

Outdoor Sensor Humidity, Temperature active with weather and radiated heat shield

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 color 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...10V outputs. NEMA 4X / IP65 rated enclosure.



## Type Overview

Type	Communication	Output signal active temperature	Output signal active humidity
22UTH-550X	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	1.8 VA
	Power consumption DC	0.7 W
	Electrical connection	Removable spring loaded terminal block max. 2.5 mm <sup>2</sup>
	Cable entry	Cable gland with strain relief 2 x Ø6 mm (1/2" NPT conduit adapter included)
<b>Functional Data</b>	Sensor Technology	polymer capacitive sensor with stainless steel wire mesh
	Communicative control	Modbus RTU
	Output signal active note	Output 0...5/10 V selectable with switch
	Application	air
<b>Measuring Data</b>	Measuring values	relative humidity Absolute humidity Dew point Enthalpies Temperature
	Measuring range humidity	adjustable via Modbus default setting: 0...100% r.H.
	Measuring range temperature	adjustable via Modbus default setting: -5...175°F [-20...80°C] 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 <sup>3</sup>
	Measuring range enthalpy	adjustable via Modbus default setting: 0...85 kJ/kg
	Measuring range dew point	adjustable via Modbus default setting: -5...175°F [-20...80°C]
	Accuracy humidity	Typical ±2% between 10...90% r.H. @ 70°F [21°C]
	Accuracy temperature active	±0.9°F @ 70°F [±0.5°C @ 21°C]
	Long-term stability	±0.3% r.H. p.a. @ 70°F @ 50% r.H. ±0.05°C p.a. @ 21°C [±0.09°F p.a. @ 70°F]
	Time constant τ (63%) in the room	R.H.: typical 16 s Temperature: typical 351 s

<b>Materials</b>	Cable gland	PA6, black
	Housing	Cover: Lexan, grey Bottom: Lexan, grey seal: 0467 NBR70, black UV resistant
<b>Safety Data</b>	Ambient humidity	short-term condensation permitted
	Fluid humidity	short-term condensation permitted
	Ambient temperature	-30...120°F [-35...50°C]
	Fluid temperature	-30...120°F [-35...50°C]
	Operating condition air flow	max. 40 ft/s [12 m/s]
	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Protection class UL	UL Class 2 Supply
	EU Conformity	CE Marking
	Certification IEC/EN	IEC/EN 60730-1
	Certification UL	cULus acc. to UL60730-1A/-2-9/-2-13, CAN/CSA E60730-1:02/-2-9
	Degree of protection IEC/EN	IP65
	Degree of protection NEMA/UL	NEMA 4X
	Quality Standard	ISO 9001

**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 the transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage ( $\pm 0.2$  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. This dissipative power should be taken into account when measuring temperature. 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 re-calibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.

**Application notice for humidity sensors**

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

For standard environmental conditions the manufacturing accuracy specified in the datasheet will be guaranteed for two years. 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 specified accuracy. Replacement of deteriorated humidity sensors due to harsh environmental conditions are not subject of the general warranty.

The sensor shows best performance when operated within recommended normal temperature range of 41...140°F [5...60°C] and humidity range of 20...80% r.H. Long-term exposure to conditions outside normal range, especially at high humidity, may temporarily offset the humidity signal (e.g. +3% r.H. after 60h kept at >80% r.H.). 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 Ø6...8 mm
- 1/2" NPT conduit adapter

Accessories

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

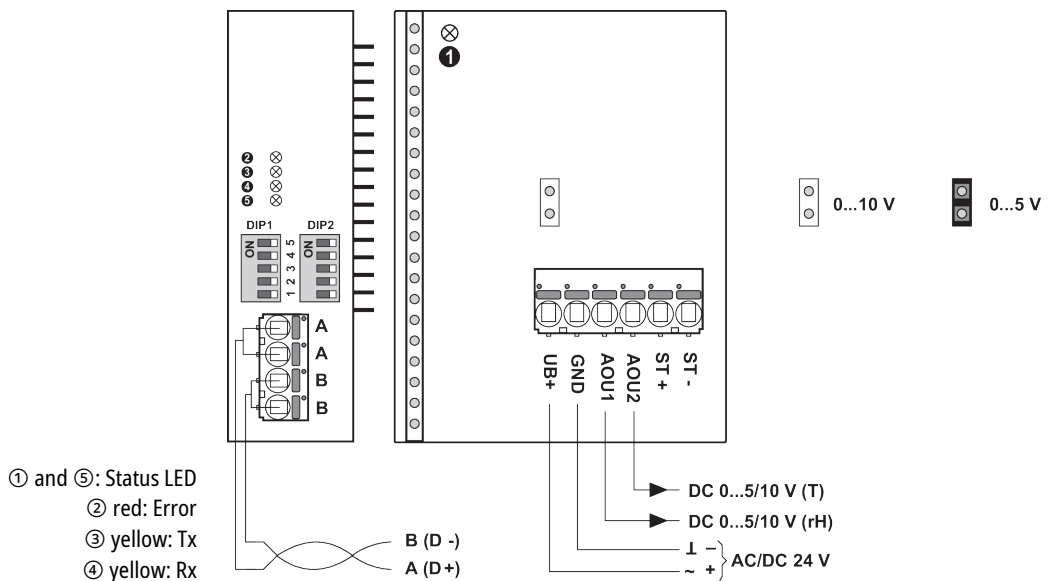
Wiring Diagram

**Notes** Supply from safety isolating transformer.



The wiring of Modbus RTU (RS485) 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-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.

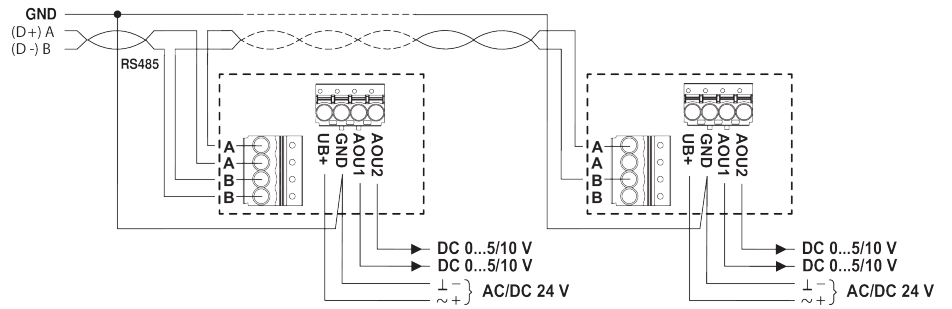
Correct temperature values are only available, when the humidity output AOU1 and both inputs UB + are connected.

The adjustment of the measuring ranges is made by changing the bonding jumpers.

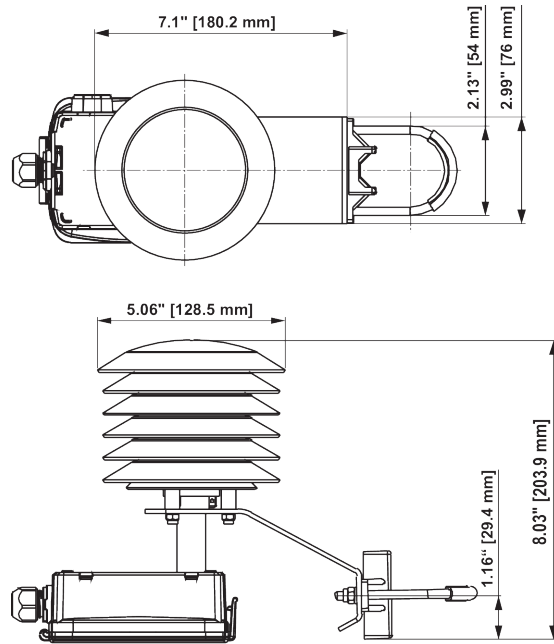
The output value in the new measuring range is available after 2 seconds.

**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-550X	1.48 lb [0.67 kg]