

CE

GNH3

XNH3 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	Ammonia, NH ₃
Detector element	Pellistor (catalytic bead sensor)
Power supply	16 – 29Vdc, 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- 20mA or 2-10V = meas. range 3.2 <4mA or 1.6-2V = underrange >20-21.6 mA or 10-10.8V = overrange 2.5 mA or 1.25V = fault, low >21.8mA or 10.9V = fault, high
Measuring range	0 – 100% LEL
Measurement interval	2 sec.
Accuracy	± 1 % LEL
Relative gas density	0.60 (Air = 1)
Resolution	0.2%
Repeatability	< 1% sig.
t90 Time (time allowed for sensor to detect 90% of existing gas conc.)	10 sec.
Zero point variation	0.5%
Long-term zero-point drift	< 0.3% LEL / month
Long-term sensitivity drift	< 1% LEL / month
Temperature range	-20 to +50 °C (-4 to 122 °F)
Humidity range	5 - 95% r.H. non-condensing
Pressure range	Atmospheric ± 20%
Sensor life time	> 36 months/normal ambient conditions

Design Features

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

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

The micro controller calculates a linear 4 – 20 mA (or 2 – 10 Vdc) 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.

Application

The gas detector is used for the detection of ammonia gases in the non-Ex zone when a typical 4–20mA (or 2–10Vdc) signal is required.

Ordering Codes

GNH3 100C	Gas Detector	4-20mA, 24Vdc
GNH3 100V	Gas Detector	2-10Vdc, 24Vdc
XNH3 100C	Replacement Sensor	4-20mA, 24Vdc
XNH3 100V	Replacement Sensor	2-10Vdc, 24Vdc
Pduct	Duct Mounting Kit	
PZ1	Protective Cap IP65	
PStain	Stainless Steel housing	

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Technical data (cont'd)

Calibration interval¹	6 months
Storage temperature	5°C to 30°C (41°F to 86°F)
Storage time	6 months
Poisoning	The sensitivity of Pellistor sensors can be influenced by substances containing silicon compounds and even poisoned and destroyed by them.
Enclosure, sensor unit	Polycarbonate UL 94 V2
Enclosure colour	RAL 7032 (light grey)
Dimensions	94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)
Weight	Appr. 0.2 kg
Packing volume	Appr. 4.5 l
Protection class	IP 65
Mounting height	0.2m under ceiling
Pre-embossed entries for cable / sensor unit	6 x M20/M25
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 61010-1:2010, ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
Warranty	1 year on material (without sensor element)

¹ Manufacturer recommended calibration interval for normal environmental conditions.

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

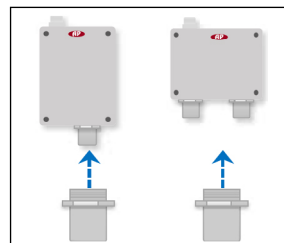
0 - 100% LEL
Early alarm level set at 10% LEL
Critical alarm level set at 20% LEL

Set-up

4mA (2V) scale on analogue output signal for end of sensor life to a relay output or similar.

3.2mA 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

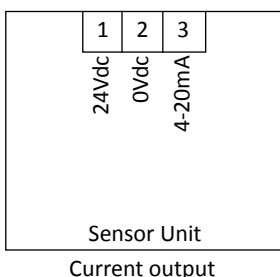


Protective Cap

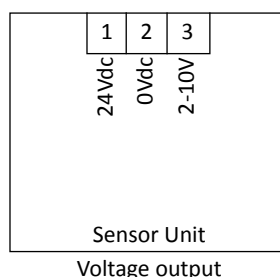


Stainless Housing

Wiring Configuration 4-20mA



Wiring Configuration 2-10Vdc



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.