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GCO2

XCO2 xxx

Replaceable sensor

Features

- Digital measurement value processing incl. temperature compensation
- Internal function control with integrated hardware watchdog
- Data / measured values sensor controller, therefore simple exchange uncalibrated <-> calibrated High accuracy, selectivity and reliability
- Low zero point drift
- Long sensor life time
- Hardware & software according to SIL2 compliant development process
- Easy maintenance and calibration by exchange of the sensor unit or by comfortable on-site calibration
- 4 – 20 mA (or 2 - 10Vdc) analog output with selectable signal output for special mode, fault etc.
- Reverse polarity protected, overload and short-circuit proof
- Housing for integration of the sensor unit

Technical Data

Gas type	Carbon Dioxide, CO ₂
Detector element	Infrared (NDIR)
Power supply	16 – 29 V DC, reverse-polarity protected
Power consumption	70 mA, max. (1.7VA for 24V)
Analog output signal	Proportional, overload and short-circuit proof, load ≤ 500 Ohm 4-20 mA or 2-10V = measuring range 3.2 <4 mA = underrange >20- 21.6 mA = overrange 2.5 mA = special mode 2 mA = fault Low >21.8 mA = fault High < 1 mA = watchdog No reading back of the analog signal
Measuring range	5 vol. % and 0 - 2000 ppm
Measurement interval	2 sec.
Accuracy	< 10 % of range
t₉₀ Time (time allowed for sensor to detect 90% of existing gas conc.)	≤ 120 sec.
Sensor life time	> 15 years for normal operating environment
Calibration interval (recommendation)	5 years
Temperature range	-35°C to +40°C (-31°F to 104°F)
Humidity range	0 - 90 % r.H. non-condensing
Pressure range	Atmospheric ± 30 % (interference + 1,6 % on measured value per kPa)
Storage temperature	5°C to 30°C (41°F to 86°F)
Storage time	6 months

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Design Features

Exchangeable sensor unit including digital value processing, temperature compensation and self control for the continuous monitoring of the ambient air to detect CO₂.

In addition to the CO₂ sensor element with infrared sensor there is a module integrated in the sensor unit with a micro controller, analog output and power supply.

The IR measurement principle with integrated temperature compensation ensures highest accuracy, selectivity and reliability despite the long calibration interval.

The micro controller calculates a linear 4 – 20 mA (or 2 - 10Vdc) signal out of the measurement signal and also stores all relevant measured values and data of the sensor element.

Application

For detecting leakages in refrigeration plants with carbon dioxide as water treatment, wastewater, industrial processes and also within a wide range of commercial and industrial applications.

The measuring range 2000 ppm is provided for the indoor air quality.

Due to the analogue signal 4-20mA CO₂ transmitter is compatible to any electronic analogue control, DDC/PLC control or automation system.

Ordering Codes

GCO2 2000	Gas Detector	0 - 2000 ppm
GCO 25	Gas Detector	0 - 5 vol. %
XCO2 2000	Replacement Sensor	0 - xxxx ppm
XCO2 5	Replacement Sensor	0 - 5 ppm

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Technical data (cont'd)

Enclosure M25	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions	(D x H) 24 x 22 mm (0.94 x 0.87 in.)
Weight	Appr. 30 g (0.066 lb)
Protection class	IP 65
Mounting	Screw mounting M25
Wire connection	Screw-type terminal min. 0.25 mm ² , max. 1.3 mm ² , 3-pin

Directives	EMC directives 2004/108/EC CE Compliance with: EN 378-1 EN 61010-1:2010 ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
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Warranty	1 year on material (without sensor element)
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Dimensions	(B x H x T) 94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)
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Weight	Ca. 0,2 kg (0.4 lb)
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Package volume	Appr. 4,5 l
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Protection class	IP 65
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Mounting	Wall mounting
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Pre-embossing for cable entry / sensor unit	6 x M20 / M25
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¹ Manufacturer recommended calibration interval for normal environmental conditions.

Ordering Codes (cont'd)

Pduct	Duct Mounting Kit
PZ1	Protective Cap IP65
PStain	Stainless Steel Housing
Option	0 - 10Vdc output signal

Special protection for persons and buildings

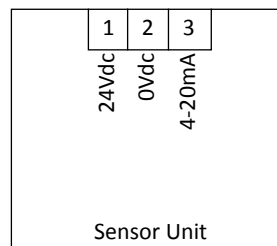
The devices are manufactured according to the regulations and various directives such as EN50545.

Products delivered by AP meet and even exceed the requirements stipulated by the new European standard EN50545.

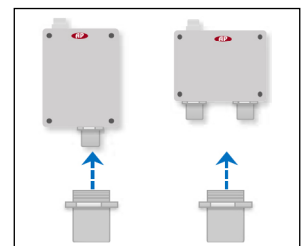
The safety features check the connecting warning devices on functionality and open circuit - day and night.

(Level SIL2 according to EN 50271)

Wiring Configuration



One or two detectors



Alarm levels

0 - 2000 ppm
Early alarm level set at 900 ppm
Critical alarm level set at 1000 ppm

Early alarm level set at 15000 ppm = **Threshold level**
Critical alarm level set at 30000 ppm = **Top limit level**

Vol.% = percent by volume, volume parts in one litre

1 vol. % = 10,000 ppm

Set-up

4mA scale on analogue output signal for end of sensor life to a relay output or similar.

3.2 mA scale and 21.6mA as sensor failure.
It is nevertheless a fault and these values can be used for diagnostics as an internal control function.



Protective Cap



Stainless Housing



Duct Mounted Version



General information

When and where is comprehensive monitoring needed to cover a large area? You may fear that leaks could occur over the whole area. One example could be a solvent storage depot. In similar places you have to assume that an area of 20 - 40 m² per detector could be affected depending on to what extent the vapours can spread (shelving, obstacles, etc.).

In a garage, the sensors are distributed rather evenly. It is estimated that no dangerously high concentrations would form in a garage between two detectors at the specified alarm thresholds with one detector covering 400 m².

Concern about combustible gases has to be based on similar considerations with 80 - 120 m² per detector.

In a brewery, it is assumed that on a floor to be supervised the CO₂ will spread relatively evenly and close to the floor level.

In a storage depot one detector per 100 m² would probably be sufficient. It is important at on-site visits to detect the deeper located areas where CO₂ could accumulate. If there are several such places, each of these areas has to be monitored with (at least) one detector independent of the other detectors. In addition you would have to consider obstacles disturbing uniform spread of vapour.

For a comprehensive monitoring of toxic gases it is important to consider the rate of propagation for this gas. Chlorine for instance, diffuses only very slowly. One detector can monitor a maximum of 10 m².

Ammonia is lighter than air and propagates easily. But if there is moisture somewhere between the leak and the detector, a great deal of ammonia will be bound there and the detector will only detect a small amount of gas .

If there are ice deposits in cold stores, the ammonia will also be bound there and a detector will detect nothing. In this respect there is no general statement for a comprehensive monitoring, but in most applications this is not necessary.