

Outdoor sensor with weather and radiated heat shield Humidity / Temperature

Active humidity and temperature sensor (0...10 V) 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.


Type Overview

Type	Output signal active temperature	Output signal active humidity
22UTH-510X	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 21.6...26.4 V / DC 13.5...26.4 V			
	Power consumption AC	0.8 VA			
	Power consumption DC	0.4 W			
	Electrical connection	Pluggable spring loaded terminal block max. 2.5 mm ²			
	Cable entry	Cable gland with strain relief ø6...8 mm (1/2" NPT conduit adapter included)			
Functional data	Sensor Technology	Polymer capacitive sensor with stainless steel wire mesh filter			
	Application	Air			
	Multirange	4 measuring ranges selectable			
	Voltage output	1 x 0...5 V, 0...10 V, min. resistance 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	0...100% RH non-condensing			
	Measuring range temperature	Active sensor: range selectable Attention: max. measuring temperature is restricted by max. fluid temperature (see Safety data)			
		Setting	Range [°C]	Range [°F]	Factory setting
		S0	-40...60	-40...160	
		S1	0...50	40...140	
		S2	-15...35	0...100	
		S3	-20...80	0...200	✓
	Measuring range absolute humidity	adjustable at the transducer: 0...50 g/m ³ (default setting) 0...80 g/m ³			
	Measuring range enthalpy	0...85 kJ/kg			
Measuring range dew point	adjustable at the transducer: 0...50°C (default setting) -20...80°C				

Measuring data	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]
	Time constant τ (63%) in the room	Relative humidity: typical 16 s @ 0 m/s Temperature: typical 351 s @ 0 m/s
Materials	Cable gland	PA6, black
	Housing	Cover: PC, orange Bottom: PC, orange Seal: NBR70, black UV resistant UL94 5VA
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
	Enclosure	UL Enclosure Type 4X
	EU Conformity	CE Marking
	Certification IEC/EN	IEC/EN 60730-1
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Type of action	Type 1
	Rated impulse voltage supply	0.8 kV
	Installation method	Independently mounted control
	Pollution degree	3
	Ambient humidity	Short-term condensation permitted
	Ambient temperature	-35...50°C [-30...122°F]
	Fluid humidity	Short-term condensation permitted
	Fluid temperature	-35...50°C [-30...122°F]
Operating condition airflow	max. 12 m/s	

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, 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.

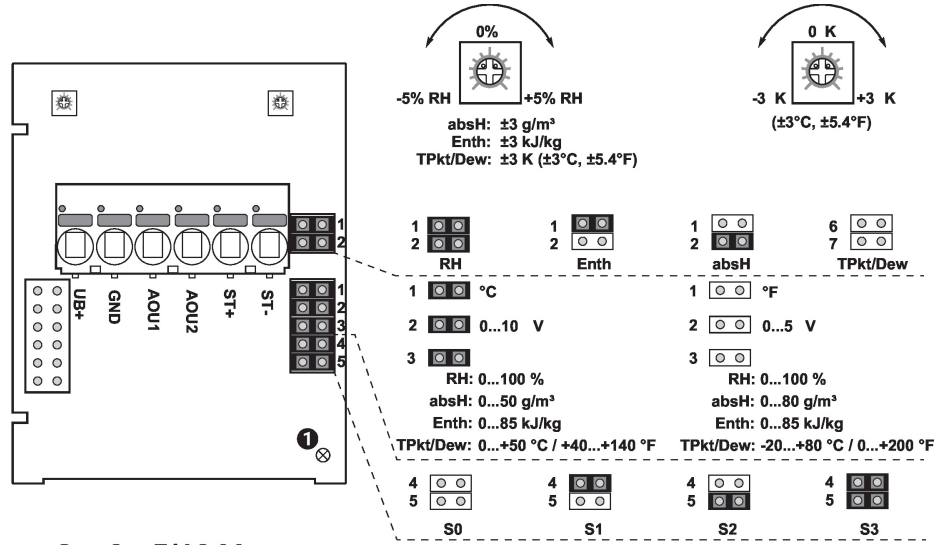
Parts included

- Dowels
- Screws
- 1/2" NPT conduit adapter

Accessories

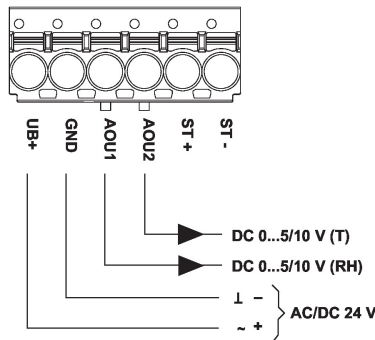
Optional accessories	Description	Type
	Replacement filter sensor probe tip, wire mesh, Stainless steel	A-22D-A06

Wiring diagram



2 x 0...5/10 V

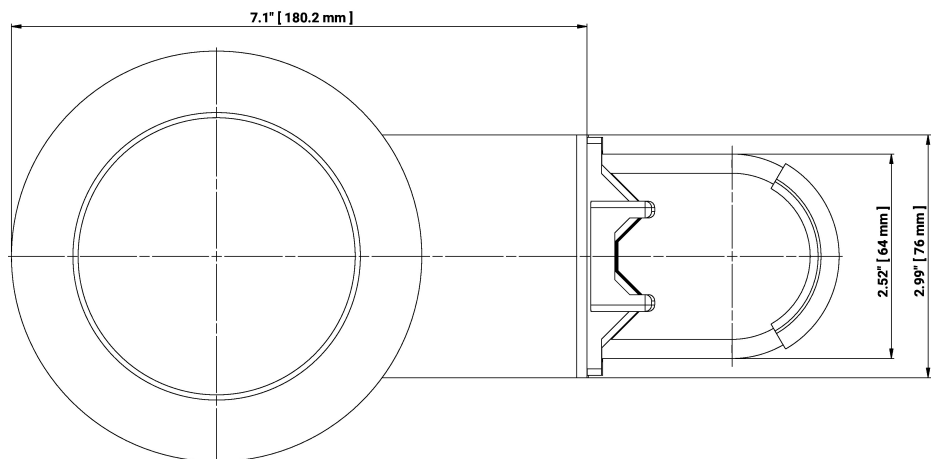
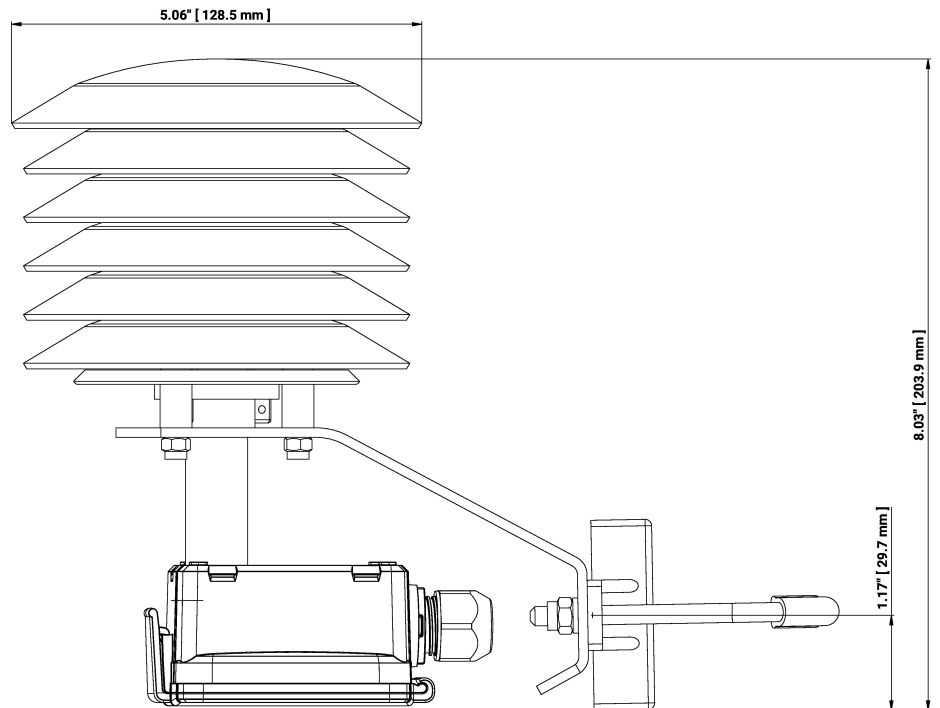
- ① Status LED
- RH Relative humidity
- absH Absolute humidity
- Enth Enthalpy
- TPkt/Dew Dew point
- (Measurement value available on Output AOU1)



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.

Setting	Range [°C]	Range [°F]	Factory setting
S0	-40...60	-40...160	
S1	0...50	40...140	
S2	-15...35	0...100	
S3	-20...80	0...200	✓

Dimensions



Type	Weight
22UTH-510X	0.54 kg

Further documentation

- Installation instructions