

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 air flow 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. NEMA 4X / IP65 rated enclosure.


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

| | | |
|------------------------|-----------------------------------|--|
| Electrical data | 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 ² |
| | Cable entry | Cable gland with strain relief 2 x Ø6 mm |
| Functional data | Sensor Technology | Polymer capacitive sensor with stainless steel wire mesh filter |
| | Application | Air |
| | Communication | Modbus RTU |
| | Voltage output | 2x 0...5 V, 0...10 V, min. load 10 kΩ |
| | Output signal active note | Output 0...5/10 V with Jumper adjustable |
| Measuring data | Measured values | Relative humidity Absolute humidity Dew point Enthalpies Temperature |
| | Measuring range humidity | Adjustable via Modbus Default setting: 0...100% RH |
| | Measuring range temperature | Adjustable via Modbus Default setting: -20...80°C [-5...175°F] Attention: max. measuring temperature is restricted by max. fluid temperature (see Safety data) |
| | Measuring range absolute humidity | Adjustable via Modbus Default setting: 0...80 g/m ³ |
| | Measuring range enthalpy | Adjustable via Modbus Default setting: 0...85 kJ/kg |
| | Measuring range dew point | Adjustable via Modbus Default setting: -20...80°C [-5...175°F] |
| | Accuracy humidity | ±2% between 0...80% RH @ 25°C |
| | Accuracy temperature active | ±0.3°C @ 25°C [±0.54°F @ 77°F] |
| | Long-term stability | ±0.3% RH p.a. @ 21°C @ 50% RH |
| | | ±0.05°C p.a. @ 21°C [±0.09°F p.a. @ 70°F] |

| | | |
|-----------------------|--|---|
| Measuring data | Time constant τ (63%) in the room | Relative humidity: typical 16 s Temperature: typical 351 s |
| | <hr/> | |
| Materials | Cable gland | PA6, white |
| | Housing | Cover: PC, white Bottom: PC, white Seal: NBR70, black UV resistant |
| <hr/> | | |
| Safety data | Ambient humidity | Short-term condensation permitted |
| | Fluid humidity | Short-term condensation permitted |
| | Ambient temperature | -35...50°C [-30...120°F] |
| | Fluid temperature | -35...50°C [-30...120°F] |
| | Operating condition air flow | max. 12 m/s |
| | Protection class IEC/EN | III, Safety Extra-Low Voltage (SELV) |
| | Power source UL | Class 2 Supply |
| | EU Conformity | CE Marking |
| | Certification IEC/EN | IEC/EN 60730-1 |
| | Degree of protection IEC/EN | IP65 |
| | Degree of protection NEMA/UL | NEMA 4X |
| | Enclosure | UL Enclosure Type 4X |
| | Quality Standard | ISO 9001 |
| | Mode of operation | Type 1 |
| | Pollution degree | 3 |
| | Rated impulse voltage supply | 0.8 kV |
| Construction | Independently mounted control | |

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 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** 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.
- 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.

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 (± 0.2 V) this is normally done by adding or reducing a constant offset value. As Belimo 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 DC 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 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 by 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

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

When exposed to harsh environmental conditions such as 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 readings may be outside the specified accuracy. Replacement of deteriorated humidity sensors due to harsh environmental conditions is not covered by the general warranty.

The sensor shows best performance when operated within recommended normal temperature range of 5...60°C and humidity range of 20...80% RH. Long-term exposure to conditions outside normal range, especially at high humidity, may temporarily offset the humidity signal (e.g. +3% RH after 60h kept at >80% RH). After returning into the normal temperature and humidity range, the sensor will slowly come back to calibration state by itself.

Scope of delivery

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

Accessories

| Optional accessories | Description | Type |
|----------------------|---|----------------------------------|
| | Replacement filter, wire mesh, Stainless steel | A-22D-A06 |
| Service 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

Service tools connection This sensor can be operated and parametrised 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.

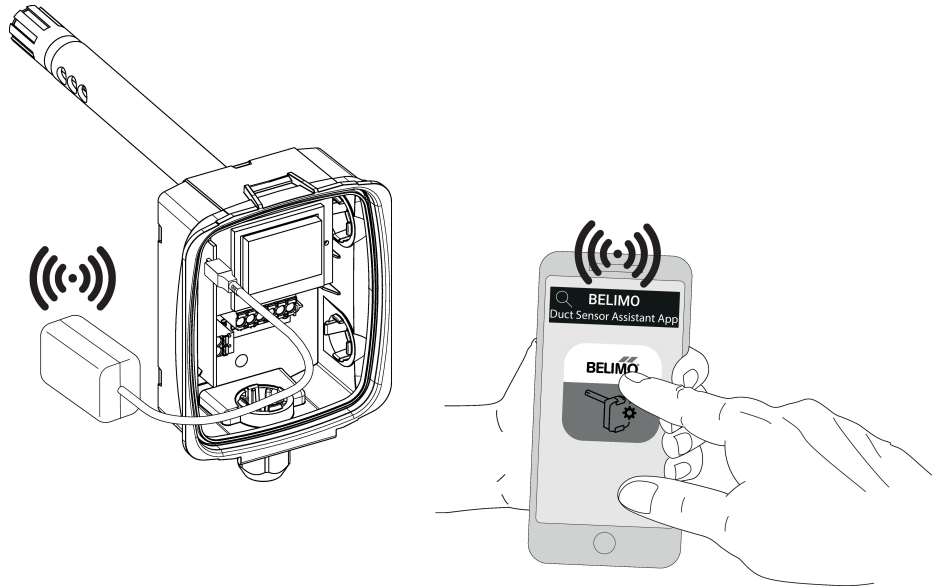
For the standard operation and parametrisation of the sensor the bluetooth dongle and the Belimo Duct Sensor Assistant App are not needed. The sensor will arrive pre-configured with the factory default settings shown above.

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 parametrisation in the Belimo Duct Sensor Assistant App



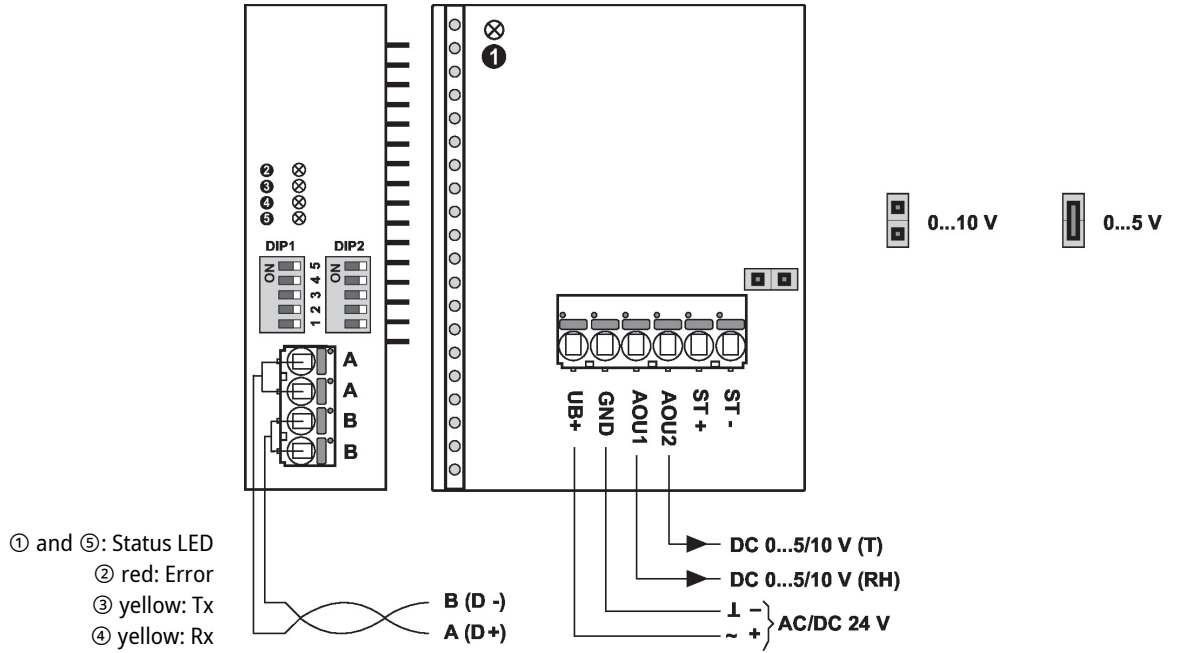
Wiring diagram

Notes Supply from isolating transformer.



The wiring of Modbus RTU (RS485) is to be carried out in accordance with applicable regulations (www.modbus.org). The device has switchable resistors for bus termination.

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

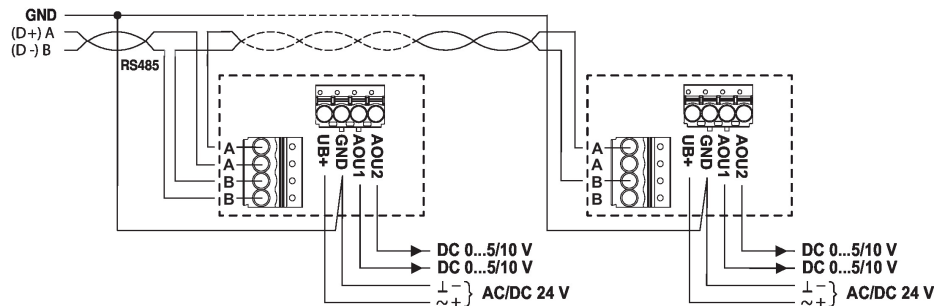


Connectors ST+ / ST- are only used for sensor types which additionally have a passive resistance sensor element for temperature measurement.
 The adjustment of the measuring ranges is made by changing the bonding jumpers.
 The output value in the new measuring range is available after 2 seconds.

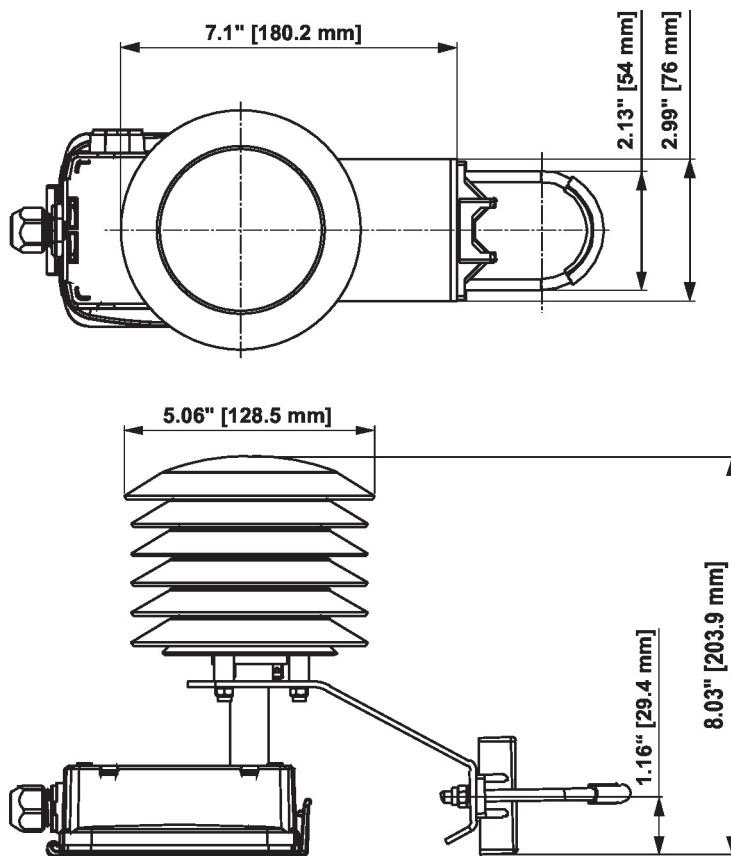
Detailed documentation

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

Wiring RS485 Modbus RTU



Dimensions



| Type | Weight |
|------------|---------|
| 22UTH-150X | 0.67 kg |