GD, Gas detector for Industrial Refrigeration

The 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.

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.

For further information; please visit
GDIR.danfoss.com

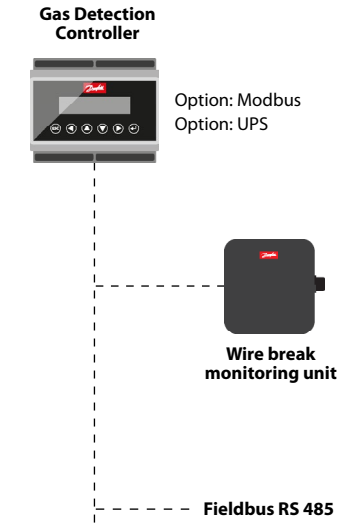
Facts

- 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.
- 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 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.

Technical data

The 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), CO_2 (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 (IR) sensors.

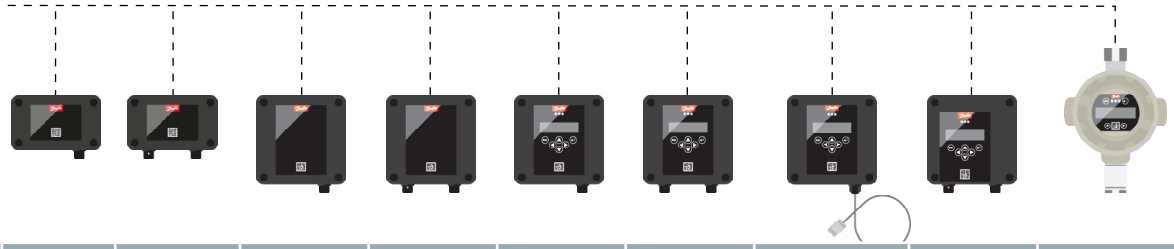
The analog or RS485 Modbus connection enables easy communication to a central system. Stand-alone gas detection units with integrated relays are available and can be connected to external systems directly to activate alarm devices.

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

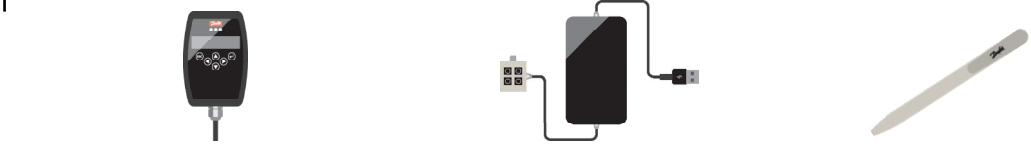
Premium GDU
6 units

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	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO_2					✓				
Fluorinated	✓	✓	✓	✓	✓				
Hydrocarbons			✓	✓	✓				

Service tools



Service Tool
(handheld)

PC tool

Magnetic Pen
(for Heavy Duty display communication)

Technical data

Basic and Basic+

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+

Gas types and thresholds - Basic and Basic+

Sensor	Sensor Type	ppm range	Alarm 1	Alarm 2	Hysteresis
Ammonia EC 100	Electrochemical	0-100	25 ppm	35 ppm	2 ppm
Ammonia EC 300	Electrochemical	0-300	25 ppm	150 ppm	2 ppm
Ammonia EC 1000	Electrochemical	0-1000	500 ppm	900 ppm	25 ppm
Ammonia SC 1000	Semiconductor	0-1000	500 ppm	900 ppm	25 ppm
HFC R404A, R507 SC2000	Semiconductor	0-2000	500 ppm	900 ppm	25 ppm

Hysteresis = 5% of Alarm1 (rounded up to the next higher integer)

Technical data

Basic and Basic+

Electrical	
Power supply	19 – 29 V AC / DC, DC reverse-polarity protected
Power consumption (24 V DC)	Max. 250 mA (6 VA)

Outgoing line local bus	
Power supply	5 V DC, 250 mA max., overload, short-circuit and reverse-polarity protected

Serial interface	
Local bus	1-wire / 19200 baud
Fieldbus	RS 485 / 19200 baud
Tool bus	2-wire / 19200 baud

General	
Temperature range	-30 – 50 °C / -22 – 122 °F
Humidity range	15 – 90% RH not-condensing
Storage temperature	5 – 30 °C / 41 – 86 °F
Storage time	12 months

Physical	
Housing	Type A
Material	Polycarbonate
Burning behaviour	UL 94 V2
Housing colour	Black
Dimensions (W x H x D in mm)	94 x 130 x 57
Weight (kg)	Approx. 0.3kg / 0.8 lbs.
Protection class	IP 65
Installation	Wall mounting
Cable entry	2 x M12 / 3 x M20
Wire connection: Power supply, fieldbus Analog output Local bus for sensor	 Screw-type terminals 0.25 – 2.5 mm^2 (25 AWG to 14 AWG) Screw-type terminals 0.25 – 1.3 mm^2 (25 AWG to 17 AWG) 3-pin plug connector
Cable lengths local bus for remote sensor board	Max. 5 m / 16.4 ft.

Directives
EMC directives 2014/30/EU
CE
Conformity to EN 50271, EN 61010-1 ETL listed to UL 61010-1 and CSA C22.2 No.61010-1 Enables regulatory compliance with EN 378:2016, ISO 5149:2014, IIAR 2-2017, and ASHRAE 15:2016

Analog output signal
Proportional, overload and short-circuit proof, load ≤ 500 Ohm 4 - 20 mA = measuring range 3.0 < 4 mA = underrange > 20 - 21.2 mA = overrange 2.0 mA = fault

Status LED / Buzzer & light (only Basic+)	
Colour	3 color light: Green, yellow, red
Acoustic pressure	> 85 dB (A) (0.1 m distance)
Frequency	2300 Hz
Protection class	IP 65

Technical data and ordering

Ordering Basic and Basic+

Basic = Standard
Basic+ = Standard + Buzzer & light warning device

Type	Model	Refrigerant	Sensor	ppm range	Alarm ppm	Temp. Range		Code number
						[°C]	[°F]	
GDA	Basic	Ammonia	Electrochemical	0 – 100	25 / 35	-30 – 50	-22 – 122	148H6000
GDA	Basic+*	Ammonia	Electrochemical	0 – 100	25 / 35	-30 – 50	-22 – 122	148H6001
GDA	Basic	Ammonia	Electrochemical	0 – 300	25 / 150	-30 – 50	-22 – 122	148H6008
GDA	Basic+*	Ammonia	Electrochemical	0 – 300	25 / 150	-30 – 50	-22 – 122	148H6009
GDA	Basic	Ammonia	Electrochemical	0 – 1000	500 / 900	-30 – 50	-22 – 122	148H6014
GDA	Basic+*	Ammonia	Electrochemical	0 – 1000	500 / 900	-30 – 50	-22 – 122	148H6015
GDA	Basic	Ammonia	Semiconductor	0 – 1000	500 / 900	-10 – 50	14 – 122	148H6023
GDA	Basic+*	Ammonia	Semiconductor	0 – 1000	500 / 900	-10 – 50	14 – 122	148H6024
GDHF	Basic	R404a, R507a, R32, R125, R407c, R434a, R488a, R125	Semiconductor	0 – 2000	500 / 900	-10 – 50	14 – 122	148H6045
GDHF	Basic+*	R404a, R507a, R32, R125, R407c, R434a, R488a, R125	Semiconductor	0 – 2000	500 / 900	-10 – 50	14 – 122	148H6046

** incl buzzer & Light*

Ordering spare parts and accessories for Basic and Basic+

Description	Code number
Replacement sensor - Ammonia EC 100	148H6200
Replacement sensor - Ammonia EC 300	148H6201
Replacement sensor - Ammonia EC 1000	148H6202
Replacement sensor - Ammonia SC 1000	148H6203
Replacement sensor - HFC R404A, R507 SC 2000	148H6210
Controller unit	148H6231
Controller solution (controller + enclosure)	148H6221
Warning module (wire break monitoring module)	148H6223
Controller expansion module	148H6222
Service tool	148H6224
PC tool	148H6235
Calibration adapter	148H6232
Buzzer & light - acoustic buzzer and optic led	148H6225
Air duct set	148H6236
Gateway for controller	148H6228
Seal cap	148H6227
Splash guard	148H6226

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.

Warning module (wire break monitoring 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 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 plastic head sensors; one for heavy duty and Premium remote metal head sensors.).

Buzzer & light - acoustic buzzer and optic led:
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.

Gateway for controller
The gateway is an addition to the controller and used for communicating via Modbus TCP/IP.

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.

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

Technical data

Premium range

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, CO_2 and selected HC's and 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 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.

Premium

Premium+

Premium Flex

Premium Remote

Premium Duplex

Premium Uptime

Gas types and thresholds - Premium range

Sensor	Sensor Type	ppm range	Alarm1	Alarm2	Hysteresis
Ammonia EC 100	Electrochemical	0 – 100	25 ppm	35 ppm	2 ppm
Ammonia EC 300	Electrochemical	0 – 300	25 ppm	150 ppm	2 ppm
Ammonia EC 1000	Electrochemical	0 – 1000	500 ppm	900 ppm	25 ppm
Ammonia EC 5000	Electrochemical	0 – 5000	1000 ppm	4500 ppm	50 ppm
Ammonia SC 1000	Semiconductor	0 – 1000	500 ppm	900 ppm	25 ppm
Ammonia SC 10000	Semiconductor	0 – 10000	5000 ppm	9000 ppm	250 ppm
Ammonia P LEL	Pellistor	0 – 140000	21% LEL (30000 ppm)	21% LEL (30000 ppm)	1%
CO_2 IR 20000 (2% Vol)	Infrared	0 – 20000	5000 ppm	9000 ppm	250 ppm
CO_2 IR 50000 (5% Vol)	Infrared	0 – 50000	10000 ppm	18000 ppm	500 ppm
HCFC R123 SC 2000	Semiconductor	0 – 2000	500 ppm	900 ppm	25 ppm
HFC R404A, R507 SC 2000	Semiconductor	0 – 2000	500 ppm	900 ppm	25 ppm
HFC R134A SC 2000	Semiconductor	0 – 2000	500 ppm	900 ppm	25 ppm
HC R290/Propane P 5000	Pellistor	0 – 5000	800 ppm	2500 ppm	40 ppm

Hysteresis = 5% of Alarm1 (rounded up to the next higher integer)
Alarm thresholds can have the same value, therefore the relays and/or the buzzer and LED can be triggered together.

Technical data

Premium range

Electrical		
Power supply	24 V DC ± 20 %, reverse-polarity protected	
Power consumption (24 V DC)	Max. 210 mA (5.1 VA)	
Alarm relays (3)	250 V AC, 5 A, potential-free, contacts (SPDT)	
Transistor output (2) (connector X13)	24 V DC / 0.1 A (switching to plus) (only at 24 V DC power supply)	
Analog output signal (1)	Proportional, overload and short-circuit proof, load ≤ 500 Ohm 4 – 20 mA = measuring range 3.0 < 4 mA = underrange > 20 – 21.2 mA = overrange 2.0 mA = fault	
Output for local bus	5 V DC, 250 mA max. Overload, short-circuit and reverse-polarity protected	

Ambient conditions		
Temperature range	Sensor dependant. See ordering section.	
Humidity range	15 – 95 % RH not-condensing	
Storage temperature	5 – 30 °C (41 – 86 °F	
Storage time	12 months	

Serial interface		
Local bus	1-wire / 19200 Baud	
Fieldbus	RS 485 / 19200 Baud	
Tool bus	2-wire / 19200 Baud	

Physical		
Housing	Type C	Type E (Premium Uptime)
Material	Polycarbonate	
Combustion	UL 94 V2	
Housing colour	Black	
Dimensions (W x H x D in mm)	130 x 130 x 75	130 x 130 x 99
Weight (kg)	Approx. 0.6 kg	Approx. 0.7 kg
Protection class	IP 65	
Installation	Wall mounting	
Cable entry	Standard 6 x M20/25	
Wire connection: Local bus (SC2) Digital input, analog output Power supply, relays	 3-pin connector Screw-type terminal min. 0.25 mm^2, max. 1.3 mm^2 (min. 25 AWG, max. 17 AWG) Screw-type terminal min. 0.25 mm^2, max. 2.5 mm^2 (min. 25 AWG, max. 14 AWG)	
Cable lengths local bus for Remote Sensor Board	Max. 5 m / 16.4 ft.	

Directives
EMC directives 2014/30/EU
Low voltage directive 2014/35/EU
CE
Conformity to EN 50271, EN 61010-1 ETL listed to UL 61010-1 and CSA C22.2 No.61010-1 Enables regulatory compliance with EN 378:2016, ISO 5149:2014, IIAR 2-2017, and ASHRAE 15:2016

Display (not Premium and Premium+)	
Temperature range	-20 – 50 °C / -4 – 122 °F
LCD	Two lines, 16 characters each, background highlighted in two colours
Operation	Menu driven via six push-buttons
Power consumption	5 V, 60 mA, 0.3 VA

Status LED	
Colour / Mode	Red / yellow / green (alarm – fault – operation - service)
Protection class	IP 65

Warning buzzer	
Acoustic pressure	> 85 dB (A) (0.1 m distance)
Frequency	2300 Hz
Protection class	IP 65

UPS (only Premium Uptime)	
Power unit with wide range input	90 – 240 V AC - 50/60 Hz
Output rating	15 VA
Rechargeable battery	12 V, 0.8 Ah
Operating time	> 60 min

Technical data and ordering

Ordering Premium range

Premium = Standard
Premium+ = Standard + Buzzer & light warning device
Premium Duplex = Standard + 2nd sensor + Display and keyboard
Premium Remote = Remote sensor (stainless steel) with 5m cable (2nd cable gland needed) not mounted but enclosed + Display and keyboard
Premium Flex = Standard + Display and keyboard
Premium Uptime = Standard + Buzzer & light warning device + Display and keyboard + UPS

Type	Model	Refrigerant	Sensor	ppm range	Alarm ppm	2nd Sensor ppm (Alarm ppm)	Remote sensor ppm (Alarm ppm)	Buzzer & Light	Display	UPS	Temp. Range [°C]	Temp. Range [°F]	Code number
GDA	Premium	Ammonia	Electrochemical	0 – 100	25 / 35						-30 – 50	-22 – 122	148H6002
GDA	Premium+	Ammonia	Electrochemical	0 – 100	25 / 35			x			-30 – 50	-22 – 122	148H6003
GDA	Premium Duplex	Ammonia	Electrochemical Pellistor	0 – 100	25 / 35	0 – 140000 (30000)			x		-20 – 50	-4 – 122	148H6004
GDA	Premium Remote	Ammonia	Electrochemical				0 – 100 (25 / 35)		x		-20 – 50	-4 – 122	148H6005
GDA	Premium Flex	Ammonia	Electrochemical	0 – 100	25 / 35				x		-20 – 50	-4 – 122	148H6006
GDA	Premium Uptime	Ammonia	Electrochemical	0 – 100	25 / 35			x	x	x	0 – 40	32 – 104	148H6007
GDA	Premium	Ammonia	Electrochemical	0 – 300	25 / 150						-30 – 50	-22 – 122	148H6010
GDA	Premium+	Ammonia	Electrochemical	0 – 300	25 / 150			x			-30 – 50	-22 – 122	148H6011
GDA	Premium Duplex	Ammonia	Electrochemical Pellistor	0 – 300	25 / 150	0 – 140000 (30000)			x		-20 – 50	-4 – 122	148H6012
GDA	Premium Flex	Ammonia	Electrochemical	0 – 300	25 / 150				x		-20 – 50	-4 – 122	148H6013
GDA	Premium	Ammonia	Electrochemical	0 – 1000	500 / 900						-30 – 50	-22 – 122	148H6016
GDA	Premium+	Ammonia	Electrochemical	0 – 1000	500 / 900			x			-30 – 50	-22 – 122	148H6017
GDA	Premium Duplex	Ammonia	Electrochemical Pellistor	0 – 1000	500 / 900	0 – 140000 (30000)			x		-20 – 50	-4 – 122	148H6018
GDA	Premium Remote	Ammonia	Electrochemical				0 – 1000 (500 / 900)		x		-20 – 50	-4 – 122	148H6019
GDA	Premium Flex	Ammonia	Electrochemical	0 – 1000	500 / 900				x		-20 – 50	-4 – 122	148H6020
GDA	Premium Uptime	Ammonia	Electrochemical	0 – 1000	500 / 900			x	x	x	0 – 40	32 – 104	148H6021
GDA	Premium	Ammonia	Semiconductor	0 – 1000	500 / 900						-10 – 50	14 – 122	148H6025
GDA	Premium+	Ammonia	Semiconductor	0 – 1000	500 / 900			x			-10 – 50	14 – 122	148H6026
GDA	Premium Flex	Ammonia	Semiconductor	0 – 1000	500 / 900				x		-10 – 50	14 – 122	148H6027
GDA	Premium+	Ammonia	Electrochemical	0 – 5000	1000 / 4500			x			-30 – 50	-22 – 122	148H6028
GDA	Premium Remote	Ammonia	Electrochemical				0 – 5000 (1000 / 4500)		x		-20 – 50	-4 – 122	148H6029
GDA	Premium Uptime	Ammonia	Electrochemical	0 – 5000	1000 / 4500			x	x	x	0 – 40	32 – 104	148H6030
GDA	Premium	Ammonia	Semiconductor	0 – 10000	5000 / 9000						-10 – 50	14 – 122	148H6032
GDA	Premium+	Ammonia	Semiconductor	0 – 10000	5000 / 9000			x			-10 – 50	14 – 122	148H6033
GDA	Premium Remote	Ammonia	Semiconductor				0 – 10000 (5000 / 9000)		x		-10 – 50	14 – 122	148H6034
GDA	Premium+	Ammonia	Pellistor	0 – 140000	30000			x			-25 – 50	-13 – 122	148H6036
GDA	Premium Duplex	Ammonia	Semiconductor Pellistor	0 – 1000	500 / 900	0 – 140000 (30000)			x		-10 – 50	14 – 122	148H6037
GDA	Premium Flex	Ammonia	Pellistor	0 – 140000	30000				x		-20 – 50	-4 – 122	148H6038
GDC	Premium Flex	CO_2	Infrared	0 – 20000	5000 / 9000				x		-20 – 50	-4 – 122	148H6040
GDC	Premium Flex	CO_2	Infrared	0 – 50000	10000 / 18000				x		-20 – 50	-4 – 122	148H6041
GDHC	Premium	R123	Semiconductor	0 – 2000	500 / 900						-10 – 50	14 – 122	148H6042
GDHC	Premium+	R123	Semiconductor	0 – 2000	500 / 900			x	x		-10 – 50	14 – 122	148H6043
GDHC	Premium Flex	R123	Semiconductor	0 – 2000	500 / 900				x		-10 – 50	14 – 122	148H6044
GDHF	Premium	R404a, R507a, R32, R125, R407c, R434a, R488a, R125	Semiconductor	0 – 2000	500 / 900						-10 – 50	14 – 122	148H6047
GDHF	Premium+	R404a, R507a, R32, R125, R407c, R434a, R488a, R125	Semiconductor	0 – 2000	500 / 900			x			-10 – 50	14 – 122	148H6048
GDHF	Premium Flex	R404a, R507a, R32, R125, R407c, R434a, R488a, R125	Semiconductor	0 – 2000	500 / 900				x		-10 – 50	14 – 122	148H6049
GDHF	Premium	R134a, R407a, R416a, R417a, R422a, R422d, R427a, R437a, R438a, R449a, R407f, R450a	Semiconductor	0 – 2000	500 / 900						-10 – 50	14 – 122	148H6050
GDHF	Premium+	R134a, R407a, R416a, R417a, R422a, R422d, R427a, R437a, R438a, R449a, R407f, R450a	Semiconductor	0 – 2000	500 / 900			x			-10 – 50	14 – 122	148H6051
GDHF	Premium Flex	R134a, R407a, R416a, R417a, R422a, R422d, R427a, R437a, R438a, R449a, R407f, R450a	Semiconductor	0 – 2000	500 / 900				x		-10 – 50	14 – 122	148H6052
GDH	Premium	R290 / Propane	Pellistor	0 – 5000	800 / 2500						-30 – 50	-22 – 122	148H6053
GDH	Premium+	R290 / Propane	Pellistor	0 – 5000	800 / 2500			x			-30 – 50	-22 – 122	148H6054
GDH	Premium Flex	R290 / Propane	Pellistor	0 – 5000	800 / 2500				x		-20 – 50	-4 – 122	148H6055

Technical data and ordering

Ordering spare parts and accessories for Premium range

Description	Code number
Replacement sensor - Ammonia EC 100	148H6200
Replacement sensor - Ammonia EC 300	148H6201
Replacement sensor - Ammonia EC 1000	148H6202
Replacement sensor - Ammonia SC 1000	148H6203
Replacement sensor - Ammonia EC 5000	148H6204
Replacement sensor - Ammonia SC 10000	148H6205
Replacement sensor - Ammonia P LEL	148H6206
Replacement sensor - CO_2 IR 20000	148H6207
Replacement sensor - CO_2 IR 50000	148H6208
Replacement sensor - HCFC R123 SC 2000	148H6209
Replacement sensor - HFC R404A, R507 SC 2000	148H6210
Replacement sensor - HFC R134a SC 2000	148H6211
Replacement sensor - HC R290/Propane P 5000	148H6212
Remote sensor - Ammonia EC 100	148H6213
Remote sensor - Ammonia EC 1000	148H6214
Remote sensor - Ammonia EC 5000	148H6215
Remote sensor - Ammonia SC 10000	148H6216

Description	Code number
Controller unit	148H6231
Controller solution (controller + enclosure)	148H6221
Controller solution Uptime	148H6237
Warning module (wire break monitoring module)	148H6223
Controller expansion module	148H6222
Service tool	148H6224
PC Tool	148H6235
Calibration adapter	148H6232
Calibration adapter for Remote sensors	148H6233
Buzzer & light - acoustic buzzer and optic led	148H6225
Air duct set	148H6236
Gateway for controller	148H6228
Seal cap	148H6227
Remote kit	148H6238
Splash guard	148H6226
NPT adapter	148H6234

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.

Warning module (wire break monitoring 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 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 plastic head sensors; one for heavy duty and Premium remote metal head sensors.).

Buzzer & light - acoustic buzzer and optic led:
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.

Gateway for controller
The gateway is an addition to the controller and used for communicating via Modbus TCP/IP.

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.

NPT adapter:
The NPT adapter is a steel fitting for installation of remote sensors into NPT threads; it converts the standards M30 X 1.5 thread of the Stainless Steel remote sensor head into an External NPT ¾" thread for more convenient installation.

Technical data

Heavy Duty

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

Gas types and thresholds - Heavy Duty

Sensor	Sensor Type	ppm range	Alarm 1	Alarm 2	Hysteresis
Ammonia EC 1000	Electrochemical	0-1000	500 ppm	900 ppm	25 ppm
Ammonia EC 5000	Electrochemical	0-5000	1000 ppm	4500 ppm	50 ppm
Ammonia SC 10000	Semiconductor	0-10000	5000 ppm	9000 ppm	250 ppm
Ammonia P LEL	Pellistor	0-140000 (0-100% LEL)	21% LEL (30000 ppm)	21% LEL (30000 ppm)	1% LEL

Hysteresis = 5% of Alarm1 (rounded up to the next higher integer)
Alarm thresholds can have the same value, therefore the relays and LED can be triggered together.

Technical data

Heavy Duty

Electrical	
Power supply	16 – 28 V DC
Power consumption (24 V DC)	90 mA, max. 130 mA
Control unit	Microprocessor with 12 bit converter resolution
Digital filter	Averaging in order to increase the EMC immunity
Visual indications	2 LEDs for operation, alarm and communication
Analog output signal (active)	Proportional, overload and short-circuit proof, load ≤ 500 Ω 4 – 20 mA = measuring range 3.0 < 4 mA = underrange > 20 – 21.2 mA = overrange 2 mA = fault > 21.8 mA = fault High
Serial interface	Serial data bus
Fault relay	Max. 30 V AC/DC, 1 A
Alarm relay	Max. 30 V AC/DC, 1 A
LCD	2 x 16 characters, 3 status LEDs, 4 menu operating elements

Sensor data			
Gas type	**Flammable gases**	**Toxic gases**	**HCFC, HFC, HFO**
Sensor element	Pellistor	Electro Chemical	Semiconductor
Measuring range	0 – 100 % LEL	0 – 1000 ppm / 0 – 5000 ppm	0 – 10000 ppm
Response time	t_{90} < 20 sec. NH_3	t_{90} < 40 sec. for NH_3	t_{90} > 120 sec. for NH_3

Sensor head housing	
Material	CrNi Stahl: 1.4404
Dimensions (d x H)	30 x 56 mm (1.18 x 2.20 in.)
Protection class	Gas inlet IP64, with option splash-proof IP65
Thread	External thread NPT ¾" ANSI/ B1.20.1

Environmental conditions	
Humidity	15 to 90% r.H.
Operating temperature	P: -25 °C to +60 °C / EC: -25 °C to +50 °C / SC: -10 °C to +50 °C

Physical characteristics	
Case / colour	Aluminium pressure die-casting / light grey RAL 7032, epoxy coating
Dimensions (d x H)	95 x 82 mm
Weight	Ca. 1.3 kg
Protection class	Housing protection IP66 to IP68 (depending on the cable glands used)
Mounting	Wall mounting (sensor head downwards)
Cable entry	1 x ¾ in. (Ansi B1.20.1)
Wire connection	Spring-type terminal, 0.08 to 2.5 mm^2 AWG 28 - 12
Wire length	Max. load 500 Ω (= wire resistance + controller input resistance)

ATEX marking
Ⓔx II2G Ex d IIC T4 Gb, CE 0158

Options: LCD display	
LCD	Two lines, 16 characters each, background highlighted in two colours
Operation	Menu driven via four magnetic buttons
Power consumption	5 V, 60 mA, 0.3 VA

Status LED	
Colour / Mode	Red / yellow / green (alarm – fault – operation - service)
Protection class	IP 65

Technical data and ordering

Heavy Duty

Type	Model	Refrigerant	Sensor	ppm range	Alarm ppm	Temp. Range		Code number
						[°C]	[°F]	
GDA	Heavy Duty	Ammonia	Electrochemical	0 – 1000	500 / 900	-25 – 50	-13 – 122	148H6022
GDA	Heavy Duty	Ammonia	Electrochemical	0 – 5000	1000 / 4500	-25 – 50	-13 – 122	148H6031
GDA	Heavy Duty	Ammonia	Semiconductor	0 – 10000	5000 / 9000	-10 – 50	14 – 122	148H6035
GDA	Heavy Duty	Ammonia	Pellistor	0 – 140000	30000	-25 – 60	-13 – 140	148H6039

Ordering spare parts and accessories for Heavy Duty

Description	Code number
Replacement sensor - Heavy Duty Ammonia EC 1000	148H6217
Replacement sensor - Heavy Duty Ammonia EC 5000	148H6218
Replacement sensor - Heavy Duty Ammonia SC 10000	148H6219
Replacement sensor - Heavy Duty Ammonia P LEL	148H6220
Controller unit	148H6231
Controller solution (controller + enclosure)	148H6221
Warning module (wire break monitoring module)	148H6223
Controller expansion module	148H6222
Service tool	148H6224
PC Tool	148H6235
Calibration adapter Heavy duty	148H6233
Magnetic pen	148H6229
Gateway for controller	148H6228

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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 plastic head sensors; one for heavy duty and Premium remote metal head sensors.).

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

Gateway for controller
The gateway is an addition to the controller and used for communicating via Modbus TCP/IP.