

Outdoor sensor with weather and radiated heat shield Humidity / Temperature

Active humidity and temperature sensor for outside applications. The radiation shield protects the outside sensors from rain and radiated heat. With the curved shape and colour of the plates, airflow is able to move across the sensors to keep radiated temperatures from rooftops and surrounding surfaces from affecting humidity readings. With Modbus RTU communication and integrated 0...10 V outputs. IP65 / NEMA 4X rated housing.



Picture may differ from product



## Type Overview

| Type       | Communication | Output signal active temperature | Output signal active humidity |
|------------|---------------|----------------------------------|-------------------------------|
| 22UTH-150X | Modbus RTU    | 0...5 V, 0...10 V                | 0...5 V, 0...10 V             |

## Technical data

|                               |                                         |                                                                                                                                                                                                                                                         |
|-------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b>        | Nominal voltage                         | AC/DC 24 V                                                                                                                                                                                                                                              |
|                               | Nominal voltage range                   | AC 19...29 V / DC 15...35 V                                                                                                                                                                                                                             |
|                               | Power consumption AC                    | 4.3 VA                                                                                                                                                                                                                                                  |
|                               | Power consumption DC                    | 2.3 W                                                                                                                                                                                                                                                   |
|                               | Electrical connection                   | Pluggable spring loaded terminal block max. 2.5 mm <sup>2</sup>                                                                                                                                                                                         |
|                               | Cable entry                             | Cable gland with strain relief 2x ø6 mm                                                                                                                                                                                                                 |
| <b>Data bus communication</b> | Communication                           | Modbus RTU                                                                                                                                                                                                                                              |
| <b>Functional data</b>        | Medium                                  | Air                                                                                                                                                                                                                                                     |
|                               | Voltage output                          | 2 x 0...5 V, 0...10 V, min. resistance 10 kΩ                                                                                                                                                                                                            |
|                               | Analogue output                         | Output 0...5/10 V with Jumper adjustable                                                                                                                                                                                                                |
| <b>Measuring data</b>         | Measured values                         | Relative humidity<br>Absolute humidity<br>Dew point<br>Enthalpies<br>Temperature                                                                                                                                                                        |
|                               | <b>Specification temperature active</b> |                                                                                                                                                                                                                                                         |
|                               | Sensing element technology              | Integrated semiconductor temperature sensor                                                                                                                                                                                                             |
|                               | Measuring range                         | Adjustable via Modbus<br>-20...80°C [-5...175°F]<br>(default setting)<br>Attention: The maximum measuring range listed does not indicate the allowable fluid temperature for the sensor. Refer to safety data for the maximum fluid temperature limits. |
|                               | Accuracy temperature                    | ±0.3°C @ 25°C [±0.5°F @ 77°F]                                                                                                                                                                                                                           |
| <b>Specification Humidity</b> | Long term stability                     | ±0.05°C p.a. @ 21°C [±0.09°F p.a. @ 70°F]                                                                                                                                                                                                               |
|                               | Time constant τ (63%) in the room       | Typical 351 s @ 0 m/s                                                                                                                                                                                                                                   |
|                               | Sensing element technology              | Polymer-based capacitive sensor with stainless steel wire mesh filter                                                                                                                                                                                   |
|                               | Measuring range                         | Adjustable via Modbus<br>Default setting: 0...100% RH                                                                                                                                                                                                   |
|                               | Measuring range absolute humidity       | Adjustable via Modbus<br>Default setting: 0...80 g/m <sup>3</sup>                                                                                                                                                                                       |

## Technical data

|                        |                                        |                                                                             |
|------------------------|----------------------------------------|-----------------------------------------------------------------------------|
| Specification Humidity | Measuring range enthalpy               | Adjustable via Modbus<br>Default setting: 0...85 kJ/kg                      |
|                        | Measuring range dew point              | Adjustable via Modbus<br>Default setting: -20...80°C [-5...175°F]           |
|                        | Accuracy                               | ±2% between 0...80% RH @ 25°C                                               |
|                        | Long term stability                    | ±0.3% RH p.a. @ 21°C @ 50% RH                                               |
|                        | Time constant $\tau$ (63%) in the room | Typical 16 s @ 0 m/s                                                        |
| Safety data            | Protection class IEC/EN                | III, Safety Extra-Low Voltage (SELV)                                        |
|                        | Power source UL                        | Class 2 Supply                                                              |
|                        | Degree of protection IEC/EN            | IP65                                                                        |
|                        | Degree of protection NEMA/UL           | NEMA 4X                                                                     |
|                        | Housing                                | UL Enclosure Type 4X                                                        |
|                        | EU Conformity                          | CE Marking                                                                  |
|                        | Certification IEC/EN                   | IEC/EN 60730-1                                                              |
|                        | Quality Standard                       | ISO 9001                                                                    |
|                        | Type of action                         | Type 1                                                                      |
|                        | Rated impulse voltage supply           | 0.8 kV                                                                      |
|                        | Pollution degree                       | 3                                                                           |
|                        | Ambient humidity                       | Short-term condensation permitted                                           |
|                        | Ambient temperature                    | -35...50°C [-30...120°F]                                                    |
|                        | Fluid humidity                         | Short-term condensation permitted                                           |
|                        | Fluid temperature                      | -35...50°C [-30...122°F]                                                    |
|                        | Operating condition airflow            | max. 12 m/s                                                                 |
| Materials              | Housing                                | Cover: PC, white<br>Bottom: PC, white<br>Seal: NBR70, black<br>UV resistant |
|                        | Cable gland                            | PA6, white                                                                  |

## Safety notes



This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application. Unauthorised modifications are prohibited. The product must not be used in relation with any equipment that in case of a failure may threaten humans, animals or assets.

Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.

The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

## Remarks

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General remarks concerning sensors | <p>When using lengthy connection wires (depending on the cross section used) the measuring result might be falsified due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.</p> <p>Sensing devices with a transducer should always be operated in the middle of the measuring range to avoid deviations at the measuring end points. The ambient temperature of transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage (±0.2 V). When switching the supply voltage on/off, onsite power surges must be avoided.</p> |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Remarks

**Remark:** Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

#### 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. The dissipative power should be taken into account 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 Belimo transducers work with a variable operating voltage, for reasons of production engineering only one operating voltage can be taken into consideration. Transducers 0...10 V / 4...20 mA have a standard setting at an operating voltage of DC 24 V. This 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 readjustment directly at the active sensor should be necessary during later operation, this can be done with the following adjustment methods.

- For sensors with NFC or dongle with the corresponding Belimo app
- For sensors with a trimming potentiometer on the sensor board
- For bus sensors via bus interface with a corresponding software variable

#### Application notice for humidity sensors

The humidity sensor is extremely sensitive. Touching the sensor element or exposing it to aggressive substances like chlorine, ozone, ammonia, hydrogen peroxide or ethanol (i.e. as a cleaning agent) may affect the measurement accuracy.

Long term operation outside the recommended conditions (5...60°C and 20...80% RH) can result in a temporary offset. After returning into the recommended range, this effect disappears.

## Parts included

Dowels  
Screws  
Cable Gland with strain relief  $\varnothing 6...8$  mm

## Accessories

| Optional accessories | Description                                                                   | Type                             |
|----------------------|-------------------------------------------------------------------------------|----------------------------------|
|                      | Replacement filter sensor probe tip, wire mesh, Stainless steel               | A-22D-A06                        |
| Tools                | Description                                                                   | Type                             |
|                      | Belimo Duct Sensor Assistant App                                              | Belimo Duct Sensor Assistant App |
|                      | Bluetooth dongle for Belimo Duct Sensor Assistant App                         | A-22G-A05                        |
|                      | * Bluetooth dongle A-22G-A05                                                  |                                  |
|                      | Certified and available in North America, European Union, EFTA States and UK. |                                  |

**Service**

**Wired connection** This sensor can be operated and configured using the Belimo Duct Sensor Assistant App. When using the Belimo Duct Sensor Assistant App, the bluetooth dongle is required to enable communication between the app and the Belimo sensor.

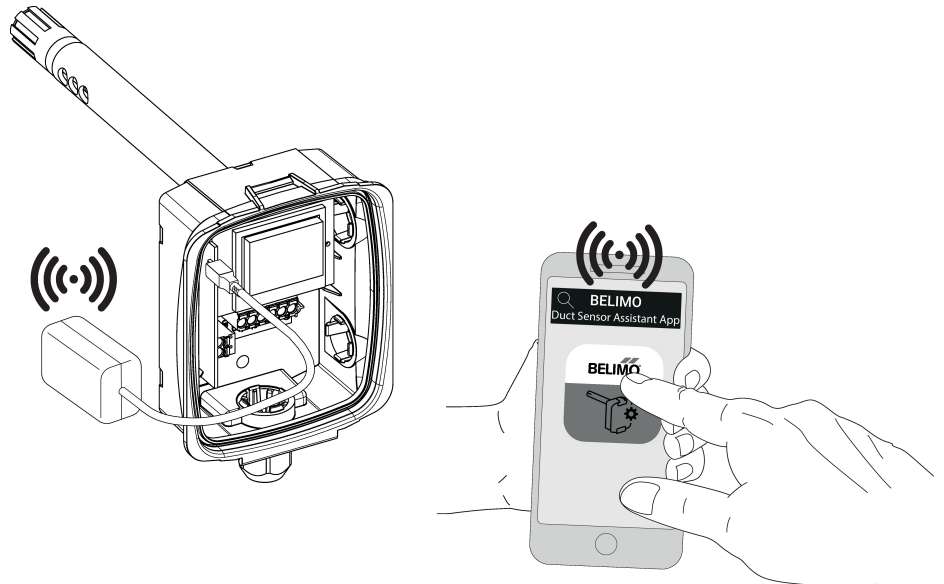
For standard operation and configuration of the sensor, the bluetooth dongle and the Belimo Duct Sensor Assistant App are not needed. The sensor will arrive pre-configured with the factory default settings shown above.

Requirement:

- Bluetooth dongle (Belimo Part No: A-22G-A05)
- Bluetooth-capable smartphone
- Belimo Duct Sensor Assistant App (Google Play & Apple App Store)

Procedure:

- Plug the Bluetooth dongle into the sensor via the Micro-USB connector or by means of the interface PCB
- Connect Bluetooth-capable smartphone with Bluetooth dongle
- Select configuration in the Belimo Duct Sensor Assistant App

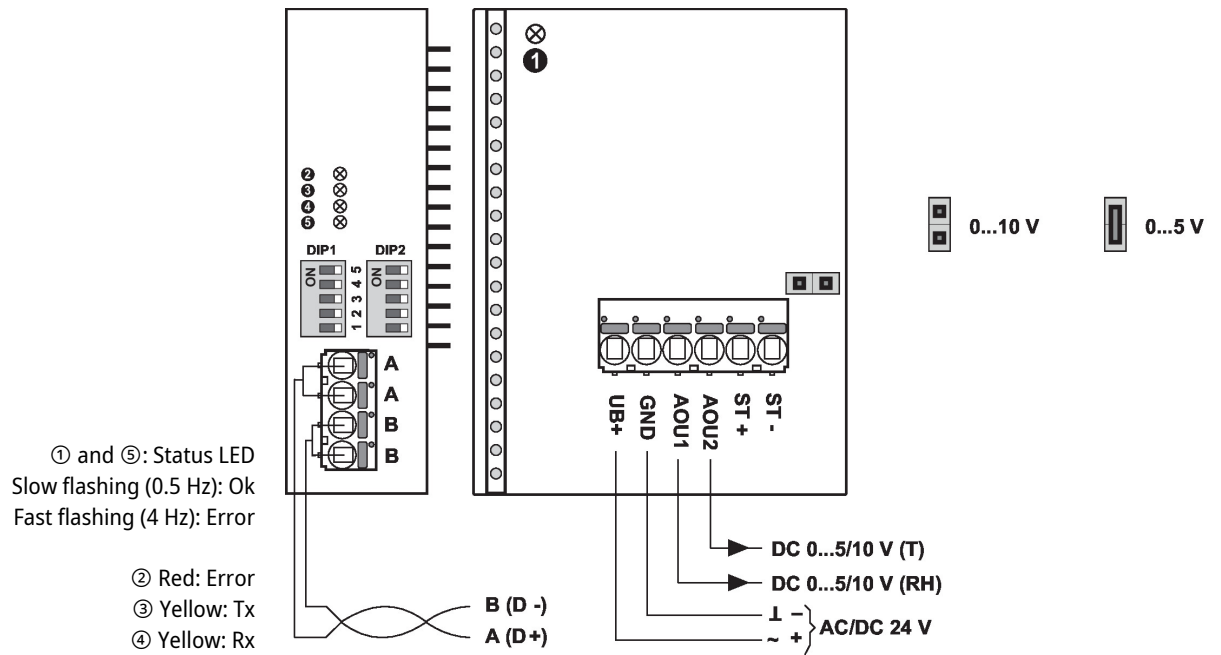

**Wiring diagram**


**Supply from isolating transformer.**

The wiring of Modbus RTU (RS-485) is to be carried out in accordance with applicable regulations ([www.modbus.org](http://www.modbus.org)). The device has switchable resistors for bus termination.

Modbus / BACnet: Supply and communication are not galvanically isolated. Connect earth signal of the devices with one another.

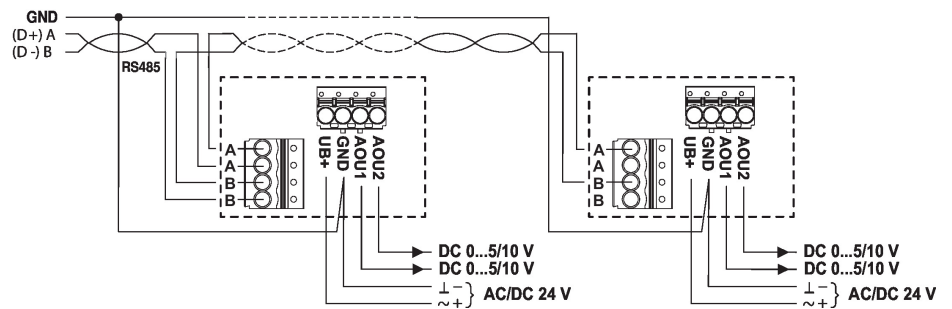
Wiring diagram

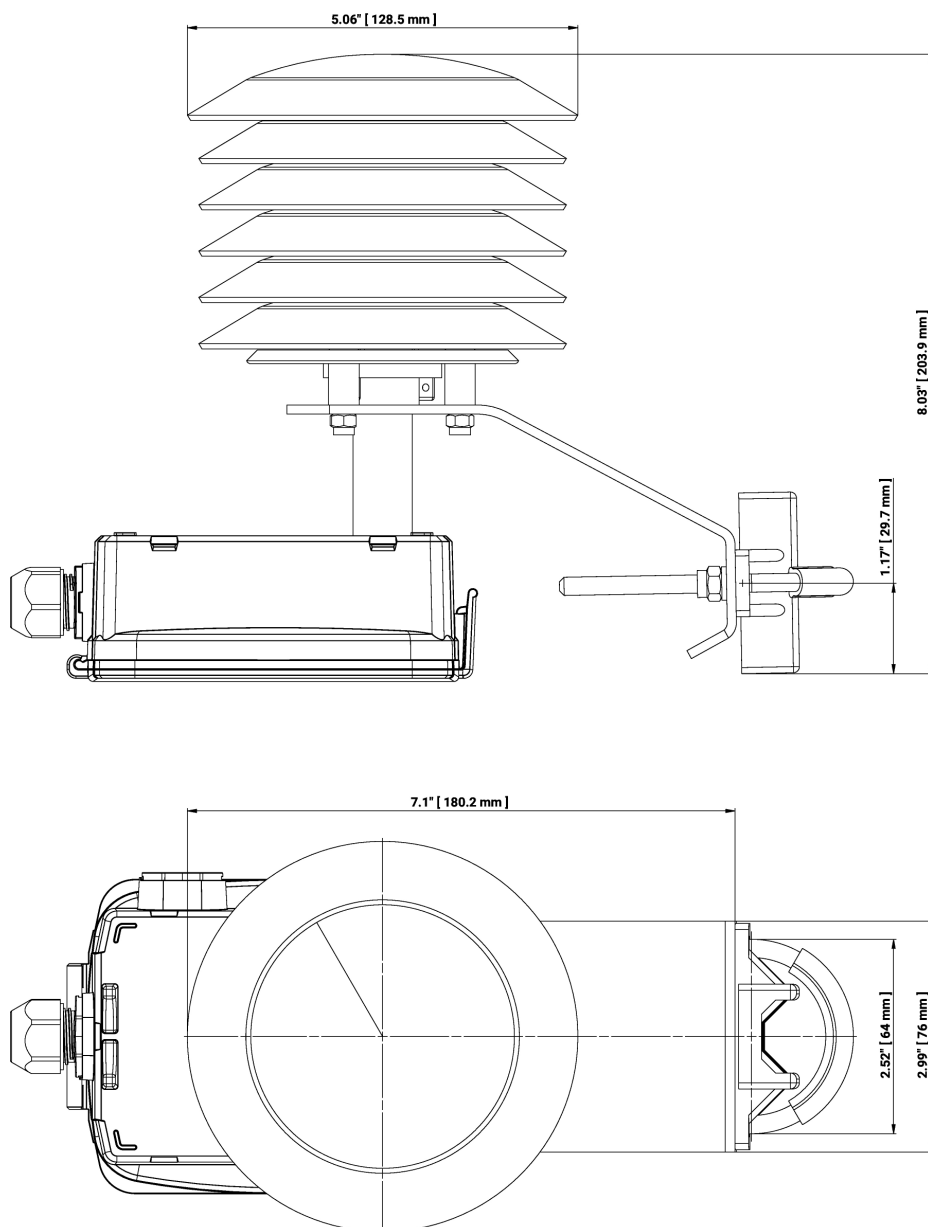


Detailed documentation

The separate document Sensor Modbus-Register informs about Modbus register, addressing, parity and bus termination (DIP1: address, DIP2: baud rate, parity, bus termination)

Wiring RS-485 Modbus RTU



**Dimensions**

**Type**
**22UTH-150X**
**Weight**
**0.68 kg**
**Further documentation**

- Modbus Interface description
- Installation instructions