EN

IST-1100.CE01.02/B

File: IST-1100 CE01 02-B_CE100-EN.DOC

CENTRAL SYSTEM

CE100

USER INSTRUCTIONS

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IMPORTANT NOTE

The control panel CE100 has three selectable laguages: Italian, English and French.

If the control panel CE100 is not already set your language, please see on page 18 “Code Setup (Password)” and on page 20 “Setting the language”.

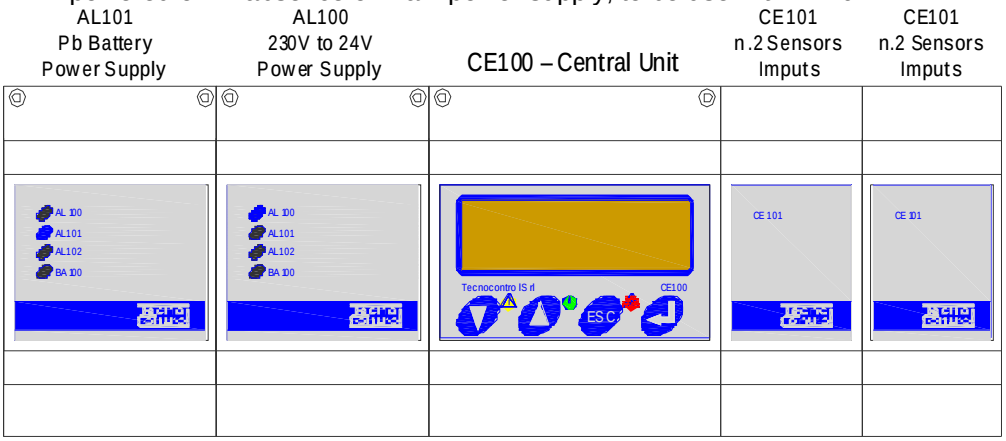
Documento / Document name: IST-1100 CE01 02-B_CE100-EN.DOC			
Oggetto / Subject : CE100			
Rev.	***Data / Date***	***Da / By***	***Note***
1	14/02/2008	UT/BD	Revised Text
A	27/07/2009	UT/FG	Revised Text and Diagrams
B	28/05/2012	UT/FG	Revised Text

CONTENTS

DESCRIPTION

The ***CE100*** gas Central System is realized for DIN rail mounting and it can be connected up to six 4÷20mA remote sensors. It represents a useful instrument for monitoring and controlling areas where there might be the presence of flammable, toxic gases or oxygen.

- **CE100** *Central Unit:* data processing module, with keyboard, backlighted graphic display 122x32 pixel, no.2 4÷20mA sensors inputs and relays outputs.
- **CE101** *Sensors Unit:* module with no.2 4÷20mA sensors inputs.(Max n. 2 modules for each CE100)
- **AL100** *230V/24 Power supply:* module (230Vac-50Hz) with 24Vcc/15W output to powered the CE100 and no.2 CE101.
- **AL101** *Pb Battery Power supply*: 12Vcc 3Ah or 7Ah Pb Battery power supply module.
- **AL102** *Li-Ion Battery Power supply* module to be use with BA100.
- **BA100** *Battery Li-Ion* module with lithium battery 10.8Vcc 1,7Ah to maintain the system powered on in absence of main power supply, to be use with AL102.



Possible combinations:

CE100	The **Central Unit:** can autonomously works if it has an external power supply 12÷24Vdc (at least 15W). **It has no.2 4÷20mA sensor inputs** (S1-S2) and no. 4 outputs relays, of which no.3 alarm relays (U1-U2-U3) and no.1 Fault relay (U4).
AL100 + CE100	**Central unit powered at 230V:** to the central unit add the AL100 power supply, that connected to the 230Vca, powers the central at 24Vdc.
AL100 + CE100 + n. 1 CE101	***Combination for 4 sensors:*** to the central unit (that has 2 inputs) add no.1 CE101 module to have other 2 inputs for 4÷20mA sensors (S3 e S4). AL100 power supply powers both the centrals CE100 and CE101.
AL100 + CE100 + n. 2 CE101	***Combination for 6 sensors:*** to the central unit (that has 2 inputs) add no.2 CE101 modules to have other 4 inputs for 4-20mA sensors (S3, S4, S5 e S6). AL100 power supply powers both the centrals CE100 and CE101.
AL100 + CE100 + one or two CE101 + AL101	***Combination with Lead Battery:*** to the previous combinations, it is possible to add the AL101 module to power a lead battery from 12Vdc 3Ah or 7Ah. (*Not included in the supply*).
AL100 + CE100 + one or two CE101 + AL102 + BA100	***Combination with Lithium battery:*** in alternative to the previous one, it is possible to use the AL102 power supply and BA100 battery to Lithium-Ion 10.8/1.7Ah (the battery module has to be installed on the left part of the AL102 module).

- ***CE100 central unit can be connected to:***
  - 4÷20mA transmitters, 3 wires with "Replaceable cartridge sensor" for:
    Flammable gases with catalytic sensor: type TS292K (IP65) or TS293K (explosion proof Ex-d) with range 0÷20%LEL
    Flammable gases with Pellistor sensor: type TS292P (IP65) or TS293P (Ex-d) with range 0÷100%LEL.
    Toxic gases with electrochemical cell: type TS220E (IP65) or TS293E (Ex-d)
    Oxygen with electrochemical cell: type TS220EO and TS293EO (Ex-d) with range 0÷25%O_2.

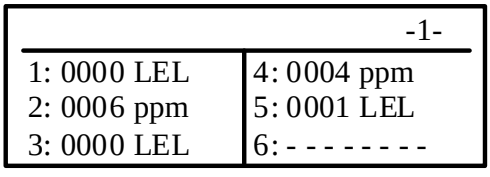
- ***NOTE**: Obviously also our previous transmitter's models made from December 2008 until today can be connected to this equipment, which are 4÷20mA transmitters, 3 wires for flammable gases type TS292K (IP65) or TS293K (Ex-d) with range 0÷20%LEL, or* type *TS293P (Ex-d) with range 0÷100%LEL and 4÷20mA transmitters 2 wires with electrochemical sensor for toxic gases and Oxygen,* type *TS220E (IP65).(See note and diagram at Page.22)*
- ***WARNING**: inputs can be taken on also with other sensors with range in % LEL or ppm that have a* 4÷20mA signal referred to ground and working technical specifications(Range, minimum operating voltage, current absorbed, etc….) the same of our products.
  We disclaim no liability for malfunctions or failures caused by not compatible products.

- ***The CE100 central unit has 3 Alarm relays:***
- Each sensor has 3 alarm levels associated to the Alarm Relays (PRE1, PRE2 and ALL). Consider that the three relays are in common with all sensors, but it can be set different alarm values for each single sensor.
- ***The CE100 central unit has a Fault relay** (FAULT**)***
  - In case of Fault the sensors activate the common Fault Relay. (*FAULT*).
- ***Every output relay can be configurated as follow:***
  - **Delay ON** from 0 to 4 minutes at exceeding of the alarm threshold set.
  - **Delay OFF** from 0 to 30 minutes to the return under the threshold level set.
  - **Time ON** from 0 to 30 minutes, this function only works, if you want to stop the alarm output after a defined time, even if the sensor remains above the alarm threshold set. (The program does not allow setting it, if it's already used the "Delay OFF"). For example it can be used to activate devices that cannot be powered for a long time or to send an impulse to a telephone dialer or any other device.
  - **MEMORY** The relay stays in "*Alarm*" even if the sensor returns under its threshold level. (The program does not allow to set it, if it's already used the "Time ON"). Make the *RESET* to reset it to the normal conditions.
  - **LOGIC** the relay can be set in **POS**itive logic with normally closed contact (**NC**) or in **NEG**ative logic with normally opened contact (**NO**).
- **CE100 central unit has an internal BUZZER:**
  - It emits a "Beep", when the keys are pressed, moreover, from the Menu "Divers" (Miscellaneous), it can be chosen to let it active in case of Alarm (**ALL**)
- **CE100 central unit has got a function that allow to disabilities sensors:**
  - Each sensor can be "disabled"without remove or cancel it from the program.
    In this case, the sensor value will be visualized with * symbol before the sensor number, but it cannot activate any relay. This function is useful in case of Faults, anomalies or maintenance and sensor calibration.
- **Ce100 central unit is protected from "PASSWORD"**
  - The menu access is protected through "***Code***" (4 numbers Passwords). To enter to this function it's necessary to digit the Password.

CENTRAL SYSTEM MONITORING

When switching on the CE100, after the message shown by side, the display will show a 60 seconds count down. This is for stabilize the sensors and to avoid false alarms.

Then, the CE100 will show the situation of the connected detectors. The Display shows all detectors (max 6). (Detectors not programmed are indicated with a dashed line). Upper on the right is indicated the enabled code level. (*See at page18 chapter **Password***).



For each sensor, the display shows the measured value and also its status: ***FAULT<** (<1mA) **PRE1**, **PRE2**, **ALL**, **FAULT>** (over 24 mA).* (*See explaination in the chapter "Sensor details"*).

Important Note: *all detectors inputs are protected against wire breakings (connection between detectors and Central System) and against short circuits.* If a short circuit occurs, to avoid damages to the central system or to the sensor, the power supply to that input, is automatically stopped (all others continue to work properly). Simultaneously the yellow LED "*FAULT*" lights up and the correspondant relay is activated (if programmed). Only after having solved the short circuit problem (to test if the channel is no more in short circuit protection you need to mesure if there is voltage between the terminals "**+**" and "**-**" with a multimeter) it will be possible to restore normal operational conditions.

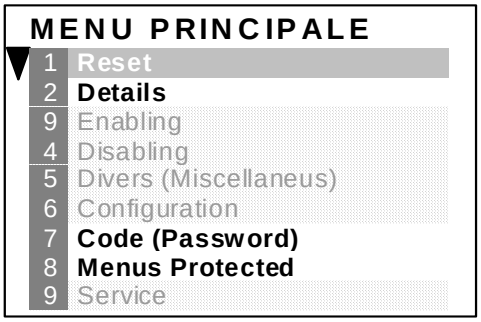
Alarms Reset

This procedure should be performed to reset the relay outputs, programmed latched in normal conditions, only when the alarm situation is finished.

From the normal screen, press key (ESC) to access to **MAIN MENU.** Select "*1-Reset"* then press (↵) to confirm.

(The menu selected is indicated by an arrow and by the dark background. Keys (▼) (▲) are used for navigate into the menus, those indicated semi-hidden can only be activated with the code).

After the message *RESET DONE*, display return to the **MAIN MENU**. Press (ESC) to view the normal screen.



Sensor Details Viewing

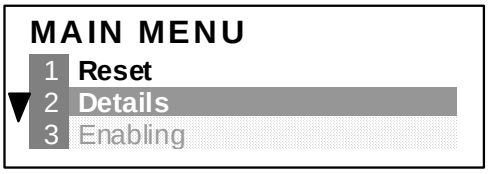
This function allows you to view all parameters of each sensor.

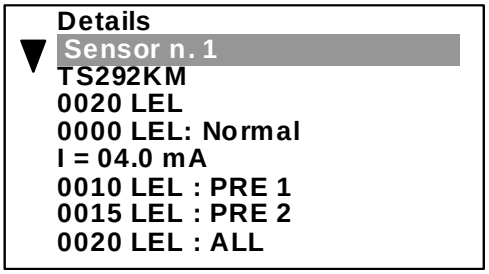
From the ***MAIN MENU*** press (▼) to select *2-Details* then press (↵) to confirm. All settings details about **Sensor no. 1** will appear.

Using keys (▼) and (▲) all Details can be seen:

1st line: type of sensor, 2nd line: the name of sensor, 3rd line: scale settled, 4th line: the sensor status, 5th line: input current in mA. Then, you can see the values of the alarm levels (PRE1, PRE2, ALL).

Pressing key (↵) you can see details of the other sensors. (*If a sensor is not used, it will appear a dashed line*) Press (ESC) to go back to the ***MAIN MENU***.





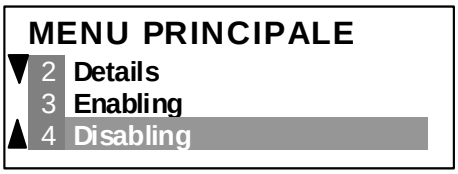
NOTE*: In the 4th line, after the value, shows the status of the sensor, with this significance:*

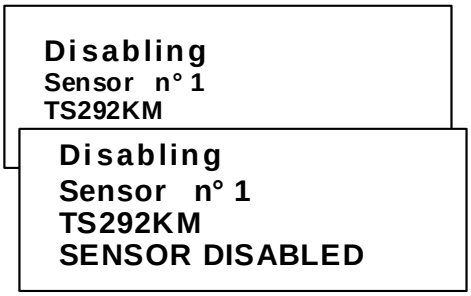
- ***FAULT <*** *(<1 mA) ..... Sensor fault, disconnected or not powered*
- ***NORm****al (up to PRE1) ..... Sensor is in its normal operating conditions.*
- ***PRE1, PRE2, ALL*** *..... the sensor has exceeded the set alarm levels, is always shown the highest alarm.*
- ***FAULT>*** *(above 24 mA)..... The sensor is measuring a gas concentration beyond all limits, or is broken or disconnected.*

WARNING*: From the main menu to access the menu 3-Enable, Disable 4-and 5-Miscellaneous, you must enter the** *CODE LEVEL 2* **(See chapter "Code***" on p. 18).**

Enabling – Disabling Sensors

Each single sensor can be "Disabled" and then "Enabled" without having to delete it from the program. The CE100 will continue to display it, with the symbol ✳ next the sensor number, but it will not activate any alarm. This function is useful in case of faults, malfunctions or maintenance and calibration of the sensors.





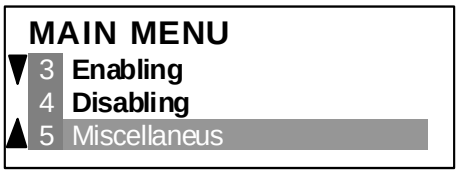
From the normal screen, press (ESC) to access to **MAIN MENU.** After having inserted the code level 2, with (▼) (▲) select "*3-Enbling"* or *"4-Disablling"* then press (↵) to confirm. Then with the same key select the number of sensor to be *Enabling* or *Disabling.*

Pressing the key (↵) the following message will appear *Sensor enabled* or *Sensor disabled*.

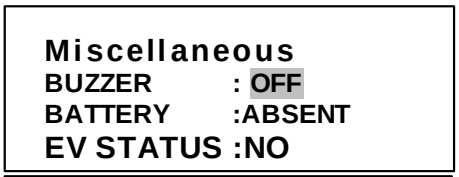
Press (ESC) to return to ***MAIN MENU***.

SETTING FUNCTION "MISCELLANEOUS"

This function allows you to set some options.

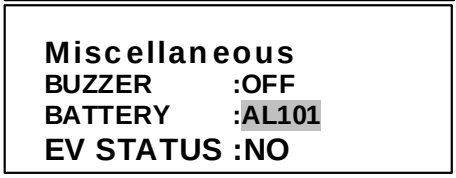


From the ***MAIN MENU*** press (▼) select "*5-Miscellaneus"* press (↵) to confirm and then with (▼) o (▲) select the desiderate choice (highlighted line). Press (↵) to go to the next line and in the same way you can set the required value. Press (ESC) to return to ***MAIN MENU***.



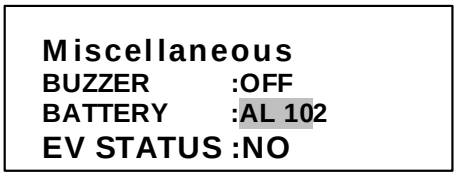
BUZZER: If you select YES means that in case of alarm, as well as the red Led also the internal buzzer will activated. If you select NO, the buzzer will never switched on.

BATTERY: Select *ABSENT* if you have not installed any supply module for the backup battery.



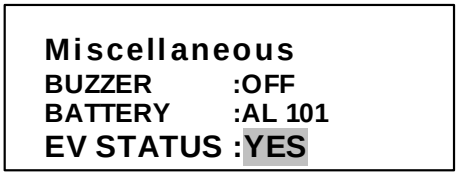
Select *AL101* if the CE100 is installed with the Module AL101 to charge a lead acid battery (12V 7Ah max).

Select *AL102*, if is installed the AL102 battery charger module and BA100 Lithium Battery Module (10.8V 1.7Ah).



NOTE: *If in the row BATTERY, it was selected the AL101 or AL102, the CE100 activates automatically, a test of one minute every 24 hours. If the battery is low voltage or exhaust, the yellow LED will flash to indicate the fault.*

EV STATUS (electro valve) *select YES if you installed a solenoid Tecnocontrol (models from VR480 to VR400) with the position sensor connected to the "*CONTACT SOLENOID VALVE*".*



Press (ESC) to return to ***MAIN MENU.***

In case of alarm the CE100 will check if the valve has effectively closed, otherwise the yellow LED will light on and the fault relay will activate (FAULT). The display will show the symbol ⋈ *for the failure to close.*

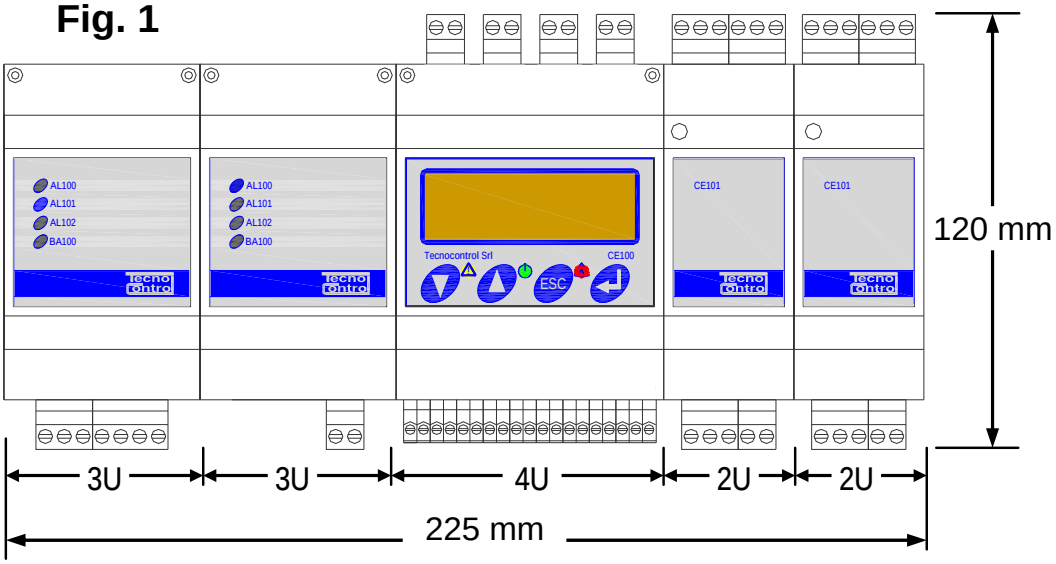
NOTE: This control acts only on the 3th alarm level, and then the valve must be connected to relay ALL.

IMPORTANT REMARK INSTRUCTIONS INCLUDED INTO THE MANUAL BELOW INCLUDE INSTALLATION AND SYSTEM SETUP PROCEDURES TO BE EXECUTED ONLY BY QUALIFIED AND AUTHORIZED PEOPLE.

CE100 INSTALLATION

The control panel should be mounted in a suitable enclosure or cabinet to accommodate modules on a DIN rail. For your convenience, we recommend to install the modules in the order shown, with the power supplies on the left of CE100 and the expansions on the right. The space occupied, depends on the configuration of CE100 (see fig. 1).
The full configuration with lithium-ion battery is 17 modules. For example, can be used an 18 modules enclosure, available from most suppliers of electrical equipment (e.g. in Fig. 2).

Fig. 1



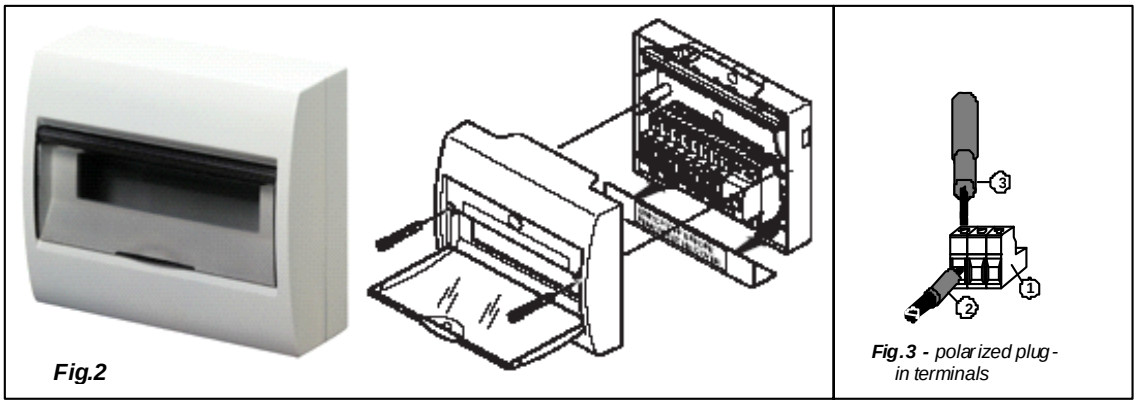


Fig.2

***Fig.3** - polarized plug-in terminals*

WARNINGS:

- ***A. Do not install the modules CE100 near heat sources such as contactors, power supplies or other.***
- ***B. Terminals (Fig. 3) are polarized plug-in (1); we recommend using appropriate cable lugs to the conductors (2) and anchor the cables to the structure to avoid excessive stress to the circuit and the terminals themselves. Use a screwdriver (3) with a suitable size.***
- ***C. The wiring diagrams on the following pages, for simplicity are always shown with all the sensors.***

ELECTRICAL CONNECTIONS

MODULE AL100 (AC 230Vca/24Vdc-15W)

230Vac *Power supply* mains must be connected to terminals "L e N". (**See figure 4**).

MODULE AL101 (AC 230Vca charger for Lead 12V Battery)

230Vac *Power supply* mains must be connected to terminals "L e N". (**See figure 4**).

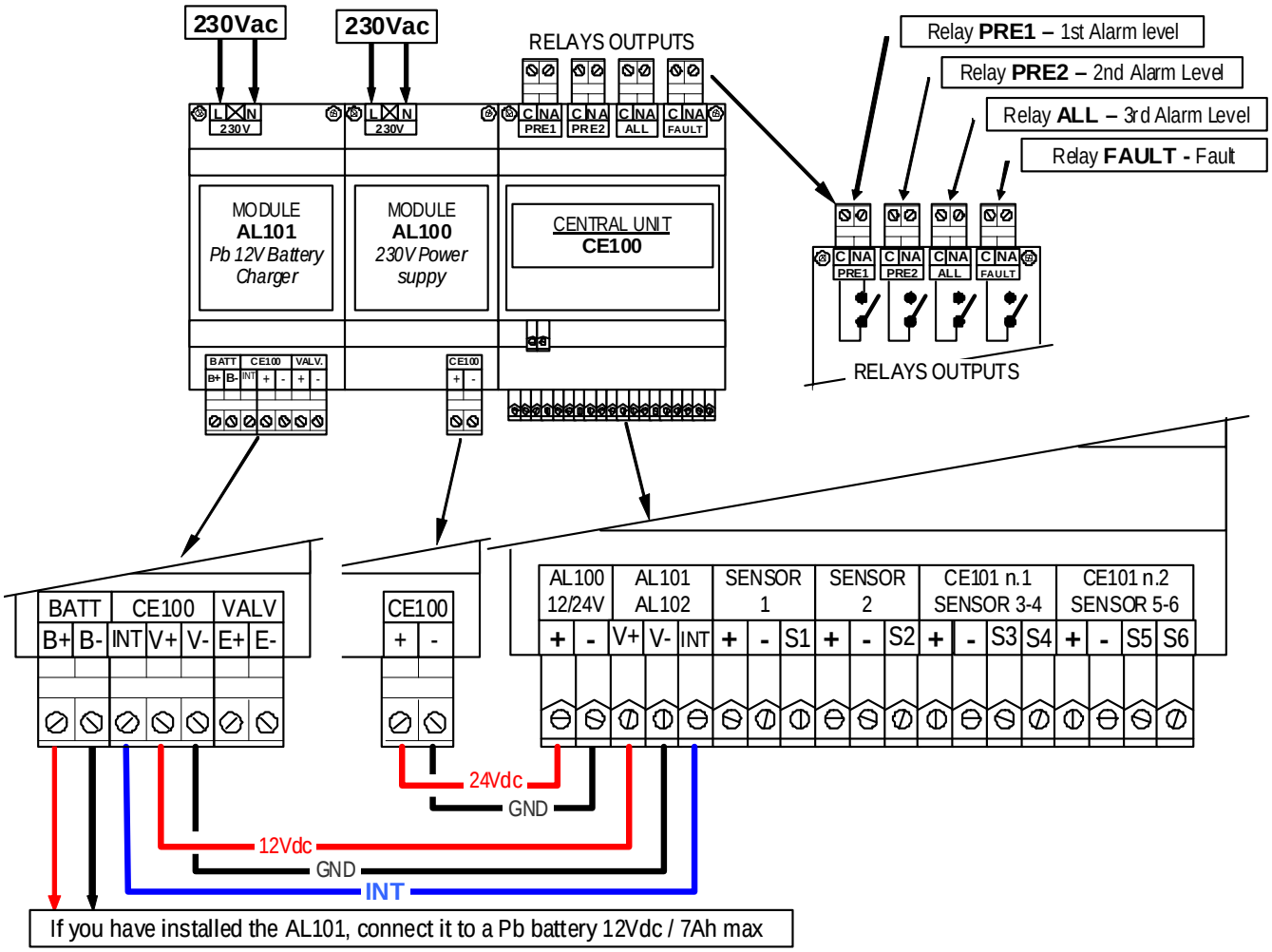
Battery can be used a 12V Lead battery with a capacity for the request autonomy and the connected total load. *With one 3Ah, battery life is about 2 hours (with n. 2 Sensors and Gas Valve 12V-12W max); while with a 7Ah you have more than 3 hours life (with n. 4 or n. 6 Sensors and a Gas Valve 12V-12W max). The battery must be connected to AL101 terminals "B +" (red) and "B-" (Black) (**see figure 4**).*

Example *for calculating the hours of autonomy of an installation with 4 sensors (typically absorb 2W each) and a 12V solenoid valve that absorbs 12W:*

$$\frac{\text{12 x no. Ah of the Battery}}{\text{no. of connected gas detectors x 2W} + \text{no. W of the electrovalve}} = \frac{\text{12 x 7Ah}}{\text{(4 x 2W)} + \text{12W}} = \text{4 hours}$$

Connecting to the CE100 the power supply should be connected to the CE100 with 3-wire on terminals **"INT, +** and **-"** as shown in **figure 4**.

Fig 4– Connection Diagram with Power Supply Module AL101



CENTRAL UNIT CE100

Inputs: *Please see the chapter on the next page "Connecting the detectors".*

Outputs: all 4 relays have only one voltage-free changeover contact. The contact rate (resistive) is 3A at 250Vac. All output relays contacts are indicated with "**C**" (common), "**NO**" (normally open). This designation refers to the relay in position without power, or programmed in negative logic. During the programming can be chosen if every single alarm relay must be in "*Negative logic*" (the contact will be **NO**) or "*Positive logic*" (the contact will be **NC**). (**See fig. 5, fig. 7 and the NOTE on page 12**).

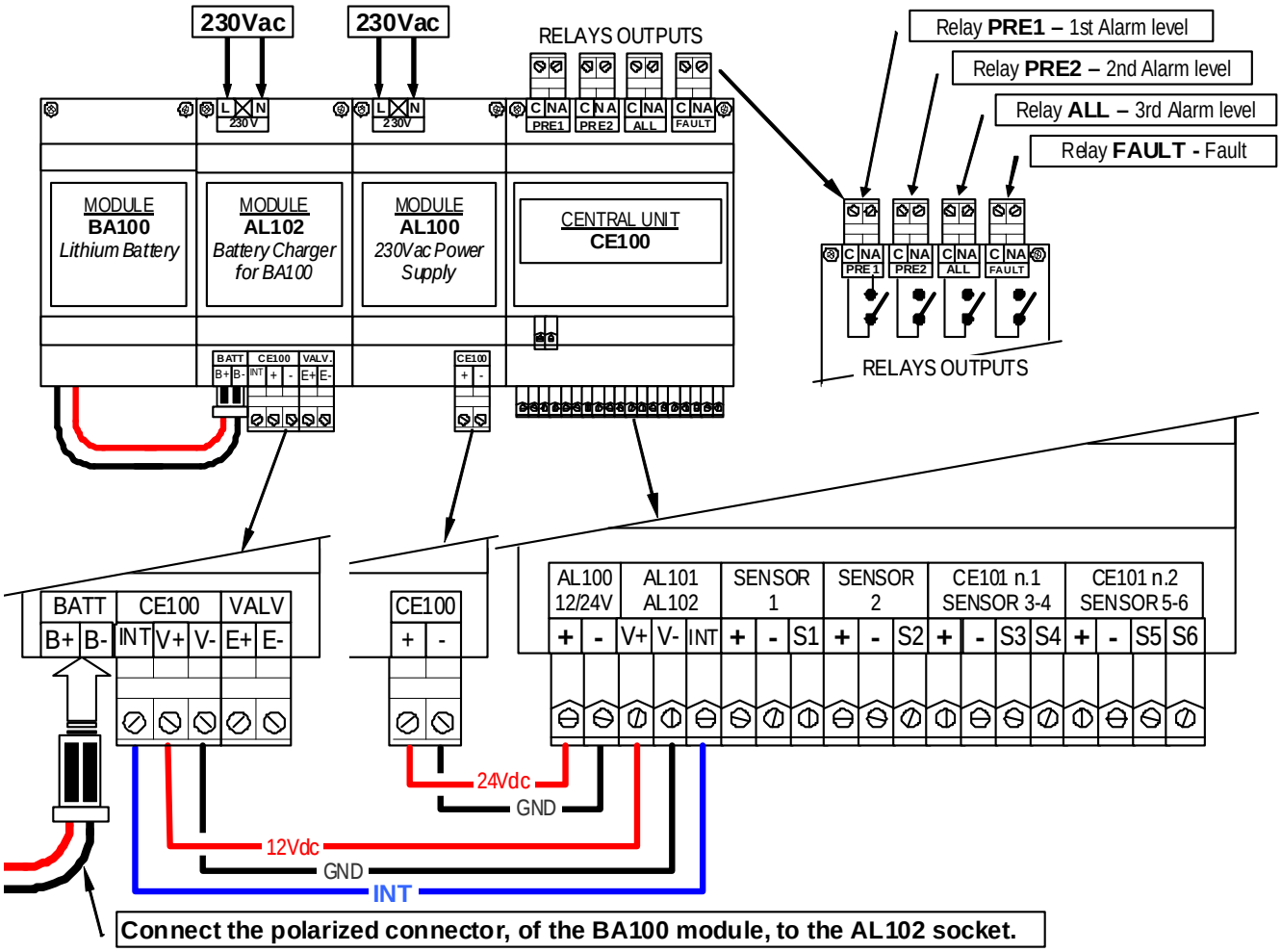
MODULE AL102 (AC 230Vca charger for Li-Ion BA100 Battery)

230Vac Power supply mains must be connected to terminals "L e N". (See figure **5**).

Battery the BA100 module, which contains the lithium battery, has a cable that should be connected to the corresponding socket.

Connecting to the CE100 the power supply should be connected to the CE100 with 3-wire on terminals **"INT, +** and **-"** as shown in **Figure 5**.

Fig 5– Connection diagram as in Fig.4, but with Modules AL102 and BA100



Connect the polarized connector, of the BA100 module, to the AL102 socket.

CONNECTING THE DETECTORS

CENTRAL UNIT CE100 can be connected up two detectors with 4 to 20mA output (S1 and S2). To have other four (from S3 to S6), you need to install the Expansion Modules CE101.

CE101 MODULE (Expansion of two inputs for detectors 4 to 20mA)

Inputs by installing a CE101 module can be connected two sensors (S3 and S4). Installing a second CE101 module can be connected other two sensors (S5 and S6).

Connecting with CE100 the first module CE101 should be connected with 4 wires, to CE100 terminals "**+, –, S3 e S4"**, as shown in **figure 6**. If you installed the second module CE101, is should be connected to the CE100 terminals **"+, -, S5 and S6"**.

Connection with 3-wires 4÷20mA gas detectors

- Detectors for flammable gases with "Replaceable Cartridge Sensor": *with Catalytic sensor*: TS292K (IP65) or TS293K (Explosion-proof Ex-d) series with 0÷20%LEL range and *with Pellistor sensor*: TS292P (IP65) or TS293P (Ex-d) series with 0÷100%LEL range.
- Detectors with "Replaceable Cartridge Sensor" using electrochemical cells: for toxic gases TS220E (IP65) or TS293E (Ex-d) series and for oxygen TS220EO e TS293EO (Ex-d) series with 0÷25%O_2 range.

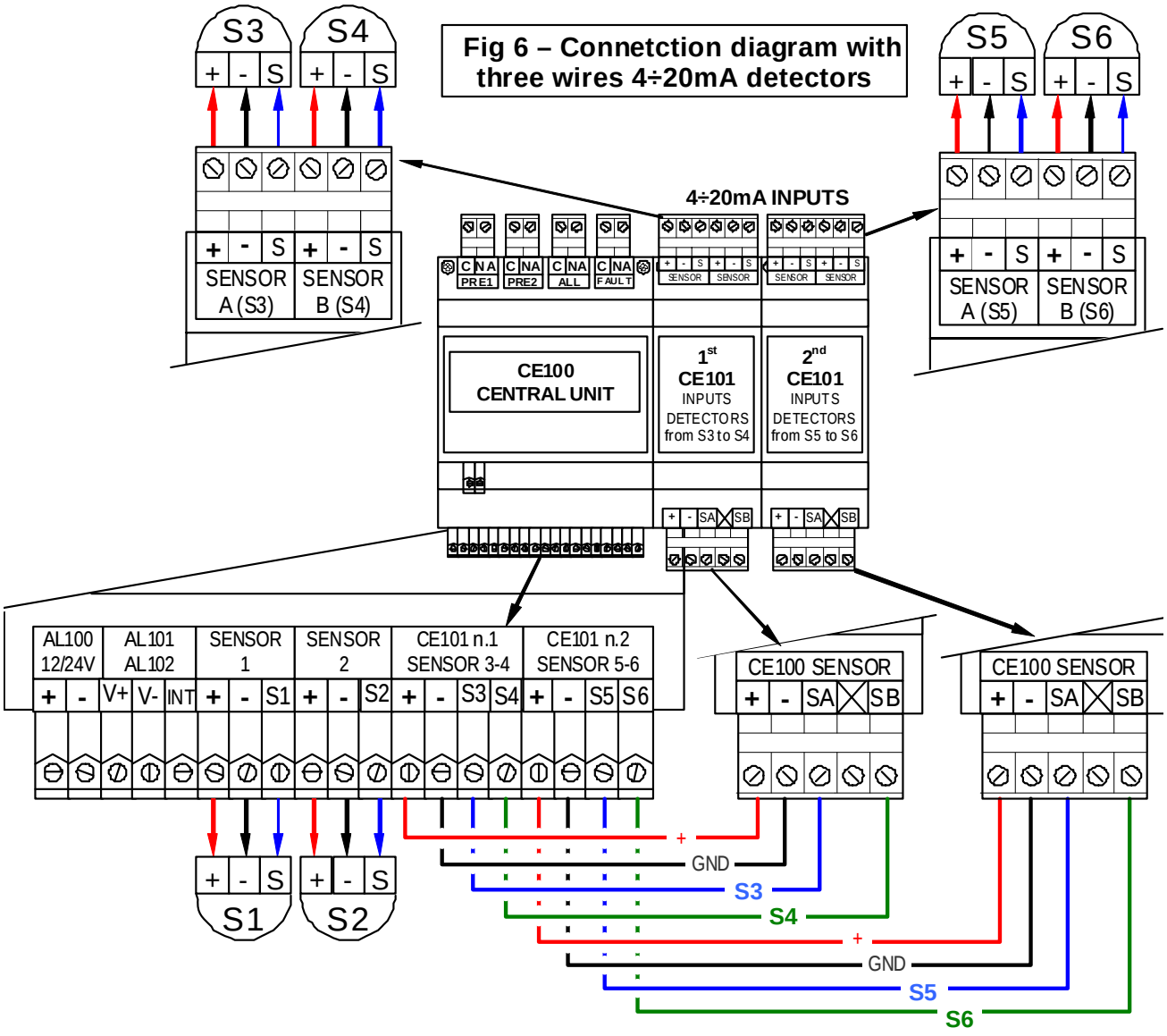
The connection with 4 to 20mA three wires detectors should be performed (**fig. 6**) between detector's terminals **"+", "-"** and **"S"** and the corresponding input terminals of the CE100 and CE101 modules.

The section of the connecting cables between the panel and the sensors must be adequate to the distance and the type of sensor used, as shown in Table.

Distance	Cable
from 0 up to 300 meters	3x1.5 mm^2 shielded
From 300 up to 600 meters	3X2.5 mm^2 shielded

We recommend the use of shielded cables, the screen (shield) must be connected only by the central side and a single point of "GROUND".

Fig 6 – Connetction diagram with three wires 4÷20mA detectors



GAS DETECTORS USE

<u>WARNING</u> Always refer to specific instructions attached to them. Please note that all documentation attached to the products "Central Unit and Gas Detectors" must be read and kept.

COLLEGAMENTO DELLA ELETTROVALVOLA GAS

The Manual Resetting NO or NC Solenoid Gas Valve or if required, the Automatic too with 230Vac supply, must be connected as shown in fig.7. If the valve has a 12V coil, please use the note at the bottom of this page and the figure 8, without consider the "Solenoid *Valve with Position Sensor*" not present in the "*Normal*" Solenoid valve.

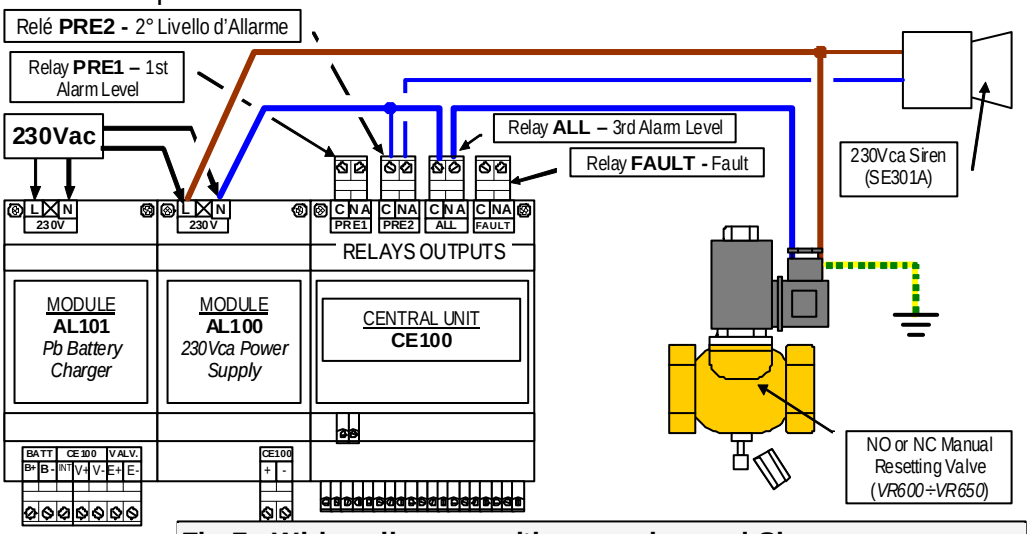


Fig 7– Wiring diagram with gas valve and Siren

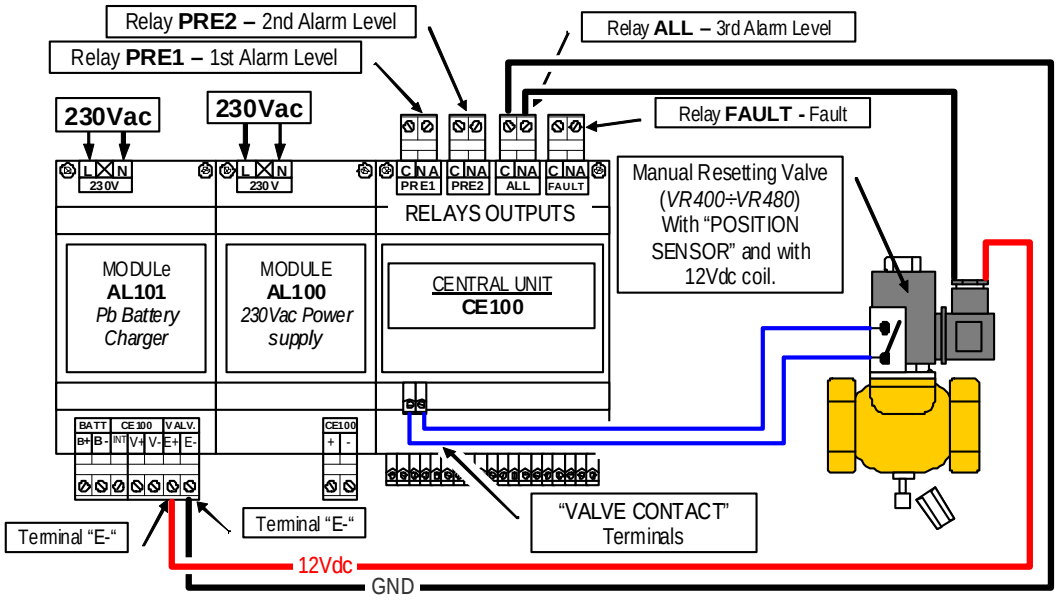
CONNECTION OF THE SOLENOID GAS VALVE WITH POSITION SENSOR

If you have installed a Tecnocontrol solenoid valve with the position sensor (VR400 to VR480 models) connected to the "*VALVE CONTACT*", in the menu "*MISCELLANEOUS*" you must configure *YES* the ***STATE EV (Electro Valve)***.

WARNING: *This control works only on 3rd alarm level, so the valve must be connected to relay **ALL**.*

If an alarm occurs, the CE100 will check if the valve has been effectively closed, otherwise the yellow LED will light and the FAULT relays activates. The display will show the symbol ⋈ *for the failure to close.*

Fig 8– Wiring diagram with gas valve with position sensor and Siren



NOTES: The AL101 and AL102 modules have an auxiliary output "**VALVE**" at 12VDC/12W max (terminals **E+** and E-). You can power a gas solenoid valve or other device, operating at 12VDC (10.8÷13.8VDC), whose absorption maximum does not exceed 12W (1A). *This output is protected from "Short Circuit", but should not be connected loads that exceed the indicated current capacity, or which may generate noise on power supply.*

CENTRAL SYSTEM SETUP

Keyboard use and general information's

The numbers to be changed or entered appear on the display highlighted by the *Cursor* (flashing black rectangle). To change or enter a number you can use:

The key ▲ to move up or increase a value.

Key ▼ to move down or decries a value.

Key ↵ to confirm or to enter in the Reset Menu.

Key ESC to enter and exit menus.

After having entered the first sensor setup, the software propose this setup as the standard for all others sensors, in this case, if you are entring more sensors with the same setup, all operations will be much more easy and quick.

SENSORS SETUP

If any sensors have been already configured, the following message will be displaied:

	-3-
1:---------	4:----------
2:---------	5:----------
3:---------	6:----------

IMPORTANT NOTES

A - To set up the Central or make changes later, from the normal screen, press ESC ***to enter the MAIN MENU. Select*** *8-Protected Menu* ***and then enter the "****Code Level 3****".*** *(Please see on page 18 chapter CODES).*

B - At the first set up, the sensor no. 1 must be programmed first. Why choosing the type of "*valve****", if installed, is binding, you cannot change this set up in the other sensors, because the choice only affects the*** *3rd Alarm Relay* ***"ALL", it follows that the gas shutoff valve should only be connected to these relays.***

Pressing the ESC key, you enter in the **MAIN MENU**.

After entering the code (*CODE ACCEPTED*), press ESC to return to **MAIN MENU**, then press key ▲ select *"**Set up**" and press* ↵ to confirm. Now, press ▲ to select the sensor number to be configured and press ↵ to confirm.

MAIN MANU
4 **Exclusion**
5 **Miscellaneus**
6 **Configuration**

Sensor choice
Sensor n. 1

Example:

"1-*Sensor Choice*" Select *"1"* press ↵ to confirm and advance to the next line.

"Model", with key ▲ selects the installed gas detector type (e.g. **TS293Px)** then press ↵. (See the following pages to Tables 1 and 2).

Sensor Choice
Sensor n. 1
Model : TS293Px

"*Valve"* presses key ▲ to select the desired valve type, if installed. After selecting one of the three options below, then press ↵ to confirm.

NO = Normally Open
NC = Normally Closed
NOT = No Valve installed

Sensor Choice
Sensor n. 1
Model : TS293Px
Valve : NO
CONFIRM ? NO

"CONFIRM" will be asked to confirm the inserted set up, with the arrow ▲ select *YES* and then ↵ to confirm. If you leave *NO* the operation will be cancel (please see chapter "***DELETION SENSORS***").

Table 1 - Pre-configured parameters of the detectors (sensors)

To simplify setup, the models indicated in the table are pre-configured with default settings; you can use in common situations. The detectors into brackets has operational characteristics identical to the first highlighted in bold, the only difference is the type of protection custody. If necessary you can also configure other detectors, selecting the "Generic" ones. In addition, you can change all parameters of each sensor according individual requirements.

MODEL	GAS	RANGE	UNITS	PRE1 (Level 1)	PRE2 (Level 2)	ALL (Level 3)
TS220EA (*TS293EA)*	NH_3	0-300	ppm	10	20	50
TS220EC (*TS293EC)* **(**[(2)]TS250**C**B**)**	CO	0-300	ppm	50	100	200
TS220EH (*TS293EH)*	H_2S	0-100	ppm	10	20	50
TS220EN (*TS293EN)*	NO	0-100	ppm	10	20	50
TS220ES (*TS293ES)*	SO_2	0-20	ppm	10	20	50
TS292KG	LPG	0-20	%LEL	10	15	20
TS292KM	METHANE	0-20	%LEL	10	15	20
TS292Kx (*TS292KB, TS292KI)*([(2)]TS250C**B**)	INFLAMMABLE	0-20	%LEL	10	15	20
TS293KG	LPG	0-20	%LEL	10	15	20
TS293KM	METHANE	0-20	%LEL	10	15	20
TS293Kx (*TS293KB, TS293KI)*	INFLAMMABLE	0-20	%LEL	10	15	20
TS292Px (*TS292PM, TS292PG, TS292PI, TS292PB)*	INFLAMMABLE	0-100	%LEL	10	15	20
TS293Px (*TS293PX-S, TS29PX-H, TS293PE, TS293PS)*	INFLAMMABLE	0-100	%LEL	10	15	20
IR101	CO_2	0-2.00	% vol.	0.20	0.50	1
IR102	CO_2	0-2.00	% vol.	0.20	0.50	1
Generic						
[(1)] **TS220EO** *(TS293EO)*	Oxygen (O_2)	0-25.0	% vol.	18.5	19.5	22.5

NOTE - (1): The alarms can be set for the oxygen detectors are: PRE1 and PRE2 to lack, and ALL for excess oxygen. Furthermore, the alarm threshold PRE2 activates the 1st relay (PRE1), while the threshold PRE1 activates the 2nd relay (PRE2).

NOTE - (2): The twin TS250CB detectors must be programmed on two distinct inputs. The CO as TS220EC and gasoline vapours as TS292Kx.

Table 2 - Pre-configured parameters for the Relays

MODEL	Relay PRE 1	Delay ON (sec)	Delay OFF (sec)	Positive Logic	MEMORISED	Relay PRE 2	Delay ON (sec)	Delay OFF	Positive Logic	MEMORISED	Relay ALL.	Delay ON (sec)	Delay OFF (sec)	Delay OFF (sec)	Positive Logic	MEMORISED	Relay FAULT	Delay ON (sec)	MEMORISED
TS220EA		1	1	NO	NO		1	1	NO	NO		30	1	1	SI	YES		30	YES
TS220EC		1	1	NO	NO		1	1	NO	NO		30	1	1	SI	YES		30	YES
TS220EH		1	1	NO	NO		1	1	NO	NO		30	1	1	SI	YES		30	YES
TS220EN		1	1	NO	NO		1	1	NO	NO		30	1	1	SI	YES		30	YES
TS220EO		1	1	NO	NO		1	1	NO	NO		30	1	1	SI	YES		30	YES
TS220ES		1	1	NO	NO		1	1	NO	NO		30	1	1	SI	YES		30	YES
TS292KG		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
TS292KM		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
TS292Kx	K1	1	1	NO	NO	K2	1	1	NO	NO	K3	30	1	1	NOTA 1	YES	K4	30	YES
TS293KG		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
TS293KM		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
TS293Kx		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
TS292Px		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
TS293Px		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
IR101		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
IR102		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES
Generic		1	1	NO	NO		1	1	NO	NO		30	1	1	NOTA 1	YES		30	YES

NOTE 1 “*YES”** if we choose *NC VALVE (normally closed valve)* or “**NO”** for ***NO Valve (*normally open valve****)*** or ***NOT VALVE.***
TIME ON (in seconds) for all relays K1, K2, K3 and K4 is= 0. This parameter should only be used and as indicated in "Change Sensor" on page 17.

SENSORS COPY

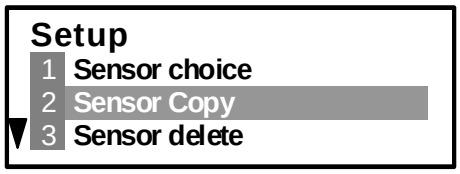
From the **MAIN MENU**, with key ▼ select the sub-menu "*Setup*". Press ↵, select with ▼ "*2-Sensor copy*" then press ↵ to confirm.

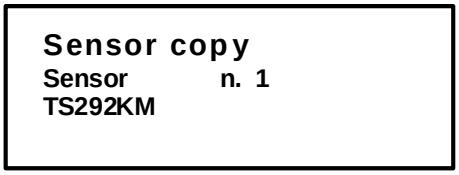
Sensor choice Select with ▲ the desired sensor you wish to copy and then press ↵ to confirm.

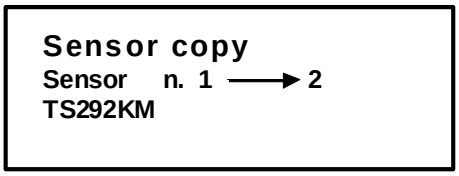
Sensor copy to an arrow with a number reference on its right will appear. With ▲ insert the desired sensors to be copy and then press ↵.to confirm.

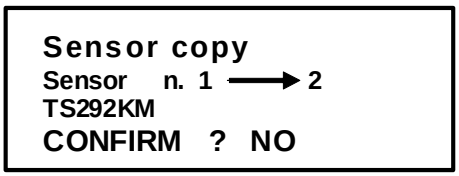
"CONFIRM" will be asked to confirm the configuration inserted. With ▲ select *YES* and press ↵.

If you leave *NO* the operation will be cancel









SENSORS DELETE

From the **MAIN MENU**, with key ▼ select the sub-menu "*Setup*". Press ↵, select with ▼ "*3-Sensor delete*" then press ↵ to confirm.

Sensor Selection: with ▲, choose the number of sensor to be deleted, and then press ↵ to confirm.

Confirm: will be asked to confirm the cancellation with ▲, select *YES* and press ↵ to confirm. If you leave *NO*, the operation will be cancelled.

NOTE: You cannot delete the sensor No.1.

MODIFYING SENSORS SETUP

It is possible to modify a sensor already configured in two ways:

1 - If you want to change the threshold values or alarm output is sufficient to operate as described below in section ***Sensor Setup***.

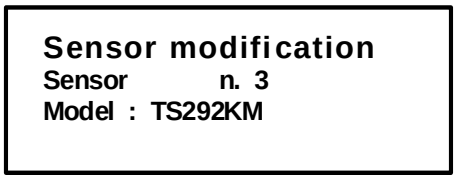
2 - If you need to change sensor model, (*except No. 1 which can be reconfigured only*) is recommended before, delete it, then configure it as if new, see the previous paragraph ***Sensors delete***.

Sensor modification

From the **MAIN MENU**, with key ▼ select the sub-menu "*Setup*". Press ↵, select with ▼ "*4-Sensor modification*" then press ↵ to confirm.

Sensor Selection: with ▲, choose the number of sensor to be deleted, (*The sensors are not configured, are indicated with a dot line*) then press ↵ to confirm.

NOTE: If you do not want to continue, press twice ESC to return to the ***MAIN MENU***.



"*PARAMETERS*" parameters are proposed in succession, to move to the next without changing it, simply press ↵.

"Endo of scale" (Full Scale 9999 max) you can change this value with the keys ▲ ▼ then press ↵ to confirm.

"Unit" (LEL, %, ppm, °C) to change this value, using the keys ▲ ▼ then press ↵ to confirm.

"Level PRE1" modify with ▲ ▼ then press ↵.

"Level PRE2" modify with ▲ ▼ then press ↵.

"Level ALL" modify with ▲ ▼ then press ↵.

Sensore modification
Parameters
End of scale : 0020

Sensore modification
Parameters
Level PRE 1 : 0010

Sensore modification
Output PRE1
Dalay ON : 00'01"

Sensore modification
Output PRE1
Delay OFF : 00'01"

NOTE: The three thresholds value must have an increasing progressive value or equal, with the exception of the Model TS220EO or TS293EO Oxygen (See NOTE 1 at the bottom of Table 1**).**

"Output PRE1" first alarm threshold.
"Delay ON": is the delay of the relay output, in minutes and seconds (max 4'10"), since the alarm threshold is exceeded.
"Delay OFF": is the time, in minutes and seconds (max 30'), during which the output (relay) remains active, even after the end of the alarm condition.
"Time ON": is the interval of time, in minutes and seconds (max 30'), during which the output remains activated, from when it is exceeded the alarm threshold. At the end of this time, the output (relay) returns to normal operation even if the value and above the alarm threshold

WARNING: "Time ON" can be set, only if the "Delay OFF" is set to "ZERO" and is not selected "Latched output" YES.

"*Positive logic*" Indicates if the relay works with Normally Closed contact (Positive), normally open or normally (Negative). Modify this with key ▲, to "**NO**" (Negative) or "**YES**" (Positive), then press ↵ to confirm.

"*Latched output*" if you want the output remains activated, even when the alarm returns under its threshold. Modify this with key ▲, to "**NO**" or "**YES**" and then press ↵ to confirm.

Sensor modification
Output PRE1
Positive Logic : NO

Sensor modification
Output PRE1
Latched Output: NO

WARNING: "Latched output" YES, can only be set if the Delay OFF and Delay ON time, are set to "ZERO". Normally the "Latched output" YES" is used on the 3rd alarm level, to prevent resetting of the solenoid gas valve (*either manual or automatic resetting****) without first verifying that the Central Unit is in alarm.***

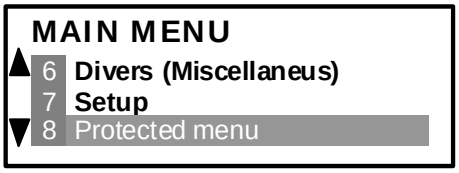
Then, continue as above, also for the other items "*Output PRE2*" (2nd alarm threshold - Relay PRE2), "*Output ALL*" (3rd alarm threshold - Relay ALL) and "*Output FAULT*" (indicating a failure - FAULT relay).

CONFIRM: will be asked to confirm the changes inserted (*if you leave NO, the whole operation will be cancelled*). By key ▲ selecting ***YES*** and then press ↵ to confirm, and then press ESC to return to the ***MAIN MENU***.

Sensor modification
Sensor n° 1
Model : TS292KM
CONFIRM ? NO

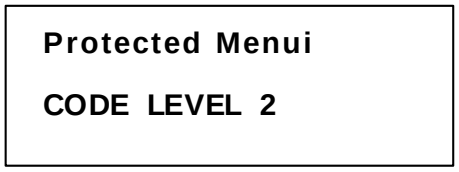
CODE SETUP (PASSWORD)

The code consists of an access key that, when inserted, is to protect all the system settings from unauthorized changes. If you want to change the Setup of inputs, outputs and the Code, you must first enter the correct code.

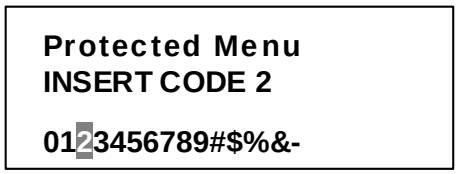


From the **MAIN MENU**, with key ▼ select the sub-menu "*8-Protected menu*". Press ↵ to confirm.

When the message "*CODE LEVEL 1*" (**which in this version is not active**) with the keys ▲ ▼ you can move to the "*CODE LEVEL 2*" or "*CODE LEVEL 3*", then made the choice you want, press ↵ to confirm.



To select the code, with the keys ▲ ▼ moves the cursor to the request number, and with ↵ confirms the choice. After entering the 4 digit, display will show "*CODE ACCEPTED*", press ESC, to return to the **MAIN MENU** and now you can change the settings enabled.



LEVELS OF CODES AND DEFAULT CODES

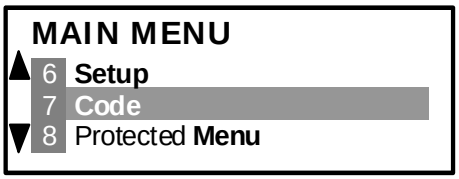
The CE100 has three levels of code, with different access so as to allow people with different responsibilities and expertise to operate on the central unit. The three "Code Levels" are factory preset, it is recommended to change them anyway, and keep them carefully.

Code 1 in this version, has no effect on the menu, under normal use you can go directly to the menu *1-RESET, 2-DETAILS, 7- CODES,* and *8- PROTECTED MENU*.

Code 2 **2222** for use by the plant manager, also gives access to the menu *3-ENABLE, 4-DISABLE,* and *5-MISCELLANEOUS*

Code 3 for maintenance or installation, gives access to all menus.

CODE EDIT (PASSWORD)

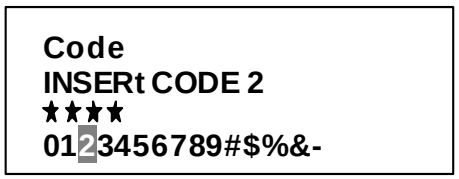


From the **MAIN MENU**, with key ▼ select the sub-menu "*7-Code*" and press ↵ to confirm.

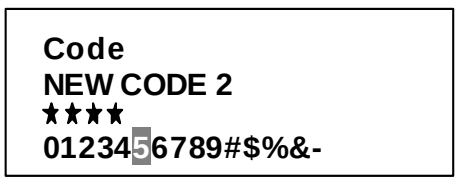
Appear, *CODE LEVEL 1* (**which in this version is not active**) then the keys ▲ ▼ you can move to the "*CODE LEVEL 2*" or "*CODE LEVEL 3*".

After you make your selection, press ↵ to confirm.

After selecting the code level to edit, **enter the 4 digit original code**, with keys ▲ ▼ scroll numbers and confirm with ↵. (*For each number entered will appear a star for confirmation*).

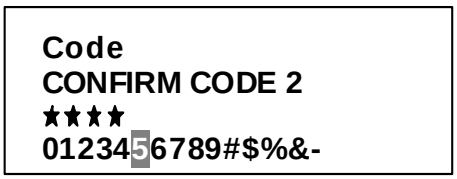


Then **enter the New Code**, scroll the numbers with keys ▲ ▼ and confirm with ↵.



Then to confirm **renter the New Code**, scroll the numbers with keys (▲) (▼) and confirm with (↵).

Now will show *STORED CODE,* with (ESC) you will return to the ***MAIN MENU***.
From this moment, the new inserted code becomes active.



<u>PAY ATTENTION</u>: we suggest writing and keeping the Password in a safety place. In case you lose the Password get in contact with our technical support.

Backlight

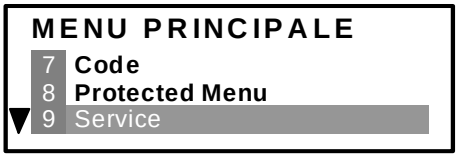
The display backlight will automatically switch off, when not used, after 60 seconds; pressing any key it light back again.

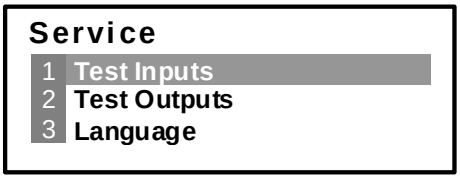
ELECTRICAL OPERATIONS "TEST"

WARNING: This procedure must be performed with extreme care by trained and authorized personnel, because both are activated relay outputs that activate the connected devices, both internal functions the control panel.

The CE100 is equipped with a test program that allows verifying the electrical operation

From the ***MAIN MENU***, after inserting the ***Code Level 3***, with (▼) select the submenu "*9-Service*" and then press (↵) to confirm.

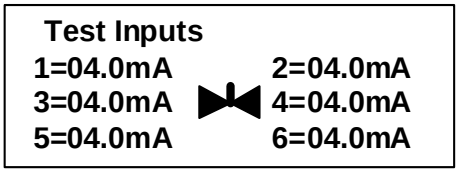




Input Test (Detectors)

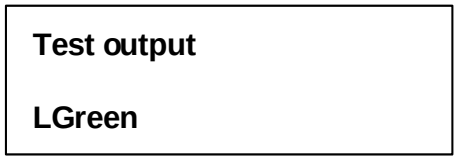
With key (▼) select "*1-Test Inputs"* and then press (↵).

Now, you will see the sensor's values, expressed in mA, even those not configured. Obviously does not consider the value of those not installed, which can be "0mA" to "50 mA". At the centre of the display there will be the symbol of the solenoid valve with Position Sensor.



Output Test (Relays and Led)

Press key (ESC) to go back to menu *"Service",* with key (▼) select *"2-Test Outputs"*, then press (↵) to confirm.



From here starts the sequence of tests listed below. Repeatedly pressing the key (↵) activates **ON** and **OFF** one after another all Led: LGreen, LYellow, LRed, the Buzzer and the outputs relay: the PRE1**,** PRE2, ALL and FAULT.
Finally, will be displayed the Battery voltage, with activation of the internal test "load".

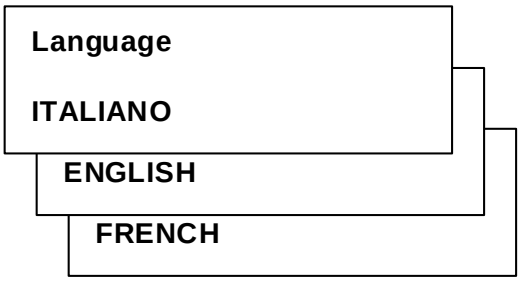
<u>Module AL101</u> (lead battery) - this value should be about 12VDC
<u>Module AL102 + BA100</u> (Lithium battery) this value should be about 10.5 Vdc

<u>WARNING</u>: *<u>Test Battery</u>***, must obviously be only used when the modules are installed AL101 or AL102. Do not leave this test active for more than a minute. During the test is activated, the "load" to the internal CE100, consisting of power resistors which obviously will become hot.**

SETTING THE LANGUAGE

With key ▼ select "*3-Language*" and press ↵ to confirm

With keys ▲ ▼ you can change the language and pressing ↵ confirms the choice.



APPENDIX

LIST OF ANOMALY MESSAGES AND ALARMS

NO SENSORS CONFIGURED	The central system is not configured.
FAULT-	The input signal is less than 1 mA. The sensor could be faulty, not connected or not powered.
UNDERFLOW	The input signal is between 1 and 3,5mA. The detector could be out of calibration on the beginning of the scale.
PRE1	The 1st alarm threshold has been exceeded and the related output relay is active (if configured).
PRE2	The 2nd alarm threshold has been exceeded and the related output relay is active (if configured).
AL	The 3rd alarm threshold has been exceeded and the related output relay is active (if configured).
OVERFLOW	The input signal is between 21 and 24 mA. The sensor is detecting gas, but the full scale has been exceeded.
FAULT+	The input signal is greater than 24 mA. The sensor could be faulty, or it's detecting gas but it has exceeded its full scale.
	*Mains 230Vac power supply is missing.*
	*B*attery empty.
	The valve with Position sensor is not close.
Display switched off	if the greed Led is ON, the Display could be damaged or the contrast is too low, tries to regulate it with the trimmer on the Board: ("Contrast ADJ" bottom right corner) placed in the CE100 housing, on the PCB placed into the front cover.

LIST OF ACOUSTIC AND OPTICAL SIGNALS

Intermittent Buzzer	One of the detectors has exceeded the 3rd Alarm Level (AL3) or the AUX input is active.
Green Led on	Mains power supply ON (normally working condition).
Green Led Blinking	The CE100 is powered by the Battery; the Mains is OFF.
Red Led on	One of the sensors has exceeded the 3rd Alarm level (AL3).
Red Led Blinking	One of the Detectors has exceeded the 1st Alarm and/or 2nd Alarm levels (AL1 and/or AL2) or one of the *Latched Output* relay has been activated.
Yellow Led Blinking	Battery voltage is less than 10.8Vdc.
Yellow Led on	One of the sensors is *FAULT+ (>24mA)* or *FAULT- (0 mA).*
Green Led and Display OFF	Mains power supply OFF, and battery has powered the central system till it got down. If the battery voltage gets down under 10VDC, it is automatically disconnected to avoid damages.

TECHNICAL CHARACTERISTICS

Technical Characteristics central system Mod. CE100	
Power Supply	12÷24VDC (-10/+15%)
Maximum absorbed power at 24VDC	15W with 6 Sensors series TS293P
Inputs	No.2 analogue Linear 4÷20 mA (Max. scale 0÷9999) No.1 ON/OFF active when the contact is Closed.
Internal Resistence of inputs charge	200 ohm *(referred to ground)*
Detectors power supply	20 Vcc (–10/+15%)
Outputs	No. 4 relays with one Voltage free exchange contact
Relay Capacity	3A resistive (1A inductive) - 230 Vac
Working Temperature with Battery	+5 ÷ +40 °C
Buffer Battery	Modules AL101 or AL102 + BA200
Battery Life	*See AL101 and AL102 technical characteristics.*
Display	Amber Back lighted Graphic LCD
Keyboard	No. 4 keys
Dimensions (l x h x p)	90x60x71 / no.4 DIN modules
Weight	About 195 grams

Technical Characteristics Expansion CE101 (*)	
Inputs	No. 2 analogue Linear 4÷20 mA
Internal Resistance of inputs charge	200 ohm *(referred to ground)*
Detectors power supply	20 Vdc (–10/+15%)
Dimensions (l x h x p)	90x60x35 / no.2 DIN modules
Weight	About 57 grams

Technical Characteristics Supply Module AL100	
Mains Power Supply Output supply	230 VAC (-15/+10%) - 50 Hz (±10%) 20Vcc
Minimum power consumption at 230V	8VA with n.2 detectors series TS293P
Power consumption at 230V	12VA with no.4 detectors series TS293P
Max power consumption at 230V	15VA with no.6 detectors series TS293P
Dimensions (l x h x p)	90x60x52 / no.4 DIN modules
Weight	about 440 grams

Technical Characteristics of Lead Battery charger AL101	
Mains Power Supply	230 VAC (-15/+10%) - 50 Hz (±10%)
Max power consumption at 230V	15VA with Battery and 12Vdc/12W max Valve
Battery power voltage	13.8 Vdc
Lead Battery (on request)	12 Vdc - 3 Ah (152 x 65 x 94mm)
Battery life	About 3 hours (with 6 sensors series TS293P and a 12Vdc/12W Gas Valve).
Dimensions (l x h x p) Weight	90x60x52 / n.4 DIN modules about 440 grams

Technical Characteristics of Lithium Battery charger AL102	
Mains Power Supply	230 VAC (-15/+10%) - 50 Hz (±10%)
Max power consumption at 230V	15VA with Battery and 12Vdc/12W max Valve
Lithium battery	Module BA100
Dimensions (l x h x p) Weight	90x60x52 / n.4 DIN modules About 440 grams

Technical Characteristics of Lithium Battery BA100	
Supplied voltage	10.8Vdc
Batterie life	About 40 minutes (with 6 sensors series TS293P and a 12Vdc/12W Gas Valve).
Dimensions (l x h x p) Weight	90x60x52 About 300 grams

CONFIGURABLE 4÷20 mA DETECTORS TABLES

				Suggested Alarm Levels		
MODEL	**GAS**	**Scale**	**Units**	**PRE1[2] Level 1**	**PRE2 Level 2**	**ALL Level 3**
TS220EA *(TS293EA)*	NH_3	0-300	ppm	10 [3]	20	50
TS220EC *(TS293EC)*	CO	0-300	ppm	25[2]-50	100	200
TS220EH *(TS293EH)*	H_2S	0-100	ppm	10	20	50
TS220EN *(TS293EN)*	NO	0-100	ppm	10	20	50
TS220EO *(TS293EO)*	O_2	0-25.0	% vol	18,5 [3] [4]	19.5[4]	22.5
TS220ES *(TS293ES)*	SO_2	0-100	ppm	7 [3]	20	50
TS292KG	GPL	0-20	% LEL	6 [3]	15	20
TS292KM	Methane	0-20	% LEL	7 [3]	15	20
TS292KX *(TS292KB, TS292KI)*	Inflammables	0-20	% LEL	6 [3]	15	20
TS293KG	GPL	0-20	% LEL	7 [3]	15	20
TS293KM	Methane	0-20	% LEL	6 [3]	15	20
TS293KX *(TS293KB, TS292KI)*	Inflammables	0-20	% LEL	7 [3]	15	20
TS292Px[1] *(TS292PM, TS292PG, TS292PI, TS292PB)*	Inflammables	0-100	% LEL	7 [3]	10÷15	20÷30
TS293Px[1] *(TS293PX-S, TS293PX-H, TS293PE, TS293PS)*	Inflammables	0-100	% LEL	6 [3]	10÷15	20÷30
IR101	CO_2	0-2.00	% vol	0.20	0.50	1
IR102	CO_2	0-2.00	% vol	0.20	0.50	1
Generico						

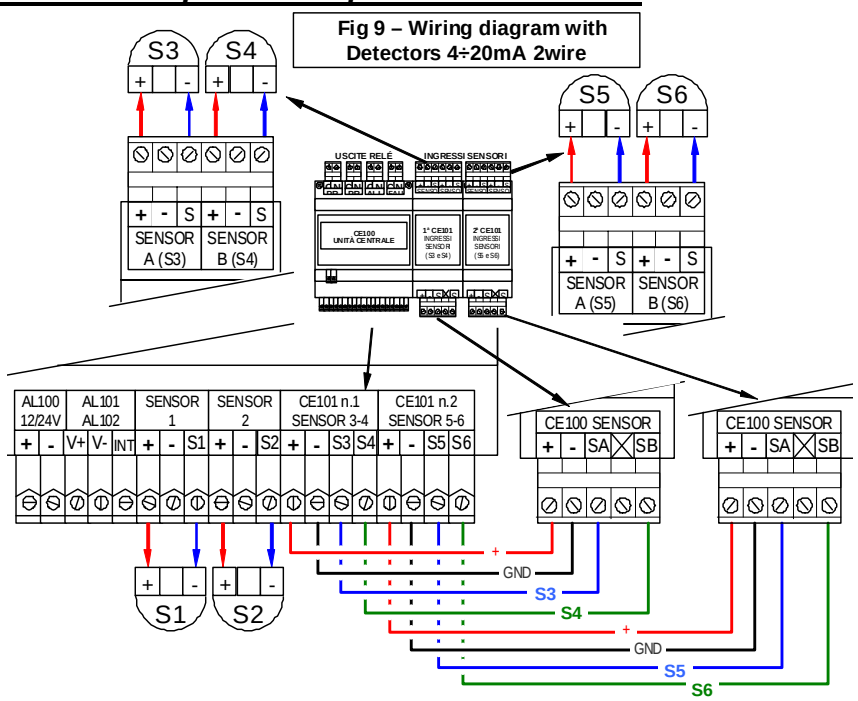
(1) The sensors are calibrated with TS293P Series FS 100% LELonly change the calibration gas.
(2) When required.
(3) It is recommended to set warning levels below the indicated value.
(4) Alarm Descending read the NOTES on page 17.
(TS .....) The models shown in brackets, are the operating characteristics identical to the first highlighted in bold, the only difference is the type of protective custody.

Connecting Detectors 4-20mA two-wire products up to December2008

- **NOTE**: *of course, can also be connected all the previous models produced up to December 2008. That is, the detector 4-20mA linear 3-wire for flammable gases, TS292K series (IP65) or TS293K (explosion proof) with a scale of 0 to 20% LEL, or series TS293P (Ex "d") with scale 0 to 100% LEL. Detector 4-20mA linear two-wire, detectors with electrochemical cell, for toxic gases and oxygen, TS220E series (IP65).*

The connection with detector 4 to 20 mA two-wire, it should be done (fig.7) between the terminals "+" and "-" the detector, and the respective terminals "+" and "S" on the control panel inputs.

Fig 9 – Wiring diagram with Detectors 4÷20mA 2wire



The section of the connecting cables between the central unit and detectors must be suited to the distance, as shown in Table. We recommend the use of shielded cables, the screen (shield) is connected only by the central side and a single point of "GROUND".

Detectors series TS210E e TS220E	
Distance	**Typo of Cable**
from 0 up to 100 meters	3x0,5 mm^2 Shielded
from 100 up to 200 meters	3x1 mm^2 Shielded
from 200 up to 500 meters	3x1,5 mm^2 Shielded
from 500 up to 1000 meters	3x2,5 mm^2 Shielded

SETUP MEMORANDUM TABLES

We suggest filling these tables as a memorandum of the configuration you set up. Moreover it will be better to make a copy of these datas, adding it to the central system (Eliminating the section "Code") and another complete copy to the central system documentation.

MODULES	**CE100**		**1st CE101**		**2nd CE101**	
Sensor Number	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
Sensor Model						
Full Scale (0÷9999)						
Unit (LIE, %, ppm o °C)						
1st Level **PRE1** (**PRE**alarm **1**)						
2nd Level **PRE2** (**PRE**alarm **2**)						
3rd Level ALL (**AL**arm)						
Output Relay **PRE1 - Delay ON** (0÷4 min.)						
Output Relay **PRE1 - Delay OFF** (0÷30 min.)						
Output Relay **PRE1 - Time ON** (0÷30 min.)						
Output Relay **PRE1 - Logic Positive** (NO/SI)						
Output Relay **PRE1 - Memorization** (NO/SI)						
Output Relay **PRE2 - Delay ON** (0÷4 min.)						
Output Relay **PRE2 - Delay OFF** (0÷30 min.)						
Output Relay **PRE2 - Time ON** (0÷30 min.)						
Output Relay **PRE2 –Logic Positive** (NO/SI)						
Output Relay **PRE2 - Memorization** (NO/SI)						
Output Relay **ALL - Delay ON** (0÷4 min.)						
Output Relay **ALL - Delay OFF** (0÷30 min.)						
Output Relay **ALL – Time ON** (0÷30 min.)						
Output Relay **ALL - Logic Positive** (NO/SI)						
Output Relay **ALL - Memorization** (NO/SI)						
Output Relay **FAULT - Delay ON** (0÷4 min.)						
Output Relay **FAULT - Delay OFF** (0÷30 min.)						
Output Relay **FAULT - Time ON** (0÷30 min.)						
Output Relay **FAULT - Logic Positive** (NO/SI)						
Output Relay **FAULT - Memorization** (NO/SI)						

NOTES:

Date of first Installation ***Serial Number***

SN:

CODE LEVEL 2 **CODE LEVEL 3**

ATTENTION: we suggest writing (max. 4 numbers) and storing the code in a safety place. In case the Code gets lost, contact our Service Dept. That will give an emergency Code.

Informazione / *Information* / *Information*

(I) Il simbolo di riciclaggio, indica che alla fine della vita utile, il prodotto dovrà essere smaltito separatamente in appositi luoghi di raccolta e non assieme ai normali rifiuti. Questo evita possibili effetti negativi sull’ambiente e sulla salute e favorisce il riciclo dei materiali di cui è composta l’apparecchiatura.

(EN) The recycling symbol means that at the end of the life of the equipment you must dispose of it separately at an appropriate collection point and not place it in the normal unsorted waste stream. This will benefit the environmental for all.

(FR) Le symbole représenté, signifie, qu’en fin de vie, cet équipement ne doit pas être mélange à vos ordures ménagères, mais doit être déposé dans un point de collecte prévu pour les déchets des équipement électriques. Votre geste préservera l’environnement.