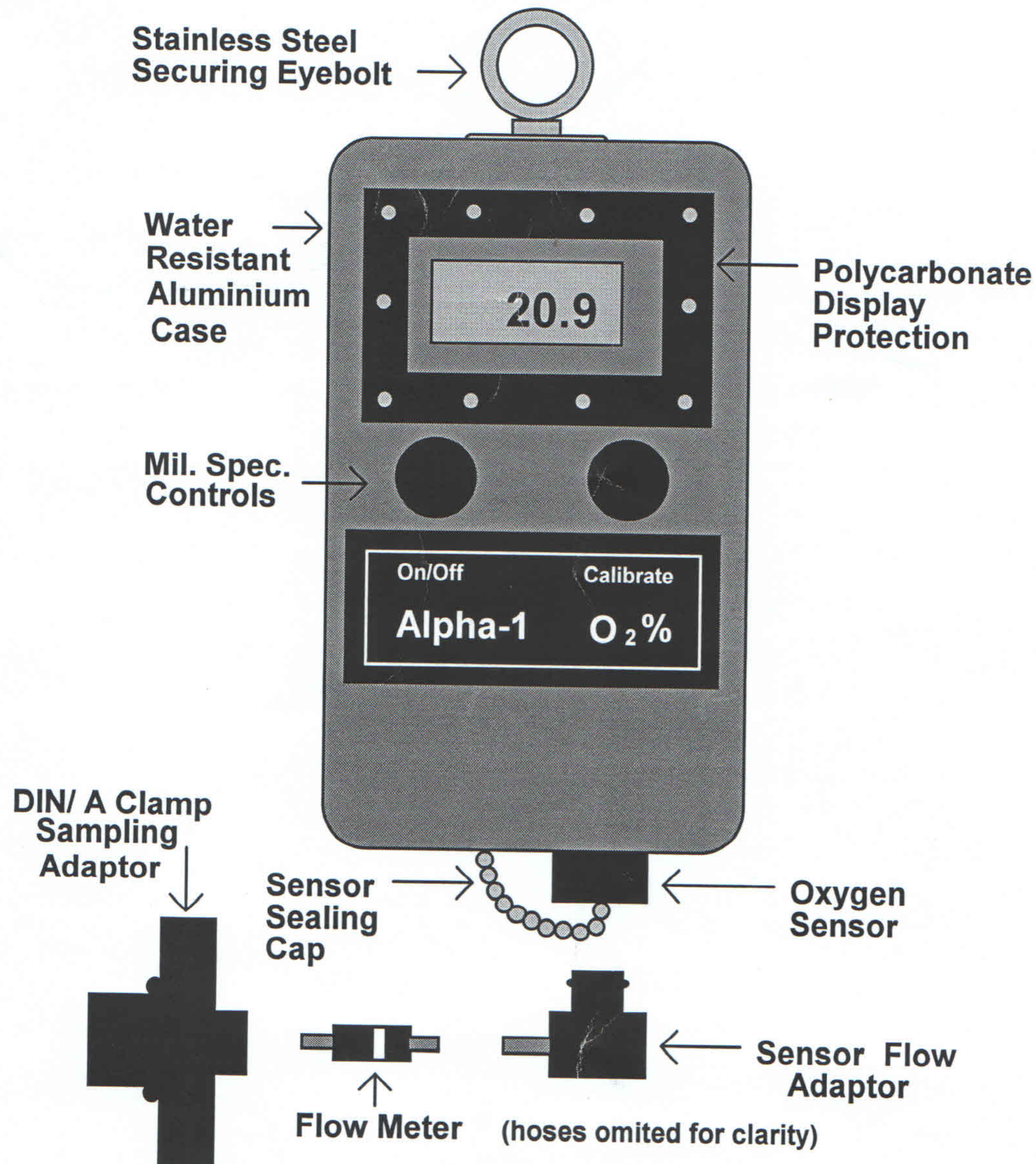


Alpha-1 Oxygen Analyser



Supplied by:

Alpha-1 Control Solutions Oxygen Analyser

Contents

- Sensor Flow Adapter
- Universal Sampling Adaptor
- Flow Meter & Hose
- Specifications

The Alpha-1 Oxygen Analyser has been designed by Divers for Divers. The Analyser is very easy to calibrate and is highly accurate. The Oxygen Sensor has been specially developed for the Alpha-1 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%).

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.

WARNING - The Universal Sampling Adaptor can not withstand high pressures Only fit to a partially open tank valve once a steady low flow has been obtained. NEVER fit to a closed valve and then try to obtain a sample as the Analyser 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 the Analyser on by pressing the On/Off switch. Allow 2-3 minutes for the Sensor to stabilise to normal air.

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 reference and should be used to Calibrate the Analyser if indoor Calibration has to be carried out.

2 - SLOWLY open the tank 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 achieved.

3 - Provided that the required low flow is achieved, the Universal Sampling Adaptor can be fitted to the tank valve and secured by placing the attached loop of silicon hose over the valve. This Sampling Adaptor can be fitted to 'A' Clamp, 200 and 300 Bar tank valves. A Flow Meter is fitted in the hose approx. 100mm from the Sampling Adaptor. The hose has been designed to "Blow Off" the Flow Meter at this point if too high a pressure is applied. This is easily replaced. The clear window in the Flow Meter will turn Yellow if the flow is too great. If this occurs the tank valve needs to be further partially closed until the window once again becomes clear. Gas will also be heard to escape from the Sampling Adaptor, at the seal on the valve, if the flow is also too high.

4 - The last action is to push the Sensor Flow Adapter into the Oxygen Sensor to commence sampling. After approximately 45 seconds the Analyser display will stabilise and indicate the percentage of Oxygen in the tank. The accuracy can be confirmed by removing the Sensor Flow Adapter from the Sensor and allow approximately 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. Observe the display which will start to increase as the Cap creates a seal. Cease tightening when this starts to increase. 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 once again pressing the On/Off Switch.

NB: If the Sensor is incorrectly allowed to come into contact with Salt Water, the Sensor should be flushed out gently by pouring clean cold tap water into the Sensor to flush out the remaining traces of Salt. Take care not to allow a high pressure flow of water into the Sensor. Shake out as much of the rinse water as possible and allow to dry before re-fitting the Sealing Cap.

Battery Replacement

A low Battery is indicated by the Display Decimal Point becoming Faint. As long as the Decimal Point is displayed the accuracy of the Analyser is not affected.

The Battery is a PP3 (MN1604) type and an Alkaline version is fitted when new.

Remove the 4 screws that hold on the rear cover and remove the cover. The Battery will be seen in the lower part of the case.

Take care not to over tighten the screws when replacing the cover as the Aluminium is quite soft. The easiest way to replace the cover is to position the gasket correctly and to then invert the case onto the cover then turn over the case and cover to replace the screws.

Sensor Replacement

The Sensor will require replacement one day. The Analyser should be returned to the Dive Store who supplied the unit for onward return to Alhpa-1 Control. Our target is to return Analysers to the Dive Store within 2 working days or sooner if possible.

Warranty

The Analyser is covered by a full 12 Months Warranty from the date purchased. Please be sure to keep a copy of your receipt during the Warranty period as this serves as the Warranty Document.

Damage caused by the following is excluded from this Warranty.

- Sensor over pressure damage. This will result in a ruptured sealing membrane in the Sensor. The result will be a very high display reading (100%+) and the Sensor will need to be replaced. Provided that the Operating Instructions are correctly followed this damage will NOT occur.
- Mechanical Damage to the Analyser and fittings.
- Ingress of Salt Water into the Sensor if the recommended recovery instructions have not been followed. (ie; Cold water flush out)
- Losses of fittings and hoses etc.

Specifications

Range	0 - 100% Oxygen
Sensor Resolution	0.1% (see below)
Sensor Life	2 Years (normal Diver use, less for very frequent sampling)
Working Temperature Range	0 to +50 degrees Celsius
Storage Temperature Range	-20 to +50 degrees Celsius
Sensor Response to target (T)	< 45 seconds
Display	3.5 digit LCD 10mm character height
Calibration	Manual to ambient Dry, Fresh air to 20.9% for EAN's up to 60%. Above 60% EAN's sampling, calibration should be carried out by calibrating to 100% O ₂ .
Environmental Seal	IP65 (sprayed jets of water)
Controls	Military Specifications
Battery	PP3 (MN1604) Alkaline
Weight	410 Grams
Sensor Replacement	Return to Dive Store or Alpha-1 Control
Support Telephone No	07770 988027
Support Fax No	(020) 8446 6546

NB: Sensor Resolution

This is quoted as competitive units specifications state this. This is frequently believed to be a statement of accuracy. This is however NOT an accuracy value as such, *Resolution* is the lowest percentage of Oxygen that can be *Resolved* in a sample. 0.1% Oxygen can not support life so this is really of little concern to us.

Accuracy

The Analyser has been independently evaluated by a number of authorities who all agree that: .
"Provided that the Analyser has been correctly Calibrated (as per the Operating Instructions) the unit is accurate to +/- 0.1%" which can be proved by repeatability tests..

Each Sensor is tested during manufacture at 100% N₂ (0% Oxygen), 100% Oxygen and a reference sample of 20.9%. These tests are repeated a number of times and are recorded against each Sensor by Sensor serial no.

Spares

A full Spare Parts service is available from the Dive Store who supplied the Analyser or direct from Alpha-1 Control via the Support Desk.

This includes all the 'O' Rings, Gasket, Hoses, Sensor Flow Adapter, Sampling Adaptor and Flow Meter. It is Alpha-1 Control policy to supply replacements at cost as we do not wish to profit from losses or unfortunate incidents.

Protective Display Window

Please DO NOT attempt to un-do the screws which hold this window in place as these are internally sealed to prevent loosening due to vibration ie: RIB/fast boat transportation .
Turning these screws will break the seal with the possible consequences of losing screws and the water resistant seal.

Alpha-1 Oxygen Analyser - Re-Calibration

The Alpha-1 Analyser will require re-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. Re-calibration is very easy to do as follows:

1. Remove the rear cover by un-doing the four screws.
2. The internal calibration adjustment control is located in the upper part of the case in the sealed Electronics module.
3. Turn the front user calibration control fully clockwise to the maximum setting.
4. Adjust the internal calibration control clockwise until the display reads 22.2%.

IMPORTANT Use a FRESH normal air fill as a reference when the re-calibration is performed

The setting of 22.2% varies according to the local atmospheric pressure. This can be obtained by contacting the local weather station or by taking the reading from an accurately set barometer. In most cases just setting to 22.2% should be OK providing that the pressure is not too high or too low. The variations required to the calibration setting of 22.2% are listed in the table below:

The nominal atmospheric pressure is 1013 mb, you will note from the table below that each 5 mb alteration of pressure requires a 0.1% change to the nominal calibration setting of 22.2%.

High Pressures		Low Pressures	
Pressure	Value	Pressure	Value
1013 mb	22.2	1013 mb	22.2
1018 mb	22.3	1008 mb	22.1
1023 mb	22.4	1003 mb	22.0
1028 mb	22.5	998 mb	21.9
1033 mb	22.6	993 mb	21.8
1038 mb	22.7	988 mb	21.7
1043 mb	22.8	983 mb	21.6
1048 mb	22.9	978 mb	21.5

5. Seal the internal calibration control with a dab of paint and replace the rear cover. Take care not to over tighten the screws as the aluminium case is softer than the stainless steel screws. Over tightening the screws may damage the case threads.

The Analyser is now re-calibrated.