Danfoss GDA Gas Detecting Sensors Installation Guide

Contents

Danfoss GDA Gas Detecting Sensors

Specifications

- Gas detecting sensor models: GDA, GDC, GDHC, GDHF, GDH
- Operating Voltage: +12- 30V d.c./12-24 V a.c.
- RemoteLCDy: IP 41
- Analog Outputs: 4-20 mA, 0- 10V,0- 5V
- Maximum Range: 1000 meters (1,094 yards)

Installation

1. This unit must be installed by a qualified technician according to the provided instructions and industry standards.
2. Ensure correct installation and setup based on the application and environment.

Operation

1. Operators should be familiar with industry regulations and standards for safe operation.
2. The unit provides alarm functions in case of leakage, but does not address the root cause.

Maintenance

1. Sensors must be tested annually to comply with regulations. Follow the recommended bump test procedure if local regulations do not specify.
2. After a significant gas leak, check and replace sensors if necessary. Follow local calibration and testing requirements.

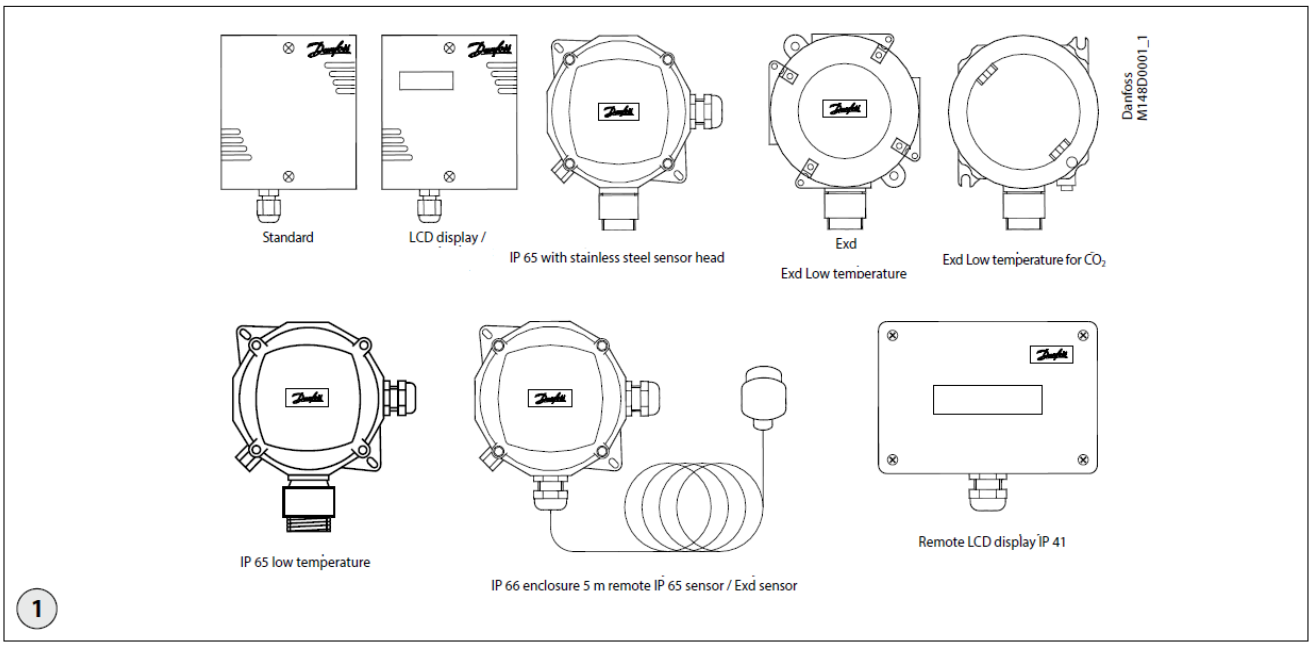
Technician use only!

- 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.
- It is the installer's responsibility to adequately ensure that the instruments are installed correctly and set up accordingly based on the environment and the application in which the products are being used.
- Please observe that Danfoss GD does hold an approval as a safety device. If a leakage occur GD will provide alarm functions to connected equipment (PLC or BMS systems), but it will not solve or take care of the leakage root cause itself.

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.

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

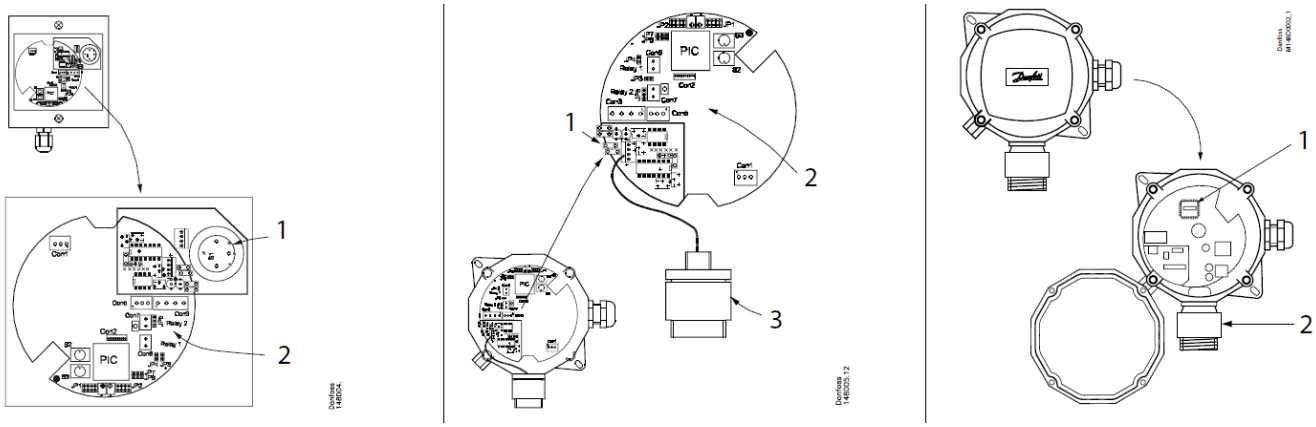


- Standard
- LLCD
- Sensor PCB
- Mother PCB
- P 65 with stainless steel sensor head
- **Exd**
    - Exd low temperature

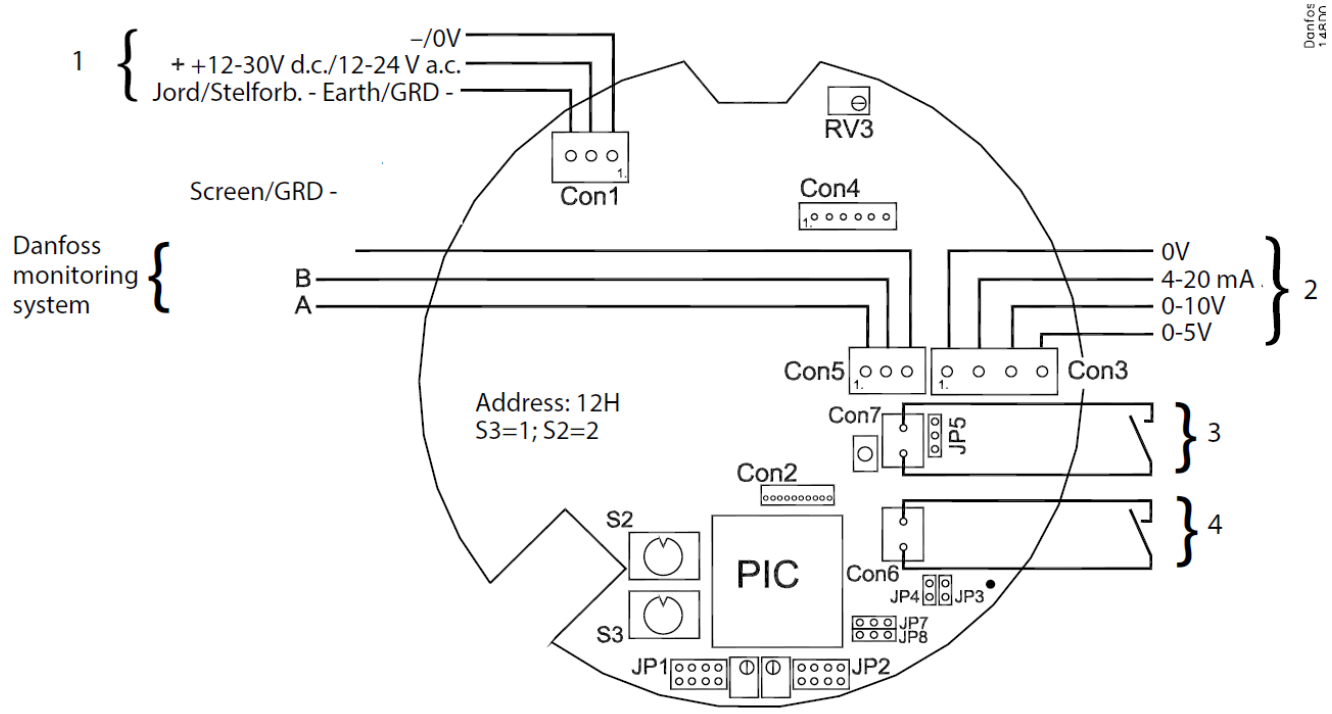
1. Sensor PCB with external sensor

2. Mother PCB
3. Sensor head

- IP 65 low temperature
- Mother PCB
- Sensor head



Electrical connection for all models

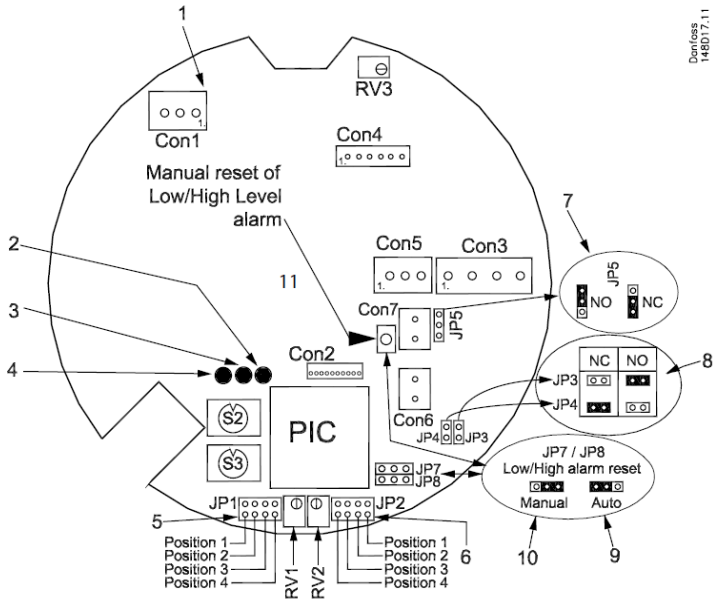


1. Supply voltage
2. Analogue output
3. Digital output -High-level alarm NO
4. Digital output – Low-level alarm NO

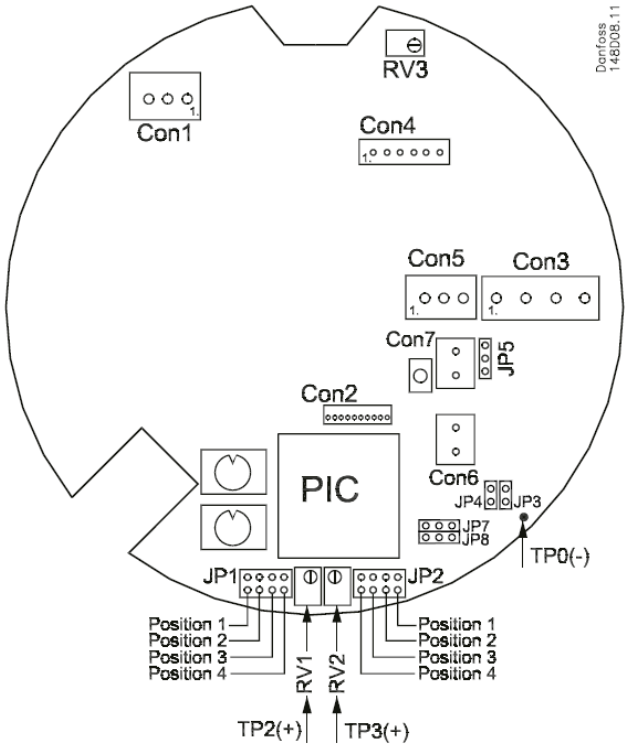
Jumper connection for all models

1. When changing any jumper position, the power must be disconnected (CON1) to enable the new jumper setting
2. Yellow LED3: Low alarm

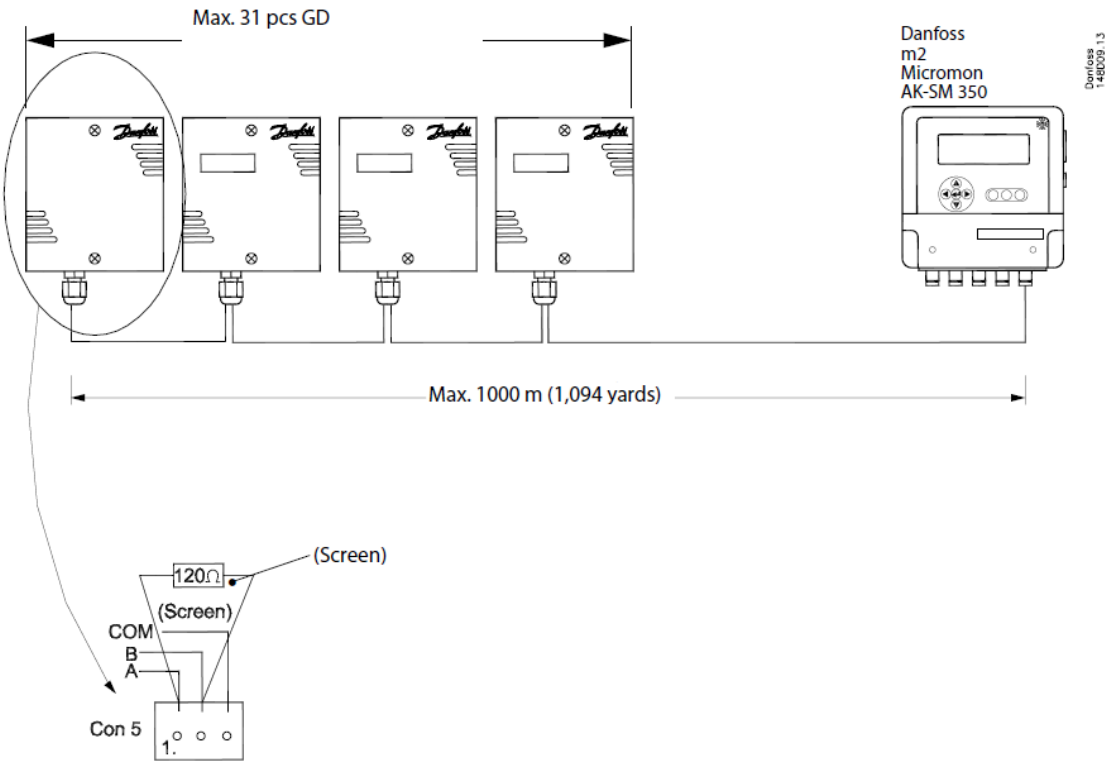
3. Red LED2: High alarm
4. Green LED1: Voltage applied
5. JP1: Delay response time for Low Level alarm
6. JP2: Delay response time for High Level alarm
7. JP5: Setting for digital output, High Level alarm
8. JP3/JP4: Setting for digital output, Low Level alarm
9. JP7: High-Level alarm
10. JP8: Low-Level alarm.
11. Manual reset of Low/High Level alarm



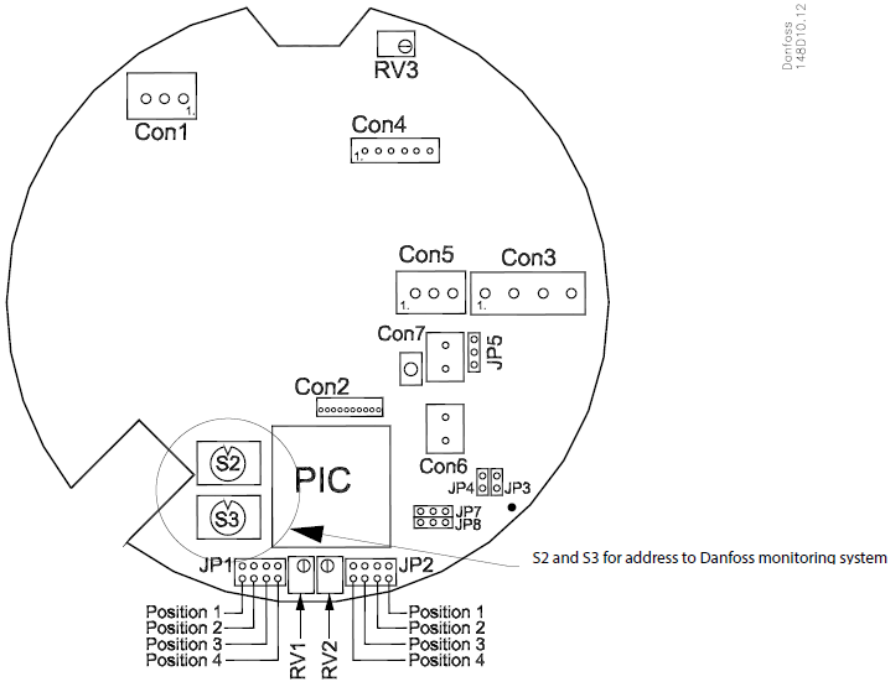
Adjusting low/high alarm values



Setting of address when communicating with the Danfoss Monitoring System



Setting of address when communicating with Danfoss m2 (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

Installation
General procedure for all GD types (fig. 2, 3, 4)
All GD products are for wall mounting. Removal of GD top cover:-

- For Standard and LCD types:
- Unscrew two front screws
- For the models IP65 with stainless steel sensor head /Exd / IP 65 low temperature(Fig. 3, 4):
- Unscrew four front screws

Electrical installation (fig. 5 and 6)
The Earth/Ground connection must be made when using the standard, LCD, or Exd enclosure types. The safety of the equipment is dependent on the integrity of the power supply and the earthing of the enclosure.
Apply voltage at CON 1 and the green LED will light up (fig. 6).

Stabilisation Period
Once the GD is initally powered up it takes some time to stabilise and will give a higher analog output (4-20 mA/0-10 V/0-5 V 1)) at the start before reverting to the actual concentration reading (in clean air and no leaks, on the analog output reverts to: (~ 0 V/4 mA / (~ 0 ppm)) 2).
The stabilisation times specified below are only intended as a guide and may vary due to temperature, humidity, cleanliness of the air, storage time 3, e.t.c

Model

- GDA with EC sensor…….20-30 Sec
- GDA with SC sensor…….. 15 min.
- GDA with CT sensor…….. 15 min.
- GDA with CT sensor, Exd model……7 min.
- GDHC/GDHF/GDHF-R3
- with SC sensor……1 min.
- GDC with IR sensor……..10 sec.

- GDC with IR sensor,
- Exd model…….20 sec.
- GDH with SC sensor……..3 min.

1. When changing any jumper position, the power must be disconnected (CON1) to enable the new jumper setting.
2. Setting of normally open (NO) / normally closed (NC) for the digital output Low/High Level alarm.
3. Both have an option to set at NO or NC. The factory setting is NO.

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

- Digital output Low Level alarm NO: JP3 ON, JP4 OFF (removed) NC JP4 ON, JP3 OFF (removed) g. 6)
- Digital output High Level alarm NO: JP5 ON in upper position NC: JP5 ON in lower position g. 6)

Manual reset/autoreset of Low/High Level alarm (fig. 6)

- This option is available through JP8 (Low Level alarm) and JP7 (High Level alarm). The pre-set factory setting is Auto Reset. If manual reset is selected for either Low/High Level alarm condition, then the manual reset push button is located next to CON 7.
- Digital output Low Level alarm
- Auto Reset: JP8 in lleft-handposition Manual: JP8 in right-hand position
- Digital output High Level alarm
- Auto Reset: JP7 in left-hand position Manual: JP7 in right-hand position

Adjusting the delayed response time (Fig. 6). The digital output for Low/High Level alarms can be delayed.
The preset factory setting is 0 minutes, Digital output, Low Level alarm

JP1 in position

1. : 0 minutes
2. : 1 minutes
3. : 5 minutes
4. : 10 minutes

Digital output High Level alarm JP2 in position

1. : 0 minutes
2. : 1 minutes
3. : 5 minutes
4. : 10 minutes

- Adjusting Low/High alarm values (fig.. 7) GDsl GD have been preset by the factory to realistic values related to the actual ppm range of the GD product. The actual Low and High alarm ppm limits are detailed on the external GD label. The factory preset value can be adjusted, with a voltmeter measuring the 0d.c.V d.c. Output.

- 0 V corresponds to the minimum. ppm range (e.g. 0 ppm)
- 5V corresponds to the max. ppm range (e.g. 1000)
- E.g., if a setting of 350 ppm is required, then the voltage shall be set to 1.75 V (35 % of 5 V)
- Adjusting the Low alarm limit value between TP0(-) and TP2(+), a voltage between 0-5 V can be measured, and with th, at the ppm Low alarm limit setting. The voltage/ppm setting can be adjusted at RV1.
- Adjusting the High alarm limit value between TP0(-) and TP3(+), a voltage between 0-5 V can be measured, and with that, the ppm High alarm limit setting. The voltage/ppm setting can be adjusted at RV2.

Connecting GD to a Danfoss monitoring system (fig. 8 and 9)

- Wiring (fig. 8)
- All GD must be connected A-A, B-B,
- COM – COM (screen)
- When connecting to the Danfoss monitoring system panel the same terminals are connected to each other i.e. A-A, B-B, Com – Com.
- On the last GD and Danfoss monitoring system, fit a 120 ohm resistor across terminal A and B to terminate the communications system.
- A maximum of 31 GDs can be connected. If more than 31 units are needed, please contact Danfoss for further information.GD address (fig. 9)
- The sensor address is set by S2 and S3, adjusting these dials between 0 and F will give the sensor its own address as shown in g. 9. A conversion chart between Danfoss monitoring system channel numbers and the hexadecimal address of the GD is attached. Power must be removed when setting addresses on the GD.

Annual Test

- To comply with the requirements of EN378 and the F GAS regulations, sensors must be tested annually. Howe, ve,r local regulations may specify the nature and frequency of this test. If not, the Danfos recommended bump test procedure should be followed. Contact Danfoss fordetailse.
- After exposure to a substantial gas leak, the sensor should be checked and replaced if necessary.
- Check local regulations on calibration or testing requirements.

1. Always use the voltage 0-10 V to check the output for stabilisation.
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 have been in long-term storage or have been swiched off for a long period, stabilisation will be much slower. However within 1-2 hours all the GD types should have dropped below the low alarm level and be operational.
4. The progress can be monitored exactly on the 0 10VV output. When the output settles around zero (400 ppm in the case of IR CO2 sensors), the GD is stabilised. In exceptional circumstances, particularly with the CT sensor, the process can take up to 30 hours.

FAQS

Q: What should I do after a gas leak is detected?
A: Check and replace sensors if necessary and follow local regulations for calibration and testing.

Q: How often should sensors be tested?
A: Sensors must be tested annually to comply with regulations. Local regulations may specify different testing frequencies.

Documents / Resources

	Danfoss GDA Gas Detecting Sensors [pdf] Installation Guide GDA, GDC, GDHC, GDHF, GDH, GDA Gas Detecting Sensors, GDA, Gas Detecting Sensors, Detecting Sensors, Sensors

References

- User Manual