

## EGQ 212: Duct transducer, CO<sub>2</sub> and temperature

### How energy efficiency is improved

Measuring the CO<sub>2</sub> concentration and duct temperature for energy-efficient, demand-controlled ventilation and room climate regulation

### Features

- Duct sensor for measuring carbon dioxide (CO<sub>2</sub>) content for demand-based ventilation of indoor spaces
- CO<sub>2</sub> measurement with NDIR<sup>1)</sup> Dual-beam technology, therefore stable in the long term and largely resistant to external influences
- Measurement of temperature in ventilation ducts
- Two analogue 0...10 V outputs are available: one for CO<sub>2</sub> measurement and one for temperature measurement. This allows direct connection to an automation station
- Automatic drift compensation
- Mounting accessories and flange included

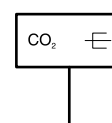
### Technical data

Power supply		
	Power supply (SELV)	15...35 VDC / 19...29 VAC
	Power consumption	Max. 2.3 W (24 VDC) / 4.3 VA (24 VAC)
	Peak inrush current	1.2 A < 3 ms
Outputs		
	Output signal	2 × 0...10 V, load min.: 10 kΩ
Parameters		
	Flow speed	Min. 0.3 m/s, max. 12 m/s
Time characteristic	In moving air (3 m/s)	5 minutes
CO <sub>2</sub>	Measuring range	0...2000 ppm
	Measuring accuracy	±50 ppm drift over the serviceable life +3% of the measured value (typical at 21 °C, 50% rh)
Temperature	Measuring range	0...50 °C
	Measuring accuracy	±0.5 K (typical at 21 °C)
Ambient conditions		
	Ambient temperature	0...50 °C
	Ambient humidity	Max. 85% rh non-condensing
Construction		
	Connection terminals	Plug-in female connectors, removable
	Cross-section of cable	Max. 2.5 mm <sup>2</sup>
	Cable inlet	Removable insert, M20 for cable, min. Ø 4.5 mm, max. Ø 9 mm
	Housing	Yellow/black
	Housing material	Housing: PC, sensor tube: PA6
	Filter unit material	Stainless steel, wire mesh
	Sensor tube diameter	19.5 mm
	Sensor tube length	180 mm
	Weight	150 g
Standards, directives		
	Type of protection	Instrument head: IP65 (EN 60529)
CE conformity according to	EMC Directive 2014/30/EU	EN 60730-1 (mode of operation 1, residential premises)
	RoHS Directive 2011/65/EU	EN IEC 63000

<sup>1)</sup> NDIR: Non-dispersive infrared sensor



EGQ212F032



### Overview of types

Type	Features
EGQ212F032	Duct transducer, CO <sub>2</sub> and temperature; 2 × 0...10 V

### Accessories

Type	Description
0300360003	Mounting flange, plastic

## Description of operation

The CO<sub>2</sub> sensor uses the NDIR optical measuring principle with 2-beam reference measurement method. An infrared light beam is split and shines in parallel through a measuring cuvette with duct air and a sealed reference cuvette containing a reference gas. As the carbon dioxide level in the air increases, so does the light attenuation at the infrared detector in the measuring cuvette. The signal is offset against the reference measurement and the electronics unit converts the CO<sub>2</sub> concentration into a voltage signal (0...10 V).

A second integrated sensor (0...10 V) measures the temperature.

### Information



Practically all the gas sensors are subject to a natural drift. The drift can be greatly reduced by choosing high-quality components and a cleverly designed duct transducer.

Drift can be caused by:

- Dust and dirt
- Absorbed aggressive chemicals in the device
- Corrosion of components
- High temperature fluctuations
- Ageing processes in the semiconductor of the photodetector
- Ageing of the infrared light source
- Drift of photodetectors
- External mechanical stress on the chamber

The 2-beam reference measurement method directly compensates for most of the ageing and contamination effects. However, drift compensation only works in air with normal concentrations, such as in offices, schools and residential buildings.

Automatic drift compensation means the duct transducer can be used 24 hours a day, 7 days a week in applications.

Because not all of the causes can be compensated, the natural deviation of the measurement result may gradually increase. This drift is due to the principle and cannot be covered by the product warranty.

## Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product regulations must also be adhered to. Changing or converting the product is not admissible.

## Improper use

The duct transducer:

- Is not suitable for safety applications
- Must not be used in very dusty air or for measuring aggressive gases
- Must not be mounted outdoors
- Must not be used in combination with devices which directly or indirectly protect human life or health or whose operation creates hazards for humans, animals or property.

SAUTER provides no warranty for duct transducers that are not used as intended.

## Engineering and fitting notes

### Fitting and connection



#### NOTICE!

Connection and fitting may only be carried out by an authorised electrician. The regulations and rules of electrical installation must be observed.

**Note**

The electrical connection may only be carried out when the power cable is disconnected from the electrical supply.

Also applicable:

- Laws, standards and directives
- The current state of technology at the time of installation
- The technical data and the fitting instructions of the device

When routing the cables, remember that electromagnetic fields can affect the measurements. These effects increase the longer the cable and the smaller the conductor cross-section. In high-interference environments, we recommend using shielded cables.

**Note**

The CO<sub>2</sub> sensor operates in pulse mode. This means its power consumption is not constant. To prevent measurement errors, it is very important to carefully connect the ground wire. (See the note in the fitting instructions)

On devices with controlling units (signal generators, transmitters etc.), it must be ensured that the device receiving the signal (actuator or other equipment) does not enter a damaged or dangerous state as a result of faulty signals during assembly and configuration of the control unit. As a precaution, disconnect the signal receiver from the power supply.

A defective sensor can be replaced without rewiring due to the removable cable inlet and cable clamp.

**Heat caused by dissipated electric power**

Temperature sensors have a certain electrical power loss that affects the temperature measurement of the ambient air. In active temperature sensors, the higher the operating voltage, the greater the power loss. This dissipated power must be taken into account in the temperature measurement. At a fixed operating voltage ( $\pm 0.2$  V), this is normally done by adding or subtracting a constant offset value. The duct transducers have a variable operating voltage, but due to the way they are manufactured, only one operating voltage can be taken into account.

**Note**

When there is a draught, the heat generated by the power loss is dissipated more effectively. This means there can be temporary variations in the measurements.

As standard, the transducers are set to an operating voltage of 24 VDC. This means that, at this voltage, the expected measurement error of the output signal is smallest. At other operating voltages, the offset error increases or diminishes due to the change in power loss of the sensor electronics.

The duct transducer can be fastened using the mounting flange (recommended) or directly on the ventilation duct.

During installation, make sure the openings in the sensor tube are fitted in the direction of flow.

**Note**

Make sure the ventilation duct is well sealed so that there is no mixing of ambient air and duct air at the sensor.

The cover must be closed during operation and the cable gland must be inserted.

Too much dust in the duct air can impair the air circulation in the CO<sub>2</sub> sensor and cause measurement errors.

**Ambient conditions**

Under normal ambient conditions, the duct transducer is subject to slight ageing. The ageing manifests itself in a drift which is not compensated by the 2-beam reference measuring method.

Increased drift occurs if the CO<sub>2</sub> sensor is used in heavily polluted air or in aggressive gases.

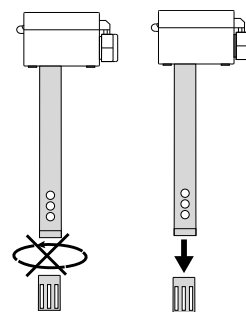
**Cleaning**

The air flow in the duct can cause dirt and dust particles to accumulate over time on the filter that protects the measuring elements. These deposits impair the function and accuracy of the sensor. Drift will occur, which can be reduced by cleaning the filter.

1. Pull off the filter (without turning it, so as not to damage the measuring element).
2. Blow out the filter with oil-free, filtered compressed air or nitrogen and/or wash it with distilled water.
3. Dry the filter and put it back on.



Very heavily soiled filters should be replaced.

Under normal ambient conditions, cleaning once a year is recommended.



## LED indicator

An LED on the circuit board indicates various operating states.

Status	Indicator sequence	Description
Flashing green		Normal mode LED lights up briefly every 2 seconds
Rapidly flashing green		Sensor error LED lights up briefly 5 times per second

## Restart after power failure

After a power reset, 5 V output voltage is present on both channels for a few seconds. The output values are only valid after this start-up period.

## Disposal


When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.

## Connection

### Connection terminals EGQ212F032

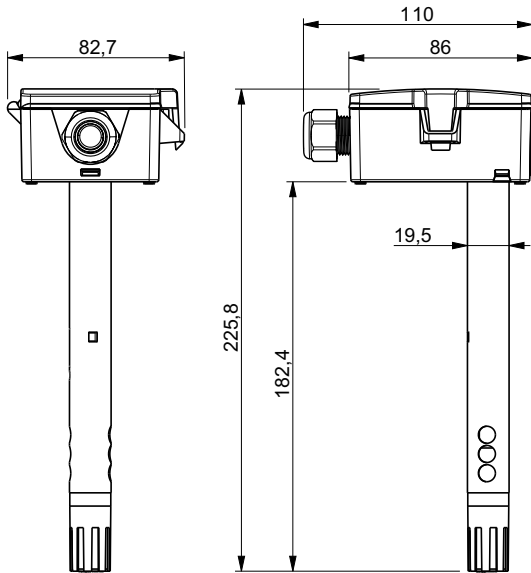
Terminal	Function
UB+	15...35 VDC / 19...29 VAC
GND	MM
AOU1	CO <sub>2</sub> (0...10 V)
AOU2	Temperature (0...10 V)
S+	not used
S-	not used

 The terminal designations are marked on the circuit board.

## Dimension drawing

All dimensions in mm.

### EGQ212F032



## Accessories

### Mounting flange Ø 19.5 mm

