 kJ / kg	(standard) (MR) (MR) (ABS) (ABS) (DEW) (DEW) (ENT.)	0 ... + 50 °C (standard) - 20 ... + 80 °C - 35 ... + 75 °C - 35 ... + 35 °C	0 - 10V	0 - 10V
<b>FTVAK - xx - Display</b>	Display				
<b>FTVAA - xx - Display</b>	Display				
Optional:	Other non-standard ranges				
Accessories:	VSG Sunshade and weather protection (FTVAA)				



**Supply Voltage**

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant.

This internal one-way rectifier also allows operating 0 – 10 V devices on AC supply voltage.

The output signal is to be tapped by a measuring instrument. Output voltage is measured here against zero potential (0Vdc) of the input voltage!

When this device is operated on DC supply voltage, the operating voltage input UB+ is to be used for 15...36 Vdc supply and UB – or GND for round wire!

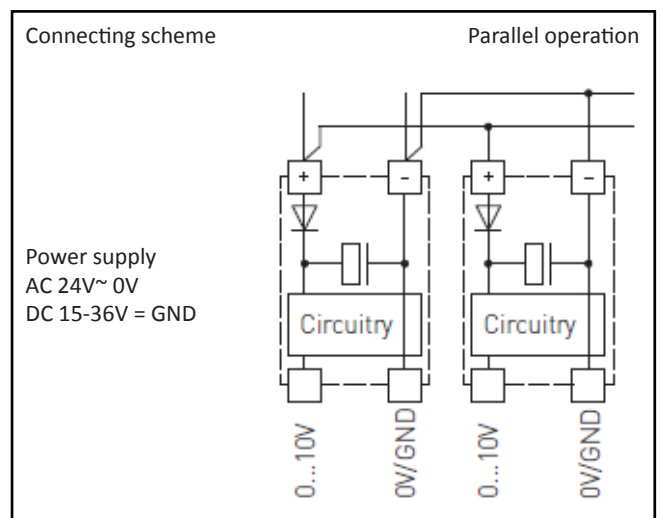
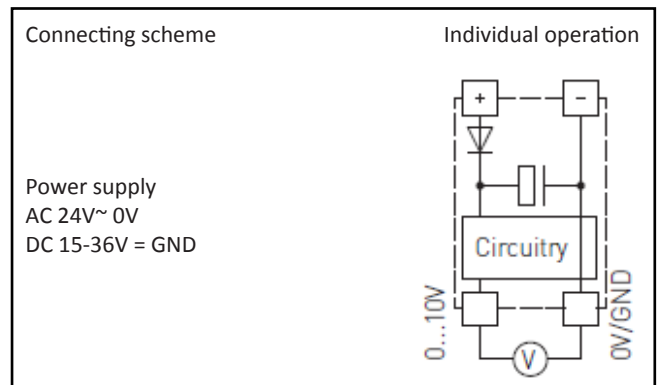
When several devices are supplied by one 24Vac voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (= reference potential) are connected together (in-phase connection of field devices).

All outputs of field devices must be referenced to the same potential!

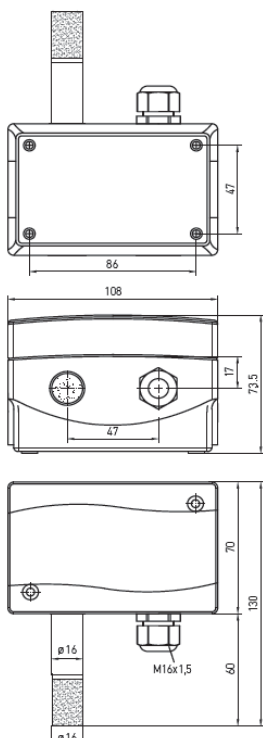
In case of reversed polarity at one field device, a supply voltage shortcircuit would be caused by that device.

The consequential short-circuit current flowing through this field device may cause damage to it.

**Therefore, pay attention to correct wiring!**



**Dimensional Drawing**



**FTVAA with display**



We cannot be held responsible errors in the manual/datasheet and reserve the right to correct any errors and to make product improvements, which may affect the accuracy of the manual/datasheet, without prior notice.