Детектор кислорода 1

Руководство по эксплуатации

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LIST OF CONTENTS

*** WARNINGS ***

1 The Analox 1 must be installed according to these instructions, which should be read entirely before commencing installation.

2 Basic versions of the Analox 1 fitted with Remote Alarm Repeaters are supplied for your convenience with the cable for the Remote Alarm Repeater already connected internally within the Analox 1 main unit.

The Analox 1 MUST NOT be switched on until the Remote Alarm Repeater has been connected. Failure to comply with this instruction may cause damage to the Analox 1, which can only be repaired by returning the unit to the manufacturer.

3 Basic models are supplied such that it is normally unnecessary to gain internal access to the instrument.

Potentially lethal voltages exist within the instrument. It must only be opened by a Qualified Technician, and must be isolated from the electrical supply before doing so.

4 The Analox 1 must be checked by a competent person once each year to ensure that the unit is operating correctly and in accordance with these instructions.

1 PACKAGING CONTENTS CHECK

The following items will be found in the packaging:

a) Analox 1 main unit, with fitted power cable (actual cable depends on version ordered)

b) User Manual

c) Test Certificate

d) Rawl Plugs and Screws for Wall Mounting

The following optional items may also be packed depending on the specification of the instrument.

e) Alarm Repeater and 8 metres of interconnecting cable.

f) Flow Adaptors for gas sampling arrangements.

2 INTRODUCTION

The Analox 1 O_2 Detector unit is designed to detect the presence of low Oxygen in ambient air.

Different versions of the instrument allow operation from

a) 210/250V A.C. supply
b) 110/120V A.C. supply
c) 12-24V DC supply

The monitor is intended to operate as a fixed installation and provides audible and visual indication of potentially dangerous deficiencies of O_2 levels in the air surrounding the instrument. 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.

The detector has two pre-set alarm levels. Please refer to your Test Certificate for the specific range of this particular monitor. A note can be made of these levels in the back of this manual.

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

a)* Remote Alarm Repeater
b) Liquid Crystal Digital display
c) One medium duty relay
d)* Flow adaptors for gas sampling arrangements
e)* Test Gas, flow indicators and control valves.

Items marked with an asterisk need not be specified at the time of order and may be retro fitted.

3 INSTALLATION

3.1 WALL MOUNTING

The Analox 1 should be mounted onto a wall using the mounting strip attached to the unit. Rawl plugs and screws are provided for this purpose.

The optional Alarm Repeater housing also has a pre drilled mounting strip.

Refer to the drawings in Section 11 for mounting details.

3.2 WIRING INSTALLATION

It is necessary to identify the model of Analox 1 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
****

3.2.1 AC SUPPLY MODELS

Mains powered Analox 1's are pre-wired with a mains cable, fitted with a plug suited to the destination country. Where internal plug fuses are fitted, these are 5 Amp. Ensure that the unit is connected to the correct supply voltage (ie 110 or 230V AC). Where no fuse is fitted in the plug, the instrument should be powered from a 5 Amp fused outlet. The Analox 1 is fitted with an internal fuse, which is rated at 100mA.

3.2.2 DC SUPPLY MODELS

DC powered Analox 1's require a DC supply in the range 12-24V DC. This is connected to the terminals marked supply on the printed circuit board mounted within the lid of the enclosure.

3.2.3 ALARM REPEATERS

The Alarm Repeater provides 4 status indicators , which mimic the status indicators on the main Analox 1 enclosure. It also provides a pushbutton, which operates in the same manner as the Mode switch on the Analox 1.

An 8 metre, 8 core screened cable is pre-wired to the Analox 1 on units to be fitted with an alarm repeater. This ensures that for a basic installation, there is no need to dismantle the Analox 1 main unit. Note that up to three repeaters may be fitted in a daisy chain configuration.

To connect and disconnect a "Quick Connect" Repeater:

1 Disconnect the supply from the Analox 1.

2 Insert the connector on the end of the wire into the socket on either side of the Alarm Repeater.

3 Restore power to the Analox 1. 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.

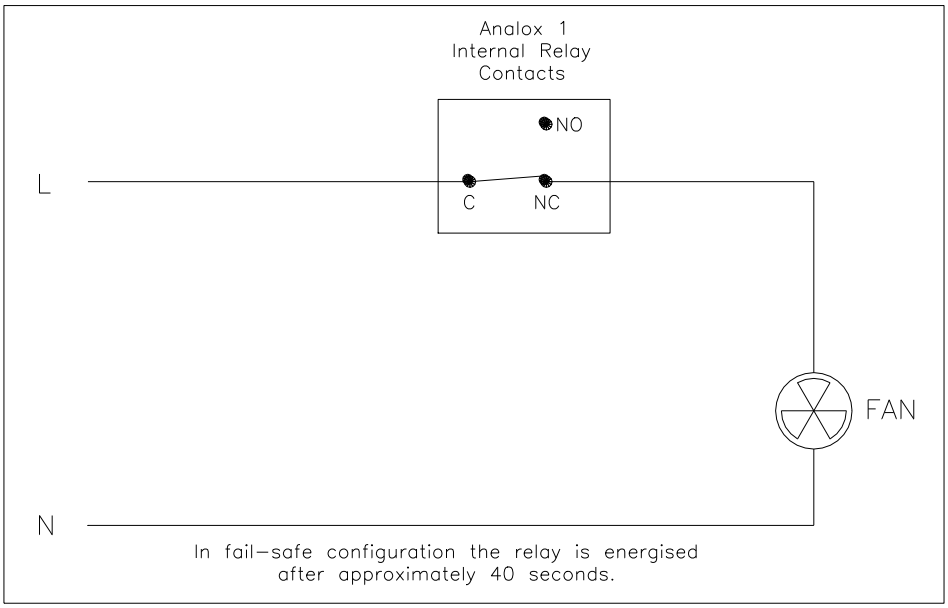
3.2.4 ALARM RELAY OUTPUT MODELS

You may have ordered your Analox 1 with a relay. The relay contacts are 'Volt-Free' single pole Changeover and are rated 250vAC/30vDC 2 Amps. The relay is non-latching. This means the relay will only initiate when gas is present.

Cable from the relay, in the Analox 1 main sensor unit, to operate your equipment is not supplied and should be rated to suit the external equipment you wish to connect.

The maximum switching resistance is 2 Amps. The drawing below, details how the relay should be connected.

4



4 OPERATION

When mains power is first applied to the Analox 1, it requires a period of approximately 10 seconds to stabilise. During this period, The 'Good/OK' and 'Fault' status indicators will be turned on. The 'Good/OK' status indicator will flash briefly every few seconds, indicating normal operation and after the initial stabilising period has expired, the 'Fault' status indicator will turn off.

A Calibration should then be carried out in accordance with section 6 of this manual.

The Analox 1 will then be in its normal operating condition. During normal operation, the 'Good/OK' status indicator will be illuminated and flash off briefly, thus indicating that the system is operating correctly.

The 'Good/OK' status indicator on any Alarm Repeaters will mimic this operation.

On Analox 1D versions, operation is identical, except that the liquid crystal display shows the measured value of oxygen in percent. Momentarily when switching on the power, the 1D's display is tested showing '.8.8.8.8'.

5 ALARM INDICATIONS

If the Analox 1 detects an O_2 concentration which is less 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 O_2 continues to fall below the second alarm level, then the 'Alarm 2' indicator will begin to flash, in addition to the 'Alarm 1' indicator and the buzzer will sound at its medium speed. This condition will be repeated on any Alarm Repeaters.

On standard units the alarms are self-cancelling when the 0_2 level rises above the alarm limits. Alternatively, latched alarm versions are available, on which the alarm conditions will be maintained until the Mode switch has been pressed to accept the alarm, and the gas level has risen above the alarm threshold.

Momentarily pressing the 'Mode' button on either the Analox 1 or any Alarm Repeaters, in the absence of any alarm conditions, causes an alarm test to be performed. The indicator lamps will flash either (a) 2 or (b) 4 times, together with the alarm buzzer.

(a) Four flashes indicate that the unit is operating correctly.

(b) Two flashes indicate that the unit is operating, but requires attention from a qualified service engineer.

Units fitted with relays are configured such that relays may operate in conjunction with the 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.

6 CALIBRATION CHECK IN AIR

A calibration check should be performed on the Analox 1, when it is first installed, then at no greater than 6 monthly intervals, and must be performed every time a new sensor is installed. This ensures that the sensor is giving an accurate Oxygen reading in air.

In order to perform a calibration check, follow the procedure below;

a) To enter Technician Mode, press the mode switch 3 successive times. If entered successfully the green LED will flash off for 1.5 seconds and on for 0.5 of a second.
b) To select Auto Calibration, press the mode switch 4 successive times. The 2 Red Alarm LED's will light up to show you are now in this phase.
c) To perform an automatic calibration in air, press the mode switch 2 times, the Red Alarm LED's will turn off, the Green LED will continue to flash.
d) 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.
e) To accept this new calibration value, press the mode switch 2 times. The green LED will illuminate to show the instrument has accepted the new oxygen value.
f) To return to normal operation, press the mode switch one time. The LED's and buzzer will illuminate / sound 4 times before returning to normal operation.

NB If at any time you send the wrong instruction and would like to abort, press the mode switch once and wait 20 seconds, this should bring you back to technician mode. Press the mode switch once again, this should bring you back to normal operation, the buzzer will sound 4 times, whilst all LED's flash 4 times.
Alternatively, disconnect the power supply to the Analox 1, wait a moment and re-power.

7 VERIFYING OPERATION

To verify that the indicators and the audible alarms are working, press the Mode switch on either the Analox 1 or any of it's Repeaters. The indicators and the audible alarm will pulse four times.

To verify that the alarm levels are correctly set, the following items are required:

a) A Test Gas cylinder containing 100% Nitrogen.

b) Flow indicator and control valve to suit the Test Gas cylinder.

c) A gassing cap with plastic tubing

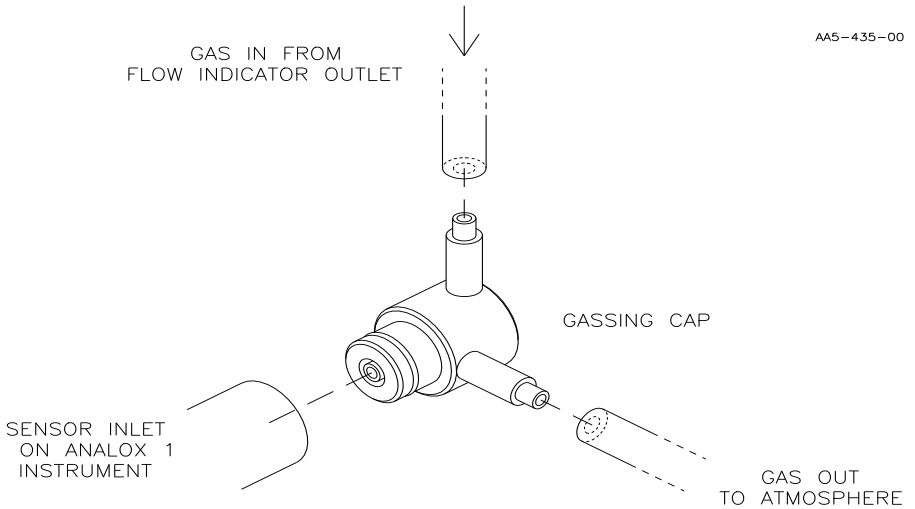
Follow the procedure below:

1 Fit the flow indicator and control valve securely to the test gas cylinder, note there will be a small escape of gas as it is fitted.

2 Connect the gassing cap to one end of the plastic tubing, and the other end of the plastic tubing to the outlet on the flow indicator.

3 Carefully unscrew the control valve until the floating ball is around the mid-scale position (1.0 litres/minute approx.)

4 Place the gassing cap into the Analox 1's sensor inlet as shown below. Ensure that the cap is pressed firmly into the sensor inlet.



5 After a few moments, the 'Alarm 1' alarm should operate, followed a little later by the 'Alarm 2' alarm.

6 Remove the test gas. It will take a little while for the N_2 mixture to drift out of the Instrument Sensor, allowing the unit to recover to its normal non-alarm condition.

7 When the test is complete, the test gas should be removed and the flow indicator control valve should be closed. The flow indicator and fine control valve should be removed from the test gas cylinder to prevent leakage.

8 FAULT CONDITIONS

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

1 If there are no indicator lamps lit on the Analox 1, check that power is connected and that the fuses are OK.

2 If the 'Good/OK' indicator is off, and the alarm indications are believed to be incorrect, contact your qualified service engineer.

A summary of the indicator lamps and buzzer operations is provided in Section 10.

9 OXYGEN SENSOR REPLACEMENT

The oxygen sensor is mounted in a special housing on the under-side of the Analox 1 enclosure. This housing allows the oxygen sensor to be easily replaced when necessary. The sensor will last in air for up to three years. It is recommended to replace the sensor at two year intervals when instruments are subjected to an annual inspection.

The procedure for replacing the cell is as follows:

1 Switch off the instrument

2 Unscrew the cap retaining the oxygen sensor in position (do not attempt to unscrew the complete housing)

3 The oxygen sensor will now be visible. Gently pull the sensor downwards to release it from the housing. It will be retained by an electrical connector.

4 Carefully pull the electrical connector from the rear of the oxygen sensor

5 Inspect the new oxygen sensor. Note it must have an O-ring fitted around its gas inlet.

6 Fit the new oxygen sensor to the connector inside the sensor housing – note it will only connect one way round.

7 Carefully push the sensor and the wiring back into the housing

8 Screw the cap back into position to retain the oxygen sensor in position (do not over-tighten or the whole housing could turn).

9 Switch the instrument back on

10 Perform a Calibration Check in Air (Section 6 **Error! Reference source not found.**) to calibrate the new sensor

11 Verify the operation of the oxygen alarm (Section 7).

10 SUMMARY OF INDICATOR LAMP STATUS

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	O_2 Level is < 19.5% Θ
OFF	FLASHING	FLASHING AND MED. BUZZER	OFF	O_2 Level is < 18% Θ
OFF	OFF	OFF	FLASHING AND SLOW BUZZER	Calibration Error at Switch On H
OFF	FLASHING	OFF	FLASHING AND FAST BUZZER	O_2 Cell Fault Output too High
OFF	FLASHING϶	FLASHING϶	FLASHING AND FAST BUZZER	O_2 Cell Fault Output too Low

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

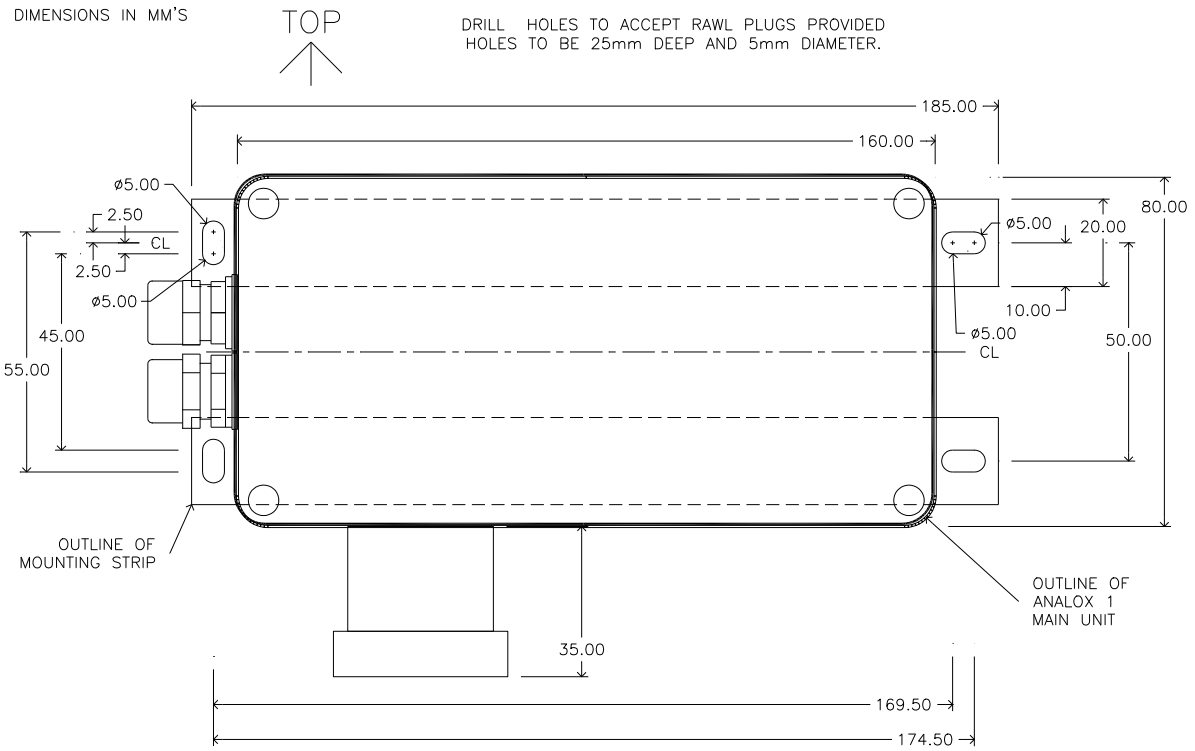
H A Calibration error or a Cell fault requires the attention of a Service Engineer. A recalibration procedure may overcome the problem.

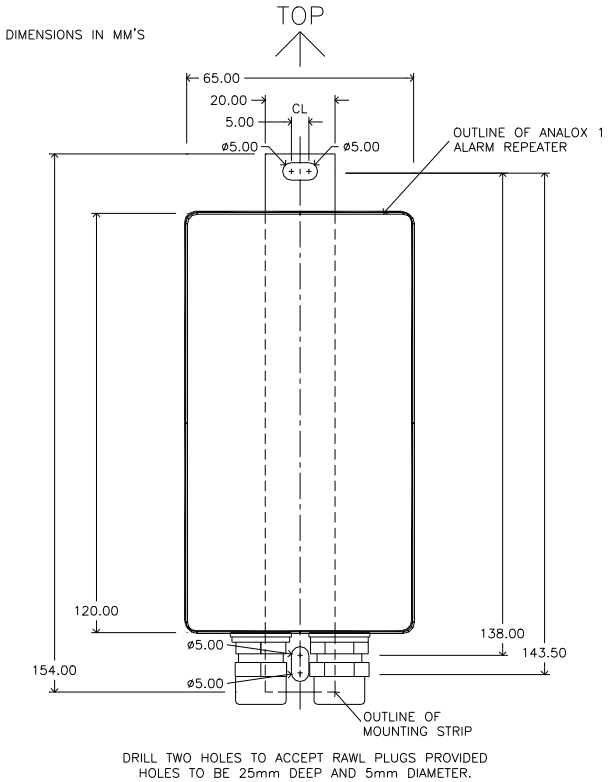
϶ Only when Alarm 1 and Alarm 2 are enabled.

Alternative Alarm Setpoints for this Instrument are as shown below.

Serial Number	
O_2 Range	
O_2 Alarm 1	
O_2 Alarm 2	

11 INSTALLATION DRAWINGS


DIMENSIONS IN MM'S
TOP
DRILL HOLES TO ACCEPT RAWL PLUGS PROVIDED
HOLES TO BE 25mm DEEP AND 5mm DIAMETER.
185.00
160.00
ø5.00
2.50
CL
2.50
ø5.00
45.00
55.00
ø5.00
20.00
80.00
10.00
ø5.00
CL
50.00
OUTLINE OF
MOUNTING STRIP
OUTLINE OF
ANALOX 1
MAIN UNIT
35.00
169.50
174.50


DIMENSIONS IN MM'S
TOP
65.00
20.00
CL
5.00
ø5.00
ø5.00
OUTLINE OF ANALOX 1
ALARM REPEATER
120.00
138.00
ø5.00
143.50
154.00
ø5.00
OUTLINE OF
MOUNTING STRIP
DRILL TWO HOLES TO ACCEPT RAWL PLUGS PROVIDED
HOLES TO BE 25mm DEEP AND 5mm DIAMETER.

12 SPECIFICATIONS

O_2 Range	0.1 to 25% or 0.1 to 100%	
Sensor Accuracy	+/- 1% of readout	
Response Time	6 Seconds to T90	
Operating Temperature	0 to 40°C	
Temperature Effect	0.1% per °C, over the specified range	
Pressure Effect	Proportional	
Warm Up Time	10 Seconds	
Orientation	Not Sensitive	
Weight (without cables)	Analox 1	600g
	Remote Repeater	150g
Dimensions (whd)	Analox 1	160 x 80 x 85mm
	Remote Repeater	65 x 120 x 40mm
IP Rating	Analox 1	IP65
	Remote Repeater	IP40
Sensor Type	Electro-Chemical Cell	
Display	Optional 4 digit Liquid Crystal Display	
Alarms	2 x O_2 Visual Indicators 1 x System Fault Indicators 1 x Status Indicator Common Audible Alarm	
Relays	One Optional Alarm Relay with changeover contacts assigned to O_2 Alarm 1, Alarm 2 or System Fault. Contact Rating 230V AC or 30V DC at up to 2A. Contacts are non-latching.	
Power Supply Options	a) 210/250V A.C. supply b) 110/120V A.C. supply c) 12-24V DC supply	

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