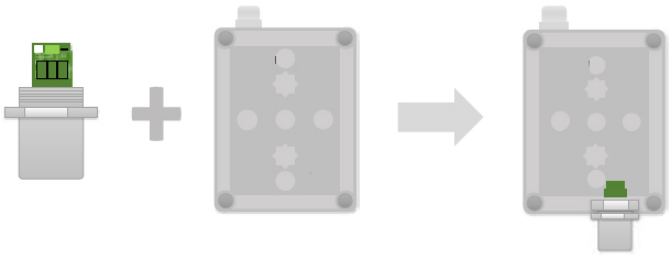
Oxygen (O_2)
Gas Detector, 4 - 20mA

GO2

Oct. 15



GO2 025

XO2 025

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**
- **4 – 20 mA 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	Oxygen, O_2
Detector element	Electrochemical
Power supply	16 – 29Vdc, reverse-polarity protected
Power consumption	50mA, 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
Detector coverage	Appr. 100 m^2
Measuring range	0 - 25 vol. %
Accuracy	±0.1 vol. %
Resolution	< ± 0.05 vol. %
t90 Time (time allowed for sensor to detect 90% of existing gas conc.)	15 sec.
Drift (Gain)	0.3 % signal/month
Temperature range	-10°C to +50°C
Humidity range, non-condensing	5-95% r.H.
Sensor life time	24 months
Relative gas density	1.1 (Air = 1)
Mounting height	Low for high density gases = floor; high for low density gases = ceiling
Calibration interval[1]	24 months
Pressure range	Atmospheric ± 20 %
Storage temperature	5°C to 30°C (41 °F to 86 °F)

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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.

The O_2 sensor unit houses a module with a micro controller, analog output and power supply in addition to the electrochemical sensor element including amplifier.

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.

Calibration is done either by simply replacing the sensor unit or by using the comfortable, integrated calibration routine directly at the system.

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

Application

For detection of oxygen in rooms where changes of the oxygen concentration are possible, such as laboratories and food production etc.

Due to the standard output signal the detector is compatible with any electronic control or automation system.

Ordering Codes

GO2 025	Gas Detector	**0 - 25 vol. %**
XO2 025	Replacement Sensor	**0 - 25 vol. %**

Cont´d on p. 2

Technical data (cont'd)

Storage time	6 months
Housing type for integration of the sensor unit	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions (W x H x D)	94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)
Weight	Ca. 0.2 kg
Packaging volume	Ca. 4.5 l
Protection class	IP 65
Mounting	Wall mounting
Pre-embossed entries for cable / sensor unit	6 x M20/M25

[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)

Alarm levels

Early alarm level set at 19 vol. % = **Threshold level**
Critical alarm level set at 17 vol. % = **Top limit level**

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

At a volume portion of 17% or less in the atmosphere there is a risk of oxygen deficiency for humans

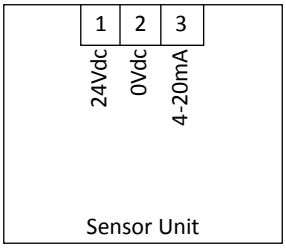
Cross Sensitivity

(The sensor reacts differently to the following gases)

Gas	Concentration
Carbon dioxide, CO_2	5 vol. %

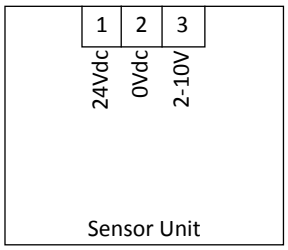
The table doesn't claim to be complete. Other gases, too, can have an influence on the sensitivity. The mentioned cross sensitivity data are only reference values valid for new sensors.

Wiring Configuration 4-20mA



Current output

Wiring Configuration 2-10Vdc



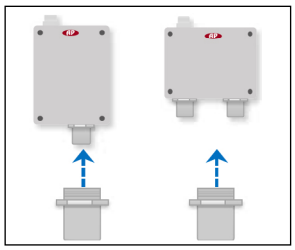
Voltage output

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.

One or two detectors



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 m^2 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 m^2.

Concern about combustible gases has to be based on similar considerations with 80 - 120 m^2 per detector.

In a brewery, it is assumed that on a floor to be supervised the CO_2 will spread relatively evenly and close to the floor level.

In a storage depot one detector per 100 m^2 would probably be sufficient. It is important at on-site visits to detect the deeper located areas where CO_2 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 m^2.

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.