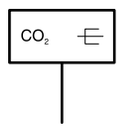
EGQ 212: Duct transducer, CO_2 and temperature

EGQ212F031



How energy efficiency is improved

Measuring the CO_2 concentration and temperature for energy-efficient, demand-controlled regulation of the room climate

Features

- Selective measurement of the CO_2 concentration and temperature for demand-controlled ventilation of rooms (e.g. meeting rooms, conference rooms, offices, classrooms, etc.)
- CO_2 measurement with NDIR[1)] 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
- The sensors have been developed according to the DIN EN 13779, DIN EN 15251, VDI 6038 and 6040 directives
- Mounting flange supplied

Technical data

Power supply		
	Power supply	15...24 V= (±10%) or 24 V~ (±10%)
	Power consumption	Max. 1.5 W (24 V=) | 2.9 VA (24 V~)
	Peak inrush current	10 A, 2 ms
Outputs		
	Output signal	2 × 0...10 V, load > 10 kΩ
Parameters		
	Readiness for operation	< 2 minutes (operational), 15 minutes (max. precision)
	Flow speed	Min. 3 m/s Max. 10 m/s
Time charateristic	In moving air (3 m/s)	5 minutes
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)
	Gradual drift	< 5% FS or < 10% per year
Temperature	Measuring range	0...50 °C
	Measuring accuracy	±1 °C for the measuring range (typ. 21 °C and 24 V=)
Ambient conditions		
	Ambient temperature	0...50 °C
	Ambient humidity	Max. 85% rh non-condensing
Construction		
	Connection terminals	Plug-in connector, max. 1.5 mm^2
	Cable inlet	M20 for cable Ø min. 5 mm, max. 8 mm
	Housing	Yellow/black
	Housing material	PA6
	Filter unit material	Stainless steel, wire mesh
	Sensor tube diameter	19.5 mm
	Sensor tube length	180 mm
	Weight	180 g
Standards and directives		
	Type of protection	Instrument head: IP65 (EN 60529)

1) *NDIR: Non-dispersive infrared sensor*

CE conformity according to	EMC Directive 2014/30/EU	EN 60730-1. Mode of operation 1. Residential premises
	RoHS Directive 2011/65/EU	EN 50581

Overview of types	
Type	Description
EGQ212F031	Duct transducer, CO_2 and temperature; 2 x 0-10 V

Description of operation

Duct transducer for measuring the CO_2 concentration and the temperature in ventilation ducts.
The CO_2 measuring principle is based on the dual-beam reference measuring process. As the CO_2 concentration in the air increases, more infrared light is absorbed. The electronics unit calculates the CO_2 concentration from this and converts it to a 0-10 V signal.
Along with the actual CO_2 measurement on the first channel, a reference is also measured on a second channel. The CO_2 signal is offset against this reference signal. This compensates in real time for any ageing or contamination effects.
The CO_2 sensor does not require any fresh outside air for repeated calibration and is therefore not affected by outside climatic conditions or air pollution.

Other than this, the following restrictions apply:

- There may not be any dust in the ventilation duct.
- The duct transducer may not be used to measure corrosive gases.
- The product may not be mounted outdoors.

The CO_2 output signal is not activated until after the standby phase. During the warm-up-phase, the CO_2 output signal is not available.

The CO_2 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!

Electrical connection

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.

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.

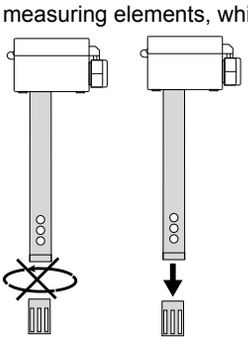
Note
Too much dust in the air can impair the air circulation in the CO_2 sensor and cause measurement errors.

Fitting

The sensor 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. The maximum ventilation speed is 10 m/s.
Make sure the sealing is good, so that there can be no exchange of gas between the duct air and the air outside.
Important:
All the CO_2 sensors are generally resistant to shock and dust, because they are based on an optical measuring principle (non-dispersive infrared – NDIR). The drift compensation of the CO_2 sensors only works in air with normal concentrations, such as in offices, schools and residential buildings.

Notes for users

Under normal operating conditions, the devices age very gradually. CO_2 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.
Air circulation may lead to particles of dirt and dust settling on the sintered filter that protects the measuring elements, which in turn may prevent the sensor from functioning properly.



After the filter has been dismantled, it can be cleaned by blowing it out using oil-free, filtered, compressed air, ultra-pure air, nitrogen or by rinsing it with purified water. Very heavily soiled filters should be replaced.

CAUTION!
Damage to device!
▶Switch off any defective or damaged devices.

Start-up

When the power is restored, all three LEDs light up for 90 seconds. The output values are only valid after this warm-up period.
The LEDs indicate the CO_2 concentration.

0...750 ppm	Green LED lights up
751...1250 ppm	Yellow LED lights up
1251...2000 ppm	Red LED lights up

Fault state

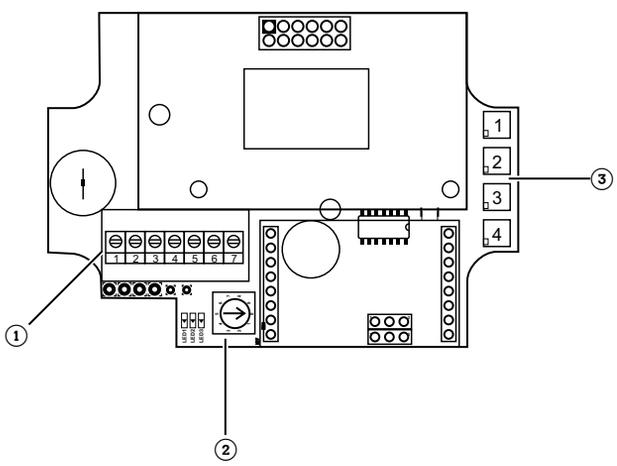
If a fault occurs, the red LED flashes once per second. The yellow and green LEDs indicate the specific fault.

Green LED	Yellow LED	Error
Flashing	OFF	CO_2 sensor failure
OFF	ON	Temperature sensor failure

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



① Connection terminals
② Rotary encoding switch
③ Offset adjustment

Connection terminals

Terminal	Function
1	24 V (LS)
2	MM
3	Not used
4	Temperature output 0...10 V (with offset)
5	CO_2 output 0...10 V (with offset)
6	CO_2 output 0...10 V (without offset)
7	Not used

Terminals 5,6 – offset: See trimmer in offset adjustment.

Rotary encoding switch

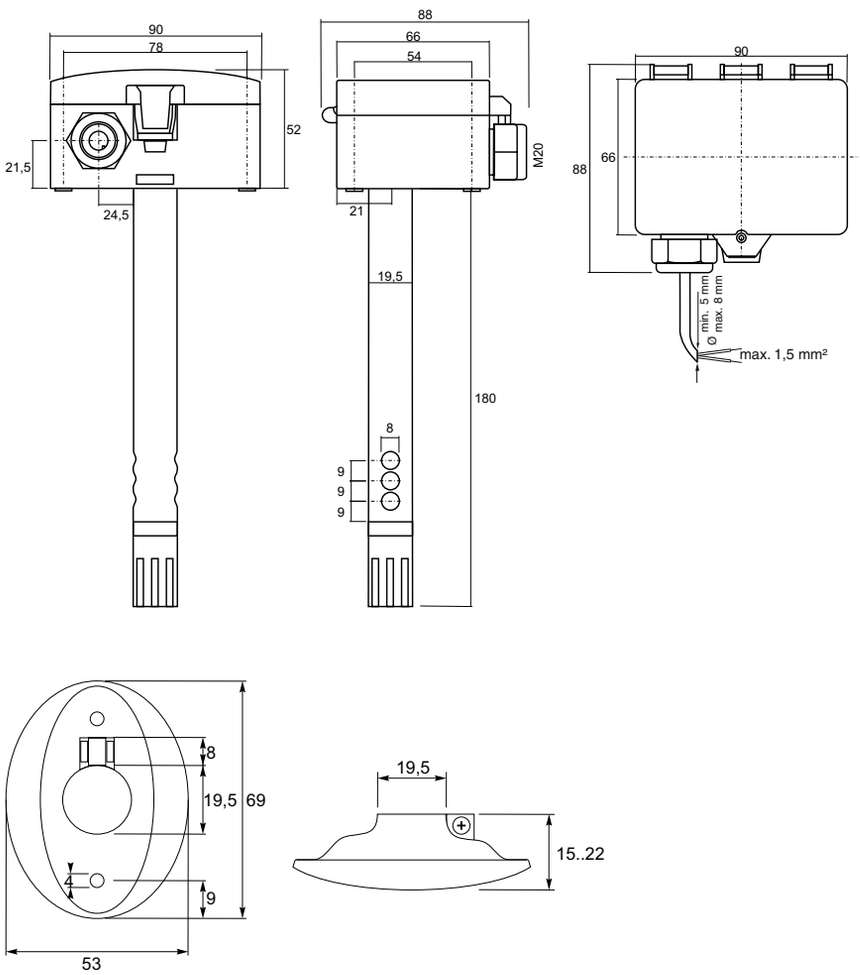
Position	Output adjustment, connection terminal #5
0	Not used
1	Not used
2	Not used
3	Not used
4	CO_2 output 0...10 V (with offset)
5	Not used

Offset adjustment

Trimmer	Function
1	Not used
2	CO_2 offset adjustment (±150 ppm)
3	Temperature offset adjustment (±3 °C)
4	Not used

Dimension drawing

[mm]



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