

Alpha-1 Oxygen Analyser



- **Water Resistant Aluminium Case**
- **Very Easy To Calibrate**
- **Fast Sample and Recovery**
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- **Extended Sensor Life**
- **Accurate To 0.1%**

Alpha-1 Control Solutions Oxygen Analyser

The Alpha-1 Oxygen Analyser has been designed by divers for divers.

The Analyser is very easy to use and is highly accurate. The Oxygen Sensor has been specially developed for the Alpha-1 Analyser and together with the electronics is temperature stable over the range of -20 to +50 degrees Celsius.

The Sensor is fitted with a Sealing Cap which when fitted extends the life of the Sensor. The Sensor life is approximately 2 years + in normal air (20.9%) and greater when the cap is fitted.

The robust aluminium case is sealed to IP65 (sprayed jets of water), the Sensor Sealing Cap should always be fitted if the unit is likely to get wet. **Do not puncture or remove the white membrane in the sensors gas input port.**

WARNING the universal Sampling Adapter can not withstand high pressures. Only fit to a partially open cylinder valve once steady low flow has been obtained. **NEVER** fit to a closed valve and then try to obtain a sample as the Sensor can be damaged beyond repair by too high pressures. The correct method of use is fully described in the Operating Instructions below.

Operating Instructions

1 – Remove the Sensor Sealing Cap and turn on the Analyser by pressing the on/off switch. Allow 3-5 minutes for the Sensor to stabilise to normal air. The display will remain constant once stabilised.

Calibrate the Analyser by adjusting the Calibration Control until a reading of 20.9% is displayed.

IMPORTANT Calibration should be performed out doors in Dry, Fresh Air. The nominal percentage of Oxygen indoors is very seldom 20.9% and can be as low as 19.9%. A normal air fill serves as an excellent calibration reference if indoor calibration has to be carried out.

2 – **Slowly** open the cylinder valve of the cylinder to be sampled to test the action of the valve. The valve must be able to be adjusted to allow a constant minimal flow. With practise this is nearly always achievable.

3 – Fit the universal Sampling Adapter to the partially open valve as shown in the photo's below:



Universal Sampling Adaptor



Fitted to an 'A' clamp valve.



Fitted to a DIN valve



Sensor Flow Adaptor

Finally check that a low volume constant flow of gas can be heard venting from the Sensor Flow adaptor. It is important to note that too high a flow level can over pressurise & destroy the sensor.

4 – The last action is to push the Sensor Flow Adapter into the Oxygen Sensor to commence sampling the gas. After approximately 45 seconds the Analyser display will stabilise and indicate the percentage of Oxygen in the gas. Accuracy can be confirmed by removing the Sensor Flow Adapter from the Sensor and allow approximately another 45 seconds for the analyser to return to the original calibration setting $\pm 0.1\%$. **(remember to use exactly the same conditions used to obtain the original calibration)**

5 – Replace the Sensor sealing cap when not analysing. Leave the unit switched on and observe the display which will start to increase as the cap creates a seal. Cease tightening when the display has increased . **DO NOT** over tighten the cap as this is not required and a poor seal may result if the internal ‘O’ ring is collapsed.

6 – Switch off the analyser by pressing the on/off switch.

Battery Replacement

A low battery is indicated by the display showing a battery symbol at the left hand top corner of the display. Remove the 4 x screws that secure the rear cover and remove the cover. The battery will be seen in the lower part of the case. The battery is a 9 volt PP3(MN1604) type and it is recommended that an alkaline type is used. The easiest way to replace the cover is to position the sealing correctly on to the cover, then invert the analyser case onto the cover, and then turn the unit over and replace the screws. Take care not to over tighten the screws as the aluminium case is quite soft.

Sensor Replacement

The Sensor will require replacement one day. The replacement Sensor should be obtained from the store that supplied the analyser. This can easily be fitted into the unit by following the instructions supplied with each replacement Sensor. To ensure continued accuracy, it is essential to fit an original Alpha-1 replacement Sensor.

Warranty Terms

The Sensor is covered by a 1 year warranty and the Analyser is covered by a 2 year warranty commencing from date of purchase. Please be sure to retain your receipt as this serves as the warranty document.

Exclusions from Warranty The following are not included in the warranty periods:

- Sensor over pressure damage. Providing that the Operating Instructions are followed correctly ***this can not occur.***
- Mechanical damage to the Analyser and fittings and the Sensor gas input port membrane.
- Ingress of water into the Analyser resulting from an incorrectly fitted or damaged rear cover sealing gasket.
- Ingress of water into the Analyser if the IP65 rating has been exceeded.
- Loss of fittings, hoses etc.

Removal or defacement of the Sensor identification label will invalidate the Sensor Warranty.

Specifications

Range	0-100% Oxygen
Linearity	Linear through out range
Sensor Resolution	0.1% (see below)
Sensor Life	2 Years + (average diver use)
Sensor Response to Target (T)	> 50 seconds
Working Temperature Range	0 to +50 degrees Celsius
Storage Temperature Range	-20 to +50 degrees Celsius
Display	3.5 digit LCD 12.5mm character height
Calibration	Manual to ambient Dry, Fresh air to 20.9% for EAN's up to 60%. Above 60% sampling, calibration to 100% Oxygen.
Environmental Seal	IP65 – Sprayed jets of water
Battery	PP3 (MN1640) Alkaline
Weight	420 grams
Sensor Replacement	By end user or dive store
Support Telephone Number	+44(0)1489878055

Alpha-1 Analyser re-Calibration

The Analyser will require internal secondary calibration before the Sensor expires. This will become apparent as the 20.9% calibration setting will not be achievable. A steady lower value will instead be displayed. Calibration is performed as follows:

1. Remove the rear cover.
2. The internal re-calibration control is located at bottom centre port (red) in the sealed electronics module. This is a fine multi-turn control and will need to be turned several times.
3. Turn the front user calibration control fully clockwise to obtain the maximum reading.
4. Adjust the internal calibration control until a nominal reading of 22.2% is displayed (see below for variations).

IMPORTANT Carry out the re-calibration outdoors in Dry, Fresh Air.

The nominal setting of 22.2% varies according to the local atmospheric pressure. This can be obtained from an accurately set barometer or by contacting a local weather station or one of the many weather websites now on line. For UK users we recommend the following website: <http://www.weather.co.uk/> the local atmospheric pressure is obtained by entering the postcode of your location.

The nominal atmospheric pressure is 1013mb. Each 5mb variation requires a .1% offset to the nominal setting of 22.2%.

In most cases a setting of 22.2% will be OK providing that the true atmospheric pressure is not too high or too low.

Consult the table below for these variations:

5. Replace the rear cover. The Analyser is now re-calibrated.

High Pressures	
Pressure	Value
1013	22.2
1018	22.3
1023	22.4
1028	22.5
1033	22.6
1038	22.7
1043	22.8

Low Pressures	
Pressure	Value
1013	22.2
1008	22.1
1003	22.0
998	21.9
993	21.8
988	21.7
983	21.6