Duct Air Quality Sensor

Duct air quality sensor for detection of $CO_2$ with 0 to10 V output. Optional integrated temperature, humidity, VOC sensors and LCD display.

5 YEAR WARRANTY

## Type Overview

| Type | Output signal active $CO_2$ | Output signal active VOC | Output signal active temperature | Output signal passive temperature | Output signal active $CO_2$/VOC | Output signal active humidity | Display type |
|---|---|---|---|---|---|---|---|
| **22DC-11** | DC 0...5 V, DC 0...10 V | - | - | - | - | - | - |
| **22DC-110L** | DC 0...5 V, DC 0...10 V | - | - | NTC10k2 | - | - | - |
| **22DCK-11** | DC 0...5 V, DC 0...10 V | DC 0...5 V, DC 0...10 V | DC 0...5 V, DC 0...10 V | - | DC 0...5 V, DC 0...10 V | - | - |
| **22DCM-11** | DC 0...5 V, DC 0...10 V | DC 0...5 V, DC 0...10 V | DC 0...5 V, DC 0...10 V | - | - | - | - |
| **22DCV-11** | DC 0...5 V, DC 0...10 V | DC 0...5 V, DC 0...10 V | - | - | - | - | - |
| **22DTC-11** | DC 0...5 V, DC 0...10 V | - | DC 0...5 V, DC 0...10 V | - | - | - | - |
| **22DTM-11** | DC 0...5 V, DC 0...10 V | - | DC 0...5 V, DC 0...10 V | - | - | DC 0...5 V, DC 0...10 V | - |
| **22DTM-1106** | DC 0...5 V, DC 0...10 V | - | DC 0...5 V, DC 0...10 V | - | - | DC 0...5 V, DC 0...10 V | LCD |

## Technical Data

| | | |
|---|---|---|
| **Electrical Data** | Power supply DC | 15...24 V, ±10%, 1.5 W |
| | Power supply AC | 24 V, ±10%, 2.9 VA |
| | Electrical connection | removable spring loaded terminal block max. 11 GA [2.5 mm²] |
| | Cable entry | Cable gland with strain relief Ø6...8 mm |
| **Functional Data** | Sensor Technology | NDIR (non dispersive infrared) with stainless steel wire mesh filter, dual channel calibration |
| | Output signal active note | output DC 0 to 5/10 V with jumper adjustable voltage output: min. 10 kΩ load |
| | Display | LCD, measured values: $CO_2$, temperature, rH, VOC |
| | Media | air |

| | | |
|---|---|---|
| **Measuring Data** | Measuring values | $CO_2$<br>VOC<br>mix $CO_2$/VOC<br>temperature<br>relative humidity |
| | Measuring range $CO_2$ | 0...2000 ppm |
| | Measuring range humidity | 0 to 100% RH |
| | Measuring range temperature | 30...120 °F [0...50 °C] |
| | Accuracy $CO_2$ | ±(50 ppm + 3% of measuring value) |
| | Accuracy humidity | ±2% between 10 to 90% RH @ 70°F [21°C] |
| | Accuracy temperature active | ±0.9 °F @ 70 °F [±0.5 °C @ 21 °C] |
| | Accuracy temperature passive | ±0.3 °F @ 77 °F [±0.2 °C @ 25 °C] |
| **Materials** | Cable gland | PA6, black |
| | Housing | UV resistant<br>cover: lexan, orange<br>base: lexan, orange<br>seal: 0467 NBR70, black |
| | Probe material | PA6, black |
| **Safety Data** | Ambient humidity | max. 95% RH non-condensing |
| | Ambient temperature | 30...120 °F [0...50 °C] |
| | Medium temperature | 30...120 °F [0...50 °C] |
| | Operating condition air flow | min. 1 ft/s [0.3 m/s]<br>max. 33 ft/s [10 m/s] |
| | Protection class IEC/EN | III safety extra-low voltage (selv) |
| | Protection class UL | UL Class 2 Supply |
| | EU Conformity | CE-Kennzeichnung |
| | Certification IEC/EN | IEC/EN 60730-1 |
| | Certification UL | cULus acc. to UL60730-1A/-2-9, CAN/CSA E60730-1:02/-2-9, CE acc. to 2004/108/EC and 2006/95/EC, NEMA 4X, IP65, UL Enclosure Type 4X |
| | Degree of protection IEC/EN | IP65 |
| | Degree of protection NEMA/UL | NEMA 4X |
| | Quality Standard | ISO 9001 |

## Safety Notes

The installation and assembly of electrical equipment should only be performed by authorized personnel.

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 human, animals or assets.
Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with
- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

## 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 the 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. This dissipative power should be taken into account when measuring temperature. 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 to 10 V / 4 to 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 re-calibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.

**Information Self-Calibration Feature $CO_2$**

All $CO_2$ sensors are subject to drift caused by the aging process of the components, resulting in regular re-calibration or replacement units. However the dual channel technology integrates automatic self-calibration technology vs common used ABC-Logic sensors. Dual channel self-calibration technology is ideally suited for applications operating 24/7 hours such as hosiptals or other commerical applications. Manual calibration is not required.

## Scope of delivery

**Scope of delivery**

| Description | Type |
|---|---|
| Mounting Flange for duct sensor 19.5 mm | A-22D-A35 |

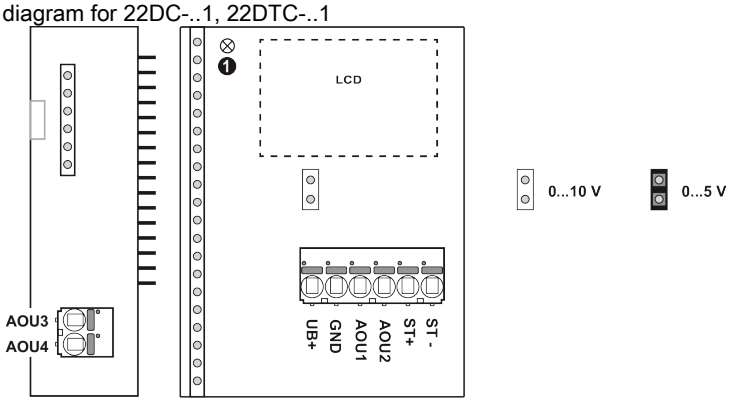
## Accessories

**Optional accessories**

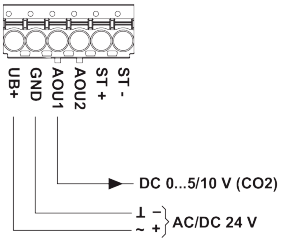
| Description | Type |
|---|---|
| Replacement filter Stainless steel, wire mesh | A-22D-A06 |

## Wiring Diagram

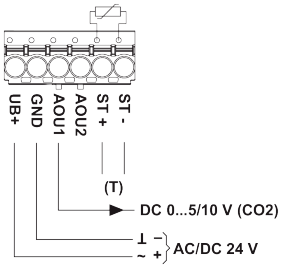
Wiring diagram for 22DC-..1, 22DTC-..1



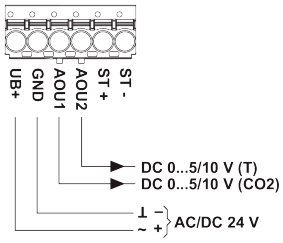

**22DC-11 / 22DC-51**
DC 0...5/10 V



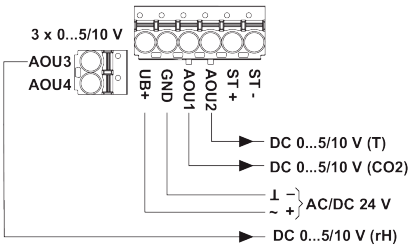

**22DC-110.. / 22DC-510..**
DC 0...5/10 V + ST



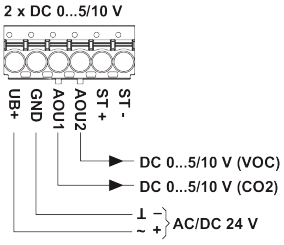

**22DTC-11.. / 22DTC-51**
2 x DC 0...5/10 V



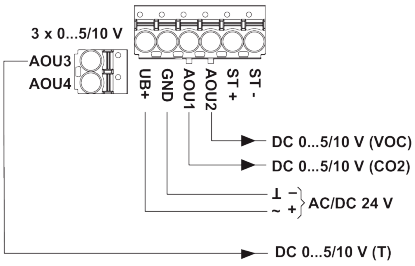

**22DTM-..1 / 22DTM-..106**



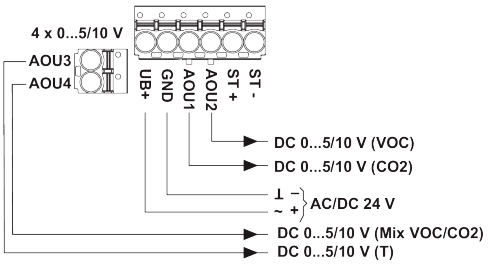

**22DCV-11 / 22DCV-51**
2 x DC 0...5/10 V




**22DCM-11 / 22DCM-51**



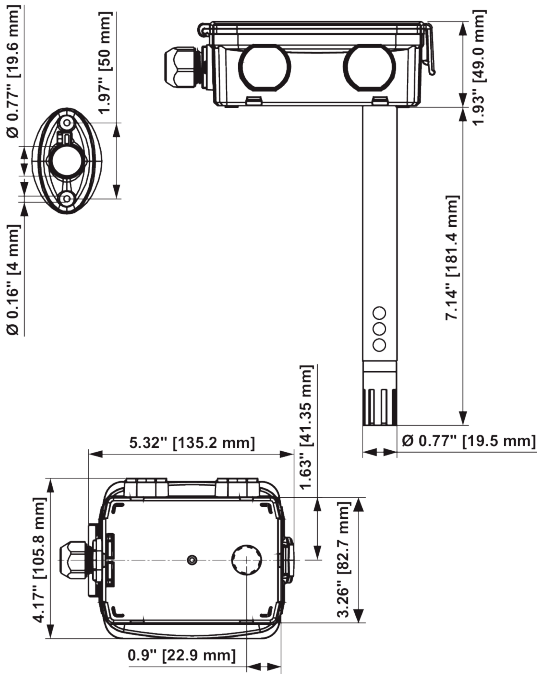

**22DCK-11 / 22DCK-51**




① Status LED

## Dimensions

### Dimensions




| Type | Weight |
|---|---|
| 22DC-11 | 0.57 lb [0.26 kg] |
| 22DC-110L | 0.57 lb [0.26 kg] |
| 22DCK-11 | 0.59 lb [0.27 kg] |
| 22DCM-11 | 0.59 lb [0.27 kg] |
| 22DCV-11 | 0.59 lb [0.27 kg] |
| 22DTC-11 | 0.57 lb [0.26 kg] |
| 22DTM-11 | 0.57 lb [0.26 kg] |
| 22DTM-1106 | 0.61 lb [0.28 kg] |