

# CO100Ar Sensor



- 12 - 24V DC supply
- IP55 protective rating
- IP65 sintered head
- Electrochemical sensor technology
- 4 - 20mA linear output and TWA
- CE certified No. 96125
- EN50079-29-1 for toxic gas
- 3 year guarantee (from date of manufacture)

## Application

Duomo is recognised within the gas industry for providing a comprehensive range of low cost, high reliability gas detection for many applications. We have installed and commissioned natural gas and carbon monoxide sensors in applications such as boiler rooms, kitchens, car parks, aircraft hangers, factories and shopping centres. The CO100Ar constantly monitors the carbon monoxide levels in its environment. The electrochemical sensor technology provides specific detection of carbon monoxide. Rugged construction and IP55 protective rating make this unit ideal for damp conditions such as car parks. The CO100Ar can be used as a stand alone instrument or can be connected to the BX444M, GS300M, GS100M and BX150 controllers. A 20mA signal will be derived from the device when alarm thresholds are reached. These are 300ppm instantaneous alarm, 100ppm alarm in 10 minutes, 30ppm alarm in 12 hours. This device, in conjunction with the above mentioned controllers can be used to control gas valves, sirens or air extract systems.

## Operation

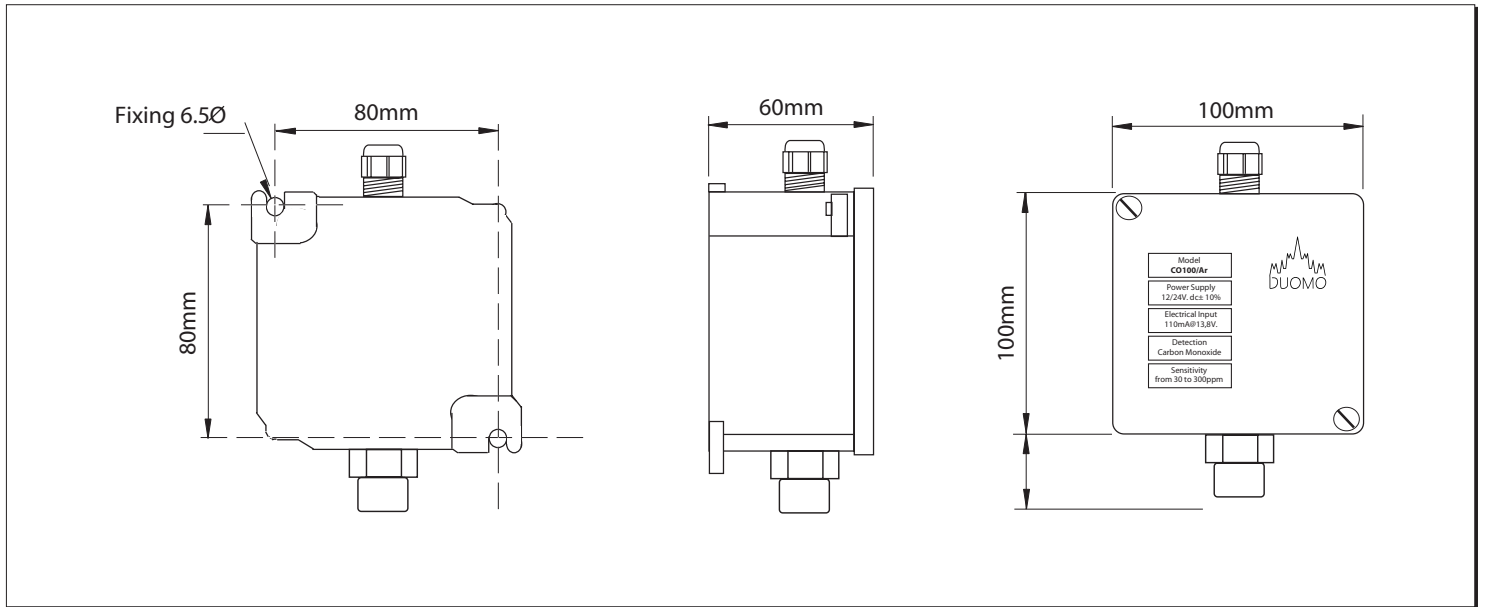
The CO100Ar is a carbon monoxide sensor which provides both a linear 4 - 20mA output and a time weighted average output. The sensor automatically calculates carbon monoxide concentration relative to time (Time Weighted Average) and will give a 20mA output from terminal 3 should the carbon monoxide levels remain above predetermined levels for extended periods. This is useful when carbon monoxide levels are likely to drop rapidly when extract fans are boosted. Thus the TWA threshold may not be reached but an indication of actual carbon monoxide levels is required for BMS and ventilation interfacing. The unit also has volt-free relays for sensor fault, CO alarm level (at 300ppm) and a time weighted average alarm.

**CAUTION!** Carefully read the following instructions prior to installation of this device. Always keep this pamphlet for future reference. Ensure that the gas detection system is wired correctly and is only used for the purpose for which it is intended.



**DO NOT TEST THIS SENSOR WITH ANYTHING OTHER THAN DUOMO TEST GAS, 350ppm CARBON MONOXIDE IN AIR.** Concentrations above this will damage the sensor and shorten sensor life.

# Overall Dimensions



## Positioning Sensors

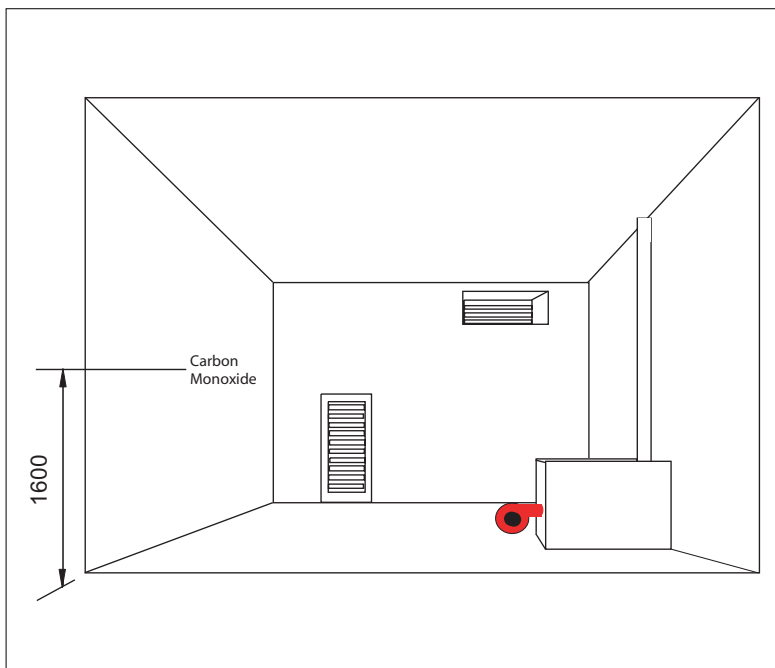
Carbon monoxide has specific gravity of 0.97 and is therefore slightly lighter than air.

However for positioning purposes, at the concentrations of carbon monoxide relating to the detector alarm thresholds, the resultant combination of carbon monoxide and air will neither rise or fall.

The best position to mount the CO100Ar is 1.6m above ground level. The image below shows the suggested position for the CO100Ar in a boiler room.

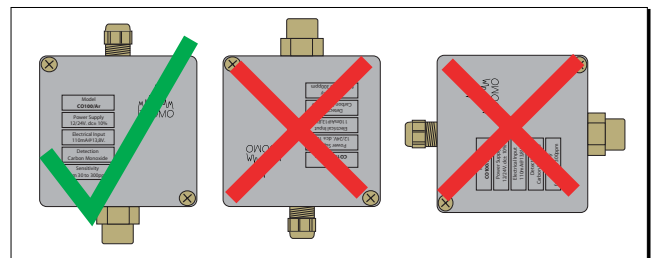
For car parks, 1.6m above ground level is still recommended.

If you require assistance regarding locating sensors please call our Droitwich factory on (01905) 797989 or fax a drawing of your application to (01905) 774296 and we will advise accordingly.



## Installing A Sensor

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



## Important Notes

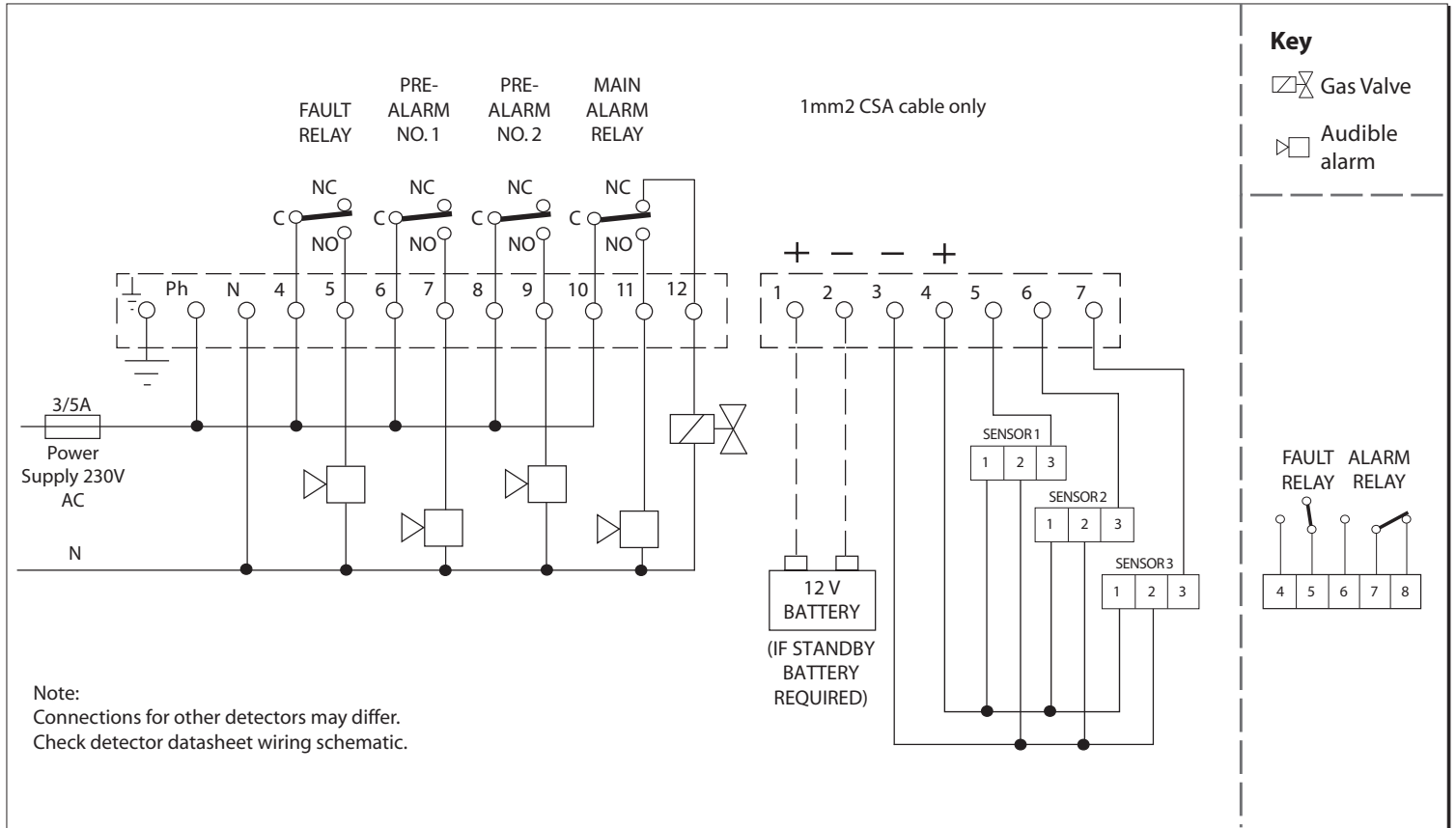
The installation of this gas detector does not release the user from observing all the regulations concerning the characteristics, installation and the use of gas appliances; the ventilation of the environment and the elimination of combustion products in accordance with local recommendations, regulations and byelaws.

For any damage caused to people, property or animals resulting from incorrect connection, installation or application of this gas detector Duomo will not be held responsible or liable.

## Replacing Sensor

When replacing sensors **NEVER** separate a sensing head from the PCB. The sensor has been calibrated using only that particular board and therefore will not function correctly with any other.

# Typical Wiring Schematic for GS300M & CO100Ar



## In Case Of Alarm

- Extinguish any naked flames.
- Do not switch lights or electrical devices on or off. Open all windows and doors to increase ventilation.
- If the audible alarm changes from continuous to intermittent 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 possible to eliminate turn off the emergency isolation valves to the area and contact your gas provider emergency line. They will advise accordingly.

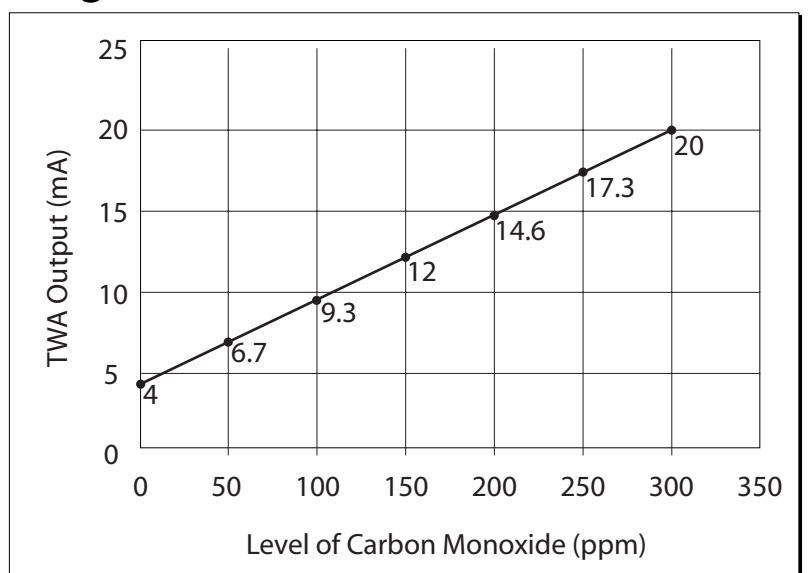
## TWA Alarm Reaction Times

CO concentration	Alarm after
30ppm	120 mins.
50ppm	60 mins.
100ppm	10 mins.
300ppm	<1 min.

## Carbon Monoxide Exposure

CO concentration	Symptoms
5000ppm	Death in 20 minutes
1500ppm	Death in 2 hours
800ppm	Convulsions in 30 minutes
400ppm	Bad headache in 30 minutes
250ppm	Headache in 2 hours
150ppm	Headache in 3 hours

## Diagram of Detection



# Electrical Installation

If the CO100Ar is to be used to monitor possible leakage of carbon monoxide in boiler rooms due to spillage or damaged or unsuitable flue systems, it is advisable to connect the sensor directly to a Duomo gas control panel. These are safety devices and are designed to give audible alarms and automatically provide latched electrical isolation of associated gas safety shut off valves.

The CO100Ar is also suitable for carbon monoxide sensing in car parks and can be connected either to Duomo gas control panels or to Building Management Systems (BMS). The sensor can be located up to 100m from the gas detector. Cable size should be 1mm csa. If the sensor cables are run separately in specific conduit it is not essential to use screened cable.

However, if the cables are routed through conduit or trunking containing other wiring the use of screened cable is advisable. The wiring should be performed by a qualified person in accordance with current regulations. The plug in terminal rail makes installation easy and quick.

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## Commissioning

It is strongly recommended that this sensor should be commissioned by Duomo Commissioning Engineers or engineers approved by Duomo to carry out this work. A quotation for commissioning or service will be provided upon request. Contact our service department by;

■ Telephone - 01905 797989

■ Fax - 01905 774296

■ Email - [service@duomo.co.uk](mailto:service@duomo.co.uk)

The benefits of this equipment being commissioned by Duomo are:

- The 3 year guarantee period will start from the date of commissioning and not from the date of manufacture
- On board spares. If for whatever reason this equipment doesn't function correctly Duomo engineers will carry spares to ensure that the commissioning is successful
- A Duomo Commissioning Certificate is provided

It is prudent to make electrical connection to the sensor terminal plug when withdrawn and leave the plug disconnected from the sensor so that the Duomo Engineer is the first to power up the unit on site. This allows wiring to be checked prior to commissioning and avoids damage due to incorrect connection. Guarantees for this product will become void if damage is caused by the installer.

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## Technical Specifications

Power supply	12-24V DC +/- 10% from detector
Electrical input	50mA @ 13.8V
External protection rating	IP55
Linear output	4mA @ 0ppm, 20mA @ 300ppm
Working temperature	-15°C to 40°C
Sensor type	Electrochemical
Detection precision	+/- 10% of detected level
CE certification	No. 96125
Detection	0 to 300ppm
Response time	<10 seconds
Interconnecting cable size	1mm csa
Material used for housing	Aluminium
Dimensions	100 x 130 x 60
Function check period	6 months
Guarantee	3 years

