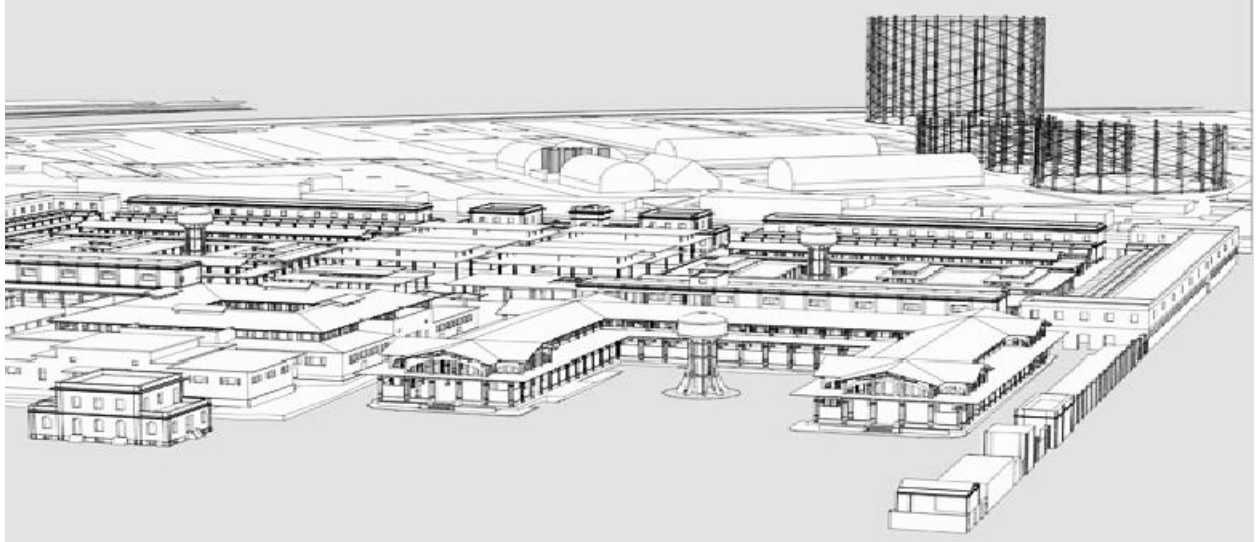


# Control Unit from 1 to 2 Conventional sensors **BX280**

Rev. 10



Through the connection of **2** remote sensors, the **BX280** control unit has been designed and built according to European regulations to detect the presence of **toxic and/or explosive gas** flexibly. A microprocessor is used to create a complete surveillance and control system with maximum flexibility. Thanks to this and its other features, the **BX280** is suitable for civil and industrial applications.

The **BX280** control unit has two danger levels:  
**1<sup>st</sup> LEVEL, 1<sup>st</sup> Pre-Alarm.** This was set at 13 % of L.E.L. for all sensors.  
**2<sup>nd</sup> LEVEL, Main Alarm.** This was set at 20% of L.E.L.

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 checks the efficiency of both the unit and connected probe to ensure total control of the **BX280**. Thanks to the Omega-type format both small and large systems can be built by exploiting the modularity of the DIN rail in the previously set electrical panels.

In addition to the alarm signal light, it is fitted with an internal buzzer.

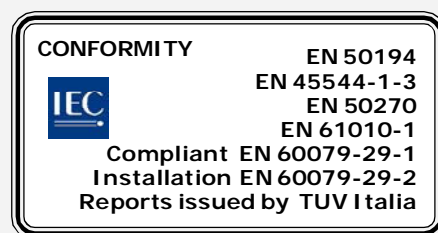
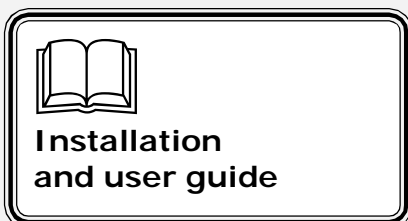


**Important:** Assembly / maintenance of the appliance must be carried out by qualified personnel and in accordance with applicable laws and regulations. The manufacturer assumes no responsibility for the use of products that have to comply with particular environmental and / or installation standards.



**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**



## 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 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 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.**

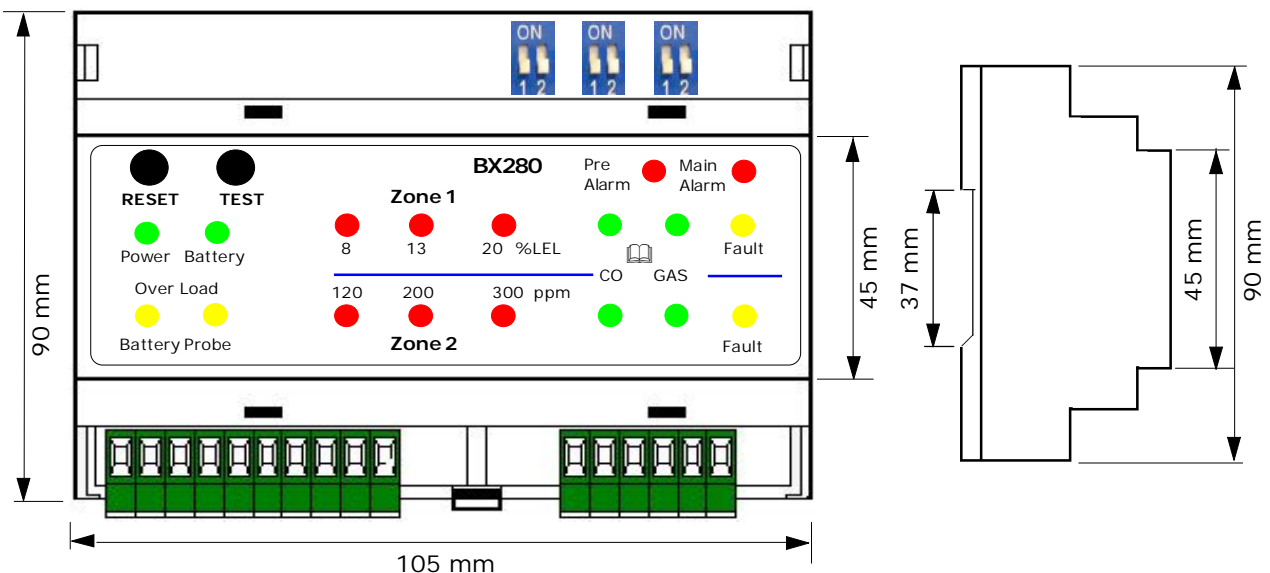
Heavy knocks or falls during transportation or installation can damage the appliance.

**Cleaning**

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

## Technical Specifications

Mains Power .....	<b>110/230VAC</b> 50/60Hz $\pm 10\%$
Secondary Power Through Battery <b>max 2.2 Ah</b> .....	<b>12,7 V</b> $\pm 10\%$
Battery Charger <b>max 2.2 Ah</b> .....	By means of a microprocessor
Power Demand .....	<b>6 W max @ 230V</b>
Power Demand .....	<b>5 W max @ 12 V</b>
Relay Contact Range .....	<b>10A 250V</b>
Pre Alarm .....	Set to 13% of L.E.L. or 200ppm CO
Final Alarm .....	Set to 20% of L.E.L. or 300ppm CO
Sensor's faults detected by Fault Circuit .....	Interruption, short circuit, or wear
OVER LOAD Check .....	1 for each probe and 1 for battery
Micro-switches to include or exclude the probes .....	2 built in
Max number of probes that can be connected <b>2</b> .....	Catalytic, Electrochemical Cell, Semiconductor
Input Signal .....	<b>4 <math>\div</math> 20 mA</b> on 220 ohm
Device Accuracy .....	<b>1% FS</b>
Control Unit .....	<b>8-bit microprocessor</b>
Functioning Temperature .....	<b>-10°C <math>\div</math> +60°C</b>
Waiting, blinking period .....	<b>90 seconds</b>
Manual Test .....	Built in
Max. distance between probes and unit.....	<b>100 m</b>
Cable diameter for connecting probes .....	<b>1 mm<sup>2</sup></b>
Connection: <b>The cable of connection of the probe must not be installed together with the power cables. Otherwise, make sure to use a shielded cable</b>	
Omega-type size DIN EN 50092 6 modules .....	<b>105*90*58</b>
Degree of Protection .....	<b>IP20</b>
Warranty .....	<b>3 years</b> from the date of manufacturing



## 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 <sup>duct</sup>	Catalytic	IP66	Zone 2	CH4LPG	0÷100% LEL	4÷20 mA	±5 %	Yes Yes
CO200 <sup>duct</sup>	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! 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.)

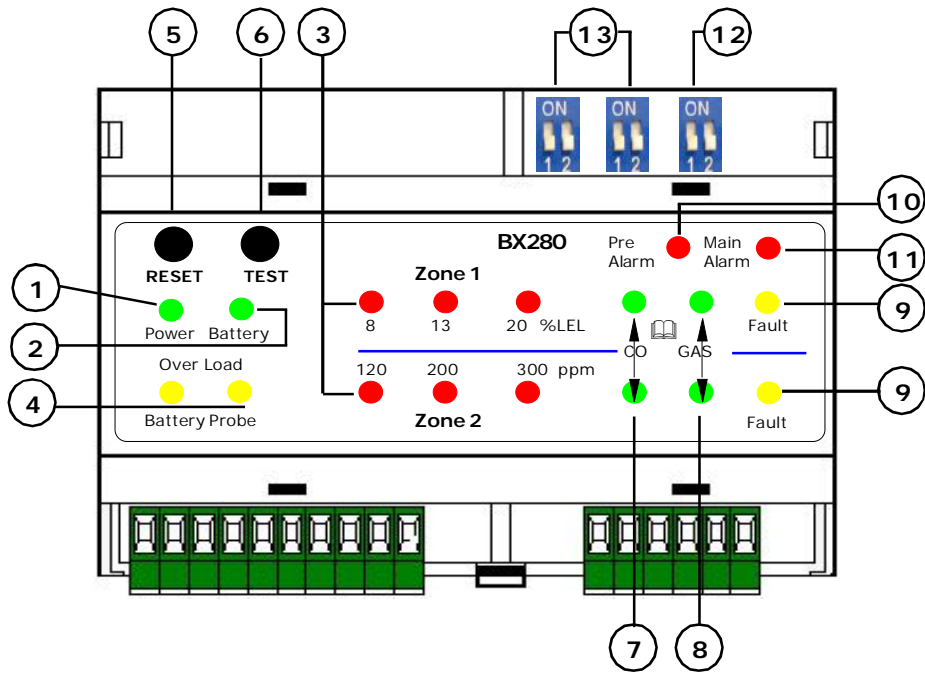
**IMPORTANT:** The operation test should not be carried out with the gas tap as this does not guarantee a sufficient concentration to activate the general alarm.

#### 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



Installation of the detector does not exonerate. From the observance of all rules regarding the characteristics, installation and use of gas appliances. The ventilation of the premises and the discharge of the combustion products prescribed by UNI norms as from ART. 3 LAW 1083/71 and the relevant provisions of law.



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

**When this LED is blinking the BX280 is not capable of detecting gas.**

2) **BATTERY LED.** This LED lights up when no mains is present and the **BX280** is powered by the battery. When this led is blinking the battery is flat.

3) **GAS CONCENTRATION SCALE LEDs.** These leds light up in sequence according to the environment gas concentration level increase.

a) When the first led turns on, the gas concentration level has reached **8% of LEL.**

b) When the second led turns on, the gas concentration level has reached **13% of LEL** and the **1<sup>st</sup> THRESHOLD** relay contact is closed.

c) When the third led turns on, the gas concentration level has reached **20% of LEL** and the **MAIN ALARM** relay contact is closed.

The 20% led stays on to keep the alarm zone in the **MEMORY.**

4) The control unit is fitted with electronic protections, called **OVER LOAD**, in order to prevent irreparable damages to the unit. Therefore, if these led turns on, it does not mean the control unit is not working. But it does mean the devices connected to it (or the corresponding connections) are faulty.

**OVER LOAD LED** (probe overload): If this led turns on, it means there is a short circuit or high current absorption in the probes, and the corresponding connection cables. Please check the battery and the connection cables.

**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.

5) **TEST BUTTON.** Pressing and holding down this 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.

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

7) **TOXIC GAS selection led.** This led lights up when the internal micro-switch is switched to "CO".

8) **EXPLOSIVE GAS selection led.** This led lights up when the internal micro-switch is switched to "GAS".

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

10) **Led PRE-ALARM.** When this led turns on, the gas concentration level has reached **13% of LEL** and the **1<sup>st</sup> THRESHOLD** relay contact is closed.

11) **Led MAIN ALARM.** When this led turns on, the gas concentration level has reached **20% of LEL** and the **MAIN ALARM** relay contact is closed.

12) These switches are used to enable or to disable the Positive Security and to select the working mode of the relay.

13) These switches are used to include or exclude the probe and to select the type of gas, toxic or explosive.

## Description of Micro-switches

### Disabling or uninstalling the probes

The control unit has two micro switches one for each zone.

The switch **number 1** is used to enable or disable the connected probe.

This micro-switch is also used to disable the probe in case of failure.

### Selection of the type of gas monitored for each probe

The control unit has two micro switches one for each zone.

The switch **number 2** is used to select reading the type of gas that the probe is connected to detect.

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.**

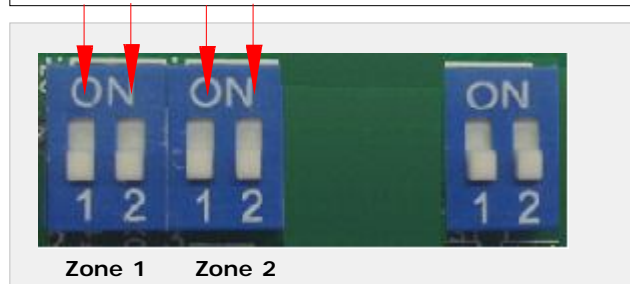
Micro-switch (1) to enable or disable the probe of the desired zone.

Position **ON** enabled position **OFF** disabled

Micro-switch (2) to select the type of gas monitored of the desired zone.

Positione **ON** reading in LEL - **Explosive gas**

In posizione **OFF** lettura in ppm - **Toxic gas**



### Working mode of the relay and the main alarm

Micro-switches **1** Positive safety

Micro-switches **2** Working mode of the main alarm relay



### Switch 1 – Selection of the intrinsic safety

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

The relay is energized after performing the step of waiting and switches when the BX280 is main alarm

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

The relay is energized only when the BX280 goes into the main alarm

### Switch 2 - Working mode of the relay and the main alarm.

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

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

# 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, adequatelylocated and easily accessible.

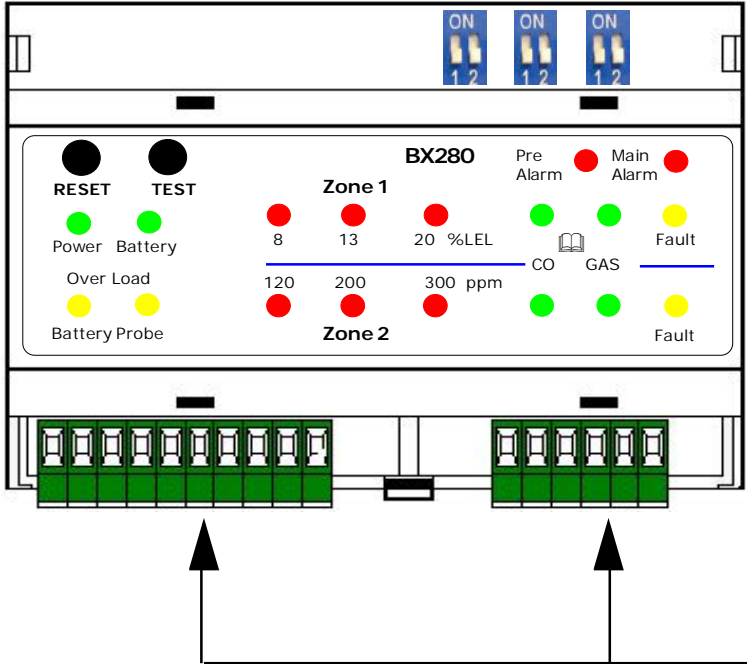
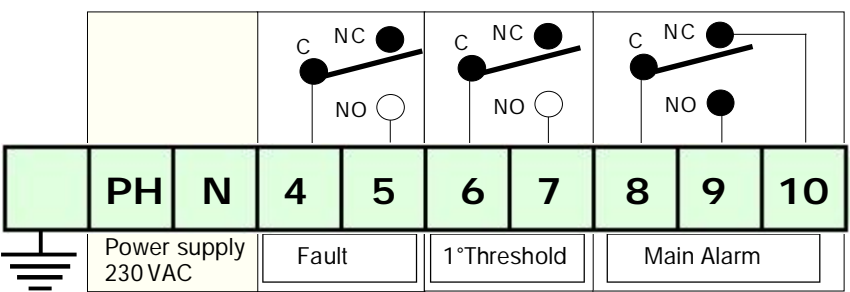
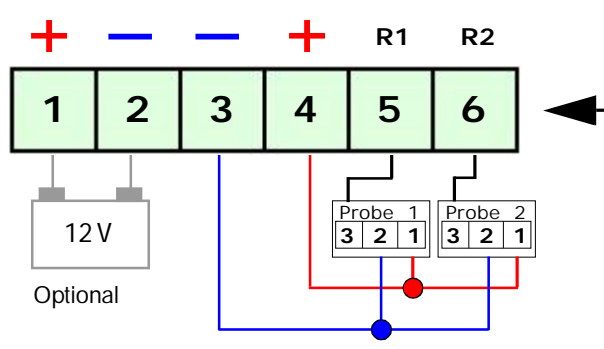


Diagram of the terminal block relay

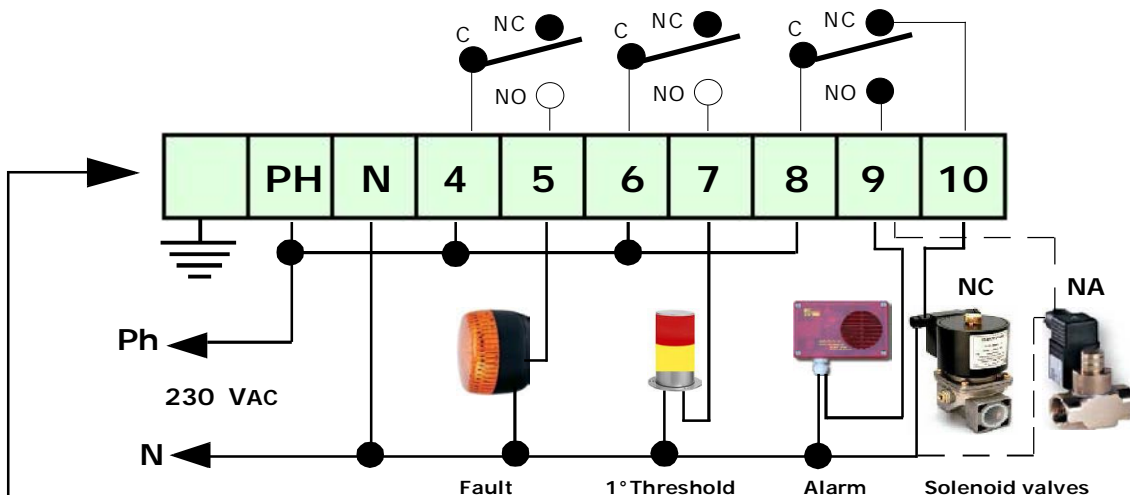


Connection of probes and eventual battery

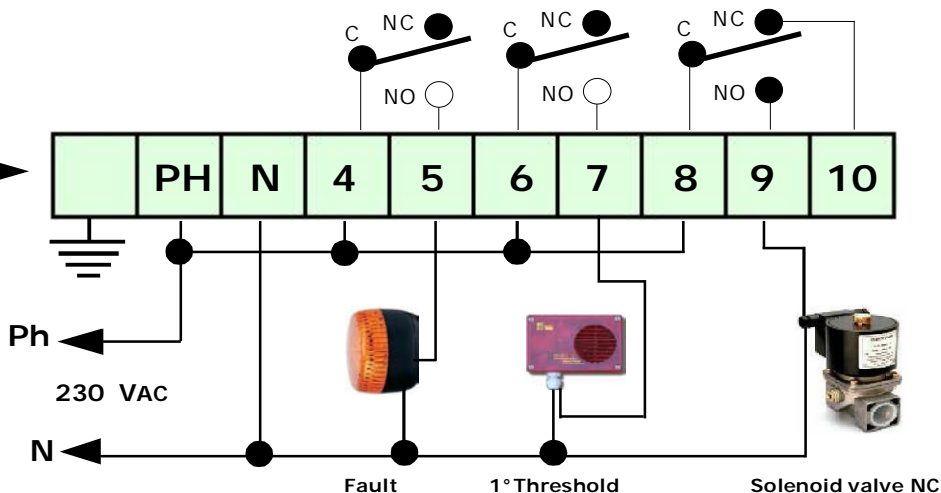


**Connection examples**

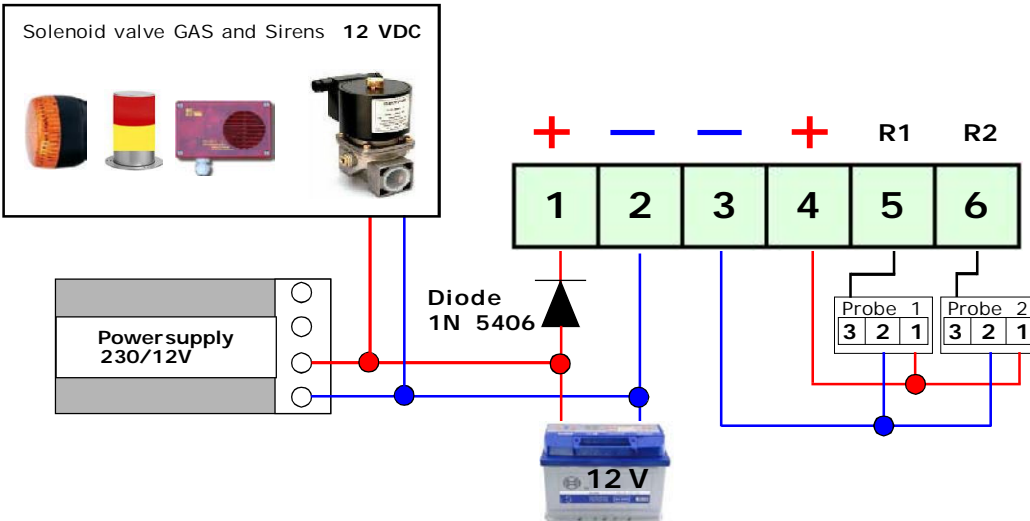
**Connections of a solenoid valve Normally Closed without Positive Safety**



**Connections of one solenoid valve Normally Closed with Positive Safety**



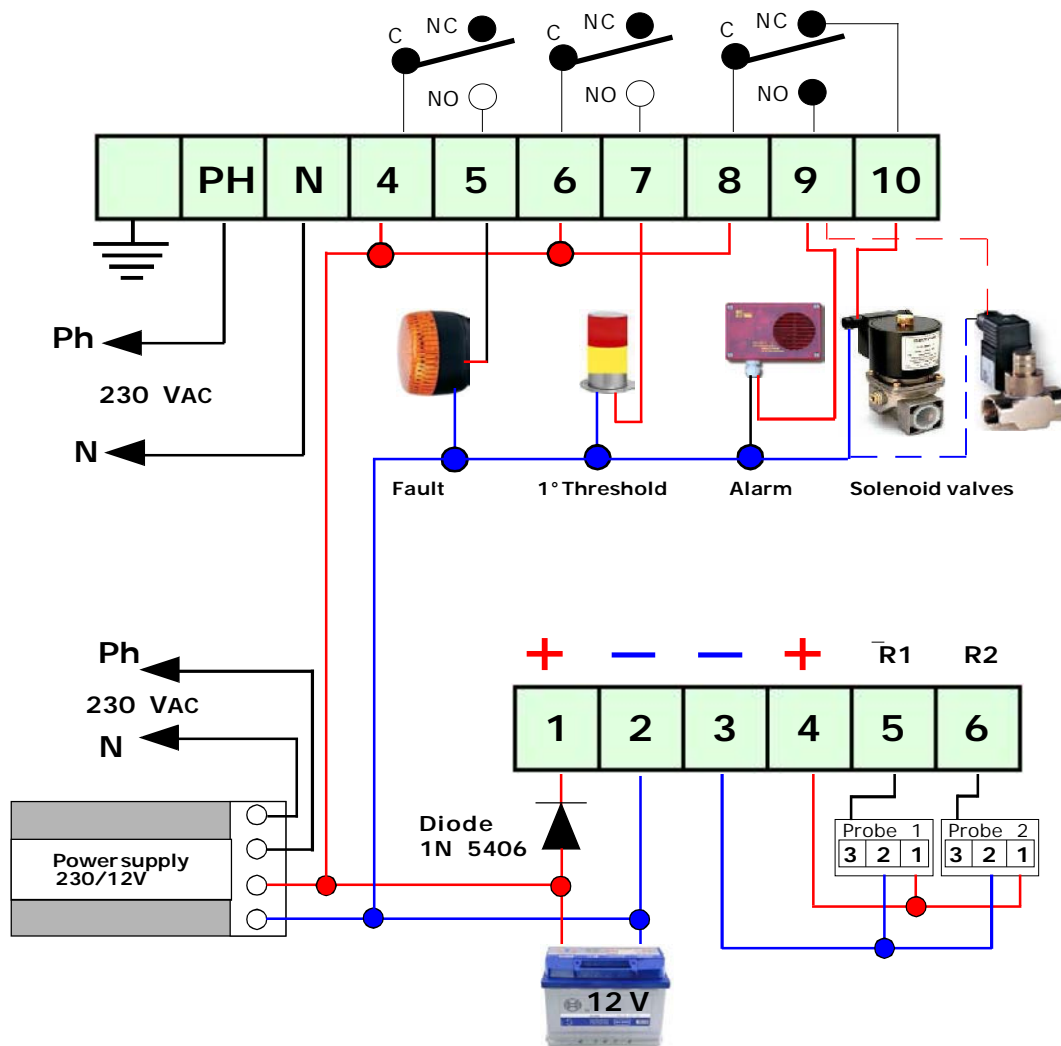
**If a 12Vdc solenoid valve, which does not work well, is connected to the BX280.**  
 Direct connection of 12VDC solenoid valves or sirens to the **BX280** is not permitted.  
 An external power unit must always be used. The **BX280 M** gives a **max** current of **50mA**.  
**Control unit power supply and connection of one solenoid valve with sirens to 12 VDC through an alternative source and recharge battery.**



## Electrical Connections

If a 12Vdc solenoid valve, which does not work well, is connected to the BX280.  
 Direct connection of 12VDC solenoid valves or sirens to the **BX280** is not permitted.  
 An external power unit must always be used. The **BX280 M** gives a **max** current of **50mA**.

**Connections to Positive Safety disabled and an external power supply for valve control and siren 12 V DC**





## Installation and positioning of the probe

The **BX280** 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 **BX280** is designed so that it can be mounted into electrical panels. The **Control Unit** complete cabinet is an equipment suitable for wall mounting and is powered by **110/240 VAC** with **IP20** 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 ....**

**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 sensors

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.

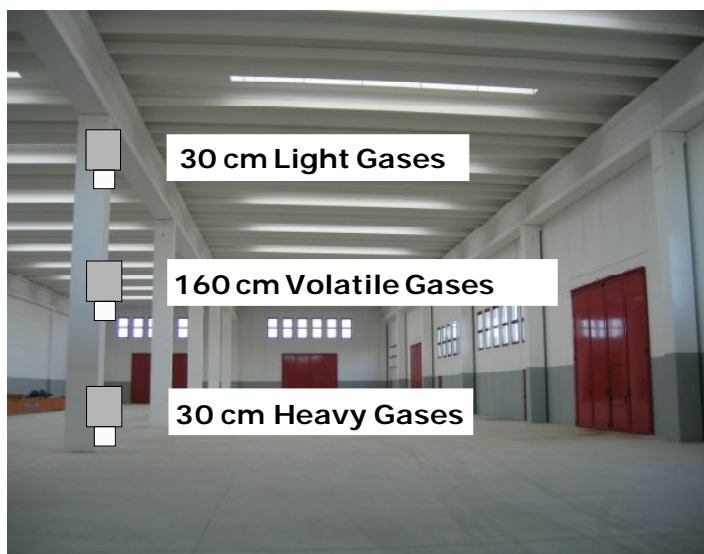
These heights are:

- **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 the BX280 ON

- 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 COUNTDOWN begins that lasts about 90 seconds (warm up) after this the unit is ready to detect.
- 4) By pressing the MANUAL TEST button, you get the simulation of a gas leak and the unit carries out the following:
  - a) **The 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
  - b) **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
- 5) To complete the general test, issue gas from a pre-calibrated aerosol
- 6) If you want to simulate a zone **fault**, you only need to disconnect the return cable of the corresponding probe.
  - lights up the flashing LED and FAULT led of the MAIN ALARM led;
  - the buzzer emits a continuous sound;
  - the fault relay and the main alarm relay will switch.Reconnect the return cable and press the RESET button to restore the functioning of the control unit.

## Troubleshooting and solutions before calling a technician

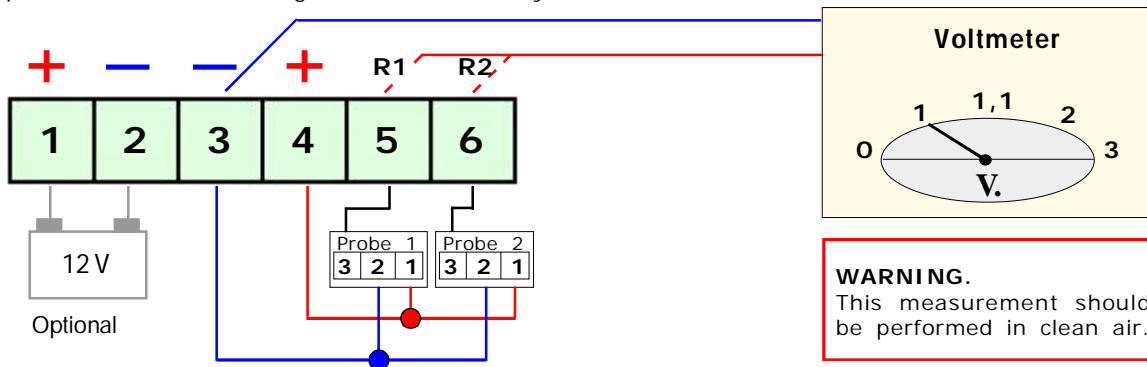


### If the device does not start up.

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 **BX280** 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 BX280.

Direct connection of 12Vdc solenoid valves or sirens to the **BX280** is not permitted.

An external power unit must always be used.

The **BX280** gives a **max** current of **50mA**.

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

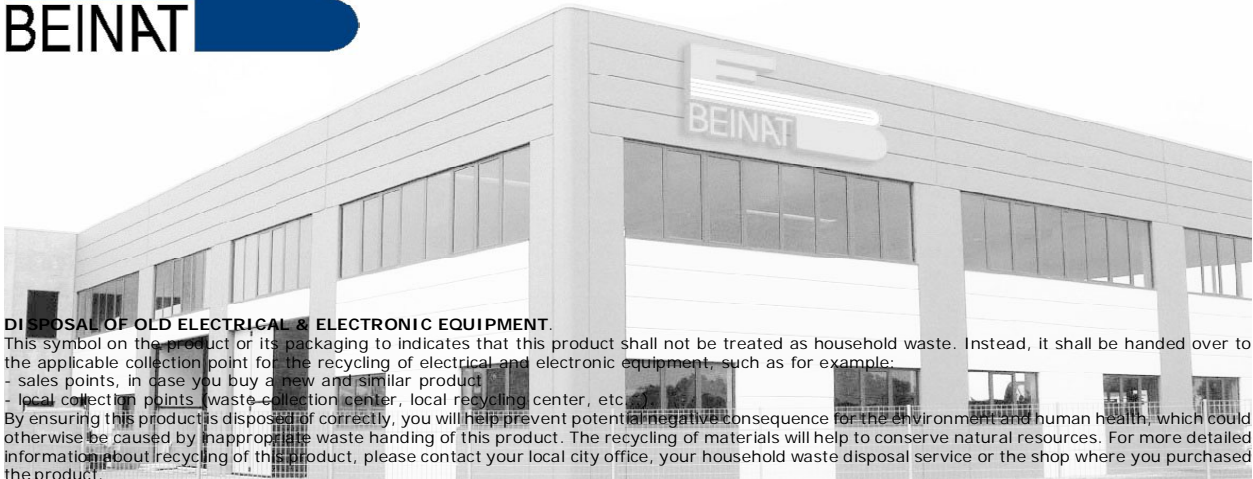


**INSURANCE.**This device is insured by the SOCIETÀ REALE MUTUA for the PRODUCT'S GENERAL LIABILITY up to a maximum of 1.500.000,00 EURO against damages caused by the device in case of failures in functioning.

**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.

The **BEINAT S.r.L.** company 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 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 BX280** *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.

**BEINAT S.r.l.**  
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