USER MANUAL

# DOMESTIC GAS DETECTOR

# D-20Xi


fidegas

Manufactured by: C.A.E., S.L. P. Ubarburu 12 · 20014 San Sebastián - Spain

Elaborated and approved in Revision 10 he 04/2025 by Dept. Quality. It consists of 28 pages.



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# INDEX

# WARNINGS

Read carefully the user manual before commissioning or operating.

No gas detector replaces to a correct facility and maintenance of the devices gas burners and must be fitted by a competent person or authorised installer.

- It should be recognized that increasing ventilation rates may actually lead to higher levels of indoor CO concentration under certain circumstances. Examples of such an occasion would be from a nearby vehicle exhaust or during extremely bad traffic pollution, especially in cold weather, it is therefore possible that outdoor conditions could be a factor in triggering domestic CO alarms.
- There may be particular conditions of exposure to emissions from next door premises, especially in buildings of several floors and occupations. There may be special problems with shared or poorly located smoke vents, for example, which could cause CO leaks from other areas of the same building.
- Type A devices provide an output signal that can be used to activate an auxiliary device, such as a fan either a shut-off valve that could be rearmed manually, but it should not be done until the source of CO has been identified and the fault corrected.
- It exists the possibility to smell the gas before that the equipment triggers the alarm, due to the process of diffusion of gas, which reaches our nose before it reaches the detector.
- No immerse the detector in water or other liquid.
- Avoid cleaning near of the detector with detergents that contain bio-alcohols, industrial solvents or polishes with silicone suspension. When cleaning the detector, use only a damp cloth with clean water.
- It is recommended to send the detector to the manufacturer for calibration at the end of its lifetime or if it does not work with the Test Kit FIDEGAS®.
- Note that the failure to observe the basic precautions can lead to equipment malfunction, the manufacturer is not liable.

# LIMITATIONS

- Remember that if the detector has been disconnected, gas may accumulate during this period and will not be detected. Therefore, it is recommended to close the main gas inlet valve.
- Ensure the supply voltage is 230 Vac and the connections are correct.
- When installing the gas detector, the places where it should NOT be installed must be taken into consideration (see section 3.2)
- The sensitivity of a catalytic sensor can be altered by exposure to inhibitors or contaminants such as silicone, halogens, sulfur, acetylene, chlorinated compounds, and heavy metals. When these inhibitors are permanently present, it is recommended to use gas detectors with infrared sensors immunized against these contaminants and inhibitors. Do not use cables containing silicone for installation.
- The detector must not be manipulated while it is powered.

Read the user manual carefully for a correct use of the product.

# WARRANTY

- Warranty five (5) years is given by C.A.E., S.L., manufacturer of FIDEGAS®, against any manufacturing defect from the date of purchase and cease to be effective if this equipment is not installed, used and maintained according to the guidelines stated in the User Manual.
- This warranty becomes void in cases where it is found that:
  a) The equipment has been repaired, tampered with or external accessories have been added, with the involvement of people outside our Authorized Service Center.
  b) It has suffered any impact or damage.
  c) The serial number has been altered or modified and does not match with our records.
- C.A.E., S.L., manufacturer of FIDEGAS®, is not liable for damages that may arise as result of misuse of the equipment.
- All the necessary efforts have been made to ensure the accuracy of the information provided in this document. However, C.A.E., S.L., manufacturer of FIDEGAS®, reserves the right to make improvements or modifications to this equipment without prior notice.

Any failure to follow these instructions automatically voids the warranty and the expenses are responsibility of the user

# QUALITY CONTROL

This product has been designed, manufactured and marketed in compliance with current regulations, guaranteed thorough a Quality Management System certified according to ISO 9001:2015 and audited annually by AENOR.

# MARKING

**GAS DETECTOR D-20Xi:**
**Sypply: 230 Vac / 50Hz** **Class II ☐ Type A**
**Power: 1,5 W** **Nº Serie:**
**Certificate** **GAS**
**UNE-EN 50194-1**
**UNE-EN 50291-1** CE **Lifetime: 5 years**

# OPTIONAL EQUIPMENT

| REFERENCE | OPTIONAL EQUIPMENT |
|---|---|
| 00007 | Closing Automatic D- 70 |
| 00202 | Module of voice for D-194i and D- 20Xi |
| 02231 | Module KNX D-20Xi |

# 1. GENERAL

The domestic gas detector **Ref. D-20Xi** can detect the presence of **Natural Gas (METHANE)** or **Liquefied Petroleum Gases (LPG: BUTANE/PROPANE),** and **Carbon Monoxide (CO)**, and as it is **Type A**, it is prepared for automatic gas cut-off in case of a gas leak, with the most security and precision due it's design which follows the guidelines of the series **EN 50194-1/2** for combustible gases and **EN 50291-1/2** for CO gas, complying with the **European Directive 2014/30/EU** for **Electromagnetic Compatibility** and **2014/35/EU Low Voltage**.

The detectors are ready to perform **executive actions** (for example, automatic gas cut form possible leakage) or for connection to home automation systems **EIB-KNX** by the module **Ref. IBOX-KNX-FDGD20X FIDEGAS®** (optional).

## 1.1 Gas detection

Gas detection is done through a sensor of catalytic technology which is not affected by variations in temperature, atmospheric pressure or humidity, therefore achieving a very precise gas detection within the prefixed limit.

**Gas alarm level:** 17% LEL (Lower Explosive Level)

CO detection is done through a sensor of electrochemical technology achieving a very precise detection within the prefixed limits on the standard application, avoiding false alarms caused by interfering gases.

**CO alarm level:** 50 ppm, 100 pp and 300 ppm

The sensor's estimated life is 5 years in clean air, although an operational check (see section 6) is recommended every 6 months.

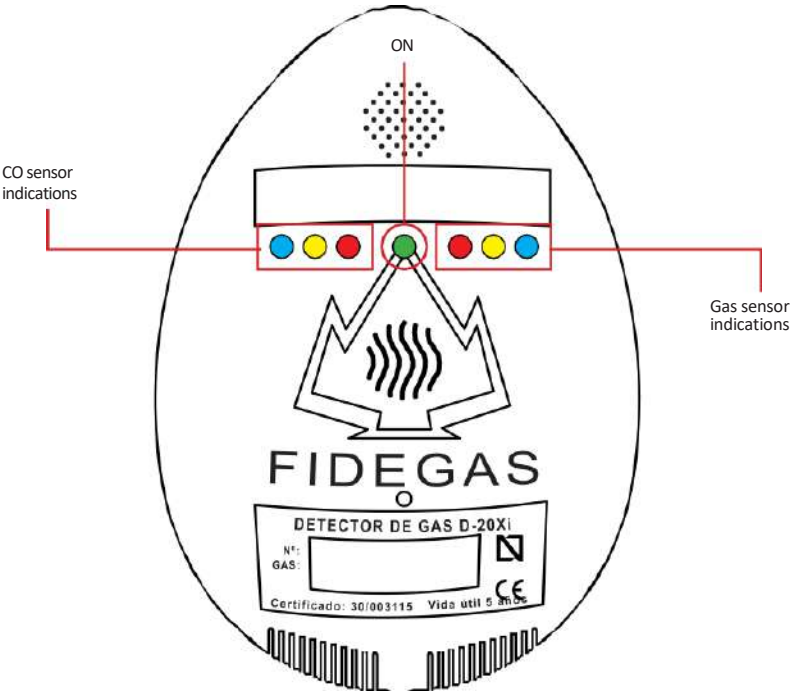
ADJUSTMENT IS PERFORMED AT FACTORY WITH A CERTIFIED STANDARD GAS MIXTURE.

VERIFICATION BY AN "ENAC" ACCREDITED LABORATORY OF COMPLIANCE WITH ALL SECTIONS OF STANDARD EN 50194-1/2 AND EN 50291-1/-2 GUARANTEES THE SAFETY AND RELIABILITY OF THIS EQUIPMENT.

## 1.2 Indications

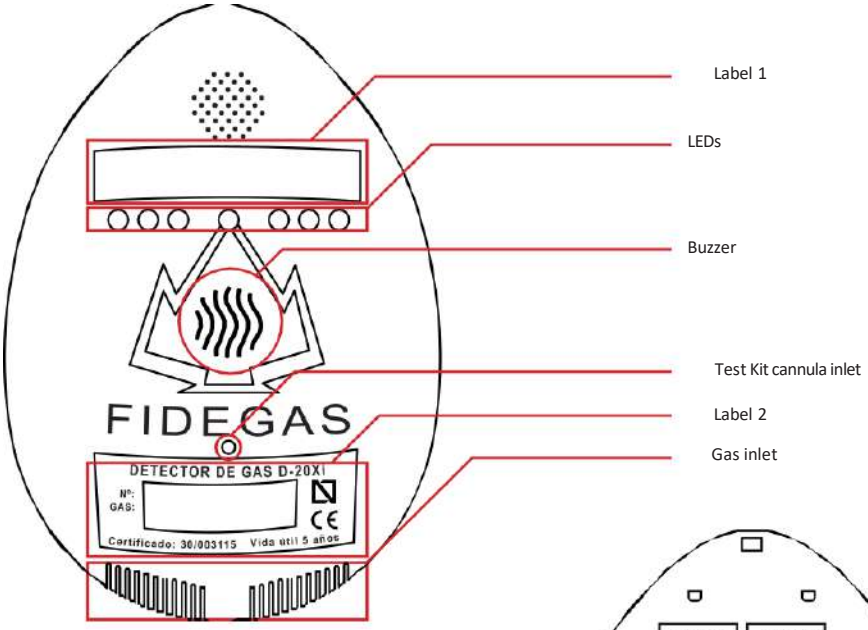
The detector has some indications that are briefly described below:

- Green LED (**ON**): power on indication
- Red LED: **ALARM** (one per sensor)
- Yellow LED **FAULT** (one per sensor)
- Blue LED **TEST:** end of life (one per sensor)
- Buzzer: acoustic support to the visual indications
- Optional: voice messages

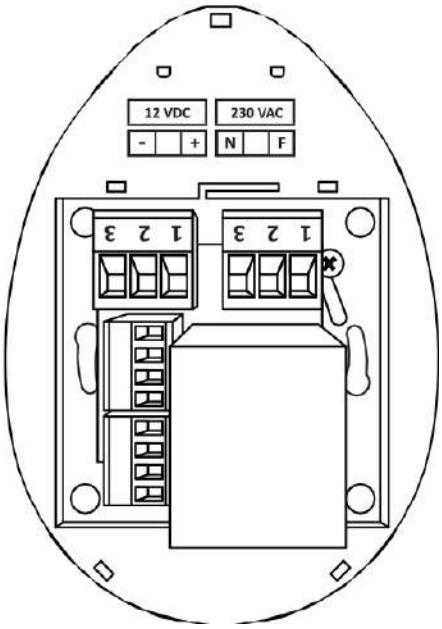


## 1.3 Elements

The detector is designed to be installed in universal distribution boxes both wall mounted and dry wall mounted. Is has been considered the aesthetic and functional design. It consists of different elements:

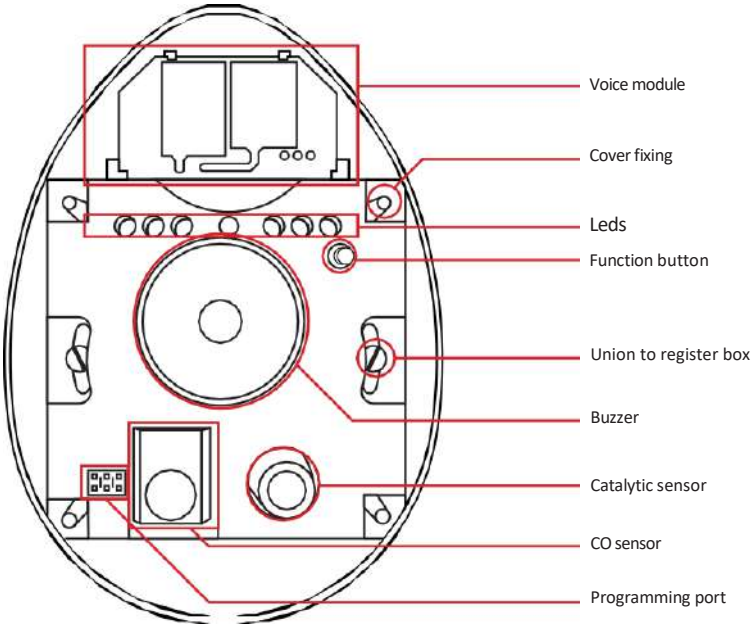



Front




Back

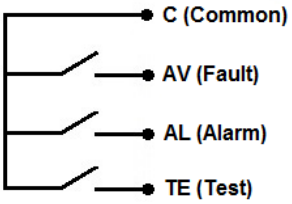
Removing the cover reveals the remaining components of the detector, including a function button for interacting with the detector, as shown in the following image.




Inside

## 1.4 Outputs

The detector provides 3 potential free LP outputs per sensor, closing on a common contact.




- **AL** - Potential free outputs and normally closed (NC) that depend on **ALARM** detection and are used to start up any other device or to send a telemetry signal, etc.
- **AV** - Potential free outputs and normally closed (NC) that depend on **FAULT** detection, allowing an external executive action when a failure is detected.
- **TE** - Potential free outputs and normally closed (NC) that depend on the indication of **TEST** periods (blinking activation) and the **END-OF-LIFE** of the sensors (permanently open).).

**Maximum permissible values**: 30 V, 300 mA

The detector also provides a permanent 12 Vdc voltage output to power external devices (e.g. shut-off valves).

**Maximum output power 12 Vdc**: 1 W

## 1.5 Voice messages (optional)

The detector can optionally provide a **voice messaging system** for displaying events. The system must be factory installed.

# 2. OPERATION

## 2.1 Warm-up

After verifying that the connections are correct (see page 15) and that there are no short circuits at the outputs, the detector will be connected to the 230 Vac mains voltage, the green LED will illuminate, and the sensor warm-up time sequence will be executed. During this time, the potential-free contacts will remain open, and gas detection will be disabled, thus preventing false alarms.

Once the warm-up time has elapsed, the detector will perform an output test, and if all connections are correct, the contacts will close and only the green LED will remain illuminated if no gas is detected.

The equipment is now operating and monitoring to detect gas. You can reset the valve or gas shutoff device, although an operational check (see page 16) is recommended as a final step in the installation process.

## 2.2 Alarm of combustible gases

It will be activated when the presence of gas is detected at alarm concentrations or higher. In this state, the **red** LED corresponding to the catalytic sensor (right side) will light up, accompanied by the **buzzer**, and the **AL** output will remain open.

Explosive limit for METHANE in %Vol. in AIR LEL = 4.4 LSI = 17
Explosive limits for PROPANE in % Vol. in AIR LEL = 1.7 LSI = 10.9
Explosive limits for BUTANE in % Vol. in Air LEL = 1.4 LSI = 9.3

Data obtained from EN ISO/IEC 80079-20-1:2019 standard and currently being used for equipment calibration

| | | % LEL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| METHANE | % VOLUME | 0.44 | **0.88** | 1.32 | 1.76 | 2.20 | 2.64 | 3.08 | 3.52 | 3.96 | 4.40 |
| PROPANE | | 0.17 | **0.34** | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 |
| BUTANE | | 0.14 | **0.28** | 0.42 | 0.56 | 0.70 | 0.84 | 0.98 | 1.12 | 1.26 | 1.40 |
| OCTANE | | 0.08 | **0.16** | 0.24 | 0.32 | 0.40 | 0.48 | 0.56 | 0.64 | 0.72 | 0.80 |

## 2.3 Alarm of CO

The conditions of alarm of CO depend of the concentration and he time of exposure according to the following

board:

| CO Concentration | No alarm before | Alarm before |
|---|---|---|
| 30 ppm | 120 min. | - |
| 50 ppm | 60 min. | 90 min. |
| 100 ppm | 10 min. | 40 min. |
| 300 ppm | - | 3 min. |

Table taken from EN 50291-1-1 standard

Once the alarm is activated, the indication differs according to the level of CO detected:

> 300 ppm: The red LED and the buzzer activate continuously.
> 100 ppm: Long flashing of the red LED and of the buzzer.
> 50 ppm: Short flashing of the red LED and of the buzzer .

In all the cases **AL** output remains open.

IT IS RECOMMENED TO INSTALL A 12 Vdc SHUT-OFF VALVE THAT CUTS THE GAS WHEN THE GAS CONCENTRATION IN THE DETECTOR'S AREA OF INFLUENCE REACHES THE ALARM LEVEL.

## 2.4 Failure

The detector provides 2 different signals of failure.

**Flashing** activation of the yellow LED in sync with the acoustic warning indicates that the corresponding sensor is in fault state. In this state the associated **C-AV** contact remains open.

**Permanent** activation of both yellow LEDs indicates a malfunction of the detector (failure of the memories or failure of the power supply of the digital units). In this state both contacts **C-AV** remain open.

## 2.5 Test required

The flashing activation of the **blue** LED and its associated **C-TE** output indicates that an operational test of the corresponding sensor is required (see page 16). There are two factors that trigger this warning; after the recovery of a state of failure of any of the sensors or approximately every 6 months.

## 2.6 End of lifetime

The **permanent** activation of the **blue** LED with the beep of the acoustic alarm every minute and its **C-TE** output associated indicates that the corresponding sensor life has been exceeded. In this state, the detector continuous to perform the monitoring functions, although **it is recommended to send it to the supplier for calibration**

## 2.7 Outputs test

To check the correct operation of the outputs and their indications is possible to carry out an outputs test whenever the detector is not in alarm condition. The button must be pushed until the beginning of the activation sequence of the leds, the outputs and the buzzer.

Press the button again to deactivate the test.

# 3. INSTALLATION

The information contained in this manual regarding the selection, installation, use and maintenance of the device complies with the specifications of the UNE-EN 50244 standard for combustible gases and UNE-EN 50292 for carbon monoxide.

The detector is this designed for easy installation in standard junction boxes.

1. First, proceed to connect the detector (see page 15).
2. Once the relevant connections have been made, adjusting the length of the cables so that they can be housed inside the junction box, screw the assembly to it.
3. Once screwed in, place the detector cover and carry out an operational test (see page 16)

## 3.1 Install in

Ideally, the detector should be installed in every room containing a fuel-burning appliance (heater, boiler, kitchen, etc.) and additional detectors should be installed to ensure that adequate warning is given for occupants in other rooms, by locating apparatus

- In remote rooms in which the occupant(s) spend considerable time whilst awake and from which they may not be able to hear an alarm from detectors in another part of the premises, and
- In every sleeping room.

However, if there is a fuel-burning appliance in more than one room and the number of detectors is limited, the following points should be considered when deciding where best to place the detector:

- Place the detector in a room containing a device with no vent or open-flued appliance, and
- Place the detector in a room where the occupant(s) spend most time.

If the domestic premises are a bedsit (a single room serving as both sitting and bedroom), then the detector should be positioned as far from the cooking appliances as possible but near to where the person sleeps.

If the appliance is in a room not normally frequented (for example a boiler room), the detector should be positioned so that the alarm may be heard more easily. Alternatively, an interlinked detector or a remote alarm siren may be connected to a type A detector located in a room(s) containing a fuel-burning appliance.

Where a fuel-burning appliance has an extended and/or concealed flue, a detector should be installed in each room through which the flue passes.

The detector should be installed in the place to protect and where the gas tends to accumulate, separated 1,5 meters from any gas appliance or smoke output (boilers) and away from air flows.

There should be NO obstacles such as columns, furniture, etc., between the detector and gas consumption points that could avoid the gas reaching the detector.

Avoid places where dirt can obstruct the entry of gas to the sensor, considering that covers an area of approximately 25 m2. This covering area applies to the perimeter of gas consumption points, trying therefore to cut the trajectory of gas advancing towards inner spaces.

**Natural Gas** and **Carbon Monoxide (CO)** are gases lighter than air (relative densities: methane 0.55 and CO 0.97), when they escape they rise upwards and accumulate in the upper areas being able to be difficult his dispersion. The main component of natural gas is **Methane** and his proportion is variable depending on the obtaining process.

TO DETECT NATURAL GAS (METHANE, INSTALL THE DETECTOR ON THE CEILING OR SEPARATE IT AT A DISTANCE OF APPROXIMATELY 30 CENTIMETERS.

**LPG** is a mixture of gases further heavier than air (relative densities: propane 1.56 and butane 2.05). When the leak descends to the ground and accumulates in lower areas, it may be difficult to disperse. The main components of **LPG** are **Butane** and **Propane**, and their proportion varies depending on the process of obtaining it from petroleum.

TO DETECT LPG (BUTANE/PROPANE), INSTALL THE DETECTOR 10-20 CENTIMETERS ABOVE THE FLOOR. CABLE ENTRY SHOULD BE PROVIDED FROM THE BOTTOM TO PREVENT WATER INGRESS.

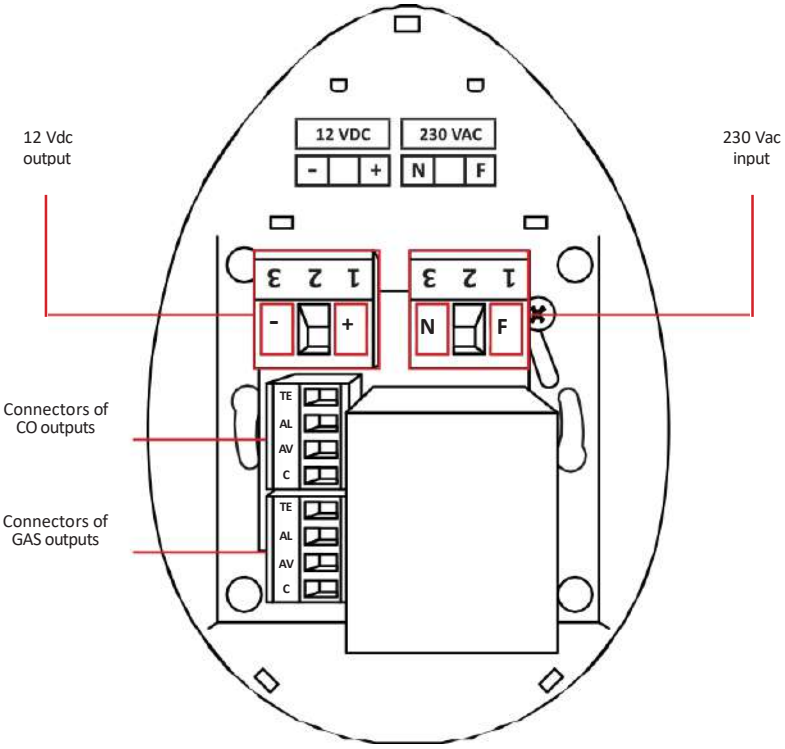
When choosing the **position** in which the detector will be placed, it is important to take into account that:

- It should be possible to see all the indicators from the surroundings.
- If the detector is to be mounted on a wall, it should be placed near the ceiling, at a height greater than the maximum height of any door or window and at least 150 mm from the ceiling.
- If the detector is going to be placed in the ceiling, it should be at less to 300 mm of any wall.
- It should be a horizontal distance between 1 m and 3 m of any potential source.
- If there is a partition in the room, the detector should be placed on the same side of the partition as the potential source
- The detectors placed in bedrooms and in rooms away from fuel burning appliances should be placed relatively close to the breathing zone of the occupants.

## 3.2 Do NOT install under the following conditions

- In a closed space (for example, in a cupboard or behind a curtain).
- Where it can be obstructed (for example by furniture).
- Directly above a sink.
- Next to a door or window.
- Just above/below of a sink.
- Near cooking appliances.
- Near of a current of air or others vents similar.
- In a damp or wet palce.
- Where the dirt and he dust can obstruct the inlet of gas to the sensor.
- Places where the temperature can be lower to -10 ºC either exceed of 40 ºC.

# 4. CONNECTIONS




## 4.1 Power supply

All D-20Xi variants are prepared to be connected directly to **mains supply 230 Vac** via F (terminal 1) and N (terminal 3) terminals.

**Maximum cable thickness at inputs**: 1.5 mm

## 4.2 Outputs

**12 Vdc**: The detector provides two 12 Vdc direct currect terminals that can be used to power any external device (e.g.: gas shut-off solenoid valve) with a maximum power of 1W. **GND** is the negative terminal (terminal 3 of the terminal block) and **+Vdc** the positive terminal (terminal 1 of the terminal block).

**LP**: The detector has one connector with 4-terminals per sensor (configuration described in section 1.4) with three LP-NC outputs (potential-free and normally closed), TE, AL and AV, which close on a common contact (C).

**Maximum cable thickness at outputs**: 1.5 mm

**CAUTION**: It is possible to close several contacts at the same time, in this case the contacts activated would be connected to each other through common contact (C).
These connectors they can be directly connected to a module **Ref. IBOX-KNX-FDGD20X** (module for KNX systems) using the supplied 4-wire cable connecting as follows:
White wire in contact (**C**), yellow wire in contact (**AV**), brown wire in contact (**AL**) and green wire in contact (**TE**).

# 5. OPERATIONAL CHECK

Approximately every 6 months or if a fault has been detected in one of the sensors (always and when this situation does not persist), the detector requests the performance of an operational test (maintenance notification). This request is signaled by the **flashing activation of the blue LED** and the **C-TE** corresponding output to the sensor to be verified.

In this situation the **detector continues to perform its monitoring functions.** To perform the operational check it is necessary to trigger an alarm with the following procedure:

**Use of Test Kit FIDEGAS®**:

Insert the tester's cannula (tube) into the hole in the lid and release gas **for 3 to 4 seconds. Wait 5 seconds** for the alarm to be triggered. If the alarm is not triggered, repeat the process releasing more gas.

After testing, the detector needs a time of recovery while the gas is evacuated and normal operation is restored.

## To consider

- An appropriate **Test Kit FIDEGAS®** must be used for each type of sensor and gas.
- When he tester canister presents low pressure, more gas application time will be necessary to perform the test.
- He tester is not suitable for further testing when there is not outlet pressure.
- Do **NOT** use gas lighters or flammable vapours that may lead to wrong conclusions.
- If the is unsuccessful contact with the supplier or the installer.

# 6. RECREATIONAL VEHICLES

## 6.1 General

There is a specific version for installation in recreational vehicles and caravans that detects the presence of **Liquefied Petroleum Gases (LPG: Butane/Propane)** or **Gasoline** and **carbon monoxide (CO)**. This design follows rigorously the guidelines of the standard **EN 50194-2** for **combustible gases** and **EN 50291-2** for **CO**, complying with the requirements of **European Directives 2014/30/ EU** for **Electromagnetic Compatibility** and **2014/35/EU Low Voltage**.

The **combustible gases** detection is performed by remote sensor, installed outside the the detector, and the **CO** detection by an integrated sensor inside the detector.

## 6.2 Installation

Make the connections before installing the detector. Adjust the length of the cables so that they can be placed inside of the junction box. Mount the cover over the circuit board to complete the installation of the device. The detector must be installed inside the vehicle, in a location that allows the alarm to be clearly seen and heard, and where it is unlikely to be damaged.

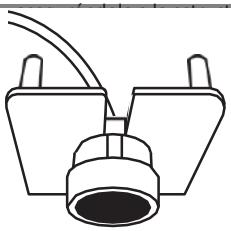
The detector must be installed inside the vehicle, in a location that allows the alarm to be clearly seen and heard, and where it is unlikely to be damaged.

**LPG** is a mixture of gases heavier that air (relative densities: propane 1.56 and butane 2.05), when the leak sinks to the ground, it accumulates in the lower areas, making it difficult to disperse. The main components of **LPG** are **butane** and **propane**, and the proportion is variable depending on the process of obtaining it from petroleum.

For **LPG** detection: The remote sensor must be installed using its support in the place to be protected and where the gas tends to accumulate, separate one and a half meters (1.5 meters) away from the gas consumption points or smoke outlets and away from air currents.

**Gasolines** are find in liquid state and their composition is very variable depending on their source (composed of dozens of hydrocarbons). Their vapours are also heavier than air, although they are not very volatility at room temperature. In terms of sensor sensitivity, they are considered equivalent to **hexane** and the alarm level will be set to 17% LIE of **hexane** .

To detect **gasoline**: install the remote sensor using its bracket in the bilg, vertically pointing downwards and ensuring it into the structure (see the illustration)



The remote sensor must be placed in the supplied holder respecting its position, matching the mark on the remote sensor cap with the opening in the bracket. The back of the bracket indicates the environmental conditions as defined in EN 60721-3-6: 6K3/6B1/6S1/6M3.

## 6.3 Precautions

No gas detector should be considered as an alternative to follow good practice of shutting off gas when leaving vehicles.

For boats, due to their water tightness and the fact that LPG is heavier than air, gas accumulation may occur during periods of non-use. This may not be detected by the device if it is disconnected, so the ignition hazard resulting from reconnecting the power supply will not be avoided by the detector.

There must be NO obstacles between the remote sensor and the gas consumption point, columns, furniture, etc. that could avoid the gas reaching the remote sensor.

## 6.4 Location

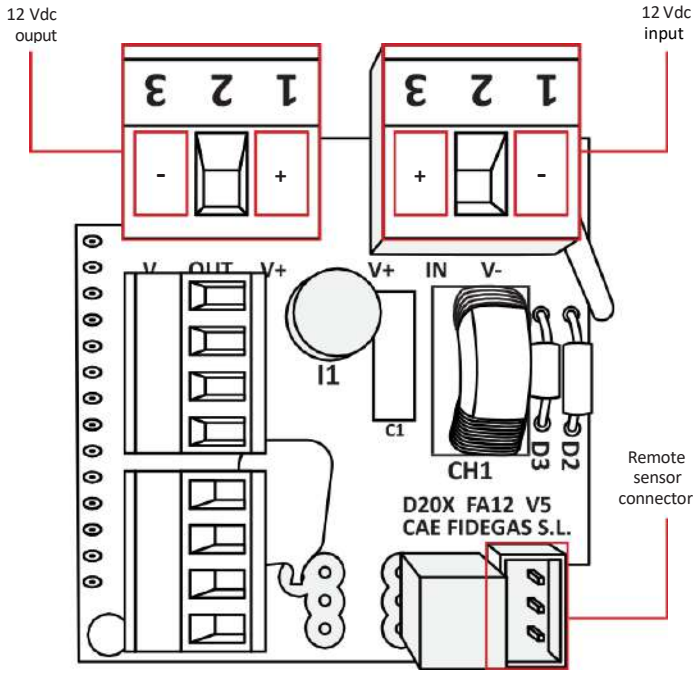
Do **NOT** install in the following conditions:

- Below the level of the bilge pump circuit breaker.
- In a closed space (for example, in a cupboard or behind of a curtain).
- Directly ovoer a drain.
- Near of a door or window.
- Near of a fan or a extractor.
- Just above/below of a sink.
- Just above cooking appliances.
- Near of a current of air or others vents similar.
- In a damp o wet place.
- Where dirt and dust can obstruct the entrance of gas to the sensor.
- Places where the temperature may exceed 40 ºC.

## 6.5 Connections

The detectors installed in boats and caravans are designed to be powered by a 2 Vdc direct current voltage. It is necessary to respect the polarity of the terminals for correct operation.

The ouputs work in the same manner that in the domestic version powered by 230 Vac. The remote sensor plugs into a dedicated connector.



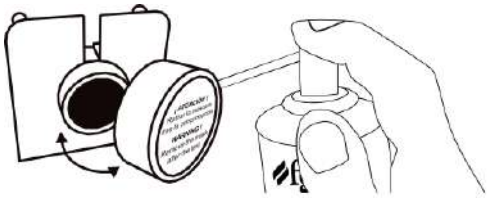

## 6.6 Operational check

Do not use gas lighters or flammable vapours that could lead to false conclusions. When the Test Kit FIDEGAS® presents low pressure, more gas application time will be necessary to perform the test. The Test Kit is not suitable for further testing when there is no output pressure.

For this purpose, FIDEGAS® supplies a Test Kit in compliance with current regulations.

1. Place the application mask so that it completely covers the sensor.
2. Insert the cannula (tube) into the hole of the mask, release gas for **2 to 3 seconds** and **wait 5 seconds. seconds** without removing the mask until the alarm is activated. If the alarm is not activated, repeat this operation releasing more gas.

The test must be performed EVERY SIX MONTHS.



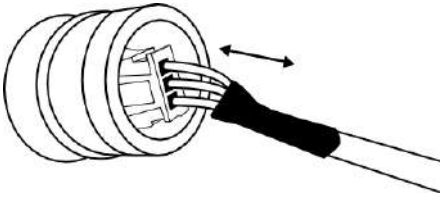
3. Once the test is completed remove the mask, the detector will need a recovery time (<20 s) while the gas inside is evacuated and normal operation is restored.

## 6.7 Calibration / replacement of the sensor

To perform a factory inspection/calibration of the detector, both the detector and the remote sensor must be returned. Disconnect the cable from both sides, both on the electronic board and on the head of the remote sensor leaving the cable in the installation.

If necessary, the sensor will be replaced with a new one and calibrated with its electronic board.

The D-20Xi detector consists of an electronic circuit and a sensor head. These elements are calibrated together at the factory, therefore they should NOT be interchanged.



Caution when realeasing the cable from the sensor and detector connectors, do not pull on the cable.

# 7. WHAT TO DO IN CASE OF ALARM OR SMELL OF GAS

## 7.1 In domestic installations

Stay calm and take following actions:

- Extinguish all open flames, including smoky materials.
- Turn off all gas appliances.
- Do not turn on or off any electrical equipment, including the gas detection device.
- Turn off the gas supply at the main gas switch and/or (with LPG supply) the storage tank.
- Open doors and windows for increase the ventilation.
- Do not use the telephone in a building where gas is suspected to be present.

If the alarm continues to operate and there is no apparent cause of a leak and /or it cannot be repaired, evacuate the premises and **IMMEDIATELY NOTIFY** the gas supplier and/or the 24-hour emergency service.

If the alarm stops and the reason why the alarm has been triggered is identified, after the gas leak has stopped and after ensuring that all appliances are turned off, the main gas supply can be restored.

## 7.2 In recreational vehicles

If a LPG leak or an accumulation of petro vapour is suspected or detected the following measures should be taken:

- Cut off the supply gas or petrol by closing the main valve(s).
- Extinguish all open flames and other ignition sources, such as heaters, cooker, pilot lights, cigarettes, etc.
- Do not use electrical devices, including electronic communication equipment (e.g., mobile phone, radio, etc.).
- Ventilate by creating a through draught to disperse the gas. For caravans and motorhomes, open all doors and windows.
- If possible, evacuate the area as an escape without fire can form an explosive mixture.
- When necessary, inform emergency services.
- For boats: If the leak is from a cylinder or replaceable tank and cannot be stopped, remove it to a location where the leak can disperse safely away from the boat and other nearby vessels. If this cannot be done, submerge the LPG cylinder underwater before risking a possible explosion. Extreme caution should be taken when removing the cylinder and/or the gas appliance containing it to prevent spillage.

Do not use the installation again until it has been checked and any faults repaired by a qualified person in accordance with national regulations.

# 8. WHAT TO DO IN CASE OF ALARM OF CO

It is recommended that the following actions are taken in the order given:

- Keep calm and **open all doors and windows** to increase the rate of ventilation. Stop using all fuel-burning appliances and ensure, if possible, that they are turned off, e.g. for gas appliances, isolate the emergency control valve;
- If the alarm continues to be activated, then **evacuate the premises**. Leave the doors and windows open, and only re-enter the building when the alarm has stopped. In multi-occupancy and multi-storey premises, ensure than all the occupants are alerted to the risk;
- **Provide medical help** for anyone suffering the effects of CO poisoning and advise that CO inhalation is suspected;
- Telephone the appropriate technical service and/or maintenance company or, when necessary, the relevant fuel supplier on their emergency number or the national Gas Emergency Service Provider, if appropriate, so that the source of CO emissions can be identified and corrected. Unless the reason for the

alarm is obviously spurious, do not use the fuel-burning appliances again, until they have been checked and cleared for use by a competent person according to national regulations.

# 9. EFFECTS OF THE CO ON HEALTH

## 9.1 Toxic effects

**Carbon monoxide** (CO) is a colourless, odourless, non-irritating gas classified as a chemical asphyxiant and whose toxic action is a direct result of the hypoxia (absorption by the blood through the lungs and replacement of oxygen by CO) produced by certain exposure.

CO is rapidly absorbed through the lungs, diffuses across the alveolar capillary membrane and is reversibly bound with haemoglobin as carboxyhemoglobin (COHb). The affinity of haemoglobin for CO is over 200 times its affinity for oxygen. This reduces the oxygen carrying capacity of the blood, and has an effect on the dissociation of oxyhaemoglobin, which further reduces the oxygen supply to the tissues. CO is chemically unchanged in the body, and is eliminated in expired air. The elimination is determined by the same factors that applied during absorption.

If the CO level in the inhaled air is constant, the level of COHb in the blood will approach an equilibrium (saturation) state after several hours. However, the rate at which the equilibrium is reached depends on many factors, e.g. lung ventilation rate (physical activity) and alveolar capillary transfer, cardiac parameters, blood haemoglobin concentration, barometric pressure, oxygen and carbon dioxide concentration in the inhaled air, but the two most important factors in determining the COHb level are the CO concentration and the duration of the exposure.

The effects of different saturation blood COHb levels on health adults are shown in the following table:

**Effects in the health of levels of COHb in blood in healthy adults.**

| % COHb | Effects |
|---|---|
| 0.3 - 0.7 | Normal range in non-smokers due to the endogenous CO production |
| 0.7 - 2.9 | Unproven psychological changes |
| 2.9 - 4.5 | Cardiovascular changes in cardiac patients |
| 4 - 6 | Normal values observed in smokers, impairment in psychomotor tests |
| 7 - 10 | Cardiovascular changes in non-cardiac patients (increased cardiac output and coronary blood flow) |
| 10 - 20 | Slight headache, weakness, potential burden on foetus |
| 20 - 30 | Severe headache, nausea, impairment in limb movements |
| 30 - 40 | Severe headache, irritability, confusion, confusion, impairment in visual acuity, nausea, muscular weakness, dizziness. |
| 40 - 50 | Convulsions and unconsciousness |
| 60 - 70 | Coma, collapse and death |

## 9.2 Chronic effects on high risk groups

Individuals with coronary artery disease exposed to low levels of CO show reduced capacity to exercise, and the time to onset of exercise-induced angina is reduced in these patients exposed to low levels of CO.

CO quickly crosses the placental barrier and can may endanger the normal development normal of the foetus.

Several high-risk groups are particularly sensitive to the effects of CO due to various conditions in organ impairments or specific changes, mainly:

- Those whose oxygen carrying capacity is decreased due to anaemia or other haemoglobin disorders.
- Those with increased oxygen needs such as those encountered in fever, hyperthyroidism or pregnancy.
- Those with systematic hypoxia due to insufficiency respiratory.
- Those with cardiac diseases and any vascular insufficiency.

## 9.3 Normal levels of COHb

Under normal conditions, humans typically have low levels of COHb between 0.3% and 0.7% present in the body. These levels are considered neither beneficial nor harmful.

## 9.4 Smokers

Tobacco smokers are exposed to significant concentrations of CO. In cigarette smokers, the concentration of COHb varies between 5% - 9%, while heavy cigar smokers may exceed 10%.

This device has been designed to protect people from the serious effects derived from CO exposure. It may not be completely safe for individuals with specific medical conditions. If in doubt, consult a medical professional.

# 10. TECHNICAL CHARACTERISTICS

| | |
|---|---|
| **DOMESTIC (230 Vac)** | |
| Supply voltage | 230 Vac 50-60 Hz |
| Maximum power maximum consumption | 5W (with charge) |
| Electric isolation | Class II ⧈ |
| Degree of Protection | IP X2D |
| Detected gases | Natural Gas (Methane) or LPG (Butane/Propane) and CO |
| **VEHICLES OF RECREATION (12 Vdc)** | |
| Supply voltage | 12 Vdc |
| Maximum power maximum consumption | 2W (without charge) |
| Electric isolation | Class III ⧈ |
| Degree of protection | Remote sensor: IP44 |
| Detected gases | Gasolines (Hexane) or LPG (Butane/Propane) and CO |
| **GENERAL** | |
| Power maximum in 12 Vdc output | 1 W |
| Values maximums in LP output | 30 V, 300 mA |
| Alarm level | 17% LIE (Limit Lower of Explosiveness) |
| Lifetime | Lifetime five (5) years in air clean. It is recommended to carry out an operational test EVERY SIX (6) MONTHS |
| Warm-up time | 30 seconds |
| Stabilization time | 1 hour |
| Area of coverage | 25 $m^2$ approximately |
| Detected gases | CO (Monoxide of carbon), GN (Methane) either LPG (Butane/Propane) either Gasolines (Hexane) |
| Temperature and humidity | (-10 to 40) ºC and (0 to 90) %HR |
| Pressure | (850 to 1150) mbar |
| Serial number | C C C C: Product Code<br>TO TO MM: Year and Month of manufacture<br>X X X X: Manufacturing number |
| Dimensions | 135 x 95 x 25 mm |
| Weight | 175 gr |

# EU DECLARATION OF CONFORMITY

**MANUFACTURER:** **Comercial de Aplicaciones Electrónicas, S.L.**

**ADDRESS:** **Paseo Ubarburu 12 - 20014 Saint Sebastian - Spain**

**DESCRIPTION OF THE PRODUCT:**

**Domestic gas detector Ref. D- 20Xi:**

The product above mentioned is declared, under our responsibility, to conform with the requirements of the following directives:

1. **Directive 2014/35/EU** Making available on the market of electrical equipment designed for use with certain voltage limits abolishing Directive 2006/95/EC (DOCE 29/03/2014) - Series L, no. 96/357). (Only version 230 Vac)

2. **Directive 2014/30/EU** Electromagnetic compatibility and repealing Directive 2004/108/EC (DOCE 29/03/2014 - Series L, No. 96/379).

This conformity is assumed by reference to the following harmonized standards:

- **EN 50194-1-2009** Electrical apparatus for the detection of combustible gases in domestic premises - Part 1: Test methods and performance requirements.
- **EN 50194-2-2019** Electrical apparatus for the detection of combustible gases in domestic premises - Part 2: Electrical apparatus for continuous operation in a fixed installation in recreational vehicles and similar premises - Additional test methods and performance requirements. (Only 12 Vdc version)
- **EN 50291-1:2018/AC:2021-01** Gas detectors - Electrical apparatus for the detection of coal monoxide in domestic premises - Part 1: Test methods and performance requirements.
- **EN 50291-2:2019** Electrical apparatus for the detection of carbon monoxide in domestic premises - Part 2: Electrical apparatus for continuous operation in a fixed installation in recreational vehicles and similar premises including recreational craft - Additional test methods and performance requirements. (Only 12 Vdc version)
- **EN 60335-1:2012** Household and similar electrical appliances - Safety - Part 1: General requirements. (Only 230 Vac version)
- **EN 50270:2015/AC:2016-08** Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen.
- **EN 50271:2018** Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies.

In San Sebastián:

JULIO BOUZAS FUENTETAJA
GENERAL MANAGER

Respectful and supportive of the environment

This product complies with European Directive 2012/19/EU WEEE, transposed into Spanish legislation through RD 110/2015 WEEE (Waste Electrical and Electronic Equipment). The Directive provides the general framework valid throughout the European Union for the collection and reuse of waste electrical and electronic equipment. Do not throw this product in the trash at the end of its useful life, take it to your FIDEGAS® distributor or to the collection points authorized by the city councils.

OFFICIAL DISTRIBUTOR

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EXPERTS IN GAS DETECTION