Duct/Immersion Temperature Sensor

Active sensor (0...10 V) for measuring temperature in duct applications. In combination with a stainless steel or brass thermowell which is also applicable for pipe applications. NEMA 4X / IP65 rated enclosure.

5 YEAR WARRANTY

Type Overview

Type	Output signal active temperature	Probe length	Probe diameter
22DT-12H	DC 0...5 V, DC 0...10 V	50 mm	6 mm
22DT-12L	DC 0...5 V, DC 0...10 V	100 mm	6 mm
22DT-12N	DC 0...5 V, DC 0...10 V	150 mm	6 mm
22DT-12P	DC 0...5 V, DC 0...10 V	200 mm	6 mm
22DT-12R	DC 0...5 V, DC 0...10 V	300 mm	6 mm
22DT-12T	DC 0...5 V, DC 0...10 V	450 mm	6 mm

Technical Data

Electrical data	Power supply DC	15...24 V, ±10%, 0.35 W
	Power supply AC	24 V, , ±10%, 0.82 VA
	Electrical connection	Removable spring loaded terminal block max. 2.5 mm²
	Cable entry	Cable gland with strain relief Ø6...8 mm
Functional data	Multirange	8 measuring ranges selectable
	Output signal active note	Output DC 0...5/10 V with Jumper adjustable Voltage output: min. 5 kΩ load
	Application	Air Water

Measuring data	Measuring values	Temperature
	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	-50...50°C	-30...130°F	
S1	-10...120°C	0...250°F	
S2	0...50°C	40...140°F	
S3	0...250°C	30...480°F	
S4	-15...35°C	0...100°F	
S5	0...100°C	40...240°F	
S6	-20...80°C	40...90°F	
S7	0...160°C	0...150°F	✔

	Accuracy temperature active	±0.5°C @ 21°C [±0.9°F @ 70°F]
	Time constant t (63%) in the air duct	typical 46 s @ 3 m/s typical 210 s @ 0 m/s
	Time constant t (63%) in water pipe	typical 7 s with thermowell brass typical 9 s with thermowell stainless steel
Materials	Cable gland	PA6, black
	Housing	Cover: Lexan, orange Bottom: Lexan, orange Seal: 0467 NBR70, black UV resistant
Safety data	Ambient humidity	Max. 95% r.H., non-condensing
	Ambient temperature	-35...50°C [-30...120°F]
	Fluid temperature	-50...160°C [-60...320°F]
	Housing surface temperature	Max. 70°C [160°F]
	Protection class IEC/EN	III Protective extra-low voltage (PELV)
	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, CAN/CSA E60730-1:02/-2-9
	Degree of protection IEC/EN	IP65
	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 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 re-calibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.

Scope of delivery

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Description	Type
Mounting clip, with screws and adhesive foil	A-22D-A11

Accessories

Optional accessories

Description	Type
Mounting plate S housing	A-22D-A09
Cold barrier, Plastic, L 50 mm, for thermowell pocket A-22P-A..	A-22P-A51
Connection adapter, M20, for cable 1 x 6 mm, Multipack 10 pcs.	A-22G-A01.1

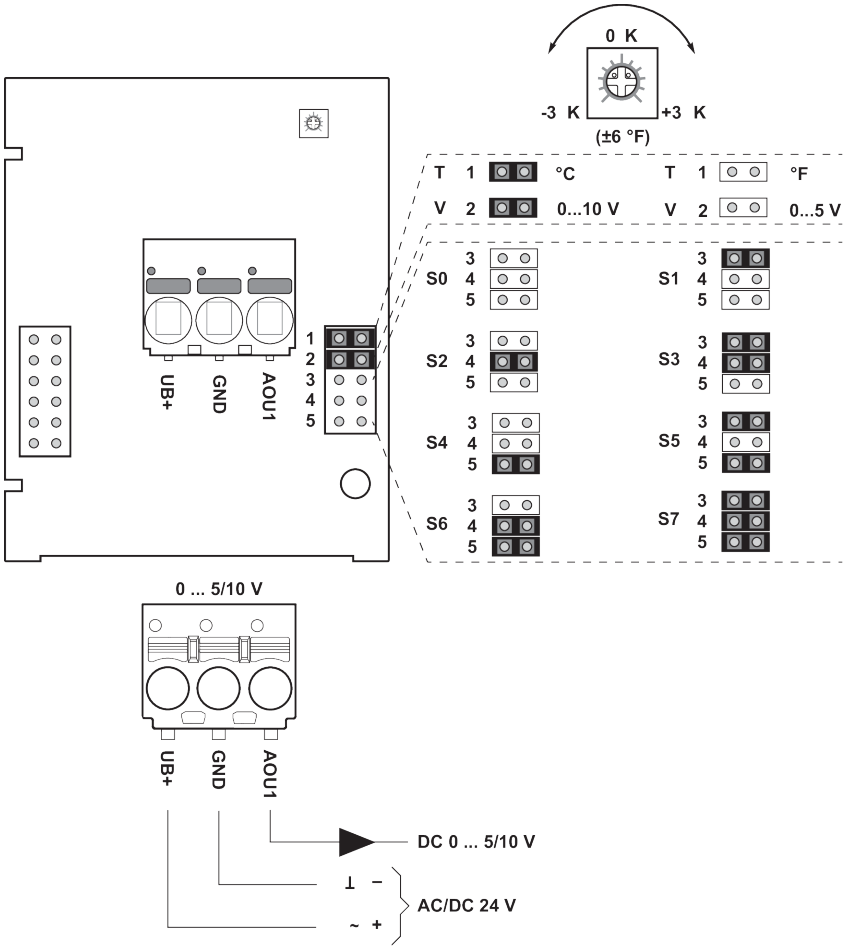
Optional accessories air

Description	Type
Mounting flange for sensor probe 6 mm, up to max. 80°C, Plastic	A-22D-A03
Mounting flange for sensor probe 6 mm, up to max. 260°C, Brass	A-22D-A05

Recommended accessories water

Description	Type
Thermowell pocket (fabricated) Stainless steel, 50 mm, G1/2", SW27	A-22P-A06
Thermowell pocket (fabricated) Stainless steel, 100 mm, G1/2", SW27	A-22P-A08
Thermowell pocket (fabricated) Stainless steel, 150 mm, G1/2", SW27	A-22P-A10
Thermowell pocket (fabricated) Stainless steel, 200 mm, G1/2", SW27	A-22P-A12
Thermowell pocket (fabricated) Stainless steel, 300 mm, G1/2", SW27	A-22P-A14
Thermowell pocket (fabricated) Stainless steel, 450 mm, G1/2", SW27	A-22P-A16
Thermowell pocket (fabricated) Brass, 50 mm, R1/2", SW22	A-22P-A18
Thermowell pocket (fabricated) Brass, 100 mm, R1/2", SW22	A-22P-A20
Thermowell pocket (fabricated) Brass, 150 mm, R1/2", SW22	A-22P-A22
Thermowell pocket (fabricated) Brass, 200 mm, R1/2", SW22	A-22P-A24
Thermowell pocket (fabricated) Brass, 300 mm, R1/2", SW22	A-22P-A26
Thermowell pocket (fabricated) Brass, 450 mm, R1/2", SW22	A-22P-A28
Syringe with thermal paste	A-22P-A44
Compression fitting, Stainless steel, G 1/4" (external thread) for 6 mm, with cutting ring	A-22P-A45

Wiring diagram



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	-50...50°C	-30...130°F	
S1	-10...120°C	0...250°F	
S2	0...50°C	40...140°F	
S3	0...250°C	30...480°F	
S4	-15...35°C	0...100°F	
S5	0...100°C	40...240°F	
S6	-20...80°C	40...90°F	
S7	0...160°C	0...150°F	✓

Dimensions

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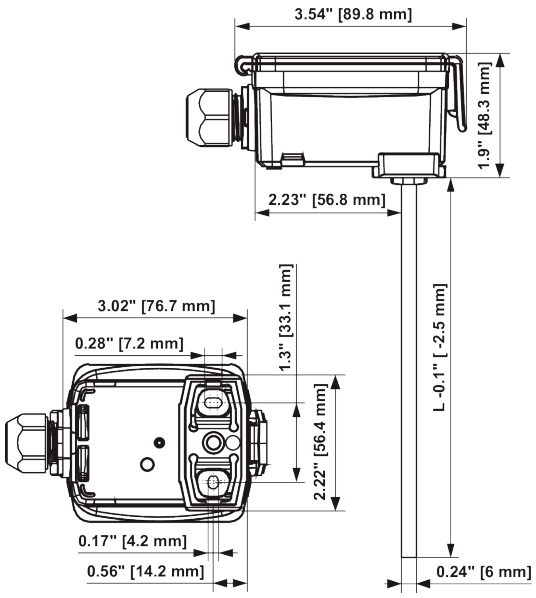

L = Probe length

Type	Probe length	Weight
22DT-12H	50 mm	0.12 kg
22DT-12L	100 mm	0.13 kg
22DT-12N	150 mm	0.13 kg
22DT-12P	200 mm	0.14 kg
22DT-12R	300 mm	0.15 kg
22DT-12T	450 mm	0.16 kg