GJ-EX

Instruction and Maintenance Manual



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

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1 Security Instructions

Important
To secure a safe installation of the GJ-EX detector in an explosive area the following must be observed.

The installation should only be carried out by qualified personnel who are well proven in the safe application and usage of electrical equipment and installation work as well as the national and international laws, directives and standards applying to the area.

When reassembling the top section of the detector after changing the sensor element, the two M5 assembly screws must be tightened to a torque of 5 Nm.

Warning
The cable gland is ATEX certified II 2G Ex d IIC Gb. If the gland is to be replaced, make sure that a type with the same approval is used.

Do not open the detector lid when an explosive gas atmosphere is present.

Avoid electrostatic charging, clean the detector with a damp cloth only.

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2 Declaration of Conformity

As manufacture

Geopal System A/S
Bygmarken 19
DK-3520 Farum

Hereby declare that the following product

Type: GJ-EX
Name: Detector for explosive areas

Is in conformity with 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)

MED directive 961981
IACS E10: 2006
IEC 60 945:2002 and Corrigendum 1: 2008
IEC 60 092-504:2001-03
IEC 60 533:1999-11

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
Manufacture's signature

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3 Application

The gas detector type GJ-EX is an explosion proof detector designed for use in zone 1 and 2 for temperatures up to 80°.

The gas detector is designed to constantly measure the gas concentration and deliver a voltage signal to the connected gas alarm monitor. The voltage signal is depending on the amount of gas in the area where the detector is installed.

The detector must be connected to a gas alarm monitor or amplifier module. The detector signal is transformed into a linear mA output and/or relay outputs in the gas alarm monitor. Calibration and alarm level settings are performed in the gas alarm monitor or amplifier module.

4 Installation

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 mm^2 with braided shield. The cable must perform IEC60332-1-2 (not fire nutritious).

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 refer to Figure 1 and make sure that the shield does NOT make contact to the detector housing.

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.

Installation to be in accordance to EN60079-14 (Explosive atmospheres).

The detector must be mounted on a flat surface. If this is not possible, the detector must be mounted on a Mounting plate, Geopal model number “ACC5245”, which supports the mounting holes of the detector.

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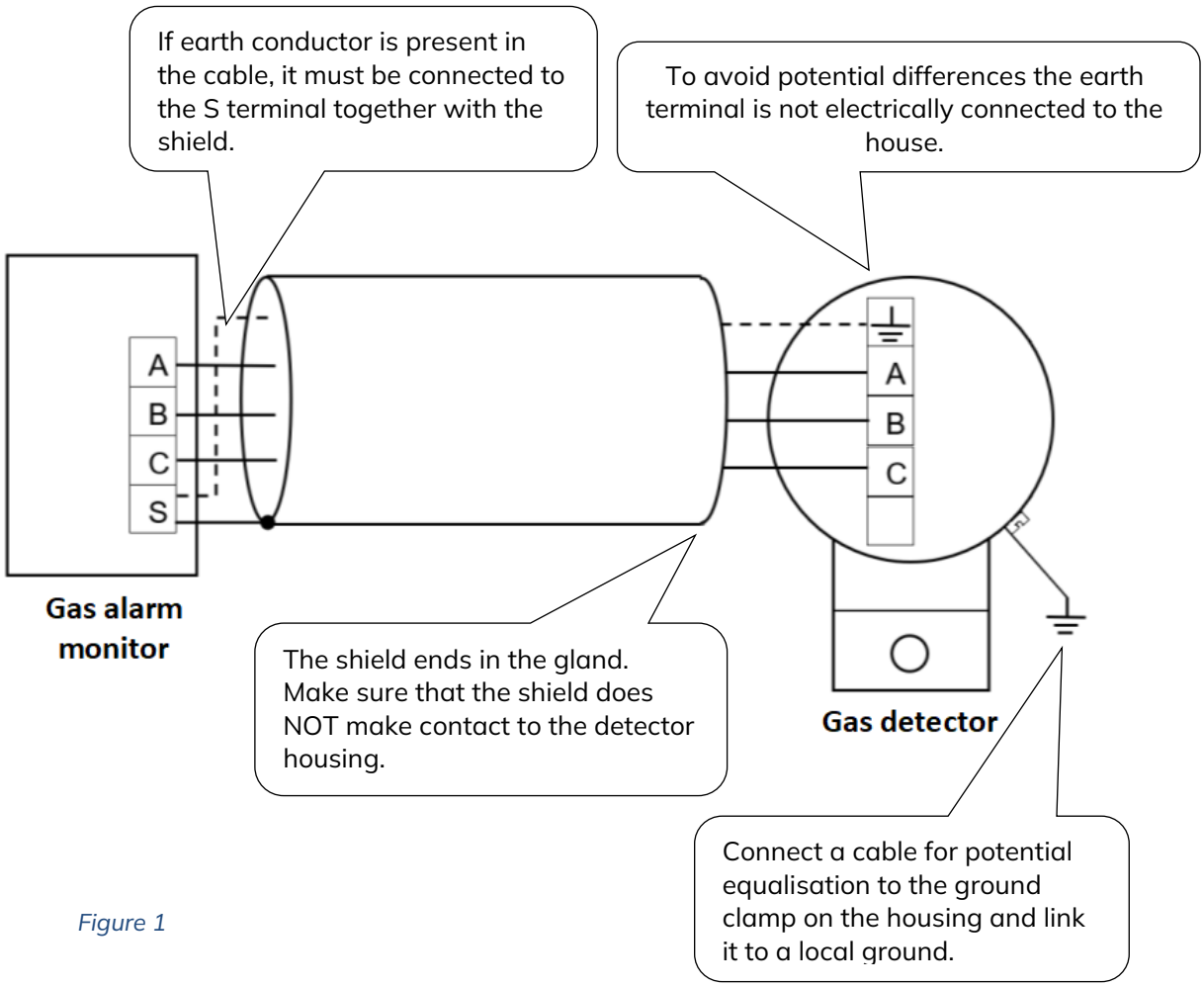


Figure 1

The detector must always have the sensor element facing downward.

If mounted in a low place, the detector should be protected by a steel bar or a similar protective arrangement to prevent it from being damaged by trucks or cars.

The detector must never be covered by boxes, cans or other obstacles hindering the air movements in the room in reaching the detector.

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5 Maintenance

All sensors are affected to a lesser or greater extent by the environment in which the detector is located. Also, all technical equipment can fail due to various reasons. We recommend a test of the gas alarm system regularly.

Under normal circumstances an annual calibration control is recommended. At exposed places a calibration control every six months is recommended. It is the responsibility of the system owner to see that the maintenance and calibration control is carried out.

Please also refer to the manual for the associated gas alarm monitor.

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5.1 *Exchange of sensor*

Important
When the sensor element needs changing, it is mandatory to either down-classify the area or to remove power to the detector unit.

1. Remove the two screws and washers in the top part.
2. Remove the top part, to gain access to the sensor element itself.
3. Remove the sensor element by gently pulling it from the socket.

   Verify that you have the correct new sensor element.
4. Gently press the desired sensor in to the socket part. Be aware that the pins are fragile and must be placed correctly.
5. The Sinter Metal (filter) is placed in the top part and afterwards placed on top of the socket part.

   The top part is then rotated until the mounting holes fit over the socket thread.
6. Fit a washer on the M5x40mm screw and insert it in the top part mounting hole.

   When both screws are mounted, tighten with 5 Nm. For this process, use a H4 bit.

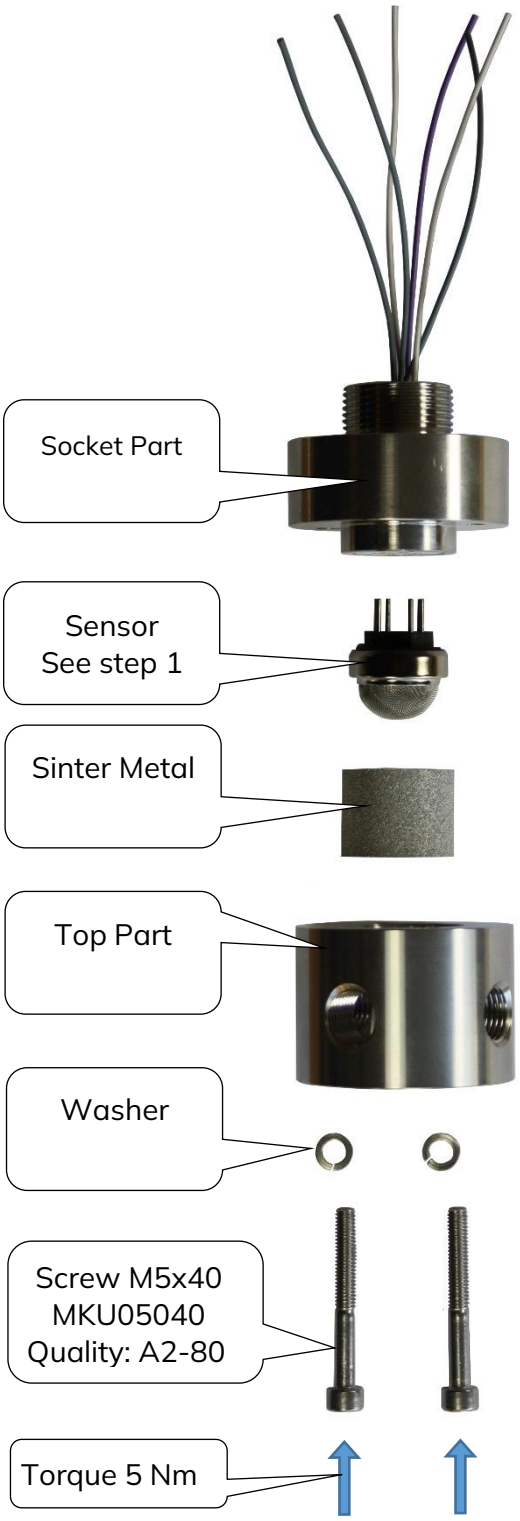


Figure 2 – Example only

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6 Fault

If the sensor element is damaged or the detector cable is cut or disconnected, the gas alarm monitor will go into fault condition, which is shown by the yellow indicator marked FAULT. The fault relay will be deactivated, and the 4-20 mA output will go to 2 mA. *(Please note that the above fault function may vary slightly depending on the type of Geopal gas alarm monitor).*

7 Adjustment and calibration

Adjustment and calibration is carried out in the gas alarm monitor or amplifier module. For specific calibration instructions please take a closer look at the corresponding manual for the gas alarm monitors or amplifier module.

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

New sensor elements will change within the first hours of operation. Therefore, the calibration should not be carried out until the gas alarm monitor or amplifier module and detector have been switched on for at least 2 hours.

7.1 Calibration equipment

To perform the calibration, you need the following:

- Test gas for high alarm level
- Valve with a flowmeter for the aerosol cans
- Hose connection set

It is not possible to calibrate the GJ-EX itself. Please refer to the calibration description for the monitor system.

7.2 Test gas in aerosol cans

The gas detector type GJ-EX is provided with one hole in the detector part (1/4” pipe thread).

Through the hose connection the test gas is led through the side hole and out of the detector bottom. This procedure makes it possible to use only a limited gas volume for calibration. A flow of approx. 200 ml/minute will be sufficient.

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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".

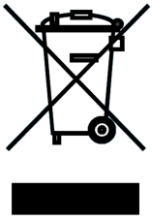
Geopal System A/S accepts no liability for consequential damages, including consequential loss, or product liability other than what may follow from mandatory legislation.

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.

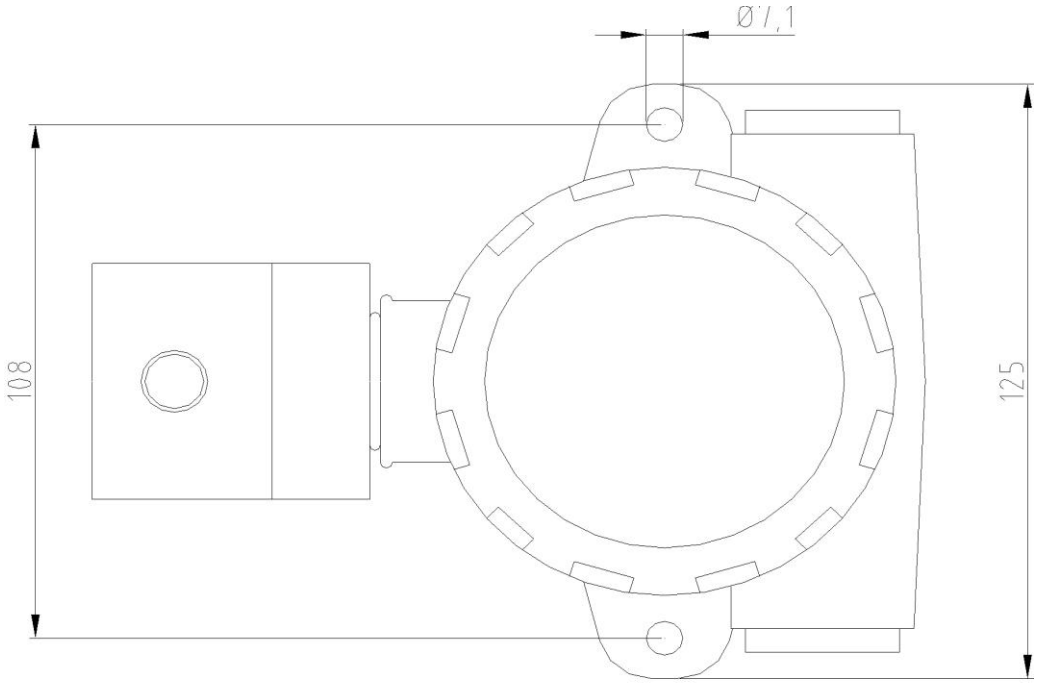
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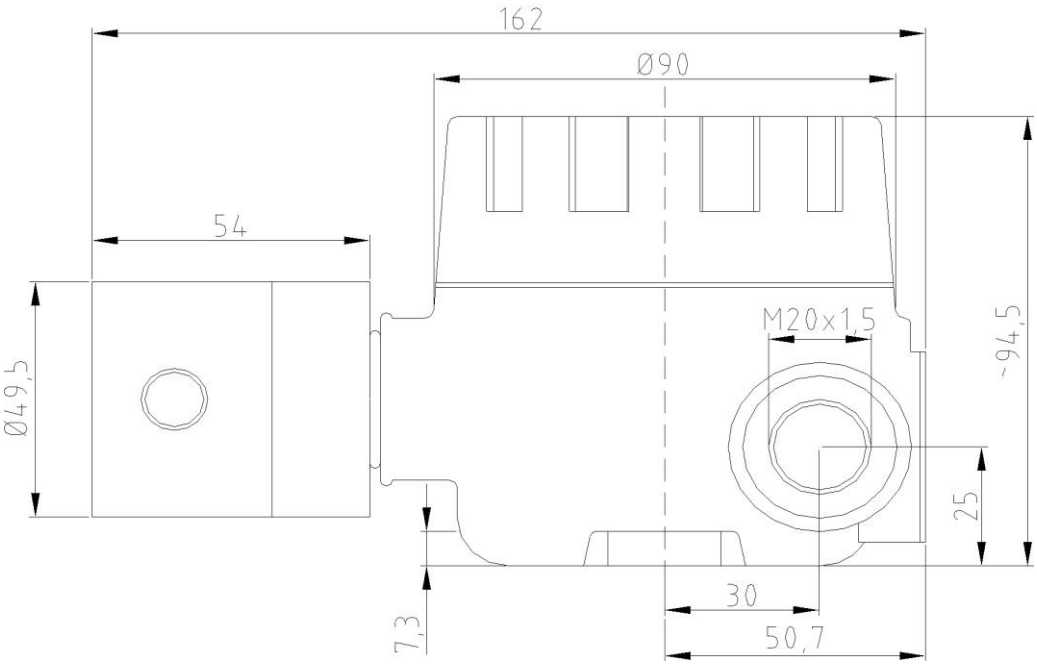
9 Specifications and illustrations

9.1 GJ-EX Semiconductor

Available gas alarm centrals	GJD-02C, GJD-04C, GJ-03R, GP-SA-2, GP-AMP
Available gases	Methane (CH4), Propane (C3H8), Butane (C_4H_{10}), Hydrogen (H_2), Hexane (C_6H_{14}), Benzene (C_6H_6), Ethane (C_2H_6), Ethylene (C_2H_4), R404A, R407C, R,417A, R134a, Ammonia (NH_3), etc.
Detection range	0-40,000 ppm, 0-100 % LEL
Response time T90	< 5 seconds depending on gas type
Repeatability	+/- 5 % of FS range
Accuracy	+/- 5 % of FS range
Long-term stability	< 5 % FS / 12 months
Housing	
Material	Aluminum chromatin, chem. resistant paint/AISI 316L
IP Rating	IP 65 DIN 60529
Weight	~1,5 kg
Dimensions	LxWxD 162 x 125 x 95 mm (without cable gland M20)
Max operating conditions	Temperature -20 °C to +80 °C Humidity 0 %RH to 100 %RH, *noncondensing* Pressure 1013 mbar ±10%
Storage	Temperature -22 °C to +80 °C Humidity 0 %RH to 95 %RH
Terminal box	Limatherm XD-I80, II 2G Ex d II C Gb, FTZU04 ATEX 0265U
Cable gland	CMP A2E-FF, II 2G Ex d IIC Gb, Sira 13ATEX 1068X

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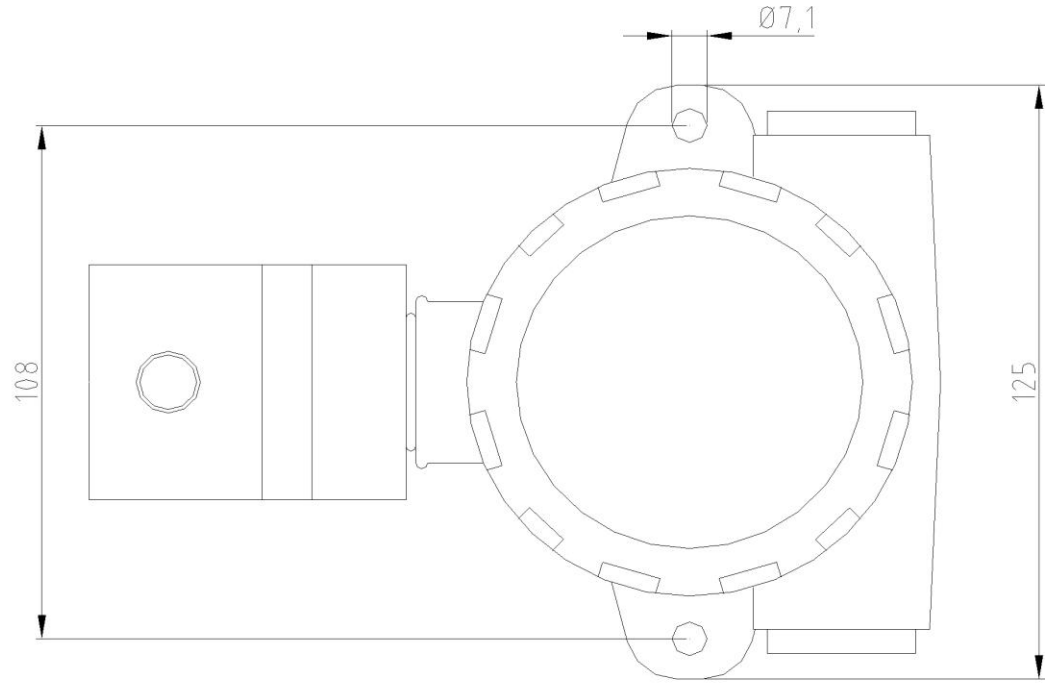
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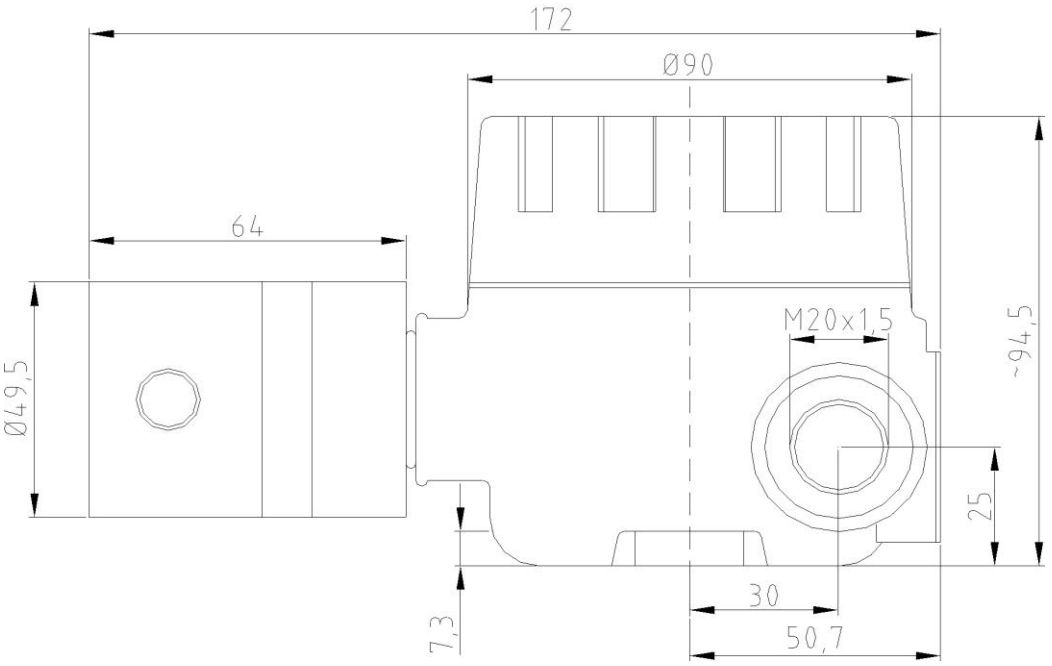
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9.2 *GJ-EX Catalytic*

Available gas alarm centrals	GJD-02C, GJD-04C, GJ-03R, GP-SA-2, GJD-L3C, GP-AMP
Available gases	Methane (CH4), Propane (C3H8), Butane (C_4H_{10}), Hydrogen (H_2), Hexane (C_6H_{14}), Ethylene (C_2H_4), Ethanol (C_2H_5OH), Ammonia (NH_3), etc.
Detection range	0-40,000 ppm, 0-100 % LEL
Response time T90	< 20 seconds depending on gas type
Repeatability	+/- 2 % of FS range
Accuracy	+/- 1 % of FS range
Long-term stability	< 3 % FS / 12 months
Housing	
Material	Aluminum chromatin, chem. resistant paint/AISI 316L
IP Rating	IP 65 DIN 60529
Weight	~1,5 kg
Dimensions	LxWxD 172 x 125 x 95 mm (without cable gland M20)
Max operating conditions	Temperature -20 °C to +80 °C Humidity 0 %RH to 100 %RH, *noncondensing* Pressure 1013 mbar ±10%
Storage	Temperature -22 °C to +80 °C Humidity 0 %RH to 95 %RH
Terminal box	Limatherm XD-I80, II 2G Ex d II C Gb, FTZU04 ATEX 0265U
Cable gland	CMP A2E-FF, II 2G Ex d IIC Gb, Sira 13ATEX 1068X

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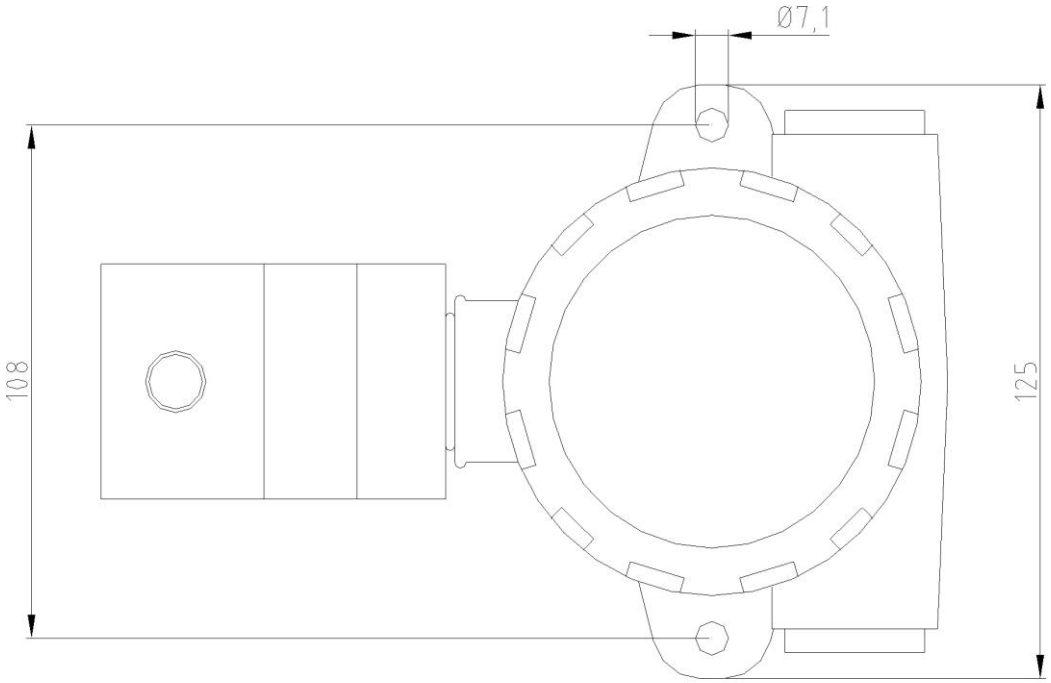
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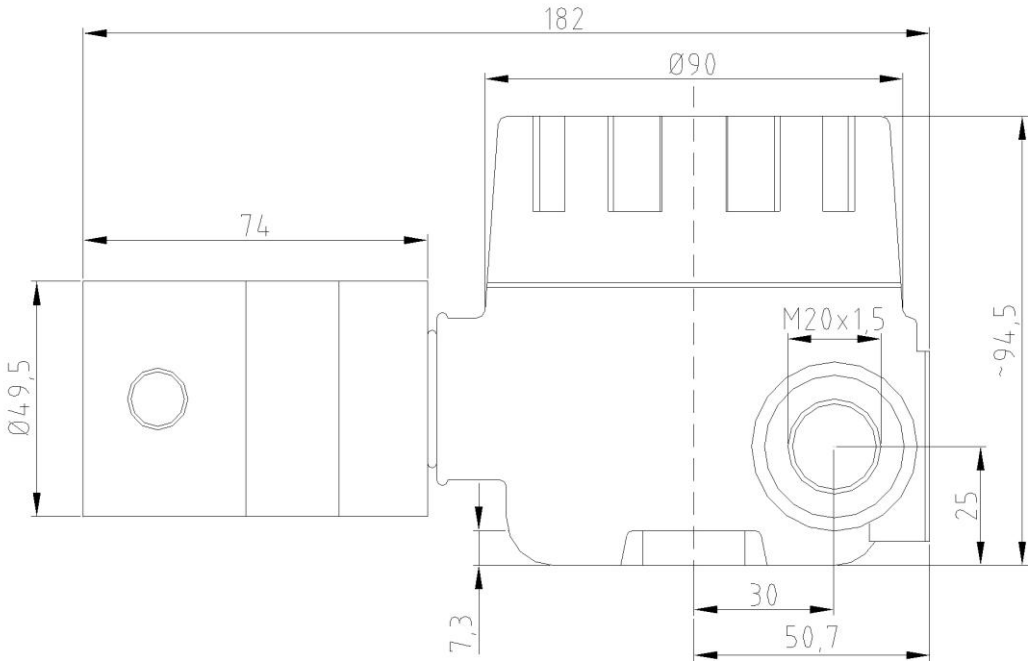
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9.3 *GJ-EX Electrochemical*

Available gas alarm centrals	GJD-02C, GJD-04C, GJ-03R, GP-SA-2, GJD-L3C, GP-AMP
Available gases	Carbon Monoxide (CO), Hydrogen Sulfide (H_2S), Nitrogen Dioxide (NO_2), Hydrogen (H_2), Hydrogen Chloride (HCl), Hydrogen Cyanide (HCN), Ammonia (NH_3), Sulfur Dioxide (SO_2), Phosphine (PH_3), Methanol (CH_3OH), etc.
Detection range	0-5,000 ppm
Response time T90	< 60 seconds depending on gas type
Repeatability	+/- 2 % of FS range
Accuracy	+/- 3 % of FS range
Long-term stability	< 2 % FS / 12 months
Housing	
Material	Aluminum chromatin, chem. resistant paint/AISI 316L
IP Rating	IP 65 DIN 60529
Weight	~1,5 kg
Dimensions	LxWxD 172 x 125 x 95 mm (without cable gland M20)
Max operating conditions	Temperature -20 °C to +50 °C Humidity 0 %RH to 100 %RH, *noncondensing* Pressure 1013 mbar ±10%
Storage	Temperature 0 °C to +30 °C Humidity 0 %RH to 95 %RH
Terminal box	Limatherm XD-I80, II 2G Ex d II C Gb, FTZU04 ATEX 0265U
Cable gland	CMP A2E-FF, II 2G Ex d IIC Gb, Sira 13ATEX 1068X

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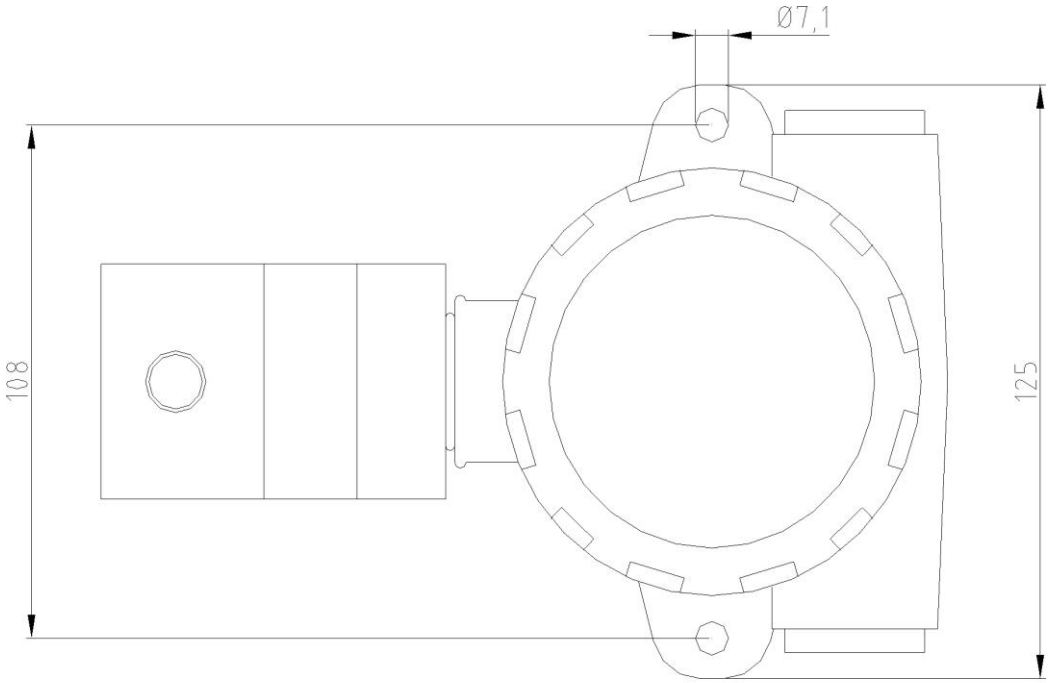
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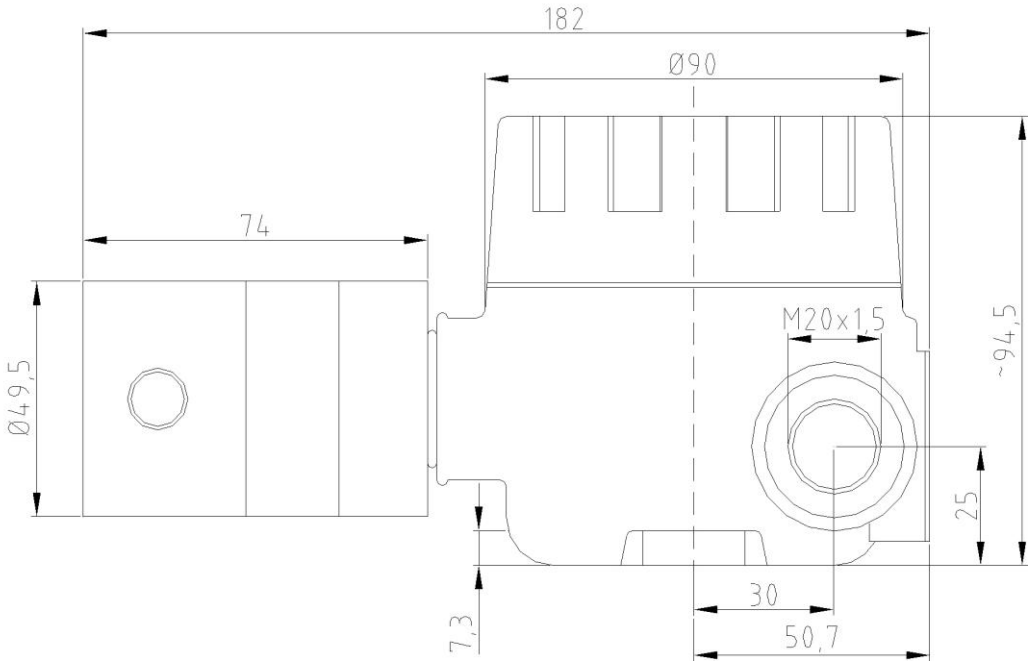
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9.4 GJ-EX NDIR HC

Available gas alarm centrals	GJD-02C, GJD-04C, GJ-03R, GP-SA-2, GJD-L3C, GP-AMP
Available gases	Methane (CH_4), Propane (C_3H_8), Butane (C_4H_{10}), Hexane (C_6H_{14}), Benzene (C_6H_6), Ethane (C_2H_6), Ethylene (C_2H_4), Ethanol (C_2H_5OH), Isopropanol (C_3H_8O), etc.
Detection range	0-100 % LEL
Response time T90	< 30 seconds
Repeatability	+/- 2 % of FS range
Accuracy	+/- 1 % of FS range
Long-term stability	< 3 % FS / 12 months
Housing	
Material	Aluminum chromatin, chem. resistant paint/AISI 316L
IP Rating	IP 65 DIN 60529
Weight	~1,5 kg
Dimensions	LxWxD 172 x 125 x 95 mm (without cable gland M20)
Max operating conditions	Temperature -20 °C to +60 °C Humidity 0 %RH to 100 %RH, *noncondensing* Pressure 1013 mbar ±10%
Storage	Temperature -22 °C to +80 °C Humidity 0 %RH to 95 %RH
Terminal box	Limatherm XD-I80, II 2G Ex d II C Gb, FTZU04 ATEX 0265U
Cable gland	CMP A2E-FF, II 2G Ex d IIC Gb, Sira 13ATEX 1068X

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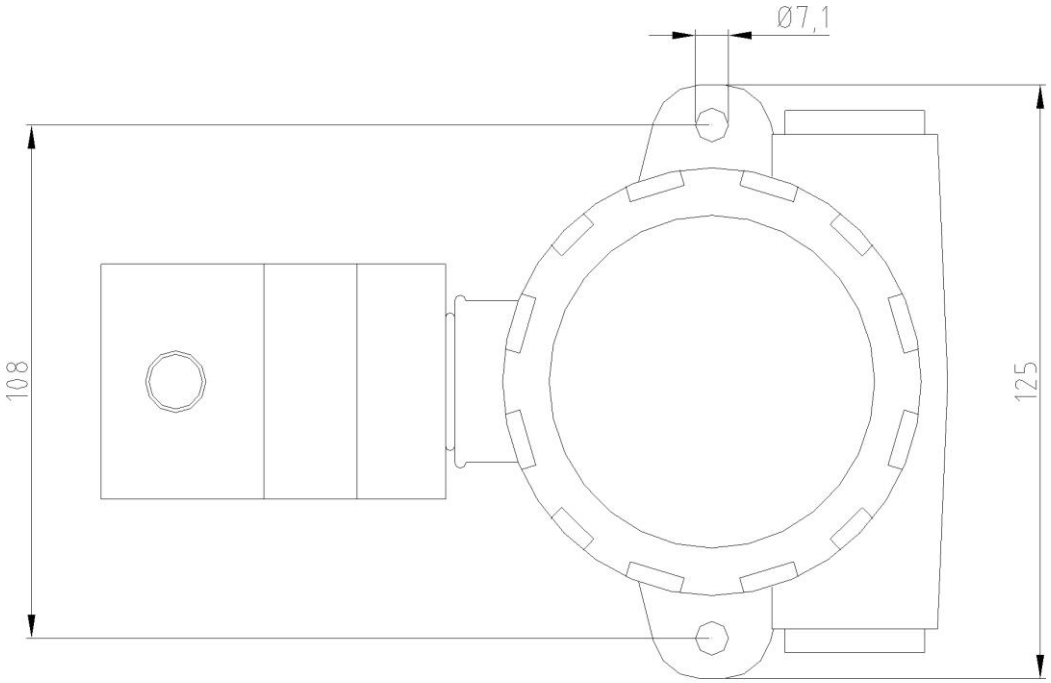
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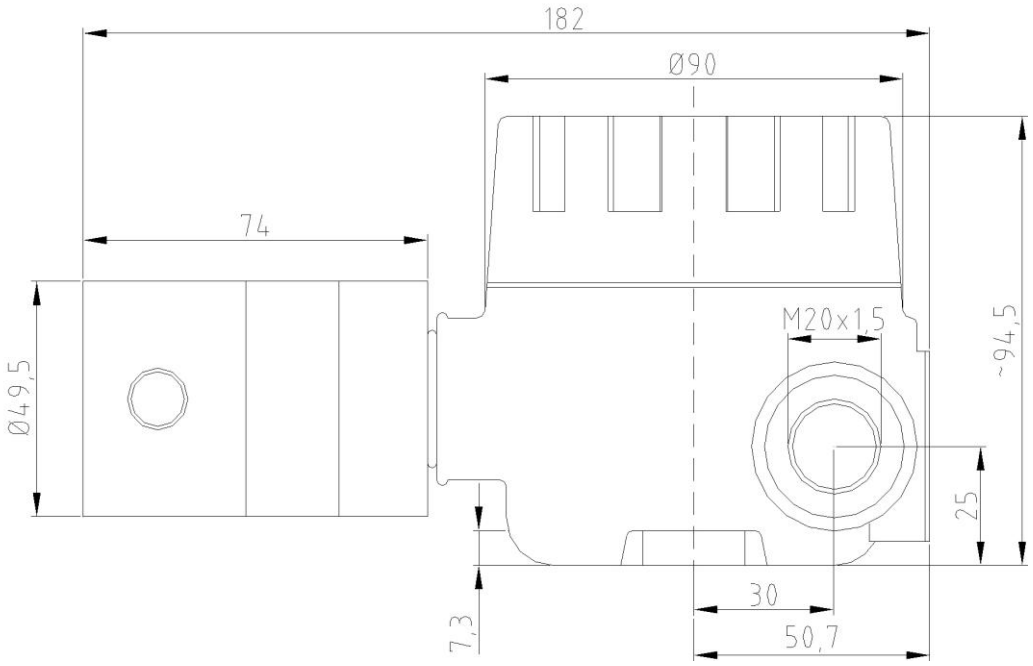
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9.5 *GJ-EX NDIR CO2*

Available gas alarm centrals	GJD-02C, GJD-04C, GJ-03R, GP-SA-2, GJD-L3C, GP-AMP
Available gases	Carbon Dioxide (CO_2)
Detection range	0-1 Vol.-%, 0-3 Vol.-%, 0-20 Vol.-%, 0-100 Vol.-%
Response time T90	< 60 seconds
Repeatability	+/- 2 % of FS range
Accuracy	+/- 1 % of FS range
Long-term stability	< 3 % FS / 12 months
Housing	
Material	Aluminum chromatin, chem. resistant paint/AISI 316L
IP Rating	IP 65 DIN 60529
Weight	~1,5 kg
Dimensions	LxWxD 172 x 125 x 95 mm (without cable gland M20)
Max operating conditions	Temperature -20 °C to +60 °C Humidity 0 %RH to 100 %RH, *noncondensing* Pressure 1013 mbar ±10%
Storage	Temperature -22 °C to +80 °C Humidity 0 %RH to 95 %RH
Terminal box	Limatherm XD-I80, II 2G Ex d II C Gb, FTZU04 ATEX 0265U
Cable gland	CMP A2E-FF, II 2G Ex d IIC Gb, Sira 13ATEX 1068X

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