

Analox O₂ Buddy™

Oxygen Analyser User Manual for your Personal Protection

WARNING

**IT IS IMPORTANT THAT THESE INSTRUCTIONS ARE
READ BEFORE USING THE ANALOX O₂ Buddy™!**

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We are delighted to welcome you as a user of the Analox O₂ Buddy™.

The following guide should assist you in using your O₂ Buddy™

However

IF YOU EVER NEED US

PLEASE CONTACT

+44 (0) 1642 711400

www.analox.net

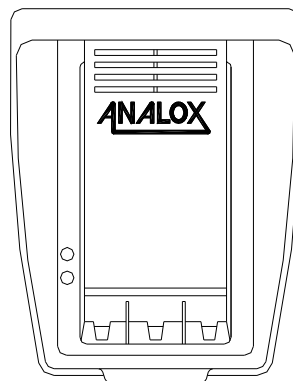
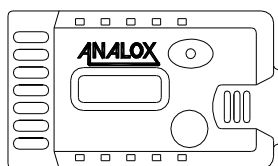
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1.0 Packaging and Contents Check

On opening your Analox O₂ Buddy™, please check you have the following items.

- a) O₂ Buddy™
- b) O₂ Buddy™ Cradle Charger
- c) User manual
- d) Test Certificate
- e) Any accessories ordered for your O₂ Buddy™, e.g.:
 - Datalogging kit



2.0 About the O₂ Buddy™

The Analox O₂ Buddy™ has been designed to detect and warn users of unsafe levels of low Oxygen (O₂). This makes the O₂ Buddy™ ideal for people working in potentially hazardous environments where harmful gases are used, stored or produced. The analyser has been designed for continuous wear during the working day. It is supplied with a belt loop and pocket clip to enable you to choose which style suits your working environment.

The O₂ Buddy™ detects O₂ using an electrochemical cell. Rechargeable NiMH batteries ensure up to 12 hours operation between charges. Factory set audible and visual alarms will immediately alert you to unsafe levels of low O₂. In the event of a sensor malfunction an audible and visual 'FAULT' alarm will activate. On receipt of your O₂ Buddy™ please perform a fresh air calibration, detailed in section 5.3.

2.1 Datalogging

The O₂ Buddy™ is fitted with a datalogging facility as standard. This logs the measured level of O₂ and the corresponding date and time. The O₂ Buddy™ has sufficient capacity to log 5 x 12-hour shifts before overwriting. This information can be transferred through a data link using the optional software, into a spreadsheet.

Datalogging kit Part No. SA2 L01 50.

3.0 Operation

During normal operation the O₂ Buddy™ measures O₂ in contact with the sensor by diffusion. For other methods of operation please see Accessories, section 3.6.

3.1 Start up

The O₂ Buddy™ can be supplied with the on/off feature enabled or disabled. A standard O₂ Buddy™ will have this feature enabled. The feature can be disabled at the customers' request, at the time of order. If this feature is disabled it will be packaged with a card to inform you and refer you to part *b*. If this feature is enabled please refer to part *a*.

a) The O₂ Buddy™ can be turned on and off, as you require.

To turn the O₂ Buddy™ on, press the 'O₂' button. The instrument will sound 4 beeps and all lights will flash. The O₂ Buddy™ will enter into a warm up phase for 10 seconds. During warm up the yellow 'FAULT' light will be permanently on and the green 'OK'* light will flash every 2 seconds. After the warm up period, the green 'OK'* light will flash every 2 seconds, and the yellow light will go off to inform you that the instrument is working correctly.

To turn the O₂ Buddy™ off, press and hold the 'O₂' button for 2 seconds. The O₂ Buddy™ will emit a continuous tone and the yellow 'FAULT' light will turn on. If fitted the display will turn off. The button can then be released.

b) The O₂ Buddy™ can only be turned off when placed in the Battery Charger. To turn the O₂ Buddy™ on, press the 'O₂' button. The instrument will sound 4 beeps and all lights will flash. The O₂ Buddy™ will enter into a warm up phase for 10 seconds. During warm up the yellow 'FAULT' light will be permanently on and the green 'OK'* light will flash every 2 seconds. After the warm up period, the green 'OK'* light will flash every 2 seconds, and the yellow light will go off to inform you that the instrument is working correctly.

To turn the O₂ Buddy™ off, place the O₂ Buddy™ into the Charger, and after a few seconds, press and hold the 'O₂' button for 2 seconds. The O₂ Buddy™ will emit a continuous tone and the yellow 'FAULT' light will turn on. If fitted the display will turn off. The button can then be released.

* On some customer specific versions the green light is labeled 'GOOD' instead of 'OK'.

3.2 Test Button

The 'O₂' Button doubles as a test button. In the absence of any alarms press once to check the alarm indicators and audible sounder are operating correctly. All lights will flash 4 times, and the buzzer will sound 4 beeps.

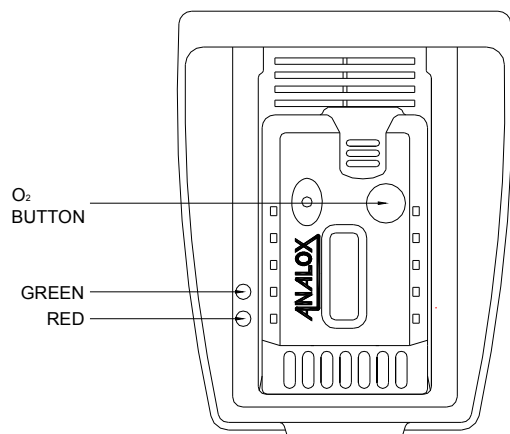
3.3 Charging the batteries

The O₂ Buddy™ operates using rechargeable NiMH batteries, which can be fast charged for your convenience. The fast charge feature is designed to charge the batteries to approximately 90% of their performance specification within 2 hours.

The O₂ Buddy™ should be fully charged before use, to ensure operation to specification. Even when switched off, the O₂ Buddy™ will consume a small quantity of power. As a result, the O₂ Buddy™ must be charged before use following periods of shipping or storage.

To charge the batteries, place the O₂ Buddy™ into the cradle Charger, as shown in the diagram below. The Charger will automatically fast charge the batteries for up to 2 hours, before reverting to a slow, continuous trickle charge. Fast charge mode is indicated by the red light on the Charger, trickle charge mode by the green light.

Do not attempt to charge the unit from an alternative power supply.



3.4 Alarms

During normal operation the O₂ Buddy™ will flash the GREEN 'OK' light every 2 seconds, and the liquid crystal display, when fitted, will show the current measured value of O₂ concentration.

The O₂ Buddy™ has been factory set with 2 alarm points, 19.5% and 18% O₂, the second alarm point will cause the 'DANGER' and 'FATAL' lights to flash.



'WARN' 19.5% O₂,



'DANGER' 18% O₂



'FATAL' 18% O₂

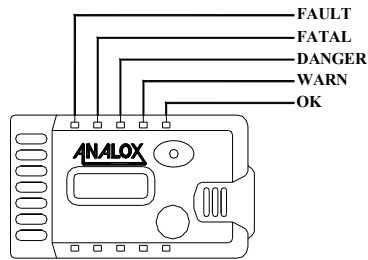


'FAULT'

Alarms must be taken seriously; you could be in a potentially hazardous environment and must follow established procedures. The safest action is to leave the hazardous area, returning only when further testing has shown the area to be safe.

If the O₂ level falls below 19.5% the RED 'WARN' light will flash and the buzzer will sound, every 2 seconds.

If the O₂ level continues to fall to 18%, the RED 'WARN', RED 'DANGER' and RED 'FATAL' lights will flash, together with a rapid buzzer sound, every 1/4 second.



The sequence of alarm lights is shown in the diagram above. The alarm lights are mirrored on the opposite side of the O₂ Buddy™.

When the level of O₂ begins to rise, the alarms will turn off in reverse sequence, from 'FATAL' and 'DANGER' to 'WARN', until only the 'OK' light is flashing, indicating that the O₂ level is above 19.5%. Please be aware that the alarm points have a hysteresis, as a result the alarm may not cancel at exactly 19.5%, but at 19.7% or 19.8%.

If you would like information regarding the effects of low O₂ please see our website www.analox.net

If the analyser detects that the internal electronics, or the sensor has failed, the buzzer will sound at a fast rate and flash the yellow 'FAULT' light. For further information on faults see section 3.5.

3.5 Faults

When switched on

O₂ readings are inhibited during a brief Warm Up period when the O₂ Buddy™ is first switched on. During warm up the 'FAULT' light will be permanently on, and the buzzer will be silent.

If the 'FAULT' light flashes during the Warm Up period, and the buzzer sounds, the analyser is indicating an internal calibration error.

In the event of a fault the O₂ Buddy™ should be returned to your supplier for servicing.

Low Battery Warning

As the battery power is drained, the analyser will issue a warning beep approximately once every 30 seconds. The O₂ Buddy™ is designed to operate for approximately 20 minutes, on a low battery, before shutting down.

If the analyser determines that the batteries are in too discharged a state for the analyser to operate correctly, the buzzer will sound at the very fast rate for 5 seconds. If a display is fitted, the display will read BATT. The O₂ Buddy™ will then shutdown and must be recharged before being used again.

Sensor Over-range

If the 'FAULT' and 'DANGER' lights are flashing and the buzzer is sounding at a medium speed, the O₂ Buddy™ is indicating a sensor fault. There will be no GREEN indicator light*. You must be aware that levels of low O₂ may be present, and should follow recommended procedures.

The O₂ Buddy™ should be returned to your supplier for servicing.

Sensor Connection

If the 'FAULT', 'WARN', 'DANGER' and 'FATAL' lights are flashing and the buzzer is sounding at a rapid speed, the O₂ Buddy™ is indicating a sensor fault, check that the sensor has been fitted correctly. There will be no GREEN indicator light*. You must be aware that levels of low O₂ may be present, and

should follow recommended procedures.

The O₂ Buddy™ should be returned to your supplier for servicing.

* In the event of an instrument fault, if your O₂ Buddy™ is not fitted with an on/off capability, the audible alarm can be silenced. To silence the alarm press and hold the O₂ button for 2 seconds, until the O₂ Buddy™ stops beeping. The visual fault alarm will remain flashing. When the O₂ Buddy™ is placed into its Charger the audible alarm will re-sound, and both the audible and visual indicators will be working. The 'FAULT' light and buzzer will only stop if the analyser starts to work again correctly.

IMPORTANT

If at any time the GREEN 'OK' light is **not** flashing and the YELLOW 'FAULT' light is flashing **the analyser must not be used**. You should contact your supplier.

If there are no indicator lights flashing ensure that the battery is charged and the unit is switched on.

3.6 Accessories





The O₂ Buddy™ can be supplied with the following accessory,

- a) Datalogging kit, comprising software and a download lead, enabling you to gain an understanding of your working environment

Part No: SA2 L01 50

For further information see section 2.1.

4.0 Quick Check

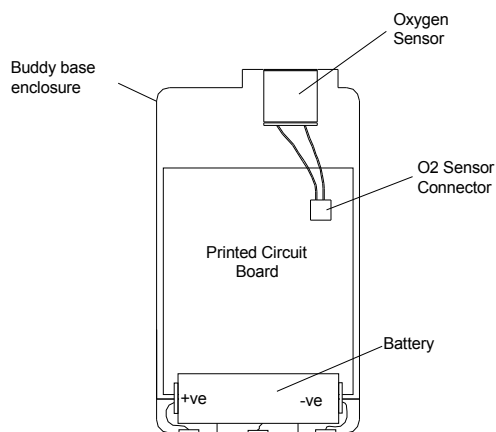
Lights (☼ means flashing light)					Buzzer	Condition	Action
Green 'OK'	Red 	Red 	Red 	Yellow 'FAULT' 			
					Silent	Turned off	
☼				On	Silent	Warm up	None
☼					Silent	Safe O ₂ >19.5%	None
	☼				¼ sec beep	O ₂ < 19.5%	Gas leak detected
	☼	☼	☼		¼ sec beep	O ₂ < 18%	Gas leak detected
☼					1 beep every 30 secs	Low battery warning	Recharge battery
☼					Rapid beep for 5 secs	Low battery O ₂ Buddy™ will shutdown	Recharge battery
		☼		☼	Medium beep	Sensor fault	Contact supplier
	☼	☼	☼	☼	¼ sec beep	Sensor fault	Check the sensor is connected

5.0 After sales service

5.1 Sensor replacement

The Oxygen sensor in the O₂ Buddy™ is expected to last 2 years. A new sensor can be ordered using *Part No. 9100-1020*. To change the O₂ sensor turn the O₂ Buddy™ off, undo the 4 fixing screws, which hold the belt loops and instrument together.

Un-clip the O₂ sensor connection, and remove the sensor. Place the new sensor into position, with the metal pins of the sensor circuit board close to the base of the box. Ensure the O₂ sensor is held in position by the lugs in the base of the box, and insert the sensor connector into its socket on the printed circuit board.



Replace the lid, the fixing screws and belt loops and screw the box together. Turn the O₂ Buddy™ on to check you have fitted the sensor correctly.

5.2 Battery replacement

Battery replacement will depend on usage of the CO₂ Buddy; the battery is expected to last between 2 and 4 years. Replacement batteries and battery fitting is available from your supplier or Analox directly.

NOTE: Only batteries supplied by Analox should be used and fitting replacement batteries **MUST** be done by a trained technician and **NOT** the Buddy operator.

5.2 Testing the Alarms

To test the alarms pass a known concentration of O₂ over the sensor at a flow rate of 150-2000ml/ min. Ensure the O₂ concentration of the gas is lower than the alarm point. For example, use 19%, or 17% O₂.

The table below can be completed when checking alarms. Calibration is required on a regular basis.

Date	Gas	Alarm

5.3 Calibration

To maintain optimum performance the O₂ Buddy™ must be regularly calibrated at least every six months. Recalibration will also be required if the O₂ Buddy™ is not alarming at its designated set points.

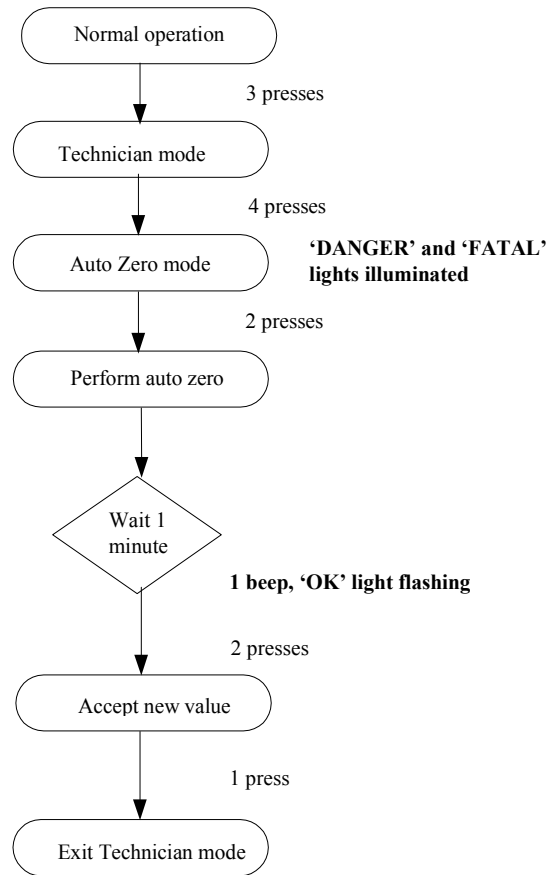
Performing a Fresh Air Calibration

A Fresh Air Calibration is a quick and easy method of calibrating the O₂ Buddy™, and must be done in clean air. In order to calibrate the O₂ Buddy™ follow the stages below or the diagram on page 17.

- 1) Press the O₂ button three times in succession to enter Technician mode, each press must be within 1 second of each other. The instrument will beep with each press. If you have entered Technician mode successfully the timing of the flash of the green 'OK' light will reverse, meaning the light will be turned on more than it is turned off.
- 2) Press the O₂ button four times in succession to enter the auto zero function. The 'DANGER' and 'FATAL' alarm lights will illuminate to show you are in auto zero mode.
- 3) Press the O₂ button two times in succession, and wait 1 minute. The O₂ Buddy™ is performing an auto zero, when it has finished the O₂ Buddy™ will emit one beep, the 'DANGER' and 'FATAL' lights will turn off, leaving only the green 'OK' light flashing. If fitted the display will read 20.9 (±0.1%)
- 4) Press the O₂ button two times in succession to accept the new zero value.
- 5) Press the O₂ button once to exit Technician mode. The O₂ Buddy will restart, emitting 4 beeps whilst flashing all lights.

If at any point your calibration is incorrect, press the O₂ button once to exit auto zero mode, and once again to exit Technician mode.

Performing a Fresh Air Calibration



5.4 Warranty

The Analox O₂ Buddy™ is supplied with a 2-year electronics warranty, and a 2 year graded warranty on the O₂ sensor. Analox terms and conditions of sales apply.

5.5 General care

- Keep the sensor face free from dust, if possible.
- Do not pierce the sensor face.
- Keep the O₂ Buddy™ and Charger out of direct sunlight.
- The O₂ Buddy™ has been designed to be splash proof; it must not be immersed in water.
- Do not place metallic or conductive objects in the Charger, as this could short out the electrical connections.
- Ensure the Charger is kept clean, excess dust could cause failure of the Infra Red communications ports.

6.0 Warranty

We provide the following Warranties for the Analox O2 Buddy:

- A 1 year sensor warranty.
- A 2 year electronics warranty.

In both cases the Warranty period runs from the date of our Invoice.

We warrant that the equipment will be free from defects in workmanship and materials.

The Warranty does not extend to and we will not be liable for defects caused by the effects of normal wear and tear, erosion, corrosion, fire, explosion, misuse, use in any context or application for which the equipment is not designed or recommended, or unauthorised modification.

Following a valid Warranty claim in accordance with the above, the equipment, upon return to us, would be repaired or replaced without cost or charge but in our discretion we may elect instead to provide to you which ever is the lesser of the cost of replacement or a refund of net purchase price paid as per our Invoice on initial purchase from us. We shall have no liability for losses, damages, costs or delays whatsoever. We shall have no liability for any incidental or consequential losses or damages. All express or implied warranties as to satisfactory or merchantable quality, fitness for a particular or general purpose or otherwise are excluded and no such Warranties are made or provided, save as set out in this Clause 7.

In order to effectively notify a Warranty claim, the claim with all relevant information and documentation should be sent in writing to:

Analox Sensor Technology Limited
15 Ellerbeck Court
Stokesley Business Park
Stokesley
North Yorkshire
TS9 5PT

Or by e-mail to : info@analox.net
Or by Fax to : +44 1642 713900

We reserve the right to require from you proof of dispatch to us of the notification of Warranty claim by any of the above alternative means.

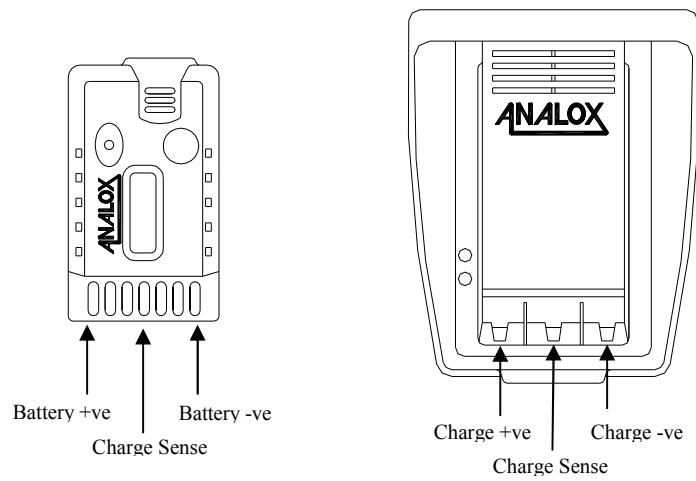
The equipment should not be sent to us without our prior written authority. All shipping and Insurance costs of returned equipment are to be born by you and at your risk. All returned items must be properly and sufficiently packed.

7.0 Specification

BUDDY RATING:	Nickel Metal Hydride, 1.2V 1600mAh
CHARGER RATING:	Mains voltage:- 230V AC (Not Adjustable - Instrument will be factory set) 110V AC (Not Adjustable - Instrument will be factory set) Mains power:- Less than 5VA – 110V AC and 230V AC Versions
ACCURACY	\pm 3% of Full Scale over 0.1-25% O ₂
RESPONSE TIME	15 seconds to T90
OPERATING TEMPERATURE	0 to 40°C
TEMPERATURE EFFECT	<0.1%FS/°C
WARM UP TIME	10 seconds
BATTERIES	NiMH rechargeable, up to 12 hours use between charges
ORIENTATION	Not sensitive
WEIGHT	150 g
DIMENSIONS	116 x 63 x 23mm
EMC	CE marked

SENSOR TYPE	Electrochemical cell
ALARMS	Audio Visual alarm plus 'FAULT' & 'OK'

8.0 Electrical Input/Output Connections



9.0 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.