

GJD-MM1 / GJSL-CO2

Instruction and Maintenance Manual



geopal®

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PENDING

ITS-I 23ATEXQ36745

DBI reg. no 233.301

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1 Safety

Important

Please read this Instruction and Maintenance Manual carefully before the GJD-MM1 and GJSL-CO2 are put into operation.

To ensure a safe installation of the GJD-MM1 and GJSL-CO2 it is necessary that the installation is carried out only by qualified personnel who are familiar with the relevant national and international legislation, directives, and standards.

Always make sure that the mains voltage corresponds with the voltage indicated on the type label.

Warning

Never remove the lid in an explosive atmosphere.

Beware of electrostatic charging. For cleaning use a damp cloth only.

2 Declaration of conformity

The producer

Geopal System A/S
Bygmarken 19
DK-3520 Farum

declares that the specified product

Name: GJD-MM1 and GJSL-CO2
Type: Gas Alarm Monitor and Gas Alarm Detector

conforms to the following directives and standards:

Low Voltage Directive 2014/35/EU
Electromagnetic Compatibility Directive (EMC) 2014/30/EU

EN 61 000-6-2 (2019)
EN 61 000-6-4 (2019)
EN 50 270 (2015)

This declaration is given in compliance with article 7, subsection 1 of the EMC directive. For specification of the acceptable EMC level, refer to the electrical data of the product.

Farum, 1 June 2025



Christian Møller
(Producer's signature)

3 General description

3.1 System overview

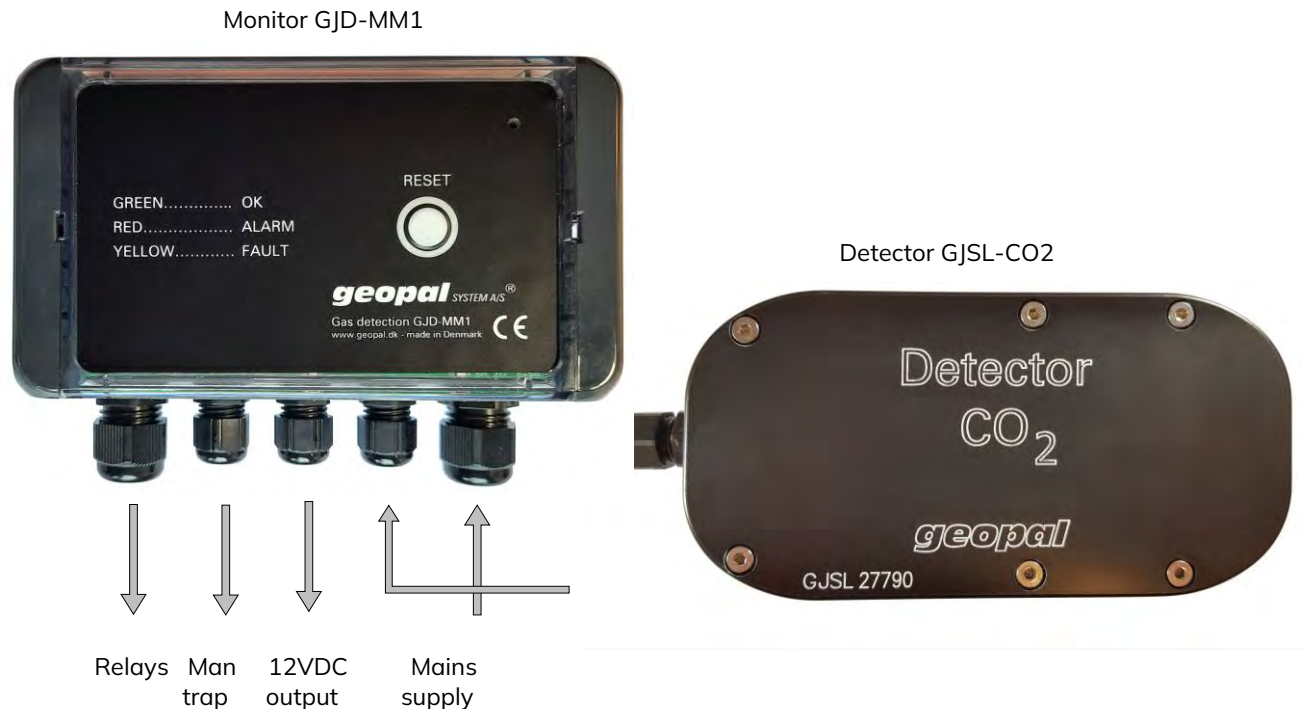


Figure 1 Overview of detector and monitor

The gas alarm monitor GJD-MM1 is used together with the CO₂ detector GJSL-CO₂. It gives a complete system that is small and quick. The monitor and detector are designed for a single point, 0-10000 ppm measurement, where CO₂ is used as a refrigerant. Due to the low height of the detector, it can be placed safely under a protective frame or a fender.

The GJD-MM1 has internal colored backlight indicator that is visible through the lid and a programmable buzzer. It has two potential-free relay outputs, each with C, NC, and NO. The relays can be configured as two relays for alarms or one relay for alarm and one relay for fault. The GJD-MM1 uses the relays to control external functions such as ventilation systems, solenoid valves etc. The 12 Volt DC output provides up to 1.0 Amp and can be used with the relays to control external equipment.

The gas level is measured continuously. The backlight indicator and relays are activated if alarm levels are exceeded or a fault occurs.

Front cover of the Monitor with reset button and hole for buzzer output (≥90 dBa).



4 Installation/assembly

Only qualified personnel must perform installation and assembly.

4.1 How to open the monitor

The GJD-MM1 lid has a hinged quick-release catch technology without screws for easy access to the cable connection area. The hinged side (left or right) is optional but can be fixed with a blanking plug as required. The cable glands and the semi trans-parent lid ensure an IP65 protection class. This requires that not used cable glands to be filled.



Figure 2 GJD-MM1 has five cable glands that gives access to the connection area

4.2 How to mount the monitor on the wall

The monitor can be mounted on the wall with four Ø4 screws. See appendices for a 1:1 template. For best protection against injecting water the monitor should be placed with the glands towards the floor.

4.3 Where to mount the monitor

Due to the visible backlight information that is giving through the lid, the monitor should be positioned in a visible height i.e. 150 cm to 170 cm above the floor.

4.4 How to open the detector

The detector GJSL-CO2 can be opened by loosening and removing the six screws that holds the lid.



Figure 3 GJSL-CO2 can be mounted under a fender due to the low height

4.5 How to mount the detector on the wall

Mounting the detector on the wall requires four Ø4 screws. See appendices for a 1:1 template. For correct positioning of the detector, the gland must turn to the left. This will provide the greatest possible protection against water ingress.

4.6 Where to mount the detector

Place the detector wherever it is desired to measure the CO₂ contents of the air. Typically, it should be installed in breathing height. This is approx. 150 - 170 cm above the floor.

The detector should never be covered by boxes, containers or other objects that might prevent the air movements from reaching the detector.

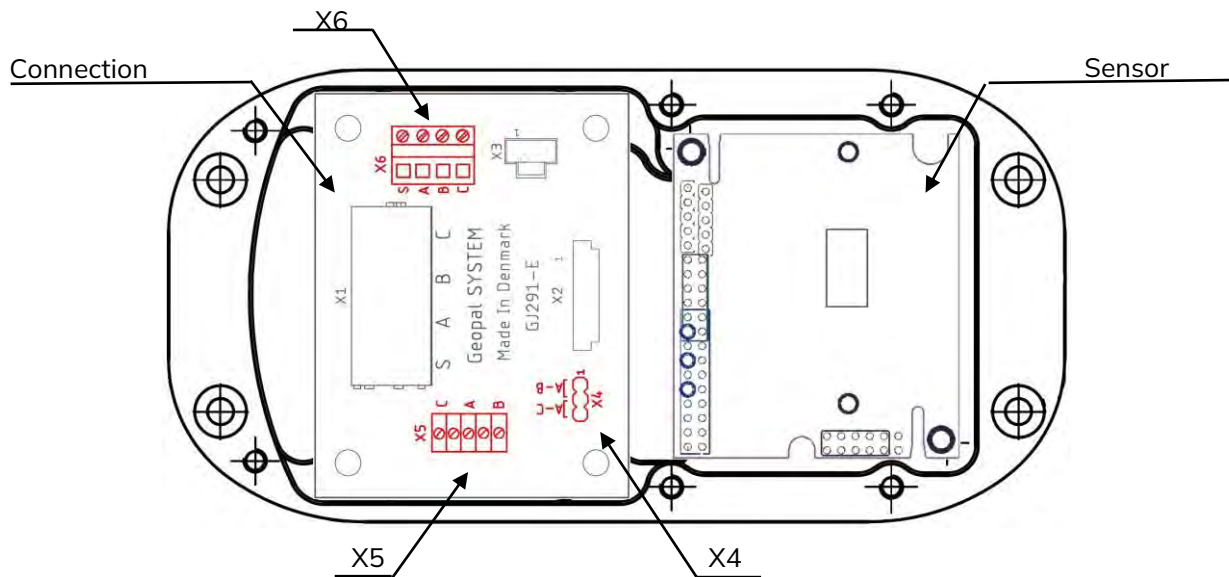
The detector should always, as far as possible, be placed in such a way that it is conveniently accessible for service and calibration.

4.7 Connection between detector and controller

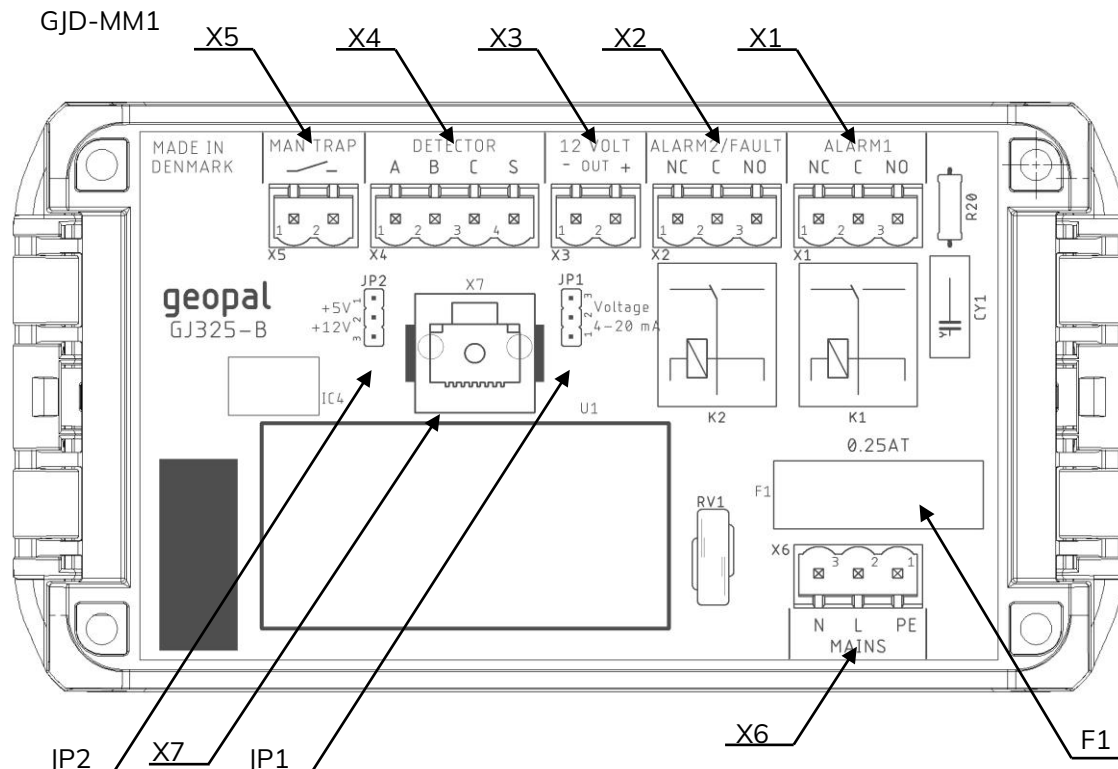
A 3-core shielded cable is recommended to connect terminal X6 in the detector to the terminal X4 in the monitor. The terminals marked A, B, C and S in the gas alarm monitor are connected to the corresponding marked terminals in the detector. The maximum cable length is 100 meters and the cable size are 0,5 mm² to 1,0 mm². Note that the cable gland allows a cable diameter from 3 mm up to 6.5 mm.

4.8 Electrical connections

GJSL-CO2



	Function	Parameter	Configuration	Position
X4	Test signal	A-B	Supply voltage	X4-1-2
		A-C	Sensor voltage	X4-2-3
X5	Connection to sensor	Supply (+)	B	X5-B
		Not connected	.	.
		GND	A	X5-A
		Not connected	.	.
		Sensor signal	C	X5-C
X6	Connection to monitor	GND	A	X6-4
		Supply (+)	B	X6-3
		Sensor signal	C	X6-2
		Shield	S	X6-1



Item	Function	Parameter	Configuration	Position
X1	K1 Relay output	Alarm 1	NO	X1-3
			C	X1-2
			NC	X1-1
X2	K2 Relay output	Alarm 2 or Fault	NO	X2-3
			C	X2-2
			NC	X2-1
X3	12 Volt out max 1 Amp	+12 V	+	X3-2
		GND	-	X3-1
X4	Detector connection terminal	Shield	S	X4-4
		Sensor signal	C	X4-3
		Supply (+)	B	X4-2
		GND	A	X4-1
X5	ManTrap	Signal	*	X5-2
		GND	*	X5-1
X6	Mains	Neutral	N	X6-3
		Single phase (Live)	L	X6-2
		Protective Earth	PE	X6-1
X7	Communication port	PC connection	RS-232	X7-1/8
JP1	Input Selector for C-terminal	Current 4-20mA Voltage 0-5 V	JP1_1-2 = 4-20 mA JP1_2-3 = Voltage	X4-C
JP2	Output Voltage Selector for B-terminal	+5V +12V	JP2_1-2 = +5V JP2_2-3 = +12V	X4-B
F1	Fuse	0.25 A Slowblow	5x20mm	F1

4.9 **Mantrap**

An emergency button can be connected and used as a trapped person alarm. If activated the internal acoustic signal together with the colored backlight LED's will indicate a person has been trapped. See 6.2 Modes. The relays are set according to 8.5 Mantrap. Mantrap indication is neutralized on the monitors reset button, after which it enters the state before mantrap was activated. If mantrap is not in use, a short circuit must be connected between X5-1 and X5-2.

5 Terminal program for communication

To change the default setup or to calibrate the equipment, it is necessary to connect a computer to the monitor. This is done using a Geopal communication cable. See section 9.5 on page 17.

5.1 Before startup

The computer program needed for communication with the monitor is a standard terminal program. Geopal uses Tera Term, a free ware program that can be downloaded from the internet.

5.2 Communication setup

Before you start Tera Term, connect the communication cable to the computer USB port. Wait until USB driver is installed. In most windows editions this happens automatically. Start Tera Term, go to setup-serial port and check/set the following parameter.

Port	:	COM2	; This value depends on the computer.
Baud rate	:	2400	
Databit	:	8	
Parity	:	none	
Stopbit	:	1	
Flow control	:	none	

Remember to save setup. This setup is only done once.

Connect the communication cable RJ45 connector to the monitor and you are ready to go.

5.3 Menu and how to navigate

When you are successfully connected to the monitor the Main Menu will be shown on the screen when tabbing ENTER. Use these three moves to navigate:

- Move the selector when pressing a numerical button or space bar for next number.
- Tab Enter to show selected menu.
- Press Esc for exit menu

Example: Press 2 and then ENTER. Now you enter Alarm & Fault menu.

New values are always 4 digits long with explanation in brackets

- New values will be added from right
- Press ENTER or Esc for exit

```
ID: ES17003A_0
Main Menu
1: Calibration
2: Alarm & Fault
3: Settings
Esc: > Exit
```

Selector

```
A1 limit = 030.0 [%FS]
```

```
Line = 0001 [0000: STANDBY, 0001: ON]
```

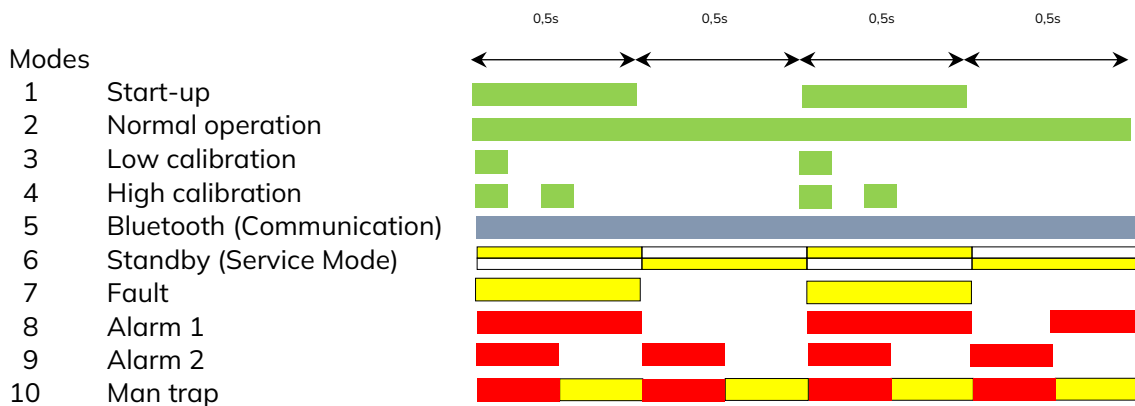
6 Description of operation

6.1 Start-up

When power is applied to the GJD-MM1, a start-up sequence is started testing that the signal coming from the sensor is stable, the heat-up timer WUT is over and no errors are detected. Then it goes to normal operation. If there is not connected a detector to the monitor after start-up, it will go into Fault mode.

6.2 Modes

At the edges of the lid a colored backlight indicates the mode of the monitor.



Mode 5) Bluetooth not implemented.

- 1) The monitor is either in the initialization phase, the WUT (warm up timer) is active or the sensor signal is not stable. If the monitor has a WUT due to sensor heating, this can be ignored if the front reset button is activated. Flash frequency 1 Hz.
- 2) Normal operation without communication, calibration, fault, or alarms.
- 3) Zero-calibration without gas. One short flash followed by a long pause.
- 4) Span calibration with test gas. Two short flashes followed by a long pause.
- 5) Bluetooth communication is indicated by blue backlight. Not implemented.
- 6) Standby mode allows you to calibrate with a high gas concentration, without activating the relays. This is particularly useful doing the annual service.
- 7) If the sensor signal is below the fault limit, a fault is indicated with a 1Hz yellow backlight flash.
- 8) When the low alarm level is exceeded, the red backlight flashes 1 Hz.
- 9) When the high alarm level is exceeded, the red backlight flashes quickly 2 Hz.
- 10) Activation of the mantrap button, the red and yellow backlight flashes quickly 2 Hz.

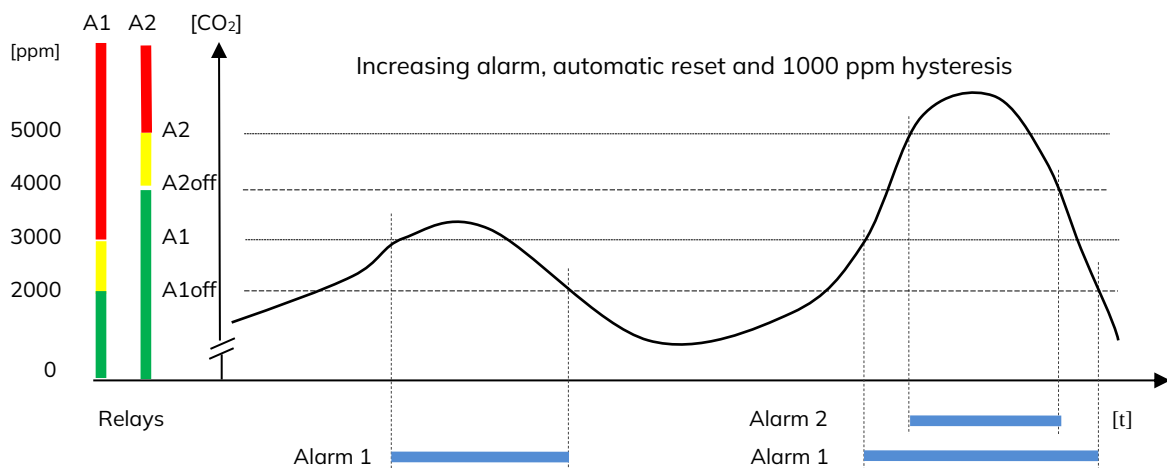
7 Alarm and fault

The GJD-MM1 has two potential-free relays to control external functions. The relays can be configured as two relays for alarms or one relay for alarm and one relay for fault. The settings are configured by agreement on delivery.

7.1 Alarms

The GJD-MM1 has the possibility of two internal alarm supervisors that work independently. When the gas concentration exceeds the alarm limit, the GJD-MM1 will go into alarm mode, which is indicated by the red flashing backlight color and the corresponding relay being activated. See page 12.

The internal alarm supervisors can be programmed to activate alarms for either increasing or decreasing gas concentrations, with an “alarm off” level that indicates a hysteresis between alarm on and alarm off.



If alarm 2 is not assigned to a relay, the red backlight will not indicate that the alarm on is exceeded.

7.2 Alarm Setting

The two alarm functions can be configured in the Alarm & Fault menu using the terminal program. In addition to set the alarm on level and the alarm off level, it also determines whether the alarm is started at increasing or decreasing levels. Eg. if the alarm off have a higher value than the alarm on it gives an indication of a decreasing gas concentration. The levels are always entered in % of Full Scale [%FS].

The reset function gives an opportunity to choose between automatic reset or manually reset. The latter will only suspend the red backlight and de-energize the relay when the front button is activated and the gas level is below the alarm on level.

7.3 Fault

If the GJD-MM1 enters fault mode it will turn on the yellow flashing backlight color.

An assigned fault relay is always energized during normal operating mode and will be de-energized if a fault occurs. Beside indicating that a detector is missing this feature also allows for an indication if the supply voltage fails.

7.4 **Fault Setting**

The fault function can be configured in the Alarm & Fault menu using the terminal program. A fault is detected if the sensor value is under a certain level relative to the sensors zero gas level V0.

Even if there is not assigned a relay to the fault function, a detected fault is indicated by a yellow flashing backlight.

7.5 **Relays**

The two relays have all output connections available on the terminal-block, giving the possibility to choose either a break function (C - NC) or a make function (C- NO). Relay K1 is always assigned to alarm 1.

Relay K2 is assigned to alarm 2 or to the fault detection. See 0 Relay K2, for the setting of the relay.

8 Settings

The settings are configured by agreement upon delivery.

8.1 *Service (Service/Online)*

During calibration of the monitor/detector the relays can be put into Service mode, preventing the alarm relays from changing state. In this mode a yellow blinking backlight will appear at the edge of the lid and the K2 relay will de-energize if assigned to fault. Changing back to Online mode the green backlight reappears and K2 relay will energize again if assigned to fault.

Value	Line
0000	Service
→ 0001	Online

8.2 *Relay K2*

The relay K2 can be assigned to two different events. Fault or Alarm 2. If used as Fault, it is always energized during normal operating mode and will be de-energized if a fault occurs. This feature allows for an indication if the supply voltage fails.

Value	Relay K2 = Event
0000	K2 = Fault
→ 0001	K2 = Alarm 2

8.3 *Reset button*

When the monitor is past the delayed start (WUT), the reset button on the lid can be used to release an Alarm 1 and an Alarm 2 even though gas is present. Reset can be used to silence an external heavy-duty sounder.

Value	Reset
0000	None
0001	K1
→ 0002	K2
0003	K1 and K2

Note: Fault assigned to relay K2 cannot be reset.

8.4 *Sounder*

The frequency of the internal buzzer can be slightly changed or turned off. If mantrap is detected, the sounder will always be activated even if it is set to silent

Value	Buzzer
0000	Silence
→ 0001	4,0 kHz
0002	3,9 kHz
0003	Alternating 1/2

8.5 *Mantrap*

When the monitor detects that the mantrap terminals are open, the relays will be activated according to the table on the right. If K2 is being used as a fault relay, it is deactivated.

Value	Activated
→ 0000	None
0001	K1
0002	K2
0003	K1 and K2

8.6 *WUT*

If a sensor needs time to settle a stable output signal after startup, a Warm-Up Timer gives a delay start in the range from 0 to 9999 seconds. Default is 60 seconds. If the reset button on the lid is activated during delay start, the remaining time is skipped.

9 Calibration

For optimal safety, the GJSL-CO2 and the GJD-MM1 must be tested and calibrated annually. For many installations, this is also a statutory requirement. A complete calibration consists of a zero calibration, followed by a span calibration both with test gasses. To prevent the relays and the internal buzzer from being activated during a calibration, the monitor can be put into Service mode. This will turn the color to blinking yellow backlight. See 6.2 Modes. Remember to end service mode when the calibration is completed, and the sensor no longer is affected by the test gas.

Note: Calibration must only be performed by qualified personnel.

9.1 Calibration equipment

To calibrate this system, access to a terminal program is a necessity. See section 4.1. Green or yellow backlight must be on without blinking, indicating normal operation. In addition, two gasses fitted with a valve, a flowmeter and a suitable length of soft plastic hose are also needed.



9.2 Test gas on aerosol cans

The detector is designed with a hole at the bottom right side. This hole is intended to facilitate the inflow of test gas during calibration. This way the gas is forced in through the bottom hole and out through the two side holes of the detector. This method makes it possible to use a moderate amount of gas for the calibration.

9.3 Zero calibration

A correct zero calibration demand a test gas with 100 % nitrogen. Apply gas to the detector and start a calibration at the terminal program. The green backlight will give one short flash followed by a long pause until the zero calibration is over. In addition, a short sound can be heard from the buzzer when the calibration finish. See section 6.2 Modes.

9.4 *Span calibration*

Add test gas to the detector (Typical 5000 ppm CO₂) and start a calibration at the terminal program. The green backlight will give two short flashes followed by a long pause until the span calibration is over. See section 6.2 Modes. In addition, a short sound can be heard from the buzzer when the calibration finish span calibration.

9.5 *Equipment and order codes*

Set of communication cables (2 pcs.) Geopal (RJ45-10p and USB-RJ45)	TEST-1038
Valve with flowmeter and hose	TEST-1020
Filling adaptor w/manometer	TEST-1071
Test gas for span calibration (CO ₂ - 5000 ppm)	TEST-1015

10 Warranty and Disposal

10.1 Warranty

Warranty coverage

Geopal System A/S provides a 1-year warranty, starting from the date of sale to the end-user. The warranty period must be documented with the original invoice or receipt. The warranty covers defects attributable to the materials and/or workmanship.

Warranty period

The warranty period begins at the date of delivery of the product to the first end-user. If the date of purchase cannot be documented, the warranty period will start at the date of production, as indicated on each product.

Warranty is void if production labels are altered, modified, or missing.

Warranty scope

The warranty does not cover labor costs for installation of replacement products or components, where Geopal System A/S chooses not to repair the product. The provision of replacement products or accessories does not extend the original warranty period. Geopal System A/S reserves the right to offer a similar replacement product or component if the original is no longer available at the time of the complaint.

Coverage pursuant to the warranty requires that the end-user can demonstrate that defects or damages have not directly or indirectly occurred because of:

- a) Faulty installation, i.e. installation contrary to the installation instructions or (in the absence of such instructions) contrary to good craftsmanship,
- b) Installation outside recommended installation areas,
- c) Misuse or abuse,
- d) Use of incompatible spare parts or accessories,
- e) Transportation, installation, or other type of handling,
- f) Product modifications,
- g) Other defects or damage not caused by material, production, or structural faults, if the preceding enumeration is not exhaustive.

Moreover, coverage pursuant to the warranty is conditional on the end-user demonstrating that defects or damages are not directly or indirectly attributable to failure (or that defects, damages and defects could not be prevented by) performing maintenance as prescribed in the instructions and maintenance manual.

Written complaints

To invoke this warranty, the end-user must submit a written complaint during the warranty period to Geopal System A/S or the retailer where the product was purchased. This must occur within two months of when the end-user discovered, or ought to have discovered, the defect.

Geopal System A/S shall then determine whether the product will be repaired, replaced or whether to refund the purchase price.



Repairs under the warranty

Unless Geopal System A/S provides otherwise, the end-user is responsible for the repair. The warranty covers the free supply of spare parts/materials necessary for the end-user's repair of the defect.

Replacement

Redelivery will occur by replacement free of charge of the old product with a new product of the same kind, type, and quality. If, at the time of the complaint, the product is no longer produced or is not produced in the exact same version, Geopal System A/S shall be entitled to exchange it for a similar product.

Transportation/shipping to and from Geopal System A/S and/or the dealer and any dismantling and reassembly of the product shall be agreed with Geopal System A/S before implementation, and if this occurs, the customer shall cover the costs.

The warranty does not cover the following

This warranty does not apply to products other than those listed under "Coverage of the warranty". For accessories, including pre-installed accessories, refer to the manufacturer's warranty, where available. Other Geopal System A/S products, regardless of whether these are pre-installed, are covered by the separate conditions stipulated in this warranty, including those relating to the warranty period referred to under "Warranty coverage".

Geopal System A/S accepts no liability for consequential damages, including consequential loss, or product liability other than what may follow from mandatory legislation.

Geopal System A/S accepts no liability for losses resulting directly or indirectly from circumstances over which Geopal System A/S has no control, including eg. strike, lockout, fire, war, blockades, import restrictions, political unrest, unusual natural occurrences, vandalism or other force majeure.

Geopal System A/S accepts no responsibility for products that are not produced by Geopal System A/S, regardless of whether they are sold or displayed together with the products listed under "Warranty coverage".

10.2 Disposal of electrical and electronic products

This product complies with the requirements for marking in the WEEE Directive (2002/96/EC).

The affixed label indicates that this electrical/electronic product must not be disposed of with household waste.



Product category

In relation to Annex 1A of the WEEE Directive 2002/96/EC, the product can be classified in Category 9: "Monitoring and control instruments".

Must not be disposed of via household waste!

More detailed information on environmentally safe disposal of electrical and electronic waste, such as waste equipment, or parts thereof, may be obtained by contacting your dealer. Look at Geopal System A/S website, as marked on the product.

11 Technical specifications

11.1 General Specifications - Monitor

Model	GJD-MM1 second edition
Supply voltage	85 to 265 VAC
Power consumption	18 W max
Sound Level	≥ 90 dB (sounder mounted in front cover)
Frequencies and Patterns	Continuous at 4000 Hz Continuous at 3900 Hz Alternating 4000 Hz / 3900 Hz
LED lights	RGB
Relay contacts	2 relay outputs for alarm or 1 relay for alarm and 1 for fault Signal contact 230 V/3 A Minimum switch load 500mW
Voltage output	12 VDC (1,0 A)
Cabinet	ABS/Polycarbonate
IP rating	IP 65 DIN 60529
Weight	0,34 kg
Mechanical dimensions	151 x 80 x 61 mm (LxWxD)
Operating temperature	-20°C to +70°C

11.2 General Specifications – Detector

Model	GJSL-CO2
Supply voltage	12 VDC (< 0,2 A)
Gas	Carbon dioxide (CO2)
Detecting range	0-2.000 ppm, 0-10.000 ppm, 0-30.000 ppm
Response time T90	< 30 sec.
Repeatability	< 2% of FS range
Long-term stability	< 3% FS / 12 months
Sensor lifetime (estimated)	> 15 years
Sensor	NDIR
Material housing	POM, black
Weight	0,25 kg (GJSL-CO2)
Mechanical dimensions	155 x 80 x 25 mm (LxWxD)
Operating temperature	-20°C to +50°C
Operating humidity	0 %RH to 95 %RH not condensing
Operating pressure	1013 mbar ±10 %
Storage temperature	-25°C to +55°C
Storage humidity	0 %RH to 95 %RH

11.3 Approvals

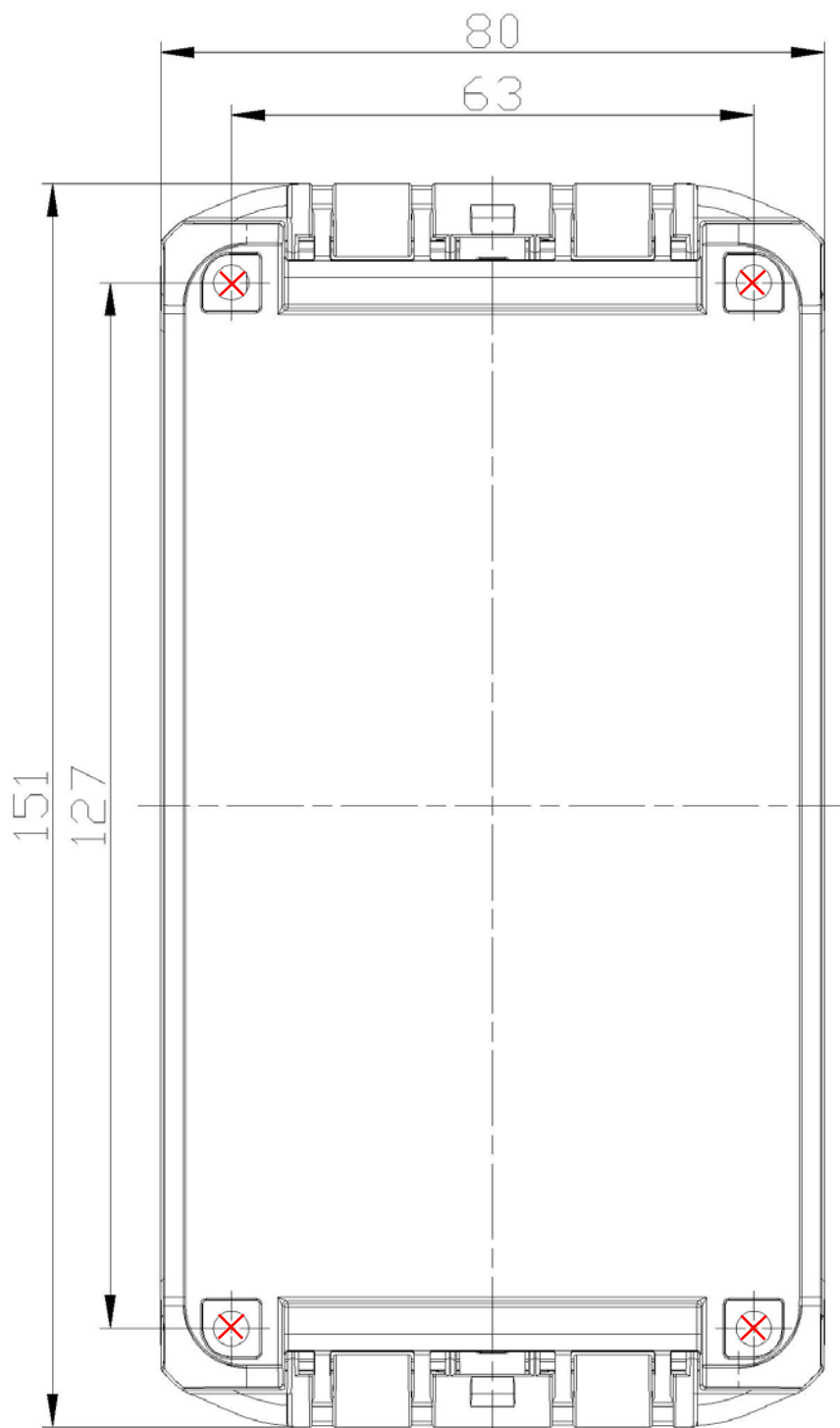
Approvals	Low Voltage Directive 2014/35/EU Electromagnet Compatibility Directive 2014/30/EU EN 61 000-6-2 (2019) EN 61 000-6-4 (2019) EN 50 270 (2015)
Quality	ISO 9001:2015

12 Appendices

12.1 Mounting templates

Mounting template for the monitor GJD-MM1.

1:1



Mounting template for the detector GJSL-CO2.

1:1

