

CO233/A Carbon Monoxide Gas Sensor

4-20mA

Carbon
Monoxide

SPECIFICATION

IP65



FEATURES

- Carbon Monoxide detection sensor
- Colour changing Digital Display
- Electrochemical Sensor Technology
- 4-20mA signal sensor output
- Automatic Calibration
- Sintered Head
- IP65 Protective Rating
- CE Certified and approved to EN50270, EN45544 1-3 & EH40 3rd edition
- 2 Year Guarantee - 3 Year by Registering at duomo.co.uk

APPLICATION

The CO233/A sensor is a gas sensor with IP65 protection that, together with a Duomo (UK) Controller can detect the presence of Carbon Monoxide (CO).

The sensor is fitted with an Electrochemical Cell and is managed by a microprocessor which not only supplies an alarm signal to the controller connected to it but also self-diagnoses to obtain the maximum accuracy and quickest response time.

This device is useful when both the maximum CO admissible concentration threshold set to 300ppm is exceeded, and when low CO concentrations persist in the environment for lengthy periods, and which according to the principle of accumulation, could also be toxic.

The sensor has a 0-300ppm linear output conforming to the 4-20mA standard.

Power

Power Supply	12-24V DC $\pm$ 10% from controller
Power Consumption	20mA (Warm up) 85mA (in Alarm) at 13.8VDC
Relay contact range	10A resistive 250VAC, 5A 30VDC Resistive

Technical Specification

Gas(es) Detected	Carbon Monoxide (CO)
Sensor Technology	Electrochemical
Dimensions	Width 100mm Height 100mm Depth 60mm
Display Indicator	Green: Regular operation Yellow: Fault Red: Alarm (over 300 ppm) Cyan: TWA Alarm (8 hours average over 20ppm) Magenta: STELAlarm (15 minutes average over 100ppm)
USB Test Socket	TS1008
Mounting	Wall Mounted
Output Signal	4-20mA
Sensor Range	0-300ppm
Device Precision	1% FS
Clean Air Shift	$< \pm$ 2ppm
Reaction Time	< 10 seconds
Autosetting	Yes
Working Temperature	-20°C to 50°C
Functioning Humidity	0-90% non condensed
Protective Rating	IP65

Peripheral Specification

Maximum Sensor Distance	100m
Cable Diameter for Sensors	1mm ² CSA (Screened and earthed at the controller end)

Compatibility

Controller Compatibility	All Conventional Duomo Controllers (Not Addressable BX132)
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Approvals, Certifications and Guarantee

Approvals	BS EN50270 & EN45544-1-3 Compliant & EH40 3 rd Compliant
Guarantee	2 Year as Standard 3 Year by Registering at www.duomo.co.uk

Precautions and Maintenance

Check the integrity of the unit after having removed it from the box.
Check that the data written on the box correspond to the type of gas used.

When doing the electrical connections, follow the drawing closely.

Any use of the detector for purposes other than the intended one is considered improper and as a result of which Duomo (UK) therefore disclaims any responsibility for possible damages caused to people, animals or objects.

Do not allow the sensor to become wet.

The product is not waterproof either when immersed in water or exposed to high levels of humidity.

Every six months must perform a function check of the sensor and connected controller. Suitable test gas must be used to avoid damaging the sensor. Disabling the sensor or the controller must be carried out by a suitably trained technician.

Every year a more accurate check must be performed by qualified personnel. Please call Duomo (UK) on 01905 797989

Important Notes



IMPORTANT: Assembly / maintenance of the appliance must be carried out by qualified personnel and in accordance with applicable laws and regulations.

The manufacturer assumes no responsibility for the use of products that have to comply with particular environmental and / or installation standards.

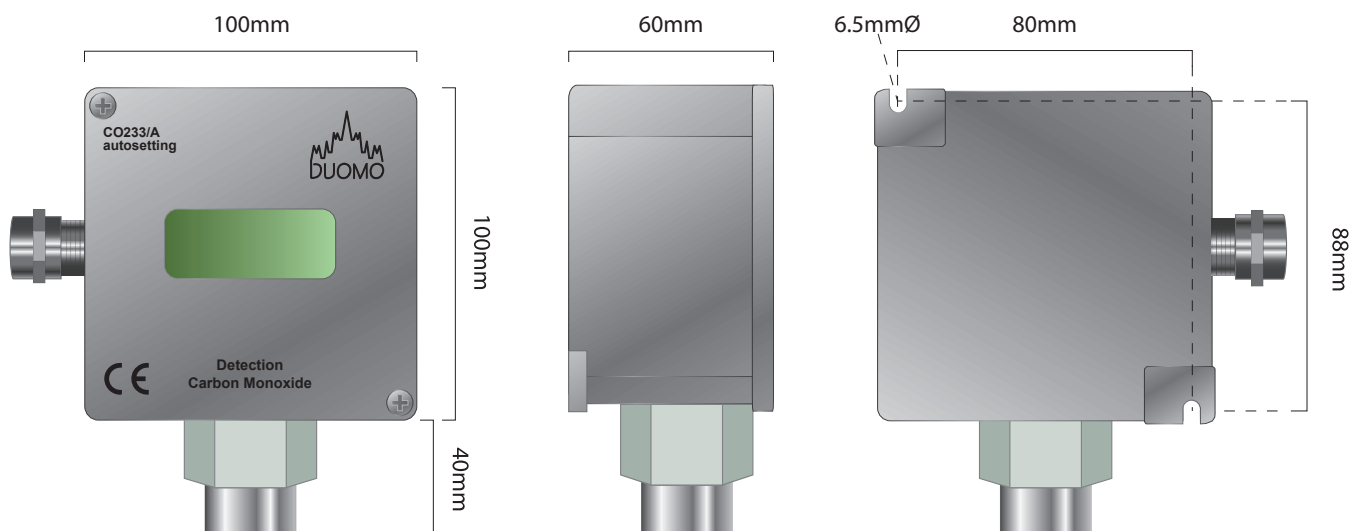
IMPORTANT: Before connecting the equipment, it is recommended that you read the instruction manual carefully and keep it for future reference.

Electrical Connections



IMPORTANT: Before connecting to the mains power, ensure the voltage is correct. Carefully follow the instructions and the connections according to Regulations in force, keeping in mind that the signal cables should be laid separate from the power cables.

Overall Dimensions (mm)



Connections and LED indicator

Important Notes



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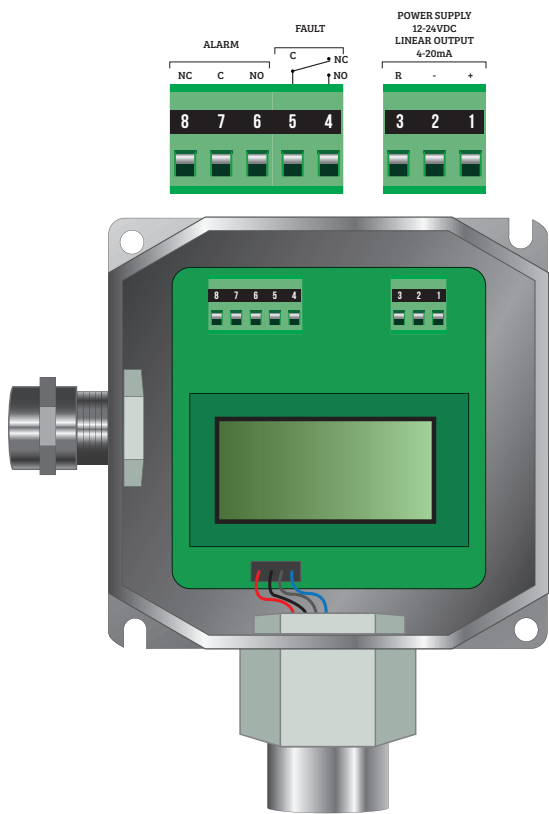
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GREEN

When the display is Green in colour with a gas concentration in parts per million (ppm). This indicates that the toxic gas threshold has not been exceeded.



WHITE

When the display shows the White colour and text 'Con' is shown. It indicates that the testing instrument is connected.



YELLOW

When the display shows the Yellow colour and text 'FAU' is shown. It indicates a sensor fault. This immediately triggers the fault relay.



MAGENTA

When the display shows the Magenta colour and text 'StA' is shown. It indicates that the maximum average concentration to which an unprotected worker may be exposed in any fifteen-minute interval during the day has been detected (100ppm) and the main alarm relay has triggered.



CYAN

When the display shows the Cyan colour and text '8hA' is shown. It indicates the maximum average concentration to which an unprotected worker may be exposed in any eight-hour interval during the day has been detected (20ppm) and the main alarm relay has triggered.



RED

When the display shows the Red colour and a gas concentration in ppm is shown. It indicates the toxic gas threshold has been reached or passed. If the 300 ppm has detected the main alarm relay is triggered immediately.

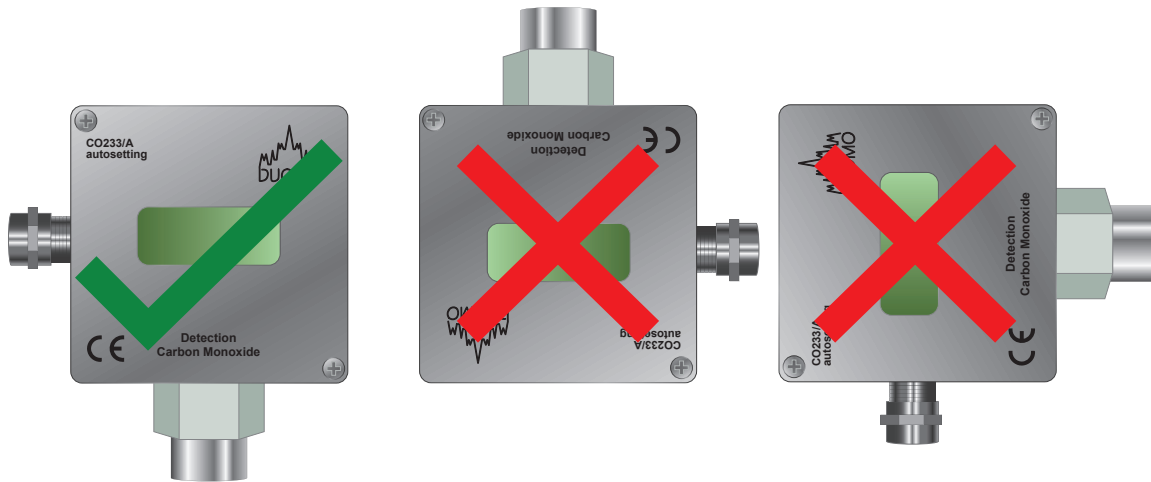
Compatible Controllers

Please consult the below table for a list of compatible controllers along with a comparison of key features and options available.

						
	BX150	GS100M	GS300M	GS300Mc	BX444Mc	BX316
Channels	1	1	3	3	4	2
Maximum Sensors	1	1	3	3	4	16
Addressable	-	-	-	-	-	-
Display	-	-	-	 Colour Change Digital Display	 Colour Change Digital Display	 Illuminated Digital Display
Mounting	Panel	Wall & Panel	Wall & Panel	Wall & Panel	Wall & Panel	Wall
Power	12V or 230V	230V	230V	230V	230V	230V
4-20mA Input	✓	✓	✓	✓	✓	✓
Self Diagnostic	✓	✓	✓	✓	✓	✓
Manual Test	✓	✓	✓	✓	✓	✓
Internal Alarm	✓	✓	✓	✓	✓	✓
Emergency Stop Function	-	-	-	✓	✓	✓
Alarm Stages	Pre Alarm Main Alarm	1 st Alarm 2 nd Alarm Main Alarm	1 st Alarm 2 nd Alarm Main Alarm	1 st Alarm 2 nd Alarm Main Alarm	1 st Alarm 2 nd Alarm Main Alarm	Pre Alarm Main Alarm
O ₂ Monitoring	-	-	-	✓	✓	✓
Positive Safety	✓	✓	✓	✓	✓	✓
IP Rating	IP42	IP44	IP44	IP44	IP44	IP65
Extended Guarantee *	3 Year	3 Year	3 Year	3 Year	3 Year	3 Year

Sensor Orientation

The sensors must be mounted as shown below with the sintered head pointing vertically down.

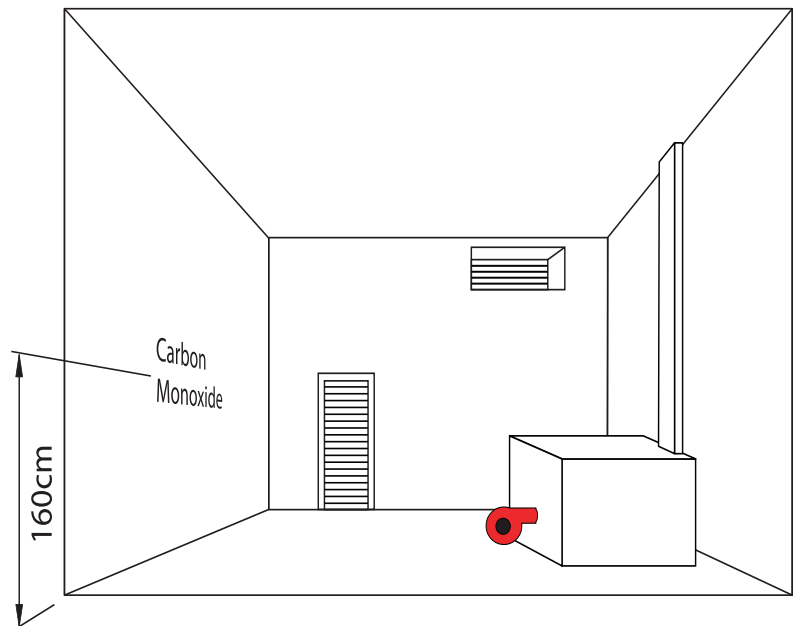


Sensor Positioning

The position of the sensor is a crucial factor for its correct functioning. The probe must be placed at a height of 160 cm from the lowest point on the floor.

The sensor must not be placed near the following: furnaces, fuel-burning kitchen appliances, fireplaces, ranges, suction fans, and should not be affected by smoke, vapour as these could distort its measurement.

The sensor must not be placed away from sources of heat, suction fans, ventilation fans, windows, doors, etc. that can distort the detection and should be placed away from heat sources and away from aspirators or fans.



Important Notes

Always check the wiring before powering up the system.

When replacing sensors never separate a sensing head from its PCB. The sensor will have been calibrated using this particular board and therefore will not function correctly with any other.

Do not test this sensor with anything other than Duomo test gas. Concentrations above this will damage the sensor and shorten sensor life.

The installation of this gas sensor does not release the user from observing all the regulations concerning the characteristics of the installation and use of gas appliance, the ventilation of the protected environment and the removal of the products of combustion. Duomo (UK) will not be held responsible or liable for any damage caused to people, property or animals resulting from incorrect connection, installation or application of this gas sensor.

To ensure correct function after installation Duomo provide a commissioning service using calibrated test gases. For this service call +44 1905 797989.

In case of alarm

Extinguish any naked flames.

Do not switch lights or electrical devices on or off.

Open all windows and door to increase ventilation.

- If the ALARM LED is off the levels of gas have dropped. A responsible, qualified person is now safe to find the cause of the alarm.
- If the alarm sound remains constant and the cause is not evident or not possible to eliminate turn off the emergency isolation valves to the area and contact your gas provider emergency line. They will advise accordingly.

Troubleshooting

The Problem

The Solution

The sensor does not power up	Check that the 12/24 VDC power is present, and that positive and negative polarity has not been inverted.
FAU text is shown with yellow backlight displayed	Check that the cables are connected according to the drawing, and that the wire isolation sheath has not been pinched. Check the voltage at the terminals 1-2. It must be a minimum of 11VDC and a maximum of 25VDC. Check the voltage at the terminals 2-3. It must be a minimum of 0.8 VDC to a maximum of 1.1 VDC.
This is a working document and will be updated as new troubleshooting and FAQs become apparent. If your issue is not listed here please call Duomo (UK) on 01905 797989 and inform us so we can list your issue and associated solution here.	

Experiencing difficulties?

If you are experiencing difficulties then please call **Duomo (UK) Ltd** on **+441905 797989** for technical assistance and support.

Commissioning



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