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GAS CONTROL UNIT

CITY

CE424P

Max No.24 4÷20mA Gas Detectors

USER MANUAL

TECNOCONTROL S.r.l.
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PLEASE READ AND KEEP CARE OF THIS MANUAL AND THE MANUAL OF INSTALLED SENSORS TOO.

All documentation relating to gas detection plant should be preserved, because it contains the procedures to be used during the routines verification and / or during the periodic calibration. We recommend that you always complete the *Setup Memorandum Tables* in the last pages of this manual**.** This will facilitate any possible change to the configuration and/or in case of additional sensors, and operations and maintenance service.

INFORMATION AND WARNINGS OF USE

The Control Unit is suitable for gas alarm systems up to ***No.24 detection points.*** *The simple installation and easy configuration via the buttons make the unit suitable for use in many areas, both civil and industrial.*

It should be noted that inappropriate use or lack of maintenance can affect the operation of the device and thus preventing the proper activation of alarms with potential serious consequences for the user.

TECNOCONTROL disclaims any responsibility if the product is misused, altered or not as planned or outside the rated operating limits or put in work incorrectly. The choice and use of the product are the sole responsibility of the individual operator.

The rules, laws, etc. mentioned, are the ones valid on the date of issue. In any case, must be observed all applicable national regulations in the country of use.

The information contained in this document are accurate, current at the date of publication, and are the result of continuous research and development, the specifications of this product and what is indicated in this manual may be changed without notice.

The Control Unit has a clock with the automatic DST change (Setting for Italy on UTC + 01:00 Time Zone), but it is possible to deactivate this option from the setting.

In the absence of power supply, the clock works with the lithium battery (on the board in the cover), its life, in normal operation is over 5 years.

If the lithium battery is exhausted and the Control Unit remained completely without power, at start up, you will need to enter the correct date and time (see chapter Date and Time) and then the battery must be replaced soon with a new one.

NOTES FOR READING INSTRUCTION

CE424	*Control unit up to No.24 gas detectors. It has 4 detectors inputs installed, expandable to 8 with no.1 ES404 card and up to 24 with no.2 CE380UR remote units. Equipped with No.5 relay outputs expandable to 9 with no.1 ES414 card and up to 25 with no.4 ES380UR cards (inside CE380UR units). The control unit also has No.1 Logic Input.*
ES404	*Expansion card with No.4 inputs*
ES414	*Expansion card with No.4 relay outputs.*
ES415	*Expansion card with No.1 RS485 serial port Communication via Modbus® RTU binary.*
R.U.	*Remote Unit CE380UR, with 8 input 4 to 20mA for gas detectors, which can be installed up to 2 expansion cards ES380UR, each with 4 relay outputs.*
SENSOR	*It is the name that, for simplicity, is indicated the Remote Gas Detectors models.*
FIRMWARE	*Program inserted into the microcontroller which controls the unit functioning.*
⚠	*Symbol that indicates an important warning in the instructions.*
ℹ	*Symbol indicates information or additional explanation in the instructions.*

SOMMARIO

PRODUCT DESCRIPTION

Fig.1 - ***CE424P - Wall mount housing***

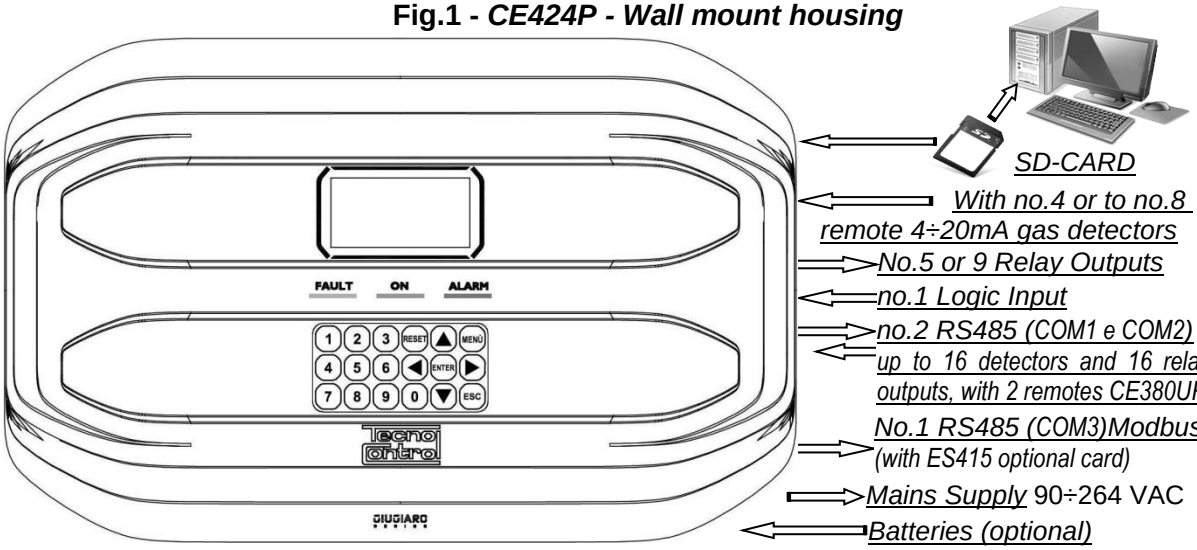


Fig.1 - *CE424P - Central wall mounted*

The Control unit is wall mount, ***GIUGIARO DESIGN*** housing 379x241x133 mm.

The CE424P can be connected up to no.24 of our remote Gas Detectors (Sensors) with three-wire, 4÷20mA linear output: (*See List in Table 1*)

MODELS WITH "REPLACEABLE CARTRIDGE SENSOR" for:
- *Flammable gases with Catalytic sensor (20% LFL range) TS282K(IP65) or TS293K(Ex"d") series.*
- *Flammable gases with Pellistor sensor (100% LFL range) TS282P(IP65) or TS293P (Ex"d")* series.
- *Flammable gases with Infrared sensor (100% LFL range) TS293I(Ex"d") series.*
- *Toxic gases with electrochemical cell TS282E (IP65) or TS293E (Ex"d") series.*
- *Oxygen with electrochemical cell (25% volume range) TS282EO or TS293EO (Ex"d").*
- *Carbon dioxide with Infrared sensor TS210IC2 (IP54), TS282IC2 (IP65) or TS293IC2 (Ex"d").*
- *Parking with dual sensor TS255CB (CO+PETROL vapors) or TS255CN2 (CO+NO_2)*
- *Refrigerant gases with Semiconductor sensor TS282SF (IP65) or TS293SF (Ex"d") series*.

MODELS WITH DISPLAY AND WITH "REPLACEABLE CARTRIDGE SENSOR" for:
- *Flammable gases with Pellistor sensor (100% LFL range) TS593P (Ex "d") series.*
- *Flammable gases with Infrared sensor (100% LFL range) TS593I (Ex"d") series.*
- *Toxic gases with electrochemical cell TS293E (Ex"d") series.*
- *Oxygen with electrochemical cell (25% volume range) TS593EO (Ex"d").*

SHOULD BE CONNECTING ALL MODELS WITHOUT THE REPLACEABLE CARTRIDGE:
Refrigerant gases with Infrared sensor TS282IF *(IP42) series.*

MODELS WITHOUT REPLACEABLE CARTRIDGE, USABLE ONLY IN NON-INDUSTRIAL ENVIRONMENTS, for**:**
- *Flammable gases with Catalytic sensor (20% LFL range) SE192K (IP44) or SE193K (Ex"d") series.*
- *Toxic gases with electrochemical cell (300ppm CO range) TS192EC(IP44)* or *SE193EC(Ex"d") series*

May be connected, even discontinued models*. Detectors three-wire 4 to 20mA linear for flammable gases or those two-wire 4 to 20mA linear for toxic gases or oxygen,*

Also, from ***January 2017*** *the TS282xx (IP65) series, supersede all TS220xx and the TS292xx****.*** *(Example: TS292KM will become TS282KM or the TS220EO will become TS282EO).*

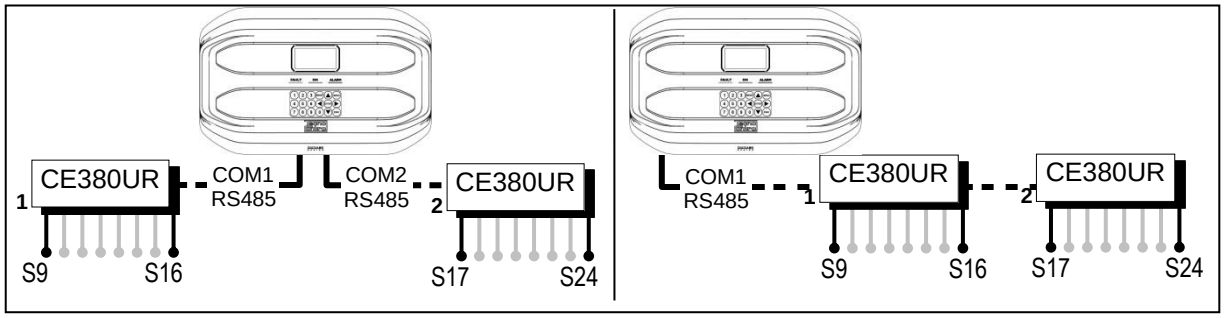
Inputs are configurable for 4÷20mA sensors with referred current to ground and operating characteristics same as our products (unit in %LFL or ppm, minimum operating voltage, absorption, load resistance etc.).

Available gas detectors: *some models of detectors or calibrations for some gases may not yet be available. We recommend that you contact us for confirmation or for specific requests. e-mail:* ***info@tecnocontrol.it***

NO LIABILITY IS DISCLAIMED FOR MALFUNCTIONS, FAILURES OR DAMAGES CAUSED BY PRODUCTS THAT ARE NOT COMPATIBLE OR NOT OF OUR PRODUCTION.

- La Unit has No. 2 **RS485** serial ports (***COM1*** e ***COM2***):

On both ports, 1 or 2 can be connected remote units CE380UR.



- The Unit has No.**1 AUX Input**, which can be associated with a relay output:

It can be configured to activate one of the available relays and can be used by devices with NO or NC contact outputs (*gas sensors with a relay contact, smoke sensors, buttons, etc.*).

- Each SENSOR can be configured in two ways quickly and easily:
  - **PRECONFIGURED SETUP**: Here you can choose one of the models of our production, (See list in Table 1), which is then automatically set in the configuration recommended by the respective thresholds and relay outputs. *Is enough set the output number (relay) to complete the configuration***.** Modifications of the other values are however allowed.
  - **GENERIC CONFIGURATION**: Here you can configure any type of sensor (*compatible or a new model not yet listed*), manually entering all parameters.

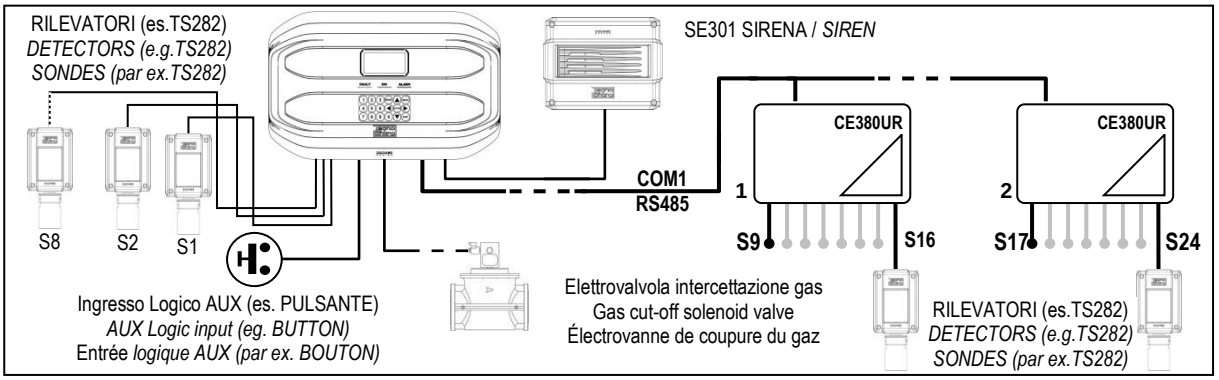


Fig.2 – *Eg. installation with TS282 series detectors.*

- Each **SENSOR is protected** and has a FAULT signal:

All sensors inputs are protected against short-circuit or wire breakings. If a short-circuit occurs, the power supply to that input, is automatically stopped (all others continue to work properly). At the same time, the FAULT signal is activated.

- Each **SENSOR** may be associated with a **ZONE**:

The sensors can be grouped into *Zones (Max No.6)***,** which can associate up to *No.2 relay* outputs different for each alarm level and *No.1 for the FAULT***.**

- Each **ZONE** can be set according to **operating LOGIC**:

  The logic used are the typical logic functions (*OR***,** *AND*), management of adjacent sensors (*CORR.CON, CIRC.CON*).

  Note that PARK-ITA is a function only for Italy standard (Italian Ministerial Decree DM 01/02/1986 replaced by DM 03/08/2015 and subsequent updates).

- The **Unit can manage up to No.5, No.9, No.17 or No.25 Alarm relays**:

Each sensor has three alarm levels (*Threshold 1, Threshold 2 and Threshold 3*) and a *FAULT*, freely addressable to any relay output. The control unit has no.5 relays already installed, which can be increased to No.9 with the *expansion card ES414*, or up to No.17 or No.25 with 1 or 2 Remote Units.

- The **ALARM THRESHOLDS** can be configured with special mode of operation:

For use in car parking "PARKING EN" (EN 50545-1) or to the workplace, such as exposure limit value TLV.

- Each **output** (*relay*) can be configured as follows:
  - ***Silenceable***: the output is disabled for the *Silence time*, when *RESET* is carried out and the sensor is above the set threshold. This function can, for example, be used for the outputs connected to audible warning devices.
  - ***Silence Time*****:** is the time, adjustable from 0 to 300 seconds, so Silenceable output (*e.g. relay connected to a siren*) is disabled when the RESET is performed and a sensor is above the set threshold
  - ***Hysteresis ON***: is the delay, adjustable from 0 to 300 seconds, of the relay, associated with an alarm threshold.
  - ***Hysteresis OFF*****:** is the delay, adjustable from 0 to 300 seconds, of the relay to return to normal condition, when it ends the alarm.
  - ***Time ON:*** is adjustable from 0 to 300 seconds. This function can only be used if you want to stop the alarm output after a finite time, even if the sensor remains above the alarm threshold set (*This function cannot be used in conjunction with Hysteresis OFF delay*). For example you can use it to enable devices that cannot be powered down, or to send a pulse to a phone dialer.
  - ***Memorized****:* the relay remains in alarm, even if the sensor returns below the threshold (*this function does not work if the Time ON or into Hysteresis OFF has already been inserted a value other than zero*), to return to normal conditions must be done RESET. Serves, for example, to prevent the accidental or unauthorized resetting of a block valve of the gas, without first checking the cause of the alarm.
  - ***Positive Logic***: the operation of the relay can be set normally activated or in positive logic, therefore, if the relay fails, or is completely out of power, automatically moves into the Alarm position, the NC contact becomes NO.
- The Control Unit has a **BUZZER** inside:
  The internal *Buzzer* sounds a *Beep* every touch of the keyboard, but it is possible to deactivate this option from the settings (*SETTINGS>>BUZZER*). It can also be set to sound in case of Fault and / or Alarm.
- The Control Unit can **store the Events**:
  The system can store up to 100 events *(Alarms, Faults, Power ON, Mains blackout and Resetting)*, that can be re-called at any time.
- The Control Unit has an **SD-CARD slot**, it can be used for:
  - Future updates of the Control Unit firmware.
  - Loading or Saving the Control Unit configuration and the events.
  - Transfer of a copy of the configuration from a *CE424*, to another *CE424***.**
  - Data Logger (Storing in time, of the values read by the sensors, in text format).
- The Control Unit has 1 **Modbus® RS485 serial port** (COM3):
  With the expansion board ES415 (Optional PC-Card Modbus output) you can connect the Control Unit to a Building or Industrial Management Systems, using the Modbus RTU binary protocol.
- The Control Unit is protected by **3 LEVELS of PASSWORD**:
  Some menus are accessible up to three password levels, with a code composed of 4 numbers. The levels are for access to functions, used by the respective authorized persons:
  LEVEL 1: for the User
  LEVEL 2: for the Installer or Maintenance technician.
  LEVEL 3: *Reserved* - Only accessible for factory settings.

CONTROL UNIT INSTALLATION

THE FOLLOWING INSTRUCTIONS DESCRIBES ALL THE CONTROL UNIT SYSTEM SETUP PROCEDURES AND THE INSTALLATION PROCEDURES TO BE EXECUTED ONLY BY AUTHORISED AND EXPERIENCED STAFF.

WARNING*:* The unit is to be installed in an area protected from direct sunlight and rain. Please note that for safety the unit is to be installed in safe areas where there are present or can form flammable atmospheres and concentrations exceeding 24% volume of oxygen.

CLEANING: To clean the exterior of the enclosure, use a soft damp cloth with water; do not use solvents or abrasive cleaners.

POSITIONING: The unit should be mounted on the wall using 4 screws and wall plugs (Ø 6 mm) or 4 M4 screws and nuts, if the wall is not in masonry. The housing's base must be fixed through the 4 holes, on the sides of the base (*Fig.3*). The electrical connections should be executed all on the housing base.

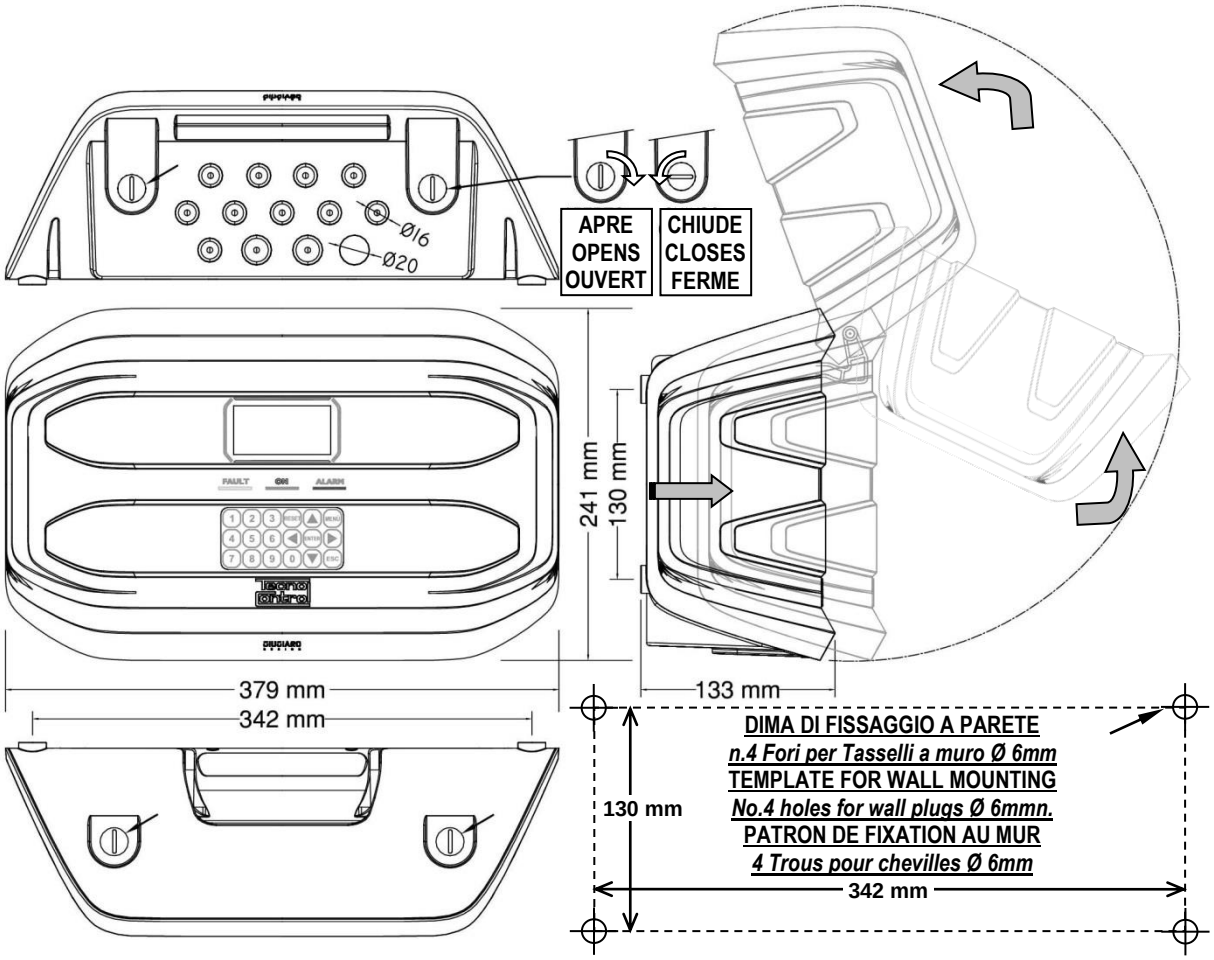


Fig 3 – *Dimensions and Template for wall mounting*

The cover unlocks (with a coin) by turning 90° the 4 buttons located above and below the enclosure. It is opened by pulling and then rotating it up until it rests at the base.

OPEN – CLOSING THE HOUSING

The housing has two sliding internal hinges. To open the case, you must:

1- With a coin or screwdriver (blade 10-12mm), unlock the 4 closing buttons, turning them 90° clockwise.
2- Gently, pull the cover outwards of about 4 cm and then rotate it up and place it on the upper edge of the base housing, in this way remain in the open position.

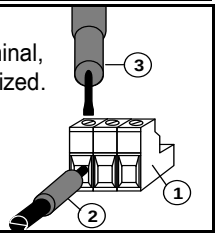
To close the housing act in reverse order. Pay attention that the cover and the locking mechanism enter into place. Finally block 4 buttons, turning 90 ° counterclockwise. To facilitate the closure, press on the lid, the buttons, which are eccentric, will bring the lid to adhere to the base housing.

ELECTRICAL CONNECTIONS

The electrical connections should be executed all on the housing base.

The details of the connections to the mains, the two batteries, the AUX input and relay output n.9 are illustrated in Fig. 4. While the details of the connections to the sensors and the other outputs are illustrated in Fig. 5. The connections with the Remote Units are illustrated in Fig. 6

The terminals are of *"polarized inlet" type (1).* We suggest to use lugs adequate to the *conductors (2)* and to fix the wires to the box structure to avoid excessive stress to the circuits and to the terminals. Use *a screwdriver (3)* with the right dimensions.



Considering that, it should be normal procedure disconnect power to the electronic equipment when installing, or changing the connections, or when disconnecting or connecting expansion cards.

***IMPORTANT*: TO AVOID IRREVERSIBLE DAMAGE, DISCONNECT THE POWER SUPPLY TO THE CONTROL UNIT, MAINS POWER AND BATTERY (IF PRESENTS) DURING INSTALLATION (WIRING CABLES) OR BEFORE YOU INSTALL ANY EXPANSION BOARDS OR UNPLUG OR RE-CONNECT THE FLAT CABLE.**

Only if necessary, for maintenance or installation requirements, the housing cover can be separated from its base, first remove mains power and remove the batteries, then disconnect the flat cable, press on the two side tabs as shown in Fig. 3. Then you need to release the cover from sliding hinges (press fit). To reconnect it, proceed in reverse order and after hanging up the lid hinges, push the flat cable into the connector, respecting the polarization, the two levers close automatically locking it. Only then you can reconnect power supply.

BATTERIES*:* Inside the housing, it can also accommodate two 12V/1.3Ah Lead batteries connected in series (*Fig.5*) to assure the system powering in case of mains blackout.

The battery life is *about* 60 minutes with *No.8 sensors,* but each detector in less increases the autonomy of *about 8 min.*

(*The batteries are not included in the delivery, but are available on request*). *If required, to increase the autonomy, No.2 12V, 3Ah or 7Ah batteries connected in series can be used, but due to their size, they must be installed outside the control unit.*

Considering that each detector absorbs *0.1Ah* from the battery, the autonomy, with *8 detectors*, becomes: about *2 hours with 3Ah* batteries (each sensor less increases the autonomy by about *20 min*) and about *5 hours with 7Ah* (each sensor less increases the autonomy of about *50 minutes)*.

CABLE GLANDS: the lower side of the housing has 13 inputs designed for metric cable glands (ISO pitch *1.5 mm).* No.10 are for glands M16x1.5 mm (*that accept external cables Ø 4÷8 mm*) and n.3 are for glands M20x1.5 mm (*that accept external cables Ø 6÷12 mm*).

These passages are closed, but they are not manually breakable, according to the installation requirements, they must be drilling. To facilitate the operation, they have a centering for the drill bit.

Please, pay attention not touch the tip of the internal circuits or the power supply cables

To guarantee the degree of protection of the enclosure, it is recommended to use cable glands with protection IP55 or higher.

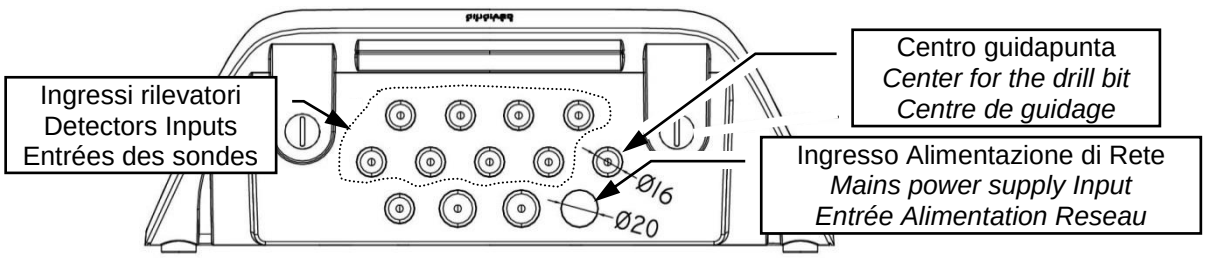


Fig.4 – *Inputs for cable glands*

Power connection

The installation must include a power line protection device. To the mains line, a bipolar disconnecting switch dedicated for the gas detection system. The device, clearly identified, must act only on Phase and Neutral, but not on the Earth. It is advisable to also provide for a surge protector, lightning etc.

Mains Power Supply (**90÷264Vdc / 47÷63Hz**) should be connected to terminal *L*, *N* and *Earth* at the right of the housing base. The terminal has a protective fuse (5x20) 2A.

The two 12V/1.3Ah Lead internal batteries if required should be connected in series to "*BAT+"* (Red) and "*BAT-* "(Black) terminals. For the series connection, use the black cable supplied with two terminals (4.8 mm Fastens).

The auxiliary input (**AUX**) can be used to connect devices with a *NO* or *NC* contact (*gas sensors with relay contacts, smoke sensors, buttons, etc.*). It can be configured to activate one of the available relays. It can be connected to multiple devices if it's are homogeneous. (If the device has an NC contact must be connected in series or in parallel if it's have all a contact NO).

Output Relay No.9 has the same characteristics and use of those described on the next page.

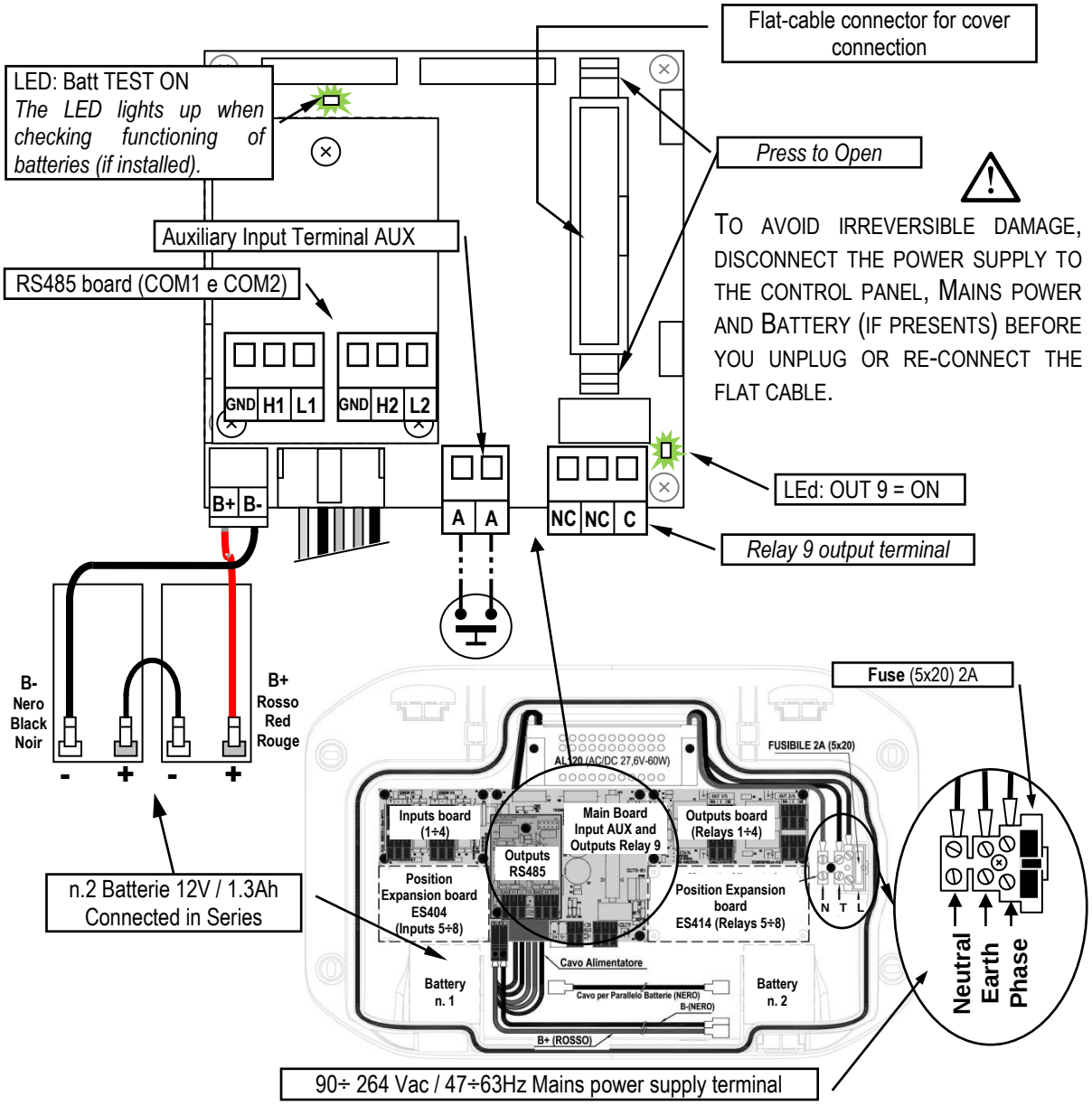


Fig 5 – *CE424P Wiring diagram for Power, Batteries, AUX input and relay output No.9.*

CONNECTION WITH GAS DETECTORS (Sensors)

Please always refer to the specific instructions supplied with detectors

*Please note that the Control Unit has relay output no.5 outputs. An **ES414** board can be installed to have a total of 9 outputs. In the diagrams, for simplicity, they are always indicated with all the Outputs.*

Cable section and distance between Control Unit and Sensors: They must be 3-pole shielded cables, with a section suitable for the distance as indicated below in the table.

Distanza massima di ogni rilevatore dalla centrale *Maximum distance of each detector from the control panel.* *Distance maximale de chaque détecteur du panneau de contrôle*	*Tipo di Cavo schermato* **Shielded** *Cable Type* *Type de câble* **a écran**
Max. 200 metri / meters / mètres	3 x 1 mm^2 Schermato / Shielded / à écran
Max. 400 metri / meters / mètres	3 x 1,5 mm^2 Schermato / Shielded / à écran
Max. 600 metri / meters / mètres	3 x 2,5 mm^2 Schermato / Shielded / à écran

Connection of the detectors: (**Sensors 1÷8**) is carried out on the Input boards (4 ÷ 20mA) mounted in the base on the left, the terminals "**+**", "**-**" and "**S**" must be connected to the corresponding terminals of the detector.

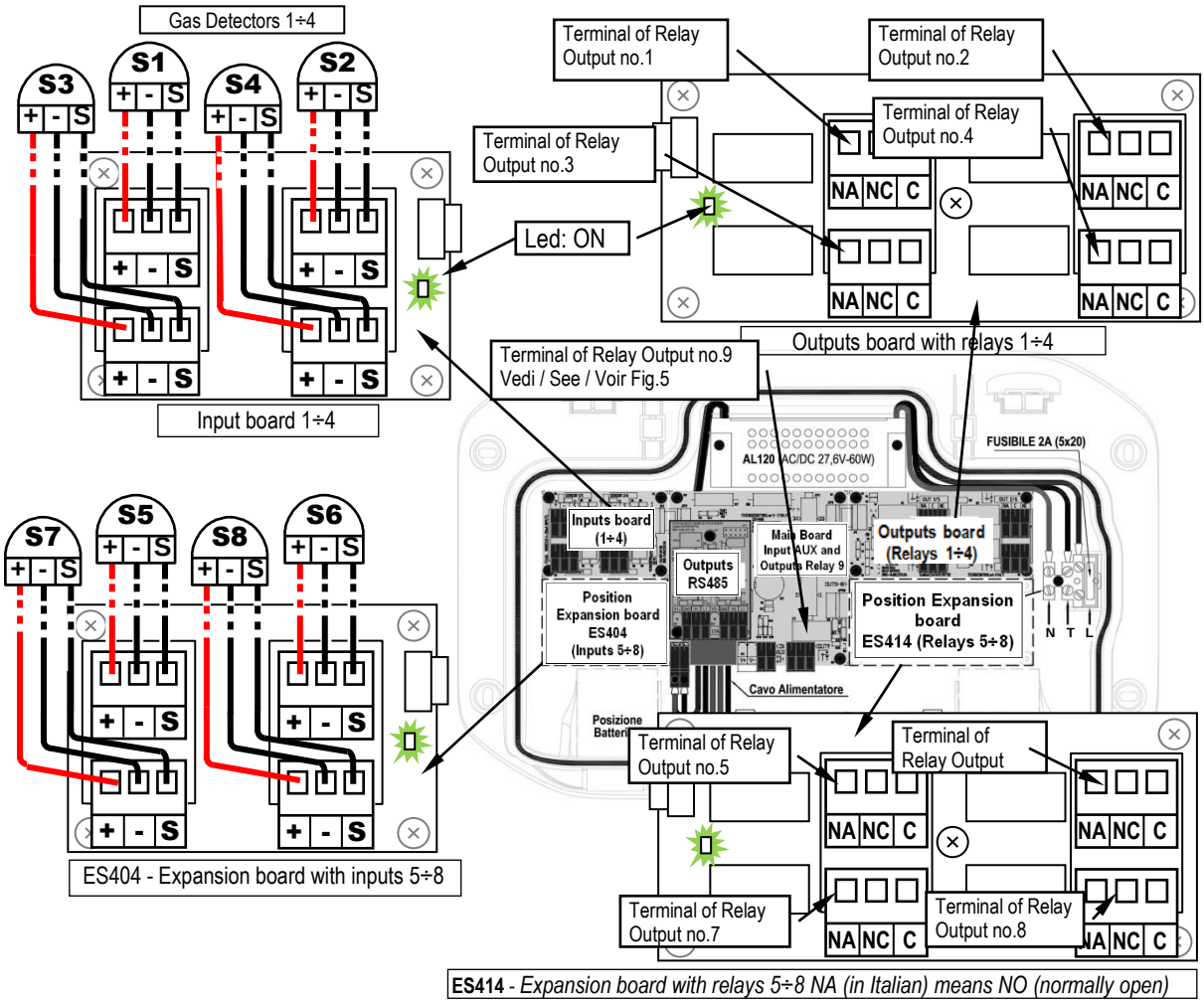


Fig 6 – *CE424P - Wiring diagram for Inputs Sensor 4 to 20mA and relay Outputs*

Connection of the other detectors: (*Sensors 9÷24*) is carried out in the Remote Units (*See specific instructions*).

The cable shield must be connected only from the Control Unit side and on a single "*EARTH*" point which must be equipotential. On each detector (*sensor*) it will be necessary to use two cable glands, one for the input and one for the output.

IMPORTANT ADVICE: before installing and configuring the control unit, evaluate how many alarm devices are connected to the relays to determine how many relays are needed and how they should act. Please see in SENSORS> Configure> Description of the items related to the relay outputs.

*Please note that the unit has **No.5 outputs (relays)** that can be increased by installing the **ES414** expansion board to have a total **of 9 outputs**. The diagrams, for simplicity, show all relays outputs.*

The connection to the internal outputs (**relays 1 to 9**) should be performed on the outputs board, mounted in the base, on the right. *The relay output no.9 is located on the central board*, *see **Fig. 5***. The relays nominal load is 250 VAC - 2 A or 30 VDC – 2 A (resistive load).

NOTE***:*** in Italian the indication NA means NO (Normally Open) while the others are the same***.***
The relay have changeover free voltage contacts, on the boards, the indications NO (*Normally Open*), NC (*Normally Closed*), C (*Common*), refer to the relays in the normal position (not powered).
If an output is configured as *POSITIVE LOGIC*, the NO contact will become NC and NC will become NA.

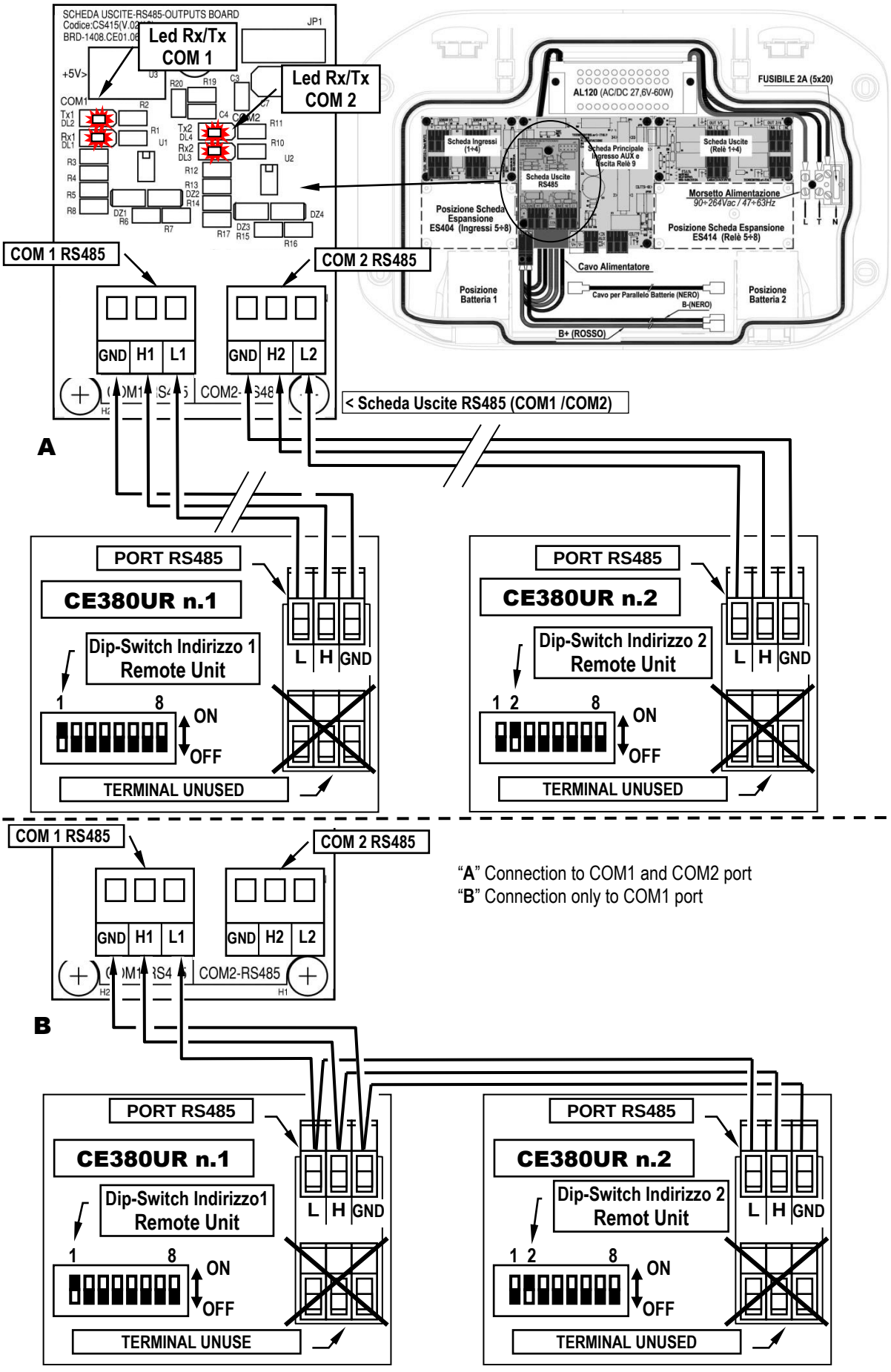


Fig.7 – *CE424P Connection of the remote units CE380UR*

Expansion Board ES415 - Modbus®

The connection to a monitoring system via Modbus RTU binary protocol (***COM3***) is carried on the optional expansion board ***ES415*** (*PC-Card Modbus output*).

The ***ES415*** board is mounted on the main board, placed in housing cover. (**See Figure 11**).

Pay attention, to put the terminals into the connector on the motherboard, making the first, matching the three click columns with the corresponding holes and then pressing to insert them.

The "***H3 (D1)***", "***GND (Common)***," and "***L3 (D0)***" terminals of the RS485 serial port (***COM3***) are to be connected to the supervision system (Master) or dedicated isolated converter (not included).

On standard MODBUS system, all devices are connected (in parallel) on a distribution cable with 3 shielded wires. Two form a balanced pair of twisted conductors, on which the bidirectional data, typically at ***9600 bits per second*** are transmitted. The third conductor (if used) is the common to all of the bus devices.

TO AVOID IRREVERSIBLE DAMAGE, DISCONNECT THE POWER SUPPLY TO THE CONTROL UNIT, MAINS POWER AND BATTERY (IF PRESENTS) BEFORE YOU UNPLUG OR RE-CONNECT, ANY EXPANSION CARD.

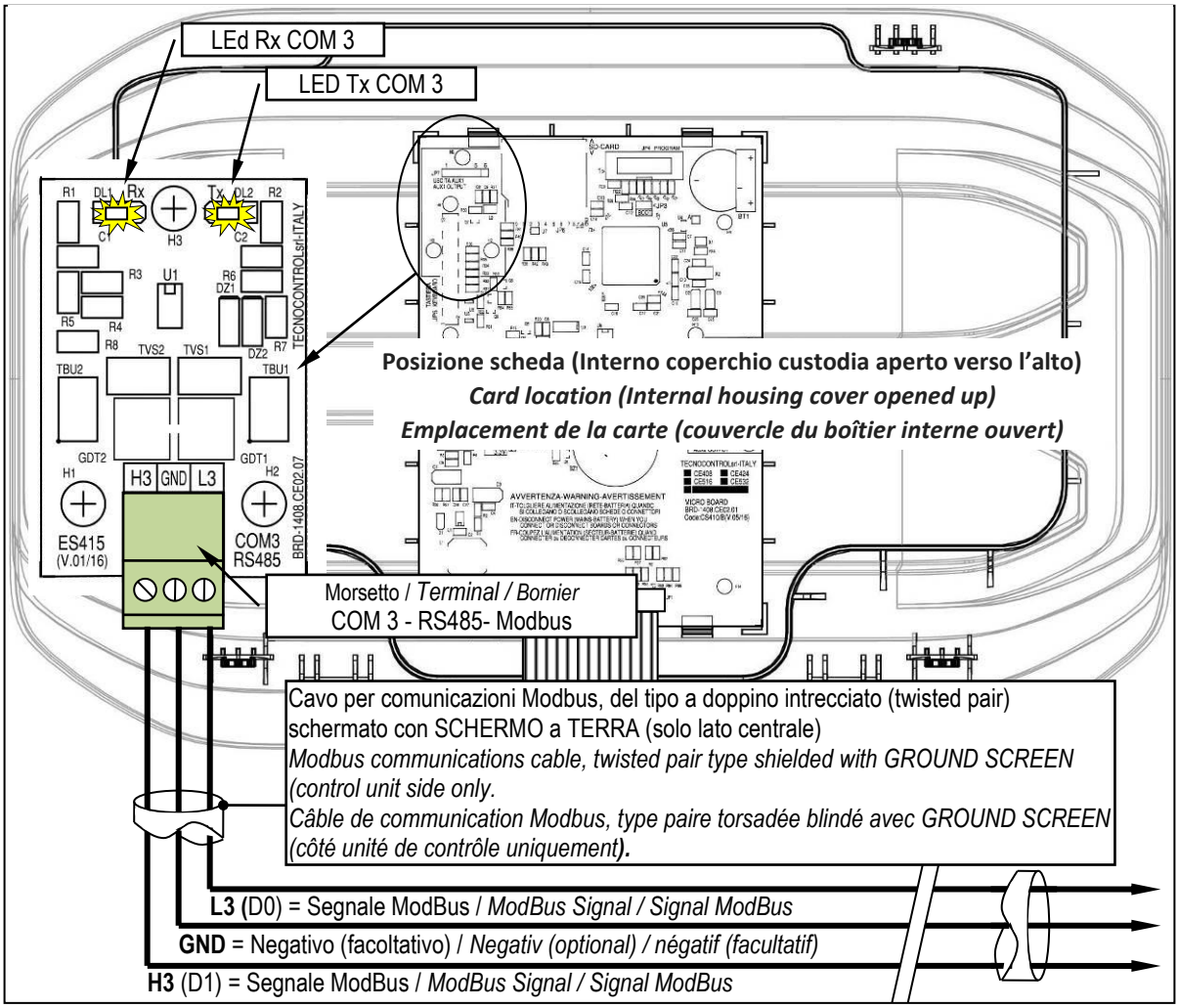


Fig. 8 – *ES415 Expansion card with COM3 (RS485) Modbus serial port.*

USE OF THE CONTROL UNIT

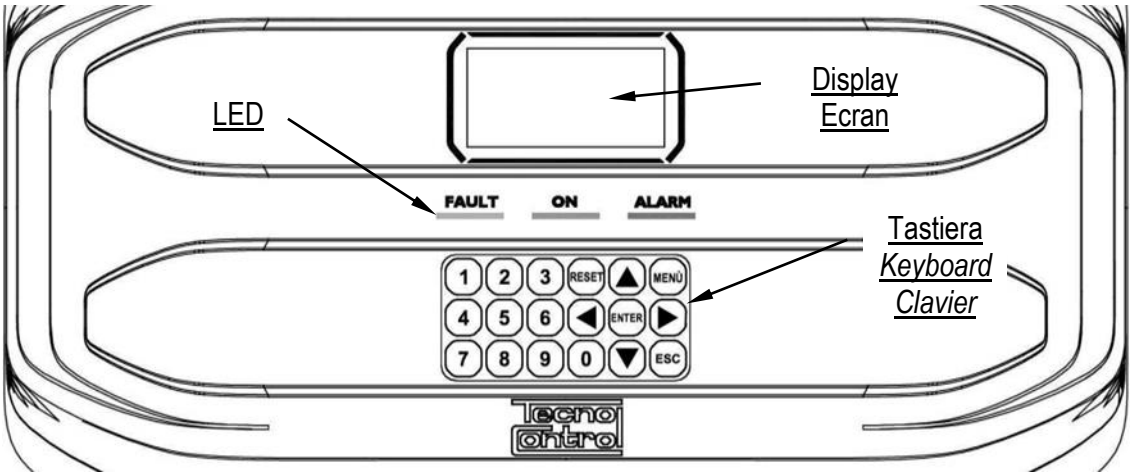


Fig.9 – *CE424P Keyboard*

- **Keyboard**

The keyboard is backlit. To save energy, the brightness is reduced to half after *10 seconds* of non-use.

RESET	*Can only be used on the main screen, it is used to reset the latched outputs to normal operation, but only if the Sensor or Zone or Input has returned from the alarm condition. If there are active alarms, outputs configured as Silenceable (e.g. alarm) returns to normal operating conditions only for the time of silencing by default.*
▲ ▼	*Scroll through the display screens and the numeric digits up and down. Keeping the key pressed increases the values' speed scrolling. In the* ***main screen*** *changes to display the status of sensors, Logic Input and configured zones.*
MENU	*Call up the Main Menu from any screen*.
ENTER	*Confirm the inserted data and in the Main Screen allows you to select the detail's sensors*.
◀ ▶	*Scroll through the pages (6 sensors at a time and 7 events at a time), and input fields. Keeping the key pressed increases the speed scrolling.*
ESC	*Cancel an operation and in the main screen is used to enter to Main Menu****.***
0 ÷ 9	*They enter a number directly into numeric fields and invoke the relevant submenu in specific screens. Furthermore, in the Main Screen, the* 0 *key calls up the summary screen of the alarm status (see below).*

- **LEDs INDICATIONS**

The unit has 3 LEDs that show the operating status of the control unit (***see also appendix***).

FAULT ***(Yellow LED)***	*Flashing = Preheat (Start Unit) or in Service or Firmware Update.* *Fixed ON = Fault (Sensor or Areas o RU) + Buzzer if enabled.* *Short flashing = Output relay associated with a latched Fault.* *Rapid flashing = Batteries Faulty or Disconnected.*
ON ***(Green LED)***	*Fixed ON = Operation with mains power.* *Flashing = Operation with the batteries.*
ALARM ***(Red LED)***	*Fixed ON = Alarm 3 is active (Sensor or Zone) + Buzzer if enabled.* *Flashing = Alarm 1 and / or 2 active (sensor or area or logic input).* *Short flashing = Alarm latched (indented) (sensor or area or logic input).*

- **INTERNAL BUZZER INDICATION**

The unit has an internal buzzer that emits a beep when a key is pressed. It can also be configured to sound in the event of a Fault and / or an Alarm.

SOUND SHORT (0.1S)	*if configured*	*Confirms the pressing of a key*
CONTINUOUS SOUND	*if configured*	*Fault (Sensor or Zone)*
CONTINUOUS SOUND	*if configured*	*Alarm 3 is active (Sensor or Zone)*

- **SINGLE DIGIT NUMERIC FIELD** *(PASSWORD ENTRY, ETC.)*

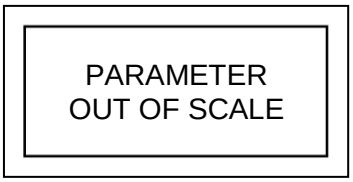
By pressing ▲ and ▼ key, the number is displayed in the field.

- **SCREENS 'ENABLE ...', 'DISABLE ...', 'COPY ...', 'DELETE ...', 'SETTINGS →DATE & TIME'**

Pressing the first time, ▲ key, the number is displayed in its field (deleting any existing number), and the next digits will be always inserted to the right of the number.

Example: to enter the number "12", press ▲ once, then press ▶ to move to the right and then press ▲ twice, or press **1** e then **2**.

If the number exceeds the maximum acceptable value, message will appear "***PARAMETER OUT OF RANGE***".



- **DISPLAY – ALL OTHER SCREENS**

As above, but in addition, when you press the ▶ key, the last digit entered will be erased and you can continue to enter additional digits.

Example: If you have entered the number "23", and then you want to change it to "25", simply press the ▶ then press ▲ 5 times (or press **5**)

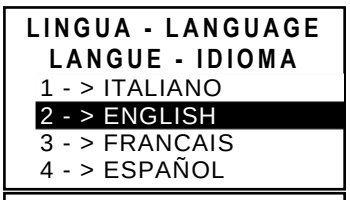
If you have already entered a single digit, pressing ▶ will display the minimum value accepted by the field. Then, by pressing ▲ or ▼ key, the value already present is deleted and replaced with the new one.

- **DISPLAY – INITIAL SCREENS**

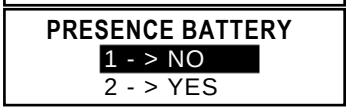
The unit, when powered, for *5 seconds* shows the model name and the installed firmware version.

This information shall be *accessible* also in the menu Settings→Info**.**
For more information read the chapter Settings.

Only at first power (and only then) will be asked to choose your language and to indicate if the battery is present. Use the key ▲ and ▼ to scroll through the languages and pressing the key ENTER to confirm the choice.

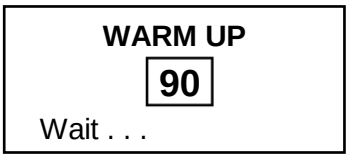


If necessary, these choices can be changed. Please see forward Service→Battery.



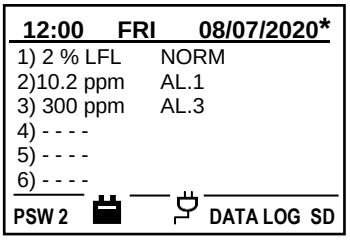
- **PREHEATING TIME**

At each start-up, a decreasing count of *90 seconds* will always start, it is the time necessary for the control unit to start up and allow the Sensors to stabilize.



- **DISPLAY – MAIN SCREEN**

After the preheating time, appears the *main screen* that the control unit displays in normal operation. The date is shown in the top row, the first 6 sensors (*with the measured concentration and its state*) and in the last line, the battery status of charge (*if installed*) and presence of the mains. PSW (*PASSWORD*) followed by a number, at the bottom left indicates the current access level (*eg PSW 2 indicates that Level 2 is enabled).*



The " * " symbol (near to the date) indicates that daylight saving time is active.
The word **'*SD*'** at the bottom right indicates that the SD-Card is inserted.
If the word **'*DATA LOG*'** is also present, data storage is enabled (Data Logger).

Symbols used to indicate the status of the battery (if installed):

Full Charge	*Half Charge*	*Low Charge*	*Discharge*	*Flashing = Faulty or Disconnected*

If by mistake, the battery (configured present) being disconnected and/or connected with the control unit, mains powered the yellow LED lights up on fast blinking.

Symbols used to indicate the presence of mains power:

	Mains operation (is absent, when the power is by the batteries).

If the control unit, had lost the date and time, due to a malfunction or discharge of the clock backup battery, screen will be displayed for entering updated values (The unit's safety functions are guaranteed, except those involving the use of date that will be wrong). By changing these parameters, see below, the section SETTINGS→*DATE and TIME.*

The status of a sensor, which appears on the main screen, may be:

- - - -	*Not configured*	The detector is not Configured
* * * *	*Disable*	Detector is disabling. The outputs (relay) are not activated if an alarm occurs.
FAULT	*Sensor failure*	General information, of a faulty detector
OFF LINE	*UR not conncted*	The detector connected to a remote unit that is not connected.
NORM.	*Normal*	There is no gas and there are no active alarms. The text blinks when relay output is latched (*Detector or Zone, returned to normality after an alarm or a fault).*
AL.1	*Alarm 1*	The first alarm threshold has been exceeded
AL.2	*Alarm 2*	The second alarm threshold has been exceeded
AL.3	*Alarm 3*	The third alarm threshold has been exceeded.

When a detector, a logic input or a zone, activate a relay output, the summary screen of the status of the Alarms and Faults appears. This allows checking quickly, the total number of active relays and their relative alarm level.

The details of the individual items is as follows:

FAULT	Indicates the number of active relays, relative to the ***Fault***, of a sensor or a group of sensors that belong to a zone.
AL. 1	Indicates the number of active relays, relating to exceeding the ***threshold of alarm 1***, of a sensor or a group of sensors that belong to a zone.
AL. 2	Indicates the number of active relays, related to exceeding the ***threshold of alarm 2***, of a sensor or a group of sensors that belong to a zone.
AL .3	Indicates the number of active relays, relating to exceeding the ***alarm threshold 3***, of a sensor or a group of sensors that belong to a zone.
INPUT	Indicates the number of active relay, ***LOGIC INPUT***.

The screen can be closed by pressing ESC or RESET key. If the alarms persist, the screen reappears after 10 minutes. If a new alarm occurs the screen will appear again automatically.

ALARM STATUS
FAULT: **00** AL 1: **01**
AL 2: **00** AL 3: **03**
INPUT: **00**
Press Reset/Esc

From the *Main screen*, by pressing ◀ and ▶ keys, to scroll through the sensors, displayed in groups of 6 at a time. Pressing ENTER, key highlights the sensor in the first row. While, using the keys ▲ and ▼ to scroll through the sensors (in the page) shown on the display. Pressing the ENTER key again, you view the details of the highlighted sensor, (of course only if it is configured).

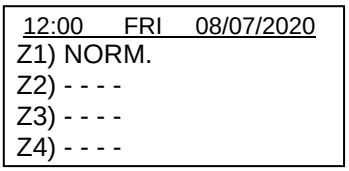
N. 1
GAS: **METHANE**
2 % LFL **5.60 mA**
ZONE: **0**
OUTPUT
0 1 2 9

Explanations of the details are as follows:

1st row	Shows the number of the sensor (Gas *Detector*).
2nd row	Shows the name of the detected gas or its formula
3rd row	Shows the currently measured gas concentration and the unit of measure and current value (*mA*) (*current generated by the sensor*).
4th row	Indicates the Zone.
5th-6throw	Indicates the output number (Relay), corresponding respectively to: **1st Threshold (AL1) 2nd Threshold (AL2) 3rd Threshold (AL3) FAULT** Value 0 (zero) indicates, at that threshold, the output not been assigned, while the highlighted value indicates that output relay is currently active (*Alarm*). The values are real time updated.

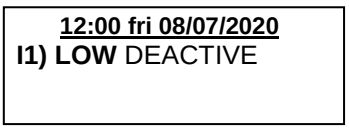
Pressing ESC key it returns to the screen of the sensors. Press ESC again, to return to the Main Screen.

Using the keys ▲ and ▼ is displayed, in cyclic mode, the situation of the Zones (from Z1 to Z4) and the Logic Input **AUX** (**I1**).



The status of a ***LOGIC INPUT*** can be configured :
- LOW (normally open contact) or
- HIGH (normally closed contact)

it can only be **ACTIVE** or **DEACTIVE**,
while a **ZONE** has the same states as a Sensor, except the Full Scale.

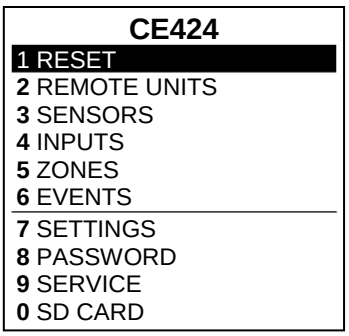


Press ESC to enter the *Main Menu*.

*The Control Unit has No. **6 Zones** and **No.1 Logic Input**.*

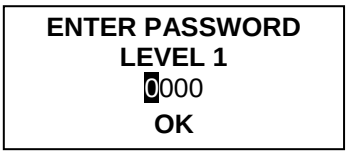
MAIN MENU

The Control Unit is provided with a ***main menu*** from which you can manage all of its functions.
The name of each line indicates the thematic area on which we can take action, by accessing the corresponding submenus.
Pressing ▲ and ▼ key to scroll through the menus.
Than press ENTER to enter in the corresponding submenus.
The Submenu 2-RESERVED, is not accessible, is not currently enabled, is reserved for other functions.



Some submenus are protected by **Level 1** or **Level 2 passwords**, indicated by the "**padlock**" symbol visible when the level was not enabled.
When a protected menu is selected, the request to enter the specific Password appears. When a menu is Enabled, all others of the same level will be Enabled and the "**locks**" disappear. Further information can be found in the ***Password*** section.

With ▲ and ▼ you can enter the value, with ◀ and ▶ keys you can move from one number to another.
After entering the Password, move to **OK** and press ENTER.
If the password entered is correct, the window will confirm the operation.
If an incorrect password was entered, the window alerts you of the error and return to the screen ***ENTER PASSWORD***



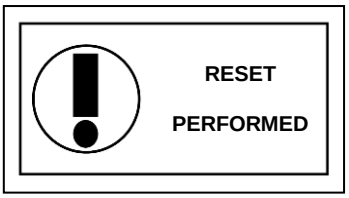
The required access level is indicated, when necessary, to the left of the individual items of the manual.

- **List and short description of the accessible menus and the required ① or ② Password:**

1-RESET	Performs silencing or Resetting the alarms and faults, not active and return to the main menu.
2-REMOTE UNITS	Enter a submenu where you can enable ①, disable ①, configure ②, modify ②, copy ②, delete ② and view the details of the Remote Units.
3-SENSORS	Enter a submenu where you can enable ①, disable ①, configure ②, modify ②, copy ②, delete ② and view the details of the sensors.
4- INPUTS	Enter a submenu where you can enable ①, disable ①, configure ②, modify ②, copy ②, delete ② and view the details of the logic input.
5-ZONE	Enter a submenu where you can enable ①, disable ①, configure ②, modify ②, delete ② and view the details of the zones.
6- EVENTS	Enter a submenu where it is possible to view, all events or ones related only to faults / alarms.
7- SETTINGS	Enter a submenu where you can change, the language ①, the display Contrast, the buzzer settings ①, date and time ① settings the Modbus ② protocol and display Info (model, version and business address).
8- PASSWORD	Enter a submenu where you can enable, disable, modify, the password, of the relative access levels ① and ②. The level ③ is not accessible, is factory reserved.
9-SERVICE	Enter a submenu where you can perform electrical testing ② of the control unit manage the battery ②, display the status of the sensors ②. Factory Test ③ is factory reserved.
0-SD CARD	Enter a submenu where you can update ② the Firmware of the control unit via an SD Card, upload or save the configuration ②, save the events ② or store the values ① read by the detectors (Detectors' data logger) on the SD card (if inserted).

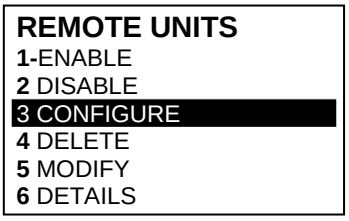
RESET

The **RESET** item in the main menu, performs the same function as RESET, key, reset the latched outputs to normal operation, but only if the Sensor or Zone or Logic Input has returned from the alarm condition.
If there are active alarms, outputs configured as Silenceable (e.g. an alarm) return to normal operating conditions only for the ***time of silencing***.
When performing the **RESET** (with key or from the menu), the display shows the confirm message for about 3 seconds, then the previous screen reappears automatically.



REMOTE UNITS

In this submenu you can manage the Remote Units connected to the unit.
Below, the individual items are described in detail, with the corresponding level password, which is indicated in brackets.
Remember that to enter values, you can use both the ▲ and ▼ keys and the corresponding numeric keys.



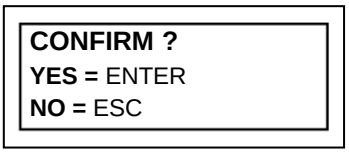
REMOTE UNITS - ENABLE / DISABLE *(Level 1)*

The control unit no longer monitors the sensors of the R.U. disabled, and therefore will no longer activate the fault and alarm outputs (relays) associated with them and therefore the devices connected to the relays will not be activated.

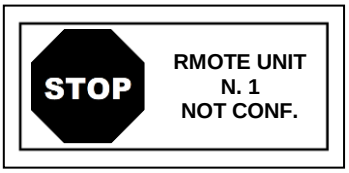
To **Enable** or **Disable** a R.U. press ENTER key on the relevant item highlighted. With ▲ and ▼ it is possible to select, if you take action on a single R.U. or both.

The 1st line, is acting on a single R.U. Pressing ENTER on the 1st line, will highlight the number of the R.U. Then you choose the desired number, with ▲ and ▼ keys and then, pressing ENTER the confirmation window will appear. The 2nd line, acts on both R.U. Pressing ENTER on the 2nd line, will highlight the 1st R.U. number.

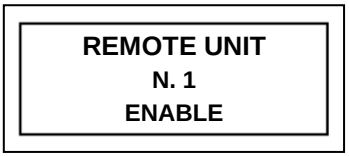
With ▲ and ▼ you can choose the number of R.U. desired, with ◀ ond ▶ you go from one extreme to the other and then pressing ENTER again the confirmation window will appear.



To confirm press ENTER. To go back, press ESC.
If a U.R. is not configured, a window warns that the operation is not possible.
Then the screen returns to the choice of the R.U.



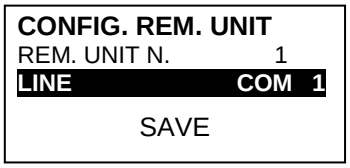
If the procedure is correct, the window warns you that the operation was successful.
Then the screen returns to the beginning of the management of the enabling and disabling of the R.U.



REMOTE UNITS – CONFIGURE *(Level 2)*

To start the configuration, press ENTER on the relevant highlighted item. With ▲ or ▼, and then pressing ENTER you can choose the number of Remote Unit to configure.

With ▲ and ▼ you scroll through the items and then by pressing ENTER only the value is selected, showing that it is possible to change it. With ▲ and ▼ you change the values. By pressing ENTER the change is accepted. Pressing ESC restores the previous value and the entire row is selected, indicating that it is only possible to scroll through the items.



- **DESCRIPTION OF ITEMS RELATED TO THE REMOTE UNITS:**

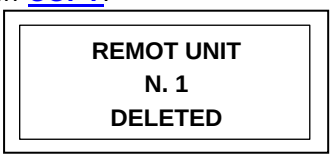
REM.UNIT	indicates the number of the R.U. installed. This number corresponds to the R.U. that must be set with the DIP-Switches (*please see the specific RU manual*).
PORT	Sets the number of serial port which the R.U. is connected to. The control unit manages two RS485 serial ports, ***COM 1*** and ***COM 2***. Please enter the correct port number. *Note that if the number of R.U. or the port is not correct, the R.U. will result out of line.*

⚠ The Control Unit considers configurable, the numbers of the sensors according to the number of R.U. configured. The **1st R.U**. manages the sensors from no.9 to 16, the **2nd R.U**. those from 17 to 24. The same concerns the relay outputs (if any), the 1st R.U. controls the relays from no.10 to 17, the 2nd R.U. those from no.18 to 25.

REMOTE UNITS - DELETE *(Level 2)*

This item allows you to delete a R.U. or a group of R.U. Press ENTER on the relevant item. *The access level and the procedure is the same as described in the previous paragraph **COPY**.*

After choosing the Remote Unit (s) and confirming with ENTER the window, will warn you that the operation was successful.
Then the screen returns to the beginning of the *CANCEL* management.



⚠ **WARNING**: deleting a Remote Unit, will be deleted both all the sensors connected to it, both the corresponding relay outputs, if installed (R.U. no.1 OUT 10 to 18 and for the R.U. n.2 OUT 19 to 25). IMPORTANT: If these relays were related to Sensors or Areas that do not belong to the R.U. cancelled, those outputs in the configuration will be set to 0 (no relay), then the outputs of these sensors will have to be reconfigured.

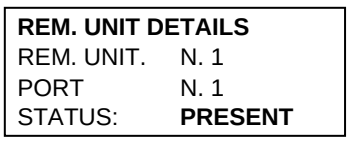
REMOTE UNITS - MODIFY *(Level 2)*

To modify a R.U. already configured, press ENTER on the relevant item. Choose the number of the U.R. to modify, then scroll through the parameters and choose the one you want to modify, with the same procedure described in the ***REMOTE UNIT - CONFIGURE*** paragraph

REMOTE UNITS - DETAILS

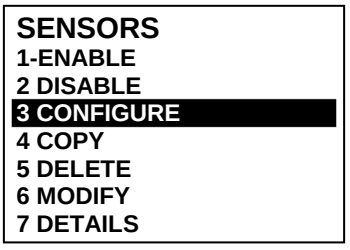
This item allows you to see parameters of a R.U. already configured, pressing ENTER on its item.

The voices are the same as the R.U. configuration. You can scroll through them using ▲ and ▼. The status of the R.U. is indicated at the end of the screen: Present or ***Out*** of Line or ***Disabled***.
In case you want to go back, press ESC.



SENSORS

In this submenu you can manage the sensors connected to the unit.



ⓘ The 3-CONFIGURE menu, should only be used for a new sensor, to modify the parameters of an already configured sensor only use the 6-MODIFY menu.

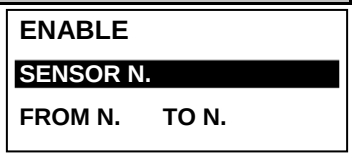
Below, the individual items are described in detail, with the corresponding level password, which is indicated in brackets.

SENSORS-ENABLE / DISABLE (Level 1):

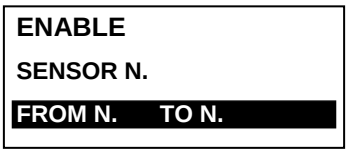
These two items allow you to enable or disable one or more sensors, even simultaneously.
A disabled sensor is displayed on the main screen, with *"★★★★"*.

> ***The Disabled sensors will no longer activate the fault and alarm outputs (relays) associated with them and therefore the devices connected to the relays will not be activated. This function can be used to exclude Sensors, not yet installed, in failure, be removed for repair or for a short time during maintenance, in order to avoid activating the alarms and then block a plant not yet put into safety.***

To **enable** or **disable** a sensor press ENTER key on the relevant item highlighted. With ▲ and ▼ it is possible to select, if you take action on a single sensor or on a group of sensors.

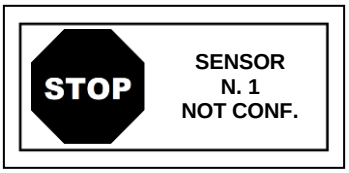


The first line, is acting on a single sensor. Pressing ENTER on the 1st, will highlight the number of the sensor. Then you choose the desired number, with ▲ and ▼ keys and then, pressing ENTER the confirmation window will appear.
The 2nd line, acts on a group of sensors. Pressing ENTER on the 2nd line, will highlight the 1st sensor's number of the group.
If the two sensor numbers are the same, the effect is identical to the management of the single sensor.



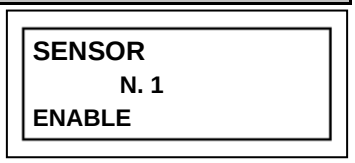
With ▲ and ▼, you can choose the number of required sensor, pressing ◀ and ▶ you change from one value to another, then pressing ENTER again, confirmation window will appear.

Press ENTER to confirm, or to go back, press ESC. If the sensor or one of the group's sensors is not configured, a window notifies you that the operation is not possible.
Then the screen returns to the selection of the sensor.



> *If you have selected a group of sensors, the ones that have been configured are enabled or disable.*

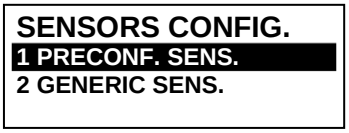
If the procedure is correct, a window warns that the operation has been successful. Then the screen returns to the start of the ***Enable / Disable*** management



> ***IMPORTANT: Before starting the setup, decide how many and which outputs are to be used (relay) according to the type, to the requested operation and the number of actuators installed and in which the alarm levels are associated.***

CONFIGURE SENSORS (Level 2):

here are two ways to configure a sensor, but both can be configured only of our production models (TABLES List detectors PRECONFIGURED) that have some parameters not editable and others already preset, but it all changed, ***must be entered only the outputs (relay number) you want to activate***.
The first way allows you to select, manually, one at a time sensor, including ones that are preconfigured.
The second way allows you can manually enter all the parameters, which are freely editable. This allows you to use compatible products but not of our production or new models not yet included in the list of pre-configured ones.



> ***For safety, it is not allowed to set outputs separately. They can only be configured in CONFIGURE or MODIFY a Sensor, a Logic Input or a Zone.***

- **CONFIGURE - PRECONFIGURED SENSOR:**

To start the configuration press [ENTER] on the relevant highlighted item. With [▲] or [▼] and then pressing [ENTER] you can choose the number of the sensor to be configured.

PRECONF. SENS.
SENSOR N. **1**

⚠ ***For safety, if you choose a previously configured sensor, the screen that warns of the possible error, with you can confirm with [ENTER] and continue, configuring it as if it were a new sensor, instead of pressing [ESC] will cancel the operation and you can choose another sensor.***

SENSOR USED
CONTINUE ?
YES= ENTER
NO= ESC

ℹ ***The configuration of a dual sensor (TS255), uses 2 consecutive sensors (1-2, 3-4, or 2-3, 4-5 etc.) You should always start from the first configuration of the two.***

Next, you can choose the model code.
To choose the desired one, its structure must be followed as described below, first the first 2 letters must be chosen, then the 3 numbers and then the other letters (*if present*) until the complete code of the model is composed.

PRECONF. SENS.
SENSOR N. **1**
MODEL: **TS**

ℹ ***CODE STRUCTURE***: our codes are made up of 2 letters that identify the type of product (e.g. **TS** = signal transmitter), 3 numbers that identify some functional characteristics, (e.g. TS**2**xx = digital signal output), other 2 or more letters specify the type of sensing element used and the gas detected, e.g. TS282**KM** (K=catalytic and M = Methane), other letters or numbers, if present, indicate other specific characteristics of the product.

With [▲] and [▼] you can scroll between the groups of letters and numbers that make up the model, with [ENTER] you can confirm your choice and move on. With [ESC] you can go back.

PRECONF. SENS.
SENSOR N. **1**
MODEL: **TS255**
TS282
TS293

***Example**: for model **TS282KM**, first select **TS** and confirm by pressing [ENTER]. Then select the 2nd item **TS282** and confirm with [ENTER] key. Finally complete the selection by selecting the complete entry **TS282KM** and press [ENTER] to confirm.*

PRECONF. SENS.
SENSOR N. **1**
MODEL: **TS282KB**
TS282KG
TS282KI
TS282KM

Chosen model, will appear a short reminder referring to the configuration of voices ***OUTPUT 1***, ***OUTPUT 2*** and ***OUTPUT 3*** that activates the corresponding alarm outputs (relays) and the specific parameters (delays) that define the operation mode of the relay outputs.

CAUTION: If the number of the relay will not be inserted, the alarm will not be activated.
ENTER to exit

Chosen model, will load its configuration.

With [▲] and [▼] you can scroll through the various items. Press [ENTER] on the item, it is only highlighted the value, editable with [▲] and [▼]. With [◀] and [▶] you move from one field to the other in the same row (*where applicable*). The **ETIC** item, is explained later. Then by pressing [ENTER] the change is accepted. With [ESC] the previous value is restored and the entire row is selected, indicating that it is possible to go back to scrolling through the various items.

PRECONF. SENS.
SENSOR N. **1**
MODEL: **TS282KM**
TAG:
TYPE: **Flammable**
GAS: **METHANE**
UoM: **% LFL**
AL: **INCREASING**

ℹ *After the non-editable items, **MODEL, TYPE, GAS, UoM. F.S.** and **AL**. other fields have a presetted value but can be changed. The only empty fields are **OUTPUT 1, 2** and **3** where the number of the relay that will activate the corresponding alarm level (**THRESHOLD 1, 2** and **3**) must be entered.*

⚠ ***ATTENTION: it is not mandatory to assign an OUTPUT relay number, but if it is not entered, alarm will not be activated. Number 0 (zero) indicates that no relay is assigned.***

ℹ *Only the configuration procedure of the two **HYSTER.OFF / TIME ON** functions is different from that described above, and must be carried out as explained in the following pages.*

Chosen model, will appear a short reminder referring to the configuration of some particular parameters (delays) that define the operation mode of the relay outputs.
The explanation is detailed below in section **HYSTERESIS OFF**.
Pressing ENTER the reading is confirmed and the pop-up disappears.

NOTE: to use the TIME ON parameter in the output settings, select DELAY OFF line and modify it with ENTER key. ENTER to exit

- **Description of items related to the Preconfigured sensor:**

TAG	It is a 10-character label, selectable one at a time, where you can write a note or a reminder for a sensor (e. FLOOR 2, BOILER, etc.). ***AVAILABLE CHARACTERS: 0 ÷ 9 A ÷ Z ▒ (Space):; <=>? @*** Pressing ENTER on the item (when it is in negative), only the 1st character is highlighted, with ▲ and ▼, you scroll through the characters, with ◀ and ▶ you go to the next character, then complete the text, by pressing ENTER you confirm the choice.
AL.	Defines the type of **ALARM** of the sensor and establishes how they should be set the thresholds of the various alarm levels. In the specific: ***INCREASING***: The alarm levels must be set from the smallest to the largest or, if needed, the same. (***ALARM 1 ≤ ALARM 2 ≤ ALARM 3 ≤ FULL SCALE of the SENSOR***). All our sensors, except for oxygen ones, are set with this type of alarm. ***DECREASING*:** The alarm levels must be set from the largest to the smallest value or, if needed, the same. (***ALARM 1 ≥ ALARM 2 ≥ ALARM 3 ≥ FULL SCALE of the SENSOR***). Some oxygen sensors can be set with this type of alarm. ***OXYGEN***: Alarm levels should be set to detect concentrations lower (deficiency) or higher (excess) than the normal presence of oxygen in the air (20.9% v/v). (***ALARM 2 ≤ ALARM 1 ≤ 20.5% vol and ALARM 3 ≥ 21.2% vol and not beyond the FULL SCALE of the SENSOR***). Our oxygen sensors are set with this type of alarm.

Only for Oxygen detectors, ALARM 2 is displayed as AL ↓, while the ALARM 3 as AL ↑

ZONE	***ZONE:*** Sets the area that will be associated with the sensor. ***The number of available areas is max 6.*** The area **0** means that the sensor is not associated in any area
TLV	(***T****hreshold* ***L****imit* ***V****alues*) are exposure limit values (***OELs-O****ccupational* ***E****xposure* ***L****imits*) for toxic substances to which workers may be exposed every day for the entire duration of working life without harmful effects. i.e. **SENSOR SCALE ≥ ALARM 3 ≥ ALARM 1 ≥ ALARM 2 ≥ FAULT** must be set in increasing order**.** Each alarm level is a value obtained with a temporal average. TLVs in detail are:

ALARM 1 = TLV-TWA (Time-**W**eighted **A**verage**)** is the *time-weighted average concentration* for a conventional ***8-hour workday and a 40-hour workweek***, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. This alarm is triggered when the weighted average concentration within ***8 hours*** exceeds the set threshold.

ALARM 2 = TLV-STEL (Threshold **L**imit **V**alue–**S**hort-**T**erm **E**xposure Limit**)** is the concentration to which it is believed that workers can be *exposed continuously for a short period* of time without suffering from irritation, chronic or irreversible tissue damage, or narcosis. STEL ***is defined as a 15-minute TWA exposure***, which should not be exceeded at any time during a workday. This alarm is triggered when the weighted average concentration in the last 15 minutes, exceeds the set threshold.

ALARM 3 = TLV-C (Threshold **L**imit **V**alue-**C**eiling**)** is the ***concentration that should not be exceeded*** during any part of the working exposure. This type of alarm is triggered when the instantaneous concentration exceeds the set threshold. Are not carried out, time weighted average.

Only our sensors for detection of toxic gases can be set up with this type of alarm.

PARKING EN*:** The alarm levels should be set so increasing, i.e. ***SENSOR SCALE ≥ ALARM 3 ≥ ALARM 2 ≥ ALARM 1 ≥ FAULT. In this case, the first two levels of alarm representing a value obtained with a time average between 5 and 60 min. (*according to standard EN 50545-1 for the car parks*). This value can be set via the parameter **TWA**. ***ALARM 3***, however is instantaneous.

This type of alarm (See Table 4) can only be set with our sensors for toxic gases in car parks (series TS282 and TS293 /EC/EN/EN2) or the dual sensors (series TS255).

THRESHOLD	Indicates the value beyond which the relative Alarm level (Relay) will be activated. ***THRESHOLD 1 = ALARM 1 associated with OUTPUT 1*** ***THRESHOLD 2 = ALARM 2 associated with OUTPUT 2*** ***THRESHOLD 3 = ALARM 3 associated with OUTPUT 3***

*Each **THRESHOLD** has a hysteresis to prevent the relay output from activating and deactivating, if around its value. This hysteresis is 20% of the set value, for all sensor models, except for those that detect oxygen (TS... .EO) whose hysteresis is 2%.*

- **Description of the items relating to the outputs:**

OUTPUT	Indicates the relay number that will be activated when the relative threshold is exceeded. The relays available ranging from **1** to **9**. The output set to **0** indicates that it is not associated with any relay. ***OUTPUT 1 = RELAY for ALARM 1 activated by THRESHOLD 1*** ***OUTPUT 2 = RELAY for ALARM 2 activated by THRESHOLD 2*** ***OUTPUT 3 = RELAY for ALARM 3 activated by THRESHOLD 3***

If the cards, with the relay outputs, are not mounted or correctly connected, for safety reasons the outputs cannot be configured.

- If the **ES414** board is not connected to the **'OUT 5-8**' terminal, the available outputs will only be from **1** to **4** and **9**.
- If no **ES414** card is connected, the only available output is **9**.

The operating mode of the relay outputs must be uniquely configured. The same relay output, used for different alarm levels, only the highest alarm configuration will be considered valid.
It is not possible to choose the same output for an alarm level and a fault.

SILENCEABLE	Indicates that the output is deactivated for the Silence Time when the **RESET** is performed. This function can be used, for example, for relay outputs connected to acoustic alarms The parameter can be set **YES** or **NO**
SILENCE T.	Is the ***SILENCING TIME***, adjustable from 0 to 300 seconds for which a ***SILENCABLE*** output is deactivated by means of the ***RESET***. It can only be used if the ***SILENCEABLE*** parameter is set to "***YES***".
***DELAY* ON**	Is the delay, ***HYSTERSIS ON*** adjustable from 0 to 300 seconds, of the relay associated with an alarm threshold.
DELAY OFF	The item (in bold) **HYSTERESIS OFF**, which can be set from 0 to 300 seconds, is the delay of the relay it is associated with, to return to normal condition at the end of the alarm state.

IMPORTANT NOTE for the HYSTERESIS OFF item: *by pressing ENTER the item is selected, then with ▲ and ▼ it is possible to change it to **TIME ON** (see explanation of the function below). Then to program its value, press ENTER, set the value with ▲ and ▼, than press ENTER to confirm. The **INST.OFF** and **TIME ON** functions cannot be used simultaneously or with the **LATCHED** function. For safety, if the delay is set other than zero, the **LATCHED** parameter will automatically become **NO**.*

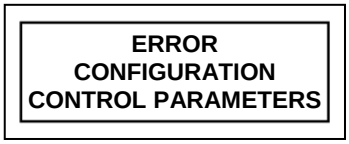
TIME ON	*The second item, **TIME ON**, adjustable from 0 to 300 seconds, can only be used to stop the alarm output after a pre-set time, even if the sensor remains above the alarm threshold set. (It can be used to activate devices that cannot be powered on or to send a pulse to a phone-dialer).*
POS.LOGIC	setting it to **YES**, indicates that the output operation is in **POSITIVE LOGIC** or the relay is normally activated, so, in case of failure automatically moves into the position of the alarm, and then the NC contact becomes NO.
LATCHED	Setting it to ***YES***, indicates that the relay remains in alarm, even if the sensor back below the alarm set. To bring it back into the normal, ***RESET*** must be performer.

*The function **latched**, cannot be used simultaneously with **DELAY OFF** or **TIME ON**. For safety, if the parameter **latched**, was set **YES**, the parameters **DELAY OFF** and **TIME ON**, will be automatically set to Zero.*

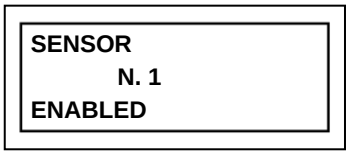
Then at the end of the screen, **SAVE** appears. Pressing ENTER will prompt you to save the configuration entered. Press ENTER again to confirm, or ESC to go back to make changes.

*Only for double sensors, **TS255** series*, at the end of the screen, the message **CONTINUE** appears. Because in this case, must be programmed two consecutive sensors. Only after the second configuration, you can save the configuration entered.

If there are incorrect parameters, a warning will appear, in particular:
If the alarm thresholds set, were in contrast with the criteria for the type of alarm set.
If a same relay output already used and configured, as possible, it was associated with another level of alarm and / or fault (***FAULT***) but with modified operating parameters, compared to those already configured for the same output.
Then the screen returns to the configuration of the sensor.



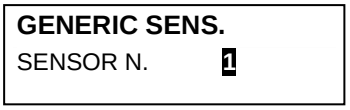
If the procedure is correct, the window warns that the operation was successful; the configured sensor is enabled and active.
Then the screen returns to the choice of the type of configuration.



- **CONFIGURE - GENERIC SENSOR:**

This item allows you to manually enter all the parameters, which are freely editable. This allows you to use compatible products but not of our production or new models not yet included in the list of pre-configured ones. To start configuration, press ENTER on the relevant item.

With ▲ or ▼ and then pressing ENTER you can choose the number of the sensor to be configured.



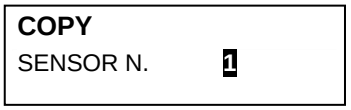
It proceeds in the same way as described in the CONFIGURE SENSORS chapter, in the paragraphs: Descriptions of items relating to the Preconfigured Sensor ***and*** Descrition of items relating to the relay outputs.
In this case, however, you can also change the following items:

- **Description of the items relating to the GENERIC SENSORS:**

TYPE	It indicates the gas that the sensor will detect. You can choose between **Flammab.** (Flammable), **Toxic**, **Vital** (e.g. Oxygen), **Asphixian**. (e.g. CO2 is asphyxiating) and **Refriger**. (Refrigerant e.g. R134a).
GAS	It indicates the name of the gas for which the sensor has been calibrated. You can choose between METHANE, LPG, PETROL (Petrol vapours), HYDROGEN, VARIOUS (various gases), STYRENE, ACETYLENE, AMMONIA, CO, CO_2, H_2S, NO, NO_2, SO_2, HCN, OXYGEN, CL_2 e HCL.
UoM	It indicates the unit of measurement of the concentration detected by the sensor. You can choose between **%LFL** (*Lower Flammable Limit*), **%vol** (Volume), **ppm** (*parts per million*), **ppb** (*parts per billion*) and **°C** (temperature in degrees Celsius).
RANGE	It shows the sensor's full scale. It consists of four digits and you can also set the decimal point. The numbers allowed, ranging from a minimum of **1**, **0.1** or **0.01** up to a maximum of **9999**, **99.9** or **9.**99. Other values or combinations are not accepted and, if entered, will display the previous value.

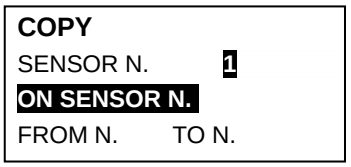
SENSORS-COPY (Level 2):

This item allows you to copy the configuration of a sensor to another sensor or group of sensors.



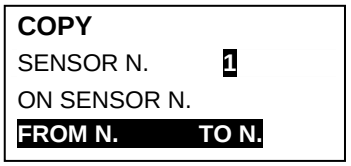
To copy a sensor, press ENTER on its item.

On the screen, press ENTER, then with ▲ and ▼ you can choose which Sensor to copy. Press to confirm. Then, with ▲ and ▼, you can choose whether to copy to a single sensor or to a group.



The 1st line acts on a single sensor. Pressing ENTER on the 1st line the sensor number will be highlighted.

Then with ▲ and ▼ you can choose the desired number, then by pressing ENTER the confirmation window will appear.

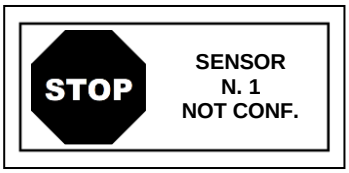


The 2nd line instead acts on a group of sensors. Pressing ENTER on the 2nd line will highlight the number of the first sensor in the group.

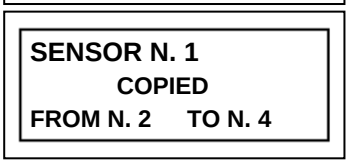
It is possible to copy all sensors between 2. Either from the smallest to the largest number, or the other way around. If 2 numbers were the same, the effect is like managing the single sensor.

With ▲ and ▼ you choose the desired sensor number, with ◀ and ▶ you go from one extreme to the other. Then pressing ENTER the confirmation window will appear.
To confirm press ENTER. To go back, press ESC. Each time it is pressed, it will return to the previous stage.

If the sensor to be copied is not configured, a window warns that the operation is not possible.
Subsequently the screen returns to the choice of the sensor.



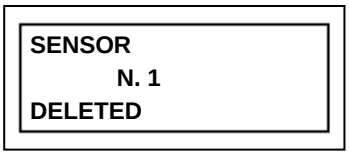
If this procedure is correct, a window notifies you that the operation has been successful.
Then the screen returns to the beginning of the copy management



SENSORS-DELETE (Level 2):

This item allows you to delete a ***Sensor*** or a ***Group of Sensors*** from the configuration.
The access level and the procedure is the same as described in the previous paragraph **COPY.**

After choosing the sensor or sensors and confirming with ENTER the window, it will warn you that the operation was successful.
Then the screen returns to the beginning of the **CANCEL** management.



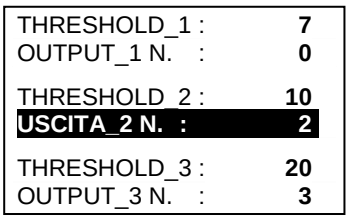
SENSORS-MODIFY (Level 2):

It must be used to modify an already configured sensor, press ENTER on the relevant item. Then choose the sensor number to be modified, excluding the non-modifiable items: ***MODEL., TYPE, GAS, UoM., F.S., AL.*** scroll through the parameters and choose the one you want to modify, with the same procedure described in the paragraph ***CONFIGURE PRECONFIGURED SENSOR.***

SENSORS-DETAILS:

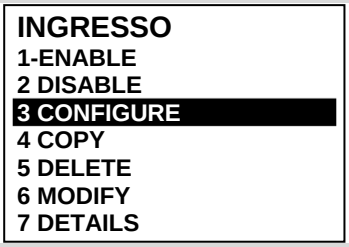
To see the parameters of an already configured sensor, press ENTER on the relevant item.

Once the desired Sensor number has been chosen, the items are as in the configuration of a Sensor. You can scroll through them with ▲ and ▼. Then at the end of the screen, the sensor enabling status is also indicated. Finally, scrolling to one of the lines with the number of the output, if it is different from zero, pressing ENTER displays the details. The items of the output details (relay) are scrolled with ▼ and ▼. At the end of the screen, the silence status of the output is indicated.



LOGIC INPUT

In this submenu it is possible to manage the **LOGIC INPUT (AUX)**, to which it is possible to connect devices with a **NO** (Normally Open) or **NC** (Normally Closed) contact such as Gas sensors with relay outputs, Smoke Sensors, Buttons, etc. . . .



The access level, the procedure and the items are as explained in the SENSORS section.

LOGIC INPUT - ENABLE/DISABLE (Level 1):

The access level, the procedure and the items are as explained in the SENSORS-ENBLE/DISABLE section.

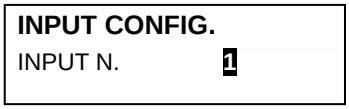
These two items allow you to enable or disable the ***LOGIC INPUT***. The "**disabled**" status is displayed on the main screen, next to the Input, with the symbol *"★★★★"*.

The disabled input no longer activates the associated relay output and therefore the devices connected to it will not be activated. This function can be used to exclude devices that have not yet been installed or failed or removed for repair.

If the procedure is correct, a window notifies you that the operation has been successful. Then the screen returns to the beginning of the enable / disable management of the **LOGIC INPUT**.

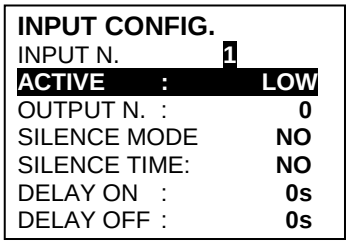
LOGIC INPUT – CONFIGURE (Level 2):

In the ***INPUTS*** submenu, press ENTER on the item for ***CONFIGURE***. Then on the screen, press ENTER to configure the ***Logic Input***.



Remember that the Control unit has only one logical input

With ▲ and ▼ you scroll through the different items and then pressing only the value is selected, showing that you can change it. Then with ▲ and ▼ you change the values, while with ◀ and ▶ you go from field to field on the same line (where applicable) and then pressing ENTER the change is accepted. Instead, pressing ESC restores the previous value and the entire row is selected, showing that it is only possible to scroll through the various items.
The various items are explained in detail below:



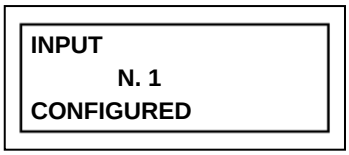
Description of items relating to Logic Inputs

ACTIVE	***Indicates the status of the input. LOW means that it will go into ALARM when the circuit is open (e.g. button). HIGH mean it will go into ALARM when closed.***

Description of items relating to Outputs (relays):

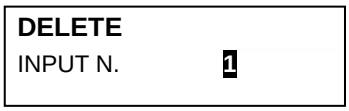
The description of the items: **OUTPUT N, SILENCEABLE, SILENCE, HYSTER.ON, HYSTER.OFF/TIME ON, POS LOGIC and *LATCHED*** are identical to those of the chapter, **CONFIGURE SENSORS**

Then at the end of the screen, move to **SAVE** to save the configuration entered. By pressing ENTER the confirmation window will appear. Press ENTER again to confirm, or ESC press to go back.
After confirming, a window warns that the operation was successful. Then the screen returns to the ***INPUTS*** configuration.

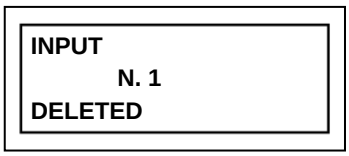


LOGIC INPUT – DELETE (Level 2):

To delete the ***LOGIC INPUT*** from the configuration. Press ENTER on the relevant item ***and then proceed in the same way as described in the paragraph*** **SENSORS-DELETE**



Press ENTER to confirm or ESC to return to the previous step. (If the Input was not configured, the window warns that the operation is not possible). After confirming, the window will notify you that the operation was successful.
Then the screen returns to the beginning of the Delete management.



LOGIC INPUT - MODIFY (Level 2):

To modify a configured ***LOGIC INPUT***, press ENTER on the relevant item ***and then proceed in the same way as described in the paragraph*** **SENSORS - MODIFY**

LOGIC INPUT – DETAILS:

To see the parameters of the already configured Logic Input, press ENTER on the relevant item. After choosing the input, as in the configuration, the related items and the number of the corresponding relay output are shown. To go back, press ESC.

You can scroll through the items with ▲ and ▼. Then at the end of the screen, the operating and enabling status of the input are indicated. Finally, by selecting the line with the number of the output, if different from 0, you can view the details by pressing ENTER.

The items can be scrolled with ▲ and ▼. In addition, at the end of the screen, the output silencing status is indicated.

INPUT DETAILS	
INPUT N.	1
ACTIVE :	LOW
OUTPUT N. :	2
STATUS :	ALTO
ENABLE :	SI

ZONES

In this submenu it is possible to manage the **ZONES**, to which it is possible to associate the Sensors.
The access level, the procedure and the items are as in the SENSORS section

ZONES
1 ENABLE
2 DISABLE
3 CONFIGURE
4 DELETE
5 MODIFY
6 DETAILS

The **ZONES** can be used in various ways, compatibly with the number of relay outputs available:
A - Group several sensors of the same type and use the same outputs (relays) for all of them, configuring them only in the zone. In this case, in the individual sensors configure only the alarm thresholds and the number of outputs all at 0. When the sensors belonging to the zone exceed the set thresholds, they will activate the relative relay outputs, following the chosen operating logic.
B - Group different sensors but placed in the same room or on the same floor. In this case, in the individual sensors, also configure the relay number in the outputs, while in the ZONE set in the outputs only the numbers of the relays common to the sensors associated with that ZONE.

ZONES - ENABLE/DISABLE (Level 1):

The access level and the procedure are as described in the SENSORS-ENABLE / DISABLE section

These two items allow you to ***Enable*** or ***Disable*** one or more ***ZONES*** at the same time. The ***Disable*** status is displayed on the main screen, next to the Input, with the symbol *"★★★★"*.

The disabled ZONE no longer activates the associated relay output and therefore the devices connected to it will not be activated. This function can be used to exclude devices that have not yet been installed or failed or removed for repair.

If the procedure is correct, a window notifies you that the operation has been successful. Then the screen returns to the beginning of the ***Enable / Disable*** management of the **ZONES.**

ZONES - CONFIGURE (Level 2):

In the ***ZONES*** submenu, press ENTER on the item for ***CONFIGURE*** to configure the ***ZONE***.

On the screen, pressing ENTER, then using ▲ and ▼ you choose the number of the ***ZONE*** to be configured.

ZONES CONFIG.	
ZONE N.	1

*Remember that the Control unit **has 6 ZONES and 2 outputs (relays)** for each single alarm level, plus a fault output, for a total of **9 configurable outputs** (relays) for each Zone. The fault output, if configured, intervenes if any sensor in the Zone is faulty.*

With ▲ and ▼ you scroll through the different items and then pressing ENTER only the value is selected, showing that you can change it.

Then with ▲ and ▼ you change the values, while with ◀ and ▶ you go from field to field on the same line (where applicable) and then pressing ENTER the change is accepted. Instead, pressing ESC restores the previous value and the entire row is selected, showing that it is only possible to scroll through the various items.

CONFIG. ZONES	
ZONA N.	1
LOGICA :	OR
OUTPUT N. :	0
SILENCE MODE :	NO
SILENCE TIME :	0s

The various items are explained in detail below:

- **Description of items related to the Zone:**

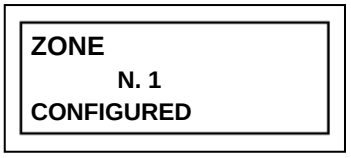
LOGIC	It defines the logical operator to activate of the outputs (*relay*) on the thresholds:

- ***OR (logical sum)*:** The outputs relating to thresholds are triggered when one or more sensors in the area exceed its threshold. (**It is the normal operation, each sensor activates the alarms at exceeding of the set threshold**)
- ***AND*(*logical product*):** The outputs relating to thresholds, are triggered only when all the sensors in the area exceeds its threshold.
- ***CORR.CON*** (***Correspondent Consecutive*):** The outputs relating to thresholds are triggered when two consecutive sensors in the area exceed its threshold. The last and the first are not considered consecutive (e.g. installation along a corridor).
- ***CIRC.CON*** (***Circular Consecutive*):** The outputs relating to thresholds are triggered when two adjacent sensors in the area exceed its threshold. The last and the first are considered consecutive (e.g. installation in a circle).
- ***PARK-ITA(Only for Italy, Parking in accordance with the Italian Ministerial Decree):*** The outputs relating to thresholds are triggered when two sensors belonging to the zone exceeds its threshold. This configuration must be used if the control unit for garages must be programmed in accordance with **Ministerial Decree 02.01.1986 (point b of paragraph 3.9.3)** and subsequent **Ministerial Decree 03/08/2015 - D.M. 21/02/2017**.
  - **Description of the items relating to the outputs:**

The description of the items: **OUTPUT N, SILENCEABLE, SILENCE, HYSTER.ON, HYSTER.OFF/TIME ON, POS LOGIC and *LATCHED*** are identical to those of the chapter, **CONFIGURE SENSORS**

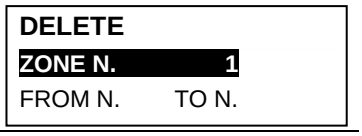
Then at the end of the screen, move to **CONTINUE** (relay output configurations relating to ***THRESHOLD 1*** and ***THRESHOLD 2***). Press ENTER to continue until the configuration screen of the outputs relating to ***THRESHOLD 3*** and ***FAULT*** (failure). Finally, move to ***SAVE***, to save the configuration entered.

By pressing ENTER the confirmation window will appear. Press ENTER again to confirm or ESC to go back. If the procedure is correct, the window warns that the operation was successful.
Then the screen returns to the **CONFIGURE ZONES** screen.



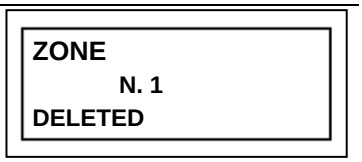
ZONES-DELETE (Level 2):

This item allows you to delete a **ZONE** or a group of **ZONES** from the configuration.



The access level procedure is explained in the SENSORS-DELETE section.

After choosing, choose whether to act on a single ***ZONE*** (1st line) or on a group of ***ZONES*** (2nd line) and confirming with ENTER the window, it will warn you that the operation was successful.
Then the screen returns to the beginning of the ***CANCEL*** management.



By deleting a ***ZONE***, the relay outputs configured in it will no longer be available.

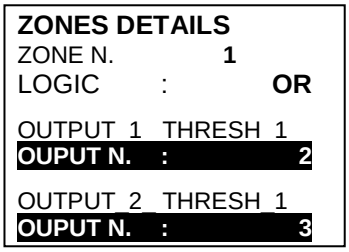
ZONES-MODIFY (Level 2):

To modify a configured ***ZONE***, press ENTER on the relevant item and then proceed to modify the parameters in the same way as the configuration as described in the **ZONES - CONFIGURE** paragraph.

ZONES-DETAILS:

To see the parameters of the already configured ***ZONE***, press ENTER on the relevant item.

Once the ***ZONE*** has been selected, as in configuration, the items relating to the zone and the number of relative relay outputs are shown. You can scroll through them with ▲ and ▼. Then, at the end of the screen, the operating and enabling status of the ***ZONE*** is indicated.
Finally, scrolling to one of the lines with the number of the output, if it is different from zero, pressing ENTER displays the details. The items of the output details (relay) are scrolled with ▲ and ▼. At the end of the screen, the silence status of the output is indicated.



EVENTS

In this submenu it is possible to view the last 100 events stored by the control unit and sorted from the most recent to the oldest.

The control unit stores the events cyclically, that is, after No.100; the oldest event is always deleted.

EVENTS - ALARMS / FAULTS: Only those relating to ***Sensors***, ***Logic Inputs***, ***Zones*** and Relay ***Outputs*** can be displayed.
EVENTS - ALL: the generic events memorized by the control unit, including those of ***Presence*** or ***Absence of mains***, ***Switching o***n and ***Reset*** of the control unit.

The items are scrolled with ▲ and ▼. Then press ENTER on the chosen item. The screen shows the date, time and type of event. Events are displayed in groups on the same day starting with the most recent. Then with the ▲ and ▼ keys you scroll through the events and days.

EVENTS - ALARMS / FAULTS:

First line: *is the date of the event, in the format dd / mm / yy (**Day / Month / Year**).*

Each subsequent line is an event

First part on the left: is the time of the event, in the format hh/mm/ss (*Hours/Minutes/Seconds*).
Second part on the right: this is the type of event as follows:

First letter: *indicates the object to which the event refers:*

S = SENSOR	**I** = LOGIC LOGICO	**Z** = ZONE	**U** = OUTPUT (relay).

Two numbers: *they are the number of the object to which the event refers.*
State: *it is the new state reached by the object that caused the event*.

The **LOGIC INPUTS** can have 2 states:
ATT. (*Active, in alarm*) or **DIS.** (*Off, returned to normal*).

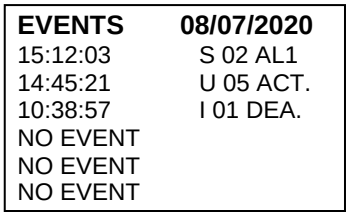
The **OUTPUTS** (relays) can have 3 states:
ATT. (*Active, in alarm*), **DEA.** (*Deactivated, returned to normal*) or **SIL.** (*Alarm Silenced*).

SENSORS and **ZONES** can have 6 states:
FLT (*Fault*), ***NORM*** (*Normal*), ***OVS.*** ↑ (*Over Scale*),
AL1 (*Alarm 1 exceeded*), ***AL2*** (*Alarm 2 exceeded*) or ***AL3*** (*Alarm 3 exceeded*).

EVENTS - ALL

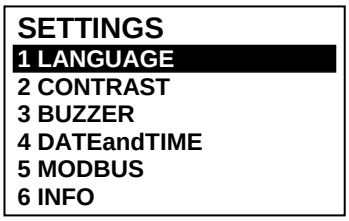
Generic events, which can be viewed from the **ALL** menu, can have 4 states:
POWER ON - *the control unit has been switched on.*
MAIN YES - *the control unit is mains power supply, only if batteries are installed.*
MAIN NO - *the control unit is powered only by batteries, if installed.*
RESET - *Reset performed from keyboard or menu.*
SERV.1 *(Electrical Test performed - Service Function).*
SERV.2 *(Battery Test performed - Service Function).*

Example: in the screen, on the left.
The first line indicates that you are seeing those of July 08, 2020.
The second line shows that, at 15, 12 minutes and 3 seconds (***15:12:03***) the sensor no.2 (***S 02***) has exceeded the threshold of ALARM 1 (***AL 1***).
The third line shows that, at 14, 45 minutes and 21 seconds (***14:45:2***1), the output relay no.5 (***U 05***) have been activated (***ACT.***).
The fourth line shows that, at 10, 38 minutes and 57 seconds (***10:38:57***) LOGIC INPUT number 1 (***I 01***) has been deactivated and returned to NORMAL operation (***DEA***.).
In the ***other rows***, there are no events.



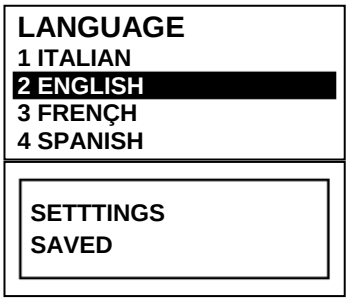
SETTINGS

In this submenu it is possible to manage the control unit settings.
Scroll the list with ▲ and ▼, with ENTER select the desired item.



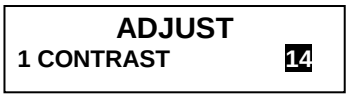
SETTINGS-LANGUAGE (Level 1):

To change the language of the control unit, press ENTER on the relevant item. With ▲ and ▼ chooses the desired one, then press ENTER. The confirmation window will appear. To go back press ESC or press ENTER to confirm. The window will warn that the operation was successful.
Then the screen returns to the beginning of the SETTINGS management.



SETTINGS-DISPLAY CONTRAST

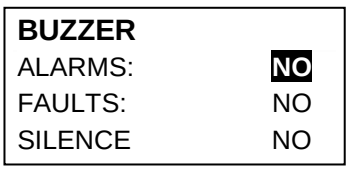
Press ENTER on the item and then adjust the value with ▲ and ▼. Having obtained the desired effect, pressing ENTER the confirmation window will appear. Press ENTER again to confirm or ESC to go back. A window will warn you that the operation was successful. Then the screen returns to the beginning of the **SETTINGS** management.



SETTINGS-BUZZER (Level 1)

Choose whether to activate the **BUZZER** inside the Control unit, if a sensor or zone failure or alarm occurs. Press ENTER on the item and then, with ▲ and ▲ keys and choose which item to modify.

- **ALARMS**: If set to ***YES***, the internal buzzer of the control unit is activated if a sensor or a zone enters the **Alarm** state.
- **FAULTS**: If set to ***YES***, the internal buzzer of the control unit activates if a sensor or a zone enters a **Fault** state.
- **SILENCE:** if set on ***YES*** , the internal buzzer of the control panel is deactivated and no *Bip* will be sound when keys are pressed.



To modify these parameters press ENTER and change the value with ▲ and ▼. Once the desired value has been chosen, by pressing ENTER the confirmation window will appear. Finally press ENTER to confirm or ESC to go back. After confirming, the window will warn that the operation was successful. Then the screen returns to the beginning of the **SETTINGS** management.

SETTINGS-DATE and TIME (Level 1):

To change date and time press ENTER on the item. With ▲ and ▼ you change the values, with ◀ and ▶ you move from one field to another.
If desired, you can set the change to daylight saving time automatically by positioning yourself on the text and pressing the button ENTER

*(Ex: [*] DAYLIGHT SAVING TIME)*

Then move to the word "*SAVE*" and press ENTER. The confirmation window will appear. Press to go back, or ENTER to confirm, the window will warn you that the operation was successful. Then the screen returns to the beginning of the SETTINGS management.

ORA
10: 15
DATA
08 / 07 / 2020
[ ] **DAYLIG.S.TIME**
SAVE

If an impossible date had been entered (e.g.: 30/02 / ....) the window will warn of the error.
Then the screen will return to changing the DATE and TIME.

DATE NOT VALID

⚠ *The control unit has an internal battery that powers the clock when the unit is turned off. If date and time are required on power, the backup battery may be discharge and / or faulty, please contact our customer service for replacement.*

SETTINGS-Modbus® (Level 2):

The following parameters can be set in this menu

MODBUS
1 ADDRESS 14
2 SPEED
3 INFO MODBUS

ADDRESS: the control unit address can be between 1 and 100. If you enter 0 (zero) disables the communication.

ENTER
MODBUS ADDRESS
0

SPEED: you can set up the following baud rate, 19200 (default), 2400, 4800 or ***9600*** baud.

ENTER
MODBUS SPEED
9600

INFO MODBUS: displays the address of the control unit and the configured baud rate.

MODBUS
ADRESSE: 0
VITESSE: 9600

ℹ *Communication, via **binary Modbus RTU protocol**, uses the RS485 serial port (**COM3**). The COM3 port is on the **ES415** expansion board (PC-Modbus output board). **RTU** is the acronym for **R**emote **T**erminal **U**nit.*

Modbus® Comunication Parameters	
PARAMETER	***SETTING***
Baud rate	*2400 – 4800 – 9600 - 19200*
Parity	*No parity*
Data bit	*8*
Stop bit	*1*

- **Function Codes and Reading**

*The sensor status reading is done through the command **Read Holding Registers (code 03)**.*
For each gas detector (sensor) are available 2 registers (non-consecutive).
The registers can only be read.
From 1 to 24 are the registers with the current values (same numbering of the sensors).
From 301 to 324 are the sensor status registers (the register 301 contains the status of sensor 1).

***NOTE**: The value of a "**NOT CONFIGURED**" sensor is always 0.*
Since the submitted values, are the word (16-bit signed), to represent decimal numbers, certain values are multiplied by a factor determined by the number of decimal places specified in the configuration of the sensor. If the decimal places are 0, the value is not multiplied. With a number, multiply it by 10, with 2 digits for 100 and 3 digits for 1000.

As for the status of the sensors, the table below explains the meaning of the possible values.

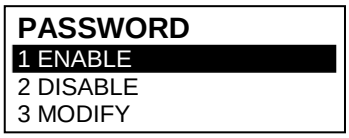
Value	*Description*
0	*Sensor in fault due to lack of signal*
1	*Sensor disabled*
2	*Sensor in normal status*
3	*Sensor in AL1 alarm status*
4	*Sensor in AL2 alarm status*
5	*Sensor in AL3 alarm status*
6	*VALUE NOT USED*
7	*Sensor faulty (Fault) due to excess signal (over the Full Scale)*
8	*Oxygen Sensor in Alarm for Oxygen Deficiency*
9	*Oxygen Sensor in Alarm for Excess Oxygen*
100	*Status unknown*
255	*Sensor not configured*

SETTINGS-INFO

In this submenu you can view the model, the Firmware version, and the contacts (postal address, telephone and email address). Press [ESC] to go back.

PASSWORD

In this submenu you can manage the levels of access to the password protected menus. Press [ENTER] on the relevant item.

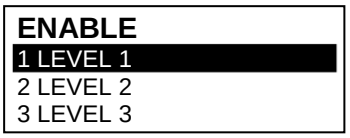


The PASSWORD Level 1 and Level 2 are factory-set to 0000

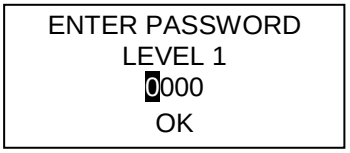
Please note that the accessible levels are only the first two:
***LEVEL 1:** intended for the User*
***LEVEL 2:** intended for the Installer or Maintenance Technician*
LEVEL 3 is reserved only for the Manufacturer (Tecnocontrol).

ENABLE LEVEL:

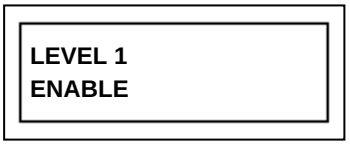
This item allows you to enable the relative access level.
Press [ENTER] on the relevant item.



With [▲] and [▼] you can enter the value, with [◀] and [▶] keys you can move from one number to another.
After entering the Password, move to **OK** and press [ENTER].



If the password entered is correct, the window will confirm the operation. Then the screen returns to the beginning of the ***PASSWORD*** management.



When a protected menu is selected, the request to enter the specific Password appears. Once enabled, the number of the enabled access level appears in the lower left corner of the main screen. In addition, the padlocks of the level enabled disappear.

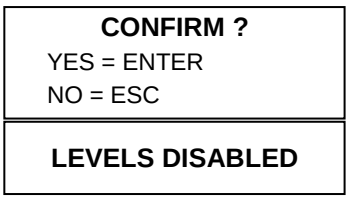
For safety, after one hour, all access levels are automatically disabled.

If an incorrect password was entered, the window alerts you of the error and return to the screen ***ENTER PASSWORD***

DISABLE LEVEL

This item allows you to **disable all active access levels**.

Press ENTER on ***DISABLE***, the confirmation window will appear. The operation is confirmed with ENTER and with ESC cancel the operation.
Then the window will warn that the operation was successful.
Then the screen returns to the beginning of ***PASSWORD*** management.



CHANGE PASSWORD:

This item allows you to ***change the password*** of the relevant access level.

Press ENTER on the relevant item. The screen will appear, asking you to enter the old password first and then the new one.
If the old password is wrong, the window will warn of the error and then return to the password entry screen.
If, on the other hand, the operation is correct, after entering the new password, the window will warn that the operation was successful.
Then the screen returns to the beginning of the ***PASSWORD*** management.

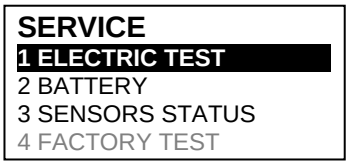
If the password for an access level were lost or forgotten, you can be changed by inserting as the old password, to a higher level of access.
Example*: if the Level 1 password is lost, it can be changed by entering the Level 2 password as the old password*

At the end of the programming it is recommended to insert new passwords for Level 1 and Level 2 in place of the factory "0000" ones. When entering new passwords, always remember to write them down and keep them in a safe place. In case of loss of passwords, contact our assistance service.

SERVICE

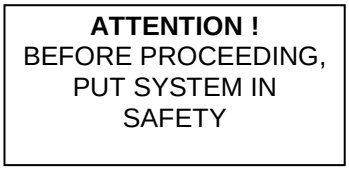
This procedure must be performed with extreme care by authorized and trained personnel. Before proceeding, make the system safe, as both the relay outputs, which will activate the connected devices, and the internal functions of the control unit will be activated.

In this submenu it is possible to manage the maintenance functions of the control unit.



The FACTORY TEST item is not accessible; it is reserved only for the Manufacturer (Tecnocontrol).

By pressing ENTER on the relevant item, a reminder (pop-up) will appear to inform you to put the system in safety mode, because the Control unit will enter a special state, during which the alarm outputs (relays) will be blocked and therefore also the devices connected to the relays will no longer be activated. *The outputs (relays) and therefore devices connected to the relays can be activated only for* ***ELECTRIC TEST - RELAY****, for all the other functions they will not be activated*. The reminder disappears automatically after 5 seconds.



This function excludes gas detection for the time required for maintenance. For safety, the control panel will restore normal operation after 60 minutes if the function is not used. If the function will be confirmed within 5 minutes of the expiry, this time will be reset and another 60 minutes will be available.

SERVICE-ELECTRIC TEST (Level 2):

By pressing ENTER on the relevant item. The screen will appear where you can choose which test to perform.

To start a test, press ENTER on the relevant item:

ELECTRIC TEST
1 DISPLAY
2 KEYBOARD
3 LED/BUZZER
4 OUTPUTS (Relay)
5 AUX
6 SD CARD
7 RS485

- **DISPLAY:** for 3 sec, all the pixels of the display will be switch on, and then the previous screen returns.
- **KEYBOARD**: the screen with the keys name will appear, displayed as the keyboard. When a key is pressed, if it is working, the corresponding name is highlighted on the display. To end the test and return to the previous screen, press ESC twice.
- **LED / BUZZER**: 1st the yellow, green and red LEDs switch off, then switch on in sequence; then for 1 second, the Buzzer will activate. When finished, the previous screen will automatically reappear.
- **RELAY**: The test checks if the output cards are installed, the display will show only the numbers of the internal relays present. Those configured in positive safety are in bold. Use ◀ and ▶ to move the cursor to the desired relay, press ENTER to change its status. At the end of the test, press ESC to return to the previous screen.
- **AUX**: checks the operation of the **Logic Input**. The display will show its status, i.e. whether the contact is OPEN or CLOSED. Changing its state verifies whether it works. Press ESC to return to the previous screen.
- **SD CARD**: check if the memory card is present. The display will show if the SD Card is PRESENT or ABSENT. If the SD card is inserted but not detected, it may be inserted incorrectly or the card holder is broken. Press ESC to return to the previous screen.
- **RS485 (COM1 e COM2):** it is possible to check the operation of the no.2 RS485 lines of the control unit. Connect the two lines together (***H1 with H2 and L1 with L2***) and start the test. If the test fails, the board will need to be replaced. At the end of the test, the control unit returns to the previous screen.

SERVICE-BATTERY (Level 2):

Pressing ENTER on the relevant item, you can choose if the battery is installed, or manually perform the function test and display the battery voltage.

Then with ▲ and ▼ keys, you can choose the item to edit. Pressing ENTER you can change the value using ▲ and ▼ key. After choosing the desired value, press ENTER to confirm or press ESC to go back.

BATTERY		
PRES. BATT.		**NO**
TEST BATT	:	NO
V.BATT.	:	27,51

The battery test is automatically performed every day. If there is no voltage, the battery test cannot be executed and will be suspended if it is in progress.

The control unit will be automatically powered by the batteries in the event of a mains failure. To avoid damaging the batteries (excessive discharge) below 22 VDC the control unit will automatically shut down. When mains power is present, the battery will be recharged and kept charged.
If the batteries (configured present) were disconnected, with the control unit powered by the mains, the yellow LED will flash quickly. Reconnecting the batteries will restore normal operation.

PRES. BATT. *(Presence Battery):*

- When set **NO**, the battery is not present. In the main screen, the icon in the bottom left will be absent and if there is no mains power, the control unit will shut down.
- When set **YES**, indicating the presence of the battery. In the main screen, the icon in the bottom left indicates the charge status of the battery according to the following scheme:

Full charge 26.5 VDC about	***Partially charge*** 24÷26.5 VDC.	**Half charge** 22 ÷ 24 VDC.	***Low battery*** 20.7÷22 VDC.	***Flashing*** *00.0 VDC* ***= Disconnected*** <at 20.7 VDC or> at 28 VDC ***= Faulty*** ***Replace the two batteries.***

TEST BAT. (Test Battery):

- When set ***YES***, it is activated or indicates that the test is in progress. The test takes about a minute, and checks, with a load, the proper functioning of the battery. If during the test, the battery voltage drops below 20.7 VDC, is reported as a **Fault** (*see above*), and the battery will not be recharged. ***The test will not be activated in the absence of mains or battery***.
- When set ***NO***, the test indicates that you disable or do not on the battery test.

⚠ *When Battery Test is active, on the power board, placed in the base of the housing, its LED will light, (**BAT TEST ON**). Consider that the two power resistors (load) will heat up during the test.*

SERVICE SENSORS STATUS (Level 2):

This item allows you to view the current value of the connected sensors. Press ENTER on the relevant item. The value of the sensors will be displayed, with ◀ and ▶ you scroll through all the sensors.
To go back, press ESC.

SENSORS STATUS
1) 04.00 mA
2) 05,23 mA
3) 04,05 mA
4) 12,38 mA
5) 12,00 mA
6) 11,58 mA

SERVICE-FACTORY TEST (Level 3)

This item is not accessible, it is reserved for factory settings.
If you try to enter, a message warns you that access is denied.

SD CARD

In this submenu it is possible to manage the SD-Card, after having inserted it in its seat. The card housing is on the circuit in the cover, inside the case.

SD CARD
1 UPDATE FIRMWARE
2 COPY CONF. FROM
3 COPY CONF. ON
4 COPYA EVENTS ON
5 DATA LOGGING
6 DELETE SD

⚠ *The compatible SD-Cards are of the SD and SDHC type up to 32Gb. SDXCs must be formatted with FAT32 (max 32Gb). Normally the control unit accepts all SD Cards, however it is recommended to use those from qualified manufacturers.*

UPDATE FW. (Level 2): This item allows you to ***Update the Firmware*** of the control unit using the file loaded on an SD-Card. The file must be downloaded from our website " ***www.cpftecnogeca.com*** " in the *DOWNLOAD>SOFTWARE>CE424 Firmware Update area* by following the relative instructions.

Press ENTER on the relevant item, the procedure to be performed before starting the update will be displayed. Then press ENTER to start the update or press ESC to go back.

UPDATE FIRMWARE
INSERT IN THE
CONTROL UNIT
THE JUMPER JP3
THE SD CARD
AND PRESS ENTER

ℹ ***First, move the jumper JP3 in the position "CLOSED" and then insert the SD-Card into its slot*** (*see below figure 12*).

Scheda posta nel Coperchio.
Board into housing cover.

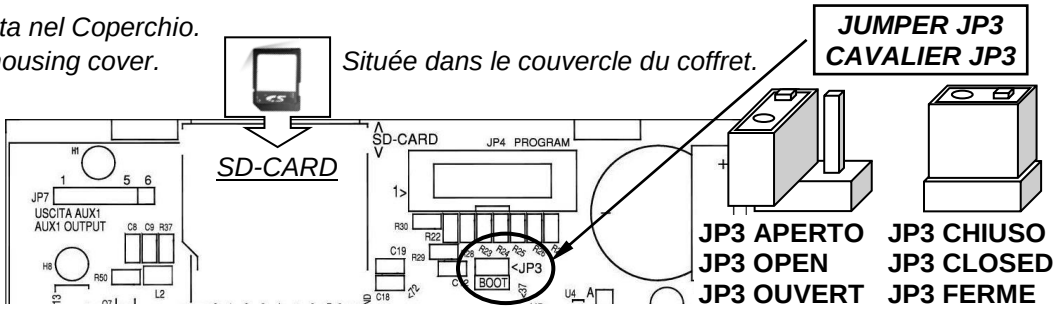


Fig.12-SD-Card insertion

⚠ *If the above procedure is correct, the control unit restarts. Otherwise the control unit does not continue. The control unit checks that there is a valid file on the SD Card for updating. If there is more than one, the file with the latest version is loaded.*

When the control unit restarts, the automatic firmware update begins, which lasts about 3 ÷ 5 minutes. This phase is indicated by the flashing of the yellow LED and the message on the display.

WAITING
UPDATE IN PROGRESS

If there is no file on the SD Card or there is a firmware version that is previous or equal to the one already installed, the control unit will report it and then restart without updating.

FIRMWARE MISSING
OR JUST PRESENT

If the SD Card is not readable, the control unit will report it and then restart normally

SD CARD
NOT READABLE

If the SD Card was write protected.

SD CARD
WRITE PROTECTED

If the SD-Card is not inserted or is not detected, the control unit will report it and then restart normally. Check that you have correctly inserted the card and, if necessary, check its operation by testing (see menu *Service → Electric Test → SD Card*).

SD CARD
MISSING

At the end of the update, a message will confirm that the operation is finished, in addition, the green LED and the buzzer will light up for 3 seconds. After that, the control unit will restart in normal operation.

UPDATE
SUCCEEDED

If the update was not carried out correctly, the display will inform you that the operation has failed and for 3 seconds, the red LED and the buzzer will light up. Then it will automatically restart in normal operation, but with the previous Firmware version.

UPDATE
FAILED

Put Jumper JP3 back in the "OPEN" position, otherwise, at each restart, the control unit will check if there is an update file on the SD Card.

Firmware may be incomplete. This would be reported when the control unit restarts. In this case, try to power down and power up the control unit and repeat the update. If the problem persists, check the integrity of the update file by loading the previous working firmware version. If not, contact the supplier.

FIRMWARE
CORRUPT

COPY CONF. FROM (Level 2): This " ***COPY CONFIGURATION FROM***" item allows you to load a configuration (Sensors, Logic Input, Zones***, RU*** and Outputs) on a control unit, using a file previously saved on the SD Card. The file, named ***'CE424P_CF.txt'***, can be created ONLY with the ***'COPY CONFIGURATION ON***' (see below). This function can be used to restore a configuration on a control unit (memory failure) or to transfer the same configuration to other control units of the same model.

By pressing ENTER on the relevant item, the operations to be performed before starting the procedure will be displayed.

In the event of an error or malfunction, the control unit configuration is irretrievably deleted. It is advisable to always fill in the Reminder Table (See at the end of the manual).

After inserting the SD Card, press ENTER to start copying and updating the configuration or press ESC to go back

COPY CONF. FORM
INSERT IN THE
CONTROL UNIT
THE SD CARD
AND PRESS ENTER

A wait message is displayed while copying.

WAIT

If the SD Card was write protected, the control unit signals it with a message and returns to the SD Card submenu.

SD CARD
WRITE PROTECTED

If the SD card is unreadable or not formatted correctly or the file is missing, the control unit signals it with a message and returns to the SD Card submenu.

ERROR
MISSING OR NOT
READABLE FILE

In the event of a Read / Write error or a corrupt file, the control unit will report the error, then delete the current configuration and then reboot normally to reload the previous configuration.

ERROR
OPERATION FAILED

If the operation is successful, the control unit will report it and then restart normally to reload the new configuration.

WAITING
REBOOT IN PROGRESS

COPY CONF. ON (Level 2): This item "***COPY CONF****iguration* ***ON***" allows you to save the configuration (***Sensors, Logic Input, Zones, RU and Outputs***) of the control unit on an SD-Card. The file in text format, "**CE*424*P_CF.txt**", it can **ONLY** be created with this function and can be used as indicated above in the previous function.

By pressing ENTER on the relevant item, the operations to be performed before starting the procedure will be displayed.
After inserting the SD-Card, press ENTER to start saving the configuration or press ESC to go back.

COPY CONF. ON
INSERT IN THE
CONTROL UNIT
THE SD CARD
AND PRESS ENTER

*The operation sequence described is also valid for the **COPY EVENTS ON** and for **DATA LOGGING**. The messages that could be displayed (**WAIT, SD CARD** **WRITE PROTECTED , FILE MISSING OR NOT READABLE and ERROR OPERATION FAILED**) are described above in the previous paragraph.*

COPY EVENTS ON (Level 2): This item **Copy Events On** allows you to save the list of the last recorded events of the control unit on an SD Card. The file in text format, "***CE424P_EV.txt***", can ***ONLY*** be created with this function.

The rest of the sequence of operation is similar to the previous function (see above).

DATA LOGGING (Level 1): This item allows you to continuously save the values read by the control unit (**Data Logger of the Sensors, of the logic input and of the Zones**), these data are written every minute, in the SD-Card, in a file in text format "***DL_No.Month_No.Year.txt***", which can be imported into Microsoft Excel to analyse its content or view its progress through graphs (**See Example below**).
The ***No.Month*** and ***No.Year*** values are two numerical digits representing the month number and the last two digits of the year, as set in the control unit date.

*The word **'SD'** at the bottom right indicates that the SD-Card is inserted.*
*When data storage is active, it is indicated on the main screen, at the bottom right, with the word "**'DATA LOG SD**"*

When the space in the SD-Card is almost exhausted, the control unit signals it with a message. It is advisable to replace the SD-Card with a new one as soon as possible. Press ESC to return to normal view.

ATTENTION !
SD CARD
ALMOST FULL

When the space in the SD-Card is exhausted, data storage will be interrupted and the control unit signals it with a message. It is recommended to replace the SD-Card with a new one. Press ESC to return to the normal view.

ATTENTION !
SD CARD FULL
DATA LOGGING STOPPED

The rest of the sequence of operation is similar to the previous function (see above).

If, via PC, you delete an SD-Card that has already been used, it must be formatted, before using it again in the control unit (FAT32 - max 32Gb).

SD-Card CAPACITY TO STORE DATA: Indicatively, it will be one based on its size: SD-4Gb 2 months / SD-8Gb 4 months, SD-16Gb 8 months / 32Gb 16 months

If the procedure is successful, the item **STOP DATA LOG.** Appears on the SD-CARD submenu screen. instead of this item.

SD CARD
1 UPDATE FIRMWARE
2 COPY CONF. ON
3 COPY EVENTS ON
4 COPY EVENTS ON
5 STOP DATA LOG.

By pressing ENTER on the relevant item it is possible to stop data storage. Then the control unit will return to the previous SD-Card submenu.
Press ESC to return to the main screen.

DATA LOGGING
STOPPED

Example: *how to import the file in Microsoft Office Excel® (in other versions, the procedure may be slightly different)*:

1) Open Microsoft Excel ®.
2) Click on top of the "***Data***" field.
3) Click on the top left, in the "***External Data***" on the "***Text***".
4) Select the file "***DL_NoMonth_No.Year.txt***" and press on the button "***Import***".
5) Select in the "***Original data type***" field "***Fixed width***".
6) Press "***Finish***" and then on "***OK***".
7) Now the file will be loaded. The fields are disposed in the following way:
   a) The first line contains: the date, the number of sensors, the number of logic inputs (***preceded by the letter "I"***) and the zone numbers (***preceded by the letter "Z"***).
   b) Below the date are listed minutes of when they have been recorded readings.
   c) Below the sensors are three columns which represent the values, the unit of measurement and status.
   d) Below the logic inputs and the areas it is written the state.
   e) If a device is not configured, it is indicated by the symbol "**- - - -**".
   f) If a logic input or a zone is disabled, it is indicated by "★★★★".
   g) If a sensor is disabled, the value will still be recorded, but the state has indicated by "★★★★".
   h) If a sensor belongs to a disabled RU, its value is not recorded and it is displayed by symbol "★★★★".
8) The structure is repeated daily. You can scroll through the values and analyse them or view the trend through a chart by selecting the column of the minutes and the recorded values.

DELETE SD (Level 2): **This item allows you to** *delete all files into SD-Card* **(***only the root files, but not the folders, if present***). E.g. to reuse a full SD-Card, without having to format it via PC.**

⚠ ***Erasing an SD-Card already used, all files will be erased and will not be recoverable. If there are folders into SD-Card, these and the files contained will remain unaltered.***

By pressing ENTER on the relevant item, a short message will be displayed before starting the procedure.

Press ENTER to confirm and to start deleting, or press ESC to go back.

ALL FILES WILL BE DELETED !
CONFIRM ?
YES = ENTER
NO = ESC

At the end, a message will confirm that the operation is finished. Then the previous SD Card submenu will reappear.

OK DELETION SUCCEEDED

APPENDIX

TECHNICAL SPECIFICATIONS	
AC power supply and frequency	90 to 264 V AC / 47 to 63 Hz
AC Maximum consumption (1)	1,6A a 110VAC / 1A at 230V AC
Max current delivered by the power supply	1,4 A a 27,6VDC
Number of detectors that can be connected	Max no. 24 of which Max 8 inside the CE424 and Max 16 inside the two CE380UR (Max 8 inside each CE380UR)
Analog Input 4 to 20 mA (Linear)	No. 8 maximum, of which no.4 factory installed, others are expandable to 8 with expansion board ES404
Analog Input - Load resistance	RL (inside of each input) = 100 ohm
Voltage / current limits for each input.	24 VDC (–10/+15%) / 100 mA (with resettable current limiter)
Digital inputs for CE380UR	No. 2 RS485 ports (COM1 and COM2)
Connectable Remote Units (CE380UR)	n. 2 (in each CE380UR, 8 linear 4 ÷ 20 mA analog inputs are installed and 8 output relays can be installed, with 2 ES380UR expansion cards available on request)
Digital Output	no.1 RS485-Modbus port (COM3) with ES415 optional expansion card. (***Available on request***)
Relay outputs (*with voltage free changeover contacts*)	No.5 factory installed, expandable to 9 with ES414 expansion card. (***Available on request***)
Nominal load of relay (SPDT contact on each relay)	250 VAC – 2 A or 30 VDC – 2 A resistive load.
Logic Input	No. 1 (setting for NA or NO dry contacts)
SD Card type accepted	SD e SDHC max 32Gb SDXC formatted by PC with FAT32 (max 32Gb).
Display	monochrome LCD graphical display with RGB backlight
Optical indications	No. 3 LED (Yellow, Green and Red)
Acoustic indications	Internal Buzzer
Keyboard	No. 18 keys with backlight
Backup battery (***optional***) (2)	N0. 2 Pb 12VDC / 1.3Ah (connected in series)
Max Charging Current from Power Supply	0.75 A a 27.6VDC
Battery operating time (3)	about 1h30' with 4 detectors, 1h with 8 detectors.
Operating temperature/humidity (with the batteries installed in the control unit)	+5 to +40 °C / 5 to 95% relative humidity
Dimensions and Protection rating (4).	379 x 241 x 133 mm / IP42 (4)
Weight (without the batteries)	about 2 Kg
Weight of the internal batteries only	(No.2x1.3Ah) about 1.2 Kg

(1) *With all the internal detectors connected and 9 relays activated.*

(2) *Batteries are not included. If greater autonomy is required, 2 of 12V 3Ah or 7Ah Pb batteries connected in series can also be used, but due to the size, they must be installed in an external container.*
The autonomy, with 3Ah batteries, becomes: about 3h30' with 4 detectors, 2h15' with 8 detectors.
The autonomy, with 7Ah batteries, it becomes: about 8h with 4 detectors, 5h10' with 8 detectors.

(3) *Battery autonomy is calculated in the worst conditions, with all relays configured in Positive Logic and also considering a negative coefficient due to possible effects on battery efficiency (aging, temperature, etc.).*

(4) *Using Metric Cable Glands (M16 and M20 Pitch ISO 1,5mm) with IP55 or higher protection degree.*

Summary of the list of Fault and Alarm messages

STATUS	*DISPLAY*	*Yellow LED*	*Green LED*	*Red LED*	*Buzzer configured*
Sensor not Configured	**- - - -**		*Fixed ON*		
Sensor or Zone in Fault	*FAULT*	*Fixed ON*	*Fixed ON*		*Activated*
Sensor or Zone returned from a Fault, but with output relay latched.	*NORM (Blinking)*	*Short blinking (2)*	*Fixed ON*		
Sensor operating normally	*NORM*		*Fixed ON*		
Battery Operation - (with graphical indication, from Full Charge up to Discharge)	▮÷▯		*Blinking (1)*		
Batteries Fault	▯ *Blinking(1)*	*Rapid blinking(3)*	*Fixed ON*		
Sensor or Zone or Logic Input, in Alarm 1	*AL 1*		*Fixed ON*	*Blinking*	
Sensor or Zone or Logic Input, in Alarm 2	*AL 2*		*Fixed ON*	*Blinking*	
Sensor or Zone in Alarm 3	*AL 3*		*Fixed ON*	*Fixed ON*	*Activated*
Sensor or zone or logic input, with Alarm 3 returned to normal, but with relay output latched.	*NORM Blinking*		*Fixed ON*	*Short blinking (2)*	
Sensor over the Full Scale	*F.S.*	*Fixed ON*	*Fixed ON*	*Fixed ON*	

***(1)** Blinking = 1sec ON / 1sec OFF / **(2)** Short blinking = 0,1sec ON / 1sec OFF / **(3)** Rapid blinking = 0,1sec ON / 0,1sec OFF*

DISPLAY MESSAGE	*EXPLICATION*
LEVEL NOT ENABLED ACCESS DENIED	*Password protected menu. The requested access level has not been enabled*
RESET DONE	*RESET performed (activates the SILENCABLE Outputs and restores the LATCHED relays)*
SENSOR NOT CONFIGURED	*The sensor is not installed or not configured, the function is not executable*
OUTPUT NOT CONFIGURED	*The Output (relay) is not configured*
INPUT NOT CONFIGURED	*The Logic Input is not configured, the function is not executable*
ZONE NOT CONFIGURED	*The Zone is not configured, the function is not executable.*
CONFIGURATION ERROR CHECK PARAMETERS	*One or more parameters entered in the configuration of a sensor are not correct or in contrast with others already entered*
OUT OF SCALE PARAMETER	*Too high a numeric value was entered.*
INVALID DATE	*Time or date entered not possible*
WRONG PASSWORD	*Wrong level code (Password) entered*
FIRMWARE MISSINGOR JUST PRESENT	*The firmware version is older or the same as the one already installed or the update file is not present in the SD-Card.*
NO SD CARD	*The SD-Card is not inserted in the control unit. (If it is, the card holder is faulty).*
SD CARD NOT READABLE	*The SD-Card is inserted, but it cannot be used (replace or format it).*
SD WRITE PROTECTED	*The SD-Card is inserted, but write-protected*
CORRUPT FIRMWARE	*The control unit is unable to start, incomplete or missing firmware.*
UPDATE FAILED ERROR MISSING OR NOT READABLE FILE	*The Control unit is unable to update the Firmware from the SD-Card* *The SD-Card File is not available or usable*
ERROR OPERATION FAILED	*An error occurred while reading or writing the SD-Card*
ATTENTION SD CARD ALMOST FULL	*The space in the SD-Card is almost exhausted, replace it as soon as possible.*
ATTENTION SD CARD FULL	*There is no more space on the SD card, replace it with a new one*
STORAGE DATA INTERRUPTED	*Data logging (Data-Logger) was interrupted*

TABLES with List of PRECONFIGURED Gas Detectors

TABLE 1 – Models with 4÷20mA output and Replaceable Sensor Cartridge.

WITH CATALYTIC SENSORS FOR FLAMMABLE GASES					Alarm levels		
MODELS		Detected Gas	RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
TS282 KB TS292 KB(4)	**TS293 KB**	Vap.BENZINA *PETROL vapors Vap.ESSECE*	0÷20	%LFL	7 (1)	10	20
TS282 KG TS292 KG(4)	**TS293 KG**	GPL (Butano) *LPG (Butane)*					
TS282 KI TS292 KI(4)	**TS293 KI**	IDROGENO *HYDROGEN*					
TS282 KM TS292 KM(4)	**TS293 KM**	METANO *METHANE*					

WITH PELLISTOR SENSORS FOR FLAMMABLE GASES					Alarm levels		
MODELS		Detected Gas	RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
TS282 PB TS292 PB(4)	**TS293 PB**	Vap.BENZINA *PETROL vapors Vap.ESSECE*	0-100	%LFL	8 (1)	12	20
TS282 PG TS292 PG(4)	**TS293 PG**	METANO *METHANE*					
TS282 PI TS292 PI(4)	**TS293 PI**	IDROGENO *HYDROGEN*					
TS282 PM TS292 PM(4)	**TS293 PM**	METANO *METHANE*					
TS282 PX(A) TS292 PX(4)	**TS293 PX(A)** **TS293 PX-H(A)**	INFIAMMABILI *FLAMMABLE FLAMMABLES*					
	TS293 PE	Acetilene Acetylene	0-100	%LFL	8 (1)	12	20
	TS293 PS	Stirene/Styrene					

NOTE (A): for the TS282PX, TS293PX and TS293PX-H models, the list of FLAMMABLE gases for which the detector can be calibrated are indicated in the instructions for the specific model.

WITH INFRARED (NDIR) SENSORS FOR FLAMMABLE GASES				Alarm levels		
MODELS	Detected Gas	RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
TS293 IB	Vap.Benzina / *Petrol vapors / Vap.Essence*	0-100	%LFL	8 (1)	12	20
TS293 IG	GPL (Butano) / *LPG (Butane)*					
TS293 IM	METANO / *METHANE*					
TS293 IX	INFIAMMABILI / *FLAMMABLE / FLAMMABLES*					

WITH ELECTROCHEMICAL SENSORS FOR TOXIC GASES				Alarm levels		
MODELS	Detected Gas	RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
TS282 EA TS293 EA **TS282 EA-H TS293 EA-H**	NH_3	0-300	ppm	10	20	50
TS282 EC-S TS293 EC-S **TS282 EC-H TS293 EC-H**	CO	0-300	ppm	25	50	150
TS282 ECL	CL_2	0-10.0	ppm	0.3	0.5	1.0
TS282 EH TS293 EH	H_2S	0-100	ppm	10	20	50
TS282 EHCL	HCL	0-10.0	ppm	3.0	5.0	10.0
TS282 EHCN TS293 EHCN	HCN	0-10.0	ppm	2.0	3.0	5.0
TS282 EN TS293 EN	NO	0-100	ppm	10	20	50
TS282 EN2 TS293 EN2	NO_2	0-30.0	ppm	3.0	6.0	15.0
TS282 ES TS293 ES	SO_2	0-20.0	ppm	5.0	7.5	10.0

NOTE TO TABLE 1: Discontinued **TS220E** (Electrochemical sensors) models are configurable using the **TS282E** codes and the only construction difference is the enclosure used.

WITH ELECTROCHEMICAL SENSORS FOR VITAL GASES					*Alarm levels*		
MODELS	**Detected Gas**		**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS282 EO **TS293 EO**	*Allarme[6]=OSSIGENO* *Alarm[6]=OXYGEN* *Alarme[6]=OXYGÈNE* *Modificabile / Configurable* *Modifiable*	O_2	0÷25.0	% vol	19.5	18.5 [2]	22.5 [3]
	Allarme[6]=DECRESCENTE *Alarm[6]=DECREASING* *Alarme[6]=DÉCROISSANTE*				20.0	19.5	18.5

WITH INFRARED (NDIR) SENSORS FOR ASPHYXIATING GAS					*Alarm levels*		
MODELS		**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS282 IC2	**TS293 IC2**	CO_2	0-5.00	% vol	0.50	1.00	2.00
TS282 IC2-H	**TS293 IC2-H**	CO_2	0-5000	ppm	1000	1800	2500
TS210 IC2	**IR101-IR102[4]**	CO_2	0-2.00	% vol	0.20	0.50	1

GAS DETECTORS WITH TWO SENSORS FOR PARKING				*Alarm levels*		
MODELS	**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS255 CB	CO	0-300	ppm	30	60	150
	Vap.BENZINA / *PETROL vapors / Vap.ESSECE*	0-20	% LFL	7[1]	10	20
TS255 CN2	CO	0-300	ppm	30	60	150
	NO_2	0-30.0	ppm	3.0	6.0	15.0

WITH SEMICONDUCTOR SENSOR FOR REFRIGERANT GAS				*Alarm levels*		
MODELS	**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS282 SFn-H **TS293 SFn-H**	Refrigeranti Refrigerant / Refrigerants	0-1000	ppm	400	600	1000

WITH (NDIR) SENSORS SENSOR FOR REFRIGERANT GAS				*Alarm levels*		
MODELS	**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS282 IFn	Refrigeranti Refrigerant / Refrigerants	0-2000	ppm	400	600	1000
TS282 IFn-H		0-1000	ppm			

NOTE: the list of REFRIGERANT gases for which the detector can be calibrated are indicated in the instructions for the specific model.

TABLE 2 - Models with DISPLAY and Replaceable Sensor Cartridge

WITH PELLISTOR SENSORS FOR FLAMMABLE GASES				*Alarm levels*		
MODELS	**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS593 PG	GPL (Butano) / *LPG (Butane)*	0-100	%LFL	8 [1]	12	20
TS593 PM	METANO / *METHANE*					
TS593PX-H	INFIAMMABILI / FLAMMABLE / FLAMMABLES					
TS593 PE	Acetilene / Acetylene					
TS593 PS	Stirene / Styrene					

WITH INFRARED (NDIR) SENSORS FOR FLAMMABLE GASES				*Alarm levels*		
MODELS	**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS593 IG	GPL (Butano) / LPG (Butane)	0-100	% LFL	8 [1]	12	20
TS593 IM	METANO / METHANE					
TS593 IB	Vap.BENZINA / *PETROL vapors* / Vap.ESSECE					
TS593 IX	INFIAMMABILI / FLAMMABLE / FLAMMABLES					

WITH ELECTROCHEMICAL SENSORS FOR TOXIC GASES				*Alarm levels*		
MODELS	**Detected Gas**	**RANGE**	**UNIT**	**Threshold 1(AL1)**	**Threshold 2(AL2)**	**Threshold 3(AL3)**
TS593 EA **TS593 EA-H**	NH_3	0-300	ppm	10	20	50
TS593 EC-S **TS593 EC-H**	CO	0-300	ppm	25	50	150
TS593 EH	H_2S					
TS593 EHCN	HCN					
TS593 EN	NO					
TS593 EN2	NO_2					
TS593 ES	SO_2					

WITH ELECTROCHEMICAL SENSORS FOR VITAL GASES	*Alarm levels*

MODELS	Detected Gas		RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
TS593 EO	*Allarme(6) =OSSIGENO* *Alarm(6)=OXYGEN* *Alarme(6)*=OXYGÈNE *Modificabile / Configurable* *Modifiable*	O_2	0÷25.0	% vol	19.5	18.5 (2)	22.5 (3)
	Allarme(6)=DECRESCENTE *Alarm(6)*=DECREASING *Alarme(6)=DÉCROISSANTE*				20.0	19.5	18.5

NOTES TO THE TABLES 1 and 2:

(1) It is not recommended to set pre-alarm levels lower than the value indicated.
(2) the Alarm for oxygen deficiency is displayed as **AL.**🡻.
(3) the Alarm for oxygen excess is displayed as **AL.**🡹.
(4) Product discontinued or no longer in stock.
(5) **N.A.** Data Not Available
(6) indicates the Alarm Type selectable in the sensor configuration. It is preconfigured as OXYGEN but can be changed to DECREASING , if the excess alarm is not needed.

TABLE 3 - Models with Fixed Sensor (Parking, Heating Plants, Civil installations)

WITH CATALYTIC SENSORS FOR FLAMMABLE GASES					*Alarm levels*		
MODELS		Detected Gas	RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
SE192 KB	SE193 KB	Vap.BENZINA *PETROL vapors* *Vap.ESSECE*	0÷20	%LFL	7 (1)	10	20
SE192 KG	SE193 KG	GPL (Butano) *LPG (Butane)*					
SE192 KI	SE193 KI	IDROGENO *HYDROGEN*					
SE192 KM	SE193 KM	METANO *METHANE*					
	SE193 PB	Vap.BENZINA *PETROL vapors* *Vap.ESSECE*	0÷100	%LFL	10 (1)	15	20
	SE193 PG	GPL (Butano) *LPG (Butane)*					
	SE193 PI	IDROGENO *HYDROGEN*					
	SE193 PM	METANO *METHANE*					

WITH ELECTROCHEMICAL SENSORS FOR TOXIC GASES					*Alarm levels*		
MODELS		Detected Gas	RANGE	UNIT	Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
SE192 EC	SE193 EC	CO	0-300	ppm	25	50	150

NOTE TO TABLE 3: The **SE183** models can be configured using the **SE193** code and the only construction difference is the enclosure (Exd) used.

TABLE 4 - Models and Values of TLVs

MODELS			Detected Gas	RANGE	UNIT	*Alarm levels* TLV-TWA Threshold 1	TLV-STEL Threshold 2	TLV-Ceiling Threshold 3
TS282 EA	TS293 EA TS293 EA-H	TS593 EA TS593 EA-H	NH_3	0-300	ppm	25 (COSHH)/(OSHA)	35(COSHH)	50(OSHA)
TS282 EC-S	TS293 EC-S TS293 EC-H	TS593 EC-S TS593 EC-H	CO	0-300	ppm	30 (COSHH)	200 (COSHH)	250
TS282 ECL			CL_2	0-10.0	ppm	0.5 (OSHA)	0.5(COSHH)	1.0
TS282 EH	TS293 EH	TS593 EH	H_2S	0-100	ppm	5 (COSHH)	10 (COSHH)	20
TS282 EHCL			HCL	0-10.0	ppm	5.0 (OSHA)	5.0 (COSHH)	10.0
TS282 EHCN	TS293 EHCN	TS593 EHCN	HCN	0-10.0	ppm	4.7 (OSHA)	10 (COSHH)	4.7 (OSHA)
TS282 EN	TS293 EN	TS593 EN	NO	0-100	ppm	25 (COSHH)/(OSHA)	25 (COSHH)	50 (OSHA)
TS282 EN2	TS293 EN2	TS593 EN2	NO_2	0-30	ppm	3.0 (COSHH)	5.0 (COSHH)	15.0
TS282 ES	TS293 ES	TS593 ES	SO_2	0-20.0	ppm	2 (COSHH)	5 (COSHH)	10
TS282 IC2	TS293 IC2	TS593 IC2	CO_2	0-5.00	% vol	0.50(COSHH)/(OSHA)	1.50(COSHH)	3.00
TS282 IC2-H	TS293 IC2-H	TS593 IC2-H	CO_2	0-5000	ppm	1000	1500	5000(COSHH)/(OSHA)
TS210 IC2			CO_2	0-2.00	% vol	0.50(COSHH)/(OSHA)	1.50(COSHH)	2.00

*The values indicated refer to the requirements of the bodies that deal with the health of workers, the European **COSHH** (Control Of Substances Hazardous to Health) and the US **OSHA** (Occupational Safety and Health Administration).* The indicated values may change according to national standards.

TABLE 5A-Pre-configured values for PARKING-EN (EN50545-1)

MODELS	Detected Gas	RANGE	UNIT	TWA minutes	*Alarm levels* Threshold 1 (AL1)	Threshold 2 (AL2)	Threshold 3 (AL3)
TS282 EC-S TS293 EC-S TS282 EC-H TS293 EC-H	CO	0-300	ppm	15	30	60	150
TS282 EN TS293 EN	NO	0-100	ppm	15	10	20	50
TS282 EN2 TS293 EN2	NO_2	0-30	ppm	15	3.0	6.0	15.0
TS255 CB	CO	0-300	ppm	15	30	60	150
TS255 CN2	CO	0-300	ppm	15	30	60	150
	NO_2	0-30.0	ppm	15	3.0	6.0	15.0

As indicated in the standard EN50545-1, the **TWA** values, shown in Table 4, can be setted from 5 to 60 minutes, while the delay of the relay activation, in **HYST.ON** (Hysteresis ON) **THRESHOLD 3**, can be set from 60 to 300 seconds.

TABLE 5B – USED ONLY IN ITALY - Values to be set to use with PARKING-ITA

MODELS	Detected Gas	RANGE	UNIT	*Alarm levels* Threshold 1(AL1)	Threshold 2(AL2)	Threshold 3(AL3)
TS282 EC-S TS293 EC-S TS282 EC-H TS293 EC-H	CO	0-300	ppm	30	50	100
TS282 KB TS293 KB	Vap.BENZINA *PETROL vapors* Vap.ESSECE	0-20	% LFL	7	10	20
TS255 CB	CO	0-300	ppm	30	50	100
	Vap.BENZINA *PETROL vapors*	0-20	%LFL	7	10	20

***This function can be applied only in Italy**, where garages must comply with the D.M. 3 August 2015 - Fire Prevention Code (and related updates, Ministerial Decree 21 February 2017, Section V - Vertical technical rules - V.6 Garage activities).*

If CO detectors and gasoline vapor detectors were used for better management of the ventilation system); it is recommended to use the configuration indicated above in the table.

Associate the CO detectors to the same zone, setting the logic as PARK-ITA, the output relating to THRESHOLD 2 must be configured in the programming of the outputs available for the ZONE (OUTPUT_1_THRESHOLD_2, OUTPUT_2_THRESHOLD_2). While for gasoline vapor detectors, THRESHOLD 1 and THRESHOLD 2 may not be used, but the output relating to THRESHOLD 3 must be configured in the programming of all individual sensors.

TABLE 6 - PRECONFIGURED Parameters of Relay Output Operation

SENSORS FOR FLAMMABLE GASES

Relay Number	ALARM	Silenceable	Hysteresis ON (seconds)	Hysteresis OFF (seconds)	Time ON (seconds)	Logique Positive	Latched Output
1	AL1	NO-NON	5	0	0	NO-NON	NO-NON
2	AL2	NO-NON	10	0	0	NO-NON	NO-NON
3	AL3	NO-NON	30	0	0	SI-YES-OUI	SI-YES-OUI
4	FAULT	NO-NON	45	0	0	SI-YES-OUI	NO-NON

SENSORS FOR TOXIC AND asphyxiating gases (CO_2)

Relay Number	ALARM	Silenceable	Hysteresis ON (seconds)	Hysteresis OFF (seconds)	Time ON (seconds)	Positiv Logic	Latched Output
1	AL1	NO-NON	1	0	0	NO-NON	NO-NON
2	AL2	NO-NON	5	0	0	NO-NON	NO-NON
3	AL3	NO-NON	30(1)	0	0	NO	NO
4	FAULT	NO-NON	40	0	0	SI-YES-OUI	NO

(1) If the type of alarm set is "Parking-EN", this value becomes "60".

SENSORS FOR VITAL GASES (Oxygen)

Relay Number	ALARM	Silenceable	Hysteresis ON (seconds)	Hysteresis OFF (seconds)	Time ON (seconds)	Positiv Logic	Latched Output
1	AL1	NO-NON	5	0	0	NO-NON	NO-NON
2	AL↓	NO-NON	10	0	0	SI-YES-OUI	SI-YES-OUI
3	AL↑	NO-NON	10	0	0	SI-YES-OUI	SI-YES-OUI
4	FAULT	NO-NON	30	0	0	SI-YES-OUI	NO-NON

Configuration Reminder Tables

We recommend compiling these tables as a reminder of the configuration performed. We also recommend that you keep a copy in the control unit documentation.

Sensor configuration in the CE424								
Sensor Number [1÷8]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
MODEL. Sensor Model								
TAG (Label)								
Type (Flammable, Toxic, Vitale, Refrigerant)								
GAS detected (Name or CAS or Formula)								
UoM (Unit of Measure) (% LFL, %vol, ppm, ppb or °C)								
F.S. (Full Scale) (Max 9.99 or 99.9 or 9999)								
AL. (Alarm Type) (Increasing, Decreasing, Oxygen, TLV, Parking-EN)								
ZONE (1÷6)								
T.W.A. (Only for PARKING-EN alarms)								
THRESHOLD 1 (Alarm 1)								
OUTPUT 1 ***(Relay number for AL1)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTERESIS ON[4] (from 0 to 300 Seconds)								
HYSTERESIS OFF[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
THRESHOLD 1 (Alarm 2)								
OUTPUT 2 ***(Relay number for AL2)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
THRESHOLD 3 (Alarm 3)								
OUTPUT 3 ***(Relay number for AL3)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
FAULT (Fault Relay Number)								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								

Logic Input configuration in the Control Unit

Input Number [1]	1
Active (High **NO** or Low **NC)**	
Output (Relay Number)	
SILENCEABLE [3] (NO/YES)	
TIME OF SILENCE (from 0 to 300 Seconds)	
HYSTEresis **ON**[4] (from 0 to 300 Seconds)	
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)	
TIME ON[6] (from 0 to 300 Seconds)	
POSITIV LOGIC (NO/YES)	
LATCHED Output [7] (NO/YES)	

NOTE [2] Only if the Expansion Board ES414 with 4 relay is installed.

NOTE [3] Normally leave NO. It is only used to temporarily silence the outputs connected to optical and / or acoustic indicators, for the silence time that can be set in the next line.

NOTA [4] To avoid false alarms, it is recommended to always set a value between 10 and 60 seconds. (typically 10÷20" for Optical/Acoustic alarms and 30÷60" for Gas Block Valves). In the event of a **Parking-EN** alarm, the minimum value is 60, but only for the relay linked to threshold 3.

NOTA [5] Normally leave ZERO. It is used only to keep devices activated, that for a limited time must remain in operation beyond the alarm. This function cannot be used in conjunction with the **Time ON** function and **Memory YES** cannot be selected.

NOTA [6] Normally leave ZERO. It is used only to deactivate devices that cannot remain in operation beyond a predetermined time. This function cannot be used in conjunction with the **Hysteresis OFF** function and **Latched YES** cannot be selected.

NOTA [7] The Output Latched is set **YES** only if **Hysteresis OFF** or **Time ON** are set to ZERO. Normally should be set to **YES** to prevent the resetting of an actuator (eg. Solenoid shut-off of the gas) without first verifying that the Control Unit is in alarm.

Configuration of CE424 sensors of the 1st Remote Unit (CE380UR)

Connected to port [1] (COM1 o COM2)	☐ *COM1*			☐ *COM2*				
Sensor Number [9÷16]	9	10	11	12	13	14	15	16
MODEL. Sensor Model								
TAG (Label)								
Type (Flammable, Toxic, Vitale, Refrigerant)								
GAS detected (Name or CAS or Formula)								
UoM (Unit of Measure) (% LFL, %vol, ppm, ppb or °C)								
F.S. (Full Scale) (Max 9.99 or 99.9 or 9999)								
AL. (Alarm Type) (Increasing, Decreasing, Oxygen, TLV, Parking-EN)								
ZONE (1÷4) (1÷6)								
T.W.A. (Only for PARKING-EN alarms)								
THRESHOLD 1 (Alarm 1)								
OUTPUT 1 ***(Relay number for AL1)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTERESIS ON[4] (from 0 to 300 Seconds)								
HYSTERESIS OFF[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
THRESHOLD 1 (Alarm 2)								
OUTPUT 2 ***(Relay number for AL2)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
THRESHOLD 3 (Alarm 3)								

OUTPUT 3 ***(Relay number for AL3)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
FAULT (Fault Relay Number)								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								

Configuration of CE424 sensors of the 2nd Remote Unit (CE380UR)								
Connected to port [1] ***(COM1 o COM2)***	☐ ***COM1*** ☐ ***COM2***							
Sensor Number [17÷24]	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
MODEL. Sensor Model								
TAG (Label)								
Type (Flammable, Toxic, Vitale, Refrigerant)								
GAS detected (Name or CAS or Formula)								
UoM (Unit of Measure) (% LFL, %vol, ppm, ppb or °C)								
F.S. (Full Scale) (Max 9.99 or 99.9 or 9999)								
AL. (Alarm Type) (Increasing, Decreasing, Oxygen, TLV, Parking-EN)								
ZONE (1÷4) (1÷6)								
T.W.A. (Only for PARKING-EN alarms)								
THRESHOLD 1 (Alarm 1)								
OUTPUT 1 ***(Relay number for AL1)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTERESIS ON[4] (from 0 to 300 Seconds)								
HYSTERESIS OFF[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
THRESHOLD 1 (Alarm 2)								
OUTPUT 2 ***(Relay number for AL2)***								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
THRESHOLD 3 (Alarm 3)								
OUTPUT 3 ***(Relay number for AL3)***								
SILENCEABLE [3] (NO/YES)								

TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								
FAULT (Fault Relay Number)								
SILENCEABLE [3] (NO/YES)								
TIME OF SILENCE (from 0 to 300 Seconds)								
HYSTEresis **ON**[4] (from 0 to 300 Seconds)								
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)								
TIME ON[6] (from 0 to 300 Seconds)								
POSITIV LOGIC (NO/YES)								
LATCHED Output [7] (NO/YES)								

CE424 Zone configuration

Zona Numero [1÷6]	1	2	3	4	5	6
LOGICA (**OR**,AND,CORR.CON, CIRC.CON,PARKing-ITA)						
OUTPUT 1 THRESHOLD 1 (1st Relay Number for ALARM 1)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						
LATCHED Output [7] (NO/YES)						
OUTPUT 2 THRESHOLD 1 (2nd Relay Number for ALARM 1)						
TACITABILE [3] (NO/SI)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						
OUTPUT 1 THRESHOLD 2 (1st Relay Number for ALARM 2)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						
LATCHED Output [7] (NO/YES)						
OUTPUT 2 THRESHOLD 2 (2nd Relay Number for ALARM 2)						
TACITABILE [3] (NO/SI)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						
OUTPUT 1 THRESHOLD 3 (1st Relay Number for ALARM 3)						
TACITABILE [3] (NO/SI)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						

HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						
OUTPUT 2 THRESHOLD 3 (2nd Relay Number for ALARM 3)						
TACITABILE [3] (NO/SI)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						

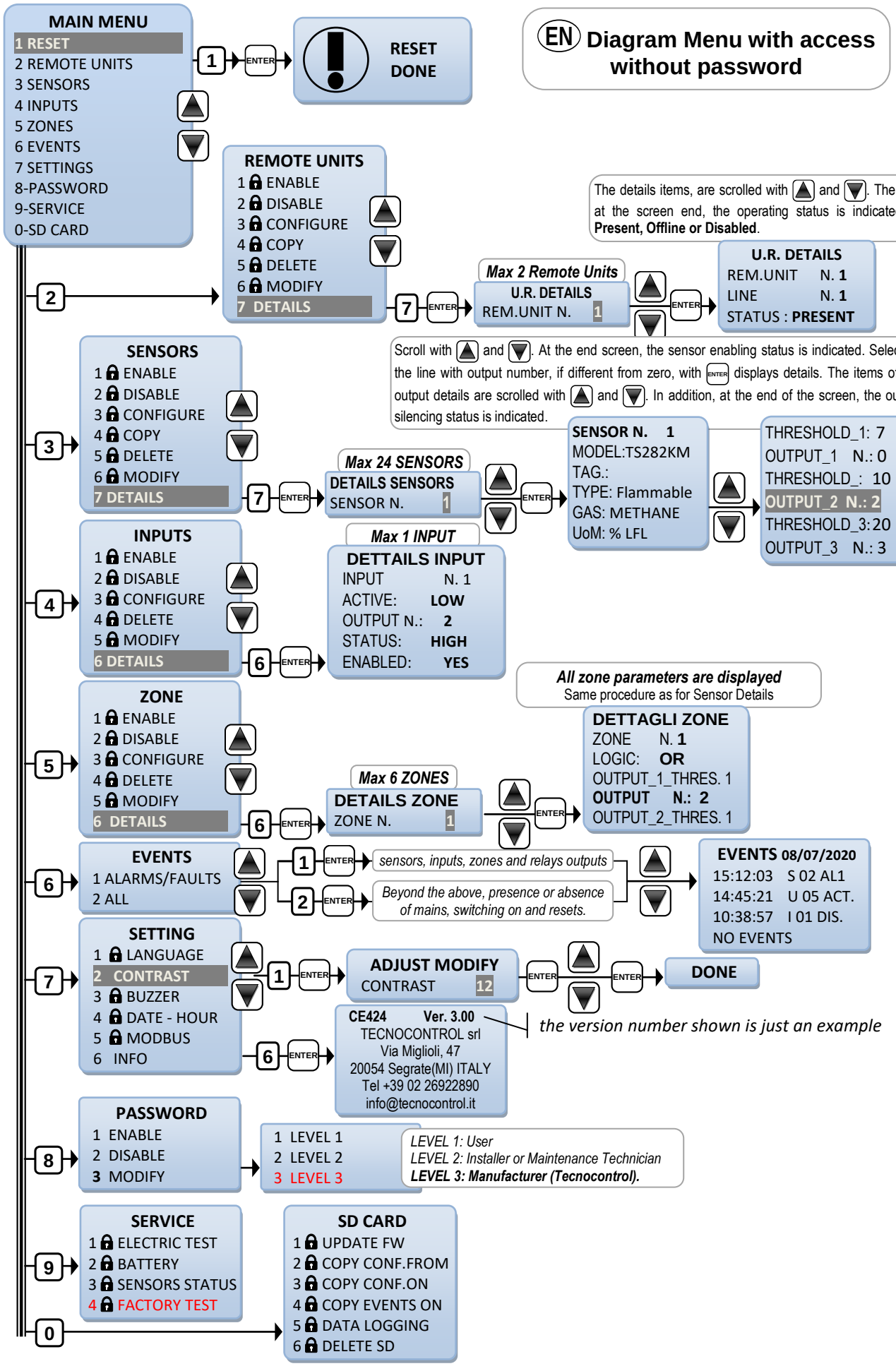
FAULT OUTPUT (Common Fault Relay Number for all Sensors in the Zone)						
SILENCEABLE [3] (NO/YES)						
TIME OF SILENCE (from 0 to 300 Seconds)						
HYSTEresis **ON**[4] (from 0 to 300 Seconds)						
HYSTEresis **OFF**[5] (from 0 to 300 Seconds)						
TIME ON[6] (from 0 to 300 Seconds)						
POSITIV LOGIC (NO/YES)						
LATCHED Output [7] (NO/YES)						

NOTE / NOTES:

Password LEVEL 1 (User)	***Password LEVEL 2 (Installer or Maintenance tech.)***	***Control Unit Model***	***Control Unit Serial Number***
		CE424P	**SN:**

You may want to write and store the password (4 numbers) in a safe place. In case of loss of passwords, contact our assistance service.

*The Serial Number is on the Test Label located inside, in the base of the Control Unit. The model and firmware version are visible at start-up or on display with **Settings → General → Info** menu.*


EN Diagram Menu with access without password
MAIN MENU
1 RESET
2 REMOTE UNITS
3 SENSORS
4 INPUTS
5 ZONES
6 EVENTS
7 SETTINGS
8-PASSWORD
9-SERVICE
0-SD CARD
ENTER
RESET DONE
REMOTE UNITS
1 ENABLE
2 DISABLE
3 CONFIGURE
4 COPY
5 DELETE
6 MODIFY
7 DETAILS
Max 2 Remote Units
U.R. DETAILS
REM.UNIT N. 1
U.R. DETAILS
REM.UNIT N. 1
LINE N. 1
STATUS : PRESENT
The details items, are scrolled with and . Then, at the screen end, the operating status is indicated: Present, Offline or Disabled.
SENSORS
1 ENABLE
2 DISABLE
3 CONFIGURE
4 COPY
5 DELETE
6 MODIFY
7 DETAILS
Max 24 SENSORS
DETAILS SENSORS
SENSOR N. 1
SENSOR N. 1
MODEL:TS282KM
TAG.:
TYPE: Flammable
GAS: METHANE
UoM: % LFL
THRESHOLD_1: 7
OUTPUT_1 N.: 0
THRESHOLD_: 10
OUTPUT_2 N.: 2
THRESHOLD_3:20
OUTPUT_3 N.: 3
Scroll with and . At the end screen, the sensor enabling status is indicated. Selecting the line with output number, if different from zero, with displays details. The items of the output details are scrolled with and . In addition, at the end of the screen, the output silencing status is indicated.
INPUTS
1 ENABLE
2 DISABLE
3 CONFIGURE
4 DELETE
5 MODIFY
6 DETAILS
Max 1 INPUT
DETTAILS INPUT
INPUT N. 1
ACTIVE: LOW
OUTPUT N.: 2
STATUS: HIGH
ENABLED: YES
All zone parameters are displayed
Same procedure as for Sensor Details
ZONE
1 ENABLE
2 DISABLE
3 CONFIGURE
4 DELETE
5 MODIFY
6 DETAILS
Max 6 ZONES
DETAILS ZONE
ZONE N. 1
DETTAGLI ZONE
ZONE N. 1
LOGIC: OR
OUTPUT_1_THRES. 1
OUTPUT N.: 2
OUTPUT_2_THRES. 1
EVENTS
1 ALARMS/FAULTS
2 ALL
sensors, inputs, zones and relays outputs
Beyond the above, presence or absence of mains, switching on and resets.
EVENTS 08/07/2020
15:12:03 S 02 AL1
14:45:21 U 05 ACT.
10:38:57 I 01 DIS.
NO EVENTS
SETTING
1 LANGUAGE
2 CONTRAST
3 BUZZER
4 DATE - HOUR
5 MODBUS
6 INFO
ADJUST MODIFY
CONTRAST 12
DONE
CE424 Ver. 3.00
TECNOCONTROL srl
Via Miglioli, 47
20054 Segrate(MI) ITALY
Tel +39 02 26922890
info@tecnocontrol.it
the version number shown is just an example
PASSWORD
1 ENABLE
2 DISABLE
3 MODIFY
1 LEVEL 1
2 LEVEL 2
3 LEVEL 3
LEVEL 1: User
LEVEL 2: Installer or Maintenance Technician
LEVEL 3: Manufacturer (Tecnocontrol).
SERVICE
1 ELECTRIC TEST
2 BATTERY
3 SENSORS STATUS
4 FACTORY TEST
SD CARD
1 UPDATE FW
2 COPY CONF.FROM
3 COPY CONF.ON
4 COPY EVENTS ON
5 DATA LOGGING
6 DELETE SD