



Analox *CO Clear*TM – Carbon Monoxide Detector

User Manual

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1 SAFETY INFORMATION

The Analox *CO Clear*TM is designed to be compliant with the following standards: EN61010-1: 2001, IEC61010-1: 2001, CAN/CSA-C22.2 No. 61010-1 Second Edition 2004, ANSI/UL 61010-1 Second Edition 2005. It is designed to be safe at least under the following conditions.

- 1) Indoor use
- 2) Altitude up to 2000m
- 3) Temperature -5°C to +40°C
- 4) Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- 5) Mains voltage supply fluctuations not to exceed 10% of the nominal voltage
- 6) Impulse withstand (over-voltage) category II of IEC 60364-4-443
- 7) Pollution degree 2
- 8) Mains voltage:-
 - 230V AC (Not Adjustable - Instrument will be factory set)
 - 110V AC (Not Adjustable - Instrument will be factory set)
 - 24V DC (Not Adjustable - Instrument will be factory set)
- 9) Mains power:-
 - Less than 5VA – 110V AC and 230V AC Versions
 - Less than 5W – 24V DC Version.
- 10) Mains frequency - 50/60Hz
- 11) The Remote Alarm Repeater has ingress protection to IP43: direct sprays of water up to 60° from the vertical in accordance with EN 60529:1991 + A1. All other units have ingress protection to IP65: low pressure water jets from all directions and totally protected from dust in accordance with EN 60529:1991 + A1.
- 12) Insulation: - Reinforced insulation, class II product according to IEC536.
- 13) Not for use in corrosive or explosive atmospheres
- 14) Not approved for use in vehicles, ships or aircraft



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Fuse ratings:-

230V AC, 500mA,	F rating 250V (20mm x 5mm Glass Cartridge)
110V AC, 500mA,	F rating 250V (20mm x 5mm Glass Cartridge)
9-24V DC, 200mA,	AS rating 250V (20mm x 5mm Glass Cartridge)

Battery Back-Up:-

The Battery Back-Up is non repairable. Please return faulty units to Analox for refurbishment/replacement.

4 to 20mA (or 0-1V) Output:-

Connected equipment must meet the requirements for reinforced insulation.

NOTE - If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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2 PACKAGE CONTENTS CHECKLIST

On receipt of the Analox CO Clear™ please check you have the following:

- 1) Analox CO Clear™ main unit and Alarm Repeater
- 2) User Manual
- 3) Test Certificate
- 4) Rawl Plugs and Screws for Wall Mounting
- 5) Drilling Template
- 6) Analox CO Clear™ Window Sticker
- 7) Analox CO Clear™ wall notice

Any optional items ordered such as:

- 1) Battery back-up
- 2) Relay junction box
- 3) Pressure Regulator
- 4) Additional 6mm Push-fit connector
- 5) Additional ¼ inch Push-fit connector
- 6) 6mm tubing
- 7) ¼ inch tubing



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3 ABOUT THE PRODUCT

Two variants of the Analox CO Clear™ are available.

The Analox CO Clear™ is designed to detect the presence of Carbon Monoxide in air or Nitrox gas compressors.

The Analox CO Clear He™ is designed to detect the presence of Carbon Monoxide in Heliox (HeO₂) gas compressors. This variant can be identified by the warning sticker shown below.



Different versions of the instrument allow operation from:

- 1) 210/250V AC supply
- 2) 110/120V AC supply
- 3) 9-24V DC supply

The Analox CO Clear™ is intended to be used as a permanent installation. It provides a digital readout of Carbon Monoxide and 2 audio and visual alarms to warn you of elevated levels of Carbon Monoxide. The alarms are set with a small hysteresis (0.5ppm) which means the CO concentration has to fall below the alarm set point before the alarm cancels. The instrument uses an Electrochemical cell together with state of the art technology, built in an IP65 splash proof housing and is designed to provide long, trouble free service, with minimum maintenance.

Optional items fitted to or supplied with the unit may include the following:

- 1) One or two medium duty relays
- 2) Test Gas and control valve
- 3) 300bar pressure regulator
- 4) Battery Back-Up
- 5) 4-20mA output

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4 SENSOR CHARACTERISTICS AND HELIUM EFFECT

The carbon monoxide sensor is a capillary type sensor. These types of sensors are affected by the presence of Helium (He), and in such cases give higher than anticipated outputs. The reason for this phenomenon is down to the small size of the helium molecule. When present in high concentration the helium molecules diffuse rapidly through the capillary into the carbon monoxide sensor and at the same time allowing more rapid diffusion of the much larger carbon monoxide (CO) molecules. The result of this process is that as the concentration of Helium increases a greater number of CO molecules enter the sensor which results in artificially high readings.

For this reason the Analox CO Clear He™ has been developed for use in Heliox gas applications (Saturation diving).

The Analox CO Clear He™ must be calibrated correctly when being used in a high concentration Helium application to reduce the result of this effect to a minimum.

The effect of the presence of helium in the sample gas is to increase the carbon monoxide (CO) cell sensitivity. This means that as the amount of He increases to its typical maximum level (typically 99% He in a Saturation diving application) the sensitivity of the CO cell increases by a factor of approximately 1.3 (typical). So, when a gas mix containing CO in 99% He, the cell's sensitivity is increased and will output a corresponding measurement signal of:

$$\begin{aligned} 5.0\text{ppm} / 1.3 &= 3.85\text{ppm CO} \\ &\approx 3.9\text{ppm CO} \end{aligned}$$

So in effect, in a gas mix containing 99% He an actual CO concentration of 3.9ppm would appear to read 5.0ppm on the instrument display.

In Saturation diving the ratio of O2 and He will change, typically between the ratio's of 21% O2:79% He to 1% O2:99% He. As the level of He changes this has the effect of changing the sensitivity of the CO cell so it is important that the instrument is calibrated correctly. The typical ratios of O2:He gas mix results in an increase in cell sensitivity ranging from 1.0 to 1.3. For this reason the instrument **MUST** be calibrated using 21% O2 in He balance calibration gas.

If the instrument is calibrated as described the typical performance expected is shown below:

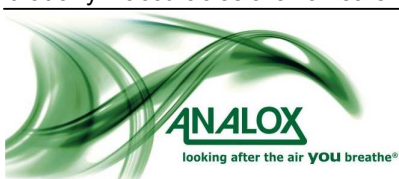
He in gas mix (%)	Alarm 1		Alarm 2	
	Set point	Actual CO (ppm ±0.6)	Set point	Actual CO (ppm ±0.6)
79	3	3.0	5	5.0
99	3	2.3	5	3.9

The table shows that as the % of He increases it has the effect that although the instrument displays that the Alarm level has been reached the actual level of CO present is less. This ensures that any inaccuracies are 'fail-safe'.

The chart below shows the typical system performance for the system with the effect of helium taken in to consideration. It shows how the actual level of CO required to trigger the 5.0ppm alarm level varies as the concentration of He varies.

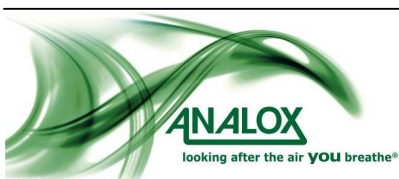
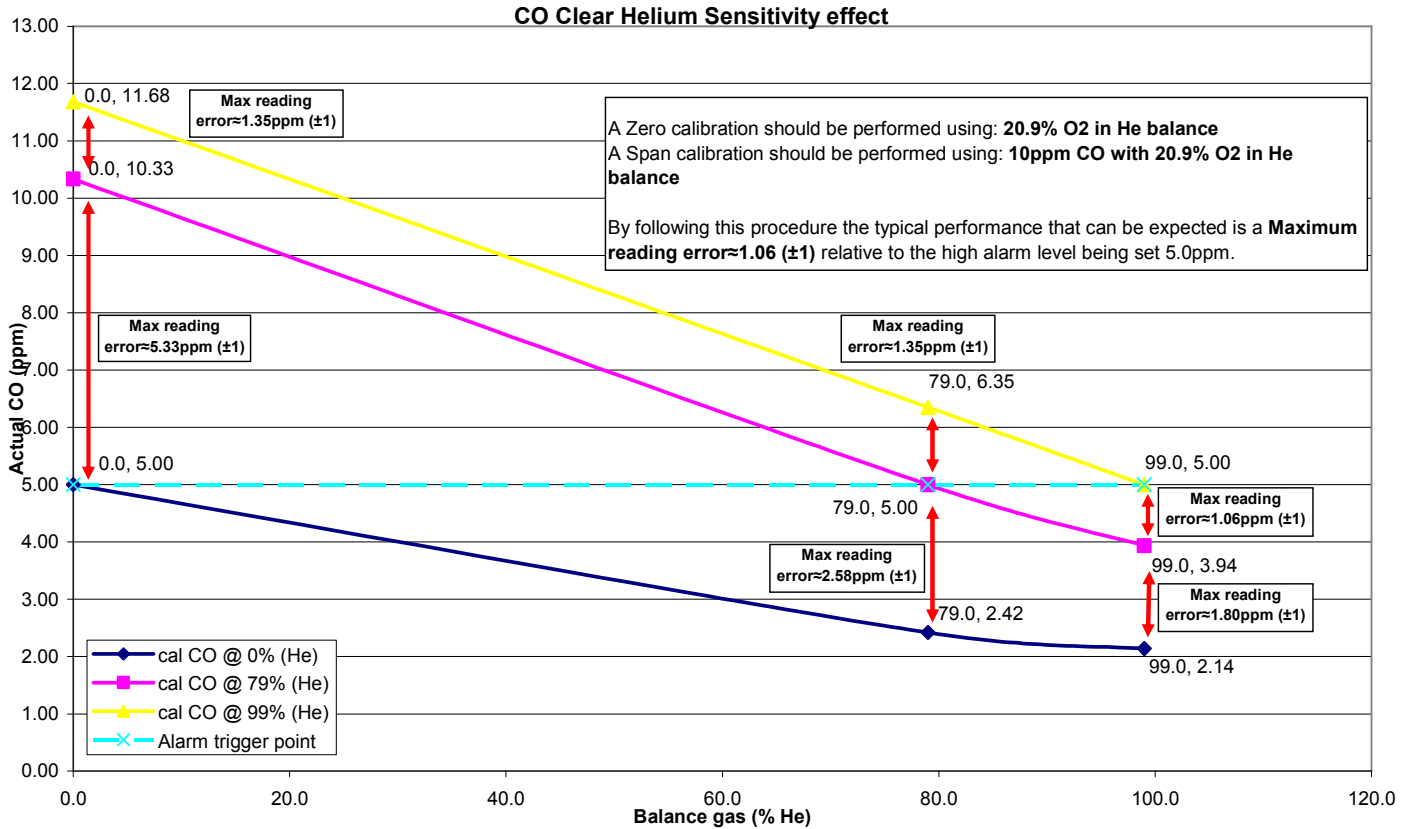
The dark blue plot shows the typical performance of the system if calibrated using calibration gas containing 0% He (i.e. Air diving). As the He concentration increases the actual level of CO required to trigger the 5.0ppm alarm becomes less. At the 79% He point only approximately 2.42ppm CO is required to trigger the alarm and at the 99% He point only approximately 2.14ppm CO is required to trigger the alarm.

The Pink plot shows the typical performance of the system if calibrated using calibration gas containing 79% He (recommended for saturation diving applications). In saturation diving applications the helium concentration will typically vary between 79-99%. As the He concentration increases the actual level of CO required to trigger the 5.0ppm alarm becomes less. At the 99% He point only approximately 3.94ppm CO is required to trigger the alarm, a reading error of ~1.06ppm. This ensures that any inaccuracies are 'fail-safe'.



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The Yellow plot shows the typical performance of the system if calibrated using calibration gas containing 99% He. In saturation diving applications the helium concentration will typically vary between 79-99%. As the He concentration decreases the actual level of CO required to trigger the 5.0ppm alarm becomes greater. At the 79% He point approximately 6.35ppm CO is required to trigger the alarm. This is a potentially dangerous situation as more CO is present than indicated by the instrument. For this reason, for saturation diving applications the instrument **MUST** be calibrated using 79% He balance calibration gases as instructed in the calibration procedure section.



5 INSTALLATION OF THE PRODUCT

Wall mounting

The Analox CO Clear™ should be mounted onto a wall or vertical flat surface using the mounting lugs; a paper drilling template is included in Section 12 of this manual. Use the paper template to drill the 4 required holes in the wall and use the Rawl plugs and screws provided to mount the unit. It is not necessary to dismantle the Analox CO Clear™ main unit in any way prior to installation. You need to ensure the mains plug, fused at 3 amps is in easy reach of a power socket.



The Alarm Repeater housing also has wall mounting lugs.

Wiring installation

It is necessary to identify the model of Analox CO Clear™ prior to installation. The Calibration Certificate accompanying each instrument will clearly identify the information required.

**ENSURE THAT THE
ELECTRICAL SUPPLY TO THE INSTRUMENT
IS SWITCHED OFF
WHILST INSTALLING ANY WIRING**

6 OPTIONS AVAILABLE

AC supply models

A mains powered Analox *CO Clear*[™] is pre-wired with a mains cable, fitted with a plug suited to the destination country. Where internal plug fuses are fitted, these are 3 Amp. Ensure that the unit is connected to the correct supply voltage (i.e. 110 or 230V AC). Where no fuse is fitted in the plug, the instrument should be powered from a 3 Amp fused outlet. The Analox *CO Clear*[™] is fitted with an internal fuse, which is rated at 500mA.

DC supply models

A DC powered Analox *CO Clear*[™] require a DC supply in the range 9-24V DC. A 2m cable is factory fitted to the instrument. The DC supply should be connected to this cable as follows:

- 1) Blue wire negative (0Volts)
- 2) Red wire positive (+9-24Volts)

Alarm repeaters

The Alarm Repeater has four status indicators and a Mode button, which mimic the button and indicators on the main Analox *CO Clear*[™] enclosure.

An 8 metre, 8 core cable is pre-wired to the Analox *CO Clear*[™] on units to be fitted with an alarm repeater. This ensures that for a basic installation, there is no need to dismantle the Analox *CO Clear*[™] main unit. A maximum of three repeaters may be fitted in a daisy chain configuration.

To connect and disconnect a "Quick Connect" Repeater:

- 1) Disconnect the power supply from the Analox *CO Clear*[™].
- 2) Insert the connector on the end of the cable into the socket on the base of the Alarm Repeater.
- 3) Restore power to the Analox *CO Clear*[™]. Press the mode button on the repeater once, and ensure that the four indicators flash. Note that in the presence of a genuine alarm, the test feature is disabled.

Alarm relay output models

You may have ordered your Analox *CO Clear*[™] with a relay. The relay contacts are 'Volt-Free' single pole Changeover, rated 250vAC/30vDC 2 Amps. The relay is non-latching. This means the relay will only initiate when gas is present. As standard the relays are setup in a Fail-Safe configuration. This means that the relay is energised during normal operation. Please note that on power up the relay is only energised after the 40 second warm-up period. See Figure 1 for details of how the relay should be connected.

Relay wiring

The cable gland is for cables of outside diameter between 5 and 7mm, if cable fitted is outside that range, a suitably specified cable gland must be used. Ensure that the gland is properly tightened. Test that the cable is adequately gripped by the cable gland. Ensure that the cable is suitable for purpose, the load is within the limits of the relay, 240VAC/28VDC, 2Amps, and the insulation of the external circuit meets the requirements for basic insulation 240VAC/28VDC, 2 Amps. After completing wiring, ensure that the terminal box cover is securely replaced.

RELAY TERMINAL BOX TERMINATIONS

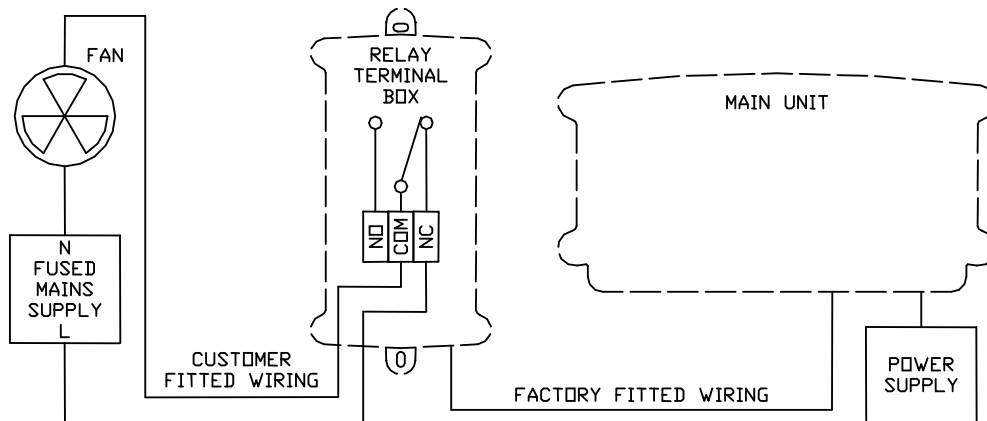
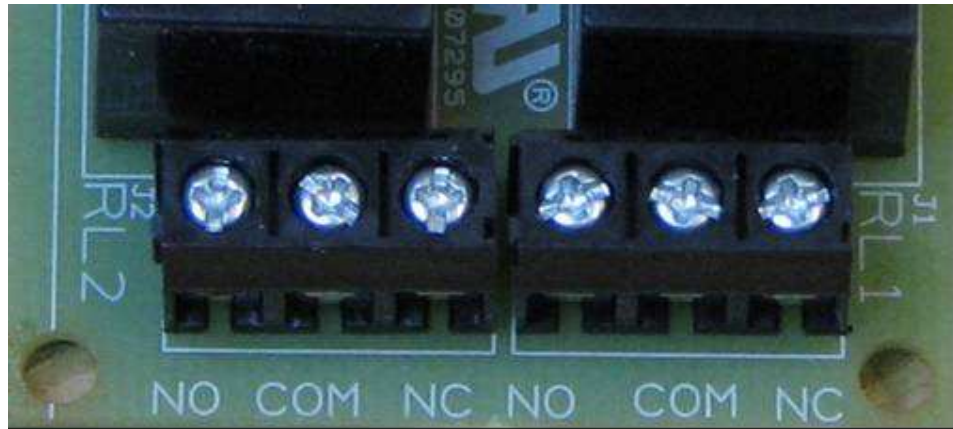


Figure 1 – Relay Connections

Battery back-up

When this option is fitted the Analox CO Clear™ should remain powered for at least 30 hours to ensure the Battery Back-up is fully charged and will provide back-up power for a minimum of 4 hours in the event of Mains power failure.

Once the Analox CO Clear™ installation has been completed a calibration should be performed in accordance with section 9 of this manual.

7 OPERATION

Normal operation

When the Analox CO Clear™ is turned on it will take approximately 10 seconds to warm up and stabilise. During this period, the 'Good/OK' and 'Fault' status indicators will be turned on. After the initial stabilising period has expired, the 'Fault' status indicator will turn off. The 'Good/OK' status indicator will be illuminated and flash off briefly every few seconds, indicating normal operation. The status indicators on any Alarm Repeaters will mimic this operation. On display models the display will briefly read '.8.8.8.8' on power up before reverting to the CO reading.

Alarm indications

If the Analox CO Clear™ detects a CO concentration which is greater than the first alarm level, then the 'Alarm 1' indicator will begin to flash and the buzzer will sound at its slow speed.

If the measured concentration of CO continues to rise above the second alarm level, then the 'Alarm 2' indicator will begin to flash and the buzzer will sound at its medium speed. The 'Alarm 1' indicator will continue to flash.



On standard units the alarms are self-cancelling when the CO level drops below the alarm limits.

Momentarily pressing the 'Mode' button on either the Analox CO Clear™ or any Alarm Repeaters, in the absence of any alarm conditions, causes an alarm test to be performed. The indicator lamps will flash 4 times and the buzzer will sound.

In all circumstances the Alarm repeater will mimic the status indications and buzzer of the main unit.

Units fitted with relays are configured such that relays may operate in conjunction with Alarm1 or Alarm2. They are factory set to be energised in the absence of alarms, and de-energised in the presence of alarms. They may be factory configured in the opposite sense if required.

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8 COMPRESSOR CONNECTION

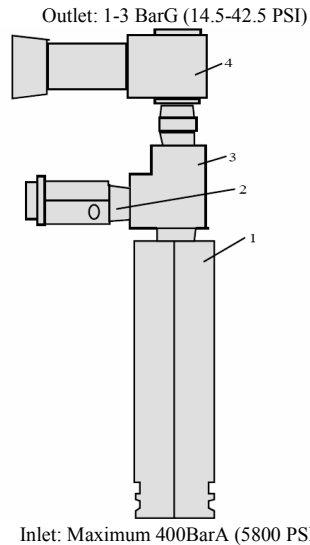
Connection of the Analox *CO Clear*TM to the compressor will require a pressure regulator. The pressure regulator must fit the following specifications:

Maximum inlet pressure 400Bar

Outlet pressure 0-3 BarG



To ensure trouble free operation of the *CO Clear*TM a 2 stage pressure regulation should be used. The recommended pressure regulator arrangement is shown below. All items in this assembly are available from Analox.



1. High Pressure regulator
2. Pressure relief valve (set at 2-7 BarG (30-100 PSI) above High pressure regulator)
3. 1/4 NPT street Tee
4. Low pressure regulator

9 MAINTENANCE

Carbon Monoxide sensor replacement

The Carbon Monoxide sensor is mounted in a special housing on the under-side of the Analox *CO Clear*TM enclosure. This housing allows the Carbon Monoxide sensor to be easily replaced when necessary. To ensure continuous operation it is recommended to replace the sensor at 9 month intervals.

The procedure for replacing the cell is as follows:

PLEASE NOTE: Do not pull on hose connection to remove the sensor. Use a flat blade screw driver as described below.

- 1) Switch off the instrument
- 2) Use a large flat blade screw driver to release the sensor housing. This is done by inserting the blade into the recess under the flange of the housing and twisting the screwdriver.



- 3) The top of the Carbon Monoxide sensor will now be visible. Gently pull the sensor housing downwards to release it from the bulkhead. It will be retained by an electrical connector.



- 4) Carefully pull the electrical connector from the rear of the Carbon Monoxide sensor.
- 5) Fit the new Carbon Monoxide sensor to the connector, note it will only connect in one orientation.
Note: The new Carbon monoxide sensor is supplied in a housing, ready to be fitted.
- 6) Carefully feed the sensor wire and sensor housing through into the bulkhead and then firmly push the housing into the Bulkhead on the under-side of the Analox *CO Clear*TM enclosure.
- 7) Switch the instrument back on.
- 8) Allow the sensor to settle for 1 hour.
- 9) Perform a Zero and Span Calibration Check to calibrate the new sensor.
- 10) Test the operation of the Carbon Monoxide alarms (see Alarm Check section).

The sensor in the Analox *CO Clear*TM is an electrochemical device and contains a caustic Electrolyte, which can have the following effects:

Skin	-	Skin contact could result in a chemical burn
Ingestion	-	Can be harmful or fatal if swallowed

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- Eye - Contact can result in permanent loss of sight
- First Aid Procedures
- Skin - Wash the effected area with lots of water and remove contaminated clothing. If stinging persists get medical attention
- Ingestion - Drink a lot of fresh water. Do not induce vomiting. Seek medical attention.
- Eye - Wash with a lot of water for at least 15 minutes and get medical help immediately.



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Calibration

In order to perform a calibration check, you will need the following equipment:

Air and Nitrox Kit (for use with Analox CO Clear™)

- 1) Zero Gas, 20.9% O₂ in N₂ balance – (Part No. SA7L2003)
- 2) Span Gas, 10ppm CO/20.9% O₂ in N₂ balance - (Part No. SA7L20153)
- 3) Control valve

Heliox Kit (for use with Analox CO Clear He™)

- 1) Zero Gas, 20.9% O₂ in He balance – (Part No. SA7L2009)
- 2) Span Gas, 10ppm CO/20.9% O₂ in He balance - (Part No. SA7L20154)
- 3) Control valve



Connecting of the gas cylinder



Correct flow rate

Zero Calibration

Note: When setting the gas flow rate on the control valve, so long as the flow indication ball is raised off the bottom of the gas flow indicator this is sufficient flow to calibrate the instrument accurately.

- 1) Fit the control valve to the zero gas.
- 2) Push the calibration valve pipe fully into the elbow push-fit connector of the sensor housing of the unit.
- 3) Fully open the control valve by turning the control knob anti-clockwise.
- 4) Allow the gas to flow for 2 minutes.
- 5) Enter Technician Mode by pressing the mode switch 3 times. If entered successfully the green LED will flash off for 1.5 seconds and on for 0.5 of a second.
- 6) Select Zero Calibration by pressing the mode switch 5 times. The Red Alarm 1 LED will light up to show you are now in this mode.
- 7) Press the mode switch 2 times to start the Zero Calibration, the Red Alarm 1 LED will turn off and the Green LED will continue to flash.
- 8) Wait one minute for the instrument to adjust. When the instrument has a new calibration value, the buzzer will sound one bleep and all the LED's will be off.
- 9) Accept this new calibration value by pressing the mode switch 2 times. The green LED will flash to show the instrument has accepted the new Carbon Monoxide value.
- 10) To return to normal operation, press the mode switch once. The LED's and buzzer will illuminate / sound 4 times before returning to normal operation.
- 11) Fully close the control valve by turning the control knob clockwise.
- 12) Remove the calibration valve pipe from the elbow push-fit connector of the sensor housing of the unit.

Note: If at any time you would like to abort Zero Calibration, press the mode switch once after step 9), this will bring you back to technician mode without accepting the new Carbon Monoxide

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value. Press the mode switch once again, this will bring you back to normal operation, the LED's and buzzer will illuminate / sound 4 times. Alternatively, disconnect the power supply to the *Analox CO Clear™*, wait a moment and re-connect power.

Span Calibration

Note: When the span calibration gas is applied both Alarm 1 and Alarm 2 will be activated.

When setting the gas flow rate on the control valve, so long as the flow indication ball is raised off the bottom of the gas flow indicator this is sufficient flow to calibrate the instrument accurately.

- 1) Fit the control valve to the span gas.
- 2) Push the calibration valve pipe fully into the elbow push-fit connector of the sensor housing of the unit.
- 3) Fully open the control valve by turning the control knob anti-clockwise.
- 4) Allow the gas to flow for 2 minutes.
- 5) Enter Technician Mode by pressing the mode switch 3 times. If entered successfully the green LED will flash off for 1.5 seconds and on for 0.5 of a second.
- 6) Select Span Calibration by pressing the mode switch 4 times. The Red Alarm 2 LED will light up to show you are now in this mode.
- 7) Press the mode switch 2 times to start the Span Calibration, the Red Alarm LED will turn off and the Green LED will continue to flash.
- 8) Wait one minute for the instrument to adjust. When the instrument has a new calibration value, the buzzer will sound one bleep and all the LED's will be off.
- 9) Accept this new calibration value by pressing the mode switch 2 times. The green LED will flash to show the instrument has accepted the new Carbon Monoxide value.
- 10) To return to normal operation, press the mode switch once. The LED's and buzzer will illuminate / sound 4 times before returning to normal operation.
- 11) Fully close the control valve by turning the control knob clockwise.
- 12) Remove the calibration valve pipe from the elbow push-fit connector of the sensor housing of the unit.

Note: If at any time you would like to abort Span Calibration, press the mode switch once after step i), this should bring you back to technician mode without accepting the new Carbon Monoxide value. Press the mode switch once again, this should bring you back to normal operation, the LED's and buzzer will illuminate / sound 4 times. Alternatively, disconnect the power supply to the *Analox CO Clear™*, wait a moment and re-connect power.

Alarm check

To verify that the indicators and the audible alarms are working, press the Mode switch on the *Analox CO Clear™*. The indicators and the audible alarm will pulse four times.

To verify that the alarm levels are correctly set, you will need the following equipment:

- 1) Test Gas cylinder containing 10ppm Carbon Monoxide, 21% Oxygen in the appropriate balance gas for that particular instrument
- 2) Control valve

Then follow the procedure below:

- 1) Fit the control valve to the test gas cylinder.
- 2) Push the calibration valve pipe fully into the elbow push-fit connector of the sensor housing of the unit.
- 3) Fully open the control valve by turning the control knob anti-clockwise.
- 4) After a short time the 'Alarm 1' alarm should operate.
- 5) After further period of time the 'Alarm 2' alarm should operate.



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- 6) Fully close the control valve by turning the control knob clockwise.
- 7) Remove the calibration valve pipe from the elbow push-fit connector of the sensor housing of the unit.

Adjusting alarm set points

The following procedure is very similar for setting either Alarm 1 or Alarm 2:

- 1) Whilst the *Analox CO Clear™* is switched on, enter Technician Mode by pressing the mode switch 3 times. If entered successfully the green LED will flash off for 1.5 seconds and on for 0.5 of a second.
- 2) From Technician Mode, press the Mode switch 2 times to set Alarm 1 or 3 times to set Alarm 2. The buzzer will bleep on each press. If this is done successfully, the instrument will show the Fault indicator and the appropriate Alarm indicator. If this is done inadvertently, or if another mode is selected, press the Mode switch once to return to Technician Mode and then repeat this selection.
- 3) The display will indicate the present value of the alarm.
- 4) Press the Mode switch twice to proceed to define a new setting, or once to abort and return to Technician Mode.
- 5) When setting Alarm 1 or Alarm 2, the display will show the maximum display value (full scale).
- 6) Press and hold the Mode switch. The displayed value will count down at approximately one count per second. Release the switch when the displayed value is equal to the desired alarm value.
- 7) Upon release of the Mode switch, the display will continue to show the new value. Accept the new setting by pressing the Mode switch twice, or alternatively ignore the new setting by pressing the switch once. This will return to the Technician Mode.
- 8) To exit from Technician Mode, press the Mode switch once. The *Analox CO Clear™* then restarts by performing the normal power on sequence (4 flashes).

Fault conditions

During normal operation, the instrument carries out a continuous self-test procedure. If operation is satisfactory, the 'OK' status indicator will be on, blinking off momentarily every few seconds.

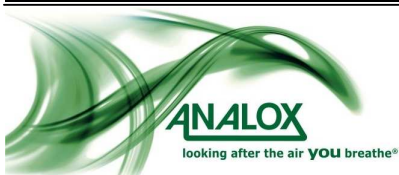
- 1) If there are no indicator lamps lit on the *Analox CO Clear™*, check that power is connected and that the fuses are OK.
- 2) If the 'OK' indicator is off, and the alarm indications are believed to be incorrect, carry out a calibration as described in section 5. If this fails to correct the problem contact your qualified service engineer.

A summary of the indicator lamps and buzzer operations is shown below.

OK LAMP (GREEN)	ALARM1 LAMP (RED)	ALARM2 LAMP (RED)	FAULT LAMP (YELLOW)	MEANING
OFF	OFF	OFF	OFF	Power Off
ON/ BLIP OFF	OFF	OFF	OFF	Normal Operation
OFF	FLASHING AND SLOW BUZZER	OFF	OFF	CO Level is > 3.0ppm *
OFF	FLASHING	FLASHING AND MED. BUZZER	OFF	CO Level is > 5.0ppm *
OFF	OFF	OFF	FLASHING AND SLOW BUZZER	Calibration Error at Switch On **

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OFF	FLASHING	OFF	FLASHING AND FAST BUZZER	CO Cell Fault Output too High
OFF	FLASHING	FLASHING	FLASHING AND FAST BUZZER	System Fault ***

* Note that Alarm levels may be set at different values, depending on customer requirement

** A Calibration error or a Cell fault requires the attention of a Service Engineer. A recalibration procedure may overcome the problem.

*** Only when Alarm 1 and Alarm 2 are enabled

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10 SPECIFICATIONS

CO Range	0.0 to 10.0ppm	
Inlet Pressure Range	1 – 3 Bar Gauge (14.5 - 42.5 PSI)	
Calibration gas flow rate	0.5-1.0 Litres/min (approx.)	
Sensor Accuracy	Better than ± 1 ppm at Constant Temperature and Pressure*	
Response Time (T90)	<60 Seconds	
Operating Temperature	0 - 40°C (32 – 104°F)	
Temperature Effect	0.04% of Reading/°C	
Atmospheric Pressure Range	800mbar to 1200 mbar	
Warm Up Time	2 Minutes	
Weight (without cables)	Analox CO Clear	400g (0.8lbs)
Dimensions	Analox CO Clear	175x130x70 mm (6.8x5.11x2.75inches)
IP Rating	Analox CO Clear	IP65
Sensor Type	Electro-Chemical Cell	
Sensor Life (Expected)	2 years at Standard Temperature and Pressure	
Sensor Warranty	9 months graded	
Electronics Warranty	1 year	
Display	4 digit Liquid Crystal Display	
Alarms	2 x Alarm Visual Indicators 1 x System Fault Indicator 1 x Status Indicator Common Audible Alarm	
Relays	One or Two Optional Alarm Relays with changeover contacts assigned to Alarm 1, Alarm 2 or System Fault. Contact Rating 230V AC or 30V DC at up to 2A. Contacts are non-latching Fail-Safe.	
Power Supply Options	Option selected at time of manufacture/order a) 210/250V A.C. supply b) 110/120V A.C. supply c) 9-24V DC supply	

* This accuracy applies to an instrument calibrated using Nitrogen balance gas and the monitoring of Nitrogen balance gas only.


11 DISPOSAL



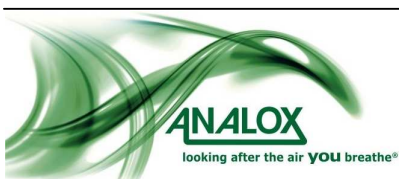
According to WEEE regulation this electronic product can not be placed in household waste bins. Please check local regulations for information on the disposal of electronic products in your area.

Analox CO Clear™ – Carbon Monoxide Detector – User Manual

12 DECLARATION OF CONFORMITY

Number:	ACO-902-01
Manufacturers name:	Analox Sensor Technology Ltd
Manufacturers address:	15 Ellerbeck Court Stokesley Business Park Stokesley North Yorkshire TS9 5PT
It is declared that the following product:	
Product name:	Analox CO Clear
Product code:	ACO
Conforms to all applicable requirements of:	EN50270:1999 EN61000-6-3:2001+A11:2004 BS EN 61010-1:2001 IEC 61010-1(2ed) AS61610.1-2003 (Australia & New Zealand)
The above product complies with the requirements of the EMC Directive 89/336/EEC, as amended.	
The above product complies with the requirements of the Low Voltage Directive 73/23/EEC, as amended.	
The above product is approved for use in the USA and Canada. CCSAUS, Master Contract 239512, Certificate 1909026	
The above product is approved for use in Europe, CB Test Certificate NO44944	
The above product complies with the Australian and New Zealand EMC requirements for C-Tick marking	
Signed on behalf of:	Analox Sensor Technology Ltd
Date:	02 June 2008
Signed:	
Name:	Mark Lewis
Position:	Managing Director

SA127 Issue 2 September 2006



13 DRILLING TEMPLATE

INSERT DRILLING TEMPLATE A50-400-01 HERE

