

GP-SA / GP-SB / GP-ELK

Instruction and Maintenance Manual



geopal®

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1. Safety

Important

Please read this user's manual carefully before the GP-SA / GP-SB / GP-ELK is put into operation.

To ensure a safe installation of the GP-SA / GP-SB / GP-ELK 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

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:

**Type: GP-SA / GP-SB / GP-ELK
Name: Gas Alarm Detector**

conforms to the following directives and standards:

**Low voltage Directive 2014/35/EC
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
Manufacturer's signature

3. Functions

3.1. Application

Geopal GP-SA / GP-SB / GP-ELK is a stand-alone gas detector that can be connected directly with existing control and monitoring systems. The detector can also be connected with any of Geopal's other gas alarm monitors, eg. GJD-02C, GJD-04C, GJ-03R or GPU-45A.

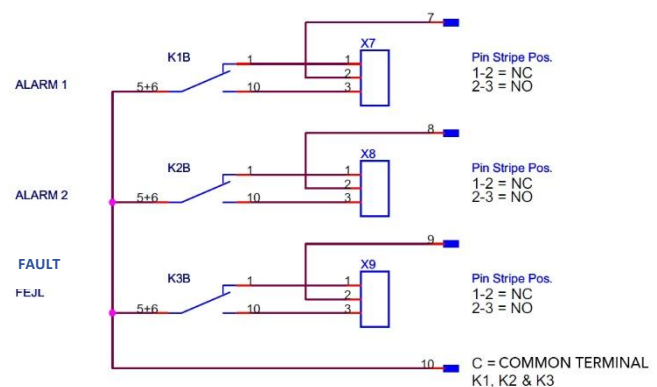
Geopal gas detector GP-SA / GP-SB / GP-ELK is designed to detect a wide range of gases and vapours. The detector continuously monitors the gas concentration. The specific setting and calibration of the individual detector will be indicated on the relevant data sheet and/or the type label.

3.2. Construction

The gas detector has two alarm levels, alarm 1 (low alarm or gas alert) and alarm 2 (high alarm). The requested alarm limit values must be specified when ordering. The current setting is indicated on the detector data sheet.

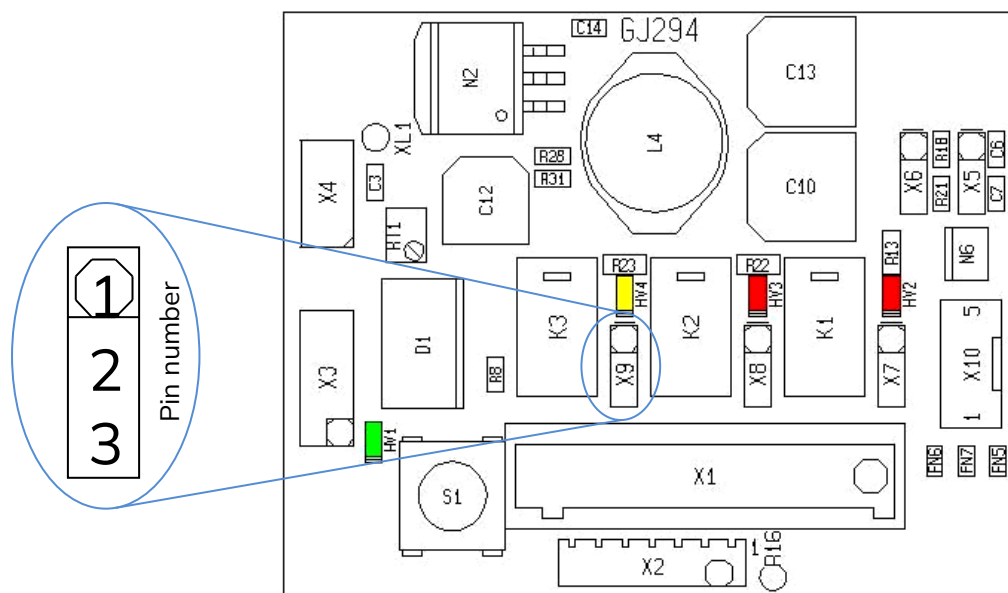
The detector can be delivered with an analogue output of 0-5 V, 0-10 V, or 4-20 mA. If the detector is configured with the lout option, 1-5 V and 2-10 V outputs are also available; see section 8.1. The preferred output must be specified when ordering. The analogue output can easily be changed if you wish to change the output from voltage to 4-20 mA (or the reverse), you should call a service employee from Geopal or hand in the detector for re-programming. The current output setting is stated in the calibration certificate supplied with the detector and on the type label.

The detector has three multi-purpose relay outputs with a common terminal one relay for low alarm and one for high alarm, plus one relay for fault (30 V/2 A, 230 V/0.1 A). These relays can control, via external effect relays, various functions, such as ventilation systems, magnet valves, disconnection of mains supply voltage, etc. The detector will automatically reset alarm and fault relays.



The detector does not have a galvanic separation of supply input and the analogue output.

The detector is encased in a sturdy plastic cabinet.



3.3. Operational mode

When the green LED, marked HV1, is blinking regularly and the yellow LED, marked HV4, is on constantly, the detector is in operational mode.

3.4. Alarm mode A1 (low alarm level)

In case of gas concentrations above the set value for alarm 1, the detector will go into alarm mode A1, which is indicated by the red LED marked HV2 turning on and relay K1 being activated. Depending on the positioning of jumper X7, relay contact K1 will either open (if NC) or close (if NO).

The table below shows the functions of the detector during normal operation – and during alarm 1:

	Normal	Alarm 1
NC (X7=1-2)	Relay K1 closed HV2 off	Relay K1 open HV2 on
NO (X7=2-3)	Relay K1 open HV2 off	Relay K1 closed HV2 on

3.5. Alarm mode A2 (high alarm level)

In case of gas concentrations above the set value for alarm 2, the detector will go into alarm mode A2, which is indicated by the red LED HV3 turning on and relay K2 being activated. Depending on the positioning of jumper X8, relay contact K2 will either open (at NC) or close (at NO).

The table below shows the functions of the detector during normal operation – and in alarm mode 2:

	Normal	Alarm 2
NC (X8=1-2)	Relay K2 closed HV3 off	Relay K2 open HV3 on
NO (X8=2-3)	Relay K2 open HV3 off	Relay K2 closed HV3 on

3.6. Fault mode

Unlike the alarm relays, the fault relay is always activated in the normal operational mode, which is indicated by the yellow LED, marked HV4, being on. This function ensures that the fault relay is deactivated and the yellow LED HV4 turns off in the event of a power failure.

The detector will go into fault mode, for instance if the sensor element is damaged or removed, or if the calibration of the detector is incorrect, which is indicated by the yellow LED, marked HV4, being turned off and relay K3 being deactivated. Depending on the setting of jumper X9, relay contact K3 will either close (at NC) or open (at NO). Note that this is the reverse of the alarm mode.

The table below shows the functions of the detector in fault mode:

	Normal	Fault
NC (X9=1-2)	Relay K3 closed HV4 on	Relay K3 open HV4 off
NO (X9=2-3)	Relay K3 open HV4 on	Relay K3 closed HV4 off

Theoretically, a combination of alarm and fault mode can occur. If, for instance, the fault mode is triggered by the need for correct calibration, the detector will still react in the event of a gas leakage. If, however, the fault mode is caused by a defective sensor, the detector will obviously not function correctly. Consequently, it is always important to investigate the underlying cause of the fault mode.

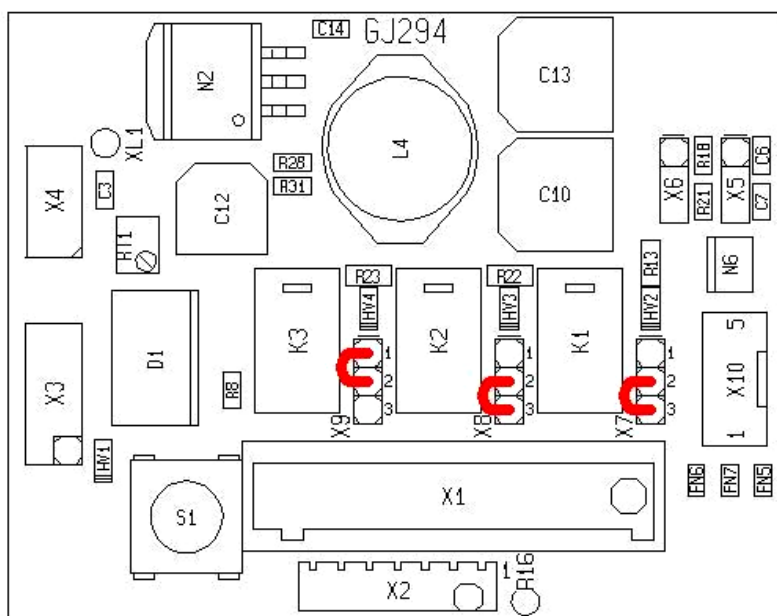
3.7. Resetting the alarm

When the gas concentration has dropped to a level below the preset alarm limits, the alarm is automatically reset. Resetting is not possible until the fault has been rectified.

3.8. Alternative signal on alarm relays

As an individual option on all alarm relays you can choose either NC (a Normally-Closed switch, i.e. a break contact) or NO (a Normally-Open switch, i.e. a make contact, or closing contact). On the printed circuit board there are three jumpers, marked X7 (A1), X8 (A2) and X9 (fault). By changing the position of the jumper, you change the alarm signal for the circuit in question. If the jumper is placed in position 1-2, the relay contact will function as a break contact (NC), and if the jumper is placed in position 2-3, the relay contact will function as a make contact or closing contact (NO).

In the example below the detector is set up with jumpers X7 and X8 in position 2-3 (NO) and jumper X9 in position 1-2 (NC):



A setup like this would result in the following functions for relays and LEDs in the detector:

Normal	Alarm 1	Alarm 2	Fault
Relay K1 open HV2 off	Relay K1 closed HV2 on	Relay K1 closed HV2 on	Relay K1 open HV2 off
Relay K2 open HV3 off	Relay K2 open HV3 off	Relay K2 closed HV3 on	Relay K2 open HV3 off
Relay K3 open HV4 on	Relay K3 open HV4 on	Relay K3 open HV4 on	Relay K3 closed HV4 off

4. Installation

Only qualified personnel must perform installation and assembly.

4.1. Detector

The detector is designed to be installed in places where gas leakage may occur or near ventilation systems where the air flow is led past the detector.

The specific density of the gas determines whether the detector should be placed high or low. Where heavy gases are concerned the detector may have to be placed as low as 15 cm above the floor, depending on the local air movements.

The detector should always be positioned so that the sensor is pointed downwards, i.e. with the cable coming out on top.

The detector should be protected with a steel bar or similar type of guard such as Geopal Detector Protection ([see website](#)), if it is mounted low and there is any risk that it may be hit by trucks or other vehicles.

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.

4.2. Electric wiring

The detector is connected to the central unit by a screened 4 to 8-conductor installation cable. The number of conductors depends on how many of the available outputs are required. The maximum conductor resistance should be 10 Ω per conductor (i.e. 20 Ω in loop).

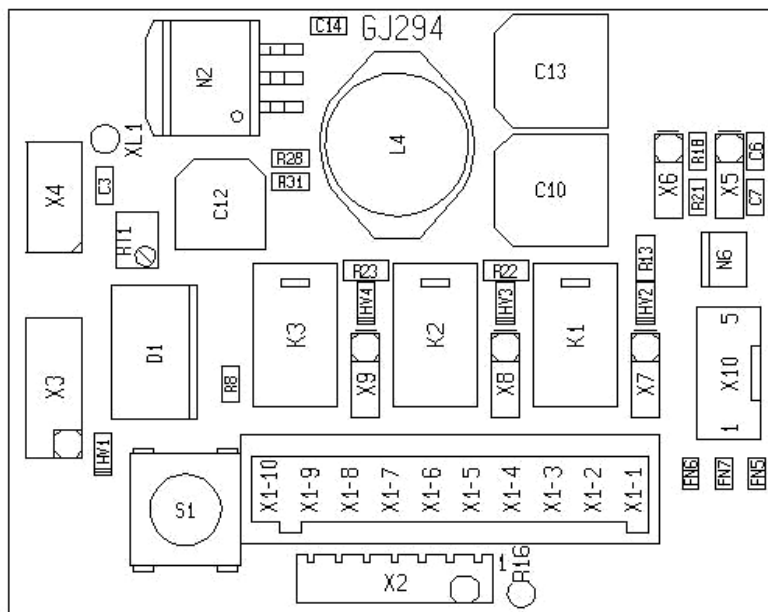
Supply voltage 12-32 VDC is connected to terminals X1-2 and X1-3 on the terminal strip. The shield to be terminated in the cable gland.

The specified analogue output is available on terminals X1-5 and X1-6.

The output signal for 4-20 mA or 0-5 V/0-10 V is found on terminals X1-5 and X1-6. For 4-20 mA output, the detector provides an active current signal.

Supply voltage and analogue output are **NOT** galvanically separated. When using a common GND with the DC supply, terminals X1-2 and X1-6 must be connected to the common GND.

The numbering of terminals on the terminal strip is indicated on the diagram below:



The table below shows an overview of the terminals on the terminal strip:

X1-1	Empty	
X1-2	Supply voltage (-)	12-32 VDC
X1-3	Supply voltage (+)	12-32 VDC
X1-4	Not connected	
X1-5	Analogue out (+)	V_{out} / I_{out}
X1-6	Analogue out (-)	V_{out} / I_{out}
X1-7	Relay out, Alarm 1	NC/NO
X1-8	Relay out, Alarm 2	NC/NO
X1-9	Relay out, Fault	NC/NO
X1-10	Relay in, Common	Common

4.3. Before use

On delivery, the detector may be fitted with a protective cap. The purpose of this is to prevent the sensor element from being affected by smoke, gases, vapours, dust etc. during construction and installation work as this may harm the sensor and result in alarm malfunction.

4.4. Final test after installation

When the supply voltage is turned on, the green LED will emit a series of short, separate blinks until the detector is operational. Meanwhile, the alarm function will be blocked.

When the green LED, marked HV1, is blinking regularly, the detector will be operational. In normal operational mode the red alarm LEDs will be off and the yellow fault LED will be on.

Normally, no calibration is required after installation, as the detector is already calibrated and tested before it is delivered. If you wish to check whether the analogue output is active and the relay functions are working properly, this can be done by using a test gas that has been produced especially for that purpose.

5. Calibration and Service

5.1. Test and calibration procedure for gas detectors

Detector type: GP-SA, GP-SA-V, GP-SB + GP-ELK.

The following information is stated in the calibration certificate. The original certificate can be obtained from Geopal. (Serial No. is required).

Sensor type, gas that needs to be detected (refrigerant, methane, hexane etc.)

Range (0-1000 ppm, 0-100 %LEL etc.)

Alarm levels, low alarm/high alarm

Test gas needed for span calibration (type and concentration)

Standard calibration

Remove cover on detector

Check status of LED's, correct is:

Green LED must be steady blinking, Frequency of 1 Hz

Yellow LED must be on

Red LED's off



If the green LED is not on, check the supply voltage and connection (12–32 VDC). If the supply voltage is correct, refer to the calibration certificate for information related to the individual detector.

If yellow LED is off or/and red LED's is on it can be due to insufficient calibration, perform calibration before further action. (First zero- then span calibration).

Note: Some sensors may require a stabilisation period of up to 1 hour after power-up. During this period, all LED's are on.

If LED's does not return to correct position after calibration replace sensor and perform new calibration.

If sensor replacement does not help replace the PCB and perform new calibration.

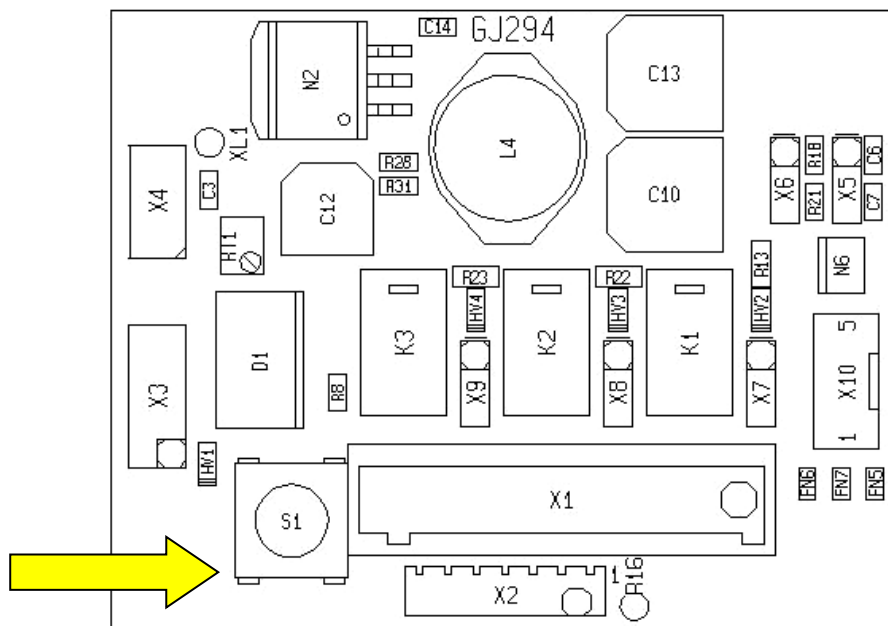
5.2. Zero calibration

Ensure that surrounding air is “clean” no strong smell from paint etc.)

Press calibration button on the detector hold down until green LED gives a short blink.

The LED will start to blink insynchronous, when green LED returns to steady blinking, by one Hz. Zero calibration is successful completed.

If analogue output is connected to central control system check reading. (must be 0).



5.3. Span calibration

Apply test gas using hose connector, valve with flowmeter, test gas can / aerosol can.

Set the gas flow according to the specification for the test gas can / aerosol can and flowmeter used.

Press calibration button until green LED gives a short blink. The LED will start to blink insynchronous, when green LED returns to steady blinking by 1 Hz span calibration is successful completed. Red LED's will be activated if alarm levels are under span point. If analogue output is connected to central control system check reading.

Remove test gas.

If the output goes to zero instead of span point when span calibration is completed it means that the output from the sensor when adding test gas has been so low that the detector has recognized it as a zero calibration and not a span calibration. This can happen if the sensor signal has declined since last calibration.

When the calibration button is pushed, the detector does not know if it is a zero or a span calibration but it compares the actual value with the stored V_o and V_a values.

If this happens replace the sensor or connect terminal program to detector.

Please see below Terminal program.

After completing the span calibration the output will drop, down to zero again, this can take up to one hour.

If the reading does not go down to zero and is indicating 0-2% of the range it can be necessary to perform the zero calibration again.

5.3.1 Span calibration after adding test gas

When does the detector perform span calibration after adding test gas and pressing the calibration button?

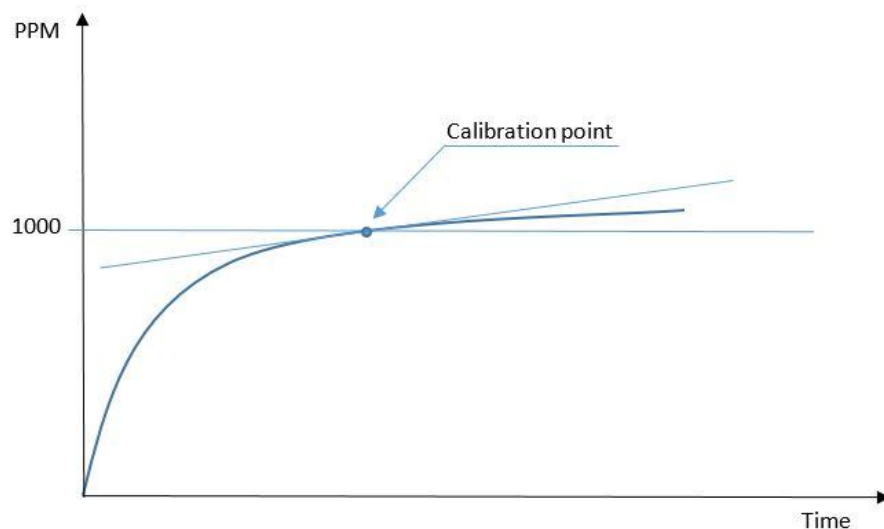
The program in the detector is set to perform the span calibration when the increase in the out-put signal from the sensor over a given time gets under a certain value.

This means that the output can keep increasing after the span calibration is completed. (Green LED has returned to steady blinking)

This is particular the case with semiconductor sensors for HFC and in particular when there is a built in coal filter.

A sensor with coal filter is used to avoid/minimize false alarms and destruction of the sensor element caused by other interfering gases (solvents, alcohol, silicon vapors).

Following curve is to visualize the sensor reaction over time. Span point is typically reached after 2 minutes after adding the test gas.



5.4. Terminal program for communicating with the detector

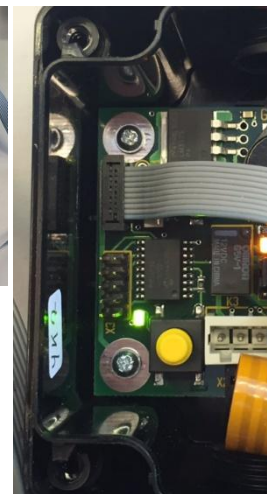
Sometimes it can be helpful to connect a computer to the detector by using a communication cable. Please refer to below for program download.

```
ID: ES01009A_0

Main Menu

1:  R1
2:  Ga
3:  Va
4:  Vo
5:  Analog Output
6:  A1
7:  A2
8:  Special Parameters

x: > Exit
```



Settings

- 1: R1: 1000, 2200, 4700 or 6800 factory setting not to be changed
- 2: Ga: Calibration point, percentage of full range
- 3: Va: Span (V) point from latest span calibration.
- 4: Vo: Zero (V) point from latest zero calibration.
- 5: Analog Output: 0001 for mA output / 0000 for V
- 6: A1: Low alarm ex. 0025% (setting of detector relays, 25% of full range)
- 7: A2: High alarm ex. 0050% (setting of detector relays, 50% of full range)
- 8: Special parameter:
 - Latch 1: 0000 (factory setting – do not change)
 - Latch 2: 0000 (factory setting – do not change)

If these values are changed, the detector can only be reset by power cycling.

Sensitivity limit: 01.50

Extra explanations

- 4: Va If span calibration fails as described in section 5.3, the value in Va can be overwritten. When test gas is added the voltage signal increases but if it only reaches ex. 1.4 V and the stored Va value is 3.0 V the detector will performed an zero calibration instead of a span calibration. In this case change Va to 1.5 V add test gas and perform new calibration.

0.87V	4.4%
0.88V	4.4%
0.89V	4.4%
0.90V	4.4%
0.91V	4.4%
0.92V	4.4%
0.93V	4.4%
0.94V	4.4%
0.95V	4.4%
0.96V	4.4%
0.97V	4.4%
0.98V	4.4%
0.99V	4.4%
1.00V	4.4%
1.01V	4.4%
1.02V	4.4%
1.03V	4.4%
1.04V	4.4%
1.05V	4.4%
1.06V	4.4%
1.07V	4.4%
1.08V	4.4%
1.09V	4.4%
1.10V	4.4%
1.11V	4.4%
1.12V	4.4%
1.13V	4.4%
1.14V	4.4%
1.15V	4.4%
1.16V	4.4%
1.17V	4.4%
1.18V	4.4%

If this occurs, redo the zero calibration, wait at least 15 min to make sure that the testgas no longer affects the sensor output.

- 5: A. out To test max output 20 mA change value from 0001 to 0100.
- 8: Special parameters

Sensitivity limit

When to replace the sensor: in the program there is a set value "sensitivity limit" setting is 1.5 (depending on gas and application the factory setting is from 1-1.5). If $V_{max} - V_o$ is smaller than 1.5 the detector goes into fault and out-put will be 2 mA and fault relay is activated (yellow LED is off), in this case the sensor must be replaced and a new calibration performed.

So as long as the calibration can be performed: zero in clean air + span and no fault occurs after calibration, the sensor is OK.

V_{max} is calculated (the value is not shown) based on R (set of resistance) G_a (span point) V_o & V_a .

5.5. Calibration procedure when computer is connected

Zero calibration

Ensure that surrounding air is "clean" no strong smell from paint etc.)

Press calibration button on the detector hold down until green LED gives short blink

On the computer screen an arrow pointing to the left will occur < and the green LED will start to blink insynchronous.

When * is shown on the screen and the green LED is steady blinking by 1 Hz, zero calibration is performed. Value shown on screen must be 0 % (voltage can vary from 0.1-1V).

Span calibration

Add test gas using hose connector, valve with flowmeter and test gas can / aerosol can.

Set the gas flow according to the specification for the test gas can / aerosol can and flowmeter used.

Press calibration button until green LED gives a short blink. The LED will start to blink insynchronous and on the computer screen an arrow pointing to the right will occur >. When * is shown on the screen and green LED returns to steady blinking by 1 Hz.

Remove test gas.

After completing the span calibration the output will drop, down to zero again, this can take up to one hour.

If the reading does not go down to zero 0-2% of the range it can be necessary to perform the zero calibration again.

5.5.1. How to install the terminal program

The terminal program is a free ware and can be downloaded free of charge.

Download Tera Term, from the internet. (it is free ware)

Install Tera Term.

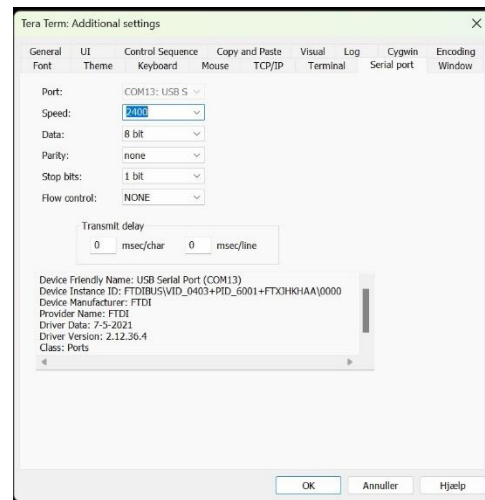
Before you start Tera Term connect a communication cable (TEST-1038) in USB laptop.

Wait until the USB driver has been installed. This is normally done automatically by the operating system.

Start Tera Term.

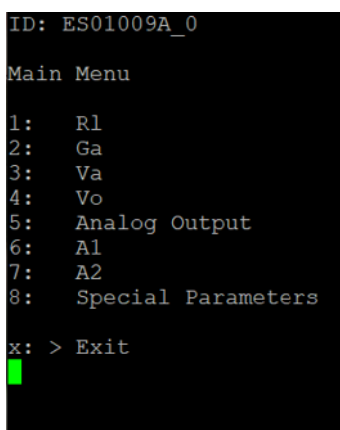
Go to Setup – Serial port and chose

Baud rate (Speed) : 2400
Data : 8 bit
Parity : none
Stop : 1 bit
Flow control : none

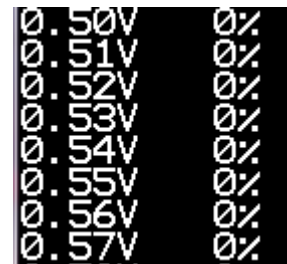


Go to Setup – Save setup and press save

When you are successfully connected this picture will be shown on the screen when tabbing ENTER



Or the actual values will appear:



Necessary calibration equipment:

Set of Communication cables (2 pcs.)
(RJ45-10pol and USB-RJ-45)

TEST-1038

Valve with flowmeter and hose

TEST-1020

Hose connector EX/OX/C/SA	TEST-1210
Filling adapter w/manometer	TEST-1071
Test gas for span calibration (type of gas to be specified by order)	TEST-1015

For test gas supplied in aerosol cans, see section 5.8.

5.6. Service interval

It is recommended that the detector is tested and calibrated once a year. For many installations this is also a legal requirement. A complete calibration comprises a calibration to zero followed by a calibration with a test gas.

5.7. Calibration equipment

In order to perform a calibration of the detector you need a test gas fitted with a valve and a flowmeter, a suitable length of soft plastic hose and a hose connector that will fit on the detector.

Before you perform the calibration, you loosen the screws that hold in the detector lid. Remove the lid to access the detector circuit board.



5.8. Test gas on aerosol cans

The detector is designed with a threaded hole at the bottom of the sensor unit (1/4" pipe thread). This hole is intended to facilitate the inflow of test gas during calibration. Via the hose connector the test gas is led to the threaded hole at the bottom. This way the gas is forced in through the bottom hole and out through the two side holes of the sensor unit.

This procedure makes it possible to use only a limited gas volume for calibration. When using aerosol cans, a flow of approx. 200 ml/minute will be sufficient. With a flow of 200 ml/min 10 litres of test gas will allow approx. 50 minutes of gas flow.

This method makes it possible to use a moderate amount of gas for the calibration.

6. Warranty and Disposal

6.1. 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.

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".

6.2. Disposal of electrical and electronic products

This product is electrical and electronic equipment (EEE) and shall not be disposed of as unsorted municipal waste. At end of life, the equipment shall be collected separately and disposed of in accordance with Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) and the applicable national regulations. Equipment marked with the crossed-out wheeled bin symbol is subject to separate collection requirements. For further information on return, collection and treatment, contact the manufacturer, distributor or the relevant local waste management authority.



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7. Technical specifications

7.1. General Specifications – GP-SA (semiconductor sensor)

Model	GP-SA
Sensor	Semiconductor
Gas	CO Carbon Monoxide NO ₂ Nitrogen Dioxide CH ₄ Methane C ₃ H ₈ Propane C ₄ H ₁₀ Butane H ₂ Hydrogen C ₆ H ₁₄ Hexane C ₆ H ₆ Benzene C ₂ H ₆ Ethane C ₅ H ₁₂ Pentane C ₂ H ₄ Ethylene NH ₃ Ammonia HFC R404A, R407C, R417A, R245fa, R134a, etc.
Detecting range	0-40.000 ppm, 0-100 % LEL
Response time T90	< 5 sec. depending on gas type
Repeatability	< 5%
Long-term stability	< 5% FS / 12 months
Starter up after installation	30 min.
Self-diagnostic	Continuously
Calibration	Calibrated to the target gas/refrigerant
Operating conditions	-30°C to +55°C -45°C to +55°C with build in heater (option)
Humidity	0 %RH to 100 %RH not condensing
IP rating	IP65 DIN60529
Weight	0,3 kg
Housing material	Polycarbonate, black
Mechanical dimensions	150 x 80 x 60 mm (LxWxH)

7.2. General Specifications – GP-SA (infrared sensor)

Model	GP-SA
Sensor	Infrared
Gas	CO ₂ Carbon Dioxide CH ₄ Methane C ₃ H ₈ Propane SF ₆ HFC R404a, R134A, R410A, R1234ze etc.
Detecting range	0-1000 ppm, 0-2000 ppm, 0-100 % LEL
Response time T90	< 30 sec.
Repeatability	+/- 1 % FS
Long-term stability	+/- 2% FS / 12 months
Self-diagnostic	Continuously
Calibration	Calibrated to the target gas/refrigerant
Operating conditions (IR sensor 20 mm)	-40°C to +55°C
Operating conditions (IR sensor 32 mm)	-20°C to +55°C
Humidity	0 %RH to 95 %RH not condensing
IP rating	IP65 DIN60529
Weight	0,3 kg
Housing material	Polycarbonate, black
Mechanical dimensions	150 x 80 x 60 mm (LxWxH)

7.3. General Specifications - GP-SB (semiconductor sensor)

Model	GP-SB
Sensor	Semiconductor
Gas	CO Carbon monoxide NO ₂ Nitrogen dioxide HC Methane, Hexane, Propane, etc.
Detecting range	CO 0-300 ppm NO ₂ 0-10 ppm HC 0-100 % LEL
Response time T90	< 40 seconds
Repeatability	< 5%
Long-term stability	< 5% / 12 months
Starter up after installation	30 min.
Self-diagnostic	Continuously
Calibration	Calibrated to the target gas/refrigerant
Operating conditions	-20°C to +50°C
Humidity	0 %RH to 100 %RH not condensing
IP rating	IP65 DIN60529
Weight	0,3 kg
Housing material	Polycarbonate, black
Mechanical dimensions	140 x 80 x 60 mm (LxWxH)

7.4. General Specifications – GP-ELK (electrochemical)

Model	GP-ELK	
Sensor	Electrochemical	
Gas	H2O2 H2S HCL C2H4 CH2O C2H4O Cl2 CO NH3 NOx O3 PH3 O2	Hydrogen peroxide Hydrogen suophide Hydrochloric acid Ethylene Formaldehyde Ethylene oxide Chlorine Carbon Monoxide Ammonia Nitrogen oxides Ozone Phosphine Oxygen
Detecting range	H2O2 H2S HCL C2H4 CH2O C2H4O Cl2 CO NH3 NOx O3 PH3 O2	0-5 ppm 0-20 ppm 0-20 ppm 0-10 ppm 0-10 ppm 0-5 ppm 0-5 ppm 0-300 ppm 0-200 ppm 0-20 ppm 0-5 ppm 0-5 ppm 0-25 Vol.-%
Response time T90	< 40 seconds	
Repeatability	< 5%	
Long-term stability	< 5% / 12 months	
Starter up after installation	Op til 60 min.	
Self-diagnostic	Continuously	
Calibration	Calibrated to the target gas/refrigerant	
Operating conditions	-20°C to +50°C	
Humidity	0 %RH to 100 %RH not condensing	
IP rating	IP65 DIN60529	
Weight	0,3 kg	
Housing material	Polycarbonate, black	
Mechanical dimensions	140 x 80 x 60 mm (LxWxH)	

7.5. Electrical specifications

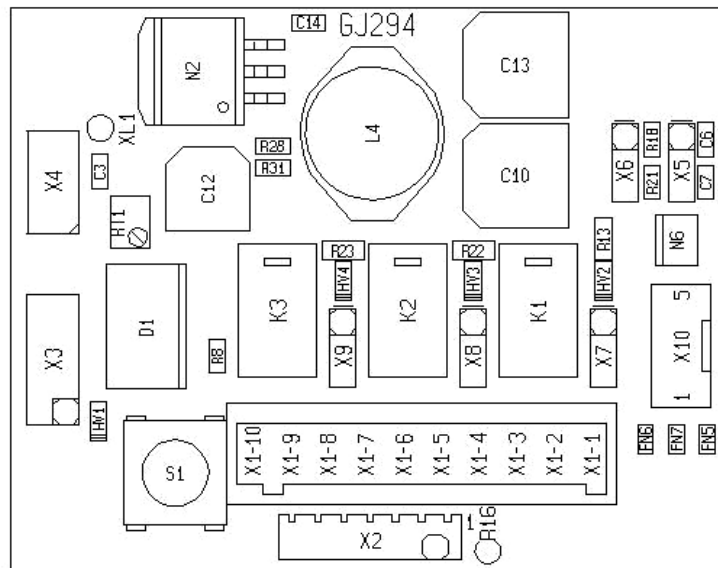
Supply voltage	12 to 32 VDC
Power consumption	6 W max.
Electrical connections	4- to 8-conductors depended on required outputs
Analogue output signal (GND)	4-20 mA / (2 mA for fault) = 100-450 Ω or 0-5 V or 0-10 V, min. RL = 600 Ω , nom. 4k7 Ω 1-5 V and 2-10 V, min. RL = 600 Ω , nom. 4k7 Ω
Fault relays	2 relay outputs for Alarm 1 and Alarm 2 1 relay output for Fault Signal contact 30 V/1 A

7.6. Approvals

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

8. Illustrations

8.1. PCB

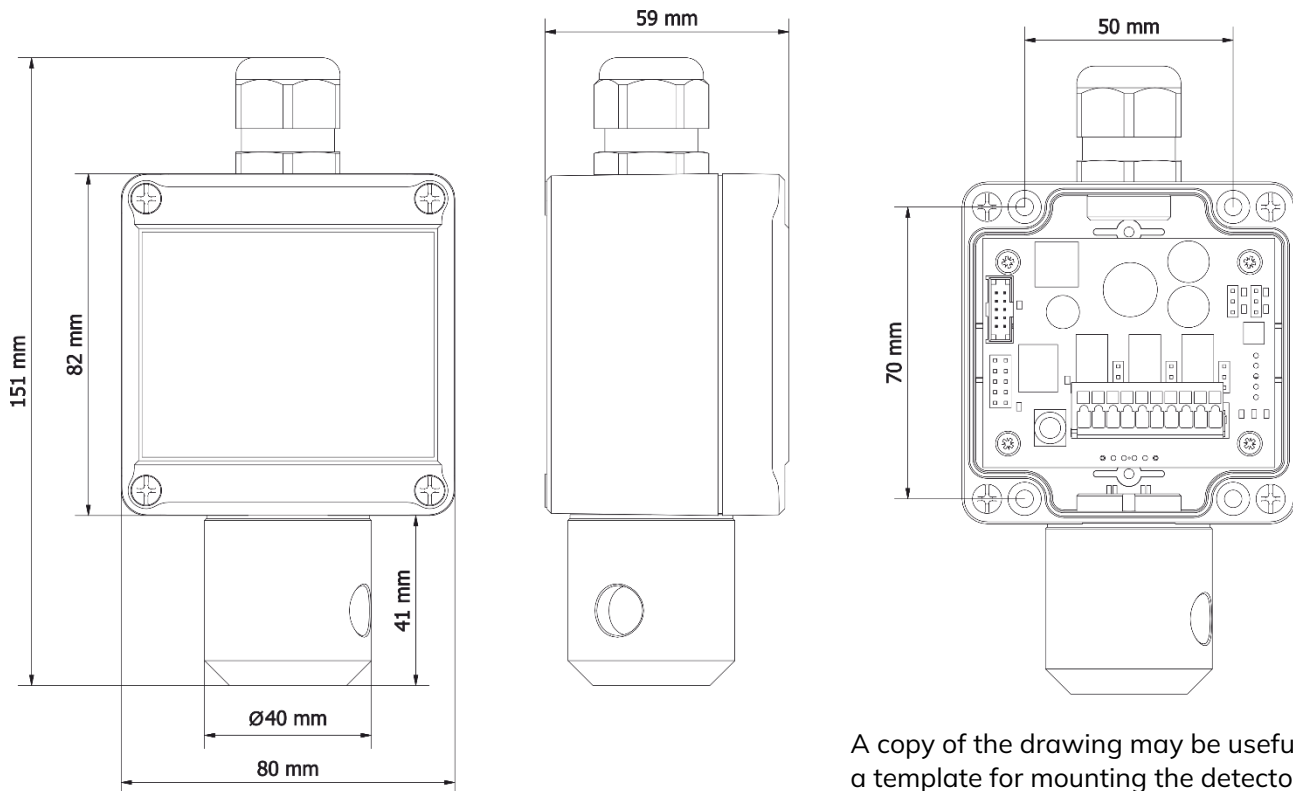


Terminal	Function	Electrical characteristic	Jumper position
X1-1	Empty		
X1-2	Supply voltage	Nom. 12-32 VDC	
X1-3	Supply voltage	I – 40 to 400 mA max.	
X1-4	Not connected		
X1-5	Out 1	0-5 V	X5=2-3, X6=2-3
	Out 2	0-10 V	X5=2-3, X6=1-2
	Out 3	4-20 mA	X5=1-2
	Out 3 - 1*	1-5 V	X5=2-3, X6=2-3
	Out 3 - 2*	2-10 V	X5=2-3, X6=1-2
X1-6	GND		
X1-7	Alarm 1	Relay K1=NC	X7=1-2
	Alarm 1	Relay K1=NO	X7=2-3
X1-8	Alarm 2	Relay K2=NC	X8=1-2
	Alarm 2	Relay K2=NO	X8=2-3
X1-9	Fault**	Relay K3=NC	X9=1-2
	Fault**	Relay K3=NO	X9=2-3
X1-10	Contact arm	Common for A1, A2 & F	

* The output is available only if the detector is set up with the option Iout.

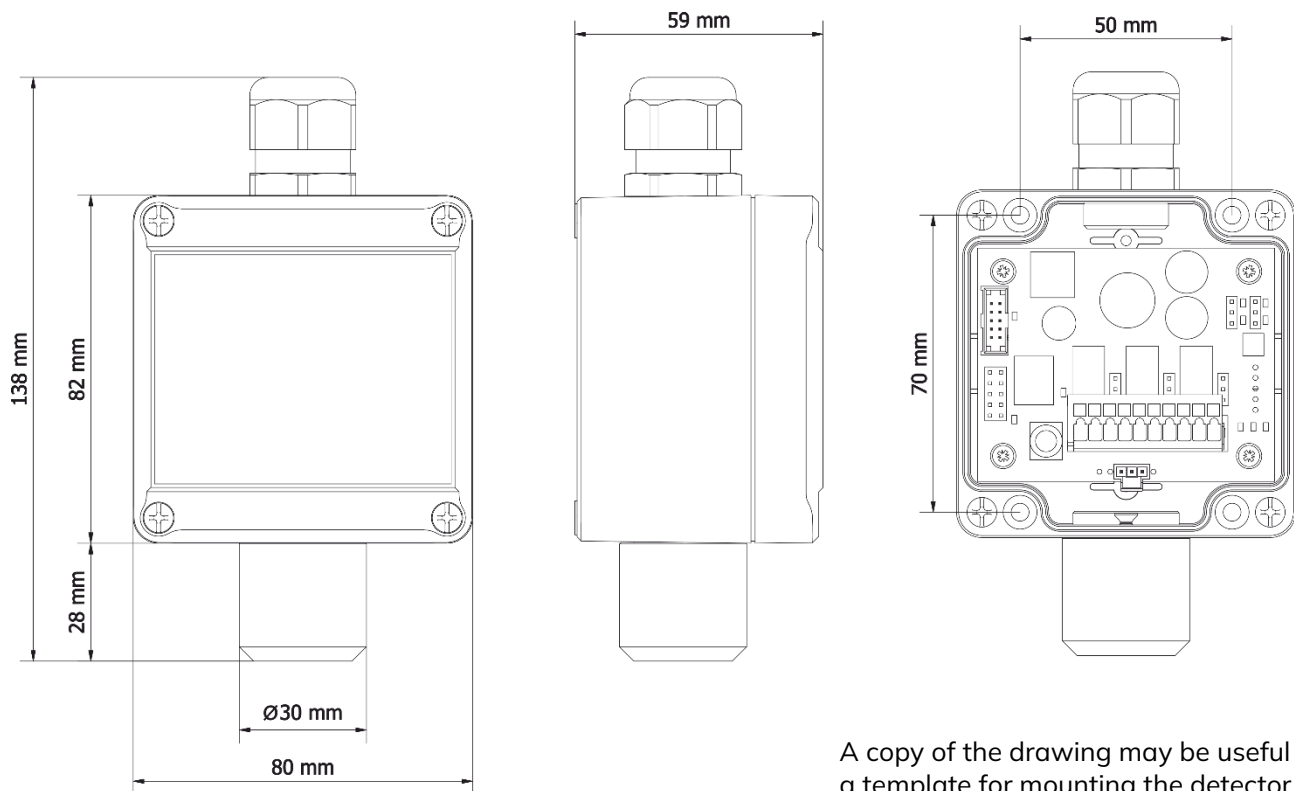
** The fault relay is active during normal operational mode and inactive in case of fault.

8.2. Layout – GP-SA



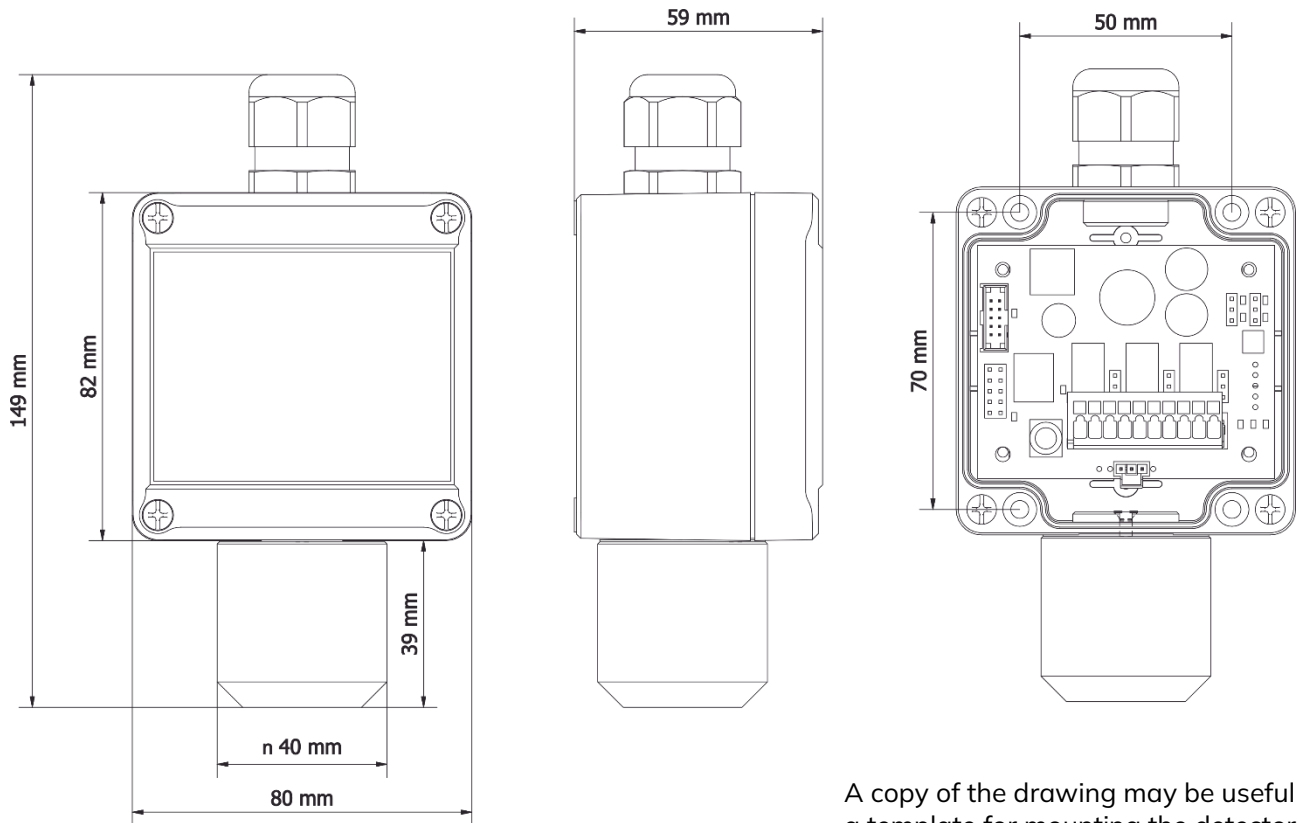
A copy of the drawing may be useful as a template for mounting the detector

8.3. Layout – GP-SB



A copy of the drawing may be useful as a template for mounting the detector

8.4. Layout – GP-ELK



A copy of the drawing may be useful as a template for mounting the detector

9. Troubleshooting

Problem						
Green operation LED not on	Yellow fault LED not on	Red alarm 1 LED on	Red alarm 2 LED on	Neither alarm LED on – even though gas is clearly present		
1	2	3	4	5	What to do	
✓					a	Make sure that the supply voltage is properly connected (see section 4.2)
	✓				b	Make sure that the flex PCB or 3 pin plug is properly installed in the gas detector
	✓				c	Make sure that the sensor unit is properly installed in the gas detector
	✓				d	Recalibrate the gas detector (see section 5.5 and 5.6).
		✓	✓		e	Investigate whether the alarm could be caused by a gas leak in the room
		✓	✓		f	Investigate whether the alarm could be caused by other activities in the room
		✓	✓	✓	g	Recalibrate the gas detector (see section 5.5 and 5.6).