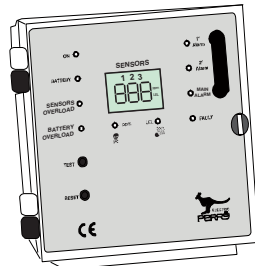




**PERRY ELECTRIC S.r.l.**  
Via Milanese, 11 - 22070 VENIANO (CO)  
ITALY - www.perry.it



Wall mounting

## Gas Control Unit 1GA300M

**IP44 external protection**

**Zones Max 3**

**Analog input 4 ÷ 20mA**

**Detection Explosive and/or toxic gases**

### REFERENCE STANDARDS

EN 50194-1 EN 50291-1

EN 60079-29-1

EN 45544-1 EN 45544-3

The 1GA300M control unit has been designed and built according to European regulations to flexibly detect the presence of toxic and/or explosive gas and OXYGEN, through the connection of 3 remote probes. The presence of this and other devices makes the control unit suitable for Tertiary and Industrial uses. The 1GA300M control unit has three danger levels:

**1st LEVEL - 1° Pre alarm, 1st Alarm.** This was set to 8 % of L.E.L. (EXPLOSIVE GAS) 120 ppm (TOXIC GAS)

**2nd LEVEL - 2° Pre alarm, 2nd Alarm.** This was set at 13% of L.E.L. (EXPLOSIVE GAS) 200 ppm (TOXIC GAS)

**3rd LEVEL- Main Alarm, This was set at 20 % of L.E.L. (EXPLOSIVE GAS) 300 ppm (TOXIC GAS)**

Through special sensors for oxygen it is possible to detect deficiency or excess of oxygen.

Other technical features make this control unit extremely versatile and reliable; for example, by using a series of microswitches 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 to enable or disable of the **intrinsic safety (positive safety)**.

The presence of a TEST button allows to check the correct functioning of the control unit in two ways:

- 1) System TEST. Pressing the TEST button tests the entire system, including the relays and accessories connected to it.
- 2) Maintenance TEST. With special arrangements you can enable the function of exclusion of the general alarm relay for a maximum duration of 60 minutes.

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 for acoustic signals.

## 1 - TECHNICAL SPECIFICATIONS

Main Power Supply .....	110/230 VAC ± 10% 50/60 Hz
Secondary Power Through Battery Max 2,2 Ah (Optional).....	12 V DC  ± 10%
Battery Charger max 2.2 Ah .....	controlled
Power Demand .....	8,3W max @ 230V
Power Demand .....	4W max @ 12V
Relay Contact Range .....	10A 250VAC resistive - 5A 30VDC resistive
1st Pre Alarm .....	set to 8% of L.E.L. or 120ppm CO
2nd Pre Alarm .....	set to 13% of L.E.L. or 200ppm CO
Final Alarm .....	set to 20% of L.E.L. or 300ppm CO
OXYGEN alarm .....	Oxygen deficiency, Oxygen Excess
Monitored Gas Indication .....	through backlit color display
Number of Conventional Sensors that can be connected .....	Max 3
Micro-switches to include or exclude the probes .....	1 per each probe
Microswitch to select OXYGEN detection .....	incorporated
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"
Functioning Temperature .....	-10°C ÷ +60°C
Waiting, blinking period (Warm up) .....	about 90 seconds
Manual Test .....	built in
Max. distance between probes and unit .....	100 m.
Cable diameter for connecting probes .....	1mm
Connection: the cable of connection of the probe <b>must not be installed together with the power cables.</b>	
<b>Otherwise, make sure to use a shielded cable</b>	
Size .....	144x144x108
Degree of Protection .....	IP44

## WARNINGS



Please read this instruction booklet carefully and keep it for future reference.

The manufacturer reserves the right to introduce any technical and/or constructive changes deemed necessary, with no prior notice.



**Important:** the installation and electrical connection of the devices and appliances must be implemented by person with electrotechnical expertise only and in conformity with current laws and regulations.

The manufacturer declines any liability for the use of products subject to special environmental and/or installation standards.

The installation of the unit, its ordinary and extraordinary maintenance, once a year, 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.



**Make sure the 230V mains power supply is disconnected before installing or carrying out any maintenance operations.**

**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.

### **IMPORTANT**

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

### **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 PERRY disclaims any responsibility for possible damages caused to people, animals or objects.
- The control unit is not waterproof: if immersed in water or exposed to high humidity, it can be seriously damaged.
- Never clean the device with chemical products. If necessary, wash with a moist cloth.
- Heavy knocks or falls during transportation or installation can damage the appliance.
- Sudden temperature variations can cause condensation and the control unit could work poorly.

## **The detector installation does not exempt...**

... the compliance with all regulations concerning the characteristics, installation and use of gas appliances. The ventilation of the premises and the discharge of the combustion products prescribed by the UNI standards as per **ART. 3 LAW 1083/71** and the related legal provisions.

### **DISPOSAL OF ELECTRICAL & ELECTRONIC EQUIPMENT**

This symbol on the product or its packaging 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...).

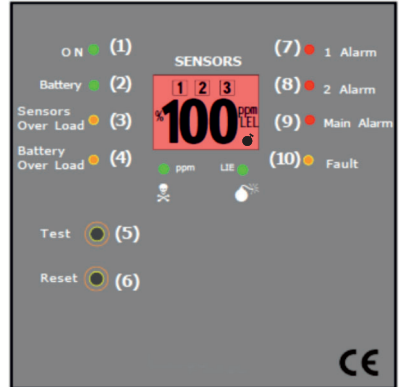
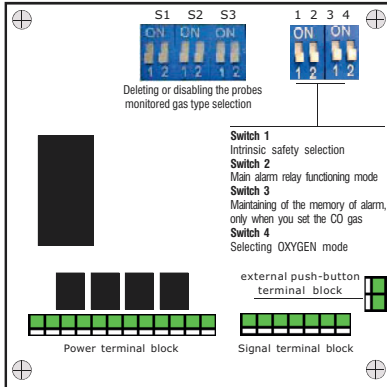
By ensuring this product is disposed of correctly, you will help prevent potential negative consequence for the environment and human health, which could otherwise be caused by inappropriate waste handing of this product.

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 house hold waste disposal service or the shop where you purchased the product.



## 2 - GENERAL DESCRIPTION OF THE CENTRAL UNIT

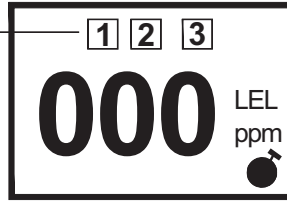


- 1) **LED ON.** It blinks for about 2 minutes (warm up time) when the mains power is supplied. When ready, the LED stays on without blinking. **During warm up the control unit is not able to detect the presence of gas.**
- 2) **BATTERY LED.** It lights up (fixed) when no mains power is present and the control unit is supplied by a 12Vdc battery. It blinks when the battery is flat.
- 3) **OVER LOAD PROBES LED.** If this LED turns on, it means there is a short circuit or high current absorption in the probes.
- 4) **OVER LOAD BATTERY LED.** If this Led turns on, it means the battery is not connected properly, or it has an anomalous voltage absorption.
- 5) **TEST BUTTON.** Pressing and holding down this button, you can obtain a gas leakage simulation. In order to perform this operation no failures or alarms should be present.
- 6) **RESET BUTTON.** This button is pressed to clear all memories, or to restore the control unit after a failure.
- 7) **1st Pre Alarm LED.** This LED will light up when the gas concentration level has reached 8% of LEL (EXPLOSIVE GAS) or 120 ppm (TOXIC GAS) and the **1st threshold** relay contact is closed. The relay disenergizes when the 13% of LEL, or 200ppm threshold is exceeded.
- 8) **2nd Pre Alarm LED.** This LED will light up when the gas concentration level has reached 13% of LEL (EXPLOSIVE GAS) or 200 ppm (TOXIC GAS) and the **2nd threshold** relay contact is closed. The buzzer will issue a low frequency sound. The relay disenergizes when dropping below the 13% of LEL, or 200ppm, threshold.
- 9) **MAIN ALARM LED.** This LED will light up when the gas concentration level has reached 20% of LEL (EXPLOSIVE GAS) or 300 ppm (TOXIC GAS) and the **MAIN ALARM** relay contact is closed. The buzzer will issue a high frequency sound.
- 10) **FAULT LED.** This LED blinks when one of the connected probes is faulty, if there is an interruption in the cable connection, or if an error was made during wiring. When this LED is blinking, the device is no longer capable of detecting. To reactivate the device, the damaged probe must be repaired or disabled using the internal micro-switch (see page 10, chapter 6) and then the RESET button must be pressed.
- 11) **DISPLAY.** The display below is represented with all its segments and indications.
  - a) The number on the display indicates the concentration of gas detected.  
The exchange of data of every connected probe is every about 4 seconds.
  - b) The numbers in the rectangle "1 2 3" are the probe connected.
  - c) The letters **ppm** means when the connected probe detects **Toxic gas**.  
The letters **LEL** means when the connected probe detects **Explosive gas**.
  - d) The timing symbol lights when the device is in warm up phase, at the same time its begins the count down.



## DESCRIPTION OF DISPLAY

Identification  
of the Sensors (probes)  
from No. 1 to No. 3



A row of LEDs numbered **from 1 to 3** and called PROBES has been fitted on the device. These LEDs are lit with a 4 seconds frequency representing the connected probes, and indicate the probe being read on the display.

**In case of alarm:** the LED that represents the probe stops for about 15 seconds. This is done in order to identify the relevant zone or zones easily. The gas percentage measured by the probe appears on the display and is maintained for 15 seconds. On the next pass, the LED (probe) will be maintained again and the alarm will be issued.

**In case of fault:** the LED of the relevant probe starts blinking and remains lit.

The display will show the "FAU" (Fault) fixed indication, and the buzzer will issue a continuous sound until:

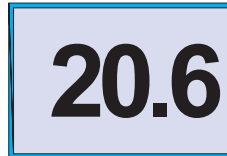
- 1) The repair has been carried out;
- 2) The relevant probe has been disabled using the micro-switch.

The device is equipped with a display backlight color to facilitate the recognition of the state of the probe monitored.

The data exchange for each probe connected happens every 4 seconds.



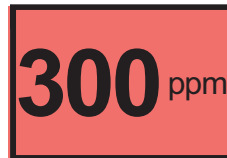
The green display shows an absence of leakage of gas, normal condition.



The blue display shows the percentage % of oxygen. normal condition



The display shows with red color a concentration of explosive gases in % LEL greater than a threshold alarm.



The display shows with red color a concentration of toxic gases ppm greater than a threshold alarm.



The yellow display shows a fault of one or more probes.

### Alarm thresholds, referring to oxygen

<b>1st Pre-Allarme</b>	<	<b>19.9 %</b>
	>	<b>21.9 %</b>
<b>2nd Pre-Allarme</b>	<	<b>19.5 %</b>
	>	<b>22.5 %</b>
<b>Main alarm</b>	<	<b>18.5 %</b>
	>	<b>23.5 %</b>

### Legend:

- < **Oxygen deficient**
- > **Excess Oxygen**

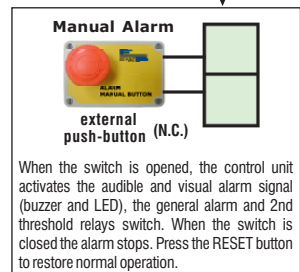
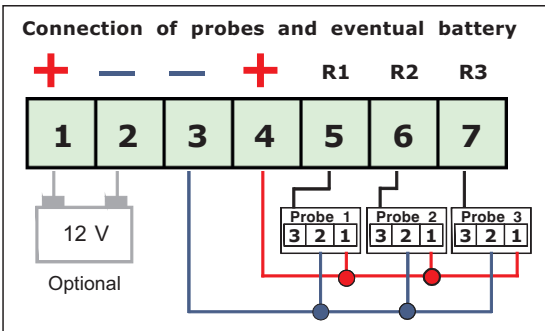
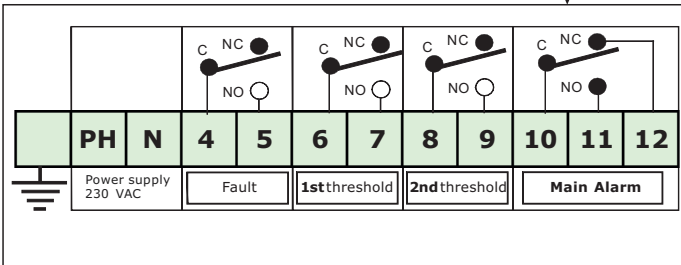
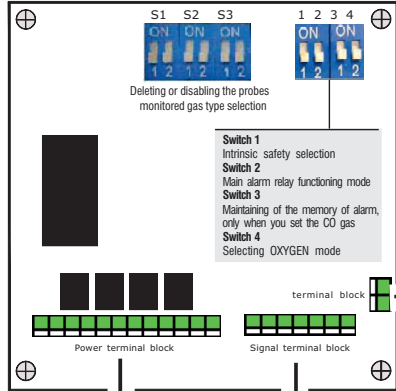
### 3 - ELECTRICAL CONNECTIONS

**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. Otherwise, make sure to use a shielded cable.** An automatic cut-off switch (appropriately identified as device sectioning of the detector) should be incorporated in the electrical system, adequately located and easily accessible.

#### Legend setting switches

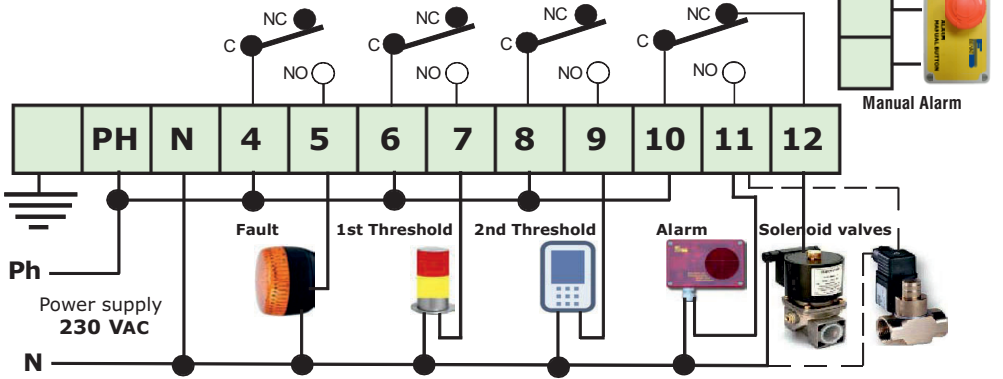
- S1) switch group reserved to the probe N° 1
  - S2) switch group reserved to the probe N° 2
  - S3) switch group reserved to the probe N° 3
- 1) Selection of intrinsic safety
  - 2) Operating mode of the main alarm relay.
  - 3) Selection of MEMORY.
- N.B.** you can remove the selection of memory when the gas CO is selected.
- 4) Selection for oxygen detection

**Diagram of the terminal block relay**  
**PLEASE NOTE!**  
 All relays are free of voltage

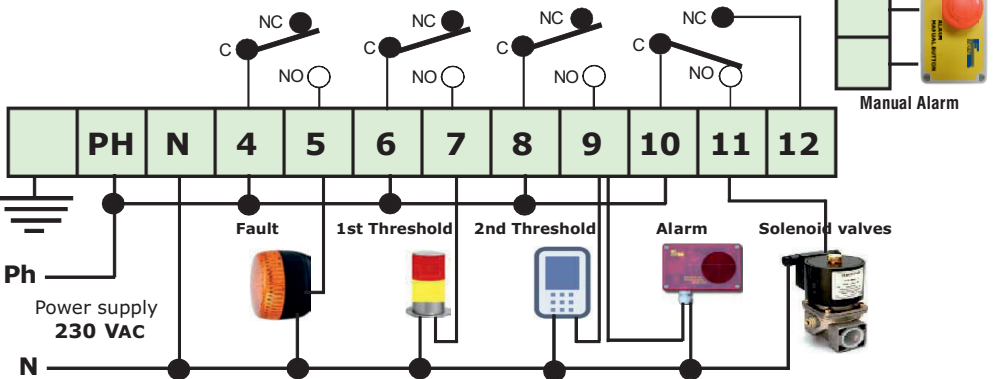


## 4 - CONNECTION EXAMPLES

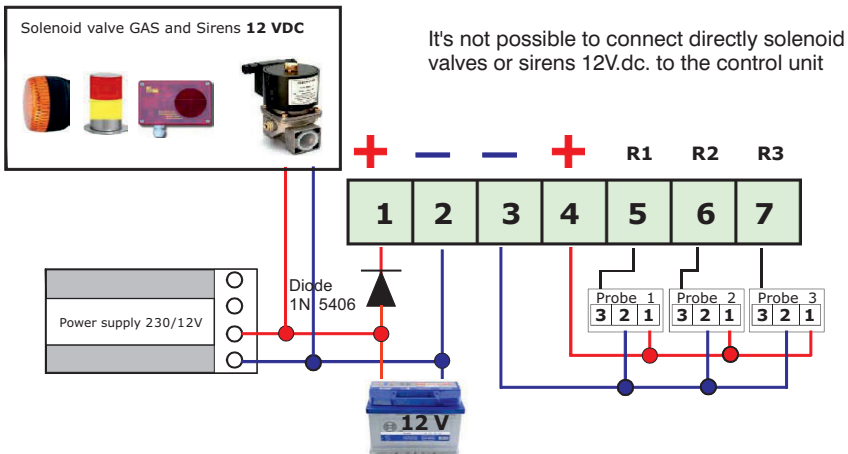
### Connections of a solenoid valve Normally Closed without intrinsic Safety



### Connections of a solenoid valve Normally Closed with intrinsic Safety



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



## 5 - SYSTEM MAINTENANCE

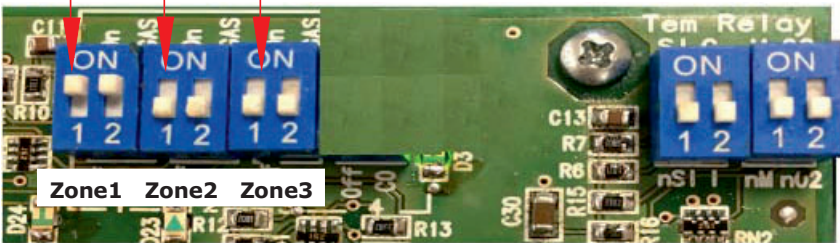
The simultaneous and prolonged pressure for **5 seconds** of the "TEST" and "RESET" buttons enables the test-on mode in which the control unit does not switch the general alarm relay for a period of 15 minutes, not even pressing the external manual button. A further key press in the same mode extends the time of 15 minutes to a maximum of 60 minutes. In this mode, before the passage from the current channel to the next, the "TEST-On" string is displayed followed by the minutes of the general alarm relay being switched off. You can terminate this mode before the natural deadline by resetting the control unit by pressing 3 consecutive times and within 5 seconds the **RESET** button.

## 6 - DESCRIPTION OF MICRO-SWITCHES

### Installing, uninstalling or disabling sensor (probe).

Through the Micro switches on the control unit, you can to activate or to deactivate 3 Zones. You can connect 3 probes to the device. The control unit is tested with the probes connected. In some installations, you may need only one probe. In this case we will proceed to disable a probe, to do this select the switch of the probe (zone) concerned. N.B.: the microswitches are also used for switching off in case of failure.

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

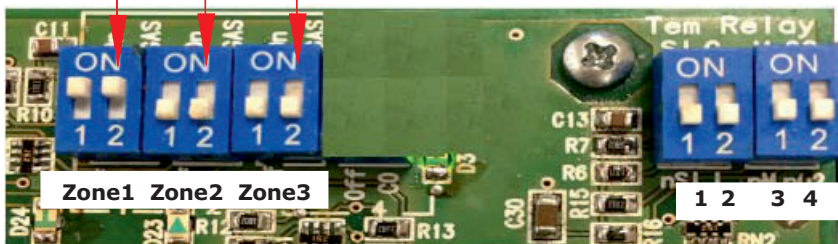


### SELECTION OF THE TYPE OF GAS MONITORED BY EACH SENSOR (PROBE)

The control unit 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 (see display)**  
 The ppm reading is obtained by shifting the switch to OFF **Toxic gas (see display)**

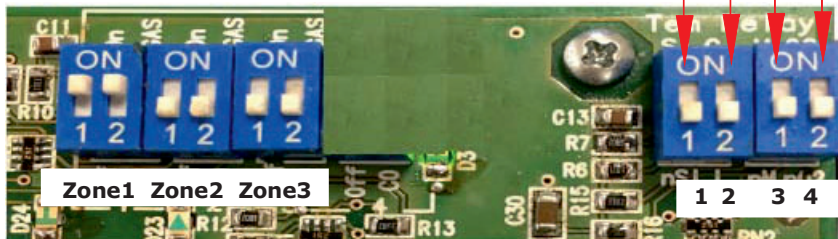
Micro-switch (2) to select the type of gas monitored  
 Position **ON** reading in LEL - **Explosive gas**  
 Position **OFF** reading in ppm - **Toxic gas**



● ppm      LEL ●

**Light signaling of the type of gas selected**  
 ppm is the concentration reading for **CO** Gas  
 LEL is the concentration reading for **Explosive Gas** (Methane or LPG)

Micro-switch 1 Intrinsic Safety  
 Micro-switch 2 working mode of the Main Alarm relay  
 Micro-switch 3 Memory maintenance  
 Micro-switch 4 Oxygen mode Inserting



**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.

In the **ON** position, the intrinsic safety function is enabled. The relay is energized immediately after performing the preheating phase, therefore the arrangement of the NO and NC contacts is inverted compared to what is indicated on the wiring diagram on page. 5. In this operating mode the relay switches, in addition to when the control unit is in a general alarm status (MAIN ALARM), even when the control panel has a fault or is switched off (disconnected).

In the **OFF** position, the positive safety function is disabled. The relay switches only when the control unit enters the state of MAIN ALARM.

Note: the general alarm relay (MAIN ALARM) in the idle state appears as shown in the wiring diagram on page

**Switch 2 – Functioning Mode of main alarm relay.**

In the **OFF** position - Impulse function, the relay remains closed for 5 seconds, and then disenergizes afterwards.

In the **ON** position - Continuous function, the relay remains closed until the **RESET** button is pressed.

**Switch 3 - Maintenance of alarm memory**

When the microswitch is set to ON, the equipment **STORES** the alarm occurred by flashing the general alarm LED, until the **RESET** button is pressed.

By setting the microswitch to OFF, the equipment **DOES NOT MEMORIZE** the alarm occurred, and the relay switches off when the connected probe no longer detects gas; in compliance with the Regulation, this function becomes active only when the detection of Toxic Gases (reading in "ppm") is selected.

**Switch 4 - Selection of the ECU in OSSIGENO detection mode**

When the microswitch is set to ON, the device **IS PREPARED FOR OXYGEN DETECTION**: the display changes color and becomes **BLUE**.

**WARNING! By selecting the oxygen detection, the entire control panel will be enabled for the detection of OXYGEN, and not other types of Gas.**

When the microswitch is set to OFF, the control unit prepares to detect explosive or toxic gas. The display changes color and turns Green.



## 7 - INSTALLATION AND POSITIONING THE 1GA300M CONTROL

The 1GA300M 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 1GA300M 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.

## 8 - INSTALLATION AND POSITIONING OF THE SENSORS (PROBES)

The Sensor 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 Perry (see page 3).

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 probes **should not be** placed near the appliances to be controlled (boilers, burners, industrial kitchens, etc.) but on the opposite side.
- 2) The probes **should not be** affected by smoke, vapour, and moving air, as they could distort their measurement.
- 3) The probes **should not be** placed near sources of heat, ventilators or fans.

N.B.: 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.

### MAINTENANCE

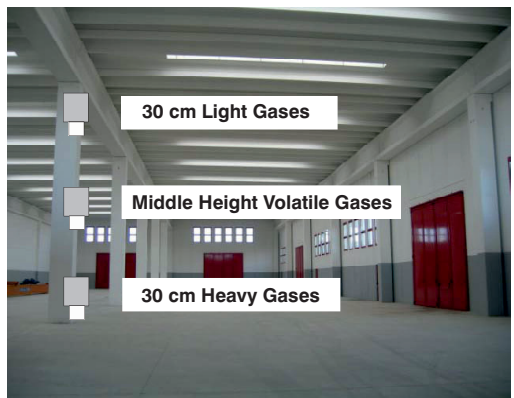
The user periodically (every 6 months) must perform a check of the operation of the control unit by spraying a suitable test gas at the base of the probes connected until the alarm condition is reached.

- At least once a year make a more accurate check by a specialist technician.
- The probes being taken out of service after 5 years from installation must be carried out by qualified personnel.

## Some types of probes that can be connected

PROBE	1GA4100MET	1GA4100GPL	1GA4200MET /A	1GA4200GPL /A	1GA895MET	1GA895MET	1GA4400CO /A
Sensor	CATALYTIC	CATALYTIC	CATALYTIC	CATALYTIC	CATALYTIC	CATALYTIC	ELECTROCHEMICAL
Gas detected	METHANE	LPG	METHANE	LPG	METHANE	LPG	CO
Range working sensor	0÷20% LEL	0÷20% LEL	0÷20% LEL	0÷20% LEL	0÷20% LEL	0÷20% LEL	0÷300% ppm
Output	4÷20 mA	4÷20 mA	4÷20 mA	4÷20 mA	4÷20 mA	4÷20 mA	4÷20 mA
Precision	±5 %	±5 %	±1 %	±1 %	±1 %	±1 %	±1 %
Calibration Relay automatic	NO	NO	YES	YES	YES	YES	NO
Supply	12÷24V dc	12÷24V dc	12÷24V dc	12÷24V dc	12÷24V dc	12÷24V dc	12÷24Vdc

## SENSORS (PROBES) INSTALLATION INFORMATION



## 9 - TURNING ON

- 1) Apply power using the proper switch. This switch should be fitted with protection fuses.
- 2) You will notice that some LED will light up in turn for about 20 seconds, so as to test the LED.
- 3) The Led ON continues to blink about 1,30 minutes after which remains steady light.  
This indicates that the control unit is ready to detect.
- 4) By pressing the 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 reference relay.
  - b) The **2nd Pre-alarm LED** lights up calibrated to 13% LEL or 200 ppm (referred to CO) switching the reference 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 sound.  
When releasing the TEST button, you will see the opposite: only the LEDs of the MAIN ALARM relay will be illuminated in flashing mode and the leds of 20% of the L.I.E.  
The main alarm will persist as long as you do not press the RESET button, so canceling the alarm memory.
- 5) To complete the test please read the manual of the probe and perform sensor test by emitting gas with a pre calibrated bottle.
- 6) To simulate the **FAULT** zone you only need to disconnect the probe return cable, the central will perform the following actions:
  - it lights in blinking mode the **FAULT** and the **MAIN ALARM LED**;
  - the buzzer sound continuously;
  - the **FAULT** relay and the **MAIN ALARM** relay will switch.Reconnect the return cable and press the RESET button 3 times every 5 seconds to restore the control unit functioning.

## Troubleshooting and solutions before calling a technician

### - If the device does not start up

Check that the 230VAC mains power is correctly connected.

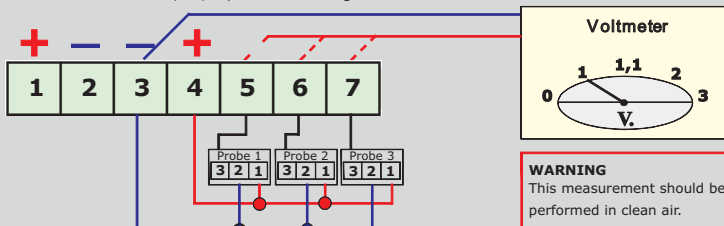
If powered by the battery, check that the 12Vdc power is correctly connected.

### - If the Fault LED lights up

Check that the probe cables are connected as in the drawing, they have not pinched the insulating sheath

Check that the voltage at the terminals 3-4, is greater than 11 VDC and less than 25 VDC

Check that at the terminals 3 and 5- (6-7) is present a voltage from a minimum of 0,8 VDC at a maximum of 1,1 VDC



### - If the Over Load Probe LED lights up

Check: that the power polarity has not been inverted, that no short-circuit is present, that no 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.

Check that together with the alarm signal is not also turn on the FAULT indicator, in this case, control 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.

NOTE: all relays are voltage free; check the connection drawing.

### - If a 12VDC solenoid valve is connected and does not work well

Direct connection of 12VDC solenoid valves or sirens to the control unit is not possible, having absorption in excess of 100mA. To connect a solenoid valve with superior absorption you must resort of an external battery.

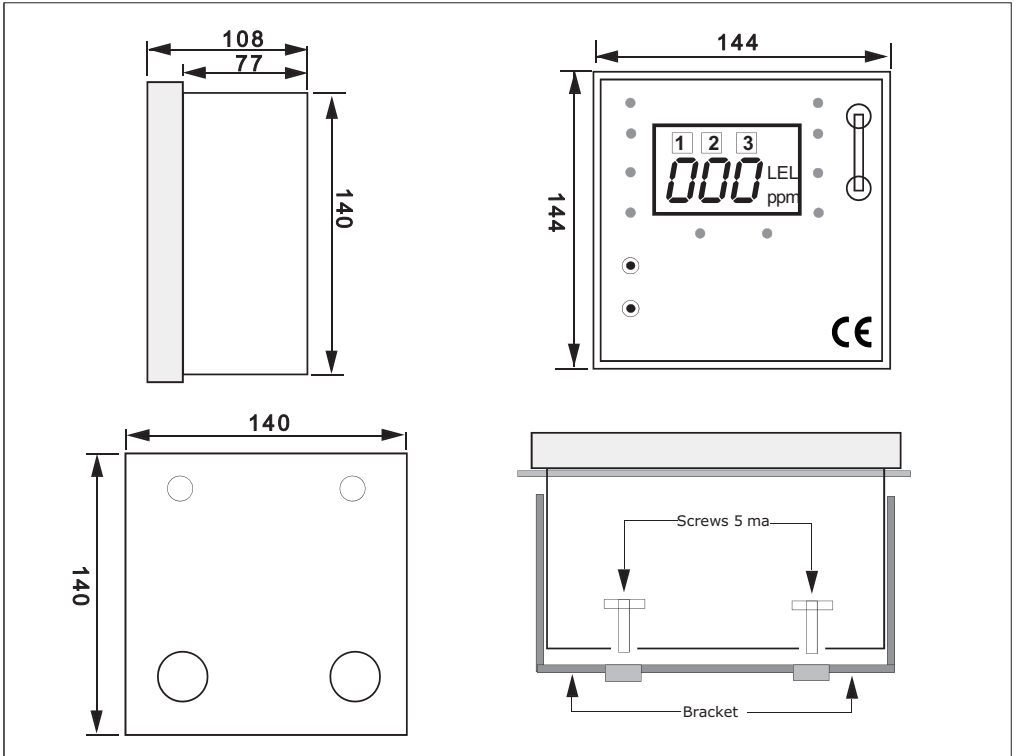
The control unit gives a max current of 100mA. Check the drawing of the connection diagram.

If other problems arise, a specialised and/or authorised technician.



## WARNING! Actions to be taken in case of alarm

- Put out all free flames.
- Close the main gas tap (CH<sub>4</sub>) or the LPG cylinder tap.
- Do not turn any lights on or off; do not turn on any electrical device or appliance.
- 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.)
- 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



### TO BE FILLED AFTER INSTALLATION

Installation date:

Serial number:

Installation room:

*Stamp and signature of the installer*