

**Cable temperature sensor**

Active sensor (0...10 V) for measuring the temperature in pipe and air applications. Incorporates a stainless steel probe and plenum-rated cable. NEMA 4X / IP65 rated enclosure.



5-year warranty


**Type Overview**

Type	Output signal active temperature	Cable length	Probe Length	Probe diameter
22CT-52H	0...5 V, 0...10 V	6.5 ft [2 m]	2" [50 mm]	0.24" [6 mm]

**Technical data**

<b>Electrical Data</b>	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 <sup>2</sup>
	Cable entry	Cable gland with strain relief ø6...8 mm (1/2" NPT conduit adapter included)
	Cable specification	1 pair shielded plenum cable, 22AWG tinned copper, green jacket, -40...300°F [-40...150°C], 300 V
<b>Functional Data</b>	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
<b>Measuring Data</b>	Measured values	Temperature
	<b>Specification Temperature active</b>	Sensing element technology based on Pt1000 1/3 DIN

**Technical data**

<b>Specification Temperature active</b>	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	±0.5°C @ 21°C [±0.9°F @ 70°F] @ measuring range setting S2 and S4	
	Long-term stability	±0.07°F p.a. @ 70°F [±0.04°C p.a. @ 21°C]	
	Time constant τ (63%) in water pipe	With thermowell A-22P-A.. and thermal contact fluid Typical 7 s with thermowell brass Typical 9 s with thermowell stainless steel	
	Time constant τ (63%) in the air duct	Typical 155 s @ 0 m/s Typical 35 s @ 3 m/s	
	<b>Safety Data</b>	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
		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	
Pollution degree		3	
Ambient humidity		Max. 95% RH, non-condensing	
Ambient temperature		-30...120°F [-35...50°C]	
Fluid temperature		-40...300°F [-40...150°C]	
Housing surface temperature	max. 160°F [70°C]		
<b>Materials</b>	Housing	Cover: PC, orange Bottom: PC, orange Seal: NBR70, black UV resistant UL94 5VA	
	Cable gland	PA6, black	
	Mounting plate	PC, grey RAL 7001	

**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. Unauthorized 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 authorized 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 ( $\pm 0.2$  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 ( $\pm 0.2$  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

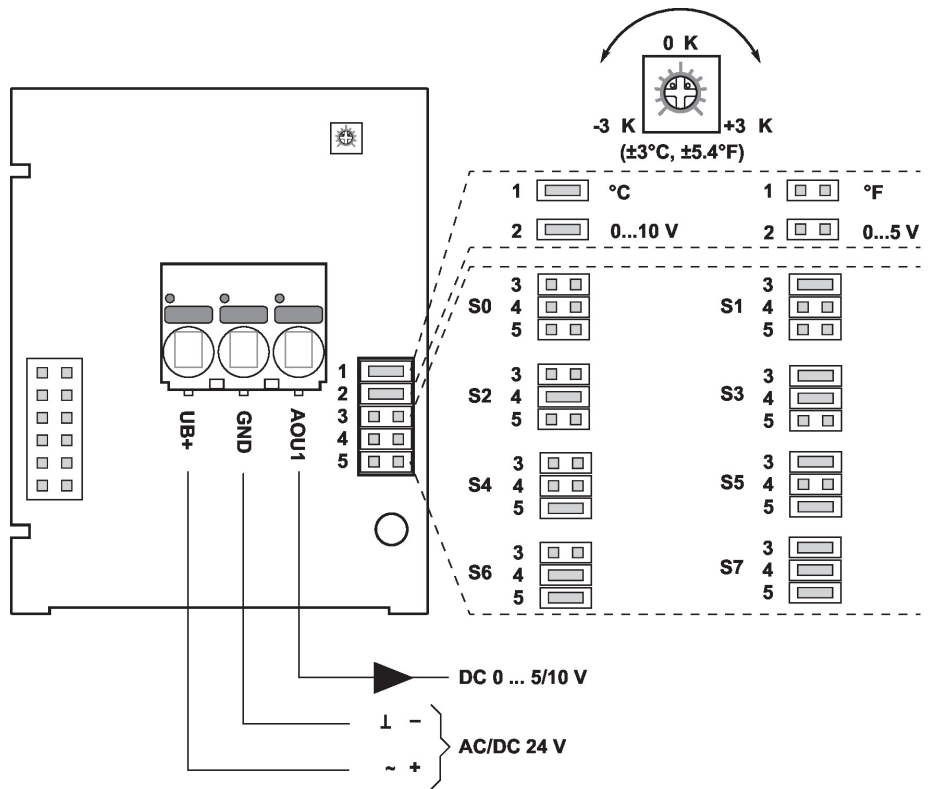
**Parts included**

Description	Type
Mounting plate S housing	A-22D-A09
Dowels	
Screws	
1/2" NPT conduit adapter	

**Accessories**

Optional accessories air	Description	Type
	Mounting flange for sensor probe 6 mm, up to max. 120°C [248°F], 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 (fabricated) Stainless steel, 2" [50 mm], 1/2" NPT, SW = 3/4"	A-22P-A05
	Thermowell (fabricated) Brass, 2" [50 mm], 1/2" NPT, SW = 3/4"	A-22P-A17
	Thermowell (machined) Stainless steel, 2" [50 mm], 1/2" NPT, SW = 3/4"	A-22P-A36
	Thermowell (fabricated) Stainless steel, 4" [100 mm], 1/2" NPT, SW = 3/4"	A-22P-A07
	Thermowell (fabricated) Brass, 4" [100 mm], 1/2" NPT, SW = 3/4"	A-22P-A19
	Thermowell (machined) Stainless steel, 4" [100 mm], 1/2" NPT, SW = 3/4"	A-22P-A37
	Thermowell (fabricated) Stainless steel, 6" [150 mm], 1/2" NPT, SW = 3/4"	A-22P-A09
	Thermowell (fabricated) Brass, 6" [150 mm], 1/2" NPT, SW = 3/4"	A-22P-A21
	Thermowell (machined) Stainless steel, 6" [150 mm], 1/2" NPT, SW = 3/4"	A-22P-A38
	Thermowell (fabricated) Stainless steel, 8" [200 mm], 1/2" NPT, SW = 3/4"	A-22P-A11
	Thermowell (fabricated) Brass, 8" [200 mm], 1/2" NPT, SW = 3/4"	A-22P-A23
	Thermowell (machined) Stainless steel, 8" [200 mm], 1/2" NPT, SW = 3/4"	A-22P-A39
	Thermowell (fabricated) Stainless steel, 12" [300 mm], 1/2" NPT, SW = 3/4"	A-22P-A13
	Thermowell (fabricated) Brass, 12" [300 mm], 1/2" NPT, SW = 3/4"	A-22P-A25
	Thermowell (fabricated) Stainless steel, 18" [450 mm], 1/2" NPT, SW = 3/4"	A-22P-A15
	Thermowell (fabricated) Brass, 18" [450 mm], 1/2" NPT, SW = 3/4"	A-22P-A27
	Syringe with thermal contact fluid	A-22P-A44
	Compression fitting, Stainless steel, G 1/4" (external thread) for 0.24" [6 mm], with cutting ring	A-22P-A45
	Cold barrier, Plastic, L 50 mm, for thermowell A-22P-A..	A-22P-A51

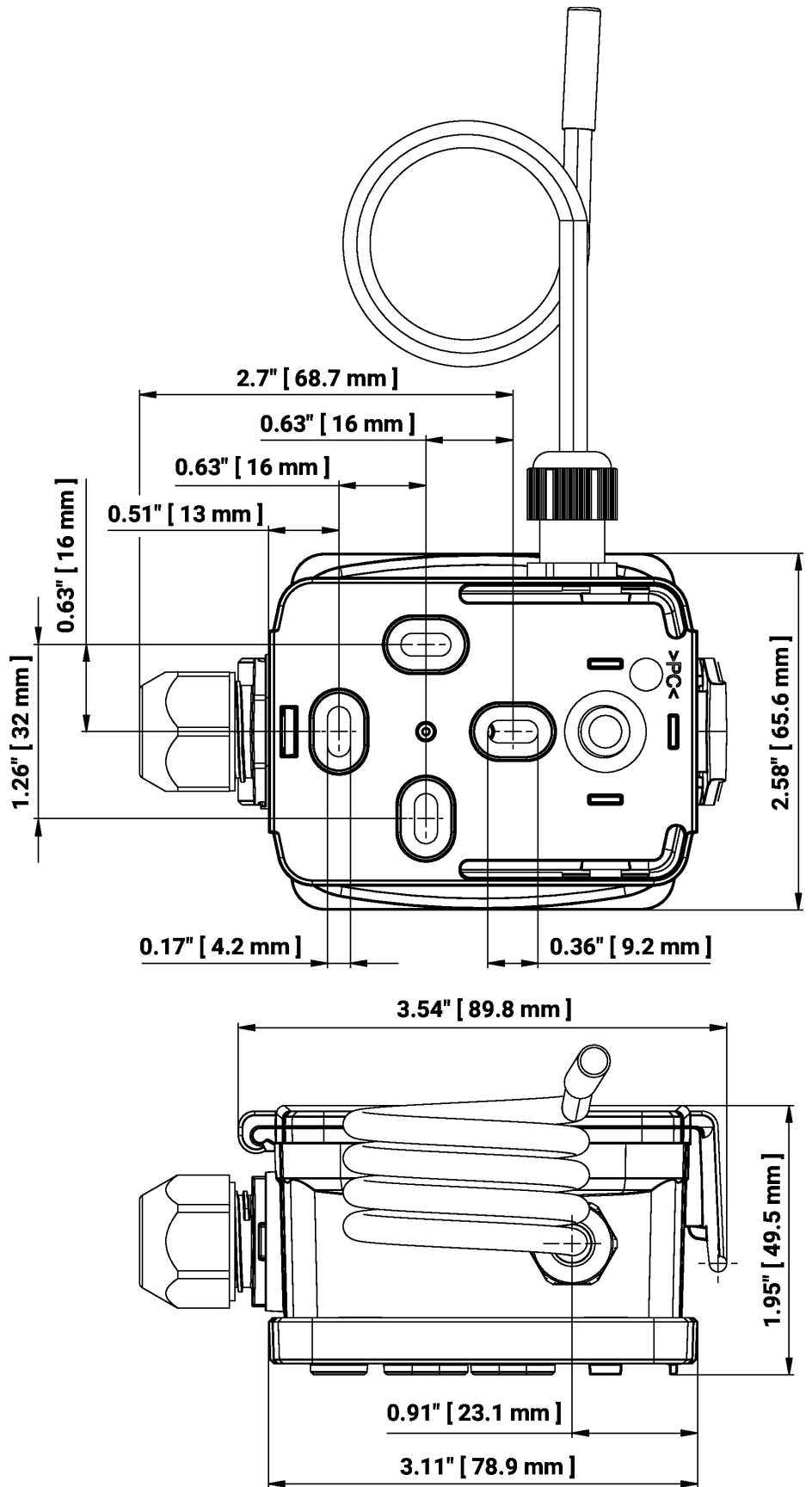
Wiring Diagram



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



**Dimensions**

Type	Probe Length	Weight
22CT-52H	2" [50 mm]	0.44 lb [0.20 kg]

**Further documentation**

- Installation instructions