ENGINEERING
TOMORROW

Catalogue | Gas detection solution

Recalibrate the way you look at **gas detection**

Next generation gas detection for industrial refrigeration
The next generation of Danfoss gas detectors are based on a digital platform that delivers multiple communication and integration options for improved operational reliability, easy calibration and maintenance efficiency, cost effectiveness, and regulatory compliance.

Plug & Play!
Pre-calibrated digital gas detectors and sensors

GDIR.danfoss.com

Danfoss gas detection solution

Reliable and efficient gas detection for industrial refrigeration

To meet the relevant safety requirements for refrigeration systems and to protect people, produce and property from the adverse effects of a potential leak of toxic and/or flammable refrigerants, having a gas detection system that you trust, is essential. With the new Gas Detection solution Danfoss offers a series of fixed gas detector units that are not only reliable and accurate – but also much easier and intuitive to work with – from initial specification to long term operation.

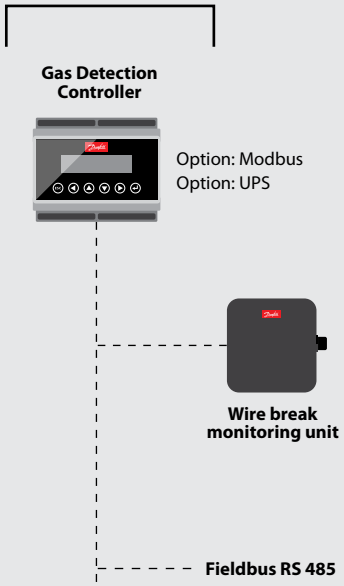
Plug & Play gas detection – simplify and improve the way you work

- All gas detection units come factory pre-configured to match refrigerant and typical PPM settings required*
- Integrated calibration routine – calibration with gas no longer involves the use of potentiometers and multimeters
- Easy replaceable and pre-calibrated sensors for plug & play replacement
- Service due information and service alerts support optimized maintenance planning

* Depending on national regulations PPM settings may be subject to change.

Flexibility building your gas detection system

Controller solution



The Danfoss Gas Detection Solution provides a high degree of flexibility when designing and building your gas detection system.

The portfolio ranges from basic to heavy duty models complemented by a range of accessories. The gas detection units (GDU) can detect a wide range of refrigerant gases including Ammonia (R717), CO2 (R744), fluorinated refrigerants (HCFC and HFCs), and Propane (R290). They come with various sensor technologies to match the specific refrigerant, application, and safety requirements of the refrigeration system including electrochemical (EC), semiconductor (SC), Pellistor (P), and infrared sensors.

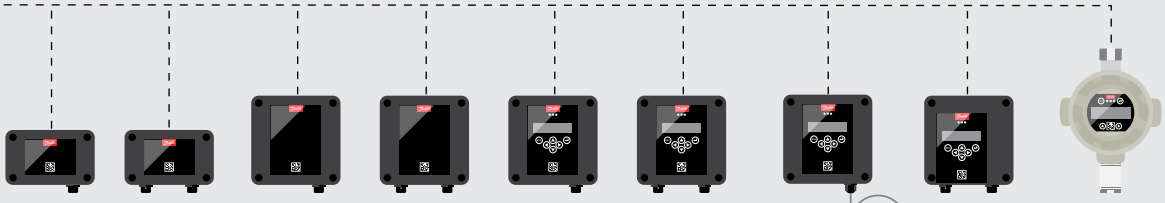
The analog or RS485 Modbus connection enables easy communication to a central system. Stand-alone gas detection units with integrated relays are available and can be connected to external systems directly to activate alarm devices.

To provide a strong plug and play solution, all gas detection units come factory pre-configured to match refrigerant and typical PPM setting requirements. Depending on national regulations PPM settings may be subject to change.

Basic GDU
2 units

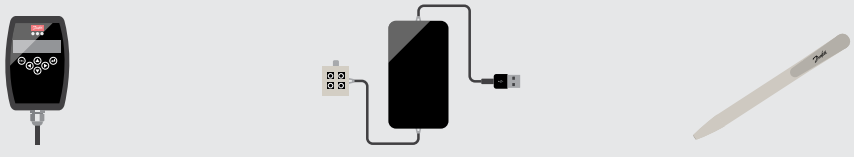
Premium GDU
6 units

Heavy Duty GDU
1 unit



Name	Basic	Basic+	Premium	Premium+	Premium Flex	Premium Duplex	Premium Remote	Premium Uptime	Heavy Duty
Features			3 relays						2 relays
		Buzzer & light		Buzzer & light				Buzzer & light	
					LCD display	LCD display	LCD display	LCD display	LCD display
						2 different sensors	Remote sensor 5 m (16.4 ft.) cable	UPS	Explosion proof (ATEX/IEC)
Protection	IP 65								
Communication	Analog (4-20 mA) and RS 485 Modbus communication								
Power supply	24 V AC/DC		24 V DC					90-240 V AC	24 V DC
Ammonia	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2					✓				
Fluorinated	✓	✓	✓	✓	✓				
Hydrocarbons			✓	✓	✓				

Service tools



Service Tool
(handheld)

PC tool

Magnetic Pen
(for Heavy Duty display communication)

Basic & Basic+

Simple cost-effective solution with the same high-quality sensors, which equip the Premium range.

The Basic and Basic+ gas detection units are used for monitoring and warning of hazardous gas concentrations.

They are intended to be connected to a central system like the Danfoss gas detection controller, or a PLC, by either Analog or RS485 open Modbus communications. The central system converts the alarm signal from the gas detection unit to activation of alarm devices.

The basic units have a factory default set-up with two (2) alarm set-points ready for use. The integrated software enables the user to configure two individual alarm ranges. Alarm 1, a pre-alarm indicating the gas level has passed a predefined threshold 1, and – if the gas level passes predefined threshold 2 – the final alarm 2. Adjustment, calibration, and maintenance are done via the dedicated Service tool or the PC tool

The basic units come with sensors for Ammonia and selected HFC's. Depending on the application, they are available with an electrochemical or a semiconductor sensor.

- **Basic:** Gas detection unit with one sensor
- **Basic+:** In addition to the Basic model, this unit Includes a buzzer & light function for local alarm (visual and audio)

Basic

Basic+

Premium range

Flexibility on an unparalleled scale.

The Premium range of gas detection units are used for monitoring and warning of hazardous gas concentrations. They can be used for detecting most commonly used refrigerants.

They are intended as stand-alone or connected to a central system like the Danfoss gas detection controller or a PLC. As stand-alone, the on-board relays can be used for activation of alarm devices, while the analog or RS485 Modbus connection to a central system allows centralized monitoring and alarm activation. Four out of the six Premium variants have integrated display/keypad for direct access to the user-interface. This means that alarm level adjustments, calibration and parameter adjustments can be made directly on the menu in the display. For models without display (Premium & Premium+) the interface is via the dedicated Service or PC tool.

The Premium gas detection units have a factory default setup with two (2) alarm set-points ready for use. The user-interface enables the user to configure two individual alarm settings. Alarm 1, a pre-alarm indicating the gas level has passed a predefined threshold 1 and – if the gas level passes predefined threshold 2 – the final alarm 2. A total of four (4) alarm set-points on each gas detection unit is possible.

The Premium variants come with sensors for Ammonia, CO2 and selected HFC's. Depending on the application and model, each unit is available with one or two different sensors (Premium Duplex). Sensor technologies include semiconductor, electrochemical, Pellistor or infrared.

Premium

Premium+

Premium Flex

Heavy Duty

ATEX/IECEx applications and harsh conditions

The Heavy Duty gas detection model is used for monitoring and warning of hazardous Ammonia gas concentrations. It is intended for ATEX/IECEx applications and consists of a robust flameproof metal enclosure that can be kept closed after wiring, as configuration is performed by magnetic field to the display via a magnetic pen.

The Heavy Duty is intended as stand-alone or connected to a central system like the Danfoss gas detection controller or a PLC. As stand-alone, the on-board relays can be used for activation of alarm devices, while the Analog or RS485 Modbus connection to a central system allows centralized monitoring and alarm activation.

The gas detection unit come with a factory default setup including two (2) alarm set-points ready for use. The integrated software enables the user to configure two individual alarm ranges. Alarm 1, a pre-alarm indicating the gas level has passed a predefined threshold 1, and – if the gas level passes predefined threshold 2 – the final alarm 2.

The unit comes with sensors for Ammonia. Depending on the application, it's available with an electrochemical, a semiconductor or a Pellistor sensor.

Heavy Duty

Premium Duplex can have two different sensors. A Pellistor in combination with either an electrochemical or a semiconductor sensor can be mounted on the unit to detect Ammonia concentrations at very low and very high levels. This may be relevant in compressor rooms with requirements for low alarm set points (e.g. 25 PPM) and very high alarm set-points (e.g. 30000 PPM).

Premium Remote is applicable for vent line applications for the continuous monitoring of refrigeration system relief valves.

Premium Uptime has an integrated UPS to stay operational during power failure.
Operating time > 60 minutes; wide range input (90-240 V AC – 50/60 Hz), and rechargeable battery.

For overview of all Premium variants, please see table.

Gas detection units are a matter of choice **continuous safety is not**

Danfoss gas detectors provide a comprehensive set of safety features:

- Digital interface provides improved accuracy and simplified operator handling, which help minimize risk of settings, calibration and service errors.
- Automatic self-diagnostics ensure correct communication and operation between units and system.
- To guarantee the proper functioning of the units and to prevent human error, the sensor head can only be replaced by the same type and ppm range.
- Password protected alarm setting allows authorized access only.
- Reduced risk of false alarms due to temperature compensated sensors (EC, P, IR).
- For improved operational safety, degenerated sensors with too little life-time expectancy (<30% sensitivity) are rejected during calibration process.

Applications

Detecting and warning of hazardous gas concentrations in industrial refrigeration systems such as food and beverage processing areas, cold storages, and on-board ships.

Danfoss Gas Detection portfolio

Complete Units overview and part numbers

Danfoss GD Basic range

Type	Refrigerants	Sensor	PPM range	Alarm 1/Alarm 2 PPM Preconfigured set-points	Code numbers Basic	 Basic+
GDA	Ammonia	EC 100	0-100	25/35	**148H6000**	**148H6001**
		EC 300	0-300	25/150	**148H6008**	**148H6009**
		EC 1000	0-1000	500/900	**148H6014**	**148H6015**
		SC 1000	0-1000	500/900	**148H6023**	**148H6024**
GDHF	HFC R404A, R507	SC 2000	0-2000	500/900	**148H6045**	**148H6046**
						Buzzer & light

EC: Electorchemical, SC: Semiconductor
Temperature range: -30 to 50 °C (-22 to 122 °F), sensor dependent

Danfoss GD Premium range

Type	Refrigerants	Sensor	PPM range	Alarm 1/Alarm 2 PPM Preconfigured set-points	2nd Sensor* PPM range (Alarm PPM)	Code numbers Premium	 Premium+	 Premium Flex	 Premium Duplex	 Premium Remote	 Premium Uptime
GDA	Ammonia	EC 100	0-100	25/35	P LEL 0-140000 (30000)	**148H6002**	**148H6003**	**148H6006**	**148H6004**	**148H6005**	**148H6007**
		EC 300	0-300	25/150	P LEL 0-140000 (30000)	**148H6010**	**148H6011**	**148H6013**	**148H6012**		
		EC 1000	0-1000	500/900	P LEL 0-140000 (30000)	**148H6016**	**148H6017**	**148H6020**	**148H6018**	**148H6019**	**148H6021**
		EC 5000	0-5000	1000/4500			**148H6028**			**148H6029**	**148H6030** w. remote sensor
		SC 1000	0-1000	500/900	P LEL 0-140000 (30000)	**148H6025**	**148H6026**	**148H6027**	**148H6037**		
		SC 10000	0-10000	5000/9000		**148H6032**	**148H6033**			**148H6034**	
		P LEL	0-100% LEL (0-140000 PPM)	21% LEL (30000 PPM)			**148H6036**	**148H6038**			
GDC	CO2	IR 20000	0-20000	5000/9000				**148H6040**			
		IR 50000	0-50000	10000/18000				**148H6041**			
GDHC	HCFC R123a	SC 2000	0-2000	500/900		**148H6042**	**148H6043**	**148H6044**			
GDHF	HFC R404A, R507	SC 2000	0-2000	500/900		**148H6047**	**148H6048**	**148H6049**			
	HFC R134A					**148H6050**	**148H6051**	**148H6052**			
GDH	R290	P 5000	0-5000	800/2500		**148H6053**	**148H6054**	**148H6055**			
							Buzzer & light	Display	Display	Display	Display
									Second sensor	Remote sensor 5 m (16.4 ft.) cable	UPS
											Buzzer & light

EC: Electorchemical, SC: Semiconductor, P: Pellistor, IR: Infrared, LEL: Lower Explosive Limit
Temperature range: -30 to +50 °C (-22 to 122 °F), sensor dependent

Danfoss GD Heavy Duty range

Type	Refrigerants	Sensor	PPM range	Alarm 1/Alarm 2 PPM Preconfigured set-points	Code numbers Heavy Duty
GDA	Ammonia	EC 1000	0-1000	500/900	**148H6022**
		EC 5000	0-5000	1000/4500	**148H6031**
		SC 10000	0-10000	5000/9000	**148H6035**
		P LEL	0-100% LEL (0-14000 PPM)	21% (30000 PPM)	**148H6039**
					Display
					Explosion proof (ATEX/IEC)

EC: Electorchemical, SC: Semiconductor, P: Pellistor, LEL: Lower Explosive Limit
Temperature range: -25 to +60 °C (-13 to +140 °F), sensor dependent

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Accessories overview

Controller and System

Controller unit:
Used for a centralized monitoring and warning. The input signals for the controller are collected via RS485 Modbus or analog communication. The controller can handle up to 96 digital sensors via Fieldbus and four (4) analog input. An additional 28 analog input is possible using seven (7) expansion modules (4-20 mA signal interface). The total number of connected sensors should not exceed 128 sensors. The controller unit can be employed as pure analog controller, as analog/digital, or as digital controller. Configuration is menu-driven via the keypad. For fast and easy configuration, the PC Tool is recommended.

Controller solution:
Controller unit placed in an enclosure ready to be connected to a power source. A separate UPS for the controller is available.

Wire break warning module:
The warning module is used for monitoring the circuiting to the warning/alarm devices on a centrally controlled gas detection system. Wire breaks or wire interruptions in the alarm device loop will be reported to the central control.

Controller expansion module:
The gas detection Controller Expansion module is used for expansion of the cable coverage in terms of number of loops and the total wire length. Each Controller Unit can handle up to 7 Expansion modules allowing additional 7 segments with a total of 7200 meters (23622 ft.) wiring and a total of 32 relays for alarm device circuits.

Service and Calibration

Service tool:
For interface with units with no display (Basic, Basic+, Premium, Premium+). Acts as a portable display and can be connected to all Danfoss gas detection units. (Heavy Duty w. adapter)

PC tool:
The PC tool is a menu-driven and standalone software used for easy addressing, parameter setting, calibration, and data logging of the Basic, Premium and Heavy Duty gas detection units, and the controller unit.

Calibration adapter
The calibration adapter is required for connecting the calibration gas container, via the flow regulator, to the sensor head on the gas detection units. (Two variants, one for Basic and Premium variants; one for Heavy Duty)

Magnetic pen:
The pen is used to operate the Heavy Duty unit display. The Heavy Duty enclosure does not permit direct touch

Other

Buzzer and light alarm:
Can be installed in Basic or Premium units providing a local alarm.

Air Duct Set:
The air duct set is specially designed to capture the airflow in air ducts. It can be connected to the standard sensor heads, except from Heavy Duty gas detection units.

Seal cap:
Airtight seal cap to protect the sensor head against premature exposure during installation. The seal cap is mounted on new sensors (complete units and replacement sensors) but is also available as an accessory.

Remote kit:
Enabling installation of a sensor head in plastic housing 5m (16.4 ft.) from the unit. This means that the gas detection unit can be placed outside the room where the sensor is placed to detect hazardous gases, allowing reading of and interfacing with the unit without entering the dedicated space. Basic and Premium gas detection units.

Splash guard:
To protect the sensor head against water exposure during wash-down cleaning and rinsing operations.

To learn more about next generation gas detection, visit
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