

EGQ 220, 222: Room transducer, CO₂, surface-mounted

How energy efficiency is improved

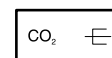
Measuring the CO₂ concentration for energy-efficient control of the room climate

Features

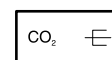
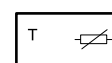
- Selective measurement of the CO₂ concentration for demand-controlled ventilation of rooms (e.g. meeting rooms, conference rooms, offices, classrooms, etc.)
- Available in 2 versions: with and without temperature measurement
- CO₂ measurement with NDIR¹⁾ Dual-beam technology, therefore stable in the long term and largely resistant to external influences
- Suitable for 24-hour operation
- Calibrated ex works and ready to use immediately
- Very fast response to changes in the CO₂ concentration in rooms
- Temperature-compensated calibration for the standard air pressure of 1013 mbar
- The sensors have been developed according to the DIN EN 13779, DIN EN 15251, VDI 6038 and 6040 directives



EGQ220F031



EGQ222F031



Technical data

Power supply

Power supply	15...24 V= (±10%) or 24 V~ (±10%)
Power consumption	Max. 3 W (24 V=) 6 VA (24 V~)
Peak inrush current	10 A, 2 ms

Parameters

Time characteristic	In room (0.1 m/s)	2 minutes
	CO ₂	
CO ₂	Measuring range	0...2000 ppm
	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)
Temperature (EGQ 222)	Gradual drift ²⁾	< 5% FS or < 10% per year
	Measuring range	0...50 °C
	Measuring accuracy	±1% of measuring range (typ. at 21 °C)

Ambient conditions

Ambient temperature	0...50 °C
Admissible ambient humidity	Max. 85% rh non-condensing

Construction

Connection terminals	Screw terminal, max. 1.5 mm ²
Cable inlet	From behind, top bottom
Housing	Pure white
Housing material	ASA
Weight	90 g

Standards and directives

	Type of protection	IP30 according to EN 60529
CE conformity according to	EMC Directive 2004/108/EC	EN 60730-1. Mode of operation 1. Residential premises
	RoHS Directive 2011/65/EU	EN 50581

¹⁾ NDIR: Non-dispersive infrared sensor

²⁾ Air flow speed 0,15 m/s, air flow direction, laminar from below upwards.

Overview of types

Type	Description	Readiness for operation	Output signal
EGQ220F031	Room transducer, surface-mounted, CO ₂ ; 0-10 V	< 2 minutes (operational), < 15 minutes (response time)	1 x 0...10 V, load ≥ 10 kΩ
EGQ222F031	Room transducer, surface-mounted, CO ₂ + temp; 2 x 0-10 V	< 2 minutes (operational), 15 minutes (response time)	2 x 0...10 V, load ≥ 10 kΩ

Description of operation

Room transducer for measuring the CO₂ concentration (and temperature) in residential premises, offices etc.

The CO₂ measuring principle is based on the dual-beam reference measuring process. As the CO₂ concentration in the air increases, more infrared light is absorbed. The electronics unit calculates the CO₂ concentration from this and converts it to a 0-10 V signal. Along with the actual CO₂ measurement on the first channel, a reference is also measured on a second channel. The CO₂ signal is offset against this reference signal. This compensates in real time for any ageing or contamination effects. The CO₂ sensor does not require any fresh outside air for repeated calibration and is therefore not affected by outside climatic conditions or air pollution.

The maximum measuring accuracy is reached after 30 minutes. It is important that the air flows along the wall up through the device at a speed of 0.15 m/s.

The CO₂ output signal is not activated until after the standby phase. During the warm-up-phase, the CO₂ output signal is not available.



The CO₂ 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)

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.

This product is not suitable for safety applications.

Engineering and fitting notes

**CAUTION!**

Damage to device!

► Electrical devices may only be installed and fitted by a qualified electrician!

When you are laying the cables, note that electrical interference 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.

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. Completely disconnect the signal receiver from the power supply if necessary.

Information on room air quality and CO₂

DIN EN 13779 defines various classes for room air quality:

Category	CO ₂ concentration above concentration in outside air in ppm		Description
	Usual range	Standard value	
IDA1	< 400 ppm	350 ppm	High room air quality
IDA2	400...600 ppm	500 ppm	Medium room air quality
IDA3	600...1000 ppm	800 ppm	Moderate room air quality
IDA4	> 1000 ppm	1200 ppm	Low room air quality

**Note**

Too much dust in the air can impair the air circulation in the CO₂ sensor and cause measurement errors.

Heat caused by dissipated electric power

Temperature sensors with electronic components are always subject to a certain amount of power loss, which affects the temperature measurement of the ambient air. In active temperature sensors, the higher the operating voltage, the greater the power loss. This power loss must be taken into account in the temperature measurement. At a fixed operating voltage (± 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.

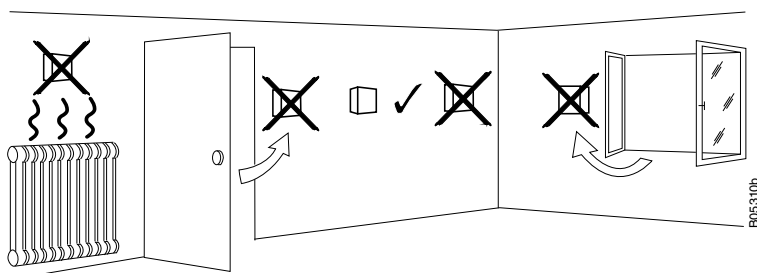
As standard, the transducers are set to an operating voltage of 24 V=. This means that, at this voltage, the expected measurement error of the output signal is smallest. At other operating voltages, the offset error increases or diminishes due to the change in power loss of the sensor electronics. If recalibration directly on the sensor becomes necessary during later operation, this can be done using the trimmer potentiometer on the sensor circuit board.



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 EGQ 200, 222 is suitable for surface mounting. For more information see the fitting instructions. Incorrect fitting can result in incorrect measuring results. Therefore, always observe the mounting instructions. The place of installation must also be chosen carefully to ensure reliable measurement of the CO₂ concentration. Cold outer walls and fitting above heat sources (radiators, for example) and right next to doors with draughts must be avoided, as well as direct sunlight. Furnishings, such as curtains, cabinets or shelves, can hinder the flow of room air to the sensor and thereby cause discrepancies in the measurements. Heating pipes inside the walls can also affect the CO₂ measurement. Do not use silicone or similar materials to seal the pipes in the wall.

**Notes for users**

Under normal operating conditions, the devices age very gradually. CO₂ sensors deteriorate more quickly if they are used in very contaminated air or corrosive gases. These factors affecting the device depend on the concentration of the aggressive media and can cause the sensor to drift.

All gas sensors are subject to component-induced drift, which generally means that the installed gas sensors require regular recalibration. With dual-beam technology, SAUTER offers automatic self-calibration for different areas of sensor use. This means sensors can also be used in applications that are operated round the clock, seven days a week.

No manual calibration of the sensors is required.

In applications with very contaminated air, the warranty does not cover the premature replacement of the entire sensor.

**CAUTION!**

Damage to device!

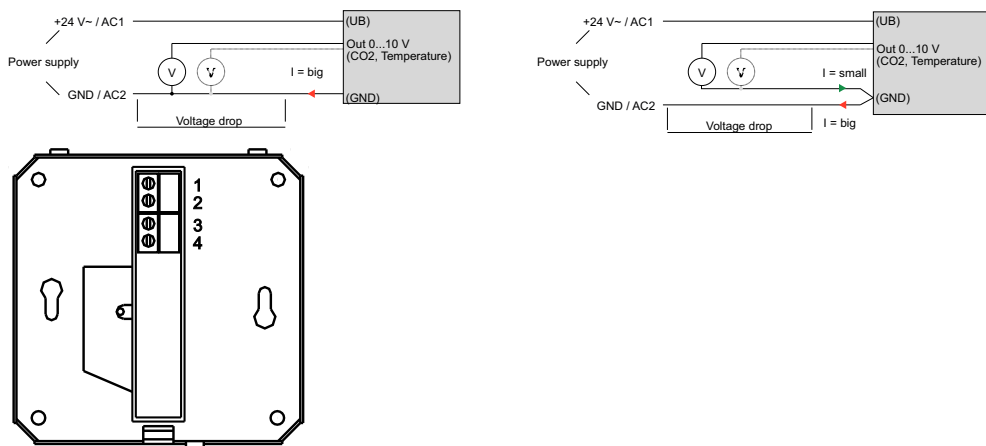
► Switch off any defective or damaged devices.

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



EGQ 220	
1	GND/AC2
2	UB +24 V~/AC1
3	0...10 V CO ₂
4	—

EGQ 222	
1	GND/AC2
2	UB +24 V~/AC1
3	0...10 V Temp.
4	0...10 V CO ₂

Dimension drawing

[mm]

