

Duct Sensor CO₂ / Humidity / Temperature

For combined measurement of CO₂, relative humidity and temperature in the duct.

Dual channel CO₂ technology.

The measured values are output via Modbus. NEMA 4X / IP65 rated enclosure.


Type Overview

Type	Output signal	Output signal active CO ₂	Output signal active temperature
22DTM-15	Modbus	DC 0...5 V, DC 0...10 V	DC 0...5 V, DC 0...10 V

Technical Data

Electrical data	Power supply DC	15...24 V, ±10%, 0.3 W
	Power supply AC	24 V, ±10%, 6 VA
	Electrical connection	Removable spring loaded terminal block max. 2.5 mm ²
Functional data	Cable entry	Cable gland with strain relief 2 x Ø6 mm
	Sensor Technology	CO ₂ : NDIR (non dispersive infrared) dual channel
	Communicative control	Modbus RTU
	Output signal active note	Output DC 0...5/10 V selectable with switch
	Media	Air

Measuring data	Measuring values	CO ₂ Temperature Relative humidity Absolute humidity Enthalpies Dew point	
	Measuring range CO ₂	0...2000 ppm selectable via Modbus	
	Measuring range humidity	0...100% rH selectable via Modbus	
	Measuring range temperature	0...50 °C [30...120 °F] selectable via Modbus Attention: max. measuring temperature is restricted by max. medium temperature (see Safety data)	
	Measuring range absolute humidity	0...80 g/m ³ selectable via Modbus	
	Measuring range enthalpy	0...85 kJ/kg selectable via Modbus	
	Measuring range dew point	-20...80 °C selectable via Modbus	
	Accuracy CO ₂	±(50 ppm + 3% of measuring value)	
	Accuracy humidity	±2% between 10...90% r.H. @ 21 °C	
	Accuracy temperature active	±0.5 °C @ 21 °C [±0.9 °F @ 70 °F]	
	Materials	Cable gland	PA6, black
		Housing	UV resistant Cover: Lexan, orange Bottom: Lexan, orange Seal: 0467 NBR70, black
	Safety data	Probe material	PA6, black
Ambient humidity		Max. 95% r.h., non-condensing	
Ambient temperature		0...50 °C [30...120 °F]	
Medium temperature		0...50 °C [30...120 °F]	
Operating condition air flow		min. 0.3 m/s max. 10 m/s	
Protection class IEC/EN		III Safety Extra-Low Voltage (SELV)	
Protection class UL		UL Class 2 Supply	
Certification IEC/EN		IEC/EN 60730-1	
Certification UL		cULus acc. to UL60730-1A/-2-9/-2-13, CAN/CSA E60730-1:02/-2-9	
Degree of protection IEC/EN		IP65	
Degree of protection NEMA/UL		NEMA 4X, UL Enclosure Type 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. 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 re-calibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.
Application Notice for Humidity Sensors	<p>Refrain from touching the sensitive humidity sensor/element. Touching the sensitive surface will void warranty.</p> <p>For standard environmental conditions the manufacturing accuracy specified in the datasheet will be covered by the calibration warranty for two years. When exposed to harsh environmental conditions such as; high ambient temperature and/or high levels of humidity or presence of aggressive gases (i.e. chlorine, ozone, ammonia) the sensor element may be affected and readings may be outside specified accuracy. Replacement of deteriorated humidity sensor due to harsh environmental conditions are not subject of the general warranty.</p>
Information Self-Calibration Feature CO₂	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 hospitals or other commercial applications. Manual calibration is not required.

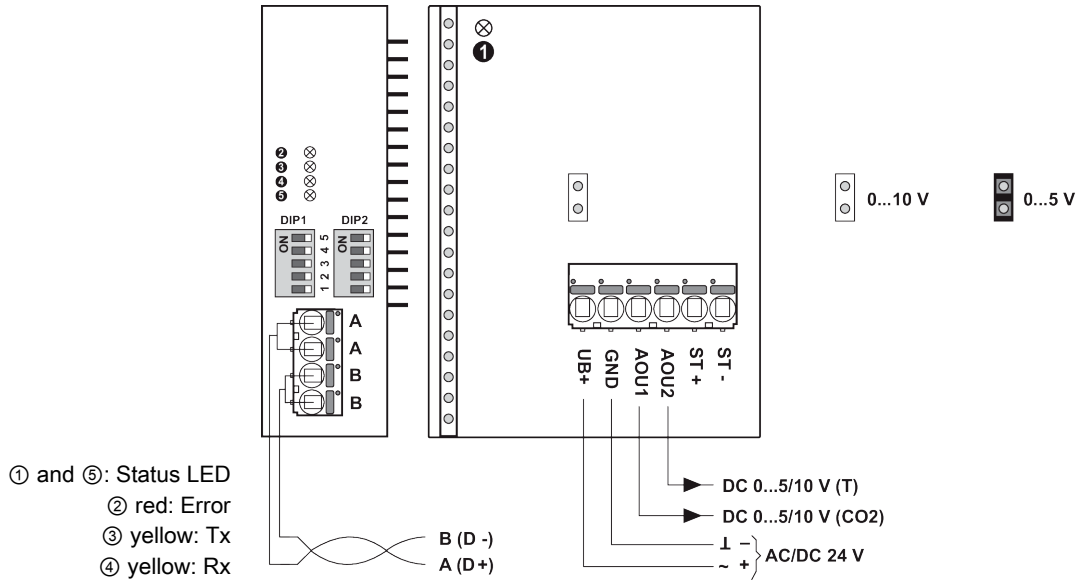
Scope of delivery

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
	Connection adapter M20 for cable 1 x 6 mm (Multi-pack 10 pieces)	A-22G-A01.1
	Connection adapter M20 for cable 2 x 6 mm (Multi-pack 10 pieces)	A-22G-A02.1

Wiring diagram



Detailed documentation

The separate document Sensor Modbus-Register informs about Modbus register, addressing, parity and bus termination (DIP1: address, DIP2: baud rate, parity, bus termination)

Notes Wiring RS485

Connection via safety isolating transformer.

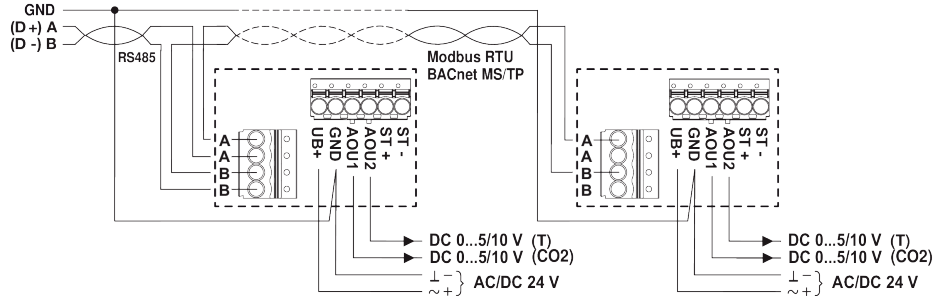


Parallel connection of other devices possible. Observe the performance data.

The wiring of the line for BACnet MS/TP / Modbus RTU is to be carried out in accordance with applicable RS485 regulations.

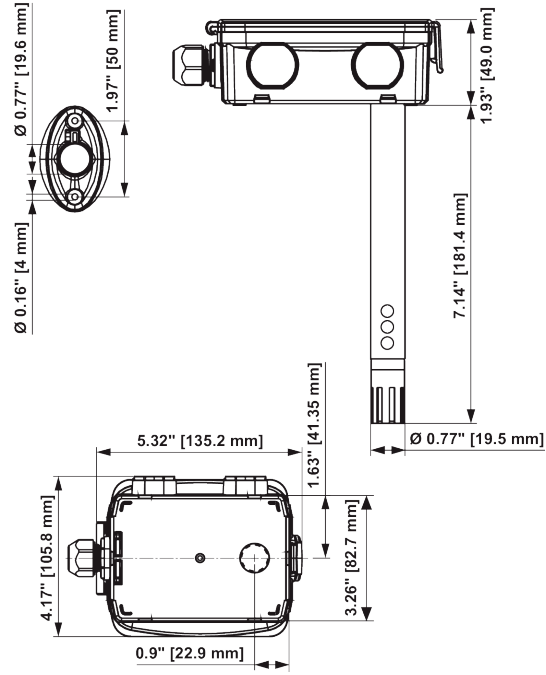
Modbus / BACnet: Supply and communication are not galvanically isolated. Connect earth signal of the devices with one another.

Wiring RS485 (Modbus RTU & BACnet MS/TP)



Dimensions

Dimensions



Type	Weight
22DTM-15	0.27 kg