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SAMON
safe monitoring

PRODUCT GUIDE

2024

SIMPLY RELIABLE

Gas Detection



NEW

SAMON
safe monitoring

GLACIÄR MIDI

SIMPLY RELIABLE REFRIGERANT GAS DETECTORS



Configuration, maintenance & service has never been easier

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Refrigerant Gas Detection

Commercial & Industrial



CO₂ Leak Detection in Refrigeration

APPLICATION NOTES

Due to their environmental impact and increasing levels of regulation and restriction to phase them down, the use of some types of refrigerants has decreased in recent years. The use of CO₂ has increased due to it being a natural refrigerant with lower environmental impact.

Applications include:

- **Supermarkets & food retail**
- **Cold rooms**
- **Walk-in Freezers**
- **Cold Storage**
- **Food processing**

Why are CO₂ detectors needed?

In high concentrations, CO₂ can be dangerous to humans because it is an asphyxiant gas. Refrigeration systems using CO₂ also operate at high pressures, sometimes as high as 2,000psig, which means that if a leak occurs the gas can escape at a high rate, quickly creating a dangerous atmosphere.

CO ₂ concentration in air (ppm)	Effect
370	Atmospheric level
5,000	Long term exposure limit - 8 hours TWA
15,000	Short-term exposure limit – 15 minutes, some physical discomfort
30,000	Respiration difficulties, headache, dizziness, nausea
40,000	IDLH limit (Immediate Danger to Life & Health)
100,000	Loss of consciousness, death

NOTE



There is no general rule or standard for establishing the appropriate number of sensors and their location for each application.

Therefore, the guidance given is intended as support for installers, and not as rules in their own right. All local, state, and national regulations should be adhered to.

For an example in a refrigeration system using CO₂ as a refrigerant, in a typical walk-in cold room with a volume of 25m³ and a rate of one air exchange per hour we can calculate that **a leak rate of 500g/hr will create an atmosphere containing 40,793ppm of CO₂ in just 250 seconds.**

That surpasses the level of 40,000ppm at which CO₂ presents an immediate danger to life and health according to OSHA guidelines.

In refrigeration, it must also be noted that if the refrigerant has leaked, the refrigeration system will be less efficient and eventually will fail. This can have a high economic impact through loss of refrigerated or frozen produce.

How to apply CO₂ detection?

CO₂ is slightly heavier than air, meaning it will eventually sink closer towards the ground. With that in mind, it can be advisable to install gas detectors at low level, circa 20cm above the ground. There can be occasions where a higher positioning is applicable, for example in cold rooms positioning the gas detector on a side-wall in the return air flow to the evaporator is best practice.

CO₂ Gas Detector Selection

How to apply CO₂ detection? (continued)

Common practice is to install gas detectors near to the likely source of a leak, for example valves, flanges, joints, and pressure reducers. Detectors can also be installed near to areas with a high concentration of refrigerant, such as compressors, storage tanks/cylinders, pipes, and conduits.

Consideration should be given to air flow and ventilation, both natural and mechanical. It typically takes a long time for leaked gas to evenly disperse into the environment, so clouds of leaked gas can be moved by ventilation. Placing gas detectors in this air flow is good practice for effective detection.

CO₂ is typically detected using infrared sensors.

Consideration should be given to then implementation of the infrared sensor and its suitability for refrigerant leak detection, which has very different needs to indoor air quality (IAQ) applications, where CO₂ sensors are also widely used.

A suitable CO₂ refrigerant leak detector should have the following characteristics:

- Fast response time
- Appropriate temperature range (e.g. -40°C - +50°C)
- Suitable IP rating for the installation environment (e.g. IP67)
- Outputs for system integration, control & safety alerts

BENEFITS

This technology has a number of benefits.

- Long lifetime (~7-10 years)
- Minimal cross-interference
- High stability
- High accuracy
- Cannot be poisoned

CO₂ Gas Detector Product Selector

	Relays	Modbus	Analogue Output	Mobile App	Service Wheel	Remote Sensor	Low Power (e.g. 24V)	Mains Power (e.g. 110V, 230V)	Page #
GLACIÄR MIDI	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Option	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21
G-Series	3	Option	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	24
MP-Series	3 via MPU/ SPU	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		32
TR-IR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	29

HFC & HFO Leak Detection in Refrigeration

APPLICATION NOTES

There is widespread use in refrigeration of a wide variety of gases and gas blends consisting of HFC and HFO refrigerants. Efforts to reduce the impact on climate change of refrigerant leaks has seen the introduction of an increasing number of gases with the goal of reducing the global warming potential (GWP) of refrigerant gases.

- Applications include:
- **Supermarkets & food retail**
 - **Cold rooms**
 - **Walk-in Freezers**
 - **Cold Storage**
 - **Food processing**

Why are HFC & HFO detectors needed?

Most of the HFC and HFO refrigerants in use today are low in acute toxicity. There has, however, been an increase in the number of refrigerants classified as A2L, commonly referred to as "mildly flammable" and therefore of a higher risk.

Leaking HFC and HFO gases can also have the effect of displacing oxygen, leading to discomfort, danger, and the risk of death.

Below are examples of what happens in a non-ventilated room of approximately 50 m³ with leakage of R134a.

R134a leakage (kg)	R134a concentration (ppm)	Oxygen level (%)	Effect on humans
0	0	~21	Normal, fresh air
21	100,645	~19	Reduced oxygen delivery to cells, adverse effect on ability to function
63	301,395	~15	Increased pulse rate, rapid breathing, impaired co-ordination, compromised thought processes
84	402,581	~13	Nausea, vomiting, risk of permanent heart damage
115.5	553,547	~10	Convulsions, inability to move, loss of consciousness, loss of life

The above figures are based on even dispersion throughout the room. This is unlikely, as refrigerant gases have a much higher molecular weight than air and will sink to the lowest part of the room. It is therefore possible that 0.5m above the ground, a 21kg leak could actually have the same oxygen displacement effect as 84kg dispersed evenly in the room.

In many regions, regulations and standards demand the need to monitor for leakage of HFC and HFO gases. These include EN378 in Europe and ASHRAE 15 in the US.

In refrigeration it must also be noted that if the refrigerant has leaked, the refrigeration system will be less efficient and eventually will fail. This can have a high economic impact through loss of refrigerated or frozen produce.

How to apply HFC & HFO gas detection?

HFCs and HFOs are generally much heavier than air, meaning they will quickly sink closer towards the ground or to any lower points in a room, such as stairwells or sumps. Gas detectors should be installed at low level, circa 20cm above the ground, in order to be most effective at detecting the leak.

Common practice is to install gas detectors near to the likely source of a leak, for example valves, flanges, joints, and pressure reducers. Detectors can also be installed near to areas with a high concentration of refrigerant, such as compressors, storage tanks/cylinders, pipes, and conduits.

Consideration should be given to air flow and ventilation, both natural and mechanical. It typically takes a long time for leaked gas to evenly disperse into the environment, so clouds of leaked gas can be moved by ventilation. Placing gas detectors in this air flow is good practice for effective detection.

NOTE

There is no general rule or standard for establishing the appropriate number of sensors and their location for each application. Therefore, the guidance given is intended as support for installers, and not as rules in their own right.

All local, state, and national regulations should be adhered to.



HFC & HFO Gas Detector Selection

HFC and HFO gases are most typically detected using semiconductor sensors, although infrared and other technologies are becoming available for refrigerant detection, albeit at a higher price. Semiconductor, metal oxide sensors are a long-proven method for detection of HFC and HFO refrigerants and blends, and have a number of benefits.

Semiconductor sensors can be cross-sensitive to other reducing gases and consideration should be given to this when selecting an installation location.

A suitable HFC and HFO refrigerant leak detector should have the following characteristics:

- Fast response time
- appropriate temperature range (e.g. -40°C - +50°C)
- suitable IP rating for the installation environment (e.g. IP67)
- outputs for system integration, control & safety alerts

For any areas zoned as being potentially explosive, a detector with the appropriate ATEX approval for that zone should be selected.

BENEFITS

This technology has a number of benefits.

- **Cost effective**
- **Long lifetime (~5 years)**
- **Low maintenance costs**

HFC & HFO Gas Detector Product Selector

	Relays	Modbus	Analogue Output	Mobile App	Service Wheel	Remote Sensor	Low Power (e.g. 24V)	Mains Power (e.g. 110V, 230V)	ATEX	Page #
GLACIÄR MIDI	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Option	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21
G-Series	3	Option	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	24
MP-Series	3 via MPU/ SPU	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		<input type="checkbox"/>	32
TR-SC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29
GEX-HFC	3 via MPU/ SPU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		Zone 1	32

NH₃ Leak Detection in Refrigeration

APPLICATION NOTES

Ammonia (NH₃) is used in larger, industrial refrigeration applications, and often when very low temperatures need to be achieved.

Typical applications include:

- **Cold storage**
- **Frozen food processing**
- **Ice factories**
- **Ice rinks & stadiums**

Why are NH₃ detectors needed?

NH₃ is both lethally toxic and explosive. It is corrosive to the skin, eyes, and lungs. At high levels, NH₃ is explosive.

NH ₃ concentration in air	Effect on humans
25ppm	Long term exposure limit - 8 hours TWA
35-50ppm	Short-term exposure limit – 15 minutes, some physical discomfort
70-300ppm	Severe irritation of nose, throat, and airways, risk of fluid accumulation in the lungs
300ppm	IDLH limit (Immediate Danger to Life & Health)
5,000ppm	Rapid respiratory arrest
15-18%	Flammable, explosive

Any leakage of ammonia is generally used to trigger an emergency alarm due to its acute toxicity. Although humans can detect ammonia by smell, typically in ranges from 5ppm – 50ppm, this is not a reliable method because repeated exposure can reduce sensitivity. The use of electronic gas detectors is therefore both recommended and mandated in most applications.

How to apply NH₃ detection?

NH₃ is lighter than air, meaning it will rise to the highest point in the room in which it leaks. Gas detectors should be installed at a high level, circa 20cm below the ceiling. Consideration should be given to the accessibility of the installation for service and maintenance.

Common practice is to install gas detectors above the likely source of a leak, for example valves, flanges, joints, and pressure reducers. Detectors can also be installed above areas with a high concentration of refrigerant, such as compressors, storage tanks/cylinders, pipes, and conduits.

Consideration should be given to air flow and ventilation, both natural and mechanical. It typically takes a long time for leaked gas to evenly disperse into the environment, so clouds of leaked gas can be moved by ventilation. Placing gas detectors in this air flow is good practice for effective detection.

NOTE



There is no general rule or standard for establishing the appropriate number of sensors and their location for each application.

Therefore, the guidance given is intended as support for installers, and not as rules in their own right.

All local, state, and national regulations should be adhered to.

NH₃ Gas Detector Selection

NH₃ is typically detected using electrochemical sensors. This technology has a number of benefits in refrigeration applications.

Electrochemical sensors have a limited life span, typically requiring replacement every 2-3 years. Selecting a gas detector with simple maintenance procedures is therefore particularly important.

Applications for NH₃ detection often require detection in high-pressure vent lines from pressure relief valves. Special mounting accessories should be used in this case, in order to ensure effective measurement and to protect the gas detector from damage by over-pressurisation.

A suitable NH₃ refrigerant leak detector should have the following characteristics:

- Fast response time
- Appropriate temperature range (e.g. -40°C - +50°C)
- Suitable IP rating for the installation environment (e.g. IP67)
- Outputs for system integration, control & safety alerts
- For any areas zoned as being potentially explosive, a detector with the appropriate ATEX certification for that zone should be selected.
- Appropriate detection range for the required alarm levels

BENEFITS

This technology has a number of benefits.

- High selectivity
- Minimal cross-interference
- High stability
- High accuracy

NH₃ Gas Detector Product Selector

	Relays	Modbus	Analogue Output	Mobile App	Service Wheel	Remote Sensor	Low Power (e.g. 24V)	Mains Power (e.g. 110V, 230V)	ATEX	Page #
GLACIÄR MIDI	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Option	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21
G-Series	3	Option	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Option	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Option	24
MP-Series	3 via MPU/ SPU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		<input type="checkbox"/>	32
TR-EC/SC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29
GEX-NH3	3 via MPU/ SPU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		Zone 1	32

R290 (propane) & Flammable Gas Leak Detection

APPLICATION NOTES

R290 (propane) is increasingly used in refrigeration applications. It is a natural refrigerant (as opposed to synthetic) and has a negligible global warming potential (GWP). Typically, it is used in self-contained refrigeration systems:

Typical applications include:

- **Display cases**
- **Heat pumps**
- **Vending machines**
- **Ice machines**

The leakage of other flammable gases, for example methane or hexane, is possible in a wide range of industrial and petrochemical applications, or anywhere where natural gas is used for fuel.

Examples include:

- **Petrol filling stations**
- **Biogas plants**
- **Tank farms**

Why are flammable gas detectors needed?

Flammable gases have a lower flammability limit (LFL) and an upper flammability limit (UFL), which are the percentage volumes in air between which the gas can burn if exposed to an ignition source. This presents a significant safety risk if there is a leak.

The LFL varies per gas, but generally detection is designed to trigger an alert at a much lower level. 10% of LFL and 25% of LFL are typical warning and alarm levels.

How to apply R290 / flammable gas detection?

The molecular weight of flammable gases varies. This is very important to consider when determining where to locate a gas detector.

For example, R290 (propane) is heavier than air and will quickly sink closer towards the ground or to any lower points in a room, such as stairwells or sumps. Gas detectors should be installed at low level, circa 20cm above the ground, in order to be most effective at detecting the leak.

Conversely, methane is lighter than air, meaning it will rise to the highest point in the room in which it leaks. Gas detectors should be installed at a high level, circa 20cm below the ceiling. Consideration should be given to the accessibility of the installation for service and maintenance.

Common practice is to install gas detectors near to the likely source of a leak, for example valves, flanges, joints, and pressure reducers. Detectors can also be installed near to areas with a high concentration of gas, such as compressors, storage tanks/cylinders, pipes, and conduits.

Consideration should be given to air flow and ventilation, both natural and mechanical. It typically takes a long time for leaked gas to evenly disperse into the environment, so clouds of leaked gas can be moved by ventilation. Placing gas detectors in this air flow is good practice for effective detection.

NOTE



There is no general rule or standard for establishing the appropriate number of sensors and their location for each application. Therefore, the guidance given is intended as support for installers, and not as rules in their own right. All local, state, and national regulations should be adhered to.

Flammable Gas Detector Selection

There are many sensor technologies which can be used to detect flammable gases, including R290. In refrigeration applications, one of the most commonly deployed is the semiconductor sensor.

Semiconductor, metal oxide sensors are a long-proven method for detection of R290, and have a number of benefits.

Semiconductor sensors can be cross-sensitive to other reducing gases and consideration should be given to this when selecting an installation location.

A suitable flammable gas leak detector should have the following characteristics:

- Fast response time
- Appropriate temperature range (e.g. -40°C - +50°C)
- Suitable IP rating for the installation environment (e.g. IP67)
- Outputs for system integration, control & safety alerts

For any areas zoned as being potentially explosive, a detector with the appropriate ATEX certification for that zone should be selected

BENEFITS

This technology has a number of benefits.

- **Cost effective**
- **Fairly long lifetime** (~5 years)
- **Low maintenance costs**
- **High accuracy**

Flammable Gas Detector Product Selector

	Relays	Modbus	Analogue Output	Mobile App	Service Wheel	Remote Sensor	Low Power (e.g. 24V)	Mains Power (e.g. 110V, 230V)	ATEX	Page #
GLACIÄR MIDI	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Option	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21
G-Series	3	Option	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Option	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Option	24
MP-Series	3 via MPU/SPU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		<input type="checkbox"/>	32
TR-SC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29
GEX-SC	3 via MPU/SPU	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Via MPU/SPU		Zone 1	32

Toxic Gas Detector in Parking Garages

Parking Garage Gas Detector Product Selector

Gas detectors are available to activate demand-controlled ventilation in parking garages, tunnels, or other occupied spaces. Typical requirements are to measure the concentration of carbon monoxide (CO) produced by gasoline powered vehicles or nitrogen dioxide (NO₂) produced by diesel- and gas-powered vehicles.

CO and NO₂ are usually measured using electrochemical sensors. This technology has a number of benefits in parking garage applications.

Electrochemical sensors have a limited life span, typically requiring replacement every 2-3 years.

VOC (volatile organic compounds) detectors are air quality sensors for garage environments, which detects emissions and other pollutants that can be formed in a garage. For example, carbon monoxide (CO) and unburned hydrocarbons (HC).

VOCs can be detected using semiconductor sensors. Semiconductor, metal oxide sensors have a number of benefits.

Semiconductor sensors can be cross-sensitive to other reducing gases and pollutants, so consideration should be given to this when selecting an installation location.

BENEFITS

Electrochemical sensors

- High selectivity
- Minimal cross-interference
- High stability
- High accuracy

Semiconductor sensors

- Cost effective
- Fairly long lifetime (~5 years)
- Low maintenance costs

Parking Garage Gas Detector Product Selector

	Relays	Analogue Output	Low Power (e.g. 24V)	Mains Power (e.g. 110V, 230V)	Gas	Page #
G-Series	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	VOC	24
TR-EC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CO ₂ , NO ₂	29

Refrigerant Gas Detection

VRF Systems & Occupied Spaces

APPLICATION NOTES

Variable Refrigerant Volume (VRV) and Variable Refrigerant Flow (VRF) types of HVAC system have become increasingly prevalent in their use in the hotel sector, amongst others. They present advantages including per-room control of temperature, cost effective and efficient installation, and both cooling and heating capability. The design of these systems is such that in the event of a leak, the refrigerant charge that could leak into an occupied space is higher than in older types of HVAC system.

Typical applications include:

- **Hotel rooms**
- **Offices**
- **Care homes**
- **Prisons**

Why are refrigerant gas detectors needed?

A larger refrigerant leak has a number of undesirable consequences for hotel owners and occupants, including:

- A danger to the safety of occupants
- Inefficient HVAC system energy use & associated cost increases
- Ineffective HVAC system operation & associated repair costs
- Failed HVAC system operation & lost revenue resulting from unsaleable rooms
- Emissions of environmentally harmful refrigerant gas to the atmosphere

A refrigerant leak is unlikely to have even dispersion throughout the room. Refrigerant gases have a much higher molecular weight than air and will sink to the lowest part of the room. It is therefore possible that 0.5m above the ground, around the height of a bed or a plug socket, a dangerously high concentration of refrigerant could be present.

In many regions regulations and standards demand the need to monitor for leakage of refrigerant gases in occupied spaces. These include EN378 in Europe and ASHRAE 15 in the US.

How to apply refrigerant gas detection in occupied spaces?

Because refrigerant gases used in VRF/VRV systems are much heavier than air, a leak will sink to the lower points in a room. Gas detectors should be installed at low level, circa 20cm above the ground, in order to be most effective at detecting the leak.

Common practice is to install gas detectors near to the likely source of a leak, underneath the evaporator mounted for the HVAC system.

Consideration should be given to air flow and ventilation, both natural and mechanical. It typically takes a long time for leaked gas to evenly disperse into the environment, so clouds of leaked gas can be moved by ventilation. Placing gas detectors in this air flow is good practice for effective detection.

NOTE

There is no general rule or standard for establishing the appropriate number of sensors and their location for each application. Therefore, the guidance given is intended as support for installers, and not as rules in their own right.

All local, state, and national regulations should be adhered to.



Occupied Space Gas Detector Selection

Refrigerant detection in occupied spaces is most typically deployed using semiconductor sensors. Semiconductor, metal oxide sensors are a long-proven method for detection of HFC and HFO refrigerants and blends. They have a number of benefits.

Semiconductor sensors can be cross-sensitive to other reducing gases and consideration should be given to this when selecting an installation location. For example, the location should be away from vanity units, mirrors, and bathrooms where aerosol products and high levels of steam may be present.

Due to the aesthetic nature of a domestically occupied space, the presence of a typical gas detector is often unacceptable. This can be overcome by using a detector that is recessed into the wall, with an unobtrusive faceplate being the only visible part.

See RM & RM-V (page 20) for details on suitable gas detectors for this application.



BENEFITS

This technology has a number of benefits.

- **Cost effective**
- **Fairly long lifetime** (~5 years)
- **Low maintenance costs**

NOTE

There is no general rule or standard for establishing the appropriate number of sensors and their location for each application. Therefore, the guidance given is intended as support for installers, and not as rules in their own right.

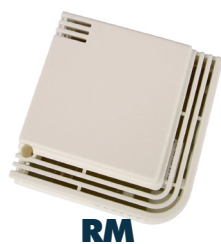
All local, state, and national regulations should be adhered to.



Products

Gas Detectors

RM & RM-V Gas Detectors for Occupied Spaces



The RM and RM-V detect leaks of refrigerant gas in occupied spaces, typically from HVAC systems including VRF/VRV air conditioning systems. Applications include hotel rooms, offices, care homes, prisons, and other occupied facilities.

- Standalone operation or connection to monitoring system
- Flush-mounted installation using RM-V with KAP045 back box
- Built-in audio-visual alarms
- Visual status indication by tri-colour LED
- 85db buzzer
- Alarm relay
- Failsafe operation
- 2 x factory-set alarm levels (1000ppm/4000ppm)
- Automatic alarm reset once under the alarm threshold
- Alarm delay to reduce false alarms from transient interfering gases
- IP21 housing
- Power supply 12-24V AC/DC
- Annual maintenance using DT300 service tool
- Standard calibration for R410A (responds to other HFC gases, alternate calibration possible on request)

Order Code	Model	Details	PG
32-220	RM-HFC	0-5000 ppm, 12-24V AC/DC, max 2 W	A
32-320	RMV-HFC	0-5000 ppm, 12..24V AC/DC, max 2 W NOTE Requires KAP045 or KAP046 back box	A
KAP045	RMV backbox, flush mount	Square shaped back-box for flush mounting, Included as standard	
KAP046	RMV backbox, surface mount	Square shaped back-box for surface mounting, height 30mm - No-cost option.	



GLACIÄR MIDI detects leaks of refrigerant gases in commercial and industrial environments, including:

Supermarkets & food retail

Cold rooms

Walk-in Freezers

Cold Storage

Food processing

Providing interfaces for set-up, configuration, and maintenance via both a digital app connection and via an analogue service-wheel, **GLACIÄR MIDI** can be used in all refrigeration environments without the need for any special tools.

GLACIÄR MIDI is available in version with a built-in sensor, or with a remote sensor.

GLACIÄR MIDI can be configured for detection of synthetic refrigerants (HFC & HFO blends) and natural refrigerants (CO₂, NH₃, R290/propane).

We have used our extensive gas detection expertise to make it possible to detect all commonly used refrigerants with only 5 different sensor types, making it simple and easy to select the right detector for your application.

SIMPLE SELECTION

HFC/HFO blends detected via just two broad-band semiconductor sensor variants

CO₂ detection via infra-red sensor

NH₃ detection via electrochemical sensors

R290 (propane) detection via semiconductor sensor

Comes ready to install with standard configuration

Multiple cable glands located for easy access to power connections & output terminals

Pluggable screw terminals for simple installation on site

IP67-rated enclosure

-40°C - + 50°C operating range suitable for all refrigeration environments

Power supply 15 to 24 VDC; 24 V AC/DC

Bluetooth® connectivity to app for configuration & calibration (Android™ & iOS)

2 x alarm relay outputs for high- and low-alarm levels, 1A at 24VAC/VDC

Configurable alarm behaviour, auto-reset or latching

Failsafe operation

Modbus RTU over RS485, galvanically isolated
Selectable analogue output range, 0-5V; 1-5V; 0-10V; 2-10V; 4-20mA

Visual health-check via high-intensity status LEDs
Service counter tells you when service is needed

Analogue configuration via service-wheel & magnetic switch

Pre-calibrated sensor module replacements
Sensor lifetime counter

**Read more about
GLACIÄR MIDI**





Order Code	Model	Details	PG
CO₂			
31-210-32	GLACIAR MIDI IR CO ₂ 10000ppm	0-10000 ppm, 15.. 24VDC; 24VAC/DC, máx. 4 W , 170mA @24VDC	G
31-510-32	GLACIAR MIDI Remote IR CO ₂ 10000ppm	0-10000 ppm, 15.. 24VDC; 24VAC/DC, máx. 4 W , 170mA @24VDC	G
HFO/HFC		Group 1	R32 / R407A / R407C / R407F / R410A / R448A / R449A / R452A / R452B / R454A / R454B / R454C / R455A / R464A / R465A / R466A / R468A / R507A
31-220-12	GLACIAR MIDI SC HFC/HFO Group 1 1000ppm	0-1000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-520-12	GLACIAR MIDI Remote SC HFC/HFO Group 1 1000ppm	0-1000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
HFO/HFC		Group 2	R134a / R404A / R450A / R513A / R1234yf / R1234ze / R1233zde
31-220-17	GLACIAR MIDI SC HFC/HFO Group 2 1000ppm	0-1000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-520-17	GLACIAR MIDI Remote SC HFC/HFO Group 2 1000ppm	0-1000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
NH₃			
31-250-22	GLACIAR MIDI EC NH ₃ 100ppm	0-100 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-250-23	GLACIAR MIDI EC NH ₃ 1000ppm	0-1000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-250-24	GLACIAR MIDI EC NH ₃ 5000ppm	0-5000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-550-22	GLACIAR MIDI Remote EC NH ₃ 100ppm	0-100 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-550-23	GLACIAR MIDI Remote EC NH ₃ 1000ppm	0-1000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-550-24	GLACIAR MIDI Remote EC NH ₃ 5000ppm	0-5000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
R290		Group 3	R290 / R50 / R600a / R1150 / R1270
31-290-13	GLACIAR MIDI SC R290 / Group 3 4000ppm	0-4000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G
31-590-13	GLACIAR MIDI Remote SC R290 HC 4000ppm	0-4000 ppm, 15.. 24VDC; 24VAC/DC, max. 4 W , 170mA @24VDC	G

G-Series gas detectors are field-proven over many years, offering simply reliable gas detection for commercial and industrial refrigerant applications.

There are a number of variants in the G-Series platform to meet application-specific needs, all sharing a common set of features.

These include:

- Operating status displayed via LEDs
- 3 x adjustable alarm levels
- 3 x alarm relay outputs
- Adjustable alarm delay
- Configurable alarm behaviour, auto-reset or latching
- Failsafe operation
- -40°C - + 50°C operating range suitable for all refrigeration environments
- Test terminal for service tools
- Annual maintenance using DT300 service tool
- Power supply options inc. 12-24V AC/DC & 230V AC



G-SERIES PRODUCTS



CO₂ detector using infrared sensor
IP67 enclosure

GSH



CO₂ detector using infrared sensor
Modbus RTU digital communications
IP67 enclosure

GSMB



CO₂ detector using infrared sensor
High-intensity LED & built-in buzzer (with mute function) for alarm indication
Terminal for connection of a manual remote alarm activation
IP67 enclosure

GSLs



HFC / HFO / NH₃ / R290 / flammable gas / VOC detection using semiconductor sensor
IP21 enclosure

GD



HFC / HFO / NH₃ / R290 / flammable gas / VOC detection using semiconductor sensor
IP54 enclosure

GS



HFC / HFO / NH₃ / R290 / flammable gas detection using semiconductor sensor
IP54 enclosure
Remote sensor, 5m cable

GSR



HFC / HFO / NH₃ / VOC detection using semiconductor sensor
IP54 enclosure
Remote sensor, 1.5m cable
Ventilation ducts installation

(plastic tube with the sensor mounted with a rubber sleeve directly in the channel)

GK



HFC / HFO / NH₃ detector using semiconductor sensor
IP54 enclosure
Remote sensor, 1.5m cable
Vent lines from pressure relief valve installation
Pipe fitting in brass 1/2" Flare.

GR



HFC / HFO / NH₃ / R290 / flammable gas detection using semiconductor sensor
IP56 enclosure
ATEX approved remote sensor, 5m cable
Flameproof sensor enclosure (EX d), can be installed in ATEX Zone 1
Controller must be installed outside the ATEX area.

GXR

Order Code	Model	Details	PG
GSH detectors	CO₂		
37-4120	GSH24-CO2-10000	0-10000 ppm, 12..24V AC/DC, max 3 W	A
37-4124	GSH24-CO2-30000	0-30000 ppm, 12..24V AC/DC, max 3W	A
37-4170	GSH230-CO2-10000	0-10000 ppm, 85...230V AC, max 3 W	A
37-4174	GSH230-CO2-30000	0-30000 ppm, 85..230V AC, max 3W	A
GSMB detectors	CO₂		
37-4120-MB	GSMB24-CO2-10000	0-10000 ppm, 12..24V AC/DC, max 3 W	A
37-4124-MB	GSMB24-CO2-30000	0-30000 ppm, 12..24V AC/DC, max 3W	A
37-4170-MB	GSMB230-CO2-10000	0-10000 ppm, 85..230V, Max 3W	A
37-4174-MB	GSMB230-CO2-30000	0-30000 ppm, 85..230V AC, max 3W	A
GSLs detectors	CO₂		
37-4120-LS	GSLs24-CO2-10000	0-10000ppm, 12...24V AC/DC, max 3W	A
37-4124-LS	GSLs24-CO2-30000	0-30000 ppm, 24 V, max 3 W	A
37-4170-LS	GSLs230-CO2-10000	0-10000ppm, 85...230V AC, max 3W	A
37-4174-LS	GSLs230-CO2-30000	0-30000 ppm, 230 V, max 3 W	A
GD detectors	HFC / HFO / NH₃ / R290 / flammable gas		
37-220	GD24-HFC-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-225	GD230-HFC-4000	0-4000 ppm, 230V AC, max 2 W	A
37-252	GD24-NH3-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-253	GD24-NH3-10000	0-10000 ppm, 12..24V AC/DC, max 2 W	A
37-257	GD230-NH3-4000	0-4000 ppm, 230V AC, max 2 W	A
37-258	GD230-NH3-10000	0-10000 ppm, 230V AC/DC, max 2 W	A
37-230	GD24-HC	0-50% LEL, 12..24V AC/DC, Hydrocarbons	A
37-235	GD230-HC	0-50% LEL, 230V AC, Hydrocarbons	A
37-270	GD24-H2	0-50% LEL, 12..24V AC/DC, (Hydrogen)	A
37-275	GD230-H2	0-50% LEL, 230V AC, (Hydrogen)	A
37-280	GD24- Methane	0-50% LEL, 12..24V AC/DC	A
37-285	GD230- Methane	0-50% LEL, 230V AC	A

Order Code	Model	Details	PG
GD detectors	HFC / HFO / NH₃ / R290 / flammable gas	Continued...	
37-290	GD24- Propane	0-50% LEL, 12..24V AC/DC	A
37-295	GD230- Propane	0-50% LEL, 230V AC	A
37-260	GD24-AQS (VOC)	0-200 ppm, 12..24V AC/DC , max 2 W	A
37-265	GD230-AQS (VOC)	0-200 ppm, 230V AC , max 2 W	A
GS detectors	HFC / HFO / NH₃ / R290 / flammable gas	Splash Proof	
37-420	GS24-HFC-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-425	GS230-HFC-4000	0-4000 ppm, 230V AC, max 2 W	A
37-452	GS24-NH3-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-453	GS24-NH3-10000	0-10000 ppm, 12..24V AC/DC, max 2 W	A
37-457	GS230-NH3-4000	0-4000 ppm, 230V AC, max 2 W	A
37-458	GS230-NH3-10000	0-10000 ppm, 230V AC/DC, max 2 W	A
37-430	GS24-HC	0-50% LEL, 12..24V AC/DC, Hydrocarbons	A
37-435	GS230-HC	0-50% LEL, 230V AC, Hydrocarbons	A
37-470	GS24-H2	0-50% LEL, 12..24V AC/DC, (Hydrogen)	A
37-475	GS230-H2	0-50% LEL, 230V AC, (Hydrogen)	A
37-480	GS24- Methane	0-50% LEL, 12..24V AC/DC	A
37-485	GS230- Methane	0-50% LEL, 230V AC	A
37-490	GS24- Propane	0-50% LEL, 12..24V AC/DC	A
37-495	GS230- Propane	0-50% LEL, 230V AC	A
37-460	GS24-AQS (VOC)	0-200 ppm, 12..24V AC/DC , max 2 W	A
37-465	GS230-AQS (VOC)	0-200 ppm, 230V AC , max 2 W	A
GSR detectors with remote sensor	HFC / HFO / NH₃ / R290 / flammable gas		
37-920	GSR24-HFC-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-925	GSR230-HFC-4000	0-4000 ppm, 230V AC, max 2 W	A
37-952	GSR24-NH3-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-953	GSR24-NH3-10000	0-10000 ppm, 12..24V AC/DC, max 2 W	A

Order Code	Model	Details	PG
GSR detectors with remote sensor	HFC / HFO / NH₃ / R290 / flammable gas	Continued...	
37-957	GSR230-NH3-4000	0-4000 ppm, 230V AC, max 2 W	A
37-958	GSR230-NH3-10000	0-10000 ppm, 230V AC/DC, max 2 W	A
37-930	GSR24-HC	0-50% LEL, 12..24V AC/DC, Hydrocarbons	A
37-935	GSR230-HC	0-50% LEL, 230V AC, Hydrocarbons	A
37-980	GSR24-Methane	0-50% LEL, 12..24V AC/DC	A
37-985	GSR230-Methane	0-50% LEL, 230V AC	A
37-990	GSR24-Propane	0-50% LEL, 12..24V AC/DC	A
37-995	GSR230-Propane	0-50% LEL, 230V AC	A
GK detectors	HFC / HFO / NH₃	For ventilation ducts	
37-820	GK24-HFC-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-825	GK230-HFC-4000	0-4000 ppm, 230V AC, max 2 W	A
37-852	GK24-NH3-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-857	GK230-NH3-4000	0-4000 ppm, 230V AC, max 2 W	A
37-860	GK24-AQS (VOC)	0-200 ppm, 12..24V AC/DC, max 2 W	A
37-865	GK230-AQS (VOC)	0-200 ppm, 230V AC, max 2 W	A
GR detectors	HFC / HFO / NH₃ /	For vent lines from pressure relief valves	
37-620	GR24-HFC-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-625	GR230-HFC-4000	0-4000 ppm, 230V AC, max 2 W	A
37-652	GR24-NH3-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-657	GR230-NH3-4000	0-4000 ppm, 230V AC, max 2 W	A
GXR detectors	HFC / HFO / NH₃ /	With ATEX approved remote sensor	
37-720	GXR24-HFC-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-725	GXR230-HFC-4000	0-4000 ppm, 230V AC, max 2 W	A
37-752	GXR24-NH3-4000	0-4000 ppm, 12..24V AC/DC, max 2 W	A
37-757	GXR230-NH3-4000	0-4000 ppm, 230V AC, max 2 W	A
37-753	GXR24-NH3-10000	0-10000 ppm, 12...24V AC/DC, max 2W	A
37-758	GXR230-NH3-10000	0-10000 ppm, 230V AC, max 2W	A
37-730	GXR24-Propane	0-50% LEL, 12..24V AC/DC, max 2 W	A
37-735	GXR230-Propane	0-50% LEL, 230V AC, max 2 W	A

TR-Series gas detector transmitters are robustly designed for use in harsh environments, offering simply reliable gas detection for industrial refrigerant applications.

There are a number of variants in the TR-xx platform to meet application-specific needs, all sharing a common set of features.

These include:

- Selectable analogue output (4-20mA, 0-10V)
- Connectivity to MPU or SPU monitoring unit
- Integrate with any PLC or gas detection controller accepting analogue signals
- -40°C - + 50°C operating range (exc. TR-EC)
- Maintenance calibration gas & TR calibration kit
- Power supply 12-30V DC



TR-SERIES PRODUCTS



CO2 detection using
infrared sensor
IP67 enclosure

TR-IR



HFC / HFO / NH3 / R290
/ flammable gas / VOC
detection using
semiconductor sensor
IP54 enclosure

TR-SC



HFC / HFO / NH3 / R290
/ flammable gas detection
using semiconductor sensor
IP54 enclosure
Remote sensor, 1.5m cable
Ventilation ducts installation
(plastic tube with the sensor
mounted with a rubber sleeve
directly in the channel)

TR-SCK



HFC / HFO / NH3
detector using
semiconductor sensor
IP54 enclosure
Remote sensor, 1.5m cable
Vent lines from pressure
relief valve installation
Pipe fitting in brass 1/2" Flare

TR-SCR



NH3 / CO / NO2 detector
using electrochemical sensor
IP67 enclosure
NH3: -30°C - + 50°C
operating range
CO / NO2: -10°C - +
40°C operating range

TR-EC

Order Code	Model	Details	PG
TR-IR detectors	CO₂		
39-4312	TR-IR-CO2-10000	0-10000 ppm, max 2,5 W	A
39-4314	TR-IR-CO2-30000	0-30000 ppm, max 2,5 W	A
TR-SC detectors	HFC / HFO / NH₃ / R290 / flammable gas		
39-4120-A	TR-SC-HFC(A)-4000	0..4000 ppm HFC (standard R404a / R507)	A
39-4120-B	TR-SC-HFC(B)-4000	0..4000 ppm HFC (standard R134a)	A
39-4152	TR-SC-NH3-4000	0..4000 ppm Ammonia, max 2 W	A
39-4153	TR-SC-NH3-10000	0..10000 ppm Ammonia, max 2 W	A
39-4130	TR-SC-HC	0-50% LEL, General for Hydrocarbons (HC)	A
39-4170	TR-SC-H2	0-50% LEL, Hydrogen (H2)	A
TR-SCK detectors	HFC / HFO / NH₃ / R290 / flammable gas	For ventilation ducts	
39-8120-A	TR-SCK-HFC(A)-4000	0..4000 ppm HFC (standard R404a / R507)	A
39-8120-B	TR-SCK-HFC(B)-4000	0..4000 ppm HFC (standard R134a)	A
39-8152	TR-SCK-NH3-4000	0..4000 ppm Ammonia, max 2 W	A
39-8130	TR-SCK-HC	0-50% LEL, General for Hydrocarbons (HC)	A
39-8170	TR-SCK-H2	0-50% LEL, Hydrogen (H2)	A
TR-SCR detectors	HFC / HFO / NH₃ /	For vent lines from pressure relief valves	
39-6120-B	TR-SCR-HFC(B)-4000	0..4000 ppm HFC (standard R134a)	A
39-6152	TR-SCR-NH3-4000	0..4000 ppm Ammonia, max 2 W	A
TR-EC detectors	NH₃ / CO₂ / NO₂		
39-4250	TR-EC-NH3-100	0 - 100 ppm	A
39-4251	TR-EC-NH3-1000	0 - 1000 ppm	A
39-4252	TR-EC-NH3-5000	0 - 5000 ppm	A
39-4253	TR-EC-NH3-10000	0 - 10000 ppm	A
39-4260	TR-EC-CO	0-300 ppm	A
39-4240	TR-EC-NO2	0-20 ppm	A

MP-Series gas detectors offer simply reliable gas detection for commercial and industrial refrigerant applications. These detectors are designed for use with a monitoring unit, and the use of one of the following is required in combination with the MP-Series detectors:

MPU2C / MPU4C / MPU6C (see page 36)
SPU / SPLS (see page 37)

There are a number of variants in the MP-Series platform to meet application-specific needs, all sharing a common set of features. These include:

- Power supply from monitoring unit
- -40°C - + 50°C operating range suitable for all refrigeration environments
- Alarm levels set via monitoring unit
- Annual maintenance using DT300 service tool
- Pre-set alarm levels
- Custom alarm levels available on request



MP-SERIES PRODUCTS



CO2 detector using
infrared sensor
IP67 enclosure

MPS



HFC / HFO / NH3 / R290
/ flammable gas detection
using semiconductor sensor
IP21 enclosure

MP-D



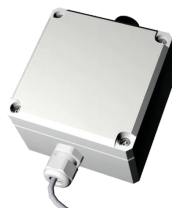
HFC / HFO / NH3 / R290
/ flammable gas detection
using semiconductor sensor
IP54 enclosure

MP-DS



HFC / HFO / NH3
detection using
semiconductor sensor
IP54 enclosure
Remote sensor, 1.5m cable
Ventilation ducts installation
(plastic tube with the sensor
mounted with a rubber sle-
eve directly in the channel)

MP-DK



HFC / HFO / NH3
detector using
semiconductor sensor
IP54 enclosure
Remote sensor, 1.5m cable
Vent lines from pressure
relief valve installation
Pipe fitting in brass 1/2" Flare.

MP-DR2



HFC / HFO / NH3 / R290
/ flammable gas detection
using semiconductor sensor
ATEX approved flameproof
sensor enclosure (EX d)
IP66 enclosure

GEX

MP-SERIES - including GEX

Order Code	Model	Details	PG
MPS detectors	CO₂		
34-410	MPS-CO2-10000	0-10000 ppm, max 2,5 W	A
34-414	MPS-CO2-30000	0-30000 ppm, max 2,5 W	A
MP-D detectors	HFC / HFO / NH₃ / R290 / flammable gas		
38-220	MP-D-HFC-4000	0-4000 ppm	A
38-252	MP-D-NH3-4000	0-4000 ppm	A
38-253	MP-D-NH3-10000	0-10000 ppm	A
38-230	MP-D-HC	0-50% LEL	A
38-280	MP-D-Methane	0-50% LEL	A
38-290	MP-D-Propane	0-50% LEL	A
MP-DS detectors	HFC / HFO / NH₃ / R290 / flammable gas	Splash Proof	
38-420	MP-DS-HFC-4000	0-4000 ppm	A
38-452	MP-DS-NH3-4000	0-4000 ppm	A
38-453	MP-DS-NH3-10000	0-10000 ppm	A
38-430	MP-DS-HC	0-50% LEL	A
38-470	MP-DS-H2	0-50% LEL	A
38-480	MP-DS-Methane	0-50% LEL	A
38-490	MP-DS-Propane	0-50% LEL	A
MP-DK detectors	HFC / HFO / NH₃	For ventilation ducts	
38-820-V2	MP-DK2-HFC-4000	0-4000 ppm	A
38-852-V2	MP-DK2-NH3-4000	0-4000 ppm	A
MP-DR2 detectors	HFC / HFO / NH₃	For vent lines from pressure relief valves	
38-620-V2	MP-DR2-HFC-4000	0-4000 ppm	A
38-652-V2	MP-DR2-NH3-4000	0-4000 ppm	A
GEX detectors	HFC / HFO / NH₃	With ATEX approved enclosure	
35-301	GEX-SC-HFC-4000	0-4000 ppm	A
35-304	GEX-SC-NH3-4000	0-4000 ppm	A
35-303	GEX-SC-NH3-10000	0-10000 ppm	A
35-302	GEX-SC-Propane	Propane, Methane etc. 0-50% LEL.	A

Controllers & Monitoring Units

Gas Detection

MPU -Multi-Point Gas Detection Monitoring Unit



The **MPU** is a centralised monitoring unit for two, four, or six connected gas detectors. It offers an ideal solution for monitoring rooms where multiple gases need to be detected, or where multiple detection points are required for a single gas.

- MP-Series gas detectors specifically designed for use with MPU
- Connect GEX gas detectors for use in potentially explosive environments
- Integrate any gas detector with a 4-20mA or 0-10V output
- Operating & alarm status displayed independently for each channel
- Visual status indication via LEDs
- Audible alarm buzzer built-in
- 3 x alarm thresholds per channel
- 3 x alarm relay outputs, 230V, 5A
- Adjustable alarm delay
- Configurable alarm behaviour, auto-reset or latching
- 1 x fault relay output
- Failsafe operation
- -40°C - + 50°C operating range
- IP66 enclosure
- Service mode to block alarm outputs
- Test terminal for service tools
- 24V DC / 150mA output for siren or flashing light
- Input for optional external battery back-up (UPS)
- Can be ordered with custom pre-set alarm levels for the specific gas type
- Power supply 230V AC / 24V DC

Order Code	Model	Details	PG
20-310	MPU2C	2 channels, 230V AC / 24V DC, max 10 W	A
20-300	MPU4C	4 channels, 230V AC / 24V DC, max 10 W	A
20-305	MPU6C	6 channels, 230V AC / 24V DC, max 10 W	A
60-300		Custom pre-set alarm levels. Price per channel/detector	Net

Note: Maximum total power consumption of all connected gas detectors is 10W, e.g. MPU6C 230V is limited to use with max. 4 x MPS-CO2

SPU / SPLS - Single-Point Gas Detection Monitoring Unit



The **SPU** is a monitoring unit for a single gas detector.

- MP-Series gas detectors specifically designed for use with SPU / SPLS
- Connect GEX gas detectors for use in potentially explosive environments
- Integrate any gas detector with a 4-20mA or 0-10V output
- Operating & alarm status displayed via LEDs
- 3 x alarm relay outputs, 230V, 5A
- Adjustable alarm delay
- Configurable alarm behaviour, auto-reset or latching
- Failsafe operation
- -40°C - + 50°C operating range
- IP67 enclosure
- Test terminal for service tools
- Input for optional external battery back-up (UPS)
- Can be ordered with custom pre-set alarm levels for the specific gas type
- Power supply options 24V AC/DC or 85-230V AC

Additional features for SPLS:

- High-intensity LED & built-in buzzer (with mute function) for alarm indication
- Terminal for connection of a manual remote alarm activation

Order Code	Model	Details	PG
20-350	SPU24	24V AC/DC, max 3 W	A
20-355	SPU230	85-230V AC, max 3 W	A
20-360	SPLS24	24V AC/DC, max 3 W	A
20-365	SPLS230	85-230V AC, max 3 W	A

LAN63/64/65 Gas Detection Alarm Panels



LAN gas detection alarm panels offer an ideal solution for multi-point monitoring of refrigerant leaks, toxic gases, and explosive gases.

The system consists of **LAN63** (master) and **LAN64** (slave) which can be expanded to a maximum of 108 inputs.

LAN63-PKT and LAN63/64-PKT is a complete package with power supply and enclosure designed for wall mounting. Current mode and alarm status is shown by LEDs on the front of the enclosure.

For mounting on a DIN rail, LAN 65 provides a potential-free NO contact for each LAN63 (LAN64) input.

- Compatible with all detectors with a volt-free relay output
- 12 inputs per module.
- 2 x relay outputs for A & B alarm, max 24V / 1A.
- Per-channel alarm indication with LEDs
- Programmable alarm delay per alarm input
- Alarm inputs for NO / NC contact.
- Failsafe function
- Manual alarm reset
- Delivered as alarm panels for installation in control cabinets or as a complete package (PKT) for wall mounting
- 0°C - + 50°C operating range
- IP32 enclosure (-PKT versions)
- 24VDC power supply output for external detectors, max. 9W (-PKT versions)

Order Code	Model	Details	PG
81-100	LAN63-PKT	12 DI, 230V AC, IP32, max 10 W	A
81-200	LAN63/64-PKT	24 DI, 230V AC, IP32, max 10 W	A
81-110	LAN63	Only alarm panel, 12 DI, 24V AC, Master, max 2 W	A
81-120	LAN64	Only alarm panel, 12 DI, 24V AC, Slave, max 2 W	A
81-130	LAN65	Relay box, 12 DI, 24V AC, max 5 W	A

Detection in Water & Brine

NH₃



AQUIS500



The Aquis system is developed for detection of ammonia leaks in refrigeration systems. The development of this robust and practical system is based on many years of experience can be used for water as well as brine.

The sensor can be used to measure ammonia (NH₃) in water. In an aqueous solution, ammonia is in a pH-dependent equilibrium with the ammonium ion (NH₄⁺ ions). Since the NH₄⁺ ions are converted to ammonia when adding lye, the sensor can detect ammonia. (the NH₄⁺ ions are not detected)

The ammonia sensor consists of a pH glass electrode and a reference electrode. Both electrodes are positioned in an electrolyte. The electrolyte is separated from the test medium with a hydrophobic, gas permeable membrane.

The local change in pH value is measured at the high resistance of the integrated pH electrode.

The monitoring unit provides a 4..20mA output, which can be connected to an external PLC.

Different sensor can be connected to the Aquis500 depending on the application and pressure in the system. The sensors can be quickly and easily installed.

Features

Designed for monitoring of ammonia in secondary cooling systems

Detection in Water, Brine mixtures, e.g. Ethylene, Tyfoxit, Hycool, etc

Selectable display of: numbers, graph or trends

Measuring low concentration (<0.2 ppm)

Measuring range: 0.01..9999 ppm

Output: 4..20mA, relay SPDT

Power supply: 230V AC

Pressure range: (0) 1 ... 6 bar

Easy installation and easy to use

User-friendly programming and access to plant documentation

Languages: English, French, German

Complies with EN 378 regulations

Expected sensor lifetime ≈ 2 year

Sensors are a consumable part.

Maintenance: every 6 months at normal operation

NOTE



When ordering, brine type must be specified!


Order Code	Model	Details	PG
		Temperature range media (in circuit): depending on sensor type. IP67	
35-210	Aquis 500	Monitoring unit, wall mount	Net
35-220	NH3 sensor, standard	Media temp (0..+50°C).	Net
35-221	NH3 sensor, low temp	Media temp (-8..+30°C).	Net
35-229	Coax cable set	1x5mm 75Ω, 5,0m	Net
35-230	Pipe fitting for sensor	Retractable pipe fitting with built in pressure reducer, max 6 bar. Pipe/process connection (G 1 ¼") Built in shut of valve for sensor maintenance.	Net
35-231	Aquis bottle kit	Mounting kit with hose and bottle for liquid sample.	Net

Auxiliary Equipment

Gas Detection


Gas Detection Auxilliary Equipment

Duct Mounting Kit


Order Code	Model	Details	PG
	MSVK	Mounting kit for detection in ventilation ducts Connection tube: 2 x 20mm Ø Compatible with: GSH, GSMB, GSLS, MPS, TR-IR, TR-EC	
60-800	-	Duct mounting kit	Net

Audio-Visual Alarms


Flashing Lights

Order Code	Model	Details	PG
	BE	For indoor or outdoor mounting IP54 with standard low socket Dimensions: 93x75mm Ambient temperature: -25oC..+70oC Option: High socket with side entry cable glands. (2 models) IP65 with high socket	
40-4021	BE-A-24VDC	Orange, 9..60V DC (88mA at 24V DC)	A
40-4022	BE-R-24VDC	Red, 9..60V DC (88mA at 24V DC)	A
40-4023	BE-BL-24VDC	Blue, 9..60V DC (88mA at 24V DC)	A
40-415	SOCK-H-R	High socket, red.	A
40-420	SOCK-H-R-230	High socket for 230V AC, red.	A

Combined flashing Light and Siren


Order Code	Model	Details	PG
	FL	Flashing light and siren can be activated separately. DIP-switches for selection of signal IP65 with standard high socket Dimensions ØxH: 93x120mm Ambient temperature: -10oC..+55oC Option: 230V AC socket	
40-440	FL-RL-R	Red, combined flashing light & siren, 18..28V DC (85mA at 24V DC)	A
40-441	FL-BL-V-SEP	Blue, combined flashing light & siren, 18..28V DC (85mA at 24V DC)	A
40-420	SOCK-H-R-230	Socket for 230V AC	A


Siren

Order Code	Model	Details	PG
	1992-LP	For indoor or outdoor mounting DIP-switches for selection of signal Built-in volume control IP54 with standard low socket Dimensions: 93x75mm Ambient temperature: -25oC..+80oC Option: High socket with side entry cable glands. (2 models) IP65 with high socket	
40-410	1992-R-LP	Red, 9..28V DC	A
40-415	SOCK-H-R	High socket, red.	A
40-420	SOCK-H-R-230	High socket for 230V AC, red.	A


Gas Detection Auxilliary Equipment


Battery back-up

Order Code	Model	Details	PG
	UPS UPS5000	Output: 6, 12 or 24V DC Maximal load: 4A Batteries: 12V / 7Ah (Battery to be ordered separately) Housing: Metal, IP21 Dimensions: 370x330 x95mm	
40-221	UPS5000		A
80-320 **)	Battery 12V/7Ah	weight 2,4 kg	C

 **) Batteries can be handled as 'dangerous goods' by shipping companies, which can add very high extra cost for shipping. In those cases, we recommend batteries to be purchased locally.

Protective Equipment

Order Code	Model	Details	PG
	Protection bracket	Bracket in 3mm stainless steel to be mounted as protection for detectors etc. Width: 50mm	
40-901	Protection bracket Big	Inner dimension L x H: 174x92mm (fits e.g. the GD24/230 series)	A
40-902	Protection bracket Small	Inner dimension L x H: 94x92mm (fits e.g. the MP series)	A

Order Code	Model	Details	PG
	Sensor Protection Cap	Protection of sensor during construction time.	
DEL659	Sensor protection large	For GS/GSR/TR-SC/MP-DS	A
DEL660	Sensor protection small.	For GR/TR-SCR/MP-DR	A

DT300

Diagnostic and calibration tool

DT300 is a unique instrument that is used for checking and calibration of detectors with semi conductive sensors.

A recurring concern when calibrating sensors is to know if the air is clean or contaminated. Traditionally, this has been accomplished by applying synthetic air or "zero gas" from a bottle. DT300 features a unique design with an integrated reference sensor that makes it possible to calibrate the relevant sensor without applying gas.

Function

The unit is equipped with a reference sensor (ordered separately) for the relevant gas.

The reference sensor is plugged into the unit and the LCD display indicates when the sensor is heated and ready to use.

The reference value for the gas appears in the LCD display.

The value is then used to calibrate offset-value on the relevant detector. Alphanumeric LCD display shows:

- The integrated reference sensors offset-value
- Offset-value on the tested detector
- System voltage (+5 V)
- C-, B-and A-alarm levels



Features

For control and calibration of semiconductor detectors

For control and adjustment of alarm levels of monitoring units

Integrated reference sensor for measuring the temperature of gas or other contamination in the detector being tested

Exchangeable factory "plug-in" sensors are available for H₂, HC, HFC / HFO, NH₃ and VOCs

Allows calibration of the current sensor without introducing calibration gas

Power supply: 4 x AA alkaline (8h) or rechargeable Ni-Mh (10h) batteries

LED indicator for battery level

Dimensions WxHxD: 100x165x44mm

Weight: 365g (including batteries)


SM300 sensor modules are a consumable part.





Easy replaceable sensor module, see spare parts

Method for test and calibration: NA

Maintenance: SM300-sensor module shall be replaced annually.

Order Code	Model	Details	PG
 <h2 style="display: inline;">DT300</h2> Ambient temperature: -25°C..+50°C			
60-130	DT300	Diagnostic tool, base unit *	A

Order Code	Model	Details	PG
 <h2 style="display: inline;">SM300</h2> Pre calibrated sensor module for DT300			
60-131	SM300-VOC	Sensor for exhaust gas, air quality (VOC)	A
60-132	SM300-HC	Sensor for hydrocarbons (HC)	A
60-133	SM300-H2	Sensor for hydrogen (H2)	A
60-134	SM300-HFC	Sensor for refrigerant gases (HFC/CFC/HCFC/HFO)	A
60-136	SM300-NH3-4000	Sensor for ammonia (NH3) – 4000	A
60-137	SM300-NH3-10000	Sensor for ammonia (NH3) – 10000	A
60-150	SM300-self sense	Sensor for refrigerant gases (HFC/CFC/HCFC/HFO) with filter	A

Order Code	Model	Details	PG
 <h2 style="display: inline;">SA200</h2> <div style="margin-left: 20px;"> <p>Basic Service Tool</p> <p>The tool is used with a voltmeter to check and adjust the settings of the alarm levels and sensor offset of gas detectors and control panels.</p> <ul style="list-style-type: none"> • Basic service tool for control and adjustment of alarm levels for detectors • For control and adjustment of alarm levels of monitoring units <p>Features:</p> <p>Service tool for detectors type GD/GS/GR/GK/GSR230, GD/GS/GR/GK/GSR24 and for detectors connected to monitoring units MPU2C/4C/6C and SPU/SPLS.</p> </div>			
60-120	SA200	for MPU, SPU/SPLS and G-series 230/24V models	Net

Order Code	Model	PG
Semiconductive sensors G / MP-DS / MP-DR2 / MP-DK2		
SEN001	VOC (CO) sensor exhaust gas (SC)	D
SEN002	HC sensor 0-50% LEL (SC)	D
SEN003	NH3 sensor 0-4000ppm (SC)	D
SEN004	HFC sensor 0-4000ppm (SC)	D
SEN006	H2 sensor 0-50% LEL (SC)	D
SEN019	NH3 sensor 0-10000ppm (SC)	D
SEN027	SELF SENSE filter sensor HFC, HFO, Propane	D
Sensor module for MP-D		
SEN204	HFC Sensor 0-4000ppm + RS02	D
SEN203	NH3 Sensor 0-4000ppm + RS02	D
SEN219	NH3 Sensor 0-10000ppm + RS02	D
Sensor module for Transmitter (TR-EC)		
SEN210	CO Sensor + RS05	D
SEN212	NO2 Sensor + RS05	D
SEN015	NH3 Sensor module 0-100ppm	D
SEN016	NH3 Sensor module 0-1000ppm	D
SEN017	NH3 Sensor module 0-5000ppm	D
SEN018	NH3 Sensor module 0-10000ppm	D
SEN021	NH3/CR-200, Spare sensor NOTE! 0-100ppm NH3 (TR-EC)	D
SEN022	NH3/CR-1000, Spare sensor 0-1000ppm NH3 (TR-EC)	D
SEN023	NH3/CR-5000, Spare sensor 0-5000ppm NH3 (TR-EC)	D
SEN024	NH3/CR-10000, Spare sensor 0-10000ppm NH3 (TR-EC)	D
CO2 Sensor. Complete with heater and lid		
SEN113	CO2 IR-sensor 0-10000ppm, MPS/TR-IR	D
SEN114	CO2 IR-sensor 0-10000ppm, GSH	D
SEN1114	CO2 IR-sensor 0-30000ppm, GSH	D
SEN115	CO2 IR-sensor 0-10000ppm, GSLS	D

Order Code	Model	PG
ATEX Sensor. 23cm cable. For GEX		
SEX013	NH3 ATEX Sensor 0-4000ppm, 23cm cable	D
SEX019	HFC ATEX Sensor 0-4000ppm, 23cm cable	D
SEX019	HC ATEX Sensor 0-50%LEL, 23cm cable	D
SEX016	NH3 ATEX Sensor 0-10000ppm, 23cm cable	D
ATEX Sensor. 5m cable. For GXR		
SEX003	NH3 ATEX Sensor 0-4000ppm, 5m cable	D
SEX018	HFC ATEX Sensor 0-4000ppm, 5m cable	D
SEX018	Propane ATEX Sensor 0-50%LEL, 5m cable	D
SEX006	NH3 ATEX Sensor 0-10000ppm, 5m cable	D
Sensor for AQUIS		
35-220	NH3 Sensor, Media temp (0..+50°C)	Net
35-221	NH3 sensor, Media temp (-8..+30°C)	Net



SAMON
safe monitoring

SIMPLY RELIABLE