

Product code: **CS-CO-02**

Carbon Monoxide Sensor

Data sheet : **D-19**

Issue: 14/06/2022

This CO sensor is used in conjunction with the CaterSense range, to allow environmental monitoring & interlocking in accordance with DW172 and IGEM/UP/19.

The sensor provides visual indication of CO levels within the catering environment complete with traffic light warning system and audible alarm.



Model Description	Model	CS-CO-02
	Description	CO Sensor
Technical Data	Power supply	24Vac / dc
	Dimensions	125 mm x 86 mm x 26 mm (Weight: 110g)
Wiring Terminals	24V	+24Vac / dc
	0V	0 volt ac / dc
	OUT	0-10vdc (CO output)
CO Detection Range	0-300ppm	Relay trip point - 100ppm
IP Rating	IP40	
Temperature Limits	T min	0 deg.C
	T max	50 deg.C
Operating Limitations	Annual calibration must be carried out	
Control Pollution Degree	Pollution degree 1	
Mounting Instructions	Independently mounted control for surface mounting (concealed wiring)	

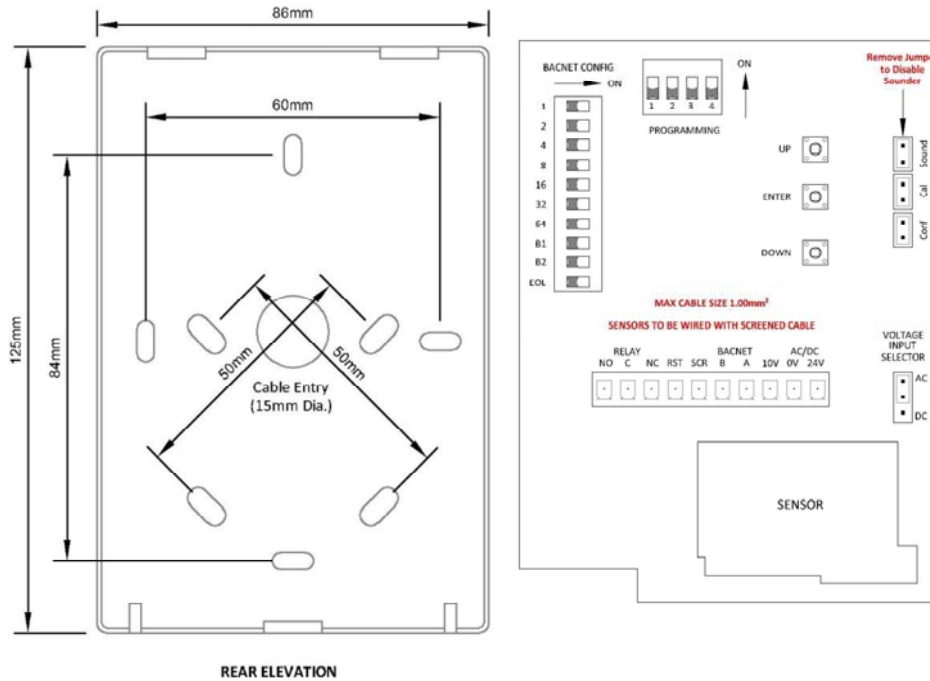
THE SENSOR REQUIRES CONSTANT POWER. DO NOT TURN OFF POWER SUPPLY.

IMPORTANT – Please read carefully

1. The sensors should not be exposed to high concentrations of the target gas or gases of a similar property. Such exposure can cause irreparable damage.
2. Following the detection of any significant gas leak, it is recommended that the sensor be replaced or recalibrated as a minimum as this may affect the sensor response or accuracy.
3. The Sensors are factory calibrated, however must be bump tested following installation to ensure that the sensing element has not been damaged and that the unit has been installed correctly.
4. All sensors must be calibrated in line with any site-specific requirements, however, must be calibrated at least annually by a competent person.

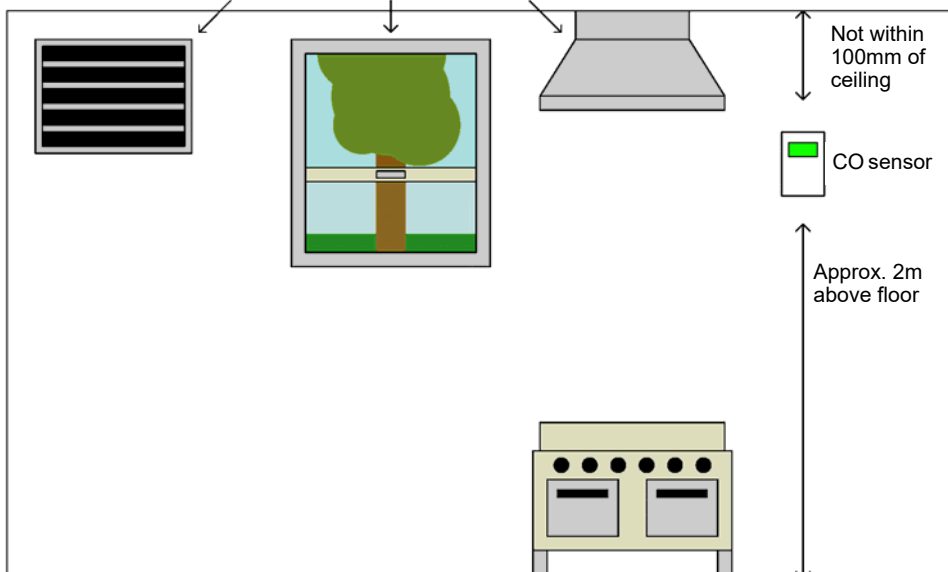
Opening the Enclosure

1. Remove securing screw from the bottom of the enclosure.
2. Release the securing clip at the bottom of the enclosure using a small screw driver whilst ensuring not to break the clip.
3. Pull outward from the bottom then down to release hooks securing the top.
4. When closing, secure the top, then push the bottom in.



Mounting of sensor

Not within 1m of an inlet air supply, opening windows and doors or in the air stream

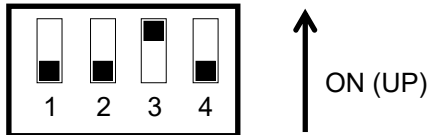


Do not mount the sensor Above or near to sources of heat or vapour. (E.g. kettle, oven.. etc)

**PLEASE ENSURE DIP SWITCHES
ARE SET TO THESE POSITIONS**

DIP Switch Setup Sequence

**DIP SWITCH 1: OFF (DOWN)
DIP SWITCH 2: OFF (DOWN)
DIP SWITCH 3: ON (UP)
DIP SWITCH 4: OFF (DOWN)**



Traffic Light Sequence

Green	Safe	0-19ppm
Amber	Elevated	20-99ppm
Amber to Red	Warning	100+ppm

OPERATION

On power up, the LCD will cycle through Green, Amber, Red then white with a 60 second count down. During this 60 seconds the volt free contact will be in the default position for the selected programme and the voltage output will give 2.00V.

Once the warm-up is complete, the LCD will display;

LINE 1 Gas Type
LINE 2 Gas Concentration
LINE 3 Sensor Status

MAINTENANCE

All sensors must be calibrated at least annually, however please note for more sensitive applications it may be required to calibrate every 6 months.

There are a number 'Fault' statuses the unit may display;

Display	Description	Audible	LCD	V Output	Relay
ERR	Sensor Error/No Sensor	Full	Red	0V	Fault
CAL	Calibration Due	1s / 30m	Amber	1V	-
REPL	Replacement Due	1s / 30m	Red	1V	-
EOL	Replacement Overdue	1s / 10m	Red	0V	Fault

The initial calibration reminder is set to 480 days to allow handover and defects on new projects, although the sensor should be calibrated at 360 days. The calibration notification will activate when it reaches 30 days.

All sensors have a set life to ensure that they are replaced in line with the expected life of the specific sensor. The replacement notification will activate when it reaches 30 days. If the sensor is not replaced within 90 days of the timer reaching 0, the sensor will cease to operate and will provide an alarm status.

When a sensor calibration or replacement is due (within 30 days), the LCD will cycle between the sensor reading and the below warnings. Please note, these warning will not effect the functionality of the sensor.

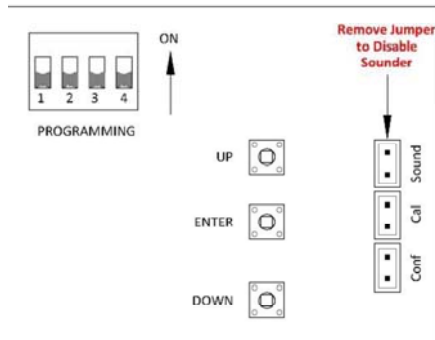


CONFIGURATION & CALIBRATION

THE CONFIGURATION AND CALIBRATION PROCEDURES SHOULD ONLY BE CARRIED OUT BY A COMPETENT ENGINEER

Basic Functions

All of the controls are located towards the top right hand corner of the PCB as follows;



To allow either the Configuration or Calibration menus to be entered, the jumper must be fitted to the **CAL** or **CONF** pins (only one to be fitted at any time). The **ENTER** button is used to enter the menu and to cycle through each parameter, with the **UP** and **DOWN** buttons being used to change the value.

Removing the jumper before the parameters have been saved will result in the unit defaulting to the last save point.

Sensor Parameter Configuration

The following parameters can be adjusted;

- Gas Type
- Range
- Alarm 1
- Alarm 2
- Relay Set Point

READ ALL INSTRUCTIONS PRIOR TO COMMENCING CALIBRATION

Sensor Calibration

The calibration reminder can only be reset by carrying out a valid calibration whereby a test gas of at least 20% of the range of the unit is applied (e.g. a 300ppm sensor cannot be calibrated with a test gas of less than 60ppm).

Calibration

To enter the calibration menu, fit the jumper across the Cal pins towards the top right hand side of the PCB and press the **ENTER** button.

Zero Calibration

ZERO
0 %LEL

Once you enter the calibration menu, the sensor will require zeroing. In clean air or zero grade air, the sensor should read '0', if it does not then use the **UP** or **DOWN** buttons to adjust accordingly. Once complete, press the **ENTER** button to continue to the span calibration.

Span Calibration

SPAN
50 %LEL

The span should be set using the correct calibration gas as defined above. The target gas should be applied to the sensing element using the calibration hood until the sensor is saturated and stable (this can take up to 10 minutes). If this does not reach the correct concentration, then use the **UP** or **DOWN** buttons to adjust accordingly.

Once the concentration has been corrected, (still with the gas applied) press the **ENTER** button and the unit will say **SAVE** then revert back to normal operating mode.

The LCD will display Green and all alarms will be inhibited for 60 seconds to allow the gas to be removed and the levels dissipate.

Calibrating Oxygen Sensors

Oxygen sensors are the exception to the above whereby the Span calibration is carried out first. In air, the span should be set to 20.9%.

The zero is then set to 0.0% using 100% nitrogen to displace all of the oxygen from the sensor.

Calibrating Infra-red Sensors

IR sensors will display the target zero/calibration level on the centre line with the live sensor reading on the bottom line of the display.

When the calibration gas is applied and the bottom line has stabilised, pressing enter will tell the sensor that the concentration is as per the centre line of the display (for span and zero). The centre line **must** match the applied concentration.

For CO2 sensors, 100% N2 should be applied to Zero.