Duct sensor CO_2 / Humidity / Temperature

Active sensor (0...10 V) for measuring CO_2, temperature and humidity. Dual channel CO_2 technology. Optional with LCD display. NEMA 4X / IP65 rated enclosure.

5 YEAR WARRANTY

Type Overview

Type	Output signal active CO_2	Output signal active temperature	Output signal active humidity	Display type
22DTM-11	0...5 V, 0...10 V	0...5 V, 0...10 V	0...5 V, 0...10 V	-
22DTM-1106	0...5 V, 0...10 V	0...5 V, 0...10 V	0...5 V, 0...10 V	LCD

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
Functional data	Sensor Technology	CO_2: NDIR (non dispersive infrared) dual channel Relative humidity: with stainless steel wire mesh filter
	Application	Air
	Voltage output	3 x 0...5 V, 0...10 V, min. resistance 10 kΩ
	Output signal active note	Output 0...5/10 V with Jumper adjustable
	Display	LCD, 29x35 mm with backlight Measured values: CO_2, temperature, relative humidity
Measuring data	Measured values	CO_2 Relative humidity Absolute humidity Dew point Enthalpies Temperature
	Measuring range CO_2	Default setting: 0...2000 ppm With A-22G-A05: 0...5000 ppm
	Measuring range humidity	0...100% RH
	Measuring range temperature	0...50°C [32...122°F]
	Accuracy CO_2	±(50 ppm + 3% of measured value)

Technical data

Measuring data	Accuracy humidity	±2% between 0...80% RH @ 25°C
	Accuracy temperature active	±0.3°C @ 25°C [±0.54°F @ 77°F]
	Calibration	Self-calibration, Dual Channel
	Long-term stability	±50 ppm p.a. ±0.3% RH p.a. @ 21°C @ 50% RH ±0.05°C p.a. @ 21°C [±0.09°F p.a. @ 70°F]
	Time constant τ (63%) in air duct	CO_2: typical 33 s @ 1 m/s Relative humidity: typical 10 s @ 3 m/s Temperature: typical 125 s @ 3 m/s
Materials	Cable gland	PA6, black
	Housing	Cover: PC, orange Bottom: PC, orange Seal: NBR70, black UV resistant
	Probe material	PA6, black
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 Approval	cULus acc. to UL60730-1A/-2-9/-2-13, CAN/CSA E60730-1/-2-9
	Type of action	Type 1
	Rated impulse voltage supply	0.8 kV
	Installation method	Independently mounted control
	Pollution degree	3
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	0...50°C [32...122°F]
	Fluid humidity	Max. 95% RH, non-condensing
	Fluid temperature	0...50°C [32...122°F]
	Operating condition airflow	min. 0.3 m/s max. 12 m/s

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. 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.

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 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.

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

Application notice for humidity sensors

The humidity sensor is extremely sensitive. Touching the sensor element or exposing it to aggressive substances like chlorine, ozone, ammonia, hydrogen peroxide or ethanol (i.e. as a cleaning agent) may affect the measurement accuracy.

Long term operation outside the recommended conditions (5...50°C and 20...80% RH) can result in a temporary offset. After returning into the recommended range, this effect disappears.

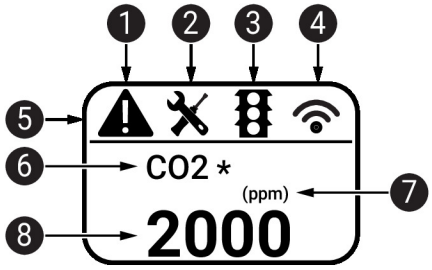
Information self-calibration feature CO_2

All CO_2 sensors are subject to drift caused by the aging process of the components, resulting in regular re-calibration or replacement of 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 those in hosiptals or other commerical applications. Manual calibration is not required.

Indicators and Operation

Indicators

Depending on the device and the number of measured values, the display automatically scales. Parameters, such as the fading in/out of measured values, brightness and traffic light function, are changed via the app or bus system. During the boot process, the software and hardware versions are displayed.



1. **Fault / sensor failure**
2. **Service / visual inspection due**
3. **TLF (traffic light function) active (thresholds for display colour changes)**
4. **Radio active (not available)**
5. **Status bar**
6. **Measured value (* appears when TLF function is activated for this value)**
7. **Unit of measure**
8. **Measured value**

Parts included

Description	Type
Mounting flange for duct sensor 19.5 mm, up to max. 120°C [248°F], Plastic	A-22D-A35

Accessories

Optional accessories

Description	Type
Replacement filter sensor probe tip, wire mesh, Stainless steel	A-22D-A06
Connection adapter flex conduit, M20x1.5, for cable gland 1 x 6 mm, Multipack 10 pcs.	A-22G-A01.1
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 parametrised using the Belimo Duct Sensor 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.

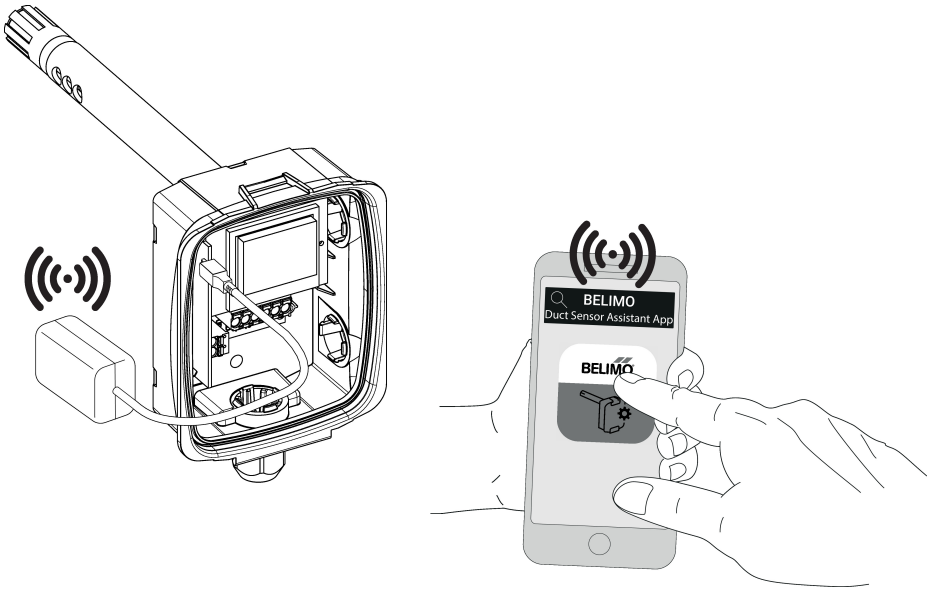
For the standard operation and parametrisation of the sensor the bluetooth dongle and the Belimo Duct Sensor Assistant App are not needed. The sensor will arrive pre-configured with the factory default settings shown above.

Requirement:

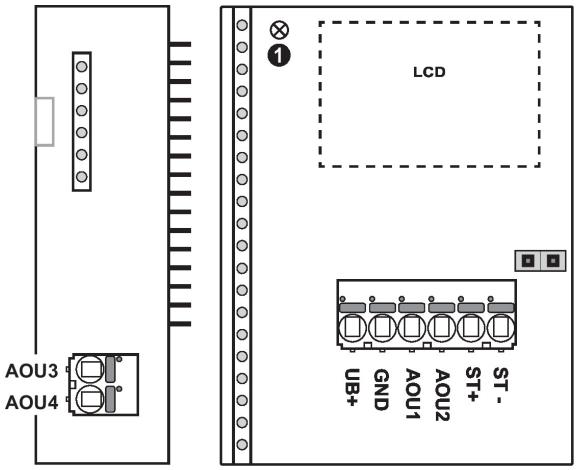
- Bluetooth dongle (Belimo Part No: A-22G-A05)
- Bluetooth-capable smartphone
- Belimo Duct Sensor Assistant App (Google Play & Apple App Store)

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 parametrisation in the Belimo Duct Sensor Assistant App

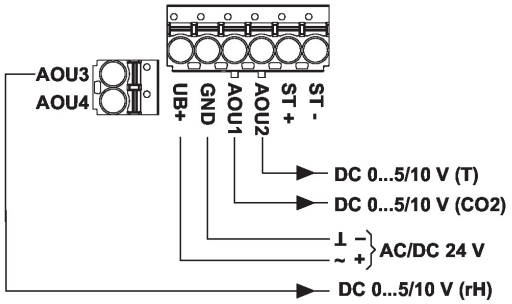


Wiring diagram



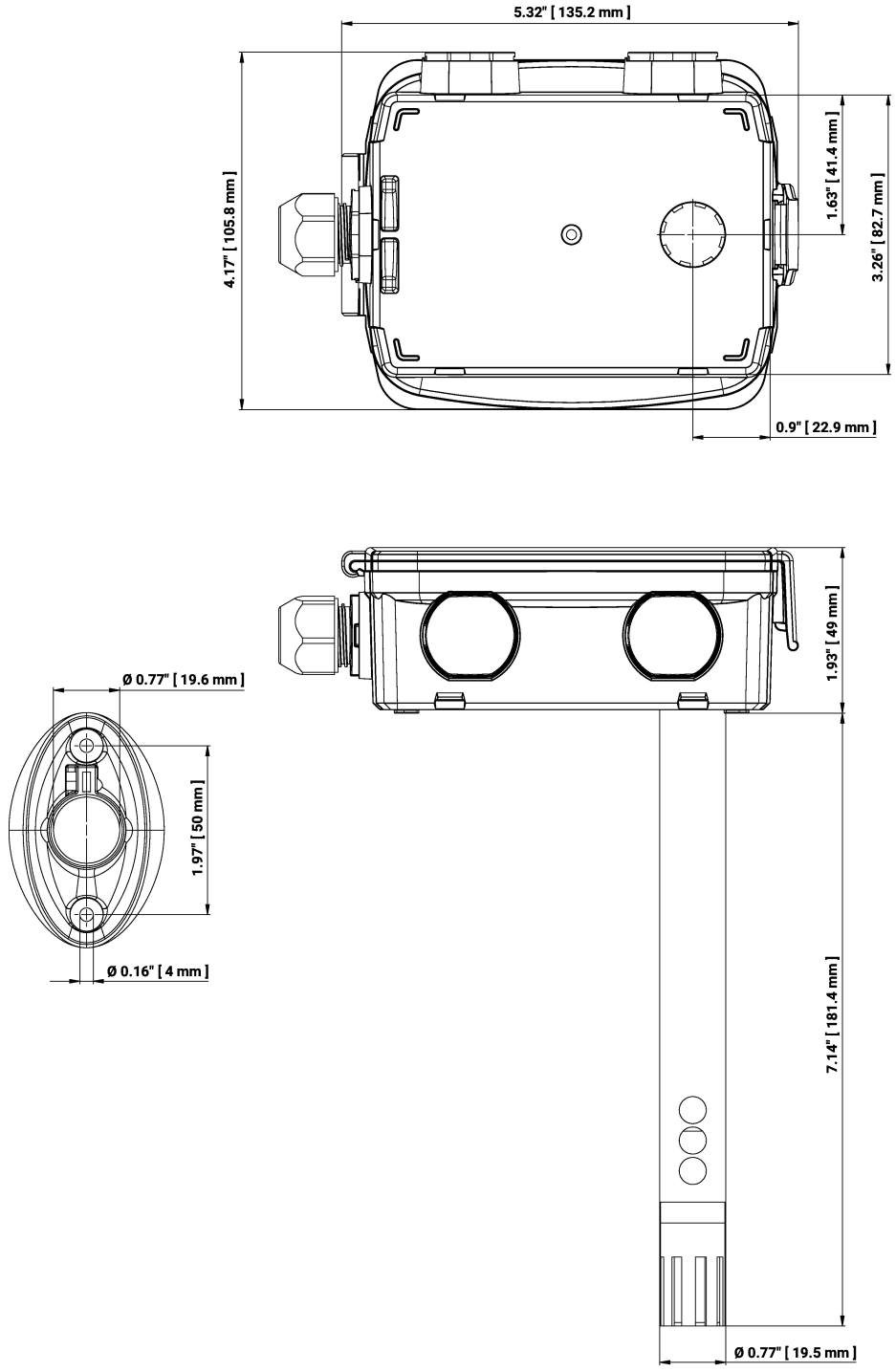
22DTM-11.. / 22DTM-51..

3 x DC 0...5/10 V



① Status LED

Dimensions



Type	Probe length	Weight
22DTM-11	180 mm	0.28 kg
22DTM-1106	180 mm	0.30 kg

Further documentation

• Installation instructions