

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.


Type Overview

| Type | Output signal active temperature | Cable length | Probe length | Probe diameter |
|----------|----------------------------------|--------------|--------------|----------------|
| 22CT-52H | 0...5 V, 0...10 V | 2 m | 2" [50 mm] | 0.24" [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 | 0.45 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) | | |
| | Cable specification | 1 pair shielded plenum cable, 22AWG tinned copper, green jacket, -40...300°F [-40...150°C], 300 V | | |
| Functional Data | Sensor Technology | based on Pt1000 1/3 DIN | | |
| | Multirange | 8 measuring ranges selectable | | |
| | Output signal active note | output 0...5/10 V with jumper adjustable Voltage load: min. 5 kΩ | | |
| | 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 | -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 active | ±0.9°F @ 70°F [±0.5°C @ 21°C] | | |
| | Long-term stability | ±0.07°F p.a. @ 70°F [±0.04°C p.a. @ 21°C] | | |
| | Time constant t (63%) in the air duct | typical 155 s @ 0 m/s typical 35 s @ 3 m/s | | |

| | | |
|--------------------|-------------------------------------|--|
| | Time constant t (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 |
| Materials | Cable gland | PA6, black |
| | Mounting plate | Lexan, gray RAL7001 |
| | Housing | cover: lexan, orange base: lexan, orange seal: 0467 NBR70, black UV resistant |
| Safety Data | Ambient humidity | max. 95% r.H., 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] |
| | 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 |
| | Degree of protection NEMA/UL | NEMA 4X |
| 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. 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 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 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 by 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

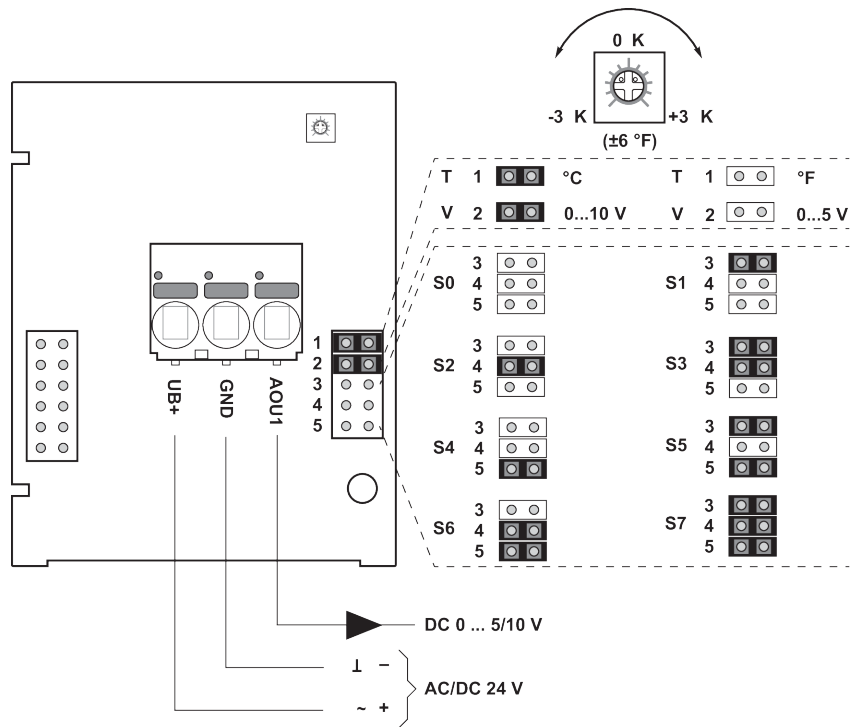
Scope of delivery

| Scope of delivery | Description | Type |
|-------------------|--------------------------|-----------|
| | Mounting plate S housing | A-22D-A09 |
| | Dowel | |
| | 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 pocket (fabricated) Stainless steel, 2" [50 mm], 1/2" NPT, wrench size 3/4" | A-22P-A05 |
| | Thermowell pocket (fabricated) Stainless steel, 4" [100 mm], 1/2" NPT, wrench size 3/4" | A-22P-A07 |
| | Thermowell pocket (fabricated) Stainless steel, 6" [150 mm], 1/2" NPT, wrench size 3/4" | A-22P-A09 |
| | Thermowell pocket (fabricated) Stainless steel, 8" [200 mm], 1/2" NPT, wrench size 3/4" | A-22P-A11 |
| | Thermowell pocket (fabricated) Stainless steel, 12" [300 mm], 1/2" NPT, wrench size 3/4" | A-22P-A13 |
| | Thermowell pocket (fabricated) Stainless steel, 18" [450 mm], 1/2" NPT, wrench size 3/4" | A-22P-A15 |
| | Thermowell pocket (fabricated) Brass, 2" [50 mm], 1/2" NPT, wrench size 3/4" | A-22P-A17 |
| | Thermowell pocket (fabricated) Brass, 4" [100 mm], 1/2" NPT, wrench size 3/4" | A-22P-A19 |
| | Thermowell pocket (fabricated) Brass, 6" [150 mm], 1/2" NPT, wrench size 3/4" | A-22P-A21 |
| | Thermowell pocket (fabricated) Brass, 8" [200 mm], 1/2" NPT, wrench size 3/4" | A-22P-A23 |
| | Thermowell pocket (fabricated) Brass, 12" [300 mm], 1/2" NPT, wrench size 3/4" | A-22P-A25 |
| | Thermowell pocket (fabricated) Brass, 18" [450 mm], 1/2" NPT, wrench size 3/4" | A-22P-A27 |
| | Thermowell pocket (machined) Stainless steel, 2" [50 mm], 1/2" NPT, wrench size 3/4" | A-22P-A36 |
| | Thermowell pocket (machined) Stainless steel, 4" [100 mm], 1/2" NPT, wrench size 3/4" | A-22P-A37 |
| | Thermowell pocket (machined) Stainless steel, 6" [150 mm], 1/2" NPT, wrench size 3/4" | A-22P-A38 |
| | Thermowell pocket (machined) Stainless steel, 8" [200 mm], 1/2" NPT, wrench size 3/4" | A-22P-A39 |
| | Syringe with thermal paste | 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 pocket A-22P-A.. | A-22P-A51 |

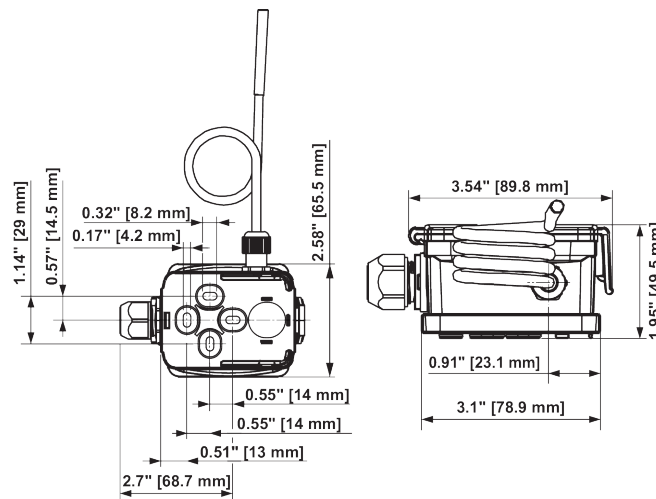
Wiring Diagram



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 | -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



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