

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

Technical data sheet

22CT-12H



Type Overview

enclosure.

| | | Туре | Output signal active temperature | Cable length | Probe length | Probe dia | ameter |
|---|-----------------|---------------------------------|-------------------------------------|-------------------------|--------------------|----------------|-----------|
| Electrical data Nominal voltage AC/DC 24 V Nominal voltage range AC 21.626.4 V / DC 13.526.4 V Power consumption AC 0.8 VA Power consumption DC 0.45 W Electrical connection Pluggable spring loaded terminal block me 2.5 mm ² Cable entry Cable gland with strain relief Ø68 mm Functional data Sensor Technology Application Air Multirange 8 measuring ranges selectable Voltage output 1x 05 V, 010 V, min. load 5 kΩ Output signal active note Output 05/10 V with Jumper adjustable Voltage output 1x 05 V, 010 V, min. load 5 kΩ Output signal active note Output 05/10 V with Jumper adjustable Measuring data Measuring range temperature Measuring range temperature Active sensor: range selectable Attention: max. measuring temperature (see S data) Setting range (°C] range (°F] So -5050 -30130 So -5050 -30130 stenting Setting range (°C] range (°C] range (°C) So -50 -5 | | 22CT-12H | 05 V, 010 V | 2 m | 50 mm | 6 m | m |
| Nominal voltage range AC 21.626.4 V / DC 13.526.4 V Power consumption AC 0.8 VA Power consumption DC 0.45 W Electrical connection Pluggable spring loaded terminal block me 2.5 mm ² Cable entry Cable gland with strain relief Ø68 mm Application Air Application Air Multirange 8 measuring ranges selectable Voltage output 1x 05 V, 010 V, min. load 5 kΩ Output signal active note Output 05/10 V with Jumper adjustable Measuring data Measuring range temperature Measuring range (°C) range (°F) Setting range (°C) Reasuring range temperature Setting Setting range (°C) Setting range (°C) Setting | Technical Data | | | | | | |
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| Power consumption DC 0.45 W Electrical connection Pluggable spring loaded terminal block ma 2.5 mm² Cable entry Cable gland with strain relief Ø68 mm Functional data Sensor Technology Based on Pt1000 1/3 DIN Application Air Water Multirange 8 measuring ranges selectable Voltage output Voltage output 1x 05 V, 010 V, min. load 5 kΩ Output signal active note Output signal active note Output 05/10 V with Jumper adjustable Measuring data Measuring range temperature Measuring range temperature Active sensor: range selectable Son -5050 -30130 Setting range [°C] range [°F] So -5050 -30130 S1 -10120 0250 S2 050 40140 S3 0250 30480 S4 -1535 0100 S4 -1535 0100 S5 0100 S5 0150 S6 -2080 < | | Nominal vo | ltage range | AC 21.6. | 26.4 V / DC 13.5. | 26.4 V | |
| Electrical connection Pluggable spring loaded terminal block ma Cable entry Cable gland with strain relief Ø68 mm Cable entry Cable gland with strain relief Ø68 mm Functional data Sensor Technology Based on Pt1000 1/3 DIN Application Air Water Multirange 8 measuring ranges selectable Voltage output 1x 05 V, 010 V, min. load 5 kΩ Output signal active note Output 05/10 V with Jumper adjustable Measuring data Measuring range temperature Measuring range temperature Active sensor: range selectable Attention: max. measuring temperature (see S data) Setting Setting range (°C) range (°F) Setting range (°C) range (°F) So -5050 -30130 S1 -10120 0250 S2 050 40140 S3 0250 30480 S4 -1535 0100 S4 -1535 0100 S4 -1535 0100 S4 -1535 0150 S4 | | Power cons | umption AC | 0.8 VA | | | |
| Functional data 2.5 mm² Functional data Sensor Technology Based on Pt1000 1/3 DIN Application Air Multirange 8 measuring ranges selectable Voltage output 1x 05 V, 010 V, min. load 5 kΩ Output signal active note Output 05/10 V with Jumper adjustable Measuring data Measured values Measuring range temperature Active sensor: range selectable Attention: max. measuring temperature is restricted by max. fluid temperature (see S data) Setting range (°C) range (°F) S0 -5050 -30130 S1 -10120 0250 S2 030 40140 S3 0250 30480 S4 -1535 0100 S6 -2080 4090 S7 0160 0150 Accuracy temperature active ±0.5°C @ 21°C [±0.9°F p.a. @ 70°F] Long-term stability ±0.04°C p.a. @ 21°C [±0.07°F p.a. @ 21°C [±0.07°F p.a. @ 70°F] | | Power cons | umption DC | 0.45 W | | | |
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| Long-term stability ±0.04°C p.a. @ 21°C [±0.07°F p.a. @ 70°F] | | Accuracy to | maaratura activa | | | | × |
| | | | • | | | | C1 |
| μ Ime constant t (63%) in air duct μ in Vincal 155 s (0.0 m/s) | | | • | | - | / гр.а. @ /0* | гJ |
| Typical 35 s @ 3 m/s | | rime consta | ווו ג (63%) וח air מעכנ | | | | |



| | Technical data sheet | 22CT-12H |
|----------------|-------------------------------------|--|
| Measuring data | 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 |
| Materials | Cable gland | PA6, black |
| | Mounting plate | PC, grey RAL7001 |
| | Housing | Cover: PC, orange Bottom: PC, orange Seal: NBR70, black UV resistant |
| Safety data | Ambient humidity | Max. 95% RH, non-condensing |
| | Ambient temperature | -3550°C [-30120°F] |
| | Fluid temperature | -50180°C [-60355°F] |
| | Housing surface temperature | Max. 70°C [160°F] |
| | Protection class IEC/EN | III, Protective Extra-Low Voltage (PELV) |
| | Power source UL | Class 2 Supply |
| | EU Conformity | CE Marking |
| | Certification IEC/EN | IEC/EN 60730-1 |
| | Degree of protection IEC/EN | IP65 |
| | Degree of protection NEMA/UL | NEMA 4X |
| | Enclosure | UL Enclosure Type 4X |
| | Quality Standard | ISO 9001 |
| | Mode of operation | Туре 1 |
| | Pollution degree | 3 |
| | Rated impulse voltage supply | 0.8 kV |
| | | |

Safety notes



Construction

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.

Independently mounted control

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

Technical data sheet

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, 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

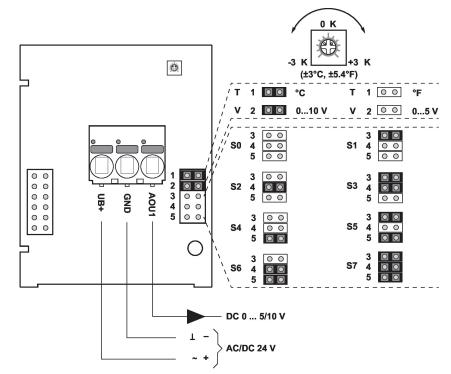
| Scope of delivery | Description | Туре |
|-------------------|--------------------------|-----------|
| | Mounting plate S housing | A-22D-A09 |
| | Dowel | |
| | Screws | |

Accessories

| Optional accessories | Description | Туре |
|-------------------------------|--|------------------------|
| | Connection adapter, M20x1.5, for cable 1x6 mm, Multipack 10 pcs. | A-22G-A01.1 |
| Optional accessories air | Description | Туре |
| | Mounting flange for sensor probe 6 mm, up to max. 120°C [248°F], Plastic Mounting flange for sensor probe 6 mm, up to max. 260°C, Brass | A-22D-A03 A-22D-A05 |
| Recommended accessories water | Description | Туре |
| | Thermowell pocket Stainless steel, 50 mm, G1/2", SW27 | A-22P-A06 |
| | Thermowell pocket Stainless steel, 100 mm, G1/2", SW27 | A-22P-A08 |
| | Thermowell pocket Stainless steel, 150 mm, G1/2", SW27 | A-22P-A10 |
| | Thermowell pocket Stainless steel, 200 mm, G1/2", SW27 | A-22P-A12 |
| | Thermowell pocket Stainless steel, 300 mm, G1/2", SW27 | A-22P-A14 |
| | Thermowell pocket Stainless steel, 450 mm, G1/2", SW27 | A-22P-A16 |
| | Thermowell pocket Brass, 50 mm, R1/2", SW22 | A-22P-A18 |
| | Thermowell pocket Brass, 100 mm, R1/2", SW22 | A-22P-A20 |
| | Thermowell pocket Brass, 150 mm, R1/2", SW22 | A-22P-A22 |
| | Thermowell pocket Brass, 200 mm, R1/2", SW22 | A-22P-A24 |
| | Thermowell pocket Brass, 300 mm, R1/2", SW22 | A-22P-A26 |
| | Thermowell pocket 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 |
| | Cold barrier, Plastic, L 50 mm, for thermowell A-22P-A | A-22P-A51 |

Wiring diagram

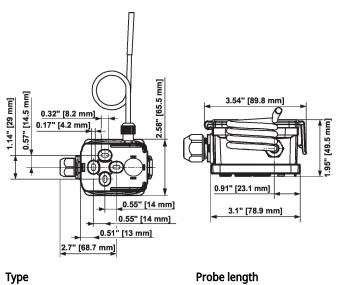
BELIMO



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.

| • | | 5 5 | |
|---------|------------|------------|-----------------|
| Setting | range [°C] | range [°F] | Factory setting |
| S0 | -5050 | -30130 | |
| S1 | -10120 | 0250 | |
| S2 | 050 | 40140 | |
| S3 | 0250 | 30480 | |
| S4 | -1535 | 0100 | |
| S5 | 0100 | 40240 | |
| S6 | -2080 | 4090 | |
| S7 | 0160 | 0150 | \checkmark |
| | | | |

Dimensions



| Probe length | Weight |
|--------------|---------|
| 50 mm | 0.20 kg |
| | |