

# O2 Portable

## Quick Start Guide



[www.analoxgroup.com/products/o2-portable](http://www.analoxgroup.com/products/o2-portable)

Scan the QR code to visit the Analox O2 Portable web page



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### 1. Introduction

The O2 Portable Oxygen Analyzer is designed to measure oxygen levels in the range 0.1 100% O<sub>2</sub>.

The Analyzer should be used for cylinder oxygen level verification or for monitoring a gas mixing panel but should not be used for both. If the Analyzer is used for measuring the oxygen level in the output from a mixing panel, another O2 Portable should be used for cylinder verification purposes.

The O2 Portable has a large digital display and operates from an internal temperature compensated 3-year life (Expected) electrochemical oxygen sensor. Power is provided by a 9V, 4000-hour life battery giving up to 3 year operation before replacement is necessary.

The O2 Portable is a water-resistant drop resistant totally self-contained unit designed specifically for all the diving industry Sport (NITROX), Commercial and Military where hostile environmental conditions are the norm not the exception.

Your O2 Portable is supplied ready to use. On receipt of the unit, please check for damage. If there is any damage, contact your supplier.



**WARNING: IT IS IMPORTANT THAT THESE INSTRUCTIONS ARE READ BEFORE USE.**

### 2. O2 Compensation chart

The O2 compensation chart should be used to check that the O2 Portable is reading correctly in hot and humid conditions, as the higher the temperature and humidity the less atmospheric oxygen there is. An air calibration should be performed prior to checking any samples and the O2 Portable should be adjusted as per the below chart.

Oxygen compensation chart for moisture in the atmosphere

ATMOSPHERIC OXYGEN PERCENT IN RELATION TO TEMPERATURE AND RELATIVE HUMIDITY										
Temp °F	32	40	50	60	70	80	90	100	110	120
Temp °C	0	4	10	16	21	27	32	38	43	49
RELATIVE HUMIDITY	ATMOSPHERIC OXYGEN PERCENT									
10	20.9	20.9	20.9	20.9	20.8	20.8	20.8	20.8	20.7	20.7
20	20.9	20.9	20.8	20.8	20.8	20.8	20.7	20.6	20.5	20.4
30	20.9	20.8	20.8	20.8	20.7	20.7	20.6	20.5	20.4	20.2
40	20.8	20.8	20.8	20.7	20.7	20.6	20.5	20.4	20.2	19.9
50	20.8	20.8	20.8	20.7	20.6	20.5	20.4	20.2	20.0	19.7
60	20.8	20.8	20.7	20.7	20.6	20.5	20.3	20.1	19.8	19.5
70	20.8	20.8	20.7	20.6	20.5	20.4	20.2	19.9	19.6	19.2
80	20.8	20.8	20.7	20.6	20.5	20.3	20.1	19.8	19.5	19.0
90	20.8	20.7	20.7	20.6	20.4	20.3	20.0	19.7	19.3	18.7
100	20.8	20.7	20.6	20.5	20.4	20.2	19.9	19.5	19.1	18.5
H <sub>2</sub> O at 100% RH	0.6	0.8	1.2	1.8	2.5	3.4	4.7	6.5	8.6	11.5

If the temperature and RH axis meet in this part of the chart, calibrate to the chart O<sub>2</sub> level or with dry air to maintain 0.5% O<sub>2</sub> accuracy in NITROX.

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### 3. Air calibration

Air calibration is essential before every use and is performed as follows:

- 1] Ensure that any flow adaptors are removed and the reading on the display has stabilised.
- 2] Expose the Analyzer to clean air for two minutes and adjust the calibration knob until the display reads the correct value using the humidity chart above. If this is not possible refer to section 5 Troubleshooting and section 6 Maintenance.
- 3] It is possible that at very high altitude normal calibration is not achievable. In this event you must ascertain the actual pressure in BAR and multiply the atmospheric oxygen percent (20.9%) by this pressure and set the reading during calibration to the calculated level (this is the surface equivalent oxygen percentage). When you measure the level of oxygen in the sample you must divide the reading by the same atmospheric pressure value to obtain the true percentage of Oxygen in your sample.

For Example: At an atmospheric pressure of 0.8 BAR the surface equivalent oxygen percentage is  $20.9\% \times 0.8 = 16.7\%O_2$  Surface Equivalent. If the reading you then obtain from your sample is 32.0% you must divide this by 0.8 to obtain the true Oxygen percentage,  $32.0/0.8 = 40.0\%O_2$  True Percentage.

- 5] The Analyzer is now ready for oxygen measurement.



**WARNING: THE ANALYZER IS SENSITIVE TO OXYGEN PARTIAL PRESSURE. CALIBRATION MUST ALWAYS BE CARRIED OUT AT THE SAME ATMOSPHERIC PRESSURE AS OXYGEN MEASUREMENT.**

### 4. Operation

#### DII flow adaptor

- 1] The Analox O2 Portable comes complete with the unique DII adaptor which allows you to directly apply the Analyzer to the outlet on your nitrox tank.
- 2] Connect the DII adaptor to the Analyzer by pushing the adaptor over the sensor turret. The o-ring on the sensor should ensure a comfortable fit.
- 3] Hold the DII adaptor firmly against the cylinder outlet facing you. Very slowly open the pillar valve until gas can just be heard hissing through the flow adaptor.



**WARNING: OPEN THE CYLINDER VALVE SLOWLY AS HIGH PRESSURE CAN RESULT IN DAMAGE TO THE SENSOR.**

- 4] Close the pillar valve after fifteen seconds when a stable reading is observed on the O2 Portable.

- 5] If in doubt repeat the procedure taking care to ensure a very low gas flow.

- 6] Note that after a few seconds of the gas flow being stopped the reading will begin to change towards the level in the surrounding air of 20.9% O<sub>2</sub> you should therefore take the reading while flow is ON.



**WARNING: DO NOT PRESSURISE THE SENSOR, THIS WILL RESULT IN INACCURATE READINGS.**

### 5. Troubleshooting

Symptom	Reason	Solution
Battery symbol	Low battery	Change battery
No display	Switched off Bad connection Dead battery	Switch on Check display connection Check battery connection
Zero reading	Sensor disconnected Sensor expired	Check connection Change sensor
Reading erratic	Pressure on sensor Radio transmission Sensor old or faulty Condensation on sensor	Check flow Move unit away Change sensor Dry sensor face
Reading does not change when calibration knob is turned	Faulty connections Sensor failure	Check connections, Change sensor
Display segments missing	Display faulty	Return to dealer
Will not calibrate	Sensor faulty Sensor not in air High altitude	Change sensor Check flow adapter Calculate percent equivalent = $20.9\% \times \text{bar}$
Reading drifts	Rapid temperature change	Do not move Analyzer from one temperature to another immediately before use

## 6. Maintenance

### Battery replacement

- 1] Remove the 4 screws located at each corner of the unit and carefully lift the lid.
- 2] Slide the battery out of its spring bracket and disconnect the lead.
- 3] Connect the lead to the new battery and slide the battery behind the spring bracket.
- 4] Replace the lid carefully and screw down taking care that the sensor locates properly. Ensure that you do not trap any wires.

### Sensor replacement

- 1] Remove the 4 screws located at each corner of the unit and carefully lift the lid.
- 2] Remove the flow adaptor if fitted and slide the sensor out of the lid.
- 3] Disconnect the in line sensor connector.
- 4] Dispose of the old sensor according to local regulations for Lead and Potassium Hydroxide solution.
- 5] Remove the new sensor from its bag and check it for leaks, connect to the inline connector and slide through the lid.
- 6] Replace the lid carefully and screw down taking care that the sensor locates properly. Ensure that you do not trap any wires.

## 7. Spares & accessories

### Spares

Your O<sub>2</sub> Portable unit is supplied with an Analox oxygen sensor, a 9v battery, a domed high pressure flow adaptor and 1 metre of tubing.

You are able to purchase these spares directly from us by contacting us using the relevant contact method from section 13.

- 9100-9212-5AD - Spare oxygen cell for the Analox O<sub>2</sub> Portable
- 8000-0002A - High pressure DII adaptor
- MIO2HO - 1 metre neoprene hose

### Accessories

The universal flow adaptor can be used in conjunction with a flow meter and suitable tubing to supply a flow of around 0.5 to 1.0 lpm across the sensor.

- 8000-0011A - Universal Flow Adaptor

## 8. Safety information

### Battery

1] When the life of the battery has expired it should be disposed of safely in accordance with local regulations.

### Sensor

1] When the life of the sensor has expired or it is leaking or otherwise damaged it must be disposed of safely in accordance with local regulations.

2] The sensor contains KOH Potassium Hydroxide solution which is hazardous and can have the following effects:

- Skin Potassium Hydroxide is corrosive – skin contact could result in a chemical burn.
- Ingestion Can be harmful or FATAL if swallowed.
- Eye Contact can result in the permanent loss of sight.

### First aid procedures

- Skin Wash the affected part with a lot of water and remove contaminated clothing. If stinging persists get medical attention.
- Ingestion Drink a lot of fresh water. Do not induce vomiting. Get medical attention.
- Eye Wash with a lot of water for at least 15 minutes and get medical help immediately.

## 9. Care of the O<sub>2</sub> Portable

1] Although designed to be water resistant the O<sub>2</sub> Portable should not be intentionally immersed in liquid or left outside unprotected.

2] The O<sub>2</sub> Portable is built to resist the effects of day to day shocks and drops but remember it is a precision oxygen analyzer and should be looked after carefully to give long trouble free service.

3] To clean the O<sub>2</sub> Portable use a damp soft cloth.

4] Protect the O<sub>2</sub> Portable from long periods of direct sunlight and do not subject it to high or low temperature extremes.

## 10. Sensor handling information

O<sub>2</sub> Portable oxygen sensors are supplied normally in sealed bags. Before the bag is opened check that the sensor has not leaked. The sensors are themselves sealed and do not under normal circumstances present a health hazard however if leakage of the Potassium Hydroxide electrolyte has occurred use rubber gloves and wear chemical splash goggles to handle and clean up. Rinse contaminated surfaces with water.



**WARNING:**

**IF AFTER HANDLING THE SENSOR YOUR FINGERS OR OTHER PART OF YOUR BODY FEELS SLIPPERY OR STINGS WASH WITH A LOT OF WATER. IF STINGING PERSISTS, SEEK MEDICAL ATTENTION.**

## 11. Specifications

Specification	Value
Range	0.1 to 100.0% oxygen
Typical accuracy	±2% of reading over range
Resolution	0.1% oxygen
Response time	90% in less than 15 seconds
Sensor type	Analox 9212 5AD
Sensor life	More than 36 months in air. 24 month graded guarantee in air.
Battery	9V Alkaline (PP3)
Battery life	4000 Hours. Up to 36 months intermittent use.
Operating temperature	- 5 to 50 °C
Storage temperature	- 5 to 50 °C
Pressure	Sensitive to the partial pressure of oxygen.

## 12. Disposal

### WEEE statement

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

## 13. Service and Support

Scan the QR code to visit the Analox Technical & Service Support web page



<https://customersupport.analox.net/support/home>

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