Duct Sensor Humidity / Temperature

Active sensor (0...10 V) for measuring the relative or absolute humidity and temperature in duct applications. Instead of the humidity signal, the enthalpy or the dewpoint can be selected as an output signal. NEMA 4X / IP65 rated enclosure.

5 YEAR WARRANTY

Type Overview

Type	Output signal active temperature	Output signal active humidity	Output signal passive temperature
22DTH-11M	DC 0...5 V, DC 0...10 V	DC 0...5 V, DC 0...10 V	-
22DTH-11MM	-	DC 0...5 V, DC 0...10 V	NTC10k Pre (10k3)

Technical Data

Electrical data	Power Supply DC	15...24 V, ±10%, 0.4 W
	Power Supply AC	24 V, ±10%, 0.8 VA
	Electrical connection	Removable spring loaded terminal block max. 2.5 mm²
	Cable entry	Cable gland PG11 Ø6...10 mm, with strain relief Ø6...8 mm
Functional data	Sensor Technology	Polymer capacitive sensor with stainless steel wire mesh filter
	Multirange	4 measuring ranges selectable
	Output signal active note	Output DC 0...5/10 V with Jumper adjustable Voltage output: min. 10 kΩ load
	Media	Air

Measuring data	Measured values	Temperature Humidity Dew point Enthalpies Absolute humidity
	Measuring range humidity	0...100% rH non-condensing
	Measuring range temperature	Passive sensor: -35...70 °C [-30...160 °F] Active sensor: range selectable Attention: max. measuring temperature is restricted by max. medium temperature (see Safety data)

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

	Measuring range absolute humidity	adjustable at the transducer: 0...50 g/m³ (default setting) 0...80 g/m³
	Measuring range enthalpy	0...85 kJ/kg
	Measuring range dew point	adjustable at the transducer: 0...50 °C (default setting) -20...80 °C
	Accuracy humidity	±2% between 10...90% r.H. @ 21 °C
	Accuracy temperature active	±0.5 °C @ 25 °C
	Accuracy temperature passive	Passive Sensors depending on used type NTC.. : ±0.2 °C @ 25 °C
	Operating condition air flow	max. 12 m/s
Materials	Cable gland	PA6, black
	Housing	Cover: Lexan, Belimo orange NCS S0580-Y6OR Bottom: Lexan, Belimo orange NCS S0580-Y6OR Seal: 0467 NBR70, black
Safety data	Ambient temperature	-35...50 °C [-30...120 °F]
	Medium temperature	-35...70 °C [-30...160 °F]
	Operating condition air flow	max. 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 and IEC/EN 60730-2-13
	Certification UL	pending
	Degree of protection IEC/EN	IP65
	Degree of protection NEMA/UL	NEMA 4X
	Quality Standard	ISO 9001
	Weight	0.12 kg

Remarks

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. 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 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 covered by the calibration warranty 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 sensor due to harsh environmental conditions are not subject of the general warranty.

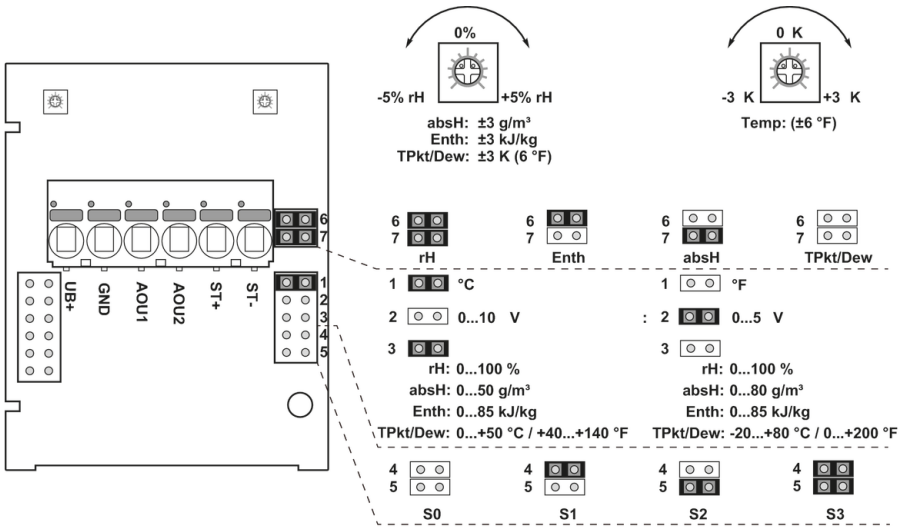
Accessories

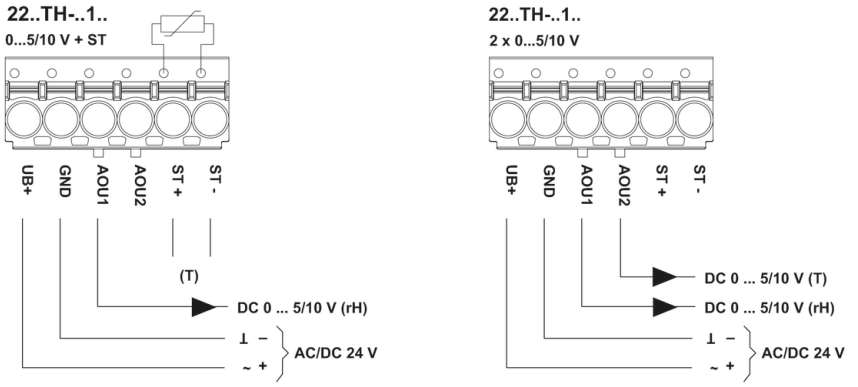
Scope of delivery Mounting flange

Optional accessories

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

Wiring diagram



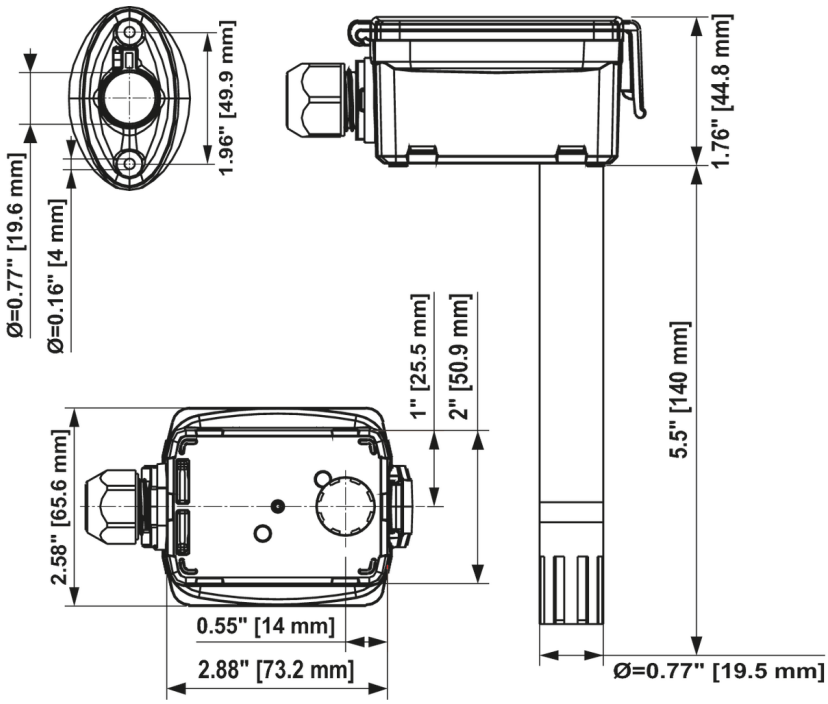


rH	Relative humidity
absH	Absolute humidity
EntH	Enthalpy
TPkt/Dew	Dew point

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 °C	-40...160 °F	
S1	0...50 °C	40...140 °F	
S2	-15...35 °C	0...100 °F	
S3	-20...80 °C	0...200 °F	✓

Dimensions


1.96" [49.9 mm]
Ø=0.77" [19.6 mm]
Ø=0.16" [4 mm]
1.76" [44.8 mm]
1" [25.5 mm]
2" [50.9 mm]
5.5" [140 mm]
2.58" [65.6 mm]
0.55" [14 mm]
2.88" [73.2 mm]
Ø=0.77" [19.5 mm]