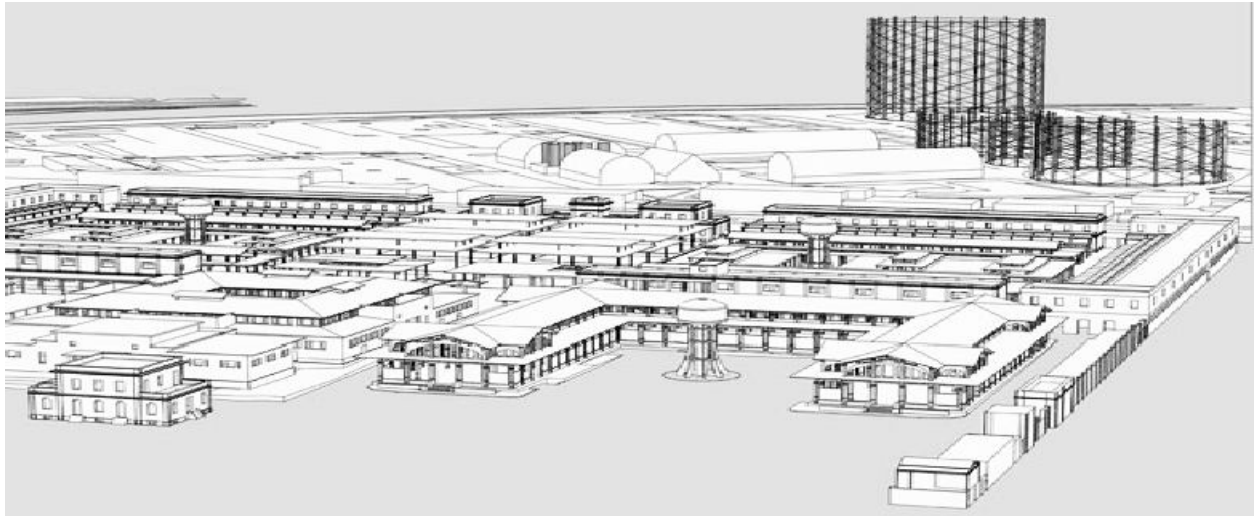


Control Unit from 1 to 3 Conventional sensors GS300M

Rev. 7



Through the connection of **3** remote probe, the **GS300M** control unit has been designed and built according to European regulations to detect the presence of **toxic and/or explosive gas**.
A microprocessor is used to create a complete surveillance and control system with maximum flexibility.
Thanks to this and its other features, it is suitable for: civil use, industrial use and small underground car parks.

The **GS300M** control unit has three danger levels:

1st LEVEL, 1st Alarm. This was set to 8 % of L.E.L. (120ppm) for all probes.

2nd LEVEL, 2nd Alarm. This was set at 13% of L.E.L. (200ppm) for all probes.

3rd LEVEL, Main Alarm. This was set at 20 % of L.E.L. (300ppm) for all probes

Other technical features make this control unit extremely versatile and reliable; for example, by using a series of micro-switches it is possible to:

Select or disable the probe when not installed or faulty;

Select the type of gas to be detected (toxic or explosive);

Choose the relay functioning mode (pulsed or continuous);

Choose the main alarm relay shut-down time.

A **TEST** button to check the efficiency of the unit and connected probes ensures total control of the **GS300M**.

The IP44 external structure was designed for installations on walls, or on electrical panels by means of special brackets. In addition to the alarm signal light, it is fitted with an internal buzzer.



Important: Assembly / maintenance of the appliance must be carried out by qualified personnel and in accordance with applicable laws and regulations.
The manufacturer assumes no responsibility for the use of products that have to comply with particular environmental and / or installation standards.



Important note

Before connecting the equipment, it is recommended that you read the instruction manual carefully and keep it for future reference. It is also recommended to perform the electrical connections correctly as per enclosed drawings, observing the instructions and the Standards.

N.B. Refer to the documentation in all cases where the symbol is on the side



**Installation
and user guide**



**INSTALL IN SAFE
AREA, NO ATEX**

CONFORMITY

**EN 50194
EN 45544-1-3
EN 50270
EN 61010-1**



**Compliant EN 60079-29-1
Installation EN 60079-29-2
Reports issued by TUV Italia**

Precautions

CHECK the integrity of the unit after having removed it from the box.
Check that the data written on the box correspond to the type of gas used.
When doing the electrical connections, follow the drawing closely.
Any use of the detector for purposes other than the intended one is considered improper, and as a result of which **BEINAT S.r.l.** therefore disclaims any responsibility for possible damages caused to people, animals or objects.



IMPORTANT: Do not test the device using the gas tap as this does not necessarily provide sufficient concentration to activate the main alarm.

TERMS and EXPECTATIONS: The installation of the **GS300M** control unit, its ordinary and extraordinary maintenance, every six months, and its out of service removal at the end of the functional life guaranteed by the manufacturer, must be carried out by **authorized or specialized personnel**.

In order to achieve long and satisfactory use of your **GS300M** digital control unit, use it by respecting the following precautions.

Do not allow it to become wet.

The control unit can be seriously damaged as it is not waterproof either when immersed in water or exposed to high levels of humidity.

Do not drop it.

Heavy knocks or falls during transportation or installation can damage the appliance.

Avoid abrupt temperature fluctuations.


Sudden temperature variations can cause condensation and the control unit could work poorly.

Over a temperature of about +45°C, the monitor turns black. In such case it should cool down to become visible again.

Cleaning

Never clean the device with chemical products. If necessary, wash with a moist cloth.

Technical Specifications

Main Power Supply boxed version	110/230VAC 50/60Hz ±10%
Secondary Power Through Battery Max 2,2 Ah (Optional)	12 V  ±10%
Battery Charger max 2.2 Ah	Controlled
Power Demand	11 W max @ 230V
Power Demand6 W max @ 12V
Relay Contact Range	10A 250VAC resistive - 5A 30Vdc resistive
1 st Pre Alarm	Set to 8% of L.E.L. or 120ppm CO
2 nd Pre Alarm	Set to 13% of L.E.L. or 200ppm CO
Final Alarm	Set to 20% of L.E.L. or 300ppm CO
Number of Conventional Sensors that can be connected	3
Micro-switches to include or exclude the probes	1 per each probe
Connectable probes	Semi-conductor, Catalytic, Electrochemical cell, Pellistore, Infrared Rays
Type of faults detected by Fault Circuit	Interruption, short circuit, or wear
Input Signal	4 ÷ 20 mA on 220 ohm
Device Accuracy	1% FS
Response Time	< 2"
Control Unit	microprocessor
Functioning Temperature	-10°C ÷ +60°C
Waiting, blinking period	90 seconds
Manual Test	Built in
Max. distance between probes and unit	100 m
Cable diameter for connecting probes	1 mm ²
Connection: The cable of connection of the probe must not be installed together with the power cables.	
Otherwise, make sure to use a shielded cable	
Size DIN EN 50092	144*144*110
Degree of Protection	IP44
Warranty.....	3 years

Main Compatible Probes

Probe	Sensor	Degree Protec.	Suitable for	Gas Detected	Range Working Sensor	Output	Precis.	Calibration Relay Automatic
SG500	Catalytic	IP30	Domestic Use	CH4-LPG	0÷100% LEL	4÷20 mA	±5 %	NO NO
SG544	Catalytic	IP44	Tertiary	CH4-LPG	0÷100% LEL	4÷20 mA	±5 %	NO NO
SGM595	Catalytic	IP55	Tertiary	See catalogue	0÷100% LEL	4÷20 mA	±5 %	Yes NO
SGM595/A	Catalytic	IP66	Zone 2	See catalogue	0÷100% LEL	4÷20 mA	±5 %	Yes NO
SGM533	Catalytic	IP55	Tertiary	See catalogue	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
SG800	Catalytic	IP66	Zone 2	See catalogue	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
HCF100	SemiConduct	IP55	Tertiary	FREON	0÷300% ppm	4÷20 mA	±5 %	NO Yes
SG895	Pellistor	ATEX	Zone 1	See catalogue	0÷100% LEL	4÷20 mA	±5 %	Yes NO
SG580	Catalytic	IP66	Zone 2	See catalogue	0÷100% LEL	4÷20 mA	±5 %	Yes NO
SGF100	Catalytic	IP64	Zone 2	Methane	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
SGF102	Catalytic	IP64	Zone 2	LPG	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
SGF104	Optical Fluores	IP64	Zone 2	Oxygen	In %	4÷20 mA	±5 %	Yes Yes
SGF106	SemiConduct	IP64	Zone 2	FREON	0÷300% ppm	4÷20 mA	±5 %	Yes Yes
SGF108	Elettrochimica	IP64	Zone 2	H2S	0÷300% ppm	4÷20 mA	±5 %	Yes Yes
SGF110	Electrochemical	IP64	Zone 2	CO	0÷300% ppm	4÷20 mA	±5 %	Yes Yes
SGF112	Catalytic	IP64	Zone 2	Hydrogen	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
CO100r	Electrochemical	IP55	Tertiary	CO	0÷300% ppm	4÷20 mA	±5 %	Yes Yes
CO100Ar	Electrochemical	IP66	Zone 2	CO	0÷300% ppm	4÷20 mA	±5 %	Yes Yes
SG800 ^{duct}	Catalytic	IP66	Zone 2	CH4LPG	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
CO200 ^{duct}	Electrochemical	IP66	Zone 2	CO	0÷300% ppm	4÷20 mA	±5 %	Yes Yes

Application in:

Domestic: family accommodation. Local boilers up to 70 kW-h
Tertiary Areas: Large Rooms Boilers, Workshops, Material Deposits, Industrial Kitchens, Large Buildings, Buildings.
Zone 2 - Mixed IP66 ATEX: High probability of escape, high risk locations, premises for which applicable regulations apply.
Zone 1 - Hazardous Area, High Risk Hazards, Rooms for Which Regulations, Tanks, Control Valves are in force.

MAINTENANCE



The user periodically (every 6 months) must perform a check of the operation of the control unit by spraying a suitable test gas at the base of the probes connected until the alarm condition is reached.

- At least once a year make a more accurate check by a specialist technician.
- Disabling the detector must be carried out by qualified personnel.



WARNING!

WARNING! Actions to be taken in case of alarm

Gas

- 1) Put out all free flames.
- 2) Close the main gas tap or the LPG cylinder tap.
- 3) Do not turn any lights on or off; do not turn on any electrical device or appliance.
- 4) Open windows and doors in order to increase ventilation.

If the alarm stops, its cause must be found and the relevant consequent measures taken.

If the alarm continues and the cause of gas presence cannot be found or removed, abandon the building and call the emergency services when outside (fire department, distributors, etc.)

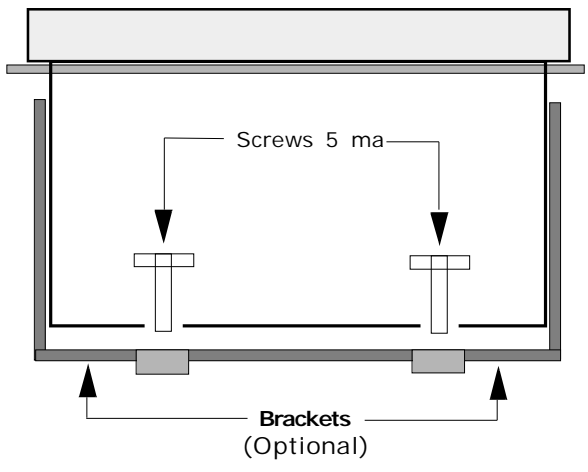
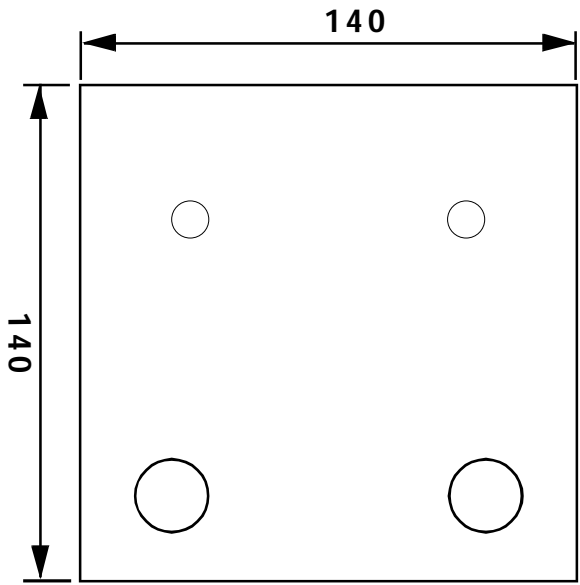
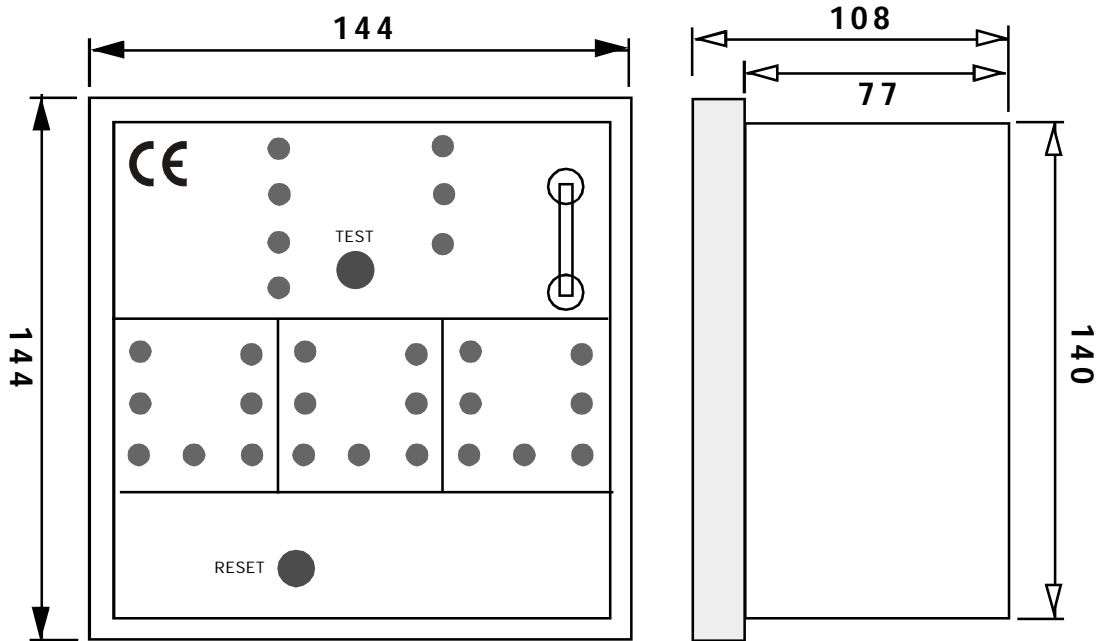
IMPORTANT: The operation test should not be carried out with the gas tap as this does not guarantee a sufficient concentration to activate the general alarm.

Warning !!

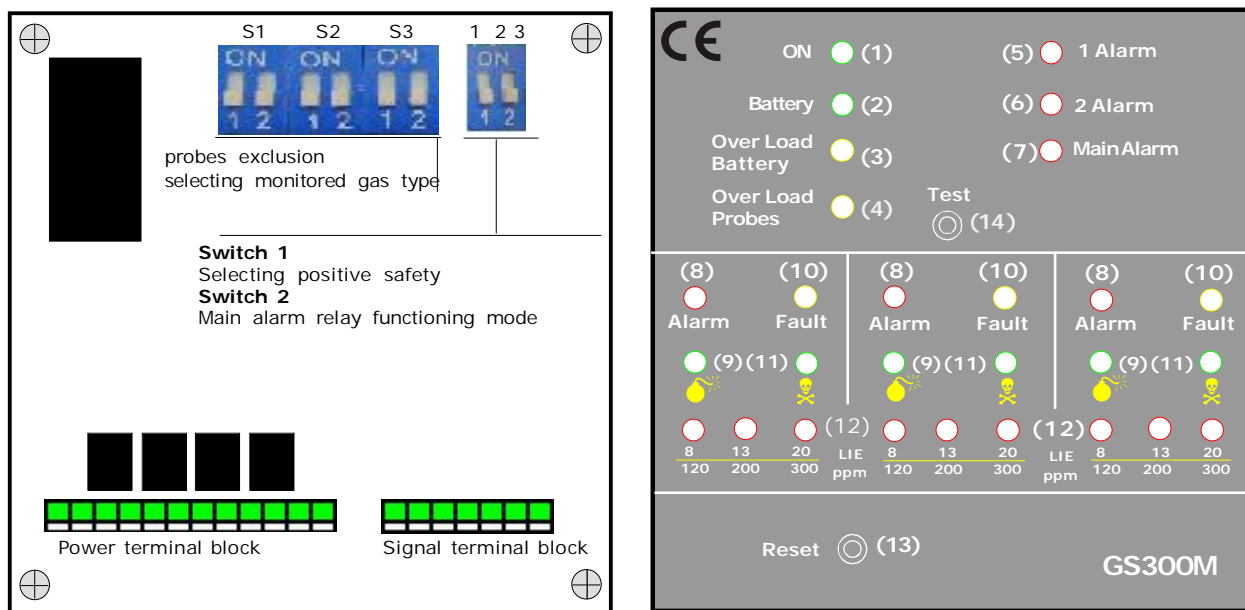
If you have the following symptoms: vomiting, sleepiness, or else, go to the closest first aid station and inform the operators that you could have been poisoned by **Carbon Monoxide, or by an excess or deficiency of oxygen**



Dimensions



Components and commands



1) MAINS LED. It lights up when electrical power is connected. Initially, this LED blinks for about 1 minute waiting for the check.

When this LED is blinking the GS300M is not capable of detecting gas.

2) BATTERY LED. This LED lights up when no mains is present and the GS300M is powered by the battery. When this LED is blinking the battery is flat.

3) OVER LOAD BATTERY LED (battery overload): If this LED turns on, it means the battery is not connected properly, or it has an anomalous voltage absorption. Please check the battery and the connection cables.

4) OVER LOAD PROBE LED. If this LED turns on, it means there is a short circuit or high voltage absorption in the probes.

5) 1st PRE ALARM LED. This LED will light up when the gas concentration level has reached the preset **8% of LEL** and the 1st **THRESHOLD** relay contact is closed.

6) 2nd PRE ALARM LED. This LED will light up when the gas concentration level has reached the preset **13% of LEL** and the 2nd **THRESHOLD** relay contact is closed.

7) MAIN ALARM LED. This LED will light up when the gas concentration level has reached **20% of LEL** and the **MAIN ALARM** relay contact is closed.

8) Zone Alarm MEMORY LED. If this LED turns on, it means an alarm has occurred.

9) EXPLOSIVE GAS LED. This LED will light up when the relevant microswitch is set to EXP.

10) FAULT LED. This LED will light up when the probe is faulty, if there is an interruption in the cable connection, or if an error was made during wiring.

11) TOXIC GAS LED. This LED will light up when the relevant microswitch is set to TOX.

12) scale of gas detection. These LEDs light up in sequence according to the environment gas concentration level increase. When the first LED turns on, the gas concentration level has reached 8% of LEL and the 1st **THRESHOLD** relay contact is closed. When the second LED turns on, the gas concentration level has reached 13% of LEL and the 2nd **THRESHOLD** relay contact is closed. When the third LED turns on, the gas concentration level has reached 20% of LEL and the **MAIN ALARM** relay contact is closed

13) RESET BUTTON. This button is pressed to reset all memories.

14) TEST BUTTON. Pressing down the TEST button, you can obtain a gas leakage simulation.

This way, all pre-alarm LEDs until the final alarm LED will light up in sequence, switching the correspondent relays.

Electrical Connections



WARNING.

Before connecting to the mains power, ensure the voltage is correct.

Carefully follow the instructions and the connections according to Regulations in force, keeping in mind that **the signal cables should be laid separate from the power cables.**

An automatic cut-off switch (appropriately identified as devicesectioning of the detector) should be incorporated in the electrical system, adequately located and easily accessible.

Legend setting switches

- S1) switch group reserved to the probe N° 1
- S2) switch group reserved to the probe N° 2
- S3) switch group reserved to the probe N° 3

- 1) Selection of positive safety
- 2) Operating mode of the main alarm relay.

PLEASE NOTE!

All relays are free of voltage

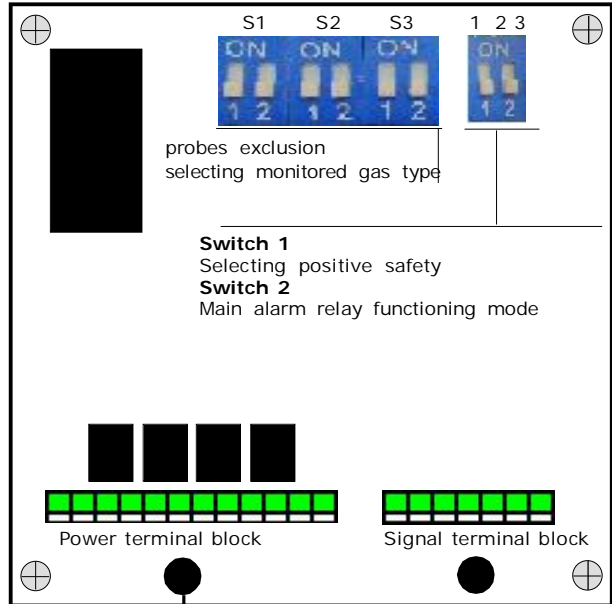
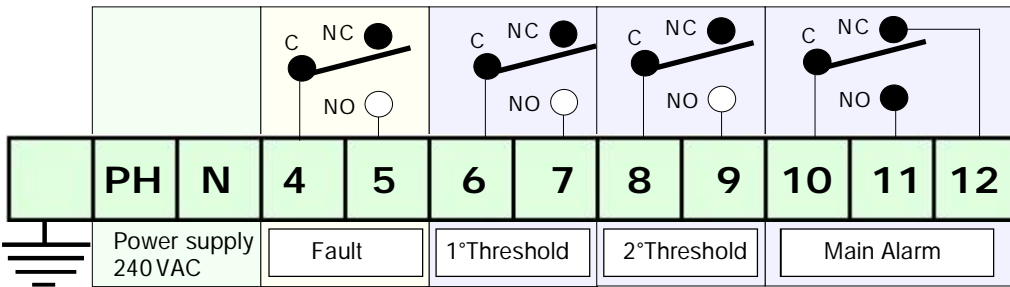
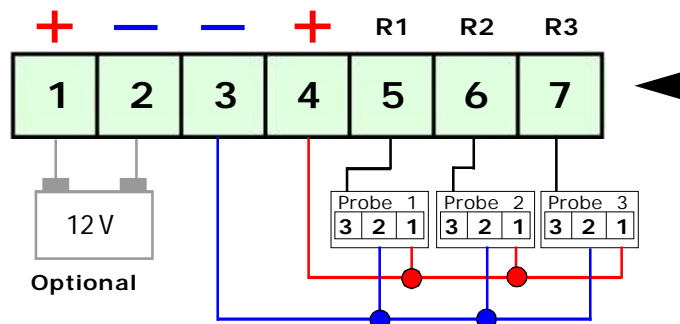


Diagram of the terminal block relay

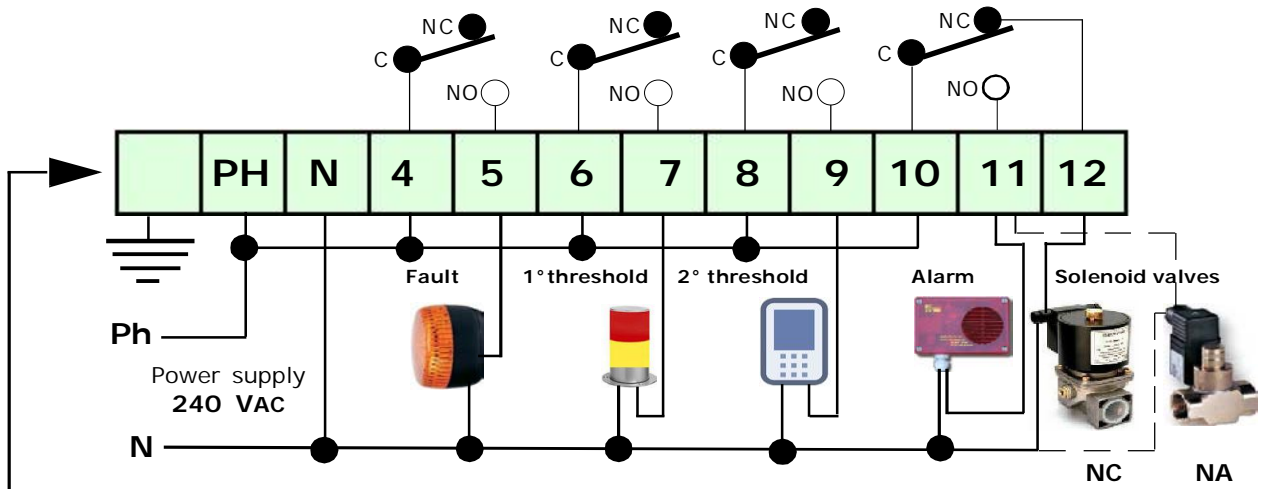


Connection of probes and eventual battery

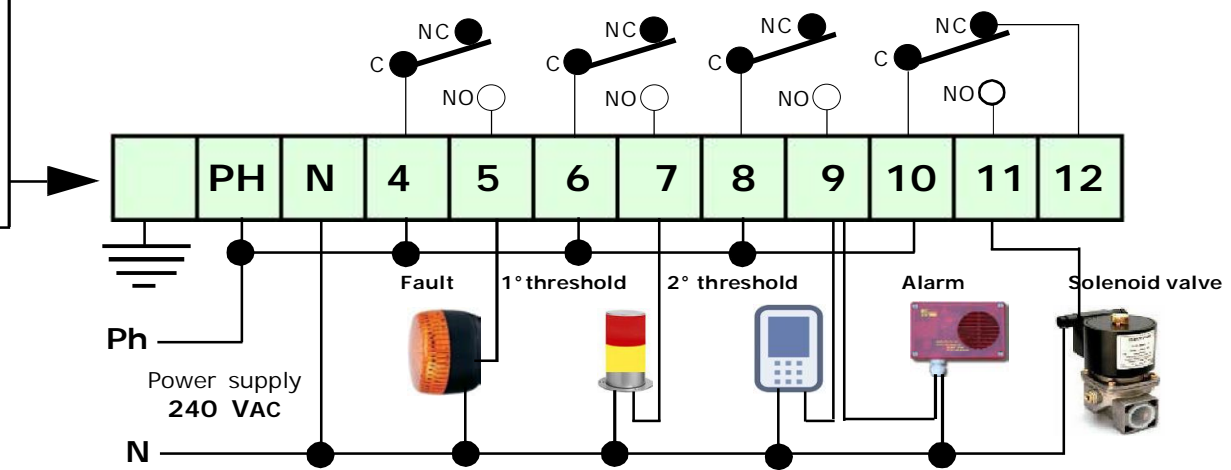


Connection examples

Connections of a solenoid valve Normally Closed without Positive Safety



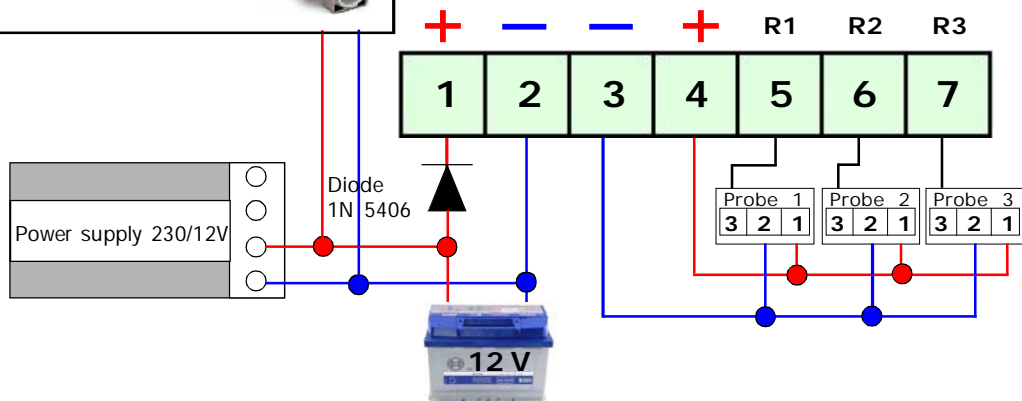
Connections of a solenoid valve Normally Closed with Positive Safety



Control unit power supply and connection of a solenoid valve with sirens to 12 VDC trough an alternative source and recharge battery.

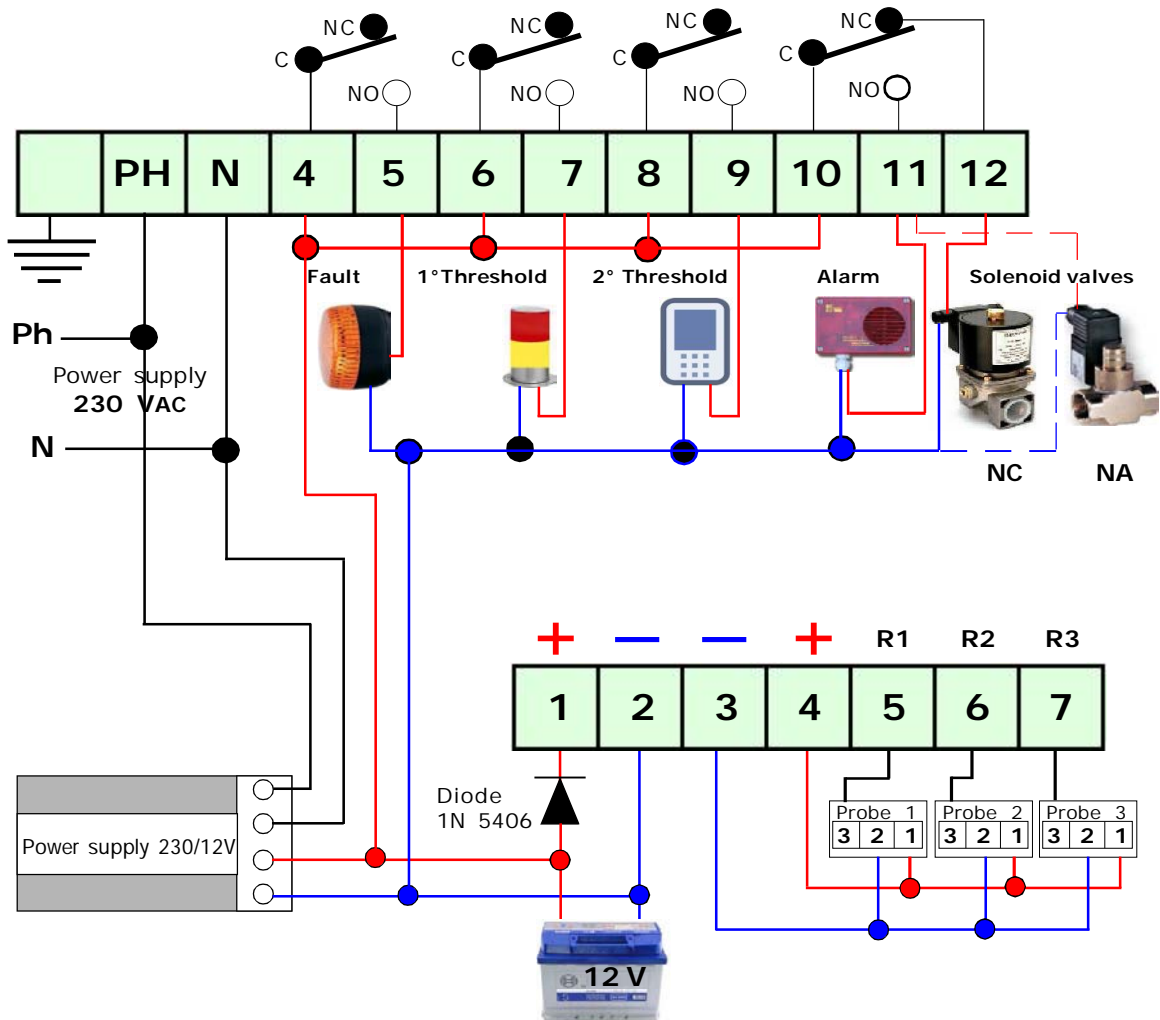


It's not possible to connect directly solenoid valves or sirens 12V.dc. to the **GS300M**.



Connection examples

Connections with Positive Safety disabled and an external power supply for solenoid valve and siren control to 12 VDC



Description of Micro-switches

Disabling or uninstalling the probes

You can connect 3 probes to the **GS300M**. The control unit is tested with the probes connected. These micro-switches are also used to disable one or all probes in case of failure.

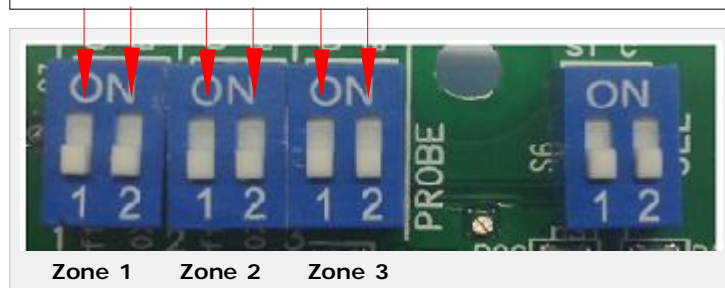
The **GS300M** is fitted with three micro-switches in order to select the type of gas that the connected probes should monitor.

The LEL reading is obtained by shifting the switch to **ON**. **Explosive gas**.

The ppm reading is obtained by shifting the switch to **OFF**. **Toxic gas**.

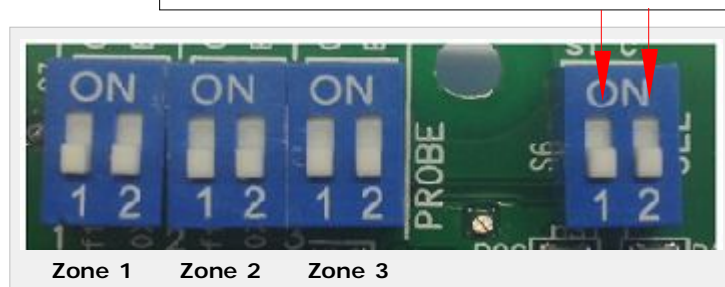
Micro-switch (1) to enable or disable the zone of the probe.
Position ON enabled Position OFF disabled

Micro-switch (2) to select the type of gas monitored zone.
Position ON reading in LEL - Explosive gas
Position OFF reading in ppm - Toxic gas



Functioning mode of the Main Alarm relay

Micro-switches 1 Positive Safety
Micro-switches 2 Working mode of the relay
Main Alarm



Switch 1 – Selection of the intrinsic safety

In the **ON** position, the intrinsic safety function is enabled.

In the **OFF** position, the intrinsic safety function is disabled.

The relay is energized only when the **GS300M** goes into main alarm state

Switch 2 – Functioning Mode

In the **ON** (continuous) position, the relay remains closed until the RESET button is pressed.

In the **OFF** (impulse) position, the relay remains closed for 20 seconds, and then disenergizes afterwards

Installation and positioning of the sensors

The **GS300M** control unit belongs to group II and must be installed in a safe area; **Outside the ATEX zone**, however, not in boiler rooms or engine room. The control unit must be accessible and visible to the user.

The **GS300M** is designed so that it can be mounted externally or built into electrical panels. The **Control Unit** complete cabinet is an equipment suitable for wall mounting and is powered by **110/240 VAC** with **IP44** protection

When installing, it is good to use the normal care that an electronic equipment requires:

- Install the equipment away from excessive heat sources.
- Avoid liquids coming into contact with the control unit, remembering that its external structure has IP20 degree of protection **if installed on the Boxed version (cabinet) supplied to the source is IP44.**

The sensors must be selected with an IP degree depending on the area to be controlled (Kitchens, Boiler Rooms, Laboratory, etc.) by selecting one of the probes from Beinat from IP30 to ATEX. see page 3

Position of the detection probes

You can connect many types of remote probes to this unit. Therefore, they should be positioned at different heights depending on the type of gas to be detected.

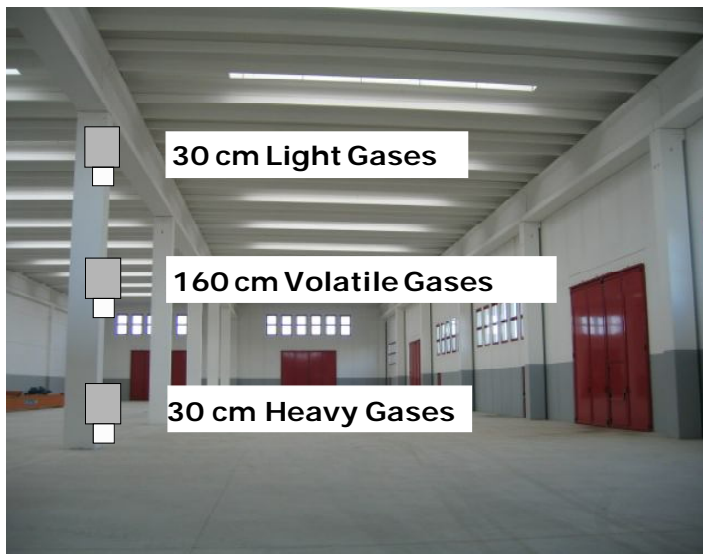
These heights are:

- **30 cm** from the lowest point of the floor in order to detect: *Heavy gases (L.P.G. etc.)*
- **30 cm** from the highest point of the ceiling in order to detect: *light gases (Methane, etc.)*
- **160 cm** from the lowest point of the floor in order to detect: *volatile gases (CO, etc.)*

It is important to note that the remote probes should be installed according to the following restrictions:

- 1) The sensors should not be placed near the appliances to be controlled (boilers, burners, industrial kitchens, etc.) but on the opposite side.
- 2) The sensors should not be affected by smoke, vapour, and moving air, as they could distort their measurement.
- 3) The sensors should not be placed near sources of heat, ventilators or fans.
It should be noted that the internal GAS sensors of the probe are perishable components with a variable average life span from 5 to 6 years (you can request the relative table). Therefore, after this period of time has elapsed it is advisable to replace them.
- 4) The control of operation and maintenance and / or extraordinary **must be carried** at least once a year. good to keep
When turning on leds fault is necessary make the replacement of the probe by a specialized technician.

PROBE INSTALLATION INFORMATION



Turning on the GS300M

- 1) Apply power using the proper switch. This switch should be fitted with protection fuses.
- 2) You will notice that some LEDs will light up in turn for about 20 seconds, so as to test the LEDs.
- 3) The LED ON will continue blinking for about 2 minutes and then remain ON.
Now the **GS300M** is ready for detection.
- 4) By pressing the MANUAL TEST button, you get the simulation of a gas leak and the unit carries out the following:
 - a) **The 1st Pre-alarm** LED lights up calibrated to 8% LEL or 120 ppm (referred to CO) switching the relay
 - b) **The 2nd Pre-alarm** LED lights up calibrated to 13% LEL or 200 ppm (referred to CO) switching the relay the buzzer will issue a low frequency sound
 - c) **The Main alarm** LED lights up calibrated to 20% LEL or 300 ppm (referred to CO) switching the relay. The Main alarm LED starts flashing; the buzzer will issue a high frequency soundWhen releasing the MANUAL TEST button, you will see the opposite: Only the Main Alarm and the zone alarm LEDs will remain ON.
- 5) To complete the general test, issue gas from a pre-calibrated aerosol
- 6) To complete the general test, issue gas from a pre-calibrated aerosol within 20% of L.E.L. A test using a common cigarette lighter could damage the sensor.
If you want to simulate a zone fault, you only need to disconnect the return cable of the corresponding probe. When the fault LED turns on a continuous sound will warn you of the failure. At the same time, the relevant relay will switch to its position.

Troubleshooting and solutions before calling a technician

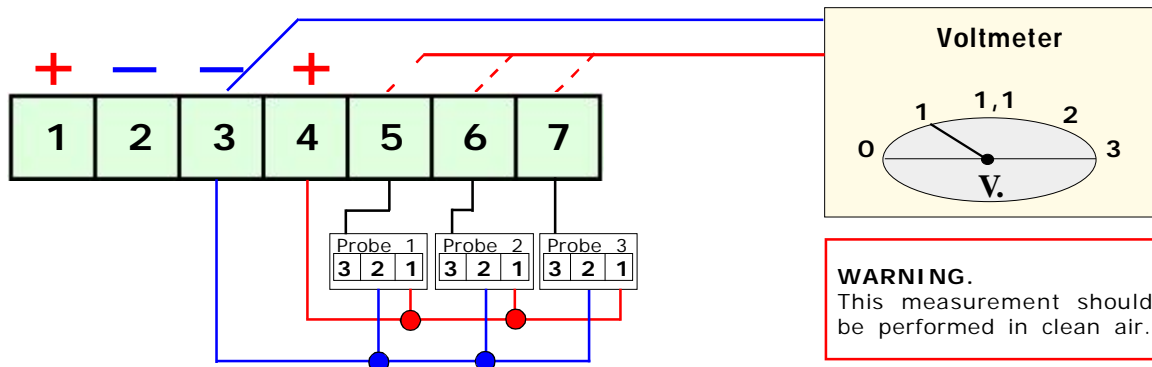


If the device does not start up.

Check that the 230V mains power is correctly connected. If powered by the battery, check that the 12Vdc power is correctly connected.

If the Fault LED lights up.

Check that the connecting cables from the **GS300M** to the probes are intact, that the probes are properly powered, and that the signal cable is correctly connected.



If the Over Load Probe LED lights up.

Check: that the power polarity has not been inverted, that no short-circuit is present, that the probes were not damaged during installation, that no excessive current absorption is present.

If the Over Load Battery LED lights up.

Check that the connection cables are not short-circuited, that the polarity has not been inverted, or that the battery is not damaged

If the Control Unit is repeatedly issuing an alarm.

Check that there are no gas leaks.

If the alarm signal and the FAULT indicator light turn on together, check the probes.

If the Control Unit is issuing an alarm and does not shut off the devices connected to it.

Check that the wiring is correct and that the jumper that carries power to the relay has been set properly. **All relays must be free from electrical power.**

Check the drawing of the connections.

If a 12Vdc solenoid valve, which does not work well, is connected to the GS300M.

Direct connection of 12Vdc solenoid valves or sirens to the **GS300M** is not permitted.

An external power unit must always be used. The **GS300M** gives a **max current of 100mA**.

If other problems arise, a specialised and/or authorised technician and/or the **Distributor** of **BEINAT S.r.l.** should be contacted directly.

INSURANCE. This device is insured by the SOCIETÀ REALE MUTUA for the PRODUCT'S GENERAL LIABILITY up to a maximum of 1,500,000.00 EURO against damages caused by the device in case of failures in functioning.

WARRANTY. The warranty term is 3 years from manufacturing date, in agreement with the following conditions. The components acknowledged as faulty will be replaced free of charge, excluding the replacement of plastic or aluminium cases, bags, packing, batteries and technical reports.

The device must arrive free of shipment charges to **BEINAT S.r.l.**

Defects caused by unauthorized personnel tampering, incorrect installation and negligence resulting from phenomena outside normal functioning shall be excluded from the warranty.

BEINAT S.r.l. is not liable for possible damage, direct or indirect, to people, animals, or things; from product faults and from its enforced suspension of use.



DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT.

This symbol on the product or its packaging to indicates that this product shall not be treated as household waste. Instead, it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment, such as for example:

- sales points, in case you buy a new and similar product
- local collection points (waste collection center, local recycling center, etc.)

By ensuring this product is disposed of correctly, you will help prevent potential negative consequence for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Attention: in some countries of the European Union, the product is not included in the field of application of the National Law that applies the European Directive 2002/96/EC and therefore these countries have no obligation to carry out a separate collection at the "end of life" of the product.



Control Unit GS300M *Lo styling è della b & b design*

Dealer stamp

Purchase date:

Serial number:

Beinat S.r.l. following the purpose of improving its products, it reserves the right to modify the technical, aesthetic and functional characteristics at any time and without giving any notice.

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