English

User's Manual

Mk9

CO_2 Safety System

LOGICO O_2

Please note that whenever installing or disconnecting a system, refer to this manual first!

Table of contents

IMPORTANT

All persons responsible for the use and maintenance of this equipment must read and understand the safety and operating information contained in this guide. Installation and service of this equipment should be performed only by professionals. The function of the equipment will be impaired if it is not properly installed.

LogiCO2 bears no legal responsibility for the functionality of the CO2 Safety System if installed by a company that has not been certified by LogiCO2.

The purpose of CO2 detection

CO2 is a colorless, odorless gas which normally exists at a concentration of about 0.04% in the air we breathe. CO2 gas does not support life and in concentrations above 4% it has dangerous effects (IDLH). The equipment that stores and uses CO2 is designed for normal safe operation when properly maintained. But leaks may cause High concentrations of CO2 creating unsafe conditions.

The equipment that stores and uses CO2 is designed for normal safe operation when properly maintained. Leaks may cause High concentrations of CO2 creating unsafe conditions. CO2 is 1 ½ times heavier than air. It will concentrate in low areas posing a risk of asphyxiation/suffocation to anyone in or entering those areas. The quantity of gas in relation to the size of a room or space is what defines if an area is to be considered a confined area.

The CO2 Safety System continuously monitors CO2. The system is designed to monitor CO2 gas concentration and to provide an alarm at four pre-set elevated levels.

CO2 concentration levels (%) and effects

(%)	Effect
20.0	Death within a few seconds.
10.0	Convulsion, Unconsciousness, Death.
7.0	Dizziness, Vomiting, Headache, Reduced blood supply to brain.
4.0	IDLH -Immediate Danger to Life and Health.
3.0	Normal exhale concentration; increased breath and pulse rates.
1.0	Shortness of breath possible.
0.5	Maximum for working conditions (TWA 8 hr. PEL).
0.1-0.2	Recommended max value in public areas.
0.04	Fresh air.

TWA (Time Weighted Average)

In most countries the Hygienic Limit Value over 8 hours/day is 0,5% or 5000 ppm. It is considered unhealthy to be exposed to more than this value during an 8-hour working day. In Europe there is EU Legislation regarding TWA. (Patented measuring method).

US Safety Codes and Norms

Notification level		CO2 Concentration or fault indicator	Reference regulatory code
1	Awareness Alert	5000 ppm (0.5%)	2015 International Fire Code
2	Alert	5000 ppm (0.5%) 8-hour Time Weighted Average	National Fire Protection Association 55 and OSHA
3	Pre-Alarm	15000 ppm (1.5%)	National Board Inspection Code part 1 supplement 3
4	Full Alarm	30000 ppm (3.0%)	National Board Inspection Code part 1 supplement 3 and short term exposure limit defined by ACGIH and NIOSH

II General Description

Product description, performance and intended use

The Carbon Dioxide (CO2) Safety System is designed to measure CO2 concentration in a confined space environment. It is designed to provide an alarm in the event that a CO2 level exceeds the preset alarm levels.

The basic Mk 9 CO2 Safety System is a precision instrument comprising one central unit (with a digital display), one (up to eight) sensor unit/s, warning lamp/s and horn/s. A separate power supply (100-240 VAC) supplies power to the system. Please observe that you have to connect the appropriate plug adaptor to the power supply depending on which country you are in. The sensor uses infrared analysis for detecting CO2. The system provides visible indication of CO2 levels in the area where the sensor is located.

When installed properly, the CO2 Safety System will continuously monitor the CO2 concentration where a sensor unit is located. A green light emitting diode (LED) on the central unit indicates normal safe conditions. If ambient conditions at the sensor unit reach a CO2 concentration level of 1.5% (preset low alarm), the central unit will emit an intermittent audible tone and the « low alarm » red LED will blink and a remote warning lamp will be activated. This will also happen if the TWA for 8 hours also reaches 5000 ppm. The difference can be acknowledged on the display.

A properly connected system will begin to operate immediately after a Self-diagnostics program has been made by the System, when plugged into to a (100-240V AC) power outlet. No additional start-up procedure or adjustment is necessary.

In the event of a system fault, the yellow « error » LED is activated and a beeping tone will be made by the Central Unit. The error will be described in the display until the fault has been rectified and cleared/ reset on the central unit.

In case of Alarm, the buzzer in the Central Unit may be muted by pressing the reset button shortly.
The alarm can only be totally cleared/reset when the CO2 level drops below 1.5% (the low alarm). At a Low Alarm, one person, supervised by another, may check for the leakage cause.
If ambient conditions at the Sensor reach a concentration level of 3% or more, the Central Unit's High Alarm will activate a constant sound signal, the red LED will light continuously and the digital display will show ALARM. **The room in which the sensor is located must not be entered when the CO2 concentration is over 3%!**
Emergency services must be contacted!

Temperature monitoring

Selectable Temperature Alarm
The Sensor Unit has a temperature alarm function that can be activated via the DIP-switches on the Sensor. If activated, the current temperature at the Sensor will be shown on both the Central Unit and the Sensor. The temperature alarm is activated if the temperature at the Sensor is lower or higher than +1°C to +10°C / +34°F to +50°F. For more information, see the CO2 Sensor section.

The functions of the Central Unit

The Central Unit is multi-lingual. The measurements from the sensor(s) and alarm indications are shown on the display. An information text for all Alarm and Error conditions is also shown on the display. If more sensors are connected their values are also displayed, indicating which sensor the value is from. On the right side of the display, there is a sound mute/reset and test button .
The Central Unit also has an alarm memory that remembers and reactivates any alarm after a power interruption.

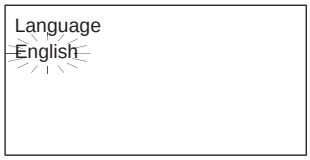
LED (Light Emitting Diode) indications
Red: CO2 concentration Alarm
Yellow: Error
Green: The system is active

General Description II

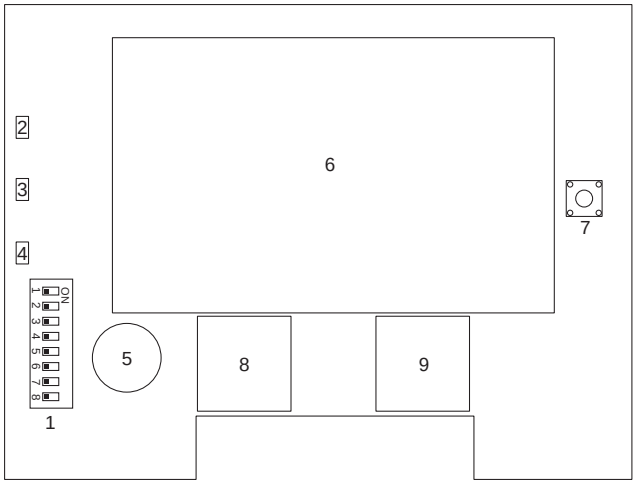
Internal buzzer
The built-in buzzer has two different sounds:
1. Beeping sound indicates Low Alarm (warning) and Error.
2. Continuous sound indicates High Alarm (danger)

Reset button
A short push on the reset button mutes the internal buzzer during an alarm situation. Push and hold the reset button for approximately 4 seconds to clear/ reset an alarm. “Alarm Cleared!” is shown in the display.
To test all alarm indications (horn/strobe/LED/buzzer), push and hold the reset button for approx. 10 seconds. “Testing system...” is shown in the display.

Changing the display language
Disconnect the power. Push and hold the Reset button, connect the power and keep the Reset button pushed for approximately 5 seconds. The display shows now: “Language” and blinking “English”, which is the default language. Push the Reset button shortly to browse through the different languages. To select a language, wait approximately 3 seconds, the display will switch to the standard view. Finished.



Internal layout



Central Unit	Function/Indication
1. DIP-switch	Setting number of connected CO2 Sensors
2. LED yellow	Fault
3. LED red	Blinking: Low Alarm – Fixed: High Alarm
4. LED green	Power ON
5. Buzzer	Alarm
6. Display	Measurement and alarm information
7. Mute/Reset/Test button	Mute/Reset/Test button
8. RJ45 input connector	Power and communication
9. RJ45 output connector	Power and communication

DIP-switch settings
All DIP-switches are set to OFF as default.

Default functions/settings:
- Connection to one CO2 Sensor

The number of connected CO2 Sensors is set on dip-switch 1-3. Dip-switch 4-8 are not used and must be in position OFF.

II General Description

Number of sensors	Dip1	Dip2	Dip3	Dip4-8 Not used
1	OFF	OFF	OFF	
2	ON	OFF	OFF	
3	OFF	ON	OFF	
4	ON	ON	OFF	
5	OFF	OFF	ON	
6	ON	OFF	ON	
7	OFF	ON	ON	
8	ON	ON	ON	

Display information during start-up:

Software version

LogiCO2 Central unit
FW:1420*

Cycle/Start-up

ID CO2 TWA TEMP
1 Heating…

FW = Firmware version

Normal display information:

One CO2-sensor is attached

ID CO2 TWA*1 TEMP*2
1 0.04% 400 5 °C

*1 *TWA (Time Weighted Average): Average CO2 exposure over 8 hours.*

*2 *Temperature measurement is only shown when temperature alarm is enabled on the CO2 sensor.*

Display information during CO2 alarm mode:

CO2 Alarm

ID CO2 TWA
1 ALARM 440ppm

Information text…*

CO2 concentration is shown in highlighted text

ID CO2 TWA
1 3,14% 440ppm

Information text…*

* Information text is only shown during alarm or error situations.*

Display information at CO2 alarm levels over 6% CO2:

CO2 concentrations that exceed the CO2 Sensors measuring range gives the following display indications, together with continuous red LED and internal buzzer.

CO2 Alarm

ID CO2 TWA
1 ALARM over 6% CO2

TWA ALARM

CO2 Sensor display

High Alarm
CO_2 hi. %

Display information during TWA Alarm:

CO2 TWA Alarm

ID CO2 TWA
1 0,14% ALARM

Information text…*

CO2 TWA concentration shows in highlighted text

ID CO2 TWA
1 0,14% 5444PPM

Information text…*

* Information text is only shown during alarm or error situations.*

Alternating display information during temperature alarm mode:

Temperature alarm

ID CO2 TWA TEMP*
1 0.04% 400 ALARM

Temperature shows in highlighted text

ID CO2 TWA TEMP*
1 0.04% 400 21 °C

* Temperature measurement is only shown when temperature alarm is enabled on the CO2 sensor.*

Display information during Error alarm mode:

CO2 Central display together with blinking yellow LED and intermittent internal buzzer.

Fault in the CO2 Sensor measuring device

ID CO2 TWA
1 Out of range

Information text…*

* Information text is only shown during alarm or error situations.*

Error codes:

Fault message	Measures
Out of range	CO2-measuring fault. Check CO2-Sensor. Exchange CO2-Sensor.
Sensor error	Internal fault in CO2-Sensor. Check CO2-Sensor. Exchange CO2-Sensor.
No sensor found	Communication error. Check communication cabling. Check CO2-Sensor. ID number.

The functions of the CO2 Sensor

The displays shows measured values and alarm indications. The display alternates between CO2 (0.0%- 6,7%), TWA (ppm) and temperature (°C or °F), if temperature alarm is enabled.

LED (Light Emitting Diode) indications

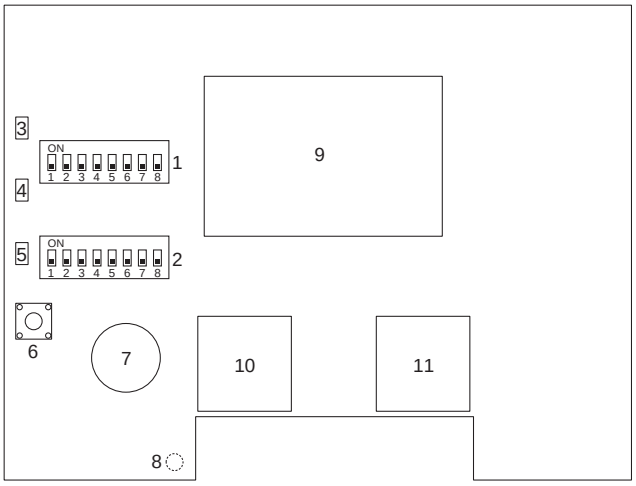
Red: CO2 concentration Alarm
Yellow: Error
Green: The system is active

Internal buzzer

The built-in buzzer has two different sounds:

1. Intermittent sound indicates Low Alarm (warning) and Error.
2. Continuous sound indicates High Alarm (danger)

Internal layout



CO2 Sensor	Function/Indication
1. DIP-switch 1	Setting of alarm levels and alarm functions
2. DIP-switch 2	Service mode and communication settings
3. LED yellow	Fault
4. LED red	Blinking: Low Alarm – Continuous: High Alarm
5. LED green	Power ON
6. Service button	Service functions
7. Buzzer	Intermittent: Low/Error. Continuous: High Alarm
8. Temperature sensor (backside of PCB)	Temperature monitoring and alarm
9. Display	Measurement and alarm information
10. RJ45 input connector	Power and communication
11. RJ45 output connector	Alarm outputs

DIP-switch settings

All DIP-switches are set to OFF as default.

Default functions/settings:

- CO2 Awareness Alert	0,5%
- CO2 Low Alarm	1,5%
- CO2 High Alarm	3%
- CO2 TWA Alarm	5000ppm
- Temperature alarm	OFF
- Communication address/ID	1

The CO2 alarm levels and functions are set on DIP-switch 1. Low alarm activates the strobe (flash) and high alarm activates the alarm horn. Temperature alarm (if selected) and CO2 TWA alarm are classified as Low alarms.

CO2 “Awareness Alert” (>5000 ppm CO2) is default activated. To deactivate: set switch no. 2 on DIP2 in ON-position. CO2 “Awareness Alert” is indicated by 0,5 sec. beep every 4,5 sec. in the CO2 Sensor Unit and blinking text “High” and “%” on the display.

II General Description

DIP-switch 1, Dip 1-4

"Low" alarm	"High" alarm	Dip1	Dip2	Dip3	Dip4
1,5%	3%	OFF	OFF	OFF	OFF
0,5%	0,5%	ON	OFF	OFF	OFF
0,5%	1%	OFF	ON	OFF	OFF
0,5%	1,5%	ON	ON	OFF	OFF
0,5%	3%	OFF	OFF	ON	OFF
1%	1%	ON	OFF	ON	OFF
1%	1,5%	OFF	ON	ON	OFF
1%	3%	ON	ON	ON	OFF
1,5%	1,5%	OFF	OFF	OFF	ON
3%	3%	ON	OFF	OFF	ON

DIP-switch 1, Dip 5-8

Function	Dip5	Dip6	Dip7	Dip8
Temp alarm OFF	OFF			
Temp alarm ON	ON			
Temp format: °C		OFF		
Temp format: °F		ON		
CO2 TWA alarm ON			OFF	
CO2 TWA alarm OFF			ON	
TWA Alarm 5000 ppm				OFF
TWA Alarm 2500 ppm				ON

Service and communication functions are set on DIP-switch 2.

DIP-switch 2, Dip 1,2 and 8

Function	Dip1	Dip2	Dip8* Not used
Service mode OFF	OFF		
Service mode ON	ON		
Awareness Alert 5000 ppm ON		OFF	
Awareness Alert 5000 ppm OFF		ON	

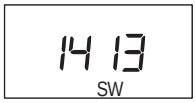
** DIP8 is not used and must be in position OFF.*

DIP-switch 2, Dip 3-7

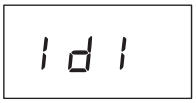
Communication address	Dip3	Dip4	Dip5	Dip6	Dip7
1	OFF	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	OFF
3	OFF	ON	OFF	OFF	OFF
4	ON	ON	OFF	OFF	OFF
5	OFF	OFF	ON	OFF	OFF
6	ON	OFF	ON	OFF	OFF
7	OFF	ON	ON	OFF	OFF
8	ON	ON	ON	OFF	OFF

Display information during start-up:

Software version



Communication address



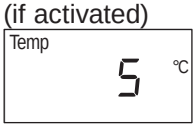
Heating/Start-up

Alternating display information during no alarm mode:

CO2 concentration

CO2: TWA*

Temperature (if activated)

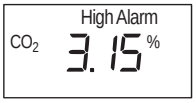


**TWA (Time Weighted Average): Average CO2 exposure over the latest 8 hours*

Display information during alarm mode:

CO2 Low Alarm

CO2 High Alarm

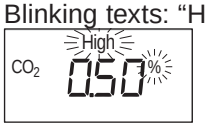


CO2 High Alarm over 6% CO2

**Out of range – Extremely high CO2 concentration: Over 6% CO2 concentration.*

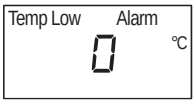
CO2 Awareness Alert if activated:

Blinking texts: "High" and "%".

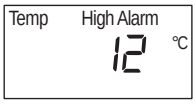


CO2 TWA Alarm

Temperature to cold*



Temperature to warm*



**Temperature alarm – only if temperature alarm is activated.*

OBSERVE!

"All persons responsible for the operation and maintenance of this equipment must read and understand the safety and operating information contained in this guide. Installation and service of this equipment should be performed only by professionals. The function of the equipment will be impaired if it is not properly installed."
Disconnection from supply source: When installing the CO2 Safety System to the power net, please ensure that the fuse that the system runs on is clearly marked. This makes it easy to disconnect the power to the system, if needed.

Plug the power supply into an electrical supply outlet **before** carefully taking the components out of the box, this to insure that it runs correctly **before** installation. **NOTE: Be aware of the very high sound from the horn.**
Notice that all LEDs on the Central Unit and the Sensor will illuminate and the built-in buzzers will beep during start-up, this is part of the Self-diagnostics program. After approximately 3 seconds all external horns and/or strobes (connected to the Sensor) will be activated for approximately 5 seconds.

Determine proper location for system components

CO2 Sensor

- The CO2 sensor should be placed in the room where CO2 equipment is being used/distributed and/or where CO2 is likely to accumulate in the event of leak. Please observe that this does not necessarily have to be where the CO2 is stored, for example when the CO2 is stored outside.
  NOTE: CO2 is a heavy gas that will collect in low areas and in confined spaces.

  One sensor unit will monitor an area up to about 5 meters from the place that it is mounted, therefore it is important/essential to place the sensors in the correct places.
  It is VERY IMPORTANT to be aware that the danger is always in relationship to how much CO2 is used (stored) in relationship to the volume of the room in question.
  It does NOT have to be BULK CO2 STORAGE CONTAINERS to be dangerous!!!

  NOTE: If a room only has mechanical ventilation, it should have a sensor, since the ventilation can be turned of.

  The sensor should be mounted 12" / 30 cm from the floor to the bottom of the sensor. It should be installed horizontally on a wall with the cable outlets pointing downwards, so it has clear exposure to room air but is mounted away from ventilation inlets or outlets. Its digital display should be clearly visible. Try to position the Sensor where it will be out of the way of moving objects. Use the supplied screws and wall anchors.

- A warning Horn/Strobe, must be located where it is clearly visible at any entrance to the area being monitored. This may require more than one Horn/Strobe.
  A Horn/Strobe should also be mounted on the wall above the sensor.

Central Unit

Place the Central Unit horizontally on a wall with the cable outlets pointing downwards, in a dry location. It should be placed at a height where it can be easily seen but where it is least likely to be damaged by items such as mop handles or boxes being moved. Use the supplied screws and wall anchors.

- The Central Unit must be placed outside the area or room being monitored, preferably in the manager's office. If the Central Unit is placed in the manager's office it is recommendable that a Horn/Strobe is mounted outside the door to make the personnel observant that there is an alarm situation.

  NOTE: The Central Unit and Sensor(s) are connected to each other by cables that may need to be disconnected for purposes of cable routing or installing a longer cable. **When reconnecting cables make sure they are properly reconnected to their proper connectors. Refer to the connection diagram on page 12 for assistance.**

Try to route all conductor cables in cable conduits for a neat and safe installation.

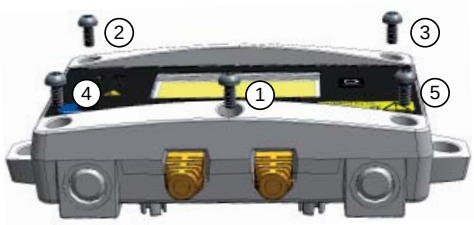
- Be sure the reset button can be pushed without obstructions.

III Installation

- Mount the Plug-lock so that the power supply cannot be disconnected without the use of mechanical tools.
- Make sure the Central Unit is not placed in the risk area that is being monitored!

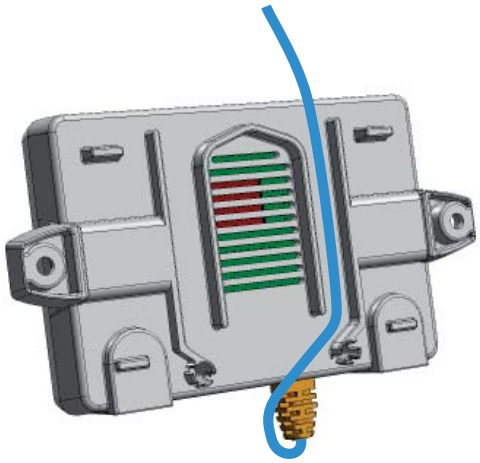
Removal of the cover

If the cover of the Central Unit or Sensor Unit needs to be removed please observe the following order of screw reassembling.



Installation suggestion

Route the cables in the cable channels on the back of the enclosure.



Horn/Strobe

The CO2 Safety System is equipped with a pre-wired Horn/Strobe. Its power cord has a blue connector at the end terminal that is connected to the splitter, marked with a blue dot.

1. Mount the horn/strobe in a proper location above the CO2 sensor. Refer to the description and diagram on page 12.

Warning Beacon (Optional US)

The CO2 Safety System is equipped with an optional prewired warning beacon. Its power cord has a blue connector at the end terminal that is connected to the splitter, marked with a blue dot.

1. Separate the beacon from its mounting base using a counter clockwise twist.
2. Mount the base in a proper location using screws through the knockouts on the « back » of the base. Refer to the following description and diagram on page 12.
3. Attach the beacon to its base using a clockwise twist.

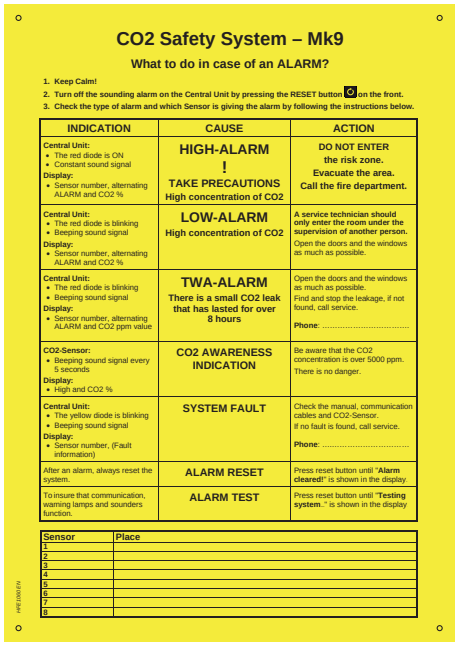
An additional beacon can be added, if necessary, at another entrance to the room being monitored. Simply add a 1-2 splitter and connect the second unit.

To ensure proper operation, the combined distance between (farthest) Warning Beacon, Horn/Strobe, Sensor Unit, and Central Unit, should not exceed 300 m (980 feet).

The warning signs provided with the CO2 Safety System

All signs must be mounted in a secure, permanent way to eliminate any risk that they fall down.

Sign 1: ”CO2 Safety System - What to do” should be placed next to the Central Unit.



CO2 Safety System – Mk9

What to do in case of an ALARM?

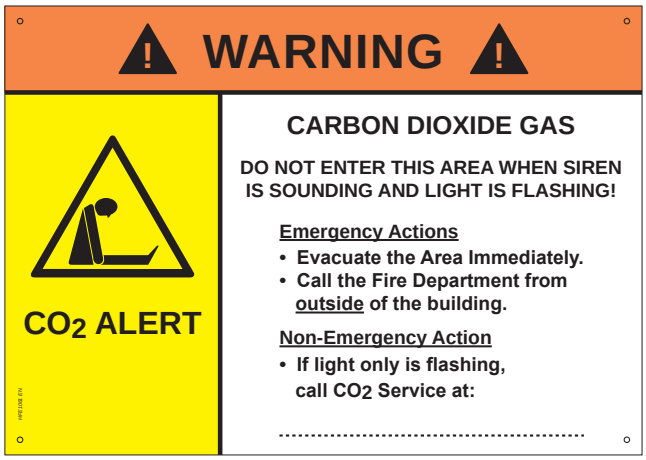
1. **Keep Calm!**
2. **Turn off the sounding alarm on the Central Unit by pressing the RESET button on the front.**
3. **Check the type of alarm and which Sensor is giving the alarm by following the instructions below.**

INDICATION	CAUSE	ACTION
Central Unit: • The red diode is ON • Constant sound signal **Display:** • Sensor number, alternating ALARM and CO2 %	**HIGH-ALARM** **!** **TAKE PRECAUTIONS** **High concentration of CO2**	**DO NOT ENTER the risk zone.** **Evacuate the area.** **Call the fire department.**
Central Unit: • The red diode is blinking • Beeping sound signal **Display:** • Sensor number, alternating ALARM and CO2 %	**LOW-ALARM** **High concentration of CO2**	**A service technician should only enter the room under the supervision of another person.** Open the doors and the windows as much as possible.
Central Unit: • The red diode is blinking • Beeping sound signal **Display:** • Sensor number, alternating ALARM and CO2 ppm value	**TWA-ALARM** **There is a small CO2 leak that has lasted for over 8 hours**	Open the doors and the windows as much as possible. Find and stop the leakage, if not found, call service. **Phone**: .....
CO2-Sensor: • Beeping sound signal every 5 seconds **Display:** • High and CO2 %	**CO2 AWARENESS INDICATION**	Be aware that the CO2 concentration is over 5000 ppm. There is no danger.
Central Unit: • The yellow diode is blinking • Beeping sound signal **Display:** • Sensor number, (Fault information)	**SYSTEM FAULT**	Check the manual, communication cables and CO2-Sensor. If no fault is found, call service. **Phone**: .....
After an alarm, always reset the system.	**ALARM RESET**	Press reset button until "**Alarm cleared!**" is shown in the display.
To insure that communication, warning lamps and sounders function.	**ALARM TEST**	Press reset button until "**Testing system**.." is shown in the display

Sensor	Place
1	
2	
3	
4	
5	
6	
7	
8	

Sign 2: ”WARNING” should be placed next to the Horn/Strobe.

Alarm functionality: CO2 Awareness Indication 5000 ppm (0.5%): Local warning on Sensor only.
TWA 5000 ppm: White Horn/Strobe flashes - Call service.
Low Alarm 1.5%: White Horn/Strobe flashes - Call service.
High Alarm 3.0%: White Horn/Strobe sounds - Evacuate area. Call the fire department.



WARNING

CO_2 ALERT

CARBON DIOXIDE GAS

DO NOT ENTER THIS AREA WHEN SIREN IS SOUNDING AND LIGHT IS FLASHING!

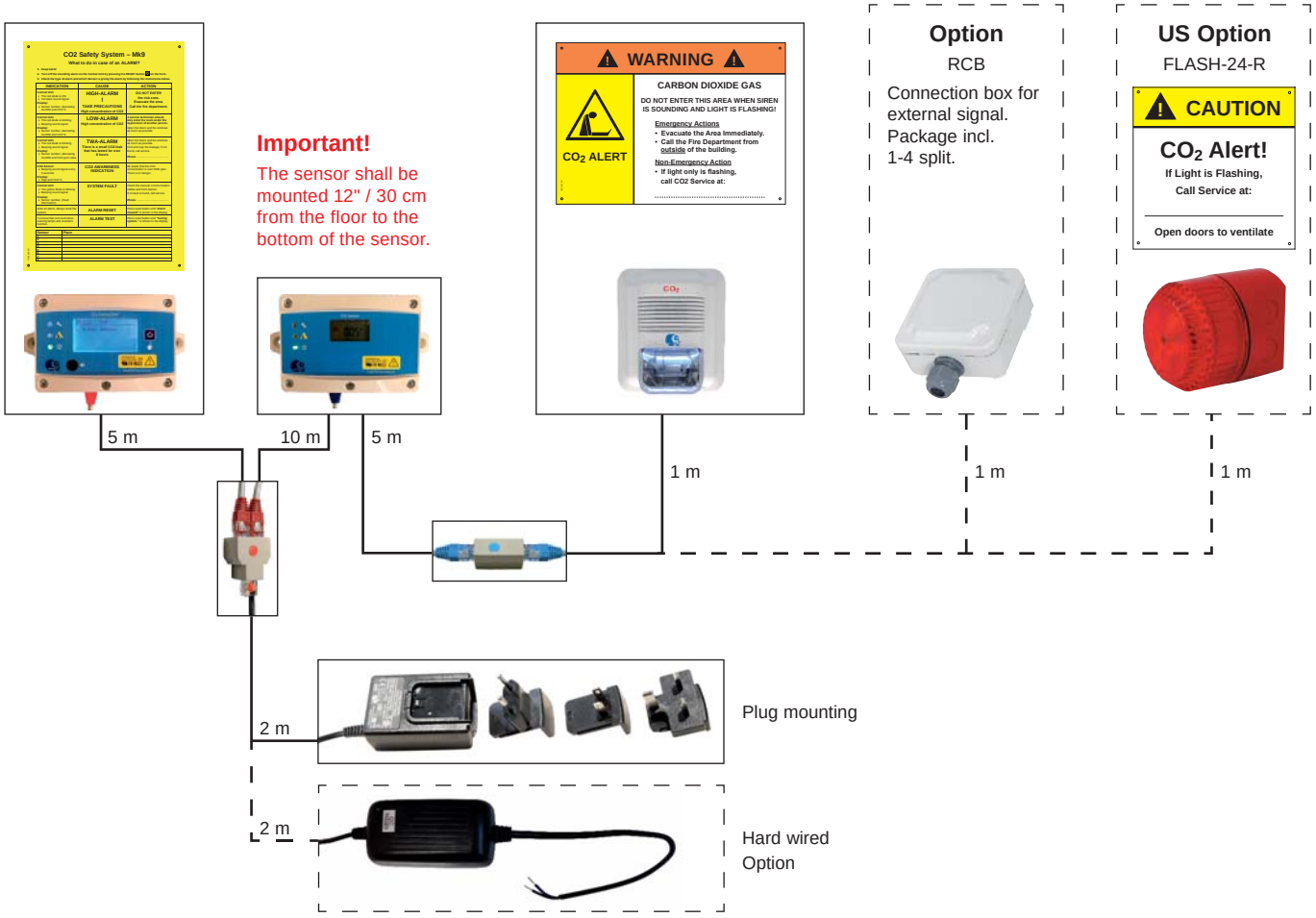
Emergency Actions
- **Evacuate the Area Immediately.**
- **Call the Fire Department from outside of the building.**

Non-Emergency Action
- **If light only is flashing, call CO_2 Service at:**

.....

IV Connection Diagrams

Connection diagram



Please OBSERVE! The hard wire option is not intended for the US market.

OBSERVE!

- The Mk9 CO2 Safety System is compatible with the earlier MkVII (Mk7) system.
- The CO2 Alert Mk10 can also be connected to the system.

Function and installation check for the Mk9 CO2 Safety System

Store Name (Store Number)	
Address	
City	
State / Region	
Zip Code	
Country	
Date of inspection	
Service Provider's Company Name	
Repair Company Name (if different)	

Power supply control

If a plug-in power supply is used, make sure that the Plug-lock is mounted in a way to eliminate the risk for the power supply to be un-plugged.

	YES	NO
Is it a hardwired power-supply (directly connected to the power network without any plug, OBSERVE not for the US)?		
Is it a plug-in power supply?		
If it is a plug-in power supply, is the plug-lock securely mounted (or any other mechanical system that eliminates the risk for the power supply to be un-plugged)?		

Central Unit

The Central Unit must be mounted at a height and where it is easily reachable (to control/reset the system and to read the values/messages). The sign "What to do" must be mounted in a permanent manner (NOT TAPE) next to the Central Unit so that the personnel can easily read it. Phone number of the Service Provider responsible if there is a CO2 Leak should be registered on the "what to do sign".
When the Central Unit is running properly, the green diode (ON) is ON, and the screen should display the CO2 levels of the CO2 Sensor or Sensors that are connected.

	YES	NO
Is the Central Unit mounted in a way that makes it easy to read?		
Is the "What to do" sign mounted next to the Central Unit and is it easily readable?		
Is the "What to do" sign mounted in a permanent way?		
Is the phone number of the Service Provider which is responsible if there is a CO2 leak written on the "What to do" sign?		
Is the green diode ON?		
Is the yellow diode (Error) ON?		
Is the red diode (Alarm/Alert) ON?		
Is any Error Message displayed? if yes, what is it: ……..		

V Function/Installation check

CO2 Values displayed on the Central Unit

When the System is running properly, the CO2 level measured by each sensor is displayed in % (actual value) and in ppm (Time Weighted Average over 8 hours). The values are displayed sequentially on the second line of the display. The first character displayed is the Sensor ID, the value is displayed after.

	Value in %	Value in ppm
Sensor 1		
Sensor 2		
Sensor 3		
Sensor 4		
Sensor 5		
Sensor 6		
Sensor 7		
Sensor 8		

CO2 Sensor check

Each Sensor should be mounted not higher than 30cm/12 inches from the floor in the lowest part of the room. The Sensor should be mounted within 5 m from the potential CO2 Leak Source. The Warning Lamp should be mounted so that it can easily be seen by the restaurant personnel without entering the zone at risk. If there is a door leading to a lower area, for example, a basement, then a sensor is also needed in this area, to insure CO2 Safety in that area. Under normal conditions the CO2 value displayed, should read between 0.03% and 0.2%.

Sensor 1

Sensor serial number (normally written on a sticker on the side of the Sensor housing and/or on the Sensor board => if necessary, open the lid).	
CO2 Value on Sensor	%
CO2 TWA on Sensor	ppm

	YES	NO
Is the green diode ON		
Is the yellow diode ON		
Is the red diode ON		
Is the Horn/Strobe or Warning Lamp mounted at a height of 2.1-2.5 m/6.9-8.2 ft so that the staff can see it without any obstructions in the way?		
Is there a CO2 Warning Sign mounted next to the Horn/Strobe or Warning Lamp, with a telephone number to the service provider?		
Is the CO2 Warning Sign next to the Horn/Strobe or Warning Lamp mounted in a permanent way?		
Is a Horn/Strobe installed above the Sensor at a height of 2.1-2.5 m/6.9-8.2 ft?		
Is there a CO2 Warning Sign mounted next to the Horn/Strobe?		
Is this CO2 Warning Sign, next to the Horn/Strobe, mounted in a permanent way?		

Horn/Strobe with sign

Warning Lamp with sign

Sensor 2

Sensor serial number (normally written on a sticker on the side of the Sensor housing and/or on the Sensor board => if necessary, open the lid).	
CO2 Value on Sensor	%
CO2 TWA on Sensor	ppm

	YES	NO
Is the green diode ON		
Is the yellow diode ON		
Is the red diode ON		
Is the Horn/Strobe or Warning Lamp mounted at a height of 2.1-2.5 m/6.9-8.2 ft so that the staff can see it without any obstructions in the way?		
Is there a CO2 Warning Sign mounted next to the Horn/Strobe or Warning Lamp, with a telephone number to the service provider?		
Is the CO2 Warning Sign next to the Horn/Strobe or Warning Lamp mounted in a permanent way?		
Is a Horn/Strobe installed above the Sensor at a height of 2.1-2.5 m/6.9-8.2 ft?		
Is there a CO2 Warning Sign mounted next to the Horn/Strobe?		
Is this CO2 Warning Sign, next to the Horn/Strobe, mounted in a permanent way?		

VI Ordering Service and Parts

Service and maintenance

1. Should be performed only by authorized professional service agents who are familiar with the CO2 Safety System and all pertinent safety and service procedures. Contact your representative for the name of the authorized service agent(s) in your area.

2. Since this is a Safety Product we recommend that a function check be performed on the CO2 Safety System by a qualified professional service agent at least once every year.

3. The CO2 Safety System has no user serviceable parts. All service work should be performed by an authorized professional agent.

4. NOTE: Any attempt to service the equipment by unauthorized persons or to perform unauthorized modifications will void the warranty.

5. **The Sensor and Central Unit housing must NEVER be opened by unauthorized personnel.**

6. Cleaning is done by use of water on a moistened cloth.

Ordering parts or service

Description	Item code
CO2 Mk9 Detector SET 4 A	2049

CO2 Mk9 Detector SET 4 A consists of:
CO2 Central Unit Mk9
Cable red 5m
CO2 Sensor Mk9
Cable red 10m
Cable blue 5m
Horn/Strobe LED with 1m cable
RJ45 1-1 split
RJ45 1-2 split
Transformer 1A
Plug-UL for transformer
Plug-CE for transformer
Plug-AU for transformer
Plug-UK for transformer
Plug-lock
Bag with 6 screws and plug
Sign CO2 Safety System Mk9
Sign Horn/strobe Mk9/10
Installation manual Mk9
Quick-guide Mk9

For parts or service contact your local authorized supplier or equipment service agent.

Environmental conditions for system

a) For indoor use.
b) Calibrated for altitude up to 2 000 m.
c) Ambient temperature 0 °C to +40 °C.
d) Maximum relative humidity 95 % (non condensing).
e) MAINS supply voltage fluctuations up to ±10 % of the nominal voltage.
f) TRANSIENT OVERVOLTAGES up to the levels of OVERVOLTAGE CATEGORY II.
NOTE 1 These levels of transient overvoltage are typical for equipment supplied from the building wiring.
g) Pollution degree 2.

Ingress protection

CO2 Sensor	IP54 (TÜV)
CO2 Central Unit	IP54 (TÜV)
Warning lamp	IP54 (CE)
Horn/Strobe	IPX0

Symbol explanations

Please note that whenever installing or disconnecting a system, refer to this manual first!

Double insulation protected equipment may also be called “Class 2”.

Symbol for the marking of electrical and electronic equipment.
(The symbol indicating separate collection for electrical and electronic equipment).

VII Specifications

CO2 SENSOR

Power supply:	24V DC
Power consumption:	No alarm status: 56 mA Alarm status: 68 mA (external optional warning lamp not included)
Wiring connections:	RJ 45
Digital interface:	RS485 serial port – MODBUS
Display:	LCD
Acoustic signal-strength:	76 dBa (1m) max.
Approval:	Manufactured in accordance with DIN 6653-2. The CO2 Safety System is tested by the German TÜV-Rheinland. EN 50081-1 / EN 50082-2 /CE. Certified by UL.
Operating principle:	Non-dispersive infrared (NDIR) and thermistor
Temperature range:	0 to +40°C (+32°F to +102°F)
CO2 measuring range:	0-3 Vol.%
Extended CO2 range:	3-6,7 Vol.%
Gas sampling mode:	Diffusion
TWA:	Time Weighted Average (TWA) calculation 8 h time span (most recent) with 2 min sample period. (Pat. Pend.)
Accuracy	
Temperature:	±1°C (±1.8°F)
Resolution:	1°C (1.8°F)
CO2:	±5% of measured value up to 3% CO2. @ ambient temperature 15-30°C The Accuracy is for altitudes under 2000 meters
Resolution:	0.01 Vol.%
Annual zero point drift:	<0.01 Vol.% with automatic self calibration feature
Ambient temperature:	0-40°C (+32°F...102°F)
General performance	
Compliance with:	2004/108/EG Sensor Life expectancy: > 15 years
Operating humidity range:	0 to 95% RH (non condensing)
Warm-up time (@ 22°C):	1 min.
Dimensions (LxWxD):	90 x 161 x 38 mm / 3.5” x 6.3” x 1.5”
Ingress protection:	IP54 according to TÜV, IP44 according to UL
Overvoltage:	Category II
Pollution degree:	II

Please observe that since this is a safety product we recommend that a function control should be carried out at least once a year.

CO2 CENTRAL UNIT

Supply:	24V DC
Current consumption:	No alarm status: 21 mA Alarm status: 32 mA
Communication:	RS485, Modbus
Display:	Graphical 128x64, backlit
Acoustic signal-strength:	80 dBa (1m) max.
Ambient temperature:	0 to +40°C (+32°F to +102°F)
Humidity:	0-90% non-condensing
Approval:	CE: Emission tests according SS-EN 61000-6-3 and the immunity tests according to SS-EN 61000-6-2. Manufactured in accordance with DIN 6653-2. The CO2 Safety System is tested by the German TÜV-Rheinland. Certified by UL.
Dimensions (LxWxD):	90 x 161 x 38 mm / 3.5” x 6.3” x 1.5”
Ingress protection:	IP54 according to TÜV, IP44 according to UL

WARNING LAMP (BEACON)

Nominal voltage:	10-26V DC
Average current:	100-130 mA @ 24V DC supply
Flash frequency:	150-180/min
Ambient temperature:	-10°C to +60°C (+14°F to +140°F)
Dimensions:	Ø 91 x Height 96 mm / Ø 3.6” x Height Ø 3.8”
Ingress protection:	IP54

HORN/STROBE CE

Nominal voltage:	18-24V DC
Average current:	120 mA @ 24V DC supply
Decibel:	110 dB / 1 m
Flash intensity:	115 CD
Flash frequency:	65/min
Ambient temperature:	-5°C to +50°C (+23°F to +122°F)
Dimensions (LxWxD):	134 x 115 x 61 mm / 5.3” x 4.5” x 2.4”
Ingress protection:	IPX0

PLUG-IN POWER SUPPLY

Type:	Model FJ-SW2401000N
Input voltage:	100-240V AC, 50/60 Hz, max 0.5 A. Output: 24V DC, max 1.0 A
Ambient temperature:	0-40°C (+32°F to +102°F)
Dimensions (LxWxD):	82.4 x 44.5 x 36.2 mm / 3.2” x 1.8” x 1.4” + input plug

Contact information

Sales and service contact:

For parts or service contact your local authorized supplier or equipment service agent.

Company: .....

Phone: .....

Place company stamp or sticker here

HFE1052 EN

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