

- If CO concentration overruns 20PPM, the function of temperature display will be disable.

3.3 CO alarm warning

When the device detects a dangerous level of CO, the device will emit a loud alarm pattern. The alarm signal pattern is 4 beeps followed by 2 seconds of silence. The ALARM indicator (red) will flash the same pattern. This cycle repeats as long as a dangerous CO condition exists.

Alarm sensitivity setting:

Conforms to EN 50291-1:2018

30PPM : Without alarm before 120 minutes

50PPM : Alarm between 60 to 90 minutes

100PPM : Alarm between 10 to 40 minutes

300PPM : Alarm within 3 minutes

NOTE: Refer to "3. What to do if the alarm sounds" when you hear the sounds of the CO alarm warning.

3.4 CO alarm warning silence

During the device under CO alarm mode, pressing the TEST/SILENCE button, it will be paused alarm sound of the device about 10 minutes. The ALARM indicator (red) will keep flash as CO alarm mode, it indicates the device is running into the CO alarm silence mode.

NOTE: The audible alarm signal will reactivate about 10 minutes from the time the TEST/SILENCE button is operated where the concentration of CO surrounding the alarm remains at 50 PPM or greater.

NOTE: The audible alarm signal cannot to silence if the alarm at concentration above 200 PPM.

NOTE: The alarm silencing activation to once throughout a CO alarm period.

WARNING! Before enable feature of CO alarm warning silence, you should be confirmed that the alarm is due to dangerous levels of carbon monoxide and the dwelling should be ventilated.

3.5 Low battery voltage warning

If the device chirps once every 40 seconds, with FAULT indicator (yellow) will be flash. It indicates the battery is low. The LCD displays always displays "🔋".

NOTE: When the low battery voltage warning is occur, the device has capable of producing a CO alarm signal for at least 4 min or 30 days of low battery voltage warning signal operation.

NOTE: The device will not protect against the risk of carbon monoxide poisoning when the battery has drained.

3.6 Low battery voltage warning silence

When the device is under the low battery warning, pressing the TEST/SILENCE button, it will come into a low battery voltage warning silence status for about 9 hours, meanwhile it will appear "🔋" on LCD, and FAULT indicator (yellow) still keep flashing.

NOTE: The silence feature of low battery voltage warning is temporary action to cancel warning sound effect, you need replace the battery as soon as possible.

3.7 Fault warning

If the device chirps twice every 40 seconds with FAULT indicator (yellow) will be flash. It indicates the CO alarm is in malfunction condition. The LCD displays "Err", that means your CO alarm have no detecting function and no respond CO.

NOTE: Maybe the sensor is missing, replace the device immediately. Please contact us to more service.

3.8 Fault warning silence

When the device is in a fault state, press the TEST/SILENCE button, it will enter the fault warning mute state for about 9 hours, while displaying "🔊" on the LCD, and the FAULT indicator (yellow) remains flashing.

NOTE: The silence feature of fault warning is a temporary action to cancel warning sound effect, you need replace the device as soon as possible.

3.9 End-of-life warning

If the device chirps 3 times every 40 seconds with FAULT indicator (yellow) flash and the LCD displays 'End'. It indicates end of life of CO alarm. You need to immediately replace the CO alarm.

3.10 End-of-life warning silence

When the device is in the End-of-life state, press the TEST/SILENCE button, it will enter the End-of-life warning mute state for about 9 hours, while displaying "🔊" on the LCD, and the FAULT indicator (yellow) remains flashing.

NOTE: The silence feature of fault warning is a temporary action to cancel warning sound effect, you need replace the device as soon as possible.



EN MANUAL CARBON MONOXIDE ALARM

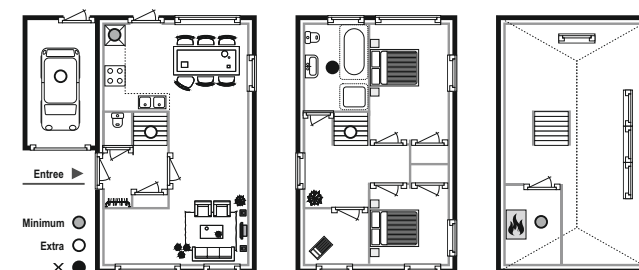
CBFC28



- Reliable electrochemical sensor
- Incl. 2x 1,5V batteries
- Silence mode
- Low-battery indicator
- End-of-life indicator

The alarm should be installed by a competent person.

This apparatus is designed to protect individuals from the acute effects of carbon monoxide exposure. It will not fully safeguard individuals with specific medical conditions. If in doubt consult a medical practitioner.



Type B apparatus
EN50291-1:2018



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Thank you for purchasing the CBFC28 carbon monoxide (CO) alarm.

This unit uses advanced electrochemical sensor, and with LCD digital display for CO concentration. Please take a few minutes to thoroughly read the user manual before operating or servicing and familiarize yourself and your family with its operation. And save for future reference.

CAUTION:

This CO alarm is designed for indoor use only. Do not expose to rain or moisture. Do not knock or drop the detector. Do not open or tamper with the alarm as this could cause malfunction. The alarm will not protect against the risk of carbon monoxide poisoning when the battery has drained. Installation of the alarm should not be used as a substitute for proper installation, use and maintenance of fuel burning appliances including appropriate ventilation and exhaust systems.

WARNING! - Do NOT try to repair the device, it has the risk of electric shock or malfunction if the device is tampered with.

Table of Contents

1. Installation instructions
2. Product overview
3. Understanding your CO alarm
4. What to do if the alarm sounds
5. Battery installation/replacement
6. General maintenance
7. Carbon monoxide overview
8. Specification

1. INSTALLATION INSTRUCTIONS

1.1 Installation location

If you install one CO detector, make sure the alarm can be heard from all rooms. Mount in the room with a combustion appliance at a central horizontal distance between 1 and 3 metres from the CO source. At least 30 centimetres from surrounding walls and not next to incoming ventilation ducts. In a room without a combustion appliance, breathing, sitting and walking height (1.1m - 1.8m) is recommended.

CAUTION: This alarm should be installed by a competent person.

1.2 Mounting step

1. Drilling two $\phi 5.0$ mm holes in the wall, the distance between two holes center is 52mm, then inserting two plastic stopper provided into the holes.
2. Insert the two screws provided until the screw heads are

approximately 5mm from wall.

3. Test the unit by using the TEST/SILENCE button. Ensure the unit sound is alarm pattern.
4. Hook the unit over the screws onto keyholes in back of unit.

1.3 Recommended installation locations:

The following suggestions are intended to help you with the placement and installation of your CO alarm.

- Place out of the reach of children. Under no circumstance should children be allowed to handle the CO alarm.
- Install in a bedroom or hallway located close to the sleeping area. Take special care to verify the alarm can be heard in sleeping areas.
- It is recommended that a CO alarm be installed on each level of a multilevel home.
- Locate 1~3 meter (3.3~10feet) away from all fuel burning appliances.
- Placing at eye level allows for optimum monitoring of the red and green indicator lights.
- Insure that all vents of the unit are unobstructed.
- Do not install in dead air spaces such as peaks of vaulted ceilings, or gabled roofs.
- Do not install in turbulent air from ceiling fans.
- Do not place near fresh air vents or close to doors and windows that open to the outside.
- Keep the CO alarm away from excessively dusty, dirty, or greasy areas such as kitchens, garages and furnace rooms. Dust, grease and household chemicals can affect the sensor.
- Keep out of damp and humid areas such as the bath room.
- Avoid spraying aerosols near the CO alarm.
- Do not install in areas where the temperature is below -10°C or hotter than 45°C .
- Do not place behind curtains or furniture. CO must be able to reach the sensor for the unit to accurately detect CO.

2. PRODUCT OVERVIEW

2.1 FAULT indicator

The FAULT indicator (yellow LED) is used to indicate fault or warning status of the CO alarm.

2.2 POWER indicator

The POWER indicator (green LED) is used to indicate power status of the CO alarm. The POWER indicator will flash every 40 seconds.

2.3 ALARM indicator

The ALARM indicator (red LED) is used to indicate alarm status of the CO alarm.

2.4 TEST/SILENCE button

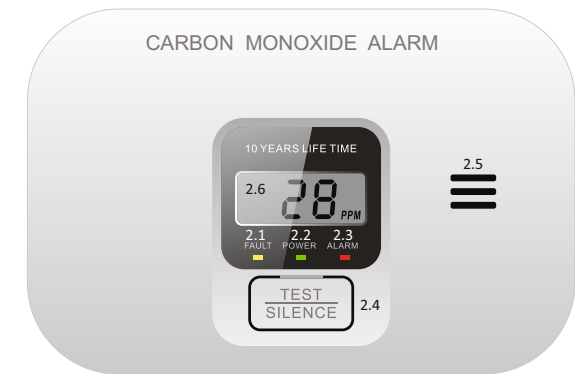
The TEST/SILENCE button is used to test the unit. Press and hold to enable TEST function.

2.5 Alarm sounder

The alarm sounder is used to send out CO alarm warning and fault warning information.

2.6 LCD screen

Indicates CO concentration and alarm status.



3. UNDERSTANDING YOUR CO ALARM

3.1 Start up

When first power on, the POWER indicator (green) flash every second, This is preheated state, 60 seconds later the POWER indicator (green) flashing every 40 seconds indicates the unit is functioning properly. The LCD displays all segments 4s and count down. When the countdown is "0", the product goes into normal operation.

3.2 Normal operation

- The POWER indicator (green) flashing once every 40 seconds.
- The LCD alternately displays current CO concentration and temperature every 40s.
- CO concentration display range $0\sim 999\text{PPM}$.
- If the CO concentration is under 20PPM , the LCD will display "0PPM".
- If the CO concentration overruns 999PPM , the LCD will display "999PPM".
- Temperature display range: $-9\sim 50^{\circ}\text{C}$.

3.11 Test the device

When the device under normal operation status, you can test the device by TEST/SILENCE button, PRESS and HOLD the TEST/SILENCE button, you should hear alarm sound pattern (<85dB) and with a corresponding ALARM indicator (red) flash. After the eighth sound, the device will issuing a normal alarm volume (>85dB). Test process will stop when release the button. The LCD displays all segments during testing.

NOTE: After the TEST/SILENCE button is enabled, the alarm sounds and the red alarm light flashes. This does not indicate that CO is present.

NOTE: Test the device every year! If at any time your device does not perform as described, replace it immediately.

3.12 Automatic brightness adjustment

Automatic brightness adjustment of POWER indicator (green). If the ambient brightness is very low (night, indoor & lights off). The flashing brightness of the POWER indicator (green) will be reduced, so as to reduce the impact of the standby indicator light on people.

NOTE: This function does not affect the brightness of the ALARM indicator (red) and the FAULT indicator (yellow).

3.13 Weekly test

Recommend test the alarm weekly by pressing the TEST/SILENCE button to ensure the normal operation of the equipment.

3.14 Alarm memory

48 hours alarm memory function. When the device detects CO and alarms, when the device return to standby mode, and the CO concentration <20PPM, LCD displays "AL" and ALARM indicator (red) flash per 40 seconds. After press TEST/SILENCE button or after 48 hours, will reset the historical memory function and enter normal operation status.

4. WHAT TO DO IF THE ALARM SOUNDS

WARNING! Actuation of your CO alarm indicates the presence of Carbon Monoxide (CO) which can KILL YOU.

4.1 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;

4.2 If the alarm continues to be activated, then evacuate the premises. Leave the doors and windows open, and only

reenter the building when the alarm has stopped. In multioccupancy and multi-storey premises, ensure that all the occupants are alerted to the risk;

4.3 Get medical help for anyone suffering the effects of carbon monoxide poisoning, and advise that carbon monoxide inhalation is suspected;

4.4 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 carbon monoxide 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.

5. BATTERY INSTALLATION/REPLACEMENT

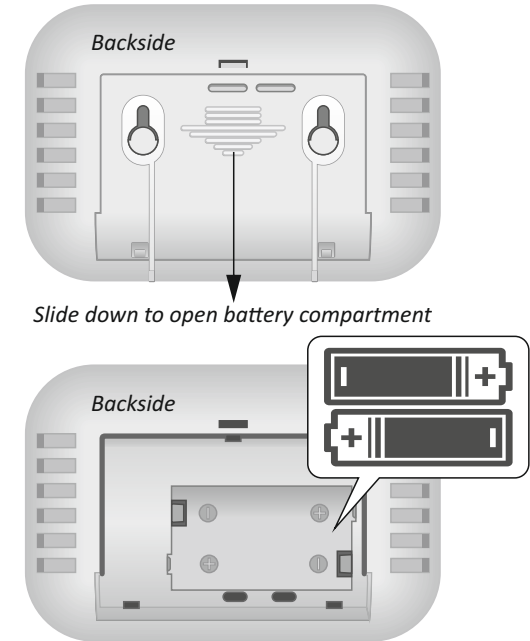
Once chirps with corresponding FAULT indicator (yellow LED) flashing once every 40 seconds indicates that the battery is low battery, you must to replace with battery specified, please see "8. Specification" To install or replace the battery in unit, please perform the following steps:

- 5.1** Take down the unit from screw heads of the wall.
- 5.2** Open battery compartment.
- 5.3** Remove the old batteries, and replace by new batteries.
- 5.4** Put the battery into the battery box.
- 5.5** Hook the alarm over the screw heads onto keyholes in back of the unit.
- 5.6** Test alarm using the TEST/SILENCE button, if the testing alarm is ok, means the product can work normally.

WARNING! Use only the battery specified. Use of different battery may have a detrimental effect on the CO alarm. A good safety measure is to replace the battery at least once a year.

CAUTION: Please replace new 2pcs same type batteries in the meantime.

CAUTION: Test the alarm for correct operation using the TEST/SILENCE button, whenever the battery is replaced!



6. GENERAL MAINTENANCE

To keep your CO alarm in good working order, please follow these simple steps:

- 6.1** Verify the unit's alarm sound and indicators operation by enable the TEST/SILENCE button once a week.
- 6.2** Remove the unit from the wall and clean the alarm cover and vents with a soft brush attachment once a month to remove dust and dirt.
- 6.3** Never use detergents or other solvents to clean the unit.
- 6.4** Avoid spraying air fresheners, hair spray, or other aerosols near the CO alarm.
- 6.5** Do not paint the unit. Paint will seal the vents and interfere with the sensor's ability to detect CO. Never attempt to disassemble the unit or clean inside. This action will void your warranty.
- 6.6** As soon as possible, place the CO alarm back in its proper location to assure continuous protection from carbon monoxide poisoning.
- 6.7** When household cleaning supplies or similar contaminants are used, the area should be ventilated.

WARNING! The following substances can affect the sensor and may cause false actions: methane, propane, isobutene, isopropanol, ethylene, benzene, toluene, ethyl acetate, hydrogen sulfide, sulfur dioxides, alcohol based products, paints, thinner,

solvents, adhesives, hair sprays, after shaves ,perfumes and some cleaning agents.

WARNING! Your CO alarm will not be operational and will not monitor for CO levels without battery.

WARNING! This apparatus is designed to protect individuals from the acute effects of carbon monoxide exposure. It will not fully safeguard individuals with specific medical conditions. If in doubt consult a medical practitioner.

7. CARBON MONOXIDE (CO) OVERVIEW

7.1 Toxic effects

Carbon monoxide (CO) is a colourless, odourless, nonirritating gas classified as a chemical asphyxiant and whose toxic action is a direct result of the hypoxia produced by a 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 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. The half-life while breathing room air is 2h - 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 exposure.

The effects of different saturation blood COHb 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

Source: U.S. Environmental Protection Agency 1984

The relationship between the CO concentration and the duration of exposure can be calculated for a given %COHb, by parameterising the above factors.

7.2 Chronic effects on high risk groups

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. Carbon monoxide 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:

- 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 systemic hypoxia due to respiratory insufficiency;
- those with heart disease and any vascular insufficiency.

WHO guidance states that in order to protect non-smoking, middle-aged and elderly population groups with documented or latent coronary artery disease from acute ischaemic heart attacks, and to protect the foetuses of non-smoking pregnant women from untoward hypoxic effects, a COHb level of 2.5% should not be exceeded. The following WHO guideline values and periods of time-weighted average exposures have been determined in such a way that the COHb level of 2.5% is not exceeded, even when a normal subject engages in light or moderate exercise:

100 mg/m ³ (90 ppm) for 15 min.
60 mg/m ³ (50 ppm) for 30 min.
30 mg/m ³ (25 ppm) for 1 h.
10 mg/m ³ (10 ppm) for 8 h.

7.3 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.

7.4 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%.

WARNING! Exposure to high levels of carbon monoxide can be fatal or cause permanent damage and disabilities.

WARNING! The device may not prevent the chronic effects of carbon monoxide exposure, and that the device will not fully safeguard individuals at special risk.

8. SPECIFICATION

Model	: CBFC28
Product standards	: EN 50291-1:2018
Type of apparatus	: Type B
Power Supply	: 3V (2pcs AA alkaline battery)
Recommend battery type	: GP GN15A or ENERGIZER E91 (The normal service life is 3years)
Sensor Type	: Electrochemical
Product life	: 10 years after manufacture
Standby Current	: <20µA (average)
Alarm Current	: <50mA (average)
Operation Ambient Condition	: -10 ~ +45°C, 25 ~ 95%RH
Storage/Transport Ambient Condition	: -20 ~ +50°C, 10 ~ 95%RH
Alarm sound	: ≥85DB at 3m
Low Battery warning silence	: about 9 hours
Installation Location	: wall
Detection range	: Max. 40 m ² within a room.
Size	: 120*80*37 ± 1mm
Weight	: 102 ± 5g (net)

NOTE: This CO alarm is designed to detect carbon monoxide gas from any source of combustion. It is not designed to detect any other gas.