

Duct/Immersion sensor Temperature

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. IP65 / NEMA 4X rated housing.


Type Overview

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

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
Functional data	Application	Air Water
	Multirange	8 measuring ranges selectable
	Voltage output	1 x 0...5 V, 0...10 V, min. resistance 5 kΩ
	Output signal active note	Output 0...5/10 V with Jumper adjustable
Measuring data	Measured values	Temperature
Specification temperature active	Sensing element technology	Based on Pt1000 class AA

Technical data

Specification temperature active

Measuring range temperature settings

Active sensor: range selectable
Attention: The maximum measuring range listed does not indicate the allowable fluid temperature for the sensor. Refer to safety data for the maximum fluid temperature limits.

Setting	Range [°C]	Range [°F]	Factory setting
S0	-50...50	-30...130	
S1	-10...120	0...250	
S2	0...50	40...140	
S3	0...250	30...480	
S4	-15...35	0...100	
S5	0...100	40...240	
S6	-20...80	40...90	
S7	0...160	0...150	✓

Accuracy temperature $\pm 0.5^{\circ}\text{C}$ @ 21°C [$\pm 0.9^{\circ}\text{F}$ @ 70°F] @ measuring range setting S2 and S4

Long term stability $\pm 0.04^{\circ}\text{C}$ p.a. @ 21°C [$\pm 0.07^{\circ}\text{F}$ p.a. @ 70°F]

Time constant τ (63%) in water pipe
Typical 7 s with thermowell brass
Typical 9 s with thermowell stainless steel

Time constant τ (63%) in the air duct
Typical 46 s @ 3 m/s
Typical 210 s @ 0 m/s

Safety data

Protection class IEC/EN III, Protective Extra-Low Voltage (PELV)

Power source UL Class 2 Supply

Degree of protection IEC/EN IP65

Degree of protection NEMA/UL NEMA 4X

Housing UL Enclosure Type 4X

EU Conformity CE Marking

Certification IEC/EN IEC/EN 60730-1

Quality Standard ISO 9001

UL Approval cULus acc. to UL60730-1A/-2-9, CAN/CSA E60730-1/-2-9

Type of action Type 1

Rated impulse voltage supply 0.8 kV

Pollution degree 3

Ambient humidity Max. 95% RH, non-condensing

Ambient temperature $-35...50^{\circ}\text{C}$ [$-30...120^{\circ}\text{F}$]

Fluid temperature $-50...160^{\circ}\text{C}$ [$-60...320^{\circ}\text{F}$]

Housing surface temperature Max. 70°C [160°F]

Materials

Housing
Cover: PC, orange
Bottom: PC, orange
Seal: NBR70, black
UV resistant

Cable gland PA6, black

Probe material V4A (1.4404)

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 with 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.

Remark: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

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

Parts included

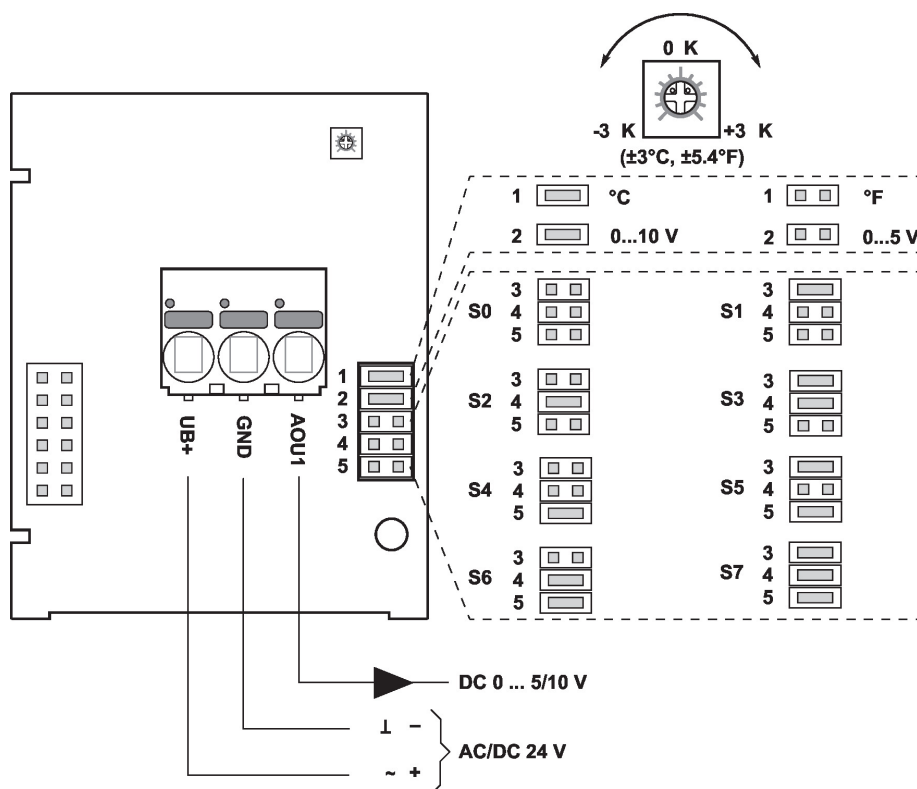
Description	Type
Mounting clip, with screws and adhesive foil	A-22D-A11

Accessories

Optional accessories	Description	Type
	Mounting plate S housing	A-22D-A09
	Connection adapter flex conduit, M20x1.5, for cable gland 1x 6 mm, Multipack 10 pcs.	A-22G-A01.1

Accessories

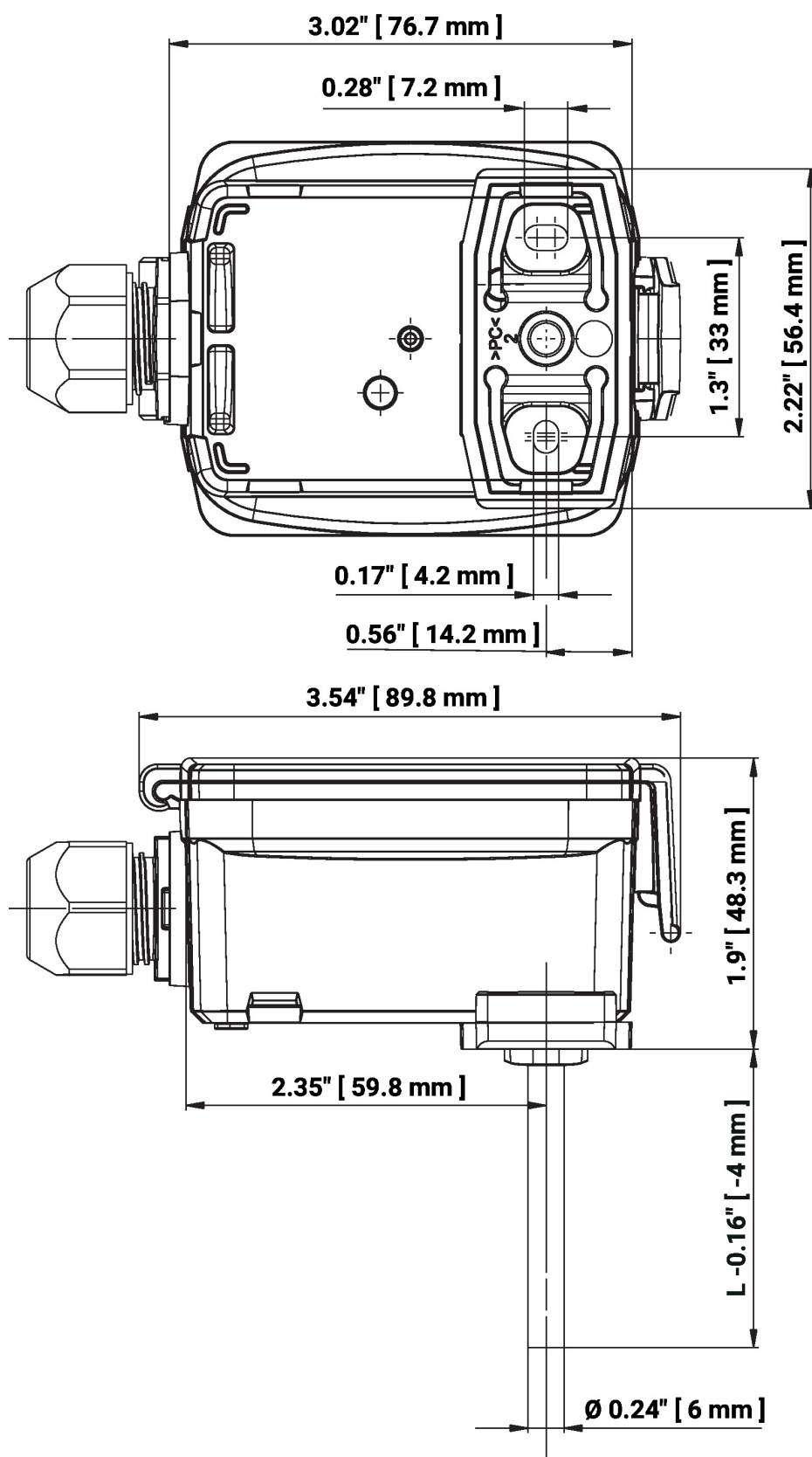
Optional accessories air	Description	Type
	Mounting flange for sensor probe 6 mm, up to max. 120°C [248°F], Plastic	A-22D-A03
Recommended accessories water	Mounting flange for sensor probe 6 mm, up to max. 260°C, Brass	A-22D-A05
	Description	Type
	Thermowell Stainless steel, 50 mm, G 1/2", SW27	A-22P-A06
	Thermowell Brass, 50 mm, R 1/2", SW22	A-22P-A18
	Thermal contact fluid	A-22P-A44
	Compression fitting, Stainless steel, G 1/4" (external thread) for 6 mm, with cutting ring	A-22P-A45
	Thermowell Stainless steel, 100 mm, G 1/2", SW27	A-22P-A08
	Thermowell Brass, 100 mm, R 1/2", SW22	A-22P-A20
	Cold barrier, Plastic, L 50 mm, for thermowell A-22P-A..	A-22P-A51
	Thermowell Stainless steel, 150 mm, G 1/2", SW27	A-22P-A10
	Thermowell Brass, 150 mm, R 1/2", SW22	A-22P-A22
	Thermowell Stainless steel, 200 mm, G 1/2", SW27	A-22P-A12
	Thermowell Brass, 200 mm, R 1/2", SW22	A-22P-A24
	Thermowell Stainless steel, 300 mm, G 1/2", SW27	A-22P-A14
	Thermowell Brass, 300 mm, R 1/2", SW22	A-22P-A26
	Thermowell Stainless steel, 250 mm, G 1/2", SW27	A-22P-A29
	Thermowell Brass, 250 mm, R 1/2", SW22	A-22P-A30
	Thermowell Stainless steel, 450 mm, G 1/2", SW27	A-22P-A16
	Thermowell Brass, 450 mm, R 1/2", SW22	A-22P-A28

Wiring diagram


The following measuring ranges can be adjusted through the jumper settings:

Setting	Range [°C]	Range [°F]	Factory setting
S0	-50...50	-30...130	
S1	-10...120	0...250	
S2	0...50	40...140	
S3	0...250	30...480	
S4	-15...35	0...100	
S5	0...100	40...240	
S6	-20...80	40...90	
S7	0...160	0...150	✓

Dimensions



L = Probe length

Type	Probe length	Weight
22DT-12H	50 mm	0.12 kg

Dimensions

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

Further documentation

- Installation instructions
- Sensor length calculator