

## EGQ 220, 222: Room transducer, CO<sub>2</sub>, surface-mounted

### How energy efficiency is improved

Measuring CO<sub>2</sub> concentration for energy-efficient room climate control. Simultaneous measurement of room temperature possible (depending on type)

### Features

- Measurement of CO<sub>2</sub> concentration for demand-controlled ventilation of rooms such as meeting and conference rooms, offices and classrooms
- Available with and without temperature sensor
- 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
- Very fast response to changes in the CO<sub>2</sub> concentration in rooms
- Developed according to EN 13779, EN 15251, VDI 6038 and VDI 6040 directives

### Technical data

Power supply		
	Power supply	15...35 VDC / 19...29 VAC SELV
	Power consumption	Typ. 0.4 W at 24 VDC Typ. 0.8 VA at 24 VAC
	Start-up current	Max. 1.6 A
Parameters		
Time characteristic	Readiness for operation	< 2 minutes operational, < 15 minutes response time
	In room (0.1 m/s)	2 minutes
CO <sub>2</sub>	Measuring range	0...2000 ppm (ex works)
	Average measuring accuracy	±75 ppm >750 ppm: ±10% (typ. at 21 °C)
	Pressure dependence	Typ. 0.135% of the measured value per mm Hg
	Temperature dependence	Typ. 2 ppm per °C (0...50 °C)
	Gradual drift <sup>2)</sup>	< 5% FS or < 10% per year
Temperature (EGQ 222)	Measuring range	-35...70 °C
	Average measuring accuracy	±0.5 K (typ. at 21 °C)
Ambient conditions		
	Ambient temperature	-35...70 °C
	Ambient humidity	Max. 85% rh, non-condensing
Inputs/outputs		
	Output signal	0...10 V CO <sub>2</sub> /temperature
Construction		
	Colour	Traffic white (RAL9016)
	Housing material	Polycarbonate (PC) UL94-V0
	Cable inlet	Through the rear wall
	Connection terminals	Spring-type terminal, max. 1.5 mm <sup>2</sup>
	Weight	90 g
Standards, directives		
	Type of protection	IP20 (EN 60529) after fitting
CE/UKCA conformity <sup>3)</sup>	EMC-D 2014/30/EU (CE)	EN 60730-1 (mode of operation 1, residential premises)
	EMC-2016 (UKCA)	See EMC-D

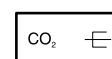
<sup>1)</sup> NDIR: Non-dispersive infrared sensor

<sup>2)</sup> Air flow velocity: 0.15 m/s. Air flow direction: Laminar upwards

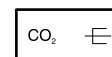
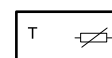
<sup>3)</sup> Explanation of abbreviations in the "Additional technical information" section of the product data sheet and in the appendix to SAUTER product catalogues



EGQ220F032



EGQ222F032



RoHS-D 2011/65/EU &  
2015/863/EU (CE)

EN IEC 63000

RoHS-2012 (UKCA)

EN IEC 63000

**Overview of types**

Type	Description	Output signal
EGQ220F032	Room transducer, CO <sub>2</sub>	Active, 1 × 0...10 V, load ≥ 10 kΩ
EGQ222F032	Room transducer, CO <sub>2</sub> , temp.	Active, 2 × 0...10 V, load ≥ 10 kΩ

**Accessories**

Type	Description
0300230010	USB Bluetooth® dongle

**Description of operation**

The EGQ 220 and EGQ 222 room transducers measure the CO<sub>2</sub> concentration in enclosed rooms such as residential premises, offices, classrooms and conference rooms. The EGQ 222 room transducer also records the room temperature.

The CO<sub>2</sub> measuring principle is based on the dual-beam reference measuring process. As the CO<sub>2</sub> concentration in the air increases, more infrared light is absorbed. The electronics unit calculates the CO<sub>2</sub> concentration from this and converts it to a 0...10 V signal. Along with the actual CO<sub>2</sub> measurement on the first channel, a reference is also measured on a second channel. The CO<sub>2</sub> signal is offset against this reference signal. This increases the measuring accuracy and compensates in real time for any deterioration due to ageing and contamination. This makes the CO<sub>2</sub> sensor independent from external climate conditions and air pollution.

**Note**

The CO<sub>2</sub> sensor operates in pulse mode. This means its power consumption is not constant. Important! To avoid measuring errors, the ground wire must be carefully connected and laid.

**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.

The device is only intended for use inside buildings. Modifying or converting the product is not admissible.

**Improper use**

The product is not suitable for:

- Safety applications
- Use outdoors and in areas where there is a risk of condensation

**Engineering and fitting notes****NOTICE!**

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

**NOTICE!**

Electronic components can be damaged by electrostatic discharge (ESD).  
▶ Do not touch the PCB, exposed sensor elements and connections.

The device is not failsafe. In cases where a failure or malfunction of the room transducer could result in personal injury or damage to the controlled system or other property, additional protective and warning devices must be incorporated into the system. Integrate monitoring or alarm systems, safety or limit controllers for this purpose.

**Electrical connection**

The devices are designed for operation with safety extra low voltage (SELV/PELV). The electrical connection is made via spring-type terminals. Wire stripping length approx. 8 mm.

The device may only be connected when the power cable is disconnected from the electrical supply. It is advisable to protect the room transducer from electrical damage with a 2AT safety fuse. No such fuse is integrated in the device.

### Cable-related measurement deviations

When routing the cables, remember that electromagnetic fields (EMC interference) can affect the measuring accuracy. This effect increases the longer the cable and the smaller the conductor cross-section. Therefore always use shielded connection and signal cables and/or avoid laying parallel with power cables.

### CO<sub>2</sub> room air quality

The following categories are defined for air quality in indoor spaces:

Category	Difference in CO <sub>2</sub> concentration between room air and outside air		Room air quality
	Usual range	Standard value	
IDA 1	< 400 ppm	350 ppm	High
IDA 2	400...600 ppm	500 ppm	Medium
IDA 3	600...1000 ppm	800 ppm	Moderate
IDA 4	> 1000 ppm	1200 ppm	Low

 Below a level of 400 ppm CO<sub>2</sub>, the output drops to 0 V

#### Note



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

### Heat caused by dissipated electric power

Resistance temperature sensors always have an electrical power loss that affects the temperature measurement. 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 room transducers have a variable operating voltage, but due to the way they are manufactured, only one operating voltage can be taken into account. 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. If recalibration directly on the sensor becomes necessary during later operation, this can be done using the device software or via the building automation system.

#### Note



Draughts that occur can dissipate the heat resulting from the power loss more effectively. This means there can be temporary variations in the measurements.

### Fitting

The room transducers are suitable for mounting in a 60 mm recessed junction box or directly on the wall. A fitting height of 140 to 150 cm is recommended.

The lower section of the housing can be premounted and wired separately from the upper section.

#### Note



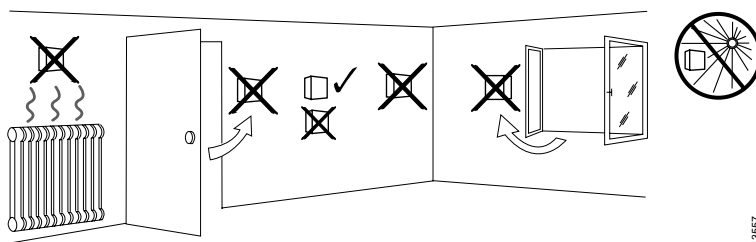
The following fitting instructions must be observed.

- Incorrect fitting can lead to incorrect measuring results. The place of installation must also be chosen carefully to ensure reliable measurement.
- The air vents must not be covered or sealed.
- The Micro-USB port and the fastening screw on the underside of the housing must not be obstructed by other devices.

Avoid:

- Poorly insulated exterior walls
- Heat sources (e.g. radiators, lamps, heating pipes)
- Doors and windows with draughts

- Direct sunlight
- Corners of rooms and alcoves
- Proximity to wardrobes, cupboards, shelves and other furnishings. These can prevent the flow of room air around the sensor.
- Multiple devices directly above each other. A device's own heat can affect the one above it.



Also, air flowing from the ducts and pipes of the electrical installation can cause measuring errors. Empty pipes and installation pipes should therefore be well sealed.

### Removal

Remove the upper section of the housing as follows:

1. Undo the slotted-head screw on the underside.
2. Slightly tilt the housing from below.
3. Insert a flat-blade screwdriver into the notch at the top and carefully push down the latch until the upper section of the housing is released and can be taken off.

### Commissioning

The device does not reach maximum accuracy and operational readiness until several minutes after switching on. The signals generated while switching on may fluctuate and not correspond to the measured value.

The CO<sub>2</sub> sensor is factory-calibrated and can be recalibrated via the USB interface if necessary.

### Notes for users

In normal operating conditions, the devices are very slow to deteriorate through age. CO<sub>2</sub> sensors age more quickly if used in rooms with very contaminated air or aggressive gases. These factors depend on the concentration of the aggressive media and can cause the sensor to drift permanently. In areas with very contaminated air, the warranty does not cover the premature replacement of the room transducer.

All gas sensors are subject to component-induced drift, which generally requires regular recalibration. With the NDIR dual-beam technology, the sensors perform automatic self-calibration. Thus, the sensors are also suitable for uninterrupted continuous operation. The sensors do not require manual calibration.

### Configuration

The device can be configured using a smartphone app. The app supports the following functions:

- Communication via USB Bluetooth® dongle (accessory 0300230010)
- Reading device information and live data
- Custom configuration of output signals
- Adjusting measuring ranges
- Readjustment of offset values
- Parameterisation of the live zero signal (1...10 V etc.)
- Adjustment of maintenance intervals
- Saving and loading configurations

### Additional technical information

Fitting instructions	P100019818
Declaration on materials and the environment	MD 37.142

### Abbreviations used

CE	Manufacturer's Declaration of Conformity for the European Union (EU)
EMC-D	Electromagnetic Compatibility Directive 2014/30/EU
EMC-2016	Electromagnetic Compatibility Regulations 2016 (UK)
RoHS-D	Restriction of Hazardous Substances in Electrical and Electronic Equipment Directives 2011/65/EU & 2015/863/EU
RoHS-2012	Restriction of Hazardous Substances (RoHS) Regulations 2012 (UK)
UKCA	Manufacturer's Declaration of Conformity for the United Kingdom of Great Britain and Northern Ireland (UK)

### Disposal

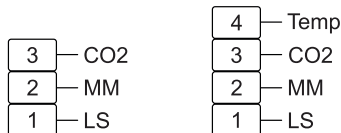
When disposing of the product, observe the currently applicable local laws.

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

### Connection diagram

EGQ220F032

EGQ222F032



### Dimension drawing

All dimensions in mm.

