

Duct sensor CO₂ / Temperature

Active sensor (4...20 mA / 0...10 V) for measuring CO₂ or with integrated temperature sensor. See options below for integrated sensors. Dual channel CO₂ technology. NEMA 4X / IP65 rated enclosure.



5-year warranty



Type Overview

| Type | Output signal active CO ₂ | Output signal active temperature |
|----------|--------------------------------------|----------------------------------|
| 22DTC-53 | 4...20 mA, 0...5 V, 0...10 V | 4...20 mA, 0...5 V, 0...10 V |
| 22DC-53 | 4...20 mA, 0...5 V, 0...10 V | - |

Technical data

| | | |
|-------------------------------------|---------------------------------------|---|
| Electrical Data | Nominal voltage | AC/DC 24 V |
| | Nominal voltage range | AC 19...29 V / DC 15...35 V |
| | Power consumption AC | 4.3 VA |
| | Power consumption DC | 2.3 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) |
| Functional Data | Application | air |
| | Voltage output | 1 x 0...5 V, 0...10 V, min. resistance 10 kΩ (Type 22DC-53) 2 x 0...5 V, 0...10 V, min. resistance 10 kΩ (Type 22DTC-53) |
| | Current output | 1x 4...20 mA, max. resistance 500 Ω (22DC-53) 2x 4...20 mA, max. resistance 500 Ω (22DTC-53) |
| | Output signal active note | output 0...5/10 V with jumper adjustable |
| | Measuring Data | Measured values |
| Specification CO₂ | Sensing element technology | NDIR (non-dispersive infrared) dual-channel |
| | Measuring range | default setting: 0...2000 ppm With A-22G-A05: 0...5000 ppm |
| | Accuracy | ±(50 ppm + 3% of measured value) |
| | Long term stability | ±50 ppm p.a. |
| | Calibration | Self-calibration Dual-channel |
| | Time constant τ (63%) in the air duct | Typical 33 s @ 1 m/s |
| | Specification Temperature | Measuring range |

Technical data

| | | |
|----------------------------------|--|---|
| Specification Temperature | Accuracy temperature active | ±0.3°C @ 25°C [±0.5°F @ 77°F] |
| | Long term stability | ±0.07°F p.a. @ 70°F [±0.04°C p.a. @ 21°C] |
| | Time constant τ (63%) in the air duct | Typical 125 s @ 3 m/s |
| Safety Data | Protection class IEC/EN | III, Safety Extra-Low Voltage (SELV) |
| | 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 | 32...122°F [0...50°C] |
| | Fluid humidity | Max. 95% RH, non-condensing |
| | Fluid temperature | 0...50°C [32...122°F] |
| Operating condition airflow | min. 1 ft/s [0.3 m/s] max. 40 ft/s [12 m/s] | |
| Materials | Cable gland | PA6, black |
| | Housing | Cover: PC, orange Bottom: PC, orange Seal: NBR70, black UV resistant UL94 5VA |
| | Probe material | PA6, black |

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 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.

Remarks

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

Requirements to be met by the medium

To ensure the ongoing and optimal functioning of the sensor, it is imperative that the air being measured is free of dust or other contaminants that could accumulate on the sensor element.

Information self-calibration feature CO₂

All CO₂ sensors are subject to drift caused by the aging process of the components, resulting in regular re-calibration or replacement of units. However, the dual channel technology integrates automatic self-calibration technology vs. commonly used ABC-Logic sensors. Dual channel self-calibration technology is ideally suited for applications operating 24/7, such as those in hospitals or other commercial applications. Manual calibration is not required.

Parts included

| Description | Type |
|--|-----------|
| Mounting flange for duct sensor 19.5 mm, up to max. 120°C [248°F], Plastic | A-22D-A34 |
| 1/2" NPT conduit adapter | |

Accessories

| Optional accessories | Description | Type |
|----------------------|---|----------------------------------|
| | Replacement filter sensor probe tip, wire mesh, Stainless steel | A-22D-A06 |
| | Mounting plate L housing | A-22D-A10 |
| Tools | Description | Type |
| | Belimo Duct Sensor Assistant App | Belimo Duct Sensor Assistant App |
| | Bluetooth dongle for Belimo Duct Sensor Assistant App | A-22G-A05 |
| | * Bluetooth dongle A-22G-A05 | |
| | Certified and available in North America, European Union, EFTA States and UK. | |

Service

Tools connection This sensor can be operated and parametrized using the Belimo Assistant App. When using the Belimo Duct Sensor Assistant App, the Bluetooth dongle is required to enable communication between the app and the Belimo sensor.

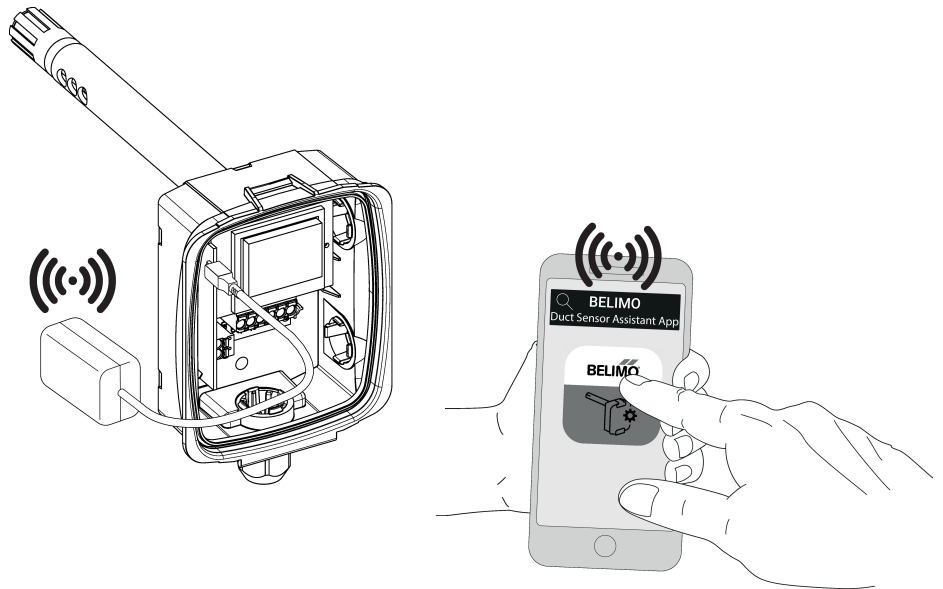
For the standard operation and parametrization of the sensor the Bluetooth dongle and the Belimo Duct Sensor Assistant App are not needed. The sensor will arrive pre-configured with the factory default settings shown above.

Requirement:

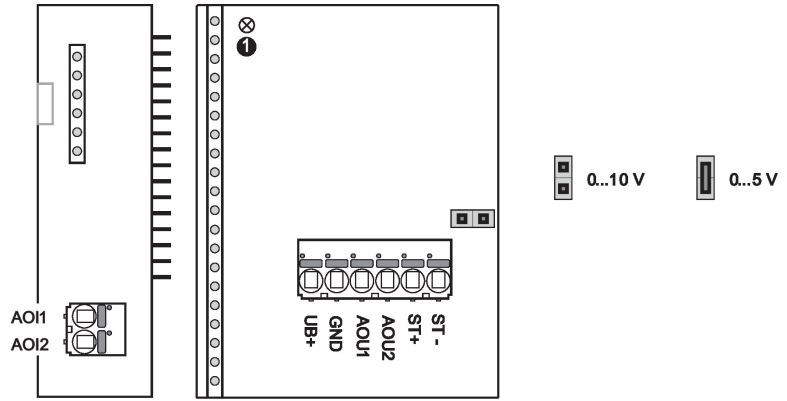
- Bluetooth dongle (Belimo Part No: A-22G-A05)
- Bluetooth-capable smartphone
- Belimo Duct Sensor Assistant App (Google Play & Apple App Store)

Procedure:

- Plug the Bluetooth dongle into the sensor via the Micro-USB connector or by means of the interface PCB
- Connect Bluetooth-capable smartphone with Bluetooth dongle
- Select parametrization in the Belimo Assistant App

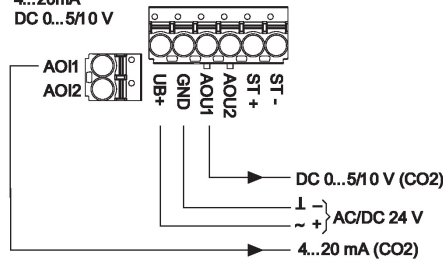


Wiring Diagram



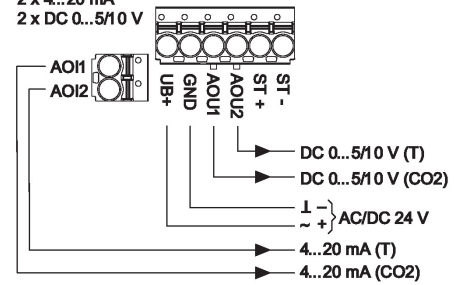
22DC-13 / 22DC-53

4...20mA
DC 0...5/10 V



22DTC-13 / 22DTC-53

2 x 4...20 mA
2 x DC 0...5/10 V

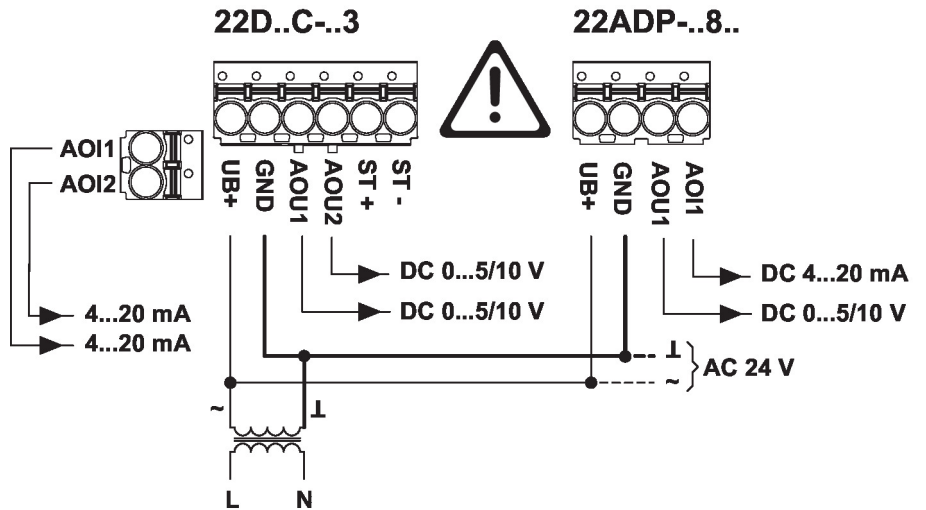


① Status LED

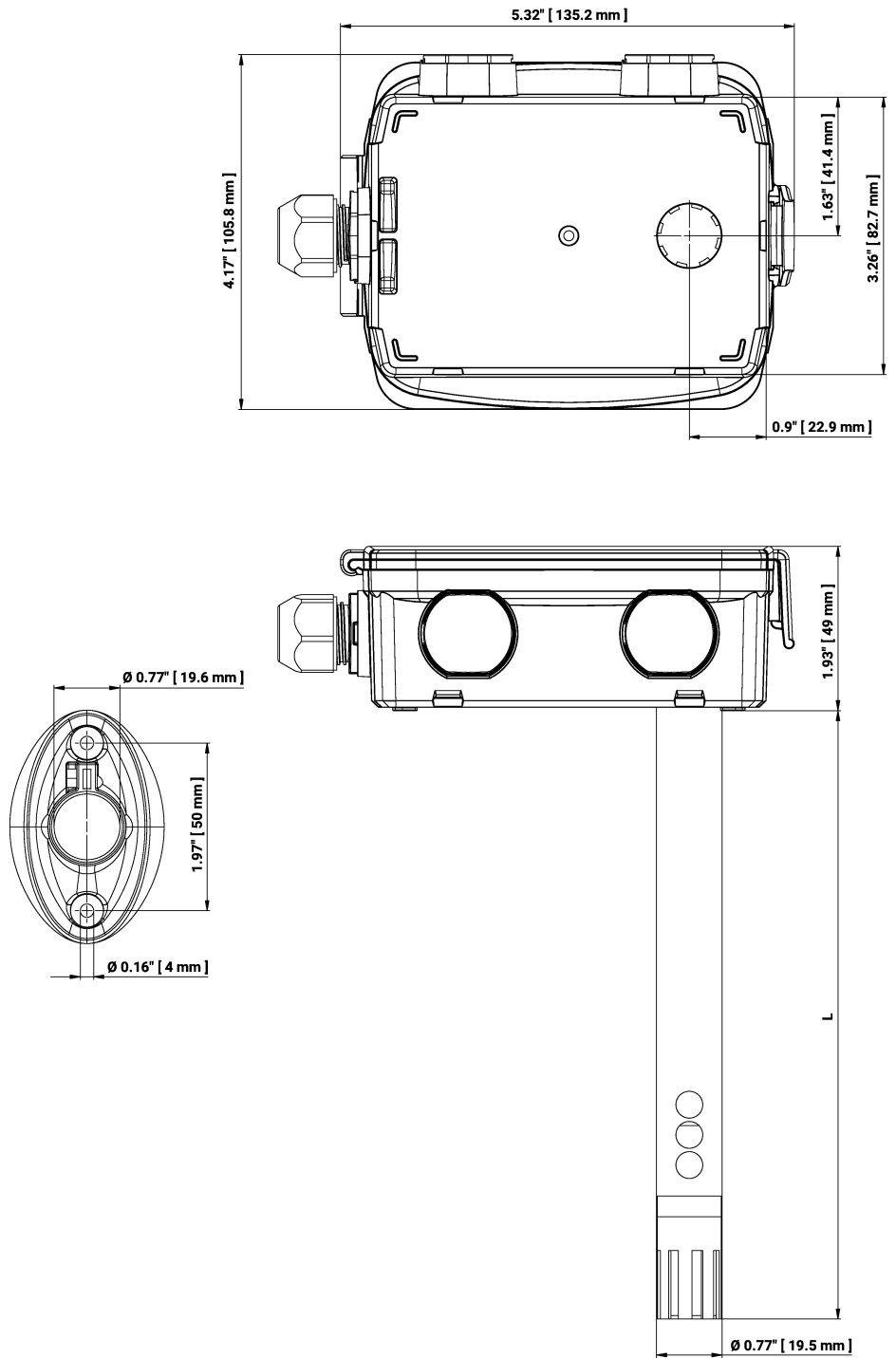
Wiring note power supply AC

For the sensor to function properly, polarity must be observed with a DC supply as well as an AC supply.

If the AC supply is connected incorrectly, i.e. if the wires are reversed, this can lead to the destruction of the sensor.



Dimensions



| Type | Probe length | Weight |
|----------|--------------|-------------------|
| 22DTC-53 | 7" [180 mm] | 0.62 lb [0.28 kg] |
| 22DC-53 | 6" [150 mm] | 0.57 lb [0.26 kg] |

Further documentation

- Installation instructions