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**Sensigas®**  
**ESN26.C**  
**General instructions**



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These instructions are to be kept with the detector



#### **CAUTION**

**The installation of a gas leak detection system does not constitute a release from compliance with all regulations for the installation and use of gas devices, for ventilation of premises and for combustion emission exhaust laid down in the safety standards and the legal provisions in force.**

**Installation, periodic inspections or replacement of equipment must be carried out by qualified service technicians.**

**Reference standard EN50291**

### **1. General**

When concentrations of carbon monoxide are reached that are dangerous for man in terms of the toxicity of the gas (see Technical Specifications), ESN26.C detectors produce visual signals (by means of dedicated LEDs) and acoustic warnings (via the built-in buzzer), and at the same time close the internal relay that controls the electrical signalling devices or activate the solenoid valve to shut off the flow of gas.

Carbon monoxide is detected by means of an algorithm referred to as "integrated threshold" which takes into account both the concentration of the gas and the time at which it is detected, in conformity to the requirements of European Standard EN50291. An initial activation threshold, set at 50 ppm (= parts per million of concentration of the gas in air) starts a timer. If the concentration continues for the time set on the timer, the alarm is launched within a time of 60 to 90 minutes. If the concentration exceeds 100 ppm the alarm is activated within a period of 10 to 40 minutes, whereas at 300 ppm (or a higher concentration) the alarm is immediate (within about ten seconds). For intermediate concentration values, the alarm will be activated in proportionally intermediate times within the time range indicated above. Once the alarm condition ceases, or below 50 ppm, for a time based on the speed of decent of the concentration, normal functioning of the detector is reinstated.

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## 2. Installation and positioning

Conform to the permitted temperature and humidity conditions (See Technical Specifications).

Installation can be done:

- By wall-mounting using 2 screws.
- In a 3 module, type "503" built-in box.

Since carbon monoxide has a specific weight similar to that of air, it will be concentrated near the same height as the appliance that manifests combustion defects or that is located in premises with insufficient ventilation.

Install about 2 metres (minimum 1 metre, maximum 3 metres) from the gas-operated appliance and at standard face height of the occupants in those premises; example: 130 - 170 cm in the kitchen, 50 - 100 cm in the bedroom.

The detector must not be installed:

- Outdoors
- Too close to stoves, cooking appliances and, more in general, to gas appliances
- Near sinks and taps
- Near exhaust hoods, windows, fans etc.
- In areas where dirt and/or dust can clog the front grille of the detector
- Where the temperature or humidity exceeds the detector's operating limits
- In closed spaces (behind curtains, inside cupboards etc.).

The detector must be installed:

- On a wall in a position in which there is always natural air circulation.
- In an accessible position to allow easy checks and inspections.

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Ensure compliance with standards in force for electrical wiring. The devices must be connected to the mains and remain permanently powered. Omnipolar disconnection must be included in the mains.

The detector and its sensing element have been designed for continuous use in areas where there is permanent occupation by people, so normally free of polluting or toxic substances or vapours. The presence of gases or vapours from some substances such as alcohol, silicones or solvents found in some detergents or polishes, or from the fumes generated by cooking may cause inappropriate action of the detector and in the long term could affect the reliability of the device.

Read the instructions in this manual and the wiring diagrams carefully, and follow them scrupulously. The device must be installed by qualified technicians.

### **3. Effects of carbon monoxide on the human body**

Carbon Monoxide (CO) is a colourless, odourless and non-irritating gas that is classified as a chemical asphyxiant whose toxic action is the direct result of hypoxia (oxygen deprivation) caused by exposure to it.

Carbon Monoxide is also rapidly absorbed by the lungs and is spread through the pulmonary alveolus where it reversibly binds with the haemoglobin as carboxyhaemoglobin (COHb), which is present in the bloodstream in small quantities.

The affinity of haemoglobin for CO exceeds its affinity for oxygen by 200 times.

This reduces the capacity to carry oxygen into the bloodstream and also has the effect of dissociation of the oxyhemoglobin that further reduces the supply of oxygen to the tissues.

CO is chemically stable in the body and is eliminated with the air breathed out.

Elimination is regulated by the same factors that determine its absorption.

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If the CO level in the air inhaled is constant, the level of COHb in the bloodstream will approach a state of equilibrium after a few hours.

Still, the speed of that equilibrium depends on a number of factors such as the rate of lung ventilation (physical activity), the transfer to the pulmonary alveolus, cardiac parameters, concentration of haemoglobin in the bloodstream, barometric pressure, concentration of oxygen and of carbon dioxide in the breathed air, the individual's state of health, but the two most important factors are the concentration of CO and the time of exposure to the gas.


Typical effects of exposure to CO (at concentrations and exposure times over the ones that set off the detector) are, in growing order of concentration and/or time:

- Slight headache, weakness and, if pregnant, possible effect on foetus
- Severe headache, nausea, loss of movement in hands
- Severe headache, irritability, confusion, loss of vision, muscle weakness, dizziness
- Convulsions and loss of consciousness
- Coma, respiratory arrest, death.

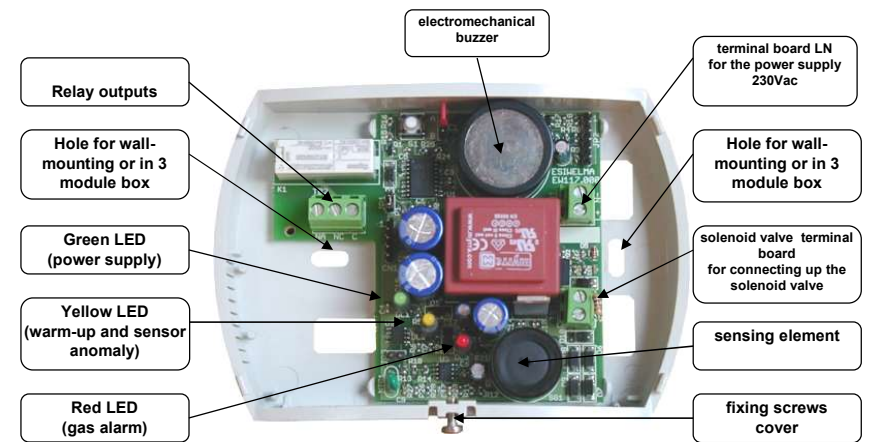
The action of the detector cannot protect individuals in particular risk categories such as people who suffer from cardiovascular disease, hyperthyroidism, respiratory disease etc..

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#### 4. Technical specifications

Power supply	230Vac $\pm$ 10%
Frequency	50 - 60 Hz
Absorption	2 VA
Command outputs	- Electronic 12VDC (13W max) for N.O. solenoid valve - Relay with contact exchange free of potential SPDT 250V 8A (2000VA)
Type of solenoid valve controlled:	N.O. (normally open) 12VDC (13W max)
Activation thresholds and times (ppm of carbon monoxide)	50 ppm between 60 and 90 minutes 100 ppm between 10 and 40 minutes 300 ppm within 3 minutes
ESN. detectors, connectable in parallel	max 9 (see wiring diagrams)
Lifespan of a detector (average)	6 years from the date of manufacture
Max area covered by a detector	40 m <sup>2</sup> approx (indicative)
Visual warnings	Green LED (power is on) Yellow LED (warm-up / sensor anomaly) Red LED (gas alarm)
Audible alarms:	Piezoelectric buzzer 85dB at 1 m
Protection Rating	IP42 when correctly installed
Operating ambient temperature	-10 to ... +40°C (storage -20 to +70°C)
Relative humidity, operating environment	30 to 90% R.H. without condensation (storage max 95% R.H.)
Dimensions	139mm x 98mm x 40mm
Conformity to standard	EN50291
 conformity	
EMC Electromagnetic Compatibility	2014/30/UE – EN50270
Low voltage (LVD)	2014/35/UE – EN50291

## 5. Inside detector



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## 6. Electrical connections

- Conform to current electrical installation norms.
- For the connections according to the diagrams in these instructions. Use cable with a minimum section of 1,5 mm<sup>2</sup>
- Permissible length for connections between detector and solenoid valve: max. **80 m**
- **Use solenoid valve output to connect only valves with power absorption not exceeding 13W**
- Check that any electrical devices controlled by the relay, are suitable for the maximum capacity characteristics (see technical specifications).
- Detectors must be connected directly to the electric relay, without disconnectors or switches between them, and must be powered permanently.

## 7. Mounting

- Remove the cover by unscrewing the screws on the bottom using a screwdriver.
- Fix the base to the wall.
- Form the electrical connections as shown in the diagrams contained in this manual.
- Fit the cover again, and tighten the fixing screw. Work carefully to avoid damaging the LEDs.



**Note: Do not touch the sensing element or the electronic circuit for any reason whatsoever. Any tampering may compromise correct functioning of the detector, as well as exposing people to a risk of electric shock.**



## 8. Commissioning

Check that the relay command logic is as required.

Jumper E1    E1 positioned towards A →    continuous ON command for relay (factory setting)  
                  E1 positioned towards B →    relay impulse command (0,5 sec ON every 10 sec)

Put the power on for the detector, and check that the initial test phase is carried out, which includes warming up the sensor, as indicated in the functional status table.

Test button



Jumper E1

### 8.1 Operating check

1. To check that the detector is working, simply push the relevant test button, located inside the equipment. The alarm condition induced by the button activates a functional check of the entire actuation chain, excepting for the sensor, which is checked continuously by specific electronic circuitry.
2. Once these tasks have been done, the detector must indicate its alarm status, as follows:
  - The red LED switches on
  - The green LED stays on
  - The buzzer sounds continuously for the entire alarm time.
  - The relay switches (continuous or impulse) activating any loads connected to it.
  - The solenoid valve is closed after 15 sec (command impulse for 0,5 sec every 10 sec).

Once the alarm has ended, the detector automatically returns to normal mode.



**It is advisable to repeat the operating test at least once a year, or after a prolonged period of stoppage and in any case, every time the detector is replaced.**

**CAUTION: The average lifespan of an ESN26.C detector is 6 years, from the date of manufacture.**



The detector is set in the factory and cannot be modified to change the alarm threshold established (see technical specifications). The procedure described in point 8.1 is not intended to check the correctness of the thresholds set, but only to check the detector's operating status, as well as any switching and signalling devices fitted.

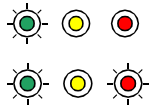


If other test methods are used instead of the one described, the detector may generate different, unexpected responses. In particular, the use of inappropriate substances or vapours (alcohol or silicon-based solvents etc.) or in any case, high concentrations of test gases could cause permanent damage to the sensing element and may cause the detector to operate incorrectly.

## 9. Operation

*Normal* - Green LED on, red and yellow LEDs off.

*Gas alarm* - Red LED on  
- The buzzer sounds continuously  
- The relay switches, activating any loads connected to it.  
- The solenoid valve closes after 15 sec (command impulse for 0,5 sec every 10 sec).



**IMPORTANT: IF AN ALARM IS ACTIVATED DUE TO THE PRESENCE OF CARBON MONOXIDE, KEEP CALM AND PROCEED AS FOLLOWS:**

- Put out naked flames and switch off all gas equipment
- Close the tap on the gas supply or the LPG cylinder.
- Open doors and windows to air the environment
- Look for and eliminate the cause of the alarm. If you are unable to determine and eliminate the cause of the alarm, exit the property and call emergency services from outside.

## 10. Functional states

<i>Detector status</i>	Outputs					
	LED GREEN	LED YELLOW	LED RED	BUZZER	SOLENOID VALVE	RELAY
Off	OFF	OFF	OFF	OFF	OFF	OFF
Initial test for LEDs and buzzer (1 sec)	ON	ON	ON	C	OFF	OFF
Sensor warm-up (60 sec)	A	OFF	OFF	OFF	OFF	OFF
Normal operation	ON	OFF	OFF	OFF	OFF	OFF
Alarm	ON	OFF	ON	ON	D	ON/Imp
Sensor faulty	ON	B	OFF	C	OFF	OFF
Solenoid valve anomaly	ON	A	E	C/E	E	E
General anomaly	ON	ON	ON	C	OFF	OFF
Functional test (inducing alarm) (25 sec)	ON	OFF	ON	ON	D	ON/Imp

Key:

<b>ON</b> = on continuously / activated/ switched	<b>OFF</b> = off / deactivated / not switched
<b>A</b> = slow flashing at 1 Hz	<b>B</b> = cycle of 2 quick flashes (2 Hz) and a 1 sec pause
<b>C</b> = short sounding of Buzzer (Beep)	<b>D</b> = 1 command impulse of about 0,5 sec every 20 sec.
<b>E</b> = depends on the other conditions (*)	<b>ON/Imp</b> = continuous / impulse switched (see Jumper E1)

(\*) Checking the integrity of the connection or of the solenoid valve itself does not affect the detector's other statuses. In other words, an anomaly status for the solenoid valve does not prejudice normal functioning of the detector, and its capacity to activate the alarm due to the presence of gas. In order to avoid the yellow LED flashing when the solenoid valve is not in use, a suitable load resistance will be fitted on the solenoid valve terminals in the factory. This resistance is only to be removed if the solenoid valve is used.

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## 11. Maintenance

This equipment does not require any maintenance, other than periodic checking that it is working. Replace the detector 6 years after its date of manufacture (see indication on the cover).

Use a wet cloth and mild detergent to periodically clean the device. Do not use aggressive detergents like alcohol, ammonia, solvents etc.



**IMPORTANT:** Before cleaning the detector, switch off the system power supply to avoid the risk of electric shock.

## 12. Environmental compatibility and disposal



This product is developed and made using materials and processes that take environmental management into account.

Refer to the following notes for disposal of the product at the end of its working life, or when it is replaced:

- For disposal purposes, this product is classified as an electric and electronic device: Do not dispose of it with normal household waste, in particular as regards the printed circuit.
- **Comply with all local laws in force.**
- As far as possible reuse basic materials to keep environmental impact to a minimum.
- Use local depots and waste recycling companies, or contact the supplier or manufacturer to return used products or to ask for information on environmental compatibility and waste disposal.

**The packaging for the ESN26.C can be reused. Keep it for future use or to return the product to the supplier.**

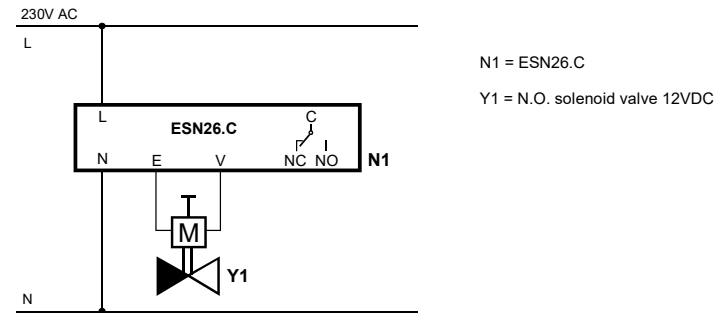
### 13. Wiring diagrams



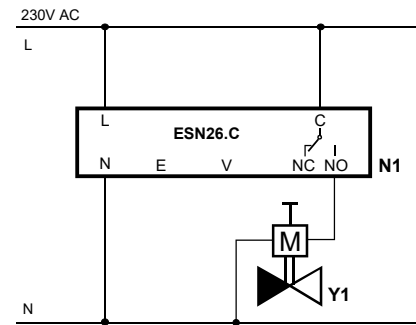
Remember:  
The ESN26.C detector can be connected in parallel with other ESN detectors that have a solenoid valve command output (e.g. ESN16.. and ESN26..) for commanding just one solenoid valve. See the wiring diagrams below.

#### Diagram 1:

ESN26.C detector with N.O. solenoid valve 12VDC

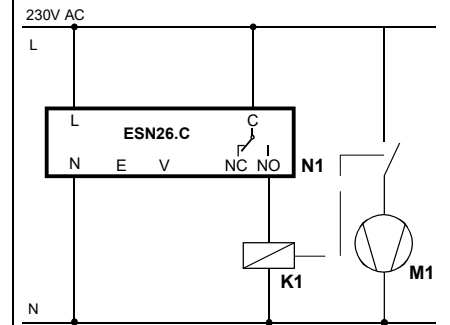


**Diagram 2:**  
ESN26.C detector with N.O. solenoid valve 230VAC



N1 = ESN26.C  
Y1 = N.O. solenoid valve 230VAC

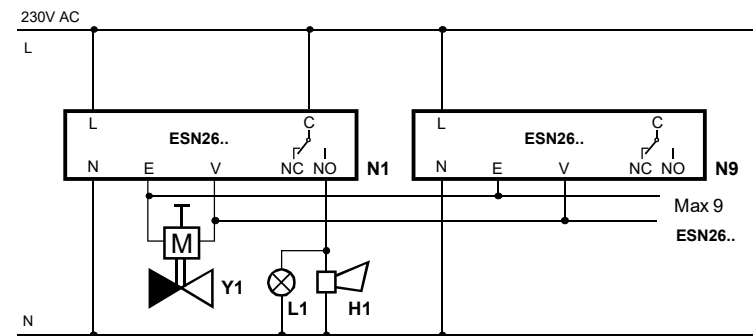
**Diagram 3:**  
ESN26.C detector air extractor command



N1 = ESN26.C  
M1 = extractor

**Diagram 4:**

Max 9 ESN26.. detectors... in parallel with N:O: solenoid valve 12VDC  
Optional signal buzzer or lamp control

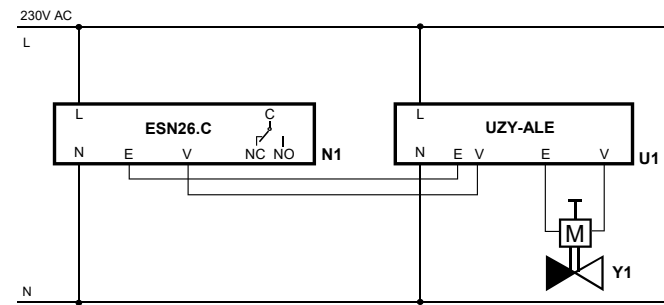


$N1 + N9 = ESN26..$

Y1 = N.O. solenoid valve 12VDC

**Diagram 5:**

ESN26.C detector with UZY-ALE adapter and N.C. solenoid valve 12VDC



N1 = ESN26.C

Y1 = N.C. solenoid valve 12VDC

U1 = UZY-ALE

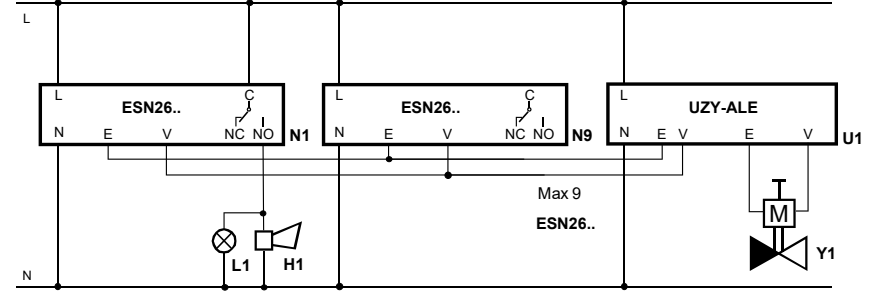


**Diagram 6:**

Max 9 ESN26.. detector... with UZY-ALE adapter and N.C. solenoid valve 12VDC

Optional signal buzzer or lamp control.

230V AC

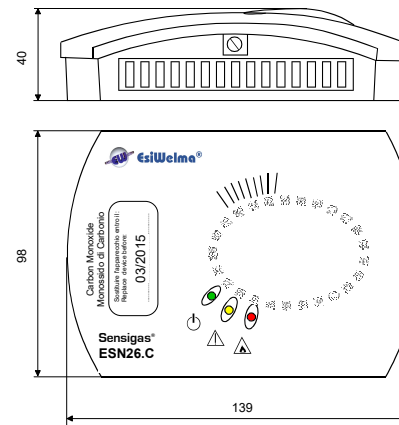


N1 ÷ N9 = ESN26..

Y1 = N.C. solenoid valve 12VDC

U1 = UZY-ALE

#### 14. Dimensions



Installation date.....

Replacement date.....

Installation premises.....

Date of manufacture.....  
(printed inside the detector)

Installer's signature.....

Seal

*Note: Due to our policy of continuous product improvement, specifications are subject to change without notice.*