ENGINEERING TOMORROW

Data sheet

Gas detecting sensor
Types GDA, GDC, GDHC, GDHF, GDH

Danfoss gas detecting sensor program, type GD is a range of products designed to meet all industrial refrigeration and air conditioning applications.

GD detects a wide range of commonly used refrigerants including Ammonia, Carbon Dioxide, Halocarbons and Hydrocarbons.

GD sensors incorporate an interchangeable precalibrated sensor board, which makes it very easy to replace the sensor when service or calibration is required.

The GD products feature reliable, real time continuous monitoring. No blocked filters, tubes or technical / maintenance problems experienced by air sampling/aspirated systems.

Features

- GD is specifically developed for refrigeration applications.
- Interchangeable precalibrated sensor board means reduced costs of recalibration and maintenance.
- Optional models: LCD display, IP 65 models, Exd (Explosion Protected), Exd Low temperature, Models with remote sensor, Models with remote Exd sensor, Models with remote display, Models for Low temperature down to –40°C (–40°F).
- Can operate as stand alone product.
- Linear analog outputs, current (mA) / volt (V) proportional to the gas concentration.
- Two digital outputs. Low Level and High Level Alarm.
- Optional NO or NC and different delay setting for both Low and High Alarm Level.
- Manual or Auto reset optional.
- Low and High Alarm levels and delays setting, can be changed by the user.
- GD can be connected directly to a Danfoss m2, Micromon or AK-SM 350 monitoring unit.
- Available with a range of different sensor technologies to monitor industrial refrigeration gases:
  - Electro-Chemical (EC)
  - Semi-Conductor (SC)
  - Catalytic (CT)
  - Infra-Red (IR)
- Calibration Certificates available.

Contents **Page**

Features ... 1
Technical data ... 3
Electrical connection ... 4
Design ... 5
Sensor technology ... 6
- Calibration / test methods ... 6
- Electrochemical Sensors - EC ... 6
- Semi-conductor – SC ... 6
- Catalytic - CT ... 6
- Infrared - IR ... 6

Calibration test methods ... 6
- Bump test ... 7

Product range ... 7
Functions - all models ... 8
Normalization Period ... 8
Mother PCB ... 9
GD connected to Danfoss monitoring ... 10
Reference material ... 11
Ordering ... 12
- GD sensor PCB ... 13
- Accessories ... 14

Dimensions ... 15

Technical data

Refrigerants - [ppm] range:

Ammonia (R 717)
Type GDA:
– 0-100 ppm
– 0-300 ppm
– 0-1,000 ppm
– 0-10,000 ppm
– 0-30,000 ppm

Carbon Dioxide (R 744)
Type GDC
0-10,000 ppm
0-20000 ppm
0-40000 ppm

Halo-Carbon - HCFC (R 22, R 123)
Type GDHC
– 0-1,000 ppm

HFC (R 404A, R 507)
Type GDHF
– 0-1,000 ppm

HFC (R134A)
Type GDHF-R3
– 0-1,000 ppm

Hydro-carbon (R 290, R 600, R 600A, R 1270)
Type GDH
– 0-5,000 ppm

Reference temperature conditions for factory calibration:
Ambient temperature
For increased accuracy the unit must be calibrated at the temperature of operation.

Response times may vary based on temperature of operation, enclosure, and environmental conditions

Alarm thresholds should be set accordingly based on the environment of operation and the application in which they are being used

Technical data
(Continued)

Models / Sensor	Standard Basic	Standard Basic with LCD display	IP 65 with stainless steel sensor head	IP 65 enclosure		Exd model	Exd model Low Temperature	IP 66 enclosure 5 m remote IP 65 sensor	IP 66 enclosure 5 m remote IP 65 Exd sensor	Remote LCD display IP 41 5 m cable [3]
Temperature range										
EC [1]	–20°C/+40°C (–4°F/104°F)	0°C/+40°C (32°F/104°F)	–20°C/+40°C (–4°F/104°F)	–20°C/+40°C (–4°F/104°F)	–40°C/+40°C (–40°F/104°F)	–20°C/+40°C (–4°F/104°F)	–40°C/+40°C (–40°F/104°F)	–20°C/+40°C (–4°F/104°F)	–20°C/+40°C (–4°F/104°F)	0°C/+40°C (32°F/104°F)
SC, CT	–20°C/+50°C (–4°F/122°F)	0°C/+50°C (32°F/122°F)	–20°C/+50°C (–4°F/122°F)	–40°C/+50°C (–40°F/122°F)		–20°C/+50°C (–4°F/122°F)	–40°C/+50°C (–40°F/122°F)	–20°C/+50°C (–4°F/122°F)	–20°C/+50°C (–4°F/122°F)	0°C/+50°C (32°F/122°F)
IR	0°C/+50°C (32°F/122°F)	0°C/+50°C (32°F/122°F)	–20°C/+50°C (–4°F/122°F)	–40°C/+50°C (–40°F/122°F)		–20°C/+50°C (–4°F/122°F)	not available	not available	not available	0°C/+50°C (32°F/122°F)
Weight (excluding packing)										
EC	912 g (2.01 lb)	947 g (2.09 lb)	903 g (1.99 lb)	562 g (1.24 lb)		4408 g (9.72 lb)	4408 g (9.72 lb)	1199 g (2.64 lb)	1199 g (2.64 lb)	421 g (0.93 lb)
SC, CT										
IR						3600 g (7.94 lb)	not available	not available	not available	
Electrical data										
EC SC, CT	12-24 V d.c., 0.23A 12-24 V a.c. 4 W					12-24 V d.c., 0.23A 12-24 V a.c. 4 W	12-24 V d.c., 0.23A 12-24 V a.c. 4 W	12-24 V d.c., 0.23A 12-24 V a.c. 4 W		Supplied from connector on GD motherboard
IR	12- 24 V d.c 0.3 A					12- 24 V d.c 0.24 A	not available	not available	not available	
Enclosure										
EC	IP 30 (~NEMA 1)	IP 30 (~NEMA 1)	IP 65 (~NEMA 4)	IP 65 (~NEMA 4)		IP 65 (~NEMA 4)	IP 65 (~NEMA 4)	[2] IP 66 (~NEMA 4x)	[2] IP 66 (~NEMA 4x)	IP 41 (~NEMA 1)
SC, CT										
IR							not available	not available	not available	

[1] Two models.
[2] Remote sensor: IP 65.
[3] For all models except Exd and Exd Low Temp.

Sensor head

Models / Sensor	Standard Basic	Standard Basic with LCD display	IP 65 for High RH and Fast response	IP 65 enclosure	Exd model	Exd model Low Temperature	IP 66 enclosure 5 m remote IP 65 sensor	IP 66 enclosure 5 m remote IP 65 Exd sensor
Thread on external sensor								
EC	–	–	M 42 x 1.5 mm	M 42 x 1.5 mm	M 42 x 1.5 mm	M 42 x 1.5 mm	M 42 x 1.5 mm	M 42 x 1.5 mm
SC			M 42 x 1.5 mm		1" 5/16 x 20 UNF	1" 5/16 x 20 UNF	M 42 x 1.5 mm	1" 5/16 x 20 UNF
CT			M 35 x 1.5 mm		1" 5/16 x 20 UNF	M 35 x 1.5 mm	M 35 x 1.5 mm	M 35 x 1.5 mm
IR			M 42 X 1.5mm		M 42 X 1.5mm	not available	not available	not available
Material for external sensor								
EC	–	–	Stainless Steel	Plastic	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
SC, CT			Stainless Steel		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
IR			Stainless Steel		Stainless Steel	not available	not available	not available

Cable connection

1 gland for 6-13 mm cable (0.2"-0.5")
1 Ø 20 mm (0.8") hole with blanking plug.
1 extra gland can be fitted (only Standard, LCD display, IP 65 and Exd).

Approvals

CE:
EN55011: 1998,
EN61326: 1996
Following the provisions of 89/336/EEC, EMC Directives and, Cenelec
EN61010-2 : 2001
Following the provisions of 73/23/EEC, Low

Voltage directive (LVD)

ATEX for Exd model:
Directive 94/9/EC Group 2, Category2, G and D, Zones 1 and 2.

Electrical connection

All terminals will accept 0.5-1.5 mm^2 (20-15 AWG)

Analog output

4-20 mA	Max. 400Ω
0-10 V	Min. 10 kΩ
0-5 V	Min. 10 kΩ

RS 485 Communication
To Danfoss Monitoring System:
Danfoss m2
Danfoss Micromon
Danfoss AK SM 350

Digital output – volt free contacts
Load: 1 A, 24 V a.c/d.c

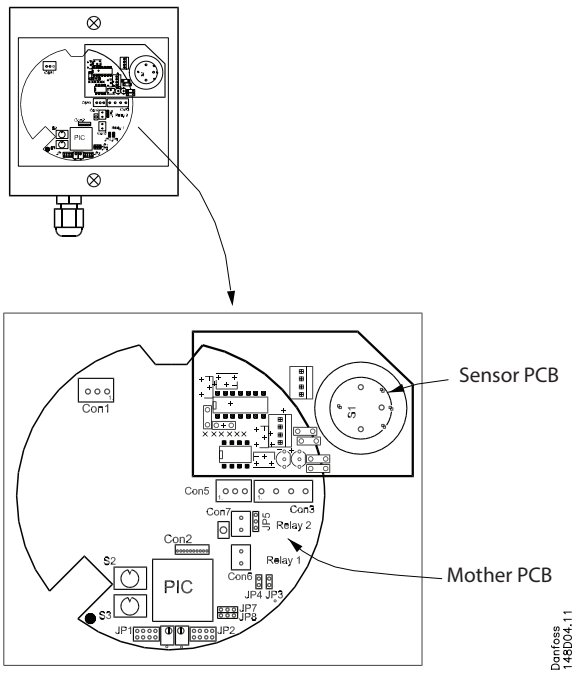
Design

The GD product range is designed in a very flexible way with a mother PCB (Print Circuit Board) and an interchangeable precalibrated sensor PCB.

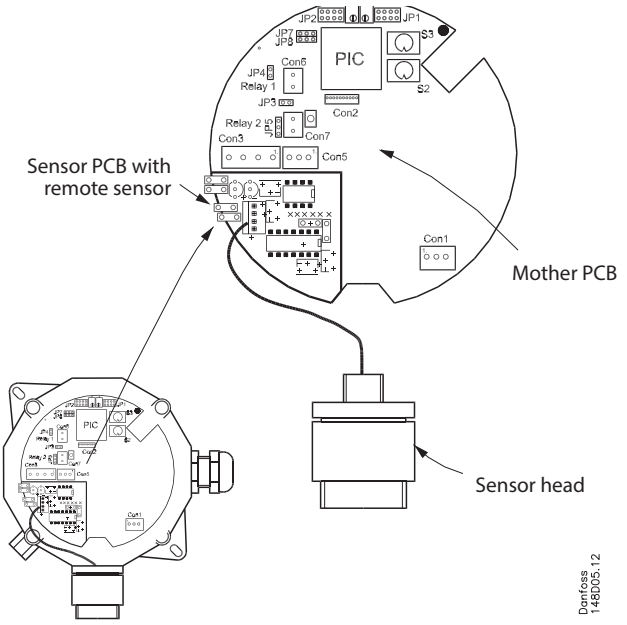
The mother PCB is the same for all GD models independent of the refrigerant or sensor technology. On the mother PCB individual settings (Alarm levels, delays e.t.c) can be set to meet local legislation or application requirements.

The sensor PCB is always precalibrated and dedicated to the actual refrigerant and ppm range. Danfoss has in advance selected the most appropriate sensor making it easy to optain safe detection and avoid false alarms from other gases present.
Because of the interchangeable precalibrated sensor PCB, it is very easy to replace the sensor when service or a calibration procedure is required (see the below drawings).

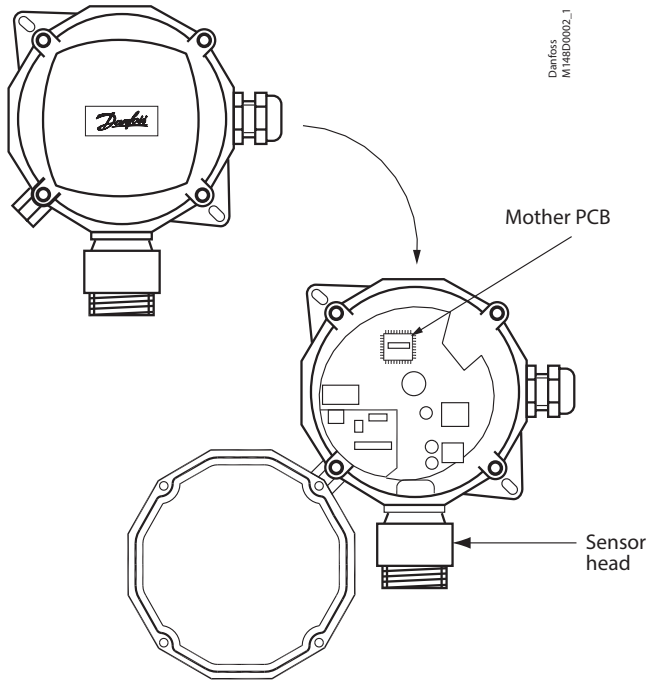
- Standard
- LCD display



- IP 65 with stainless steel sensor head
- Exd
- Exd Low Temp



- IP 65 enclosure



Sensor technology

Danfoss has, depending on actual ppm range and refrigerant, selected the most appropriate sensor for the target refrigerant gas. When the refrigerant and actual ppm range has been decided, the Danfoss GD product range makes it easy to pick out the right product.

Below is a brief introduction to the GD sensor types. For further information - please contact Danfoss.

Electrochemical Sensors - EC
EC sensors are used mainly for toxic gases and are suitable for ammonia but not for the other refrigerants. They are very accurate and tend to be used principally for toxic gases which cannot be otherwise detected or where high levels of accuracy are needed.

Semi-conductor – SC
SC sensors can be used for a wide range of gases including combustible, toxic and refrigerant gases. The SC sensors are low-cost, long life, sensitive, stable, resistant to poisoning and can be used to detect a large range of gases including all the CFC, HCFC, HFC refrigerants, ammonia and hydrocarbons.
However, they are not selective and are not suited to detecting a single gas in a mixture or for use where high concentrations of interfering gases are likely to be present.

Catalytic - CT
CT sensors have been mainly used for combustible gases including ammonia. CT are relatively low-cost, well established and understood and they have a good life span, up to 5 years. They can be subject to poisoning in certain applications but not generally in refrigeration and are more effective at gas levels of above 2,000 ppm.

Infrared - IR
IR sensors are very specific and is very precise for detection of CO_2.

Calibration / test methods

The calibration procedure consist of:
- Annual checks by qualified bump test
- Calibration by replacement of the sensor PCB with a Danfoss pre-calibrated certified sensor PCB

Annual Test
To comply with the requirements of EN378 and the F GAS regulation sensors must be tested annually. However local regulations may specify the nature and frequency of this test. If not the Danfoss recommended bump test procedure should be followed. Contact Danfoss for details.

For increased accuracy the unit must be calibrated at the temperature of operation.

After exposure to a substantial gas leak, sensor should be checked and replaced if necessary. Check local regulations on calibration or testing requirements.

Method I
Calibration / test by means of replacing Sensor PCB

This method requires that Danfoss offers factory calibrated PCB sensor boards with calibration certificate and traceability codes. Additionally an electrically simulation is required to verify the output signals and alarm settings.

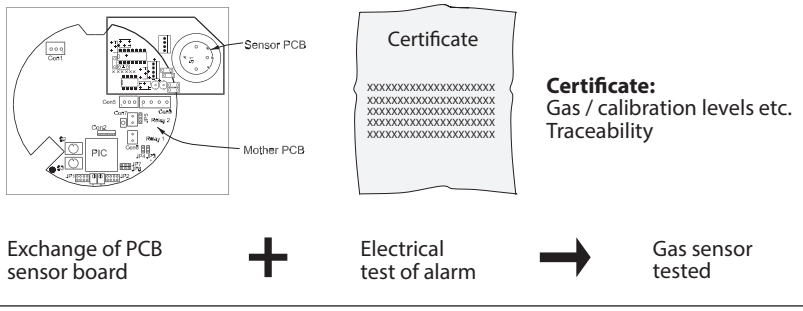
The PCB sensor board, which is the essential measuring element of the gas detector, is produced, calibrated, tested and certified by Danfoss.

After the main PCB of the gas detector has been tested with the GD tester, the new calibrated Sensor PCB can be installed.

Danfoss recommends that the calibration / test procedure is done by means of replacing the Sensor PCB, because:

- No need to purchase calibration gases in several different concentrations
- Simpler and quicker than gas calibration
- Danfoss guarantees the correct calibration and functioning of the new sensor PCB, which is supplied with a calibration certificate.
- No problems with sensor deterioration or end-of-life
- Price competitive, compared to the gas calibration carried out on site.

Test and calibration of GD Main Board by the use of GD tester



Bump test

A Bump Test consists of exposing the sensor to a gas. The objective is to establish if the sensor is reacting to the gas and all the sensor outputs are working correctly. A qualified bump test is a test carried out using ampoules or similar of known concentration.

Bump test of gas sensors (this test is a function test - it is not a calibration)

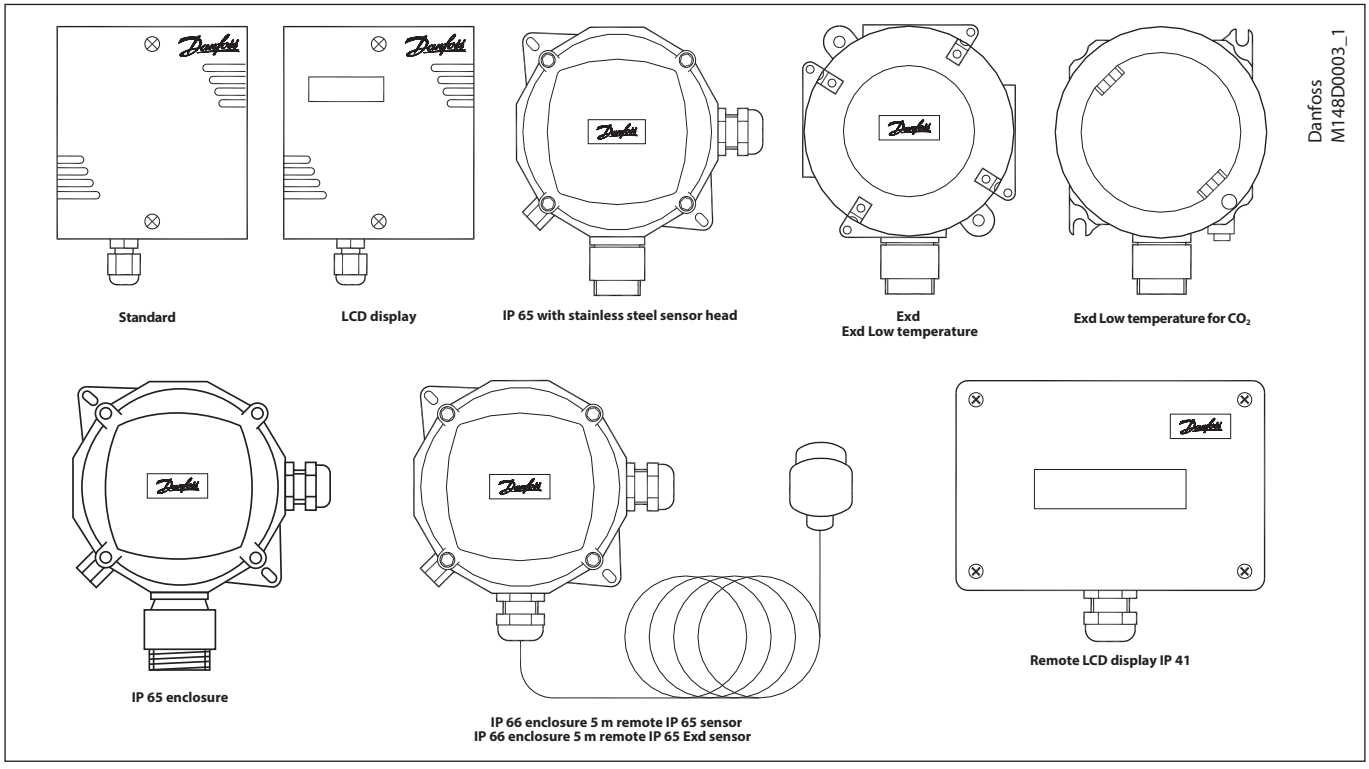
Method	Refrigerant	SC Semi-conductor	EC Electro-chemical	CT Catalytic	IR Infrared
Ampoules	Ammonia	✔	✔		
Lighter gas	HCFC, HCF	✔			
Lighter gas	HC - Hydro Carbon	✔		✔	
Ampoules or (Breath on sensor)	CO_2				✔
Ammonia water	Ammonia			✔	

Technician use only!
This unit must be installed by a suitably qualified technican who will install this unit in accordance with these instructions and the standards set down in their particular industry/country.

Suitably qualified operators of the unit should be aware of the regulations and standards set down by their industry/country for the operation of this unit. These notes are only intended as a guide and the manufacturer bears no responsibility for the installation or operation of this unit.

Failure to install and operate the unit in accordance with these instructions and with industry guidelines may cause serious injury including death and the manufacturer will not be held responsible in this regard.

Product range



- *Standard*
  Basic standard model for machine/engine rooms and cold rooms
- *Standard with LCD display*
  Basic standard model for machine/engine rooms with the actual reading of present ppm level in the room and Alarm messages.
- *IP 65*
  Two models with IP 65 available:
  - IP 65 with stainless steel sensor head. Temperature down to –20°C(–4°F)
  - IP 65 enclosure. Temperature down to –40°C(–40°F)
- *Exd*
  Like Standard but applicable in explosive areas Zone 1 and 2 and higher IP(NEMA).

  The sensor is mounted in an external Stainless Steel head.
- *Remote LCD (accessory)*
  Remote LCD display with 5 m cable
- *Remote sensor*
  Models with 5 m cable. Can be used in connection with safety valves/vent pipe applications.
  Also available with remote Exd sensor

Functions - all models

All GD models shown above have the same basic functions. All settings are done by means of jumper settings on the mother PCB.
See the section "Mother PCB" for more details.
For detailed information on how to adjust Alarm setting - please see the instruction PI.S00.A.

Alarm
All GD models can detect 2 alarm levels and give alarm via 2 volt free contacts. When an alarm has been detected a yellow LED (Low Level Alarm) or a red LED (High Level Alarm) will go ON. All GD sensors have been preset by the factory, to realistic Low/High values related to the actual ppm range of the GD model. The actual Low and High Alarm ppm values can be read on the external GD label.

The 2 volt free contacts can be set individually to either Normally Open (NO) or Normally Closed (NC).
All GD models are factory set to NO

NO/NC can not be used as fail safe during power failure.

Both Low and High Level Alarm can be delayed individually before the 2 volt free contacts are activated. This is useful when cross interference from other gasses may occur. The delayed response time can be set to 0, 1, 5 or 10 minutes.
All GD models are factory set to 0 minutes.
When the GD sensors have detected a Low or High Level Alarm an option for having these alarms with Manual reset or Auto Reset is possible. With the option Manual reset selected, a push button on the mother PCB must be activated to release the Low or High Level Alarm.

With the option Auto reset selected, the release of the Low or High Level Alarm is done automatically.
All GD models are factory set to Auto Reset.

The factory preset values can be adjusted, with a voltmeter measuring a 0-5 V d.c output.
0 V corresponds to the min. ppm range (e.g. 0 ppm)
5 V corresponds to the max. ppm range (e.g. 1000)

Example:
If a setting of 350 ppm is required the voltage shall be set to 1.75 V (35 % of 5 V)

Analog Output
All GD will continuously generate a linear analog output, proportional to the gas concentration. The signal is available as 4-20 mA, 0-10 V and 0-5 V.
All are available at the same time (see next page).

LCD display
The model with the LCD display will continuously display the actual present ppm level in the room and the Alarm messages.

Upper Line:
Actual present ppm level (e.g: "580 ppm").

Lower Line:
Alarm status.
4 text messages are possible - only one at a time:

"No Alarm"	Neither Low Level Alarm nor High Level Alarm active.
"Lo Alarm on"	Low Level Alarm active.
"Lo,Hi Alarm on"	Both Low Level Alarm and High Level Alarm active.
"Hi Alarm on"	High Level Alarm active.

Normalization Period

Once the GD is powered up it takes some time to normalize. When GD is powered up it will give a higher analog output (4-20 mA/0-10 V/0-5 V [1])) in the beginning and after some time it goes back to the actual concentration (in clean air and no leaks, the analog output will go back to:
~ 0 V/4 mA / (~ 0 ppm)) [2])

Times below are only intended as a guide.
They may vary due to temperature, humidity, cleanliness of the air, storage time [3]) etc.

Model
EC Sensors are 2 min (all models)
SC Sensors are 60 minutes (all models)
CT Sensors are 60 minutes (all models)
IR Sensors are 2 minutes (all models)

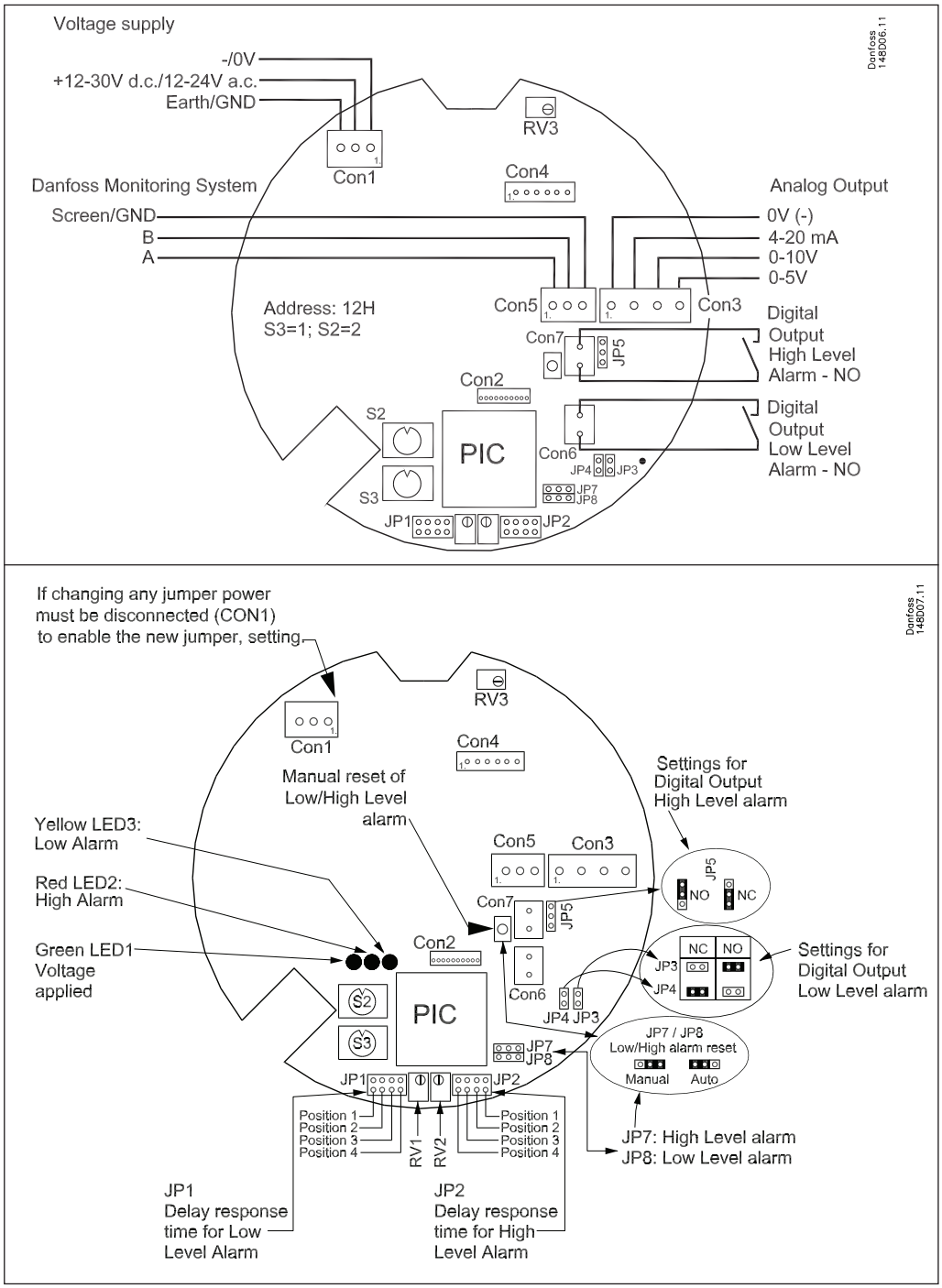
[1])
Always use the voltage 0-10 V to check the output for normalization check

[2])
GDC IR goes back to about 400 ppm as this is the normal level in air. (~4.6 mA/~0.4 V/ 0.2 V)

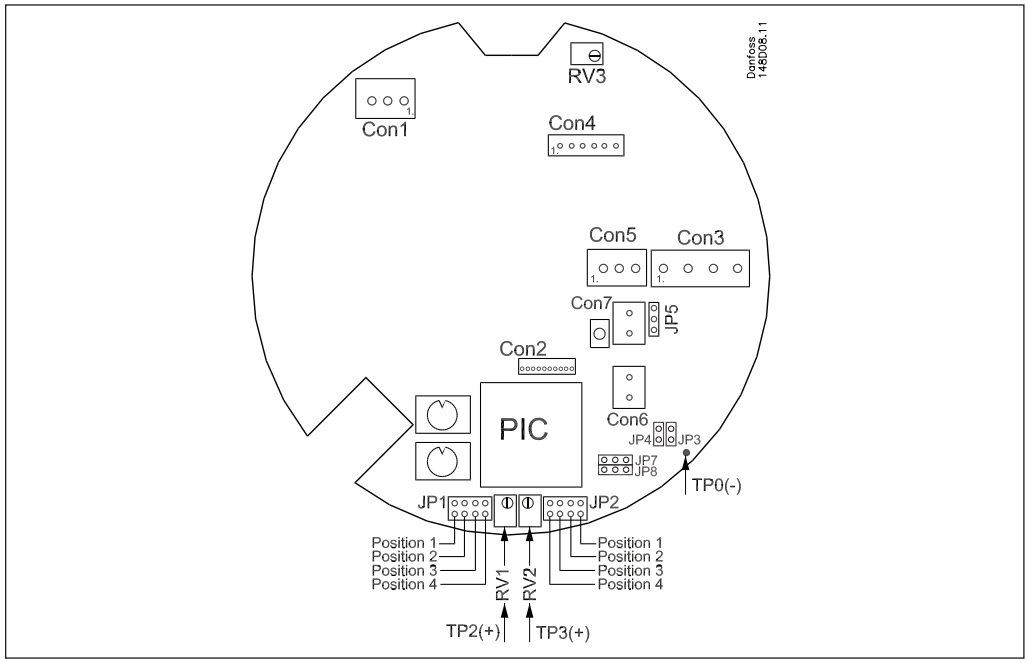
[3])
If the GD has been in long-term storage or has been turned off for a long period, normalisation would be much slower. However within 1-2 hours the GD should have dropped below the low alarm level and be operational. The progress can be monitored exactly on the 0-10V output. When the output settles around zero (400 ppm in the case of IR CO_2 sensors) the GD is normalised. In exceptional circumstances particularly with SC and CT sensors the process can take up to 30 hours.

For SC Sensors, it must be calibrated at temperature of operation.

Mother PCB


Voltage supply
-/0V
+12-30V d.c./12-24V a.c.
Earth/GND
Con1
RV3
Con4
Danfoss Monitoring System
Screen/GND
B
A
Analog Output
0V (-)
4-20 mA
0-10V
0-5V
Address: 12H
S3=1; S2=2
Con5
Con3
Con7
JP5
Digital Output High Level Alarm - NO
Con2
S2
S3
PIC
Con6
JP4
JP3
JP7
JP8
Digital Output Low Level Alarm - NO
JP1
JP2
Danfoss 148006.11
If changing any jumper power must be disconnected (CON1) to enable the new jumper, setting
Manual reset of Low/High Level alarm
Yellow LED3: Low Alarm
Red LED2: High Alarm
Green LED1 Voltage applied
Settings for Digital Output High Level alarm
NO
NC
Settings for Digital Output Low Level alarm
JP7 / JP8 Low/High alarm reset
Manual
Auto
Position 1
Position 2
Position 3
Position 4
RV1
RV2
JP7: High Level alarm
JP8: Low Level alarm
JP1 Delay response time for Low Level Alarm
JP2 Delay response time for High Level Alarm
Danfoss 148007.11

Mother PCB
(Continued)

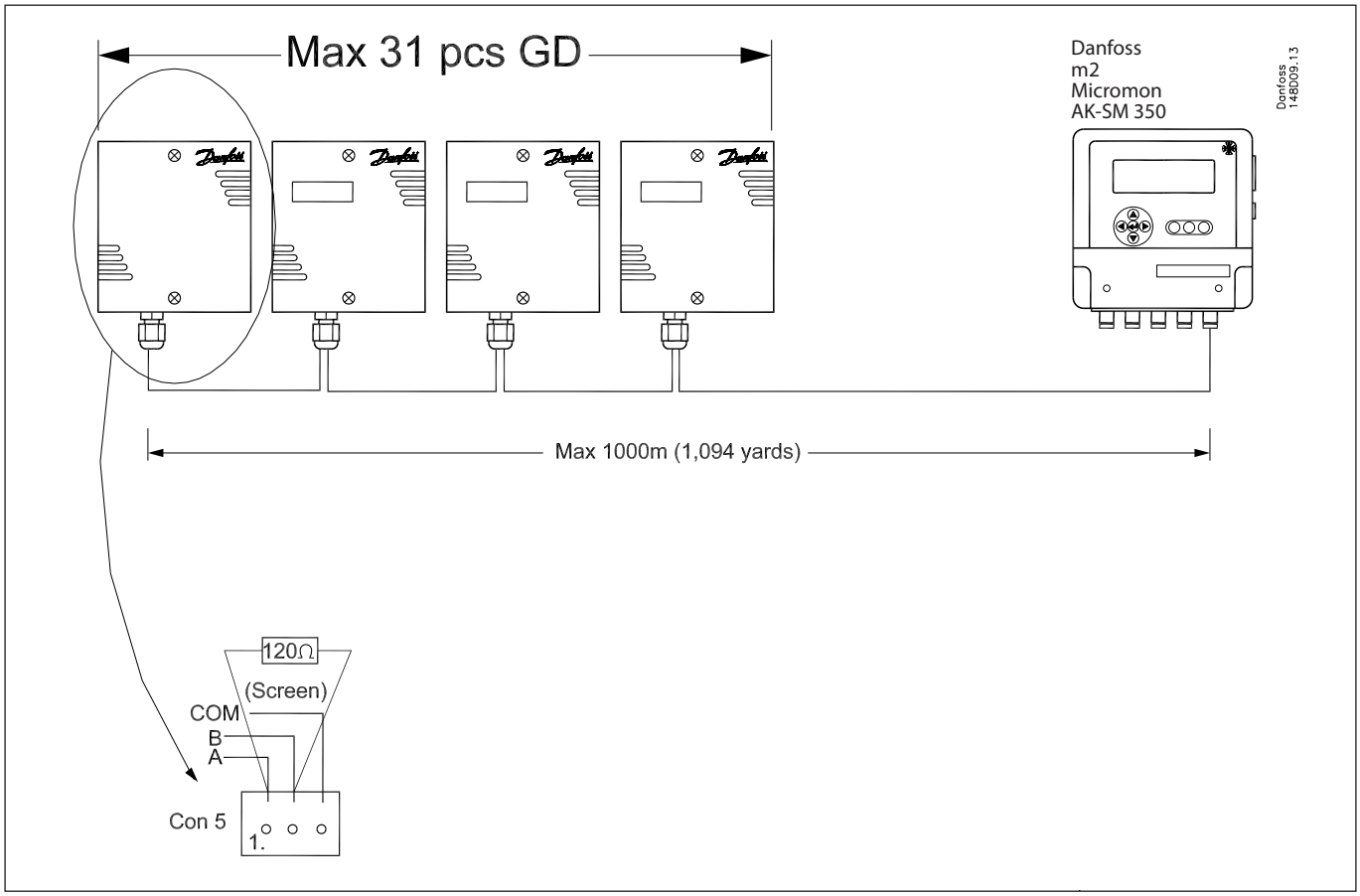


GD connected to Danfoss monitoring

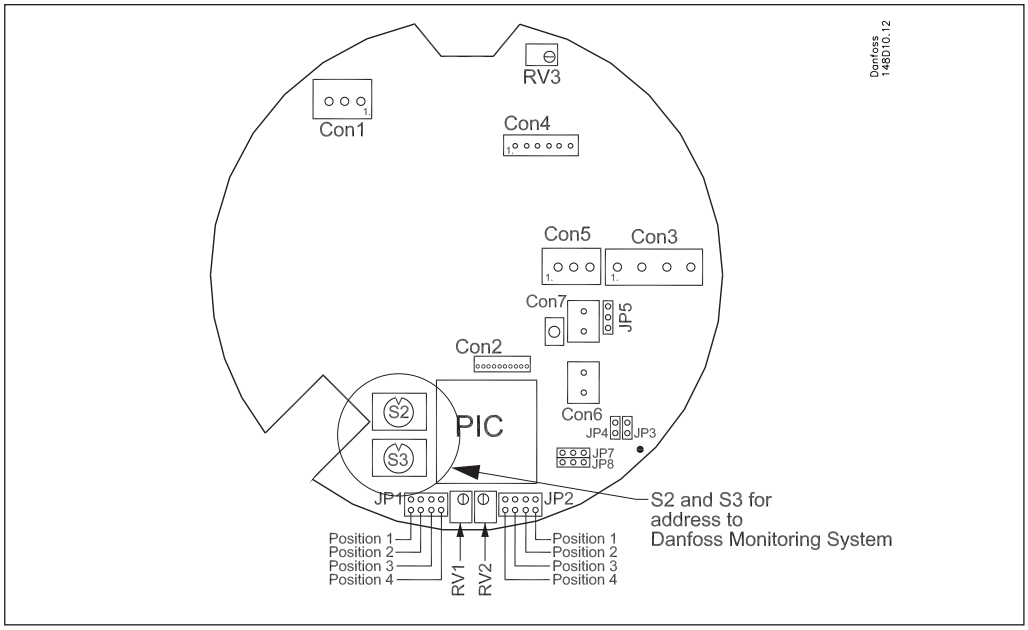
Danfoss offers the possibility of connecting every GD, independent of model, via the built-in RS 485 Bus communication, directly to the Danfoss monitoring unit.

Up to 31 GD sensors can be connected via a two-core screened communication cable (see the below drawing).
Every GD sensor needs a unique address number which must be selected. The address of GD is set by S2 and S3. By setting S2 and S3 between 0 and F, the GD will be assigned an address. See next page.
A conversion chart between channel number of the Danfoss monitoring system and the hexadecimal address of the GD is attached. Power must be removed when setting the addresses on the GD sensor.
If more than 31 units are needed, a GD Repeater (amplifier) must be installed (see Accessories).

Contact Danfoss for further information.



GD connected to Danfoss monitoring
(Continued)



Channel on Danfoss Monitoring System	S3	S2	Channel on Danfoss Monitoring System	S3	S2	Channel on Danfoss Monitoring System	S3	S2
1	0	1	34	2	2	67	4	3
2	0	2	35	2	3	68	4	4
3	0	3	36	2	4	69	4	5
4	0	4	37	2	5	70	4	6
5	0	5	38	2	6	71	4	7
6	0	6	39	2	7	72	4	8
7	0	7	40	2	8	73	4	9
8	0	8	41	2	9	74	4	A
9	0	9	42	2	A	75	4	B
10	0	A	43	2	B	76	4	C
11	0	B	44	2	C	77	4	D
12	0	C	45	2	D	78	4	E
13	0	D	46	2	E	79	4	F
14	0	E	47	2	F	80	5	0
15	0	F	48	3	0	81	5	1
16	1	0	49	3	1	82	5	2
17	1	1	50	3	2	83	5	3
18	1	2	51	3	3	84	5	4
19	1	3	52	3	4	85	5	5
20	1	4	53	3	5	86	5	6
21	1	5	54	3	6	87	5	7
22	1	6	55	3	7	88	5	8
23	1	7	56	3	8	89	5	9
24	1	8	57	3	9	90	5	A
25	1	9	58	3	A	91	5	B
26	1	A	59	3	B	92	5	C
27	1	B	60	3	C	93	5	D
28	1	C	61	3	D	94	5	E
29	1	D	62	3	E	95	5	F
30	1	E	63	3	F	96	6	0
31	1	F	64	4	0	97	6	1
32	2	0	65	4	1	98	6	2
33	2	1	66	4	2	99	6	3

Reference material

Danfoss m2 literature:
Technical Leaflet RB8BA
Manual RS8AN
Instruction RI8BM

Danfoss AK-SM 350 literature:
Manual RS8EF
Instruction RI8LC

Micromon:
Technical leaflet RC8AU
Instruction RI8HV (Micromon Expanable)
Instruction RI8GA (Micromon)

Danfoss GD apllication guide:
PA.000.B

Standard GD models

	All models					Standard Basic		Standard Basic with LCD display		IP 65 with stainless steel sensor head		IP 65 ① –20°C/+40°C (–4°F/104°F) ② –40°C/+50°C (–40°F/122°F) ③ –40°C/+40°C (–40°F/104°F)				Exd model		Exd model Low Temperature		IP 66 enclosure 5 m remote IP 65 sensor		IP 66 enclosure 5 m remote IP 65 Exd sensor	
Type of gas	Danfoss Type	Range [ppm]	Alarm limits Low/ High [ppm]	Resp. Delay [s]"	Sensor type	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB	Complete	Sensor PCB
Ammonia NH3						**Code number**																	
R 717	GDA EC 100	0-100	25/ 35	0	Electro-chemical	**148H5000**	**148H5200**	**148H5001**	**148H5200**	**148H5002**	**148H5208**	**148H5009** ①	**148H5222** ①	**148H5005** ③	**148H5221** ③	**148H5003**	**148H5208**	**148H5006**	**148H5268**	**148H5007**	**148H5273**	1)	-
	GDA EC 300	0-300	100/ 200	0	Electro-chemical	**148H5060**	**148H5215**	1)	-	1)	-	-	-	**148H5065** ③	**148H5224** ③	-	**148H5240**	1)	-	1)	-	1)	-
	GDA EC 1000	0-1000	500/ 1000	0	Electro-chemical	**148H5010**	**148H5201**	**148H5011**	**148H5201**	**148H5012**	**148H5209**	**148H5019** ①	**148H5226** ①	**148H5015** ③	**148H5225** ③	**148H5013**	**148H5209**	**148H5016**	**148H5269**	**148H5017**	**148H5275**	1)	-
	GDA EC 1000	0-1000	25/ 500	0	Electro-chemical	**148H5050**	**148H5201**	-	**148H5201**	**148H5052**	**148H5209**	**148H5059** ①	**148H5226** ①	**148H5055** ③	**148H5225** ③	**148H5053**	**148H5209**	1)	-	-	-		-
	GDA SC 1000	0-1000	80/ 250	0	Semi-Conductor	**148H5040**	**148H5249**	1)	-	**148H5042**	**148H5254**	**148H5049** ②	**148H5227** ②			1)	-	1)	-	1)	-	1)	-
	GDA SC 10000	0-10000	5000/ 9000	0	Semi-Conductor	**148H5020**	**148H5202**	**148H5021**	**148H5202**	**148H5022**	**148H5210**	**148H5029** ②	**148H5228** ②			**148H5023**	**148H5241**	**148H5026**	**148H5241**	**148H5027**	**148H5261**	**148H5028**	**148H5265**
	GDA CT 30000	0-30000	3000/ 28000	0	Catalytic	**148H5030**	**148H5203**	**148H5031**	**148H5203**	**148H5032**	**148H5211**	**148H5039** ②	**148H5229** ②			**148H5033**	**148H5211**	1)	-	1)	-	1)	-
Carbon Dioxide - CO_2																							
R 744	GDC IR 10000	0-10000	5000/ 9000	0	Infrared	**148H5070**	**148H5204**	**148H5071**	**148H5204**	-	-	**148H5072** ②	**148H5218** ②			**148H5073**	**148H5250**	1)	-	1)	-	1)	-
	GDC IR 20000	0-20000	10000/ 18000	0	Infrared	1)	-	1)	-	-	-	**148H5082** ②	**148H5219** ②			1)	-	1)	-	1)	-	1)	-
	GDC IR 40000	0-40000	20000/ 36000	0	Infrared	1)	-	1)	-	-	-	**148H5092** ②	**148H5220** ②			1)	-	1)	-	1)	-	1)	-
Halo-Carbon																							
HCFC R 22, R 123	GDHC SC 1000	0-1000	500/ 900	0	Semi-Conductor	**148H5100**	**148H5205**	**148H5101**	**148H5205**	**148H5102**	**148H5212**	**148H5109** ②	**148H5223** ②			1)	-	1)	-	**148H5107**	**148H5262**	1)	-
HFC R 404A, R 507	GDHF SC 1000	0-1000	500/ 900	0	Semi-Conductor	**148H5110**	**148H5206**	**148H5111**	**148H5206**	**148H5112**	**148H5213**	**148H5119** ②	**148H5217** ②			**148H5113**	**148H5243**	1)	-	**148H5117**	**148H5263**	1)	-
HFC R 134A	GDHF-R3 SC 1000	0-1000	500/ 900	0	Semi-Conductor	**148H5120**	**148H5246**	**148H5121**	**148H5246**	-	**148H5247**	**148H5129** ②	**148H5242** ②			1)		1)	-	**148H5127**	**148H5264**	1)	-
Hydro-Carbon																							
R 290, R 600, R 600A, R 1270	GDH SC 5000	0-5000	800/ 2500		Semi-Conductor	**148H5190**	**148H5267**	**148H5191**	**148H5267**	-	-	-	-	-	-	**148H5193**	**148H5260**	-	-	-	-	-	-

1) Contact Danfoss

© Danfoss | DCS (MWA) | 2016.11

Ordering - *GD sensor PCB*

Description	Code No.
GDA EC 100 sensor PCB	**148H5200**
GDA EC 1000 sensor PCB	**148H5201**
GDA SC 10000 sensor PCB	**148H5202**
GDA CT 30000 sensor PCB	**148H5203**
GDC IR 10000 sensor PCB for Standard Basic and Standard Basic with LCD display	**148H5204**
GDHC SC 1000 sensor PCB	**148H5205**
GDHF SC 1000 sensor PCB	**148H5206**
GDA EC 100 sensor PCB Ext for IP 65/Exd enclosure	**148H5208**
GDA EC 1000 sensor PCB Ext for IP 65/Exd enclosure	**148H5209**
GDA SC 10000 sensor PCB Ext for IP 65 enclosure	**148H5210**
GDA CT 30000 sensor PCB Ext for IP 65/Exd enclosure	**148H5211**
GDHC SC 1000 sensor PCB Ext for IP 65 enclosure	**148H5212**
GDHF SC 1000 sensor PCB Ext for IP 65 enclosure	**148H5213**
GDA EC 300 sensor PCB Ext for IP 65/Exd enclosure	**148H5240**
GDA EC 300 sensor PCB	**148H5215**
GDA SC 10000 sensor PCB Ext for Exd enclosure/Exd Low Temp. enclosure	**148H5241**
GDHF SC 1000 sensor PCB Ext for Exd enclosure	**148H5243**
GDHF-R3 SC 1000 sensor PCB	**148H5246**
GDHF-R3 SC 1000 sensor PCB Ext for IP 65 enclosure	**148H5247**
GDA SC 1000 sensor PCB	**148H5249**
GDC IR 10000 sensor PCB Ext for Exd enclosure	**148H5250**
GDA SC 1000 sensor PCB Ext for IP 65 enclosure	**148H5254**
GDH SC 5000 sensor PCB Ext for Exd enclosure	**148H5260**
GDA SC 10000 sensor PCB with 5 m remote IP 65 sensor. For IP 66 enclosure	**148H5261**
GDHC SC 1000 sensor PCB with 5 m remote IP 65 sensor. For IP 66 enclosure	**148H5262**
GDHF SC 1000 sensor PCB with 5 m remote IP 65 sensor. For IP 66 enclosure	**148H5263**
GDHF-R3 SC 1000 sensor PCB with 5 m remote IP 65 sensor. For IP 66 enclosure	**148H5264**
GDA SC 10000 sensor PCB with 5 m remote IP 65 Exd sensor. For IP 66 enclosure	**148H5265**
GDH SC 5000 sensor PCB	**148H5267**
GDA EC 100 sensor PCB Ext for Exd Low Temp. enclosure	**148H5268**
GDA EC 1000 sensor PCB Ext for Exd Low Temp. enclosure	**148H5269**
GDA EC 100 sensor PCB with 5 m remote IP 65 sensor. For IP 66 enclosure	**148H5273**
GDA EC 1000 sensor PCB with 5 m remote IP 65 sensor. For IP 66 enclosure	**148H5275**

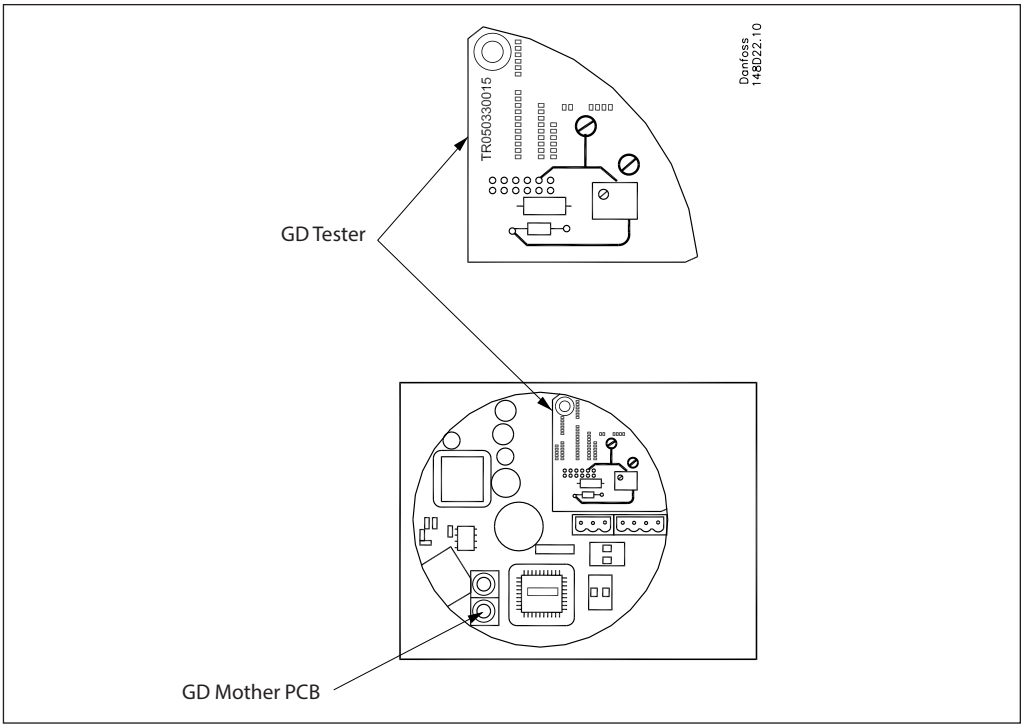
Ordering - *GD upgrade kits*

Description	Code No.
GDA EC 100 LT IP56 sensor upgrade kit	**148H5221**
GDA EC 100 HT IP56 sensor upgrade kit	**148H5222**
GDA EC 1000 LT IP56 sensor upgrade kit	**148H5225**
GDA EC 1000 HT IP56 sensor upgrade kit	**148H5226**
GDA SC 10000 IP56 sensor upgrade kit	**148H5228**
GDA CT 30000 IP56 sensor upgrade kit	**148H5229**
GDA SC 1000 IP56 sensor upgrade kit	**148H5227**
GDA EC 300 LT IP56 sensor upgrade kit	**148H5224**
GDC IR 10000 IP56 sensor upgrade kit	**148H5218**
GDC IR 20000 IP56 sensor upgrade kit	**148H5219**
GDC IR 40000 IP56 sensor upgrade kit	**148H5220**
GDHC SC 1000 IP56 sensor upgrade kit	**148H5223**
GDHF SC 1000 IP56 sensor upgrade kit	**148H5217**
GDHF-R3 SC 1000 IP 56 sensor upgrade kit	**148H5242**

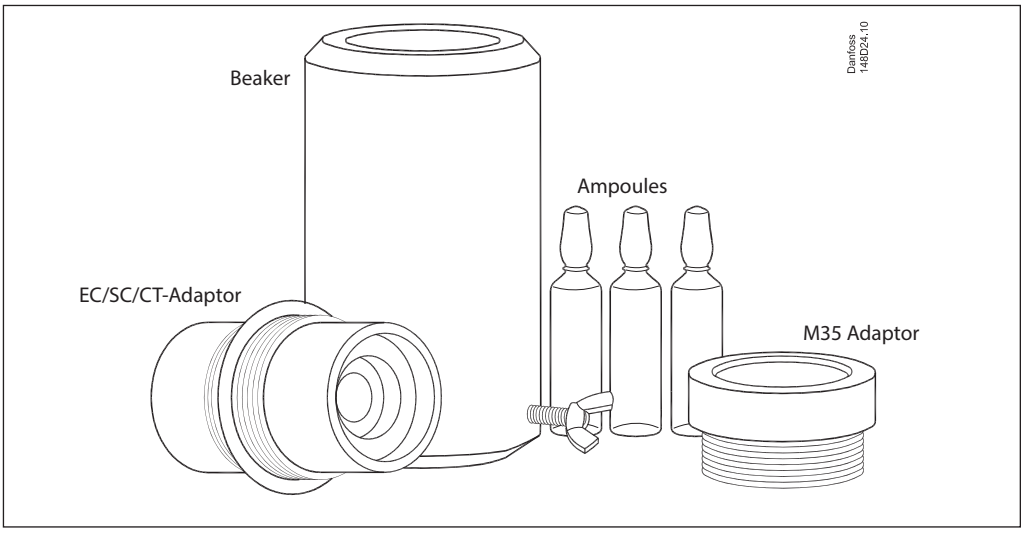
Ordering - *Accessories*

Description	Code No.
GD Test Kit - GD Tester all models. To test mother PCB at Sensor PCB replacement - Beaker M42 - EC/SC/CT-Adapter. Fit Beaker M42 - M35 Adapter. Fit Beaker M42	**148H5230**
GD mother PCB all models	**148H5232**
GD Tester for mother PCB, all models	**148H5239**
I-PACK(10) GD Ampoules 100 ppm ammonia	**148H5234**
I-PACK(10) GD Ampoules 1000 ppm ammonia	**148H5235**
I-PACK(10) GD Ampoules 2000 ppm CO_2	**148H5236**
Remote LCD display IP 41	**148H5238**

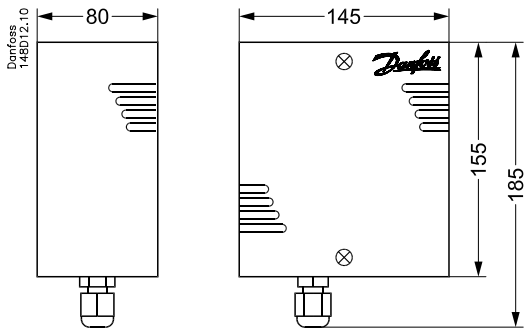
GD Tester and GD Mother PCB



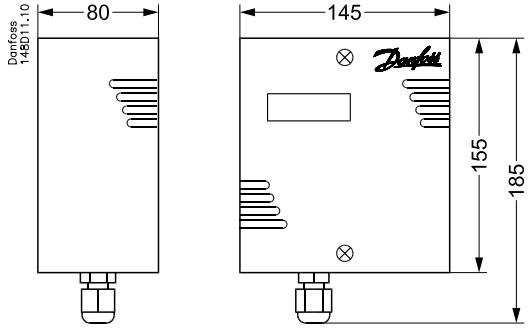
Bump test equipment



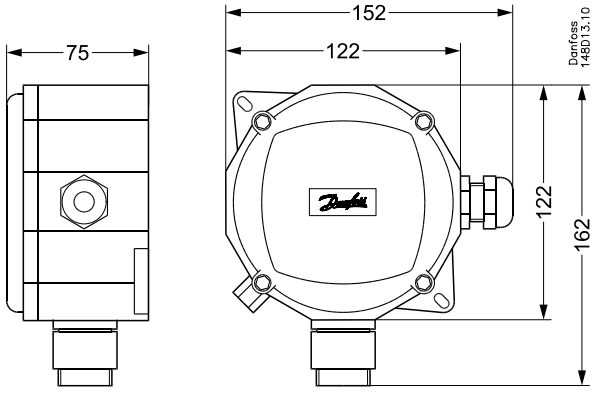
Dimensions



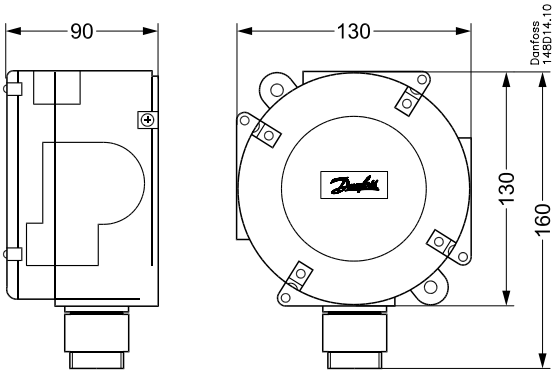
Standard



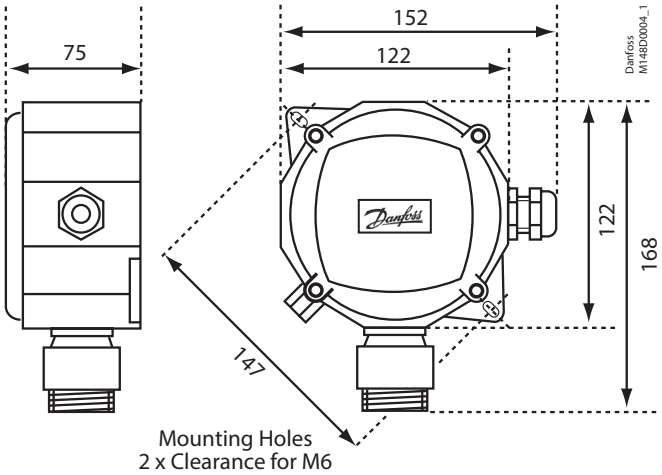
LCD display



IP 65 with stainless steel sensor head

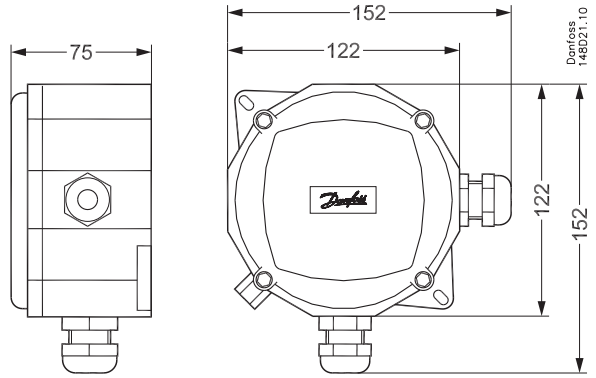


Exd
Exd Low Temperature

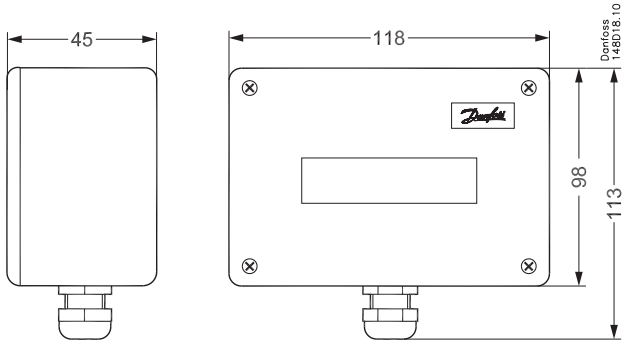


IP 65 Enclosure

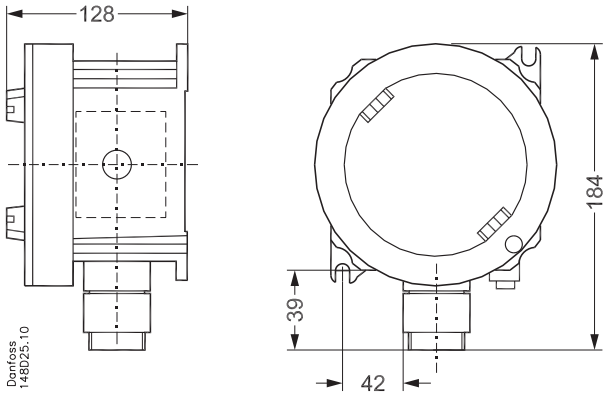
Dimensions *(Continued)*



IP 66 enclosure 5 m remote IP 65 sensor
IP 66 enclosure 5 m remote IP 65 Exd sensor



Remote LCD display IP 41



Exd for CO_2

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed.
All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.