GP-SA-2

Instruction and Maintenance Manual



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

Table of Contents

1 Safety 4

2 Declaration of conformity 5

3 Functions 6

3.1 Application 6
3.2 Construction 6
3.3 Alarm mode A1 (low alarm level) 6
3.4 Alarm mode A2 (high alarm level) 6
3.5 Fault mode 7
3.6 Resetting of alarm and fault 7
3.7 LED signals and relay outputs 7

4 Control units 8

4.1 Control circuit board 8
4.2 Operational mode 8

5 Installation 9

5.1 Detector position 9
5.2 Electrical wiring 9
5.3 Electrical connections 10
5.4 Final test after installation 11

6 Use of switch and test points 12

6.1 Setup and functions 12

7 Calibration and service 13

7.1 Test and calibration procedure for gas detectors 13
7.2 Zero calibration 14
7.3 Span calibration 14
7.4 Terminal program for communicating with the detector 16
7.5 Calibration procedure when computer is connected 17
7.6 Service interval 19
7.7 Calibration equipment 19
7.8 Test gas on aerosol cans 19

8 Warranty and Disposal 20

8.1 Warranty 20
8.2 Disposal of electrical and electronic products 22

9 Technical specifications 23

9.1 General specifications 23
9.2 Electrical specifications 23
9.3 Approvals 24

10 Illustrations 25

10.1 Measurements 25

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

11 Troubleshooting 26
12 Appendix 1 – Connection of 4-20 mA detector 27

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

1 Safety

Important
Please read this user's manual carefully before the GP-SA-2 is put into operation.

To ensure a safe installation of the GP-SA-2 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.

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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: GP-SA-2
Name: Gas alarm detector

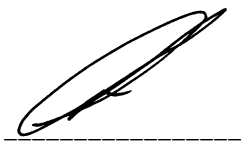
conforms to the following directives and standards:

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
Producers signature

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3 Functions

3.1 Application

The Geopal GP-SA-2 is a stand-alone gas detector which can be connected directly to existing control and monitoring systems.

The GP-SA-2 can also be used as alarm monitor and be connected to different type of detectors, e.g. GJ-EX, GJ-C, GJ-IR or GP-ELK. Typically, when a detector must be mounted high (under the ceiling) for example for Hydrogen and Ammonia.

The Geopal GP-SA-2 gas detector has been designed to detect a whole range of different gases and vapours. The detector constantly monitors the concentration of gases. The specific settings for individual detectors and their calibration are indicated in the accompanying data sheet and/or the detector's data label.

3.2 Construction

The gas detector has two alarm levels, alarm 1 (low alarm or gas warning) and alarm 2 (high alarm). The desired alarm limits must be specified when ordering. The current setting is indicated on the detector's data sheet and/or data label.

The detector has the following analog outputs: 0-5 V, 0-10 V or 4-20 mA. The required output must be specified when ordering. The analog output can be freely adjusted between 0-5 V and 0-10 V. Changing the output from voltage to 4-20 mA (or opposite) it requires a reprogramming of the detector. The current setting is indicated on the detector's data sheet and/or data label.

The detector has three voltage-free relay exits with C, NC, and NO and two relays for the low and high alarms respectively and a relay for faults. The relays can be used to control, for example, ventilation systems, magnetic valves, disconnection of the electricity supply, etc.

3.3 Alarm mode A1 (low alarm level)

In the event of gas concentrations above the set value for alarm 1, the detector will enter alarm state A1, the red ALARM LOW (3) lamp will come on and relay K1 will be activated. Relay contact K1 can be set on the terminals to either open (at NC) or close (at NO).

3.4 Alarm mode A2 (high alarm level)

In the event of gas concentrations above the set value for alarm 2, the detector will enter alarm state A2, the red ALARM HIGH (4) lamp will come on and relay K2 will be activated. Alarm state A2 can only occur in continuation of alarm state A1. Relay contact K2 can be set on the terminals to either open (at NC) or close (at NO).

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

3.5 Fault mode

Unlike the alarm relays, the fault relay is always activated in the normal state. This function facilitates indication that the supply voltage has lapsed.

The detector will, for example, go into the fault state if the sensor element is damaged or removed or if the detector is incorrectly calibrated. This is indicated by deactivation of relay K3. Relay contact K3 can be set on the terminals to either open (at NO) or close (at NC). Please note that this is the opposite of the description of the alarm state because the fault relay is active.

In theory, any combination of alarm and fault state can occur. If, for example, the fault state indicates the calibration is required, the detector will still react in the event of a gas leak. If, on the other hand, the fault state is caused by a defective sensor, it goes without saying that the detector will not work properly. It is therefore important always to investigate the underlying reason for the fault state.

3.6 Resetting of alarm and fault

The alarm resets automatically when the gas concentration has fallen to 50% below the set alarm limit. The fault state cannot be reset until the fault that has occurred has been rectified.

3.7 LED signals and relay outputs

It is possible individually to select NC (Normally Closed, i.e. break contact) or NO (Normally Open, i.e. make contact) on all the alarm relays.

This setting will result in the following functions of the detector's relays and LEDs:

Normal	Alarm 1	Alarm 2	Fault
Relay K1 broken LED A1-LOW off	Relay K1 made LED A1-LOW on	Relay K1 made LED A1-LOW on	Relay K1 broken LED A1-LOW off
Relay K2 broken LED A2-HIGH off	Relay K2 broken LED A2-HIGH off	Relay K2 made LED A2-HIGH on	Relay K2 broken LED A2-HIGH off
Relay K3 made LED FAULT off	Relay K3 made LED FAULT off	Relay K3 made LED FAULT off	Relay K3 broken LED FAULT on

A1-LOW = Low alarm A1

A2-HIGH = High alarm A2

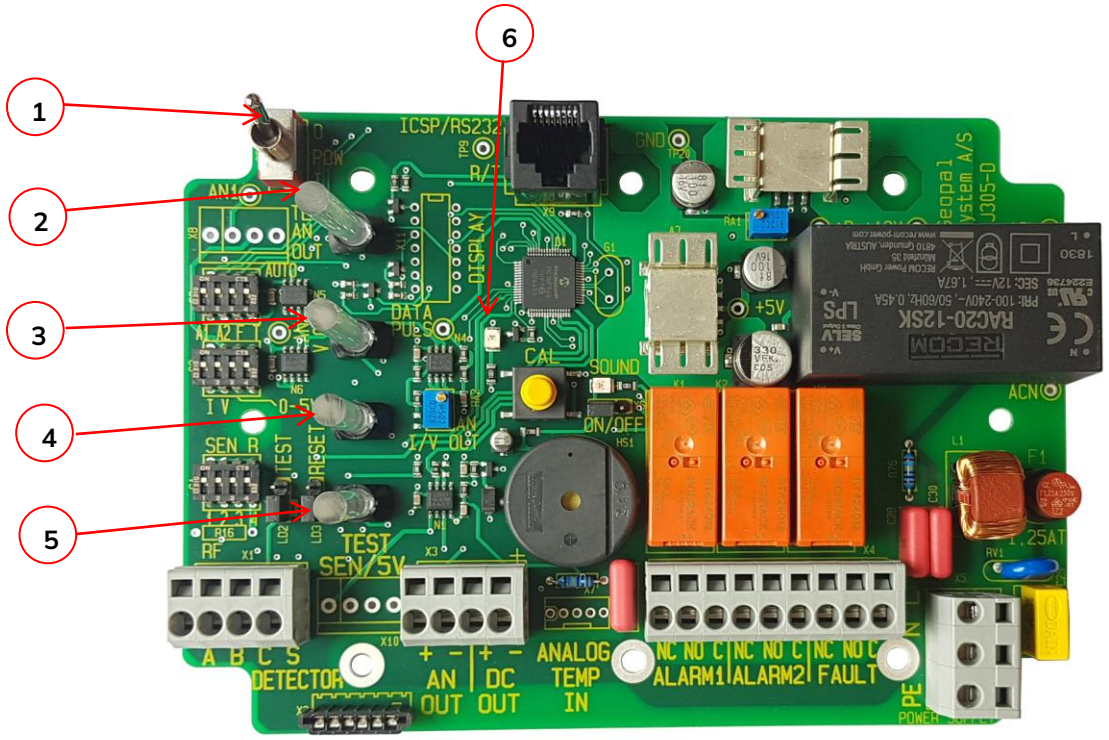
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4 Control units

4.1 Control circuit board

It is possible to inhibit alarm relays by removing the front panel and activating the switch (1). The fault relay will, however, change to indicate that the alarm relays are disconnected. Analog output to be set to 2 mA.

1. On/standby switch (Pow)
2. Mains On
3. Alarm Low indicator
4. Alarm High indicator
5. Standby/Fault indicator
6. Status indicator (warming up & operating)



4.2 Operational mode

When the switch (1) is in position I, the green Mains On LED (2) lights up and the installation is in the operational state.

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5 Installation

Installation and mounting must be carried out by qualified personnel.

5.1 Detector position

The detector is deployed in places where gas leaks may occur or in the vicinity of a ventilation installation so that the air can pass by the detector.

The position of the detector – high or low – depends on the density of the gas. If dense gases are involved it may be necessary to mount the detector as low as 15 cm above the floor, depending on air movements in the vicinity.

The detector should be mounted with sensor element and cable gland downwards.

If it is mounted close the floor or ground, the detector should be protected by a steel guard or similar if it is likely to be hit by trucks or other work vehicles.

The detector must never be covered by boxes, containers, etc. which may prevent the air circulating in the room reaching the detector.

The detector should always be installed with acceptable access for service and calibration.

5.2 Electrical wiring

The supply voltage *(please refer to the data label)* is connected to the terminals X5 (PE), (N) and (L).

The analog output (e.g. for 4-20 mA) is on the terminals X3-1 & -2.

The DC OUT (12V / 1 Amp) can be used for connection of external flash and sounder.

The analog output are not galvanically isolated. If a common GND is selected together with DC supply it must connect to terminal X3-2 and be connected to common GND.

The alarm relay outputs are on terminals X4.

If GP-SA-2 is connected to an external detector (e.g. GJ-EX, GJ-C or GJ-IR) a 3-core 1mm^2 cable with schield must be used. The external detector is connected to the terminals X1(A), (B), (C) and (S).

Type of cable depends on type of detector. Please refer to Appendix 1 for connection of 4-20mA detector.

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5.3 *Electrical connections*

The numbering of the terminals is as indicated on the drawing below:

The diagram below provides an overall overview of the terminals:

X1-1	A: for optional connection to an external detector	GND
X1-2	B: for optional connection to an external detector	+5V
X1-3	C: for optional connection to an external detector	SIGN
X1-4	S: for optional connection to an external detector	SCHIELD
X2	Internal sensor, flex cable	GND/+5V/Sign
X3-1	Analog out (+)	V_{out} / I_{out}
X3-2	Analog out (-) (GND)	V_{out} / I_{out}
X3-3	12VDC out (+)	Vdc (+)
X3-4	12VDC out (GND)	Vdc (-)
X4-1	Relay out, Alarm 1	NC
X4-2	Relay out, Alarm 1	NO
X4-3	Relay out, Alarm 1	C
X4-4	Relay out, Alarm 2	NC
X4-5	Relay out, Alarm 2	NO
X4-6	Relay out, Alarm 2	C
X4-7	Relay out, FAULT	NC
X4-8	Relay out, FAULT	NO
X4-9	Relay out, FAULT	C
X5-1	Ground (PE)	(Chassis)
X5-2	Supply voltage (please refer to data label)	N (-)
X5-3	Supply voltage (please refer to data label)	L (+)

PENDING ITS-I 23ATEX036745 DBI rea. no 233.301 DIC444OMS

5.4 *Final test after installation*

When the supply voltage is switched on, the detector will enter the warming-up period. This is shown by rapid blinking of the green status LED (6). During this period, both alarm outputs are blocked.

The warming-up state will automatically end after 1-5 minutes which is indicated by the green LED (6) is blinking at frequency 1 Hz. Following the detector will be ready for operation.

If the switch (1) is in the O position when power is switched on, the yellow fault indicator (5) labelled STANDBY/FAULT will come on as a reminder that the detector must be switched on.

The fault relay contacts set will be activated, but the internal buzzer will not sound an alarm.

Normally, it will not be necessary to calibrate the detector after mounting as it has been calibrated and tested before delivery. If you wish to check whether the detector's analog outputs are active, or the relays' function correctly, the sensor can be activated by a test gas manufactured specially for the purpose.

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

6 Use of switch and test points

6.1 Setup and functions

The diagram below provides an overall overview of the switches & test points:

Bold text indicates a standard setting from Geopal.

	Function	Electrical specification	Position 1 2 3 4
S-1	SEN-R	1K0	1 0 0 0
	SEN-R	2K2	0 1 0 0
	SEN-R	4K7	0 0 1 0
	SEN-R	200R (R16)	0 0 0 1
S-2	Iout	4-20 mA	1 0 0 X
	Vout	2-10 V	0 1 0 X
	Vout	1-5 V	0 1 1 X
S-3	Alarm 1	Auto / Man	1 X X X
	Alarm 2	Auto / Man	X 1 X X
	Error	Auto / Man	X X 1 X
	Test	Test system	X X X 1
LD2	TEST A1 & A2		LD2=1-2
LD2	NORM		*LD2=2-3*
LD3	RESET A1 & A2		*LD3=1-2*
LD3	NORM		LD2=2-3
X6	SOUND	OFF	X6=1-2
X6	SOUND	ON	**X6=2-3**
X9	RS232	SERVICE TERMINAL	X10
RA1	ADJUST	5V SENSOR *For use with external detector (semiconductor/catalytic sensor)*	
RA2	ADJUST	ANALOG OUT	

PENDING ITS-I 23ATEX036745 DBI rea. no 233.301 DIC444OMS

7 Calibration and service

7.1 Test and calibration procedure for gas detectors

Detector type: GP-SA-2

The following information is stated in the data-sheet / 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 off

Red LED's off



Green LED
steady blinking

If green LED is not on check supply voltage and connection, if voltage supply is correct replace PCB.

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

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.

PENDING ITS-I 23ATEX036745 DBI rea. no 233.301 DIC444OMS

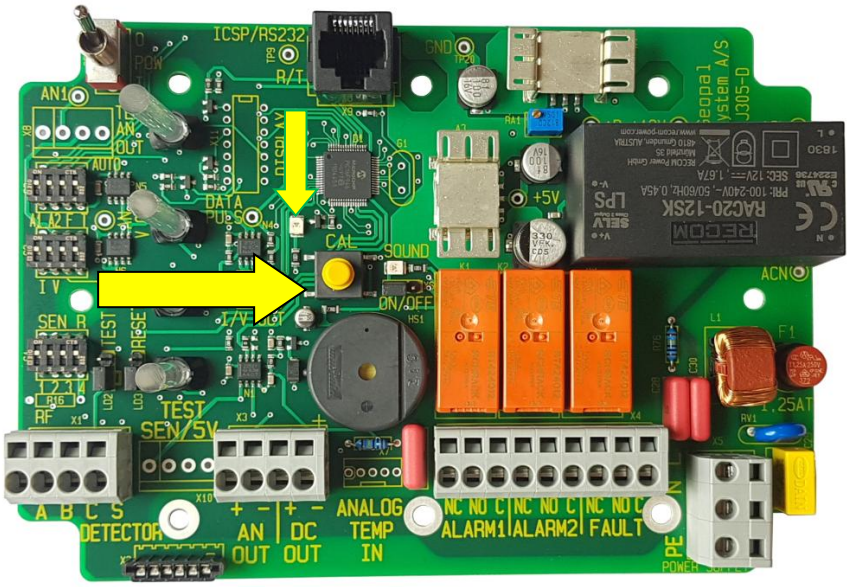
7.2 Zero calibration

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 in synchronous, 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).



7.3 Span calibration

Ad test gas using hose connector, valve with flowmeter, test gas can.

Open gas to a flow of 0.1 liter/min, se side of aerosol can.

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 happened if the sensor signal has declined sense last calibration.

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

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

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

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.

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

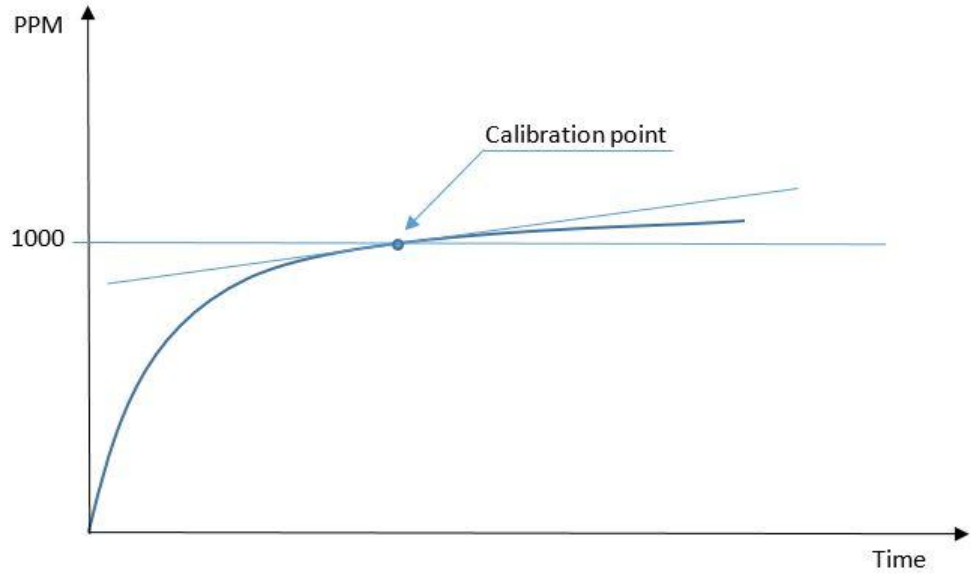
The program in the detector is set to perform the span calibration when the increase in the out-put signal from the sensor over a given time gets under a certain value.

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).

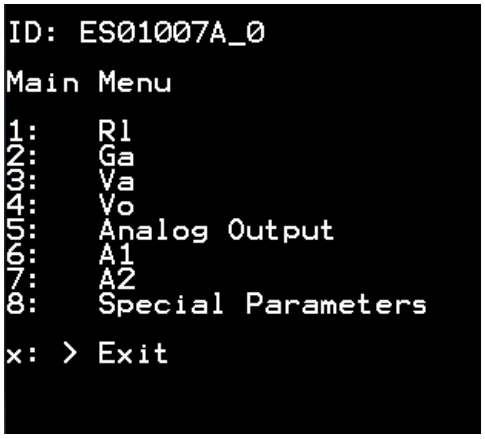
Following curve is to visualize the sensor reaction over time. Span point is typically reached after 2 minutes after adding the test gas.



PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

7.4 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.





Settings

Software version. ID: ES01007A, ES01006A and ES01005A

1: R1: 1100, 2200, 4700 or 6800 factory setting not to be changed

2: Ga: 25.00-50.00 % (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)

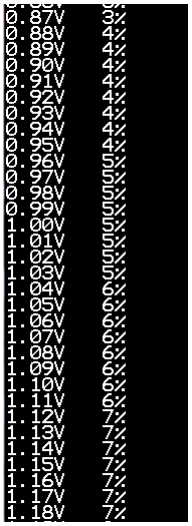
7: A2: High alarm ex. 0050% (setting of detector relays, 50% of full range)

8: Special parameter:

Latch 1 (must be 0000 for auto)

Latch 2 (must be 0000 for auto)

Sensitivity limit: 01.50



Extra explanations

4: Va If span calibration fails as described above (red block) 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.

If this occurs, redo the zero calibration, wait atleast 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.

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

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 Vmax – Vo 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.

Vmax is calculated (the value is not shown) based on R (set of resistance) Ga (span point) Vo & Va.

7.5 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, test gas can.

Open gas to a flow of 0.1 liter/min, se side of aerosol can.

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.

PENDING ITS-I 23ATEX036745 DBI rea. no 233.301 DIC444OMS

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-1037) in USB laptop.

Wait until USB driver is installed, what happens automatically in windows 7.

Start Tera Term.

go to Setup – Serial port and chose
Baud rate : 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



Necessary calibration equipment:

Communication cable (USB-RJ-45)	TEST-1037
Valve with flowmeter and hose	TEST-1020
Hose connector EX/OX/C/SA	MON-1435
Filling adapter w/manometer	TEST-1071
Test gas for span calibration *(type of gas to be specified by order)*	TEST-1015

PENDING ITS-I 23ATEX036745 DBI rea. no 233.301 DIC444OMS

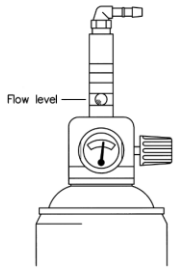
7.6 Service interval

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.

7.7 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.







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

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

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.

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

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".

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

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

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

9 Technical specifications

9.1 General specifications

Model	GP-SA-2
Gas	Methane (CH_4), Propane (C_3H_8), Butane (C_4H_{10}), Hydrogen (H_2), Hexane (C_6H_{14}), Benzene (C_6H_6), Ethane (C_2H_6), Carbon Monoxide (CO), Pentane (C_5H_{12}), Ethylene (C_2H_4), Ammonia (NH_3), 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% of FS range
Long-term stability	< 5% FS / 12 months
Self-diagnostic	Continuously
Operating conditions	-25ºC to +55ºC
Humidity	15 %RH to 90 %RH not condensing
Pressure	1013 mbar ±10 %
IP rating	IP65 DIN 60529
Weight	0,75 kg
Material housing	Polycarbonate, black
Mechanical dimensions	180 x 170 x 60 mm (LxWxH)

9.2 Electrical specifications

Supply voltage	85 to 264 VAC, 24 VDC
Power consumption	100 W max. *(depended on connected flash/sounder)*
Analogue output signal	4-20 mA / (2 mA fault) or 1-5 V / (0,5 V fault) or 2-10 V / (1 V fault). 0-5 V, 0-10 V
Relay outputs	2 relay outputs for Alarm 1 and Alarm 2 1 relay output for Fault Signal contact 230 V / 6 A

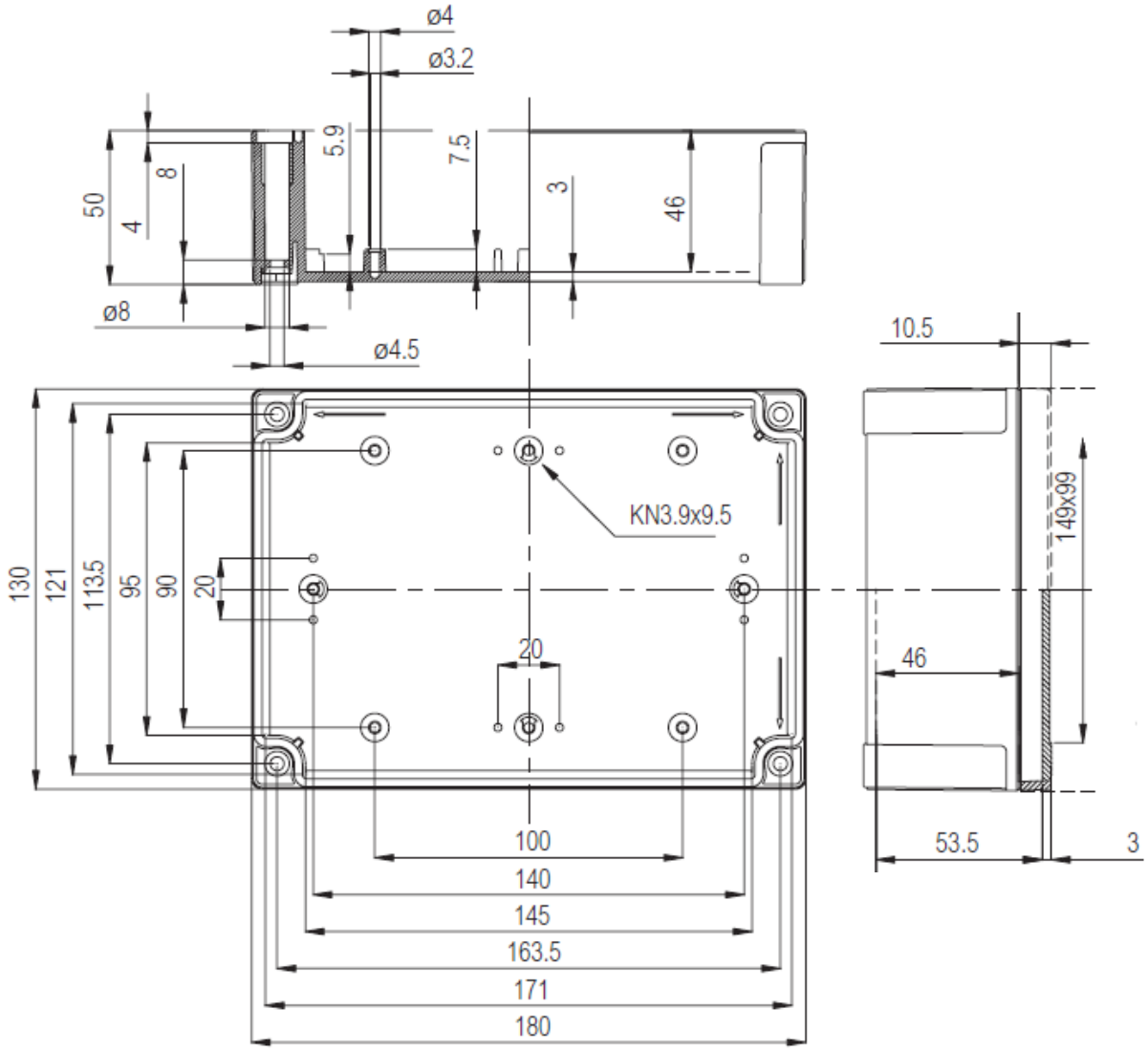
PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

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

10 Illustrations

10.1 Measurements



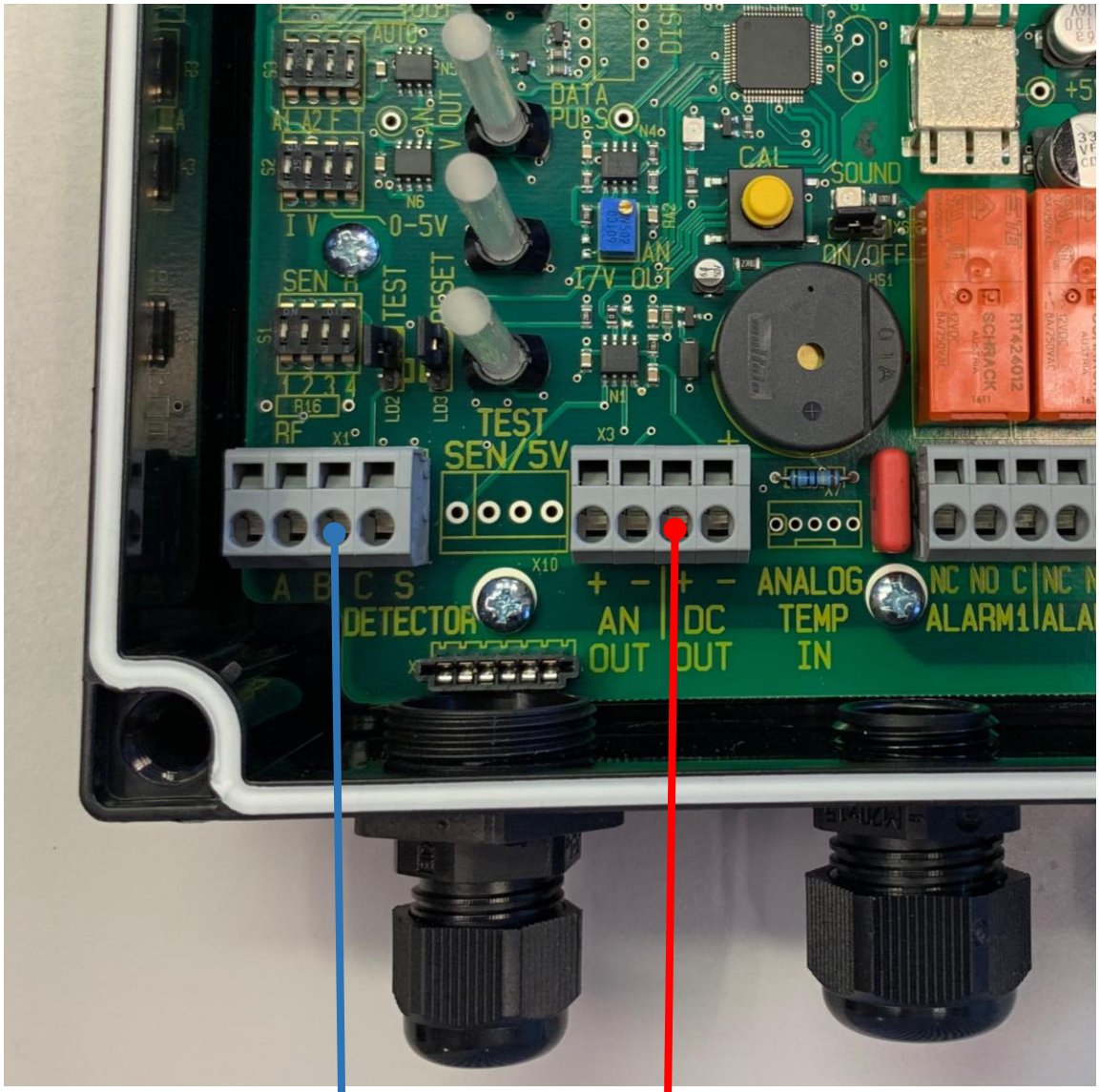
PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

11 Troubleshooting

Problem							
Green operation LED not on	Yello fault LED on	Red alarm 1 LED on	Red alarm 2 LED on	Red alarm 2 LED comes on before/without 1 LED	No alarm LED on despite presence of gas		
1	2	3	4	5	6		**Probable Causes/Remedy**
●						a	Make sure that the supply voltage is properly connected (see section 5.3).
●						b	Check that the toggle switch S5 on the base circuit board is set to "**I**" (see section 4.1).
●						c	Check that the power supply fuse F1 is correctly inserted and intact.
	●	●	●			d	Try to reset the alarm monitor by disconnecting the power and reconnecting it.
	●					e	Check that the detector is correctly connected to GP-SA-2: X1 or X1 + X3 for 4-20 mA detector according to Appendix 1. *(Connection of external detector)*
	●					f	Make sure the detector cable is correctly connected to the terminal in the external detector.
	●					g	Check that the sensor element fits properly into its socket in the detector. To do this you must first remove the nose of the detector.
	●					h	Measure the output of the detector between terminals A and C (+). If the voltage is lower than approximately. 100 mV, the sensor should be replaced. (Can also be measured on X11-1 & -2)
	●	●	●	●	●	i	Calibrate the detector (see section 7).
	●	●	●	●	●	j	Replace the sensor element and calibrate the GP-SA-2 (see section 7).
		●	●			k	Investigate the possibility that there actually may be gas in the room.
		●	●			l	Investigate the possibility of other gases in the room since most sensors have a certain degree of cross-sensitivity.
		●	●	●	●	m	Calibrate the GP-SA-2 (see section 7).

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS

12 Appendix 1 – Connection of 4-20 mA detector



Connect the detector minus to terminal X1-C

Connect the detector plus to terminal X3 +DC OUT

PENDING ITS-I 23ATEX036745 DBI reg. no 233.301 DIC444OMS