USER MANUAL

GAS DETECTOR

D-30X LW

CO

A F T

ON

Combustible

A F T

SENSOR CO SENSOR

LoRaWAN™

CE

fg fidegas

fg fidegas

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

INDEX

WARNINGS

⚠️ Read carefully the user manual before commissioning or operating.

- Remember that if the detector has been disconnected there may be accumulation of gas during that period that will not be detected.
- There is the possibility of smelling the gas before the equipment triggers the alarm, due to the diffusion process of the gas, which reaches our nose before the detector.
- During the construction, installation or maintenance of the installations, devices must be protected so as to prevent the sensor from damage resulting from work such as welding or paints and should be installed as late as possible, but always before there is a risk of the presence of gas or vapor. If the detectors are already installed, during the works they must be protected by an airtight packaging and clearly pointed out as not in operation.
- Detectors must be protected from vibration, against the risk of mechanical impact and direct exposure to sunlight.
- Do not submerge the remote sensor in water or other liquid under any circumstances.
- Avoid cleaning near the detector with detergents containing bioalcohols, industrial solvents or brighteners with silicones in suspension. To clean the detector use a cloth dampened with clean water only.
- A long exposure to the target gas, even in small concentrations, can dramatically shorten the life of the sensor.
- Overexposure above the detection range can irreversibly damage the sensor.
- Note that the failure to observe these basic precautions can lead to equipment malfunction, the manufacturer is not liable.
- A bad connection can result in a failure of both the detector and associated equipment.
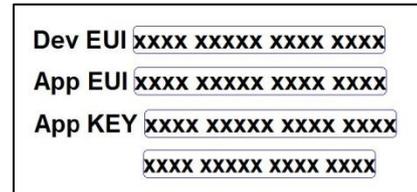- The detector must not be manipulated while it is powered.

WARRANTY

- Warranty three (3) 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 is designed, manufactured and commercialised under the honesty of the after-sales service, controlled within a Quality Management System certified according to ISO 9001:2015 and audited by AENOR.

MARKING

DETECTOR D-30X LW xxxMHz
GAS: CO + NAT Vida útil 5 años
Tensión 110-240Vac 5W   Clase II
Nº Serie: CCCC AAMM XXXX
Fabricado por C.A.E.,S.L. www.fidegas.com

Dev EUI xxxx xxxxx xxxx xxxx
App EUI xxxx xxxxx xxxx xxxx
App KEY xxxx xxxxx xxxx xxxx
xxxx xxxxx xxxx xxxx

1. GENERAL

The D-30X LW domestic gas detector detects the presence of carbon monoxide gas (CO) and combustible gases (methane, butane / propane or hydrogen).

Plug & play installation with integrated power supply.

Indication of mains power supply and indication of alarm, failure and end-of-life for each gas.
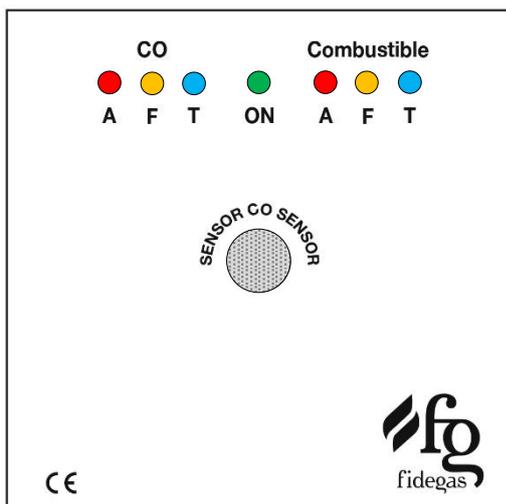
Alarm silence with configurable time.

Easy maintenance by a replaceable sensor system.

Serial communication via Mosdbus RTU protocol for monitoring and configuration.

The detector has implemented radio communication for its integration in LoRaWAN networks. Two different versions are available for 868 MHz or 915 MHz frequencies.

1.1   INDICATIONS

- Green led **ON**: indication of mains power supply.
- Red led **A**: gas alarm indication (one per sensor)
- Yellow led **F**: fault indication (one per sensor)
- Blue led **T**: end-of-life indication (one per sensor)
- Buzzer: sound support for indications

The leds have 5 available states: no operation (OFF), slow flashing (1), medium flashing (2), fast flashing (3) or fixed (ON).

The buzzer beeps can sound at three different speeds: slow (1), medium (2), or fast (3).

1.2 ELEMENTS

Release the detector cover by unscrewing the screw at the bottom of the housing to gain access to the inside of the detector.

- CO sensor
- Buzzer
- Function button
- Modbus connection
- Combustible gases sensor
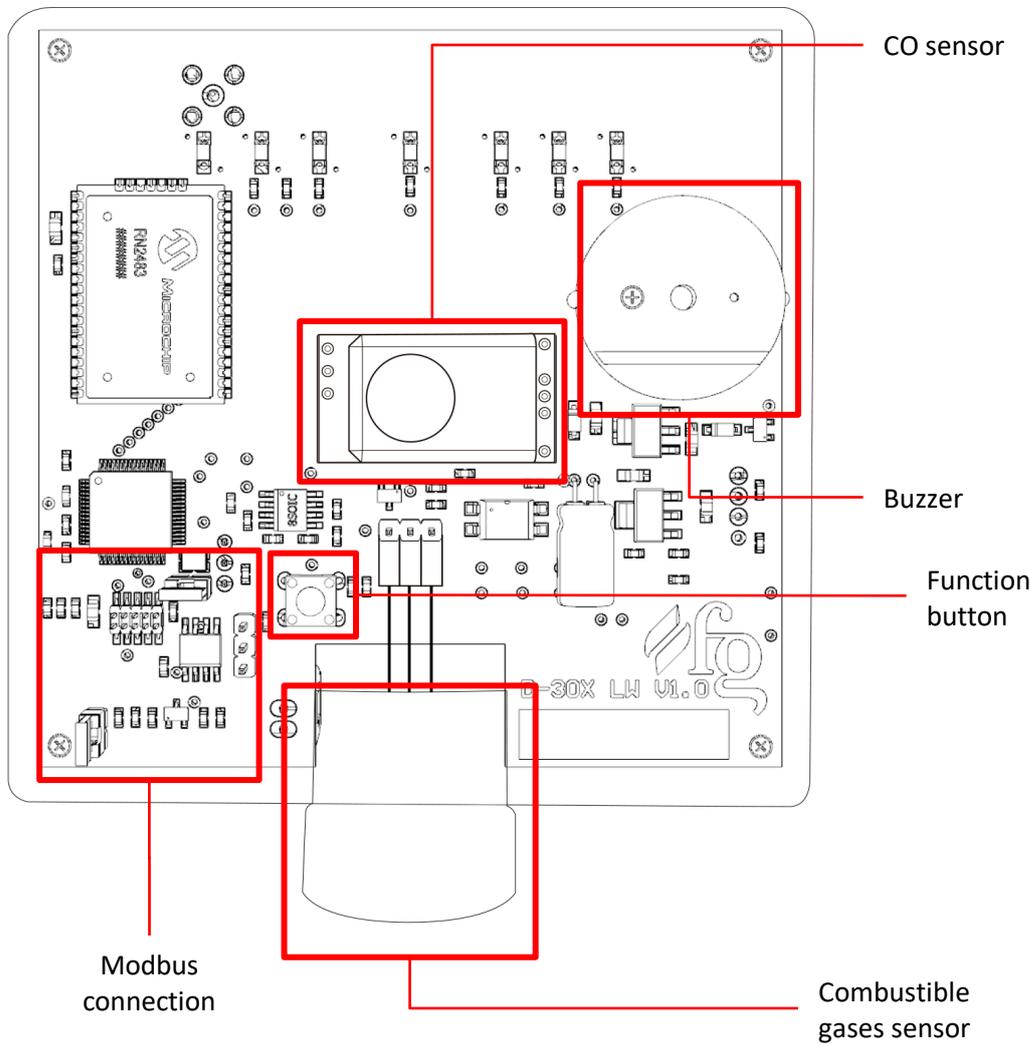
Function button

Between the elements inside the detector, it is located the function button to act with the detector. The button has 4 different pulsations: short, medium, long or very long. Each time a pulsation is made, the green ON led blinks according to the pulsation made. With a short press of the button, the green led blinks slowly, if the pulse is held, the led blinks medium and with a long press the led blinks quickly. If the button is held for a longer time, the pulsation is cancelled by keeping the green led steady.

These are the functions that the button can do:

Detector status	Pulsation	Action
warming adjustment	short	change combustible gas
	long	enters zero adjustment
	very long	no action
alarm	short	silence
	long	send payload
	very long	change sensors mode
normal	short	indications test
	long	send payload
	very long	change sensors mode

During normal operating mode it is possible to perform an indication test with a short pulsation of the function button. The test consists of activating the indications and the buzzer following this sequence:

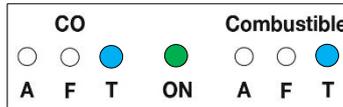| Seconds	Led A CO	Led F CO	Led T CO	Led A CAT	Led F CAT	Led T CAT	Beep
1	ON	x	x	ON	x	x	ON
2	x	ON	x	x	ON	x	x
3	x	x	ON	x	x	ON	x
4	x	x	x	x	x	x	x

X = OFF

2. OPERATION

2.1 WARMING / START-UP

After connecting the detector to the mains voltage, the detector makes an internal check and the sensor warm-up period begins. During this time gas detection is disabled.

Indication of warming time:
(fixed leds)

If after this period all the parameters are correct, the 3 leds start to blink slowly. From this moment on, gas detection is enabled after the joins the LoRaWAN network. The detector indicates every time that tries to connect to the network.

Indicación conexión a red LoRaWAN:
(fixed leds)
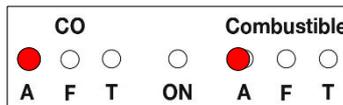
Once the detector is connected to the network, it performs an output test, and it is fully operational.

Indication of operational detector:
(fixed led)
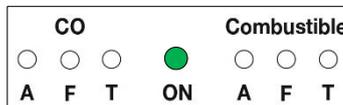
It is recommended to perform a functional test as the final phase of the installation process.

2.2 DETECTION OF CO

The detection of gas CO is done with an electrochemical sensor which achieves a very precise and selective detection within the limits.

The CO alarm conditions depend on the concentration and the exposure time according to the following table based on the EN-50291-1 Standard:

CO concentration	Alarm not before	Alarm before
Level 1 (30 ppm)	120 min.	
Level 2 (50 ppm)	60 min.	90 min.
Level 3 (100 ppm)	10 min.	40 min.
Level 4 (300 ppm)	-	3 min.

Each CO alarm level is indicated according to the concentration detected:

CO concentration	Red led (A)	Buzzer	Payload
Level 1 (30 ppm)	OFF	OFF	Yes
Level 2 (50 ppm)	Slow flashing	Slow	Yes
Level 3 (100 ppm)	Medium flashing	Medium	Yes
Level 4 (300 ppm)	Fast flashing	Fast	Yes

While the detector is in alarm it is possible to silence the buzzer by a short pulsation of the functions button for a predetermined time of 10 minutes. Another short pulsation restores the sound. The Level 4 alarm cannot be silenced for regulatory compliance.

Configurable parameters via Modbus

There are configuration parameters that can be accessed via Modbus. It must be considered that the assigned default values are those that make the detector comply with the regulatory requirements, any change will be the responsibility of the user.

Command		Admissible values	Default values
Test frequency	Number of hours to activate the test warning (Payload). Common for both sensors.	168 - 17520	8760
Alarm level 1	Concentration in ppm for CO alarm level 1	20 - 40	30
Alarm level 2	Concentration in ppm for CO alarm level 2	40 - 75	50
Alarm level 3	Concentration in ppm for CO alarm level 3	75 - 200	100
Alarm level 4	Concentration in ppm for CO alarm level 4	200 - 1.000	300
Persistence level 1	Number of seconds that must remain in alarm level 1 to activate the warning	3000 - 7200	3.900
Persistence level 2	Number of seconds that must remain in alarm level 2 to activate the warning	3000 - 7200	3900
Persistence level 3	Number of seconds that must remain in alarm level 3 to activate the warning	600 - 2400	720
Persistence level 4	Number of seconds that must remain in alarm level 4 to activate the warning	0 -120	2

2.3 DETECTION OF COMBUSTIBLE GASES

The detection of combustible gases is done with a catalytic technology sensor, which is not affected by variations in temperature, atmospheric pressure and humidity, so it achieves very precise gas detection within the limit.

Concentration	Red led (A)	Buzzer	Payload
Level 1 (15 %LEL)	Medium flashing	Medium	SI
Level 2 (100 %LEL)	Fasta flashing	Fast	SI

During the alarm condition it is possible to silence the buzzer by a short pulsation of the functions button for a predetermined time of 10 minutes. Another short pulsation restores the sound.

Configurable parameters via Modbus
There are configuration parameters that can be accessed via Modbus. It must be considered that the assigned default values are those that make the detector comply with the regulatory requirements, any change will be the responsibility of the user.

| Command		Admissible values	Default values
Test frequency	Number of hours to activate the test warning (Payload). Common for both sensors.	168 - 17520	8760
Alarm level 1	Concentration in %LEL for alarm level 1	5 -20	15
Alarm level 2	Concentration in %LEL for alarm level 2	70 - 120	100
Persistence level 1	Number of seconds that must remain in alarm level 1 to activate the warning	0 - 120	5

2.4 FAULTS

The detector has a general fault indication:

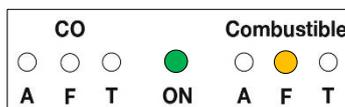Detector fault indicator:
(fixed leds)
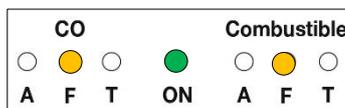
And fault indication for each of the sensors:

CO sensor fault indication:
(fast flashing led)
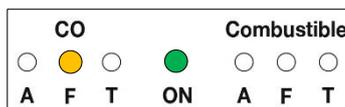
Combustible sensor fault indication:
(fast flashing led)

2.5 TEST AND END-OF-LIFE WARNING

Test warning

Approximately every 6 meses the detector requieres to execute an operational test as indicated in section 7.1 OPERATIONAL TEST. The The detector does not have an indication, but the warning is sent through a Payload.

In this state, the detector continues monitoring the sensors.

En-of-life

The detector indicates the end of life of each sensor, which is calculated with an the operating hours counter. It is recommended to replace the sensors as indicated in section 7.2 REPLACING THE SENSORS. In this state, the detector continues monitoring the sensors.

End-of-life indication for CO sensor:
(fixed led)

End-of-life indication for combustible sensor :
(fixed led)
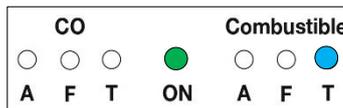
2.6 POWER SUPPLY

The detector is supplied with an integrated 100-240 Vac 50/60 Hz 5W power supply. In case of power loss, the device sends a warning (payload) before turning off.

2.7 LoRaWAN COMMUNICATION

The detector is supplied with LoRaWAN communication 100% configured. The necessary passwords are attached with the detector (Dev EUI, App EUI y App KEY).

The type of communication used is OTAA

While connected to the LoRaWAN network, every 12 hours the detector sends a routine control message (Linckcheck). It is possible to force this transfer (payload) at any time by long pulsation of the function button.

LoRaWAN failure indication
(fast flashing leds)
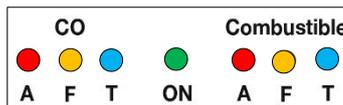
Payload format

Messages sent through LoRaWAN are encoded in two bytes.

The most significant byte corresponds to the status (faults) of the detector, where each bit is associated with a specific type of fault.

> 0: Vcc failure
>
> 1: LoRa transmission failure
>
> 2: CHIP LoRa communication failure
>
> 3: RAM failure
>
> 4: Eeprom failure
>
> 5: FLASH failure
>
> 6: Program failure
>
> 7: General power failure

The less siginifical byte corresponds to the state of the sensors, of which the 4 most significant bits correspond to the CO sensor and the other 4 to the catalytic sensor.

CO Status		COMBUSTIBLE Status	
Value	Meaning	Value	Meaning
0x00	Sensor not adjusted	0x00	Sensor not adjusted
0x10	Sensor OK	0x01	Sensor OK
0x20	Alarm 30ppm	0x02	Alarm
0x30	Alarm 50 ppm	0x03	Overrange
0x40	Alarm 100ppm	0x04	Sensor failure
0x50	Alarm 300ppm	0x05	Test request
0x60	Sensor failure	0x06	End-of-life
0x70	Test request	0x07	Warming adjustment
0x80	End-of-life	0x08	Zero adjustment
0x90	Warming adjustment	0x09	
0xA0	Zero adjustment	0x0A	
0xB0		0x0B	
0xC0		0x0C	
0xD0		0x0D	
0xE0		0x0E	
0xF0	Loss of power	0x0F	Loss of power

Configurable parameters via Modbus

Command		Admissible values		Default values	
		868 MHz	**915 MHz**	**868 MHz**	**915 MHz**
Linkcheck	Number of hours between each routine transmission for communication verification	0 - 255		12	
Frequency	Frequency of the radio communication	863 - 870	902 - 928	868,1	923,3
Power index	The index value for the output power	1 -5	5 -10	5	8
Spreading factor	Value of the spreading factor	7 - 12		12	
Coding rate	String representing the coding rate	4/5 - 4/8		4/5	
Radio watchdog	Time-out length for the watchdog timer (milliseconds)	0 - 4294967295		60000	
Sync byte	Synchronization of the transmission	0 - 255		34	
Band width	Operation radio bandwith	125 KHz 250 KHz ó 500 KHz		125 KHz	
App EUI	Identification of the detector within the LoRaWAN network consisting of 4 registers				
App Key	Identification of the detector within the LoRaWAN network consisting of 8 registers				
Data rate	Value of the data rate	0 - 7	0 - 4	0	0
Retx	Number or retransmissions	0 - 255		3	
Rx 1 delay	Interval in milliseconds for the first receive window	0 - 65535		5000	
Rx 2 data rate	Date rate of the second receive window	0 - 7	8 - 13	0	8
Rx 2 Frec	Frequency of the second receive window	863 – 870	923,3 – 927,5	869,525	924,5
Port radio	Radio communication port	1 - 223		22	
Stop LoRaWAN	LoRaWAN communication can be enabled or disabled			Enabled	
ADR	Adaptative Data Rate can be enabled or disabled			Enabled	
Auto reply	Auto reply can be enabled or disabled			Enabled	
Radio CRC	The state of the CRC header can be enabled or disabled			Enabled	
Radio IQI	The state of the invert IQ can be enabled or disabled			Disabled	

3. LOCATION

Ideally, the detector should be installed in every room that contains a fuel-burning appliance (heater, boiler, stove, etc.). Additional detectors can be installed to ensure that adequate warning is being provided to occupants of other rooms by locating detectors at:

- Remote rooms where occupants are awake for a long time and from which they cannot hear alarms from other detectors elsewhere in the building, and
- In each bedroom.

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

- Place the detector in a room containing a non-draft or open-draft device, and
- Place the detector in a room where the occupant spends most of his time.

If the place for domestic use is a room (a room that uses as a bedroom and a living room) then the detector should be placed as far as possible from the kitchen but close to the area where the person sleeps.

If the detector is in a room not normally used (for example a boiler room), it should be placed just outside the room so that the alarm can be heard more easily.

The detector must be installed in the place to be protected and where gas tends to accumulate, separated by a meter and a half (1.5 meters) from the points of gas consumption or smoke outlet (heaters) and away from air currents.

Between the detector and the point of gas consumption there must be NO obstacles such as a partition, columns, furniture, etc. that prevent the passage of gas to the detector.

Avoid places where dirt can obstruct the gas inlet to the sensor. This coverage area is applied to the perimeter of the gas consumption points, trying to cut the path of the gas in its advance towards the interior spaces.

Natural Gas, Hydrogen and Carbon Monoxide (CO) are gases that are lighter than air, when they escape they rise upwards and accumulate in the upper areas, their dispersion can be difficult. The main component of Natural Gas is Methane and its proportion varies depending on the production process.

TO DETECT METHANE or HYDROGEN and CO: INSTALL THE DETECTOR ON THE CEILING OR SEPARATELY FROM IT AT A DISTANCE OF APPROXIMATELY 15 CENTIMETERS.

LPG is a mixture of gases heavier than air, when it leaks it descends to the ground and accumulates in the lower areas, its dispersion can be difficult. The main components of LPG are Butane and Propane, and their proportion varies depending on the process of obtaining from oil.

TO DETECT LPG (BUTANE / PROPANE), INSTALL THE DETECTOR 10 - 20 CENTIMETERS FROM THE GROUND.

When choosing the position in which the detector is to be placed, it must be taken into account that:

- It should be possible to see all indicator lights from the surroundings.
- If the detector is to be mounted on the wall, it should be placed close to the ceiling, at a height greater than the maximum height of any door or window and at least 150mm from the ceiling.
- If the detector is to be mounted on the ceiling, it should be at least 300mm from any wall.
- It should be at a horizontal distance of between 1 m and 3 m from 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.
- Detectors located in bedrooms and in rooms away from fuel burning appliances should be located relatively close to the breathing zone of the occupants.

In addition, the following warnings should be taken into account when locating the detectors and avoid installing them under the following conditions:

- In a confined space (for example, in a closet or behind a curtain);
- Where it can be obstructed (for example, by furniture);
- Directly above a drain;
- Near a door or window;
- Near a fan or exhaust fan;
- Right above / below a sink;
- Near cooking appliances;
- Near a draft or other similar vents;
- In a damp or wet place;
- Where dirt and dust can obstruct the gas inlet to the sensor;
- Places where the temperature may be lower than -10ºC or exceed 55ºC.

4. TECHNICAL DRAWING

SECTION C-C

SECTION D-D
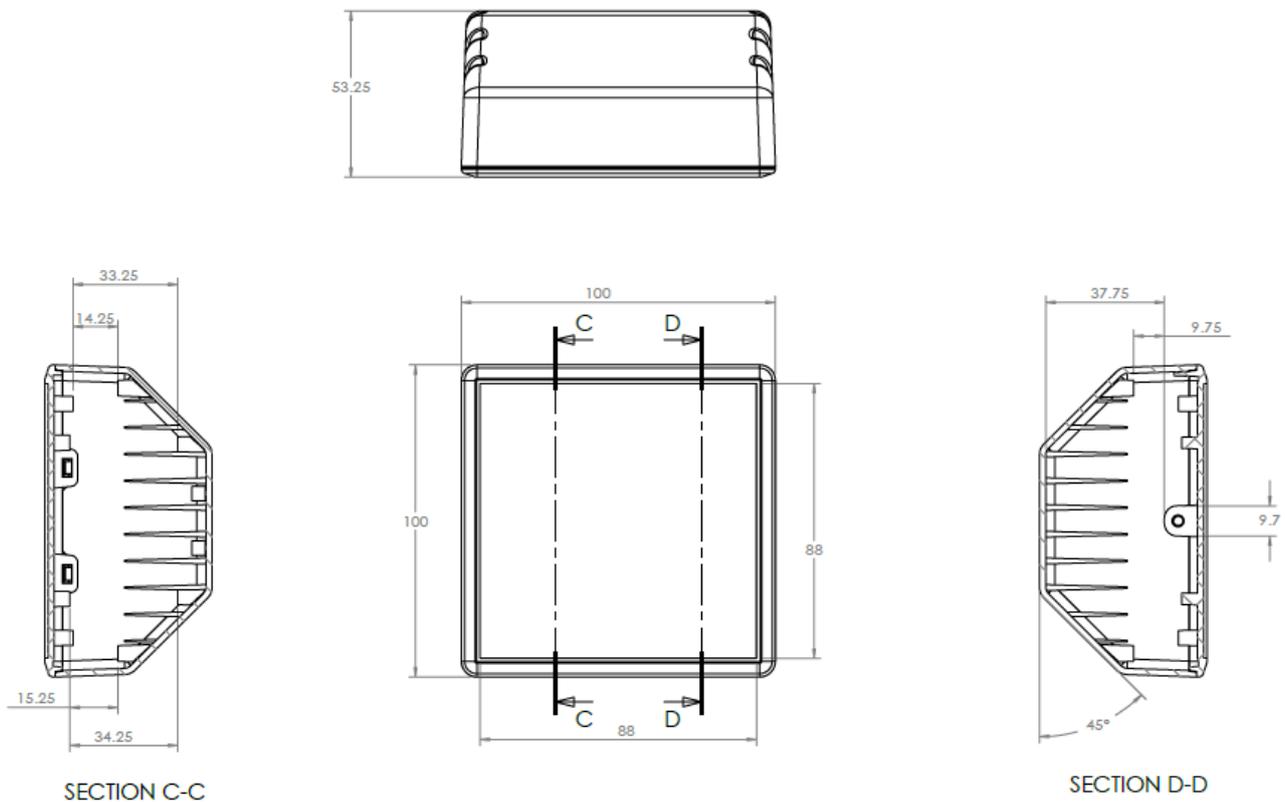
5. WHAT SHOULD BE DONE IN CASE OF AN ALARM

5.1 COMBUSTIBLE GAS ALARM OR SMELL GAS

Keep calm, and carry out the following actions:

– Extinguish all naked flames, including all smoking material;

– Turn off all gas appliances;

– Do not switch on or off any electrical equipment, including the gas detection apparatus;

– Turn off the gas supply at the gas main control and/or (with a LGP supply) the storage tank;

– Open doors and windows to increase ventilation;

– Do not use a telephone in the building where the presence of gas is suspected.

If the alarm continues to operate, even after an alarm resetting action where appropriate, and the cause of the leak is not apparent and/or cannot be corrected, vacate the premises and INMEDIATELY NOTIFY the gas supplier and/or the gas emergency 24 h-service in order that the installation may be tested and made safe, and any necessary repair carried out.

If the alarm stops and the reason for the alarm having operated is identified, (for example a gas tap switched on with the burner unlit), after stopping the gas release and ensuring that all appliances are turned off, the main gas supply may be reinstated.

5.2 ALARMA DE CO

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

1   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;

2   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;

3   get medical help for anyone suffering the effects of CO poisoning and advise that CO inhalation is suspected;

4   telephone the appropriate appliance servicing and/or maintenance agency 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.

6. EFFECTS OF CO ON HEALTH

6.1 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 produced by given exposure.

CO is rapidly absorbed through the lungs, diffuses across the alveolar capillary membrane and is reversibly bound with haemoglobin as carboxyhaemoglobin (COHb), however, a minute amount is present in the plasma. The affinity of haemoglobin for CO y 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. The half-life while breathing room air is 2 h – 6,5 h depending on the initial COHb level.

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:

Health effects of COHb blood levels on healthy adults

% COHb	Effects
0.3 – 0.7	Normal range in non-smokers due to endogenous CO production
0.7 – 2.9	No proven physiological changes
2.9 – 4.5	Cardio-vascular changes in cardiac patients
4 – 6	Usual values observed in smokers, impairment in psychomotor tests
7 – 10	Cardio-vascular 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, impairment in visual acuity, nausea, muscular weakness, dizziness
40 – 50	Convulsions and unconsciousness
60 - 70	Coma, collapse, death

6.2 CHRONIC EFFECTS ON HIGH RISK GOUPS

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

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

A number of high-risk groups are particularly sensitive to the effects of CO because of various organ impairments or specific changes, mainly:

a) Those whose oxygen carrying capacity is decreased due to anaemia or other haemoglobin disorders;

b) Those with increased oxygen needs such as those encountered in fever, hyperthyroidism or pregnancy;

c) Those with systemic hypoxia due to respiratory insufficiency;

d) Those with heart disease and any vascular insufficiency

6.3 NORMAL COHb LEVELS

Under normal conditions, humans typically have low levels of COHb of between 0,3% and 0,7% present within the body. These levels are considered neither beneficial nor harmful.

6.4 TOBACCO SMOKING

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

> This apparatus is designed to protect individuals from the acute effects of CO exposure. It will no fully safeguard individuals with specific medical conditions. If in doubt consult a medical practitioner.

7. MAINTENANCE

7.1 OPERATIONAL TEST

The purpose of the operational test is not to check the accuracy of the of the measurement, but that the sensors are capable of detecting the target gas at safe concentrations. For this purpose, the TEST KIT FIDEGAS® is used to apply a known and approximate gas concentration, which must be detected by each sensor and activate the alarm.
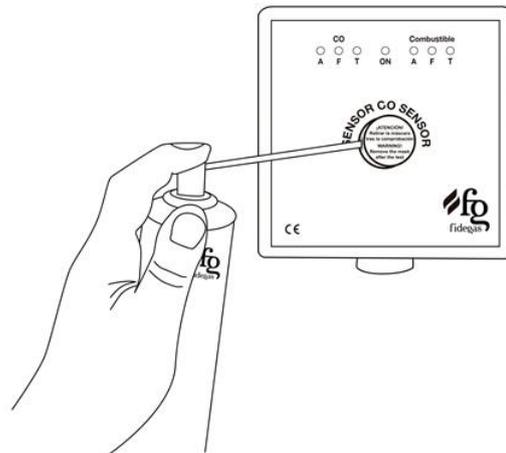

⚠️ Do NOT use gas lighters or flammable vapours that could lead to wrong conclusions.
When the test kit indicates low pressure, more time of gas release will be needed to perform the test. When the test spray indicates no pressure it is invalid for further testing

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1. Take the mask out of the Test Kit and place it on the corresponding sensor.

2. Insert the cannula (tube) into the hole of the mask and dropo gas during 2 and 3 seconds, wait 5 seconds for the alarm to be triggered. In case the alarm indication is NOT activated, repeat the process releasing more gas.

3. Then remove de mask and store it together with the Test Kit.
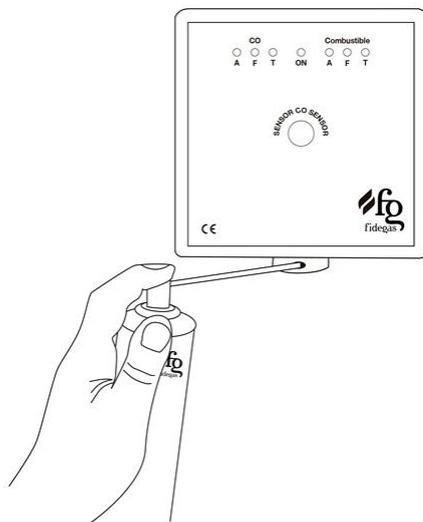
Gas application to combustible gas sensor   Gas application to CO sensor

7.2 REPLACING THE SENSORS

It is recommended to replace both sensors at the end of their useful life or after failure of the operational test.


1. Disconnect the detector from the power supply
2. Remove the combustible sensor by pulling the base down.
3. Open the detector cover by unscrewing the lower screw.
4. Remove the CO sensor.
5. Put the two new sensors in their locations.
6. Connect the detector to power.

7. Press the function button for a long time to enter warming mode. At this moment a message is sent (payload) and it is indicated as follows:
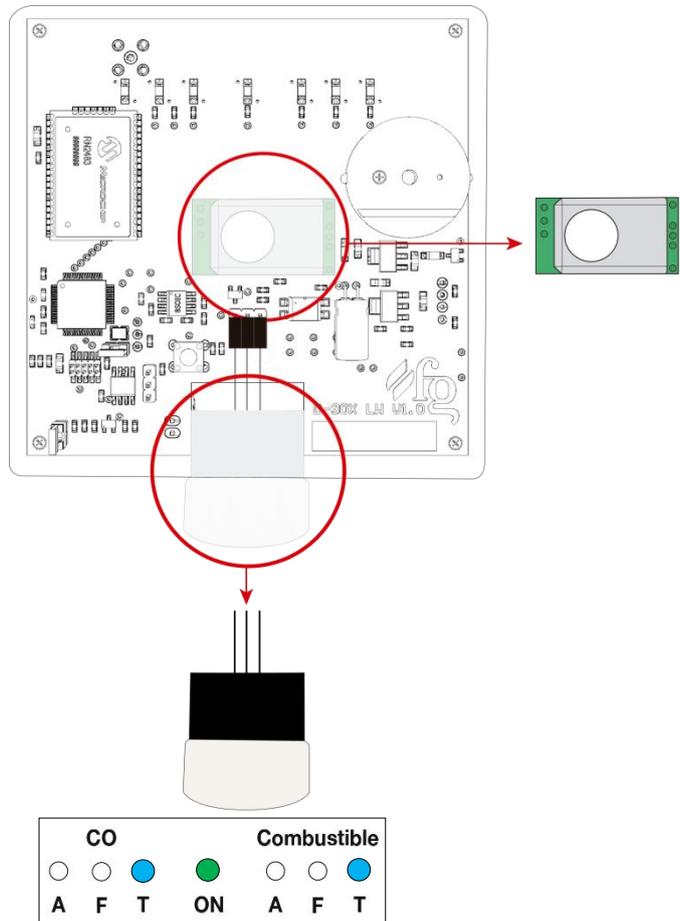
   Indication of warming period :
   (fast flashing leds)

The sensors need a period of about 5 hours to be able to perform the automatic adjustment process and begin to detect gas. This time can be canceled by a long pulsation of the function button.

8. Combustible gas selection: at this time it is possible to change the combustible gas to which the detector is to be adjusted, by default it will be adjusted to the gas that the previous sensor was adjusted to. Short pulsations of the function button toggle between methane, butane / propane gas or hydrogen.

Methane	Butane/propane	Hydrogen
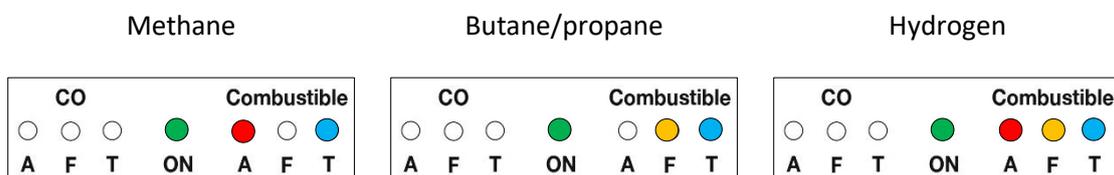
9. Sensor adjustment: once the warming and sensor adjustment period has ended, the detector remains operational and sends a message (payload) to confirm it.
10. Close the cover and screw in the lower screw.

8. STANDARD APPLIED

The D-30X LW gas detector has been designed following the guidelines of the following standards:

- **EN 50194-1:2009** Electrical apparatus for the detection of combustible gases in domestic premises -- Part 1: Test methods and performance requirements

- **EN 50291-1:2018** Gas detectors - Electrical apparatus for the detection of carbon monoxide in domestic premises - Part 1: Test methods and performance requirements

- **EN 50270:2015** 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

9. TECHNICAL CHARACTERISTICS

Power Supply	100-240 Vac 50/60 Hz
Power	5 W
CO alarm	50 / 100 / 300 ppm
Combustibles alarm	15 %LEL
Lifetime	Five (5) years in clean air approximately
Connectivity	Radio LoRaWAN Modbus RTU
Temperature range	-10 a 55 ºC
Serial code	C C C C: Product code Y Y M M: Manufacturing Year and Month X X X X: Manufacturing Number
Dimensions	100 x 100 x 53 mm
Weight	200 gr

Respetuosos y Solidarios con el Medio Ambiente

Este producto cumple con la Directiva europea 2012/19/UE WEEE, transpuesta a la legislación Española a través del RD 110/2015 RAEE (Residuos de Aparatos Eléctricos y Electrónicos). La Directiva proporciona el marco general válido en todo el ámbito de la Unión Europea para la retirada y la reutilización de los residuos de los aparatos eléctricos y electrónicos. No tire este producto a la basura al final de su vida útil, llévelo a su distribuidor FIDEGAS® o a los puntos de recogida habilitados por los ayuntamientos.

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