GJD-02C / GJD-04C

Instruction and Maintenance Manual



geopal®

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PENDING ITS-I 23ATEXQ36745 DBI reg. no 233.301 DIC444QMS

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1 Safety

Important
Please read this user's manual carefully before the GJD-02C and GJD-04C is put into operation.

To ensure a safe installation of the GJD-02C and GJD-04C 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 supply voltage corresponds with the voltage indicated on the type label.

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

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2 Declaration of conformity

The producer

Geopal System A/S
Bygmarken 19
DK-3520 Farum

declares that the specified product:

Type: GJD-02C and GJD-04C
Name: Gas alarm monitor

conforms to the following directives and standards:

Low voltage Directive 2014/35/EC
EMC directive 2014/30/EU

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

Type: GJ-C / GJ-C-V
Name: Detector for unclassified areas

ATEX directive 2014/34/EU

EN 60079-0 (2013)
EN 60079-1 (2014)
EN 60079-7
EX-certificate TÜV 16 ATEX 176482 X

Notified body by CENELEC / ATEX: TÛV 0044

IECEx certificate no. **TUN 11.0006X**
IEC 60079-0 (2013)
IEC 60079-1 (2014)

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
Producers signature

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3 System description

3.1 Gas Alarm Monitors

Gas alarm monitor type GJD-02C is used where only one detection point is required, i.e. one gas detector.



Fig. 1 GJD-02C

Gas alarm monitor type GJD-04C is used where two detection points are required, i.e. two gas detectors.



Fig. 2 GJD-04C

The purpose of the alarm monitor is to receive and evaluate the signals from the detector(s), perform the necessary signal processing and give gas warning and gas alarm. In the following text “Gas warning” and “Gas alarm” will be called “Low alarm level” or “ALARM1” and “High alarm level” or “ALARM2” respectively.

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External functions such as ventilation systems, electromagnetic valves, disconnection of power supply etc. in case of gas leakage are controlled through the alarm monitor relay circuits.

The alarm monitor is normally set for manual reset of alarm mode, but can be modified to automatic reset.

The alarm monitor consists of a detector circuit processing the signal from the detector(s) and a power supply providing the correct operating voltage to the detector circuit and the detector(s).

The alarm monitor contains relay circuits for “Low alarm level”, “High alarm level” and “Fault” and is built into a sturdy plastic cabinet with a transparent front cover.

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3.2 Detectors

The gas detector type GJ-C is approved by the Danish Institute of Fire and Security Technology (DBI) and is suitable for use in unclassified industrial areas.

The detector can be fitted with a variety of sensors depending on the gas or vapour to be detected.



M20 cable gland

Fig. 3 Detector GJ-C for use in unclassified non-hazardous areas

The gas detector type GJ-EX is approved by the Danish Institute of Fire and Security Technology (DBI) and is an explosion-proof detector for use in EX classified areas (Zone 1), industrial areas classified as explosive or otherwise aggressive environments.

The detector can be fitted with a variety of sensors depending on the gas or vapour to be detected.



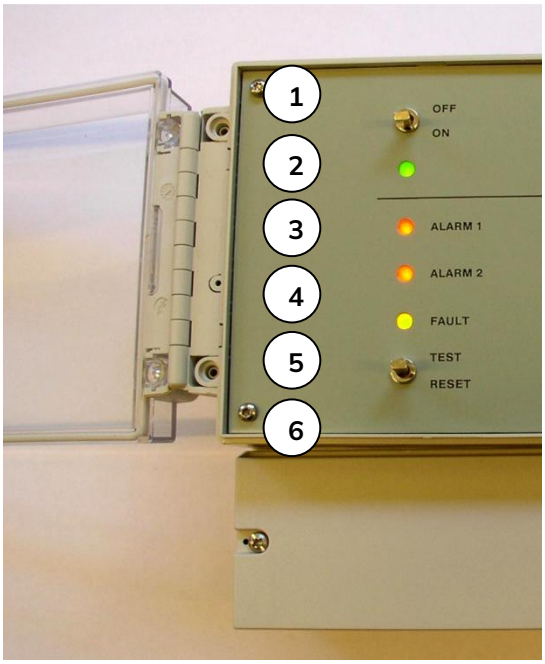
M20 cable gland

Fig. 4 Detector GJ-EX for use in zone 1 hazardous areas

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4 System function

4.1 Front Panel Overview



1. On/off switch
2. ON indicator (Green)
3. Low alarm level indicator (A1) (Red)
4. High alarm level indicator (A2) (Red)
5. Fault indicator (Yellow)
6. Test/reset switch

4.2 System Behavior on Initial Power On

If the switch (1) is in ON position when power is connected, the monitor may go into fault mode, thus activating both the yellow fault LED (5), the fault relay and the internal buzzer. This is a normal reaction, and often happens when the sensor is cold. After a few minutes the fault condition can be reset by pressing test/reset switch (6) downwards.

If the switch (1) is in OFF position when power is connected, the yellow LED (5) FAULT will be on to remind the operator that the monitor should be switched on.

4.3 Operating Mode

When the switch (1) is in ON position, the green LED (2) will be on and the system is in operating mode.

4.4 Alarm Mode A1 (low alarm level)

At gas concentrations corresponding to the set value for alarm 1, the alarm monitor will go into alarm mode indicated by the red alarm LED (3) marked ALARM 1. The alarm 1 relay is activated and the internal buzzer sounds.

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4.5 Alarm Mode A2 (high alarm level)

At gas concentrations corresponding to the set value for alarm 2, the alarm monitor will go into alarm mode indicated by the red alarm LED (4) marked ALARM 2. The alarm 2 relay is activated and the internal buzzer sounds.

4.6 Fault Mode (F)

Unlike the alarm relays, the fault relay is constantly energized during operation. This makes it possible to receive an alarm in case of a power failure.

If the alarm monitor is switched off on the front plate, the yellow LED (5) marked FAULT will light and the fault relay is deactivated.

If the sensor element is damaged or if the detector cable is disconnected, the alarm monitor will enter fault mode. The yellow alarm indicator LED (5) marked FAULT will be on, the fault relay is deactivated and the internal buzzer sounds.

4.7 Reset of Alarm Mode

When the gas concentration has decreased to a level below the set alarm limits, the alarm monitor can be reset by pressing the reset switch (6) downwards.

Fault mode cannot be reset until the fault has been corrected.

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4.8 Automatic Reset

On delivery the alarm monitor is set to manual reset function. This applies to all alarm circuits: A1 (Alarm 1), A2 (Alarm 2) and F (Fault). If desired, the alarm circuits can be set individually to automatic reset function.

This is done as follows: Remove the four screws that secure the front panel of the alarm monitor and lift up the panel, thereby gaining access to the PCB mounted on the reverse side of the front panel. On the back of the PCB are three jumpers marked X14, X15 and X16. X14 applies to Alarm1. X15 applies to Alarm2 and X16 applies to Fault.

When a jumper is placed on pins 1-2, the alarm function is changed to automatic reset for the circuit in question.

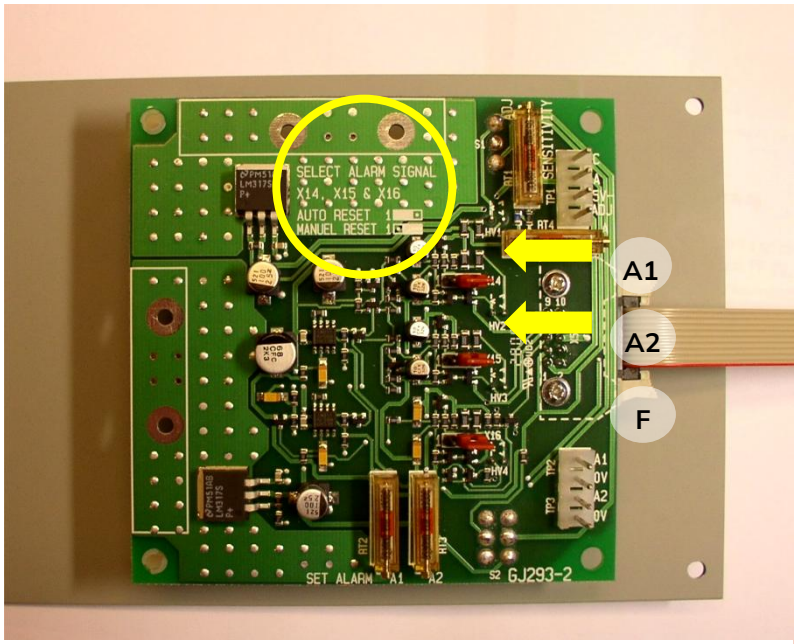


Fig. 5 The alarm function settings can easily be changed.

4.9 Test Function

Test/reset switch (6) allows an electrical test of the system. When the switch is held in the position marked TEST, both alarm circuits are activated. After testing, reset is done as previously described by pressing the same switch downwards

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5 Installation instruction

5.1 Detector

The detector should be installed where gas leakages may occur or near exhaust systems so that gas will be drawn past the detector.

The detector should be placed below the ceiling for light gases or 10-15 cm above the floor for heavier gases, depending on the air movement in the area.

The detector is connected to the gas alarm monitor through a 3-core cable 1 or 1,5 mm2 with braided shield.

The terminals marked A, B and C in the gas alarm monitor are connected to the corresponding marked terminals in the detector. The shield must be connected in the gas alarm monitor. Please make sure that the shield does NOT make contact to the detector housing.



Fig. 6 The GJD-02C terminal blocks

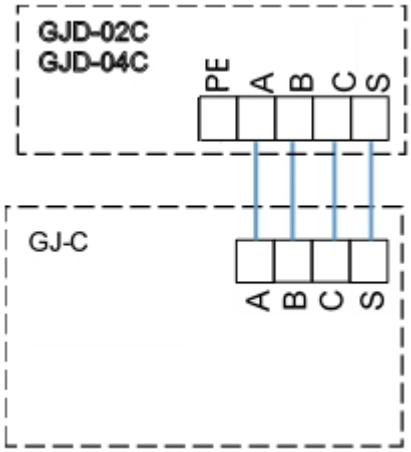
NOTE. AN.OUT - *Analog output is not in use in GJD-02C.*



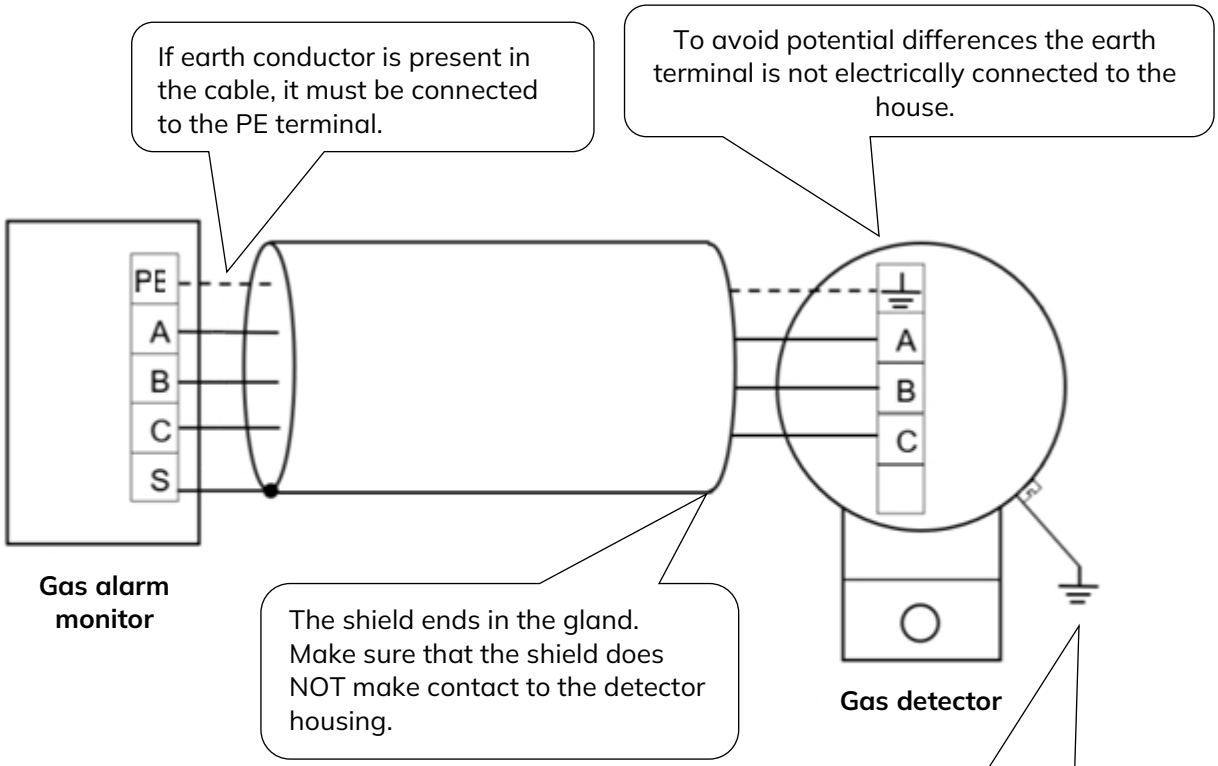
Fig. 7 The GJD-04C terminal blocks

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5.2 Connection of Detector GJ-C



5.3 Connection of Detector GJ-EX



Geopal System detector GJ-EX is SELV (Safety extra-low voltage according to IEC60950-1) circuits when connected to the gas alarm monitors.

This means that it is not required to have a PE (ground) conductor. Ground conductor is illustrated with a dotted line.

The EX/OX types of detectors must have an external ground connection due to the ATEX directive. It is especially important in this case that you avoid ground loops.

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5.4 Relay Contacts

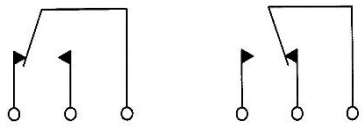
The detector should be installed according to the installation instructions supplied with the detector.

The terminals in the alarm monitor terminal block marked ALARM 1, ALARM 2 and FAULT are potential-free relay contacts for Alarm 1, Alarm 2 and Fault. The designations NC, NO and C are described below:

NC : Normally closed (Break switch)

NO : Normally open (Make switch)

C : Common (Relay switch)



Alarm relays Fault relay

Max. load: 250 V AC, 10 A. Relay contacts shown in normal operation

During normal operation, the Alarm 1 and Alarm 2 relays are un-energized whereas the Fault relay is energized.

5.5 Power Supply

A source of 230V AC / 110V AC / 24V DC is connected to the alarm monitor terminals marked correspondingly. The actual supply to your monitor is specified on the box label and on the data sheet.

Note: If incorrect power supply voltage is applied, permanent damage can occur.

5.6 Before Use

On delivery, the GJD-02C/04C is configured and calibrated as ordered. The only thing needed is to mount the alarm central in an appropriate place, connect the wiring and power up the unit.

Upon delivery the GJ-C detector is provided with a protective tape and plug. This is intended to prevent the sensor element from being exposed to smoke, gases, vapors, dust, etc. during construction and installation work. Tape and plug are removed when used.

5.7 Final Post-Installation Test

The alarm functions are blocked for the first 30 seconds after switching on the system. When all functions have been tested and found ok the system is ready for operation.

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6 Calibration

6.1 Calibration Overview

All sensor elements will change slightly over time for various reasons: the harshness of the installation environment, the frequency of gas exposures etc. Natural wear and tear will also affect the sensitivity.

The purpose of the calibration is to ensure that the gas alarm system will set off the alarm at the specified gas concentrations. On delivery, the gas alarm system is calibrated as ordered. During later calibrations, only the sensitivity of the sensor element is adjusted. The alarm level voltages initially set for alarm 1 and alarm 2 will need no further adjusting, unless new alarm levels are required (see section 6.6).

A new sensor element should be allowed a few days of operation to settle in to its environment. Therefore, the calibration should not be carried out until the system has been switched on for at least 24 hours.

As a reference for the alarm levels, a test gas corresponding to the high alarm level should be used.

A test gas corresponding to the low alarm level is not required for calibration but may be useful as a means of checking the alarms.



Fig. 8 Geopal System can deliver a wide selection of test gases.

6.2 Calibration Equipment

To feed the gas to the detector, a suitable length of flexible tube and a hose connector for detector type GJ-C, or a hose connector set for detector type GJ-EX, is required.
For the voltage measurements a digital voltmeter will be suitable.



Fig. 9 Test and calibration set for test gas cans with pressure

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6.3 *Applying Test Gas to the Detectors*

The gas detector type GJ-C is provided with a threaded hole (1/4” pipe thread) in the bottom of the sensor housing, while the GJ-EX detector has four threaded holes in the bottom detector part. The holes are to facilitate the inflow of gas.

On detector GJ-C the test gas is led to the hole at the bottom via the hose connector. This way the test gas is forced in through the bottom hole and out of the two side holes in the sensor housing.

On detector GJ-EX the test gas is led into one of the four side holes. The remaining three holes are covered with a calibration ring, which is slid over the bottom part of the detector. This way the test gas is forced in through one of the side holes and out of the bottom hole.

This method makes it possible to use a moderate amount of gas for the calibration. A flow of about 200 ml per minute will normally be sufficient. With a flow of 200 ml per minute 10 liters of test gas will allow approx. 50 minutes of gas flow.



Fig. 10 Detector GJ-C (left) and detector GJ-EX prepared for calibration

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6.4 Dismounting the Front Panel

Before the calibration can be carried out, the four screws securing the alarm monitor front panel must be removed. The front panel can now be lifted and turned over to make the potentiometers and the measuring terminals accessible.

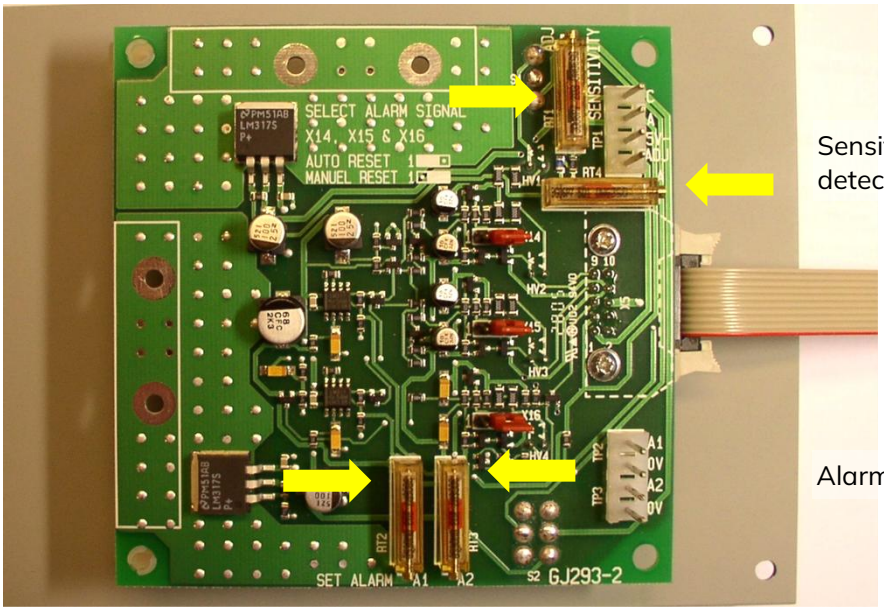


Fig. 11 The potentiometers and measuring terminals are easily accessible on the circuit board

6.5 Calibration / Sensitivity Adjustment

Typically, the alarm voltage is set at approx. 2.5-3.5 V at the high gas concentration. The exact voltage settings for the alarm levels are shown in the alarm system data sheet or can be supplied from Geopal System.

Gas	LEL (%)	GV (ppm)	Alarm 1	Alarm 2
Methane	X		10	25
			2.2 V	3.0 V

Example: excerpt from a data sheet showing the alarm levels and corresponding voltages.

Connect a voltmeter to the test terminals marked A (0V) and C (sensor output). Attach the hose connector to the threaded hole in the detector (and attach the calibration ring, if relevant). Fitted with the valve and flow meter, the can of test gas can be connected to the hose connector via the flexible plastic tube. Open the regulator and apply a suitable flow of test gas, as described above.

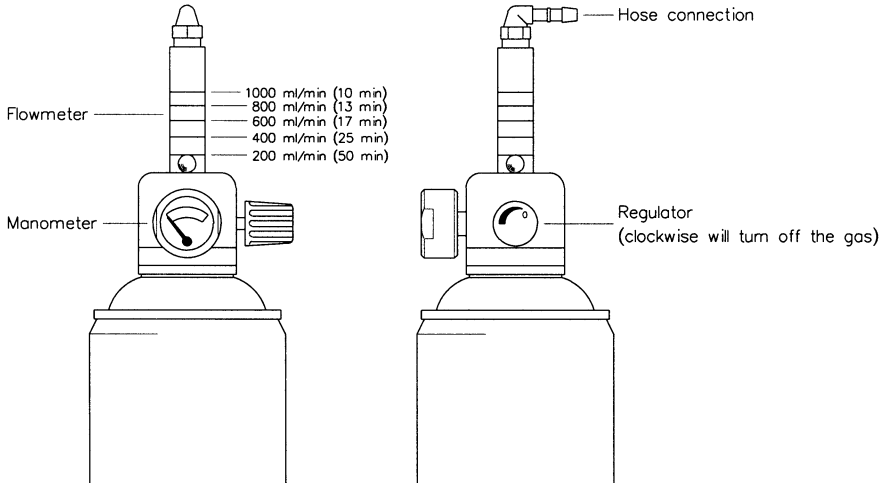
When the test gas reaches the sensor, the measured voltage will increase. Wait for a few moments until the voltage has stabilized. Adjust the potentiometer marked ADJ SENSITIVITY (RT1) to a voltage corresponding to the voltage shown in the data sheet (in this example: 3.0 V). If possible, leave the monitor in on position when performing the calibration to ensure that

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the alarm relays are activated. It is also possible to calibrate the monitor in off position. When the monitor is in off position the fault relay will activated and the alarm relays inhibited.

The alarm-level settings are unaffected by calibration, and there is no need to make further adjustments.

Disconnect the hose connector, gas cylinder and voltmeter.



The Geopal test gas cans are easy to use for calibration.

6.6 Adjusting the Alarm Levels

The alarm level settings are set on delivery and adjusting them should always be avoided unless new alarm levels are required.

Adjusting the alarm levels for Alarm 1 and Alarm 2 is done by first connecting the voltmeter between the terminals A2 and 0V.

Then adjust the potentiometer marked SET ALARM A2 (RT3). Set the voltage to the value corresponding to the voltage level for the high gas concentration, e.g. 3.0 V.

Next, connect the voltmeter between the terminals A1 and 0V. Adjust the potentiometer marked SET ALARM A1 (RT2) corresponding to the voltage level for the low gas concentration, e.g. 2.2 V.

Note: The values in the above description are only examples. Changing the alarm levels should only be done after first consulting Geopal System.

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6.7 *Adjusting the Detector Voltage*

The sensor has a typical working voltage of 5.0 V. In some cases the detectors are connected by long cables. This could be due to installation obstructions or where the gas alarm system covers a large area. The long cables can lead to a voltage drop which results in a decrease in detector performance.

As a rule of thumb: When the detector cable lengths exceeds 50 meters, the detector voltage should be checked and, if necessary, adjusted. The detector voltage is measured at the terminal block at the terminals marked A (0V) and B (detector voltage). Remember to measure the voltage at the detector-end, and not at the GJD-02C/04C end. It is recommended that an adjustment is made if the voltage is less than 4.9 V.

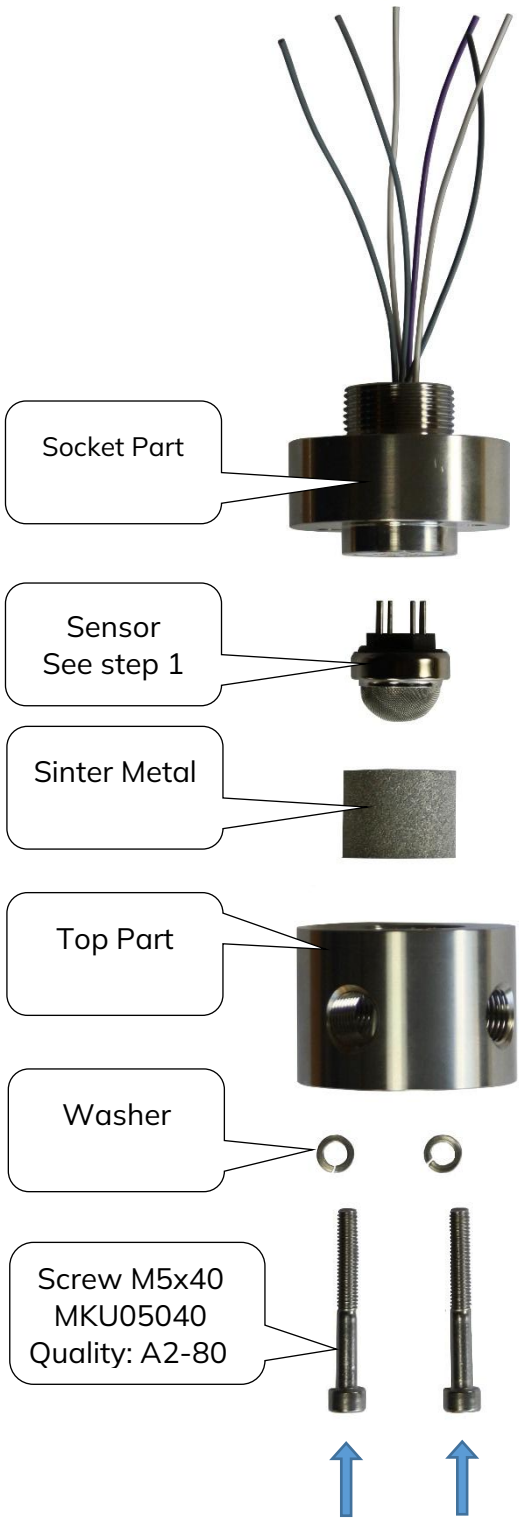
Connect the voltmeter to the terminals B (5V) and A (0V) in the detector and adjust the potentiometer marked RT4 in the alarm monitor until 5,0V is reached.

When do the sensor need to be replaced?

- If the zero voltage after calibration is higher than 1,2 V. (in clean air)
- If it isn't possible to adjust the sensitivity to the specified value when adding test gas (typical 3,0V)

Replacement of senor / filter

- GJ-C detector unscrew the detector nose and remove sensor.
- Detector GJ-EX Please see drawing below
- After mouthing new sensor wait min. 1 hour to ensure that the sensor is heated up.
- Perform calibration as described in chapter 6.5
- After having performed a success full calibration and test mark the monitor with calibration date and next calibration date. (recommended every 12 months)



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7 Maintenance

All sensors are affected by the environment in which it is located. Also, all technical equipment can go wrong for various reasons. Therefore we recommend a regular system test.

The following electrical test should be done once a month: The switch (6) is switched and held to the position marked “TEST” (see section 4.1), thus activating both alarm circuits. After testing, reset is done by toggling the same switch to the position “Reset”

Under normal circumstances an annual calibration and control is recommended. In harsh environments, it is recommended to have this done every six months. It is the responsibility of the system owner to see that the maintenance and calibration is carried out.

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8 Warranty and Disposal

8.1 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 labour 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, damage and defects could not be prevented by) performing maintenance as prescribed in the instructions and maintenance manual.

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Written complaints
In order 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".

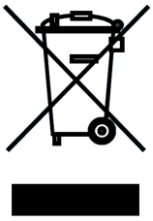
Geopal System A/S accepts no liability for consequential damages, including consequential loss, or product liability other than what may follow from mandatory legislation.

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 e.g. 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".

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8.2 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

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9 Technical Specifications

9.1 General Specifications

Model	GJD-02C & GJD-04C
Available gasses	Depends on the detector
Response time T90	< 5 seconds, depending on gas type
Detecting range	0-100% LEL, 0-40.000 ppm
Calibration	Calibrated to specified type of gas/refrigerant
Repeatability	±5%
Cabinet	ABS/Polycarbonate
Front panels	Dull green, lacquered alminium with lithographic print
Indicators	Green, red and yellow LED plus internal sound indicator
IP rating	IP55 DIN40050
Weight	GJD-02C 1,3 kg GJD-04C 2,0 kg
Mechanical dimensions	GJD-02C 185x213x104,5 cm (HxWxD) GJD-04C 217x257x132,5 cm (HxWxD)
Operating conditions	-10°C to +50°C

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9.2 *Electrical Specifications*

Supply voltage	230V AC, 110V AC, 24V DC
Power Consumption	10 W
Relay contacts	Low and High alarm level and system fault Max. load is 230VAC 10A
Voltage output - sounder, flash, etc.	24V DC (2 Amp)
Cable between detector and monitor	3 conductors 1 or 1.5 mm^2 shielded

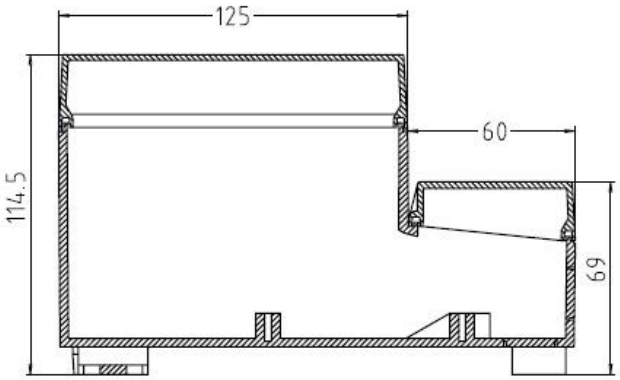
9.3 *Approvals*

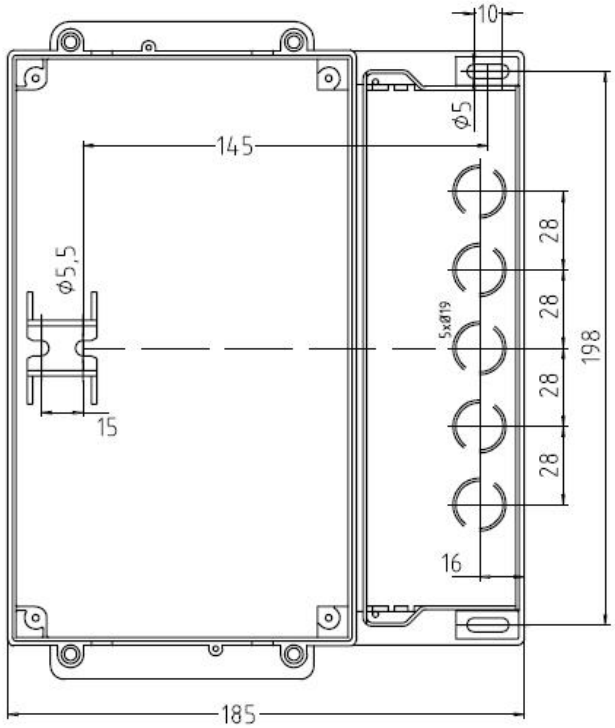
Approvals	Low Voltage Directive 2014/35/EC Electromagnet Compatibility Directive 2014/30/EU EN 61 000-6-2 (2019) EN 61 000-6-4 (2019) EN 50 270 (2015)
Quality	ISO 9001:2015

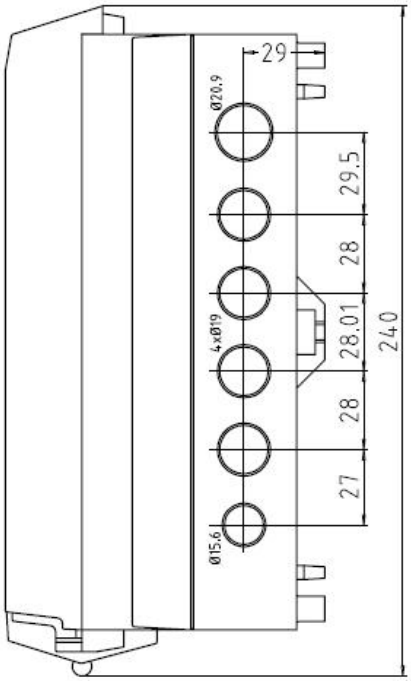
PENDING ITS-I 23ATEXQ36745 DBI reg. no 233.301 DIC444QMS

10 Illustrations

10.1 Gas Alarm Monitor GJD-02C

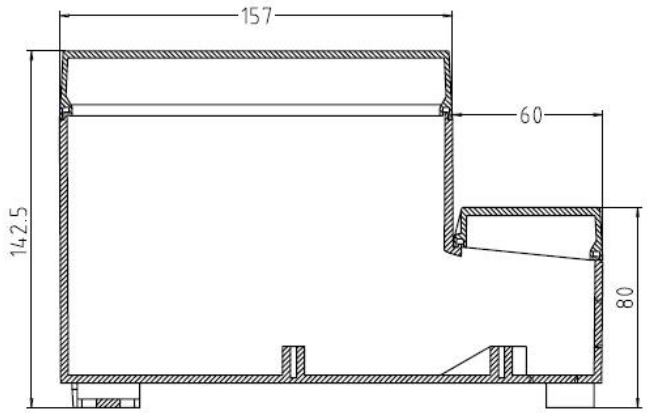


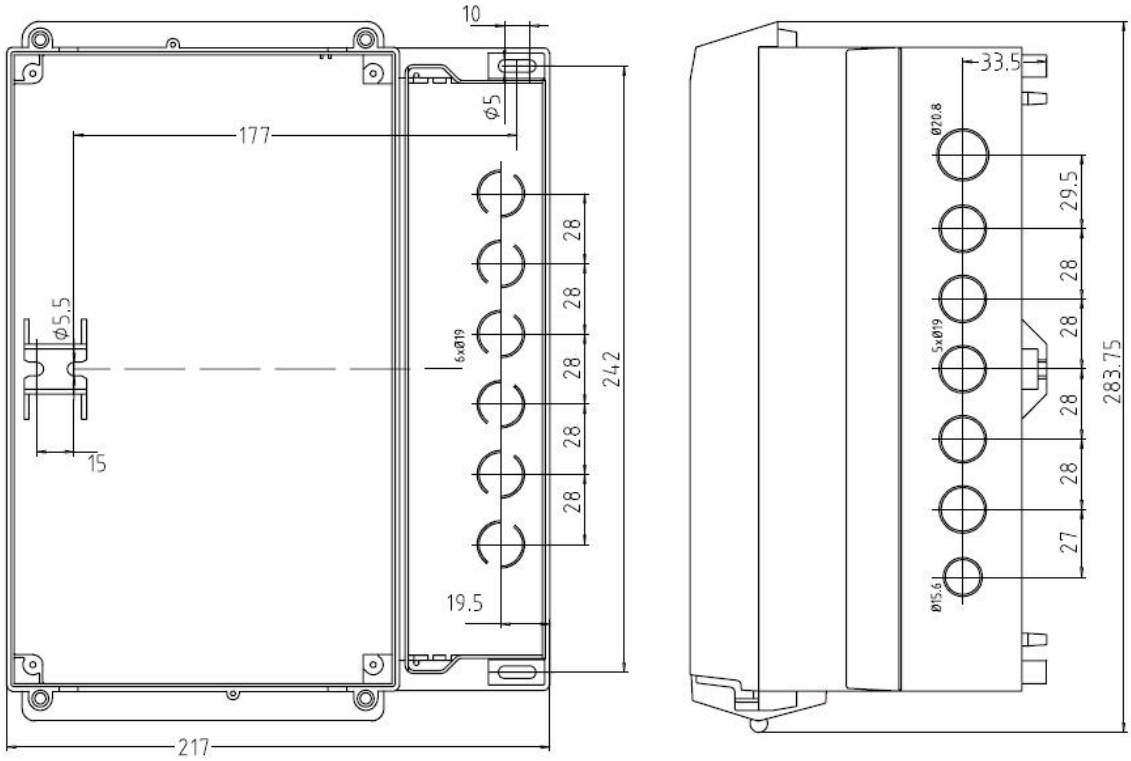




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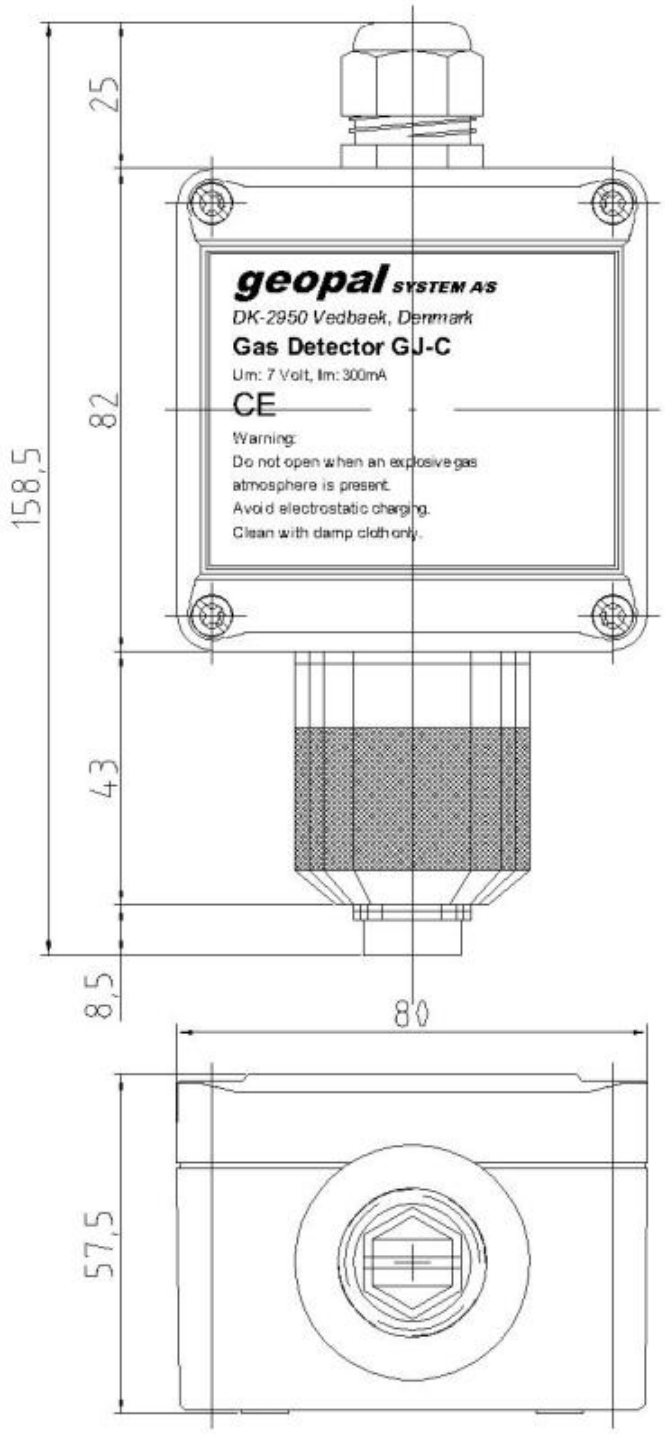
10.2 Gas Alarm Monitor GJD-04C





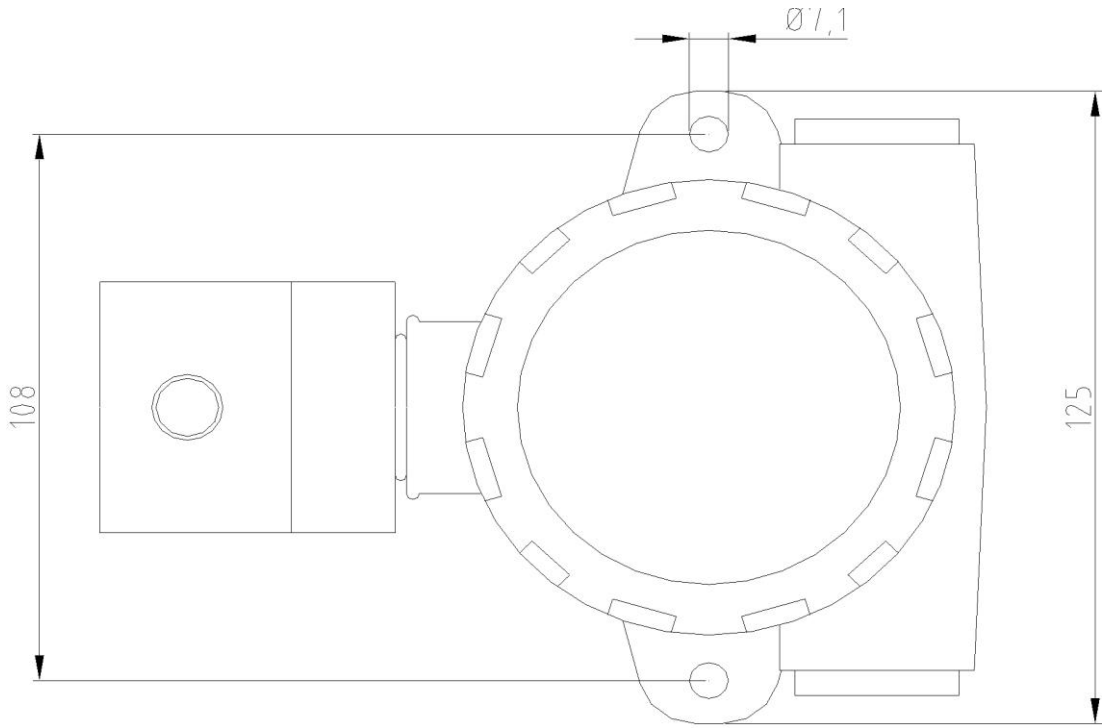
PENDING ITS-I 23ATEXQ36745 DBI reg. no 233.301 DIC444QMS

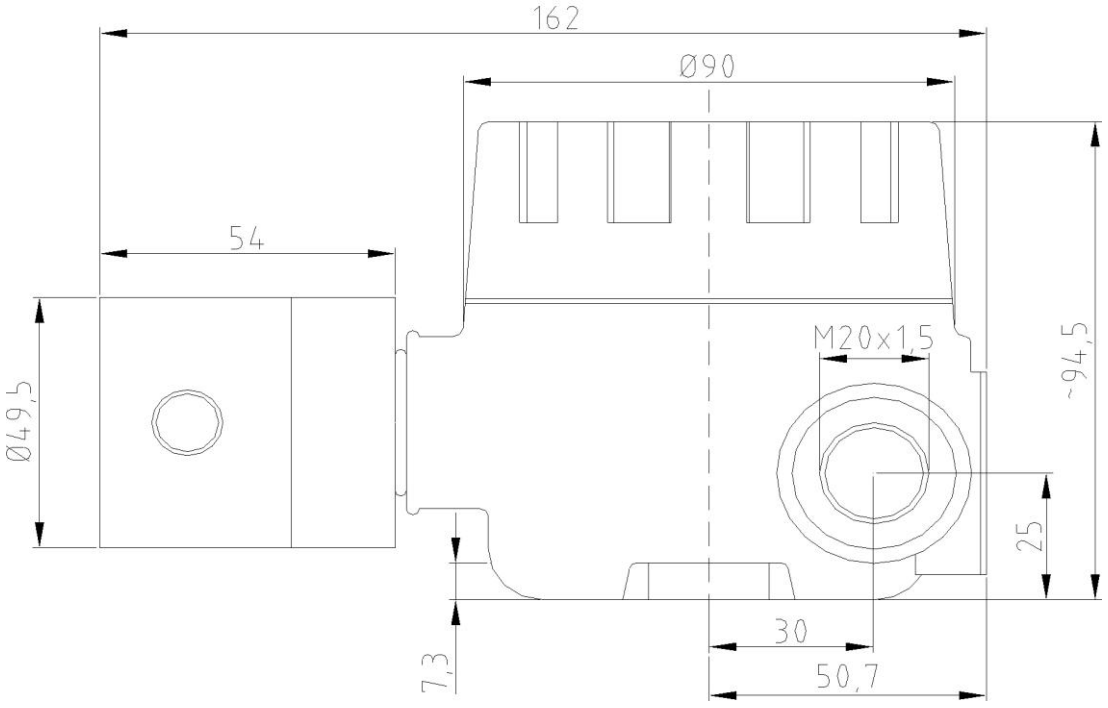
10.3 Gas Detector GJ-C



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10.4 Gas Detector GJ-EX





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11 Troubleshooting

Problem							
Green power LED is not on	Yellow fault LED is on	Red alarm 1 LED is on	Red alarm 2 LED is on	Red alarm 2 LED is on before alarm 1 LED	No alarm LEDs are on despite presence of gas		
1	2	3	4	5	6		Possible Reasons/Remedies
○						a	Check that the power supply is correct voltage and properly connected to the alarm monitor (see section 5.3).
○						b	Check that the power switch is in on position (see section 4.1).
○						c	Check that the fuse in the power supply is properly installed and intact.
	○	○	○			d	Try resetting the alarm monitor by pressing the reset switch (see section 4.7).
	○					e	Check that the detector is properly connected to the alarm monitor (see section 5.1).
	○					f	Check that the detector cable is connected properly to the detector box (see section 5.1).
	○					g	Check that the sensor element is properly installed in the detector.
	○					h	Measure the output from the detector between terminals A and C. If the voltage is less than approx. 100 mV the sensor should be replaced.
	○	○	○	○	○	l	Recalibrate the alarm monitor (see section 6).
	○	○	○	○	○	j	Replace the sensor element and recalibrate the alarm monitor (see section 6).
		○	○			k	Check for the possibility of an actual gas leakage in the room.
		○	○			l	Check for the presence of any gases in the room, since all sensors have a certain cross-sensitivity.
		○	○	○	○	m	Check that the alarm levels have not been maladjusted by accident (see section 6.6. Please bear in mind that the figures mentioned are only examples).
					○	n	Check that the alarm levels are not set at voltages too high to release the alarms at the current gas concentration.

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