

# Transmitter CI 21 Carrier Injection NH<sub>3</sub> Monitoring in Refrigeration Plants

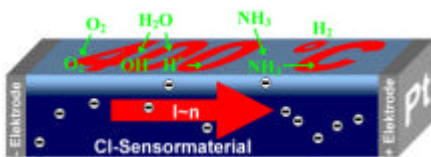


## Carrier Injection

What does this mean? A proven product – with a name for a new sensor principle which has to be taken note of!

## Detection principle

The progress of this principle is characterized by a specially developed, gas sensitive material, which is capable to adsorb NH<sub>3</sub> (ammonia) rather selectively. The adsorption of the NH<sub>3</sub> molecules injects so-called charge carriers into the absolutely new sensor material. After many years of development, special micro-structured electrodes allow to accurately determining the ammonia concentration without the known disadvantages of semiconductor sensors or electrochemical cells.



In long-term studies and tests GfG has adjusted and optimized this new detection principle to offer the best possible solution for the customer. For the very first time ammonia concentrations can be monitored over an extremely wide detection range – without damaging the sensor like a semiconductor or exhausting the sensor like an electrochemical cell. In addition to this a long lifetime of the sensor could be achieved.

## Alarm only for ammonia

A monitoring system for ammonia should not detect other gases which may be present in the ambient air. Unnecessary false alarms cause expensive action of safety and service personnel. In machinery rooms of refrigerating plants you often have oil vapours. Hydrogen is generated by charging of batteries. Cleaning action release solvent and cleaning agents in the air. The transmitter CI21 provides drastically reduced cross sensitivities for all these components. Forget the times of the semiconductor sensors with frequent false alarms at night or on Sundays!

## Safe even at low temperatures

In cold rooms of a refrigeration plant the humidity is very low. At –35°C the humidity is approx. 20 times lower than at +20°C. This fact was often causing detection errors for the measurement of ammonia.

GfG's CI 21 is fully operable even in almost dry air and does not dry out like electrochemical sensors. Thermostatic control eliminates detection errors from temperature changes ( $\Delta T < 10K/min$ ) within the operational range from –35 to +55 °C.

The CI 21 is the perfect solution for applications which could not or not completely be covered in the past – providing the same safety in cold and in machinery rooms. The CI 21 allows to use ammonia, as it is present at the detection point, for calibration and function check even at low temperatures. Only this makes sure that the gas monitoring system will reliably give alarm when a hazardous gas leak occurs.

## Immediate reaction

In less than 8 seconds ( $t_{90}$ ) the transmitter CI 21 responds to ammonia leakages. This extremely short response time allows to take measures in time, before further damage occurs.

Using the Delta-Alarm of GfG's control module GMA 300 reduces the alarm delay even further.

## Low and high Ammonia concentrations

Very low gas concentrations from 30 ppm up to the LEL range - the CI 21 covers a wide applicational range which other sensors do not even survive.

## Good value for money

Is such a sensor still affordable? Yes, not only its purchase is a bargain. A long sensor life (independent from NH<sub>3</sub> concentrations) and long maintenance intervals (once or twice a year) make the CI 21 a low cost transmitter for ammonia monitoring. The CI 21 is supplied calibrated with NH<sub>3</sub>.

The distance between transmitter and controller may be more than 1000 m.

A robust aluminium enclosure protects the sensor and the circuitry from impacts, splash water and dirt; damages by condensation are prevented by the potting of the electronics.

## One partner – many advantages

- GfG consultants and salesmen will help you at site to position the transmitters.
- On request we supply complete control circuits including connection diagrams.
- For comprehensive monitoring including water and even brine circuits we offer the perfect ion-selective measurement for detection even in ppm range.

# Transmitter CI 21 - Technical Data

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**Gas**

Ammonia, NH<sub>3</sub>

**Ranges**

30 .. 200 ppm  
30 .. 1.000 ppm  
30 .. 10.000 ppm

**Gas supply**

Diffusion through stainless steel mesh and PTFE membrane

**Humidity**

1 .. 100 % r. h.

**Pressure**

800 .. 1200 hPa

**Ambient temperature**

-35 .. +55 °C

**Response time**

t<sub>90</sub> less than 8 seconds

**Output signal**

0.2 .. 1 mA  
4 .. 20 mA

**Voltage supply**

10 .. 32 V, 300 mA

**Cable**

Shielded cable  
3 x 0.75 mm<sup>2</sup> for up to 500 m,  
3 x 1.5 mm<sup>2</sup> for more than 500 m,  
PG11 – cable gland

**Weight**

370 g

**Dimensions**

82 x 77 x 57 mm (WxHxD)

**Expected sensor life**

2 years for normal operation (independent from NH<sub>3</sub> concentration)

**Casing protection**

IP 54, splash water proof

**All from one**

We help you planning and effecting your project:

- Consultation for gas and water monitoring
- Optimum positioning of transmitters
- Warning concepts
- Configuration and installation of complete cabinets
- Customer-specific documentation of gas warning systems

- **Selective and precise detection even in almost dry air and up to 100 % rel. humidity**
- **No false alarm from hydrogen, natural gas, carbon monoxide, oil vapours**
- **No temperature effect because of thermostatic sensor**
- **Wide dynamic detection range, from a few ppm up to the LEL range**
- **Low-cost, long-life, superior alternative for electrochemical sensors and semiconductors**
- **No damage by high ammonia concentrations**



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