

O2 EII Pro

Technical Manual

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1 Packing and Contents Check

On Opening your Analox O2 EII Pro, please check you have the following items:

- a) O2 EII Pro.
- b) O2 Sensor.
- c) Dome adaptor with Hose Barb (to receive a sample from your BCD).
- d) O2 EII Pro Quick Start Guide.
- e) Any accessories ordered for your O2 EII Pro.



2 About the O2 EII Pro

The O2 EII Pro Oxygen Analyser is designed to measure Oxygen levels in the range 0.1 100% O2 for tank oxygen level verification.

The O2 EII Pro is ergonomically designed, and equipped with several features to ensure ease of use, and reliability. The instrument has been designed to be held in the left hand to enable ease of use when checking your tank. It is fitted with a large digital display and operates from an internal temperature compensated electrochemical oxygen sensor. Power is provided by a 9V battery which will last for approximately 1 year before replacement is necessary. The O2 EII Pro will automatically switch off after 10 minutes to ensure battery life is not compromised if the instrument is accidentally turned on.

The O2 EII Pro is water and drop resistant. Designed specifically for the diving industry – whether you may be a Sport (NITROX), Commercial or Military diver where hostile environmental conditions are the norm not the exception.

3 Setting up your O2 EII Pro

NOTE: ON OPENING YOUR O2 EII PRO YOU WILL HAVE TO FIT THE O2 SENSOR.

3.1 Fitting the O2 Sensor

1. Remove the contents and take the sensor out of the packaging and carefully cut open the antistatic bag to obtain the sensor. Allow the sensor to settle for 24hr prior to use.



2. Loosen the 4 screws located on the front cover. The gasket seal is designed to prevent water leaking into the O2 EII Pro as a result the seal may be tight. Loosen the seal by moving the lid from side to side, and then and carefully lift the cover.



3. Screw the sensor to the inside of the front cover tightly.



4. Connect the JST cable <u>connector to the JST header on the PCB of the O2 Sensor</u>.



 Replace the cover carefully taking care that the sensor locates properly and that you do not trap any wires. Screw down until you feel the gasket tighten; do not over tighten the screws.



Your Oxygen Analyser is now ready to take a reading.

CAUTION: IF AFTER HANDLING THE SENSOR YOUR FINGERS OR OTHER PARTS OF YOUR BODY FEEL SLIPPERY OR STINGS WASH WITH A LOT OF WATER. IF STINGING PERSISTS GET MEDICAL ATTENTION! REFER SECTION 7.0, SAFETY INFORMATION.

4 **Operation**

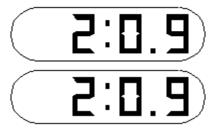
4.1 Controls

The analyser is fitted with an 'On' button located on the side of the unit, when held in your left hand the button should sit comfortably under your thumb. To turn the unit on press the button once, the unit will automatically turn off 10 minutes after the button has been pressed, as a result if the O2 EII Pro is accidentally turned on your battery will not be drained of power. When it is switched on the analyser's display will show an oxygen reading do not use the O2 EII Pro before calibration (see Section 3.2).



Switch on

The 'On' button also acts as a hold button, to freeze the reading on the display press the 'on' button once. A ':' symbol will appear to show the instrument is holding the reading. To cancel the hold press the 'On' button once, the ':' symbol will disappear and the instrument will monitor ambient O2.



Reading Held

Reading released monitoring ambient O2

The low battery warning is a shown by 'L' on the display. When present, change the battery before using the instrument (see Section 5.0, After Sales Service).



'L' Low battery symbol

A waterproof calibration knob is located on the front. Turn it fully from left to right and then fully left, the reading should increase and then decrease. (If the reading does not change see Section 4.0, Quick Check).

NOTE: IF LOW BATTERY SYMBOL IS SHOWN REPLACE THE BATTERY ASAP.

4.2 Air Calibration

▲ WARNING: THE ANALYSER IS SENSITIVE TO OXYGEN PARTIAL PRESSURE. TO ENSURE YOU ARE RECIVING THE MOST ACCURATE READING, CALIBRATION MUST ALWAYS BE CARRIED OUT AT THE SAME ATMOSPHERIC PRESSURE AS OXYGEN MEASUREMENT.

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

- 1. Ensure that the sensor saver is not in place and that the EII adapter is fitted. The adapter simply pushes into the sensor aperture.
- 2. Expose the analyser to clean air for two minutes and adjust the calibration knob until the display reads the correct value using the oxygen compensation chart (you can find this chart on the inside of the back cover). If this is not possible refer to the note below or to Sections 4.0, Quick Check and 5.0, After Sales Service.



Calibration in clean air

The Analyser is now ready for oxygen management.

NOTE: AT VERY HIGH ALTITUDE, IT IS POSSIBLE THAT NORMAL CALIBRATION IS NOT ACHIEVABLE. FOR USERS WHO INTEND TO USE THE ANALYSER AT ALTITUDE, PLEASE REFER TO OUR WEB SITE FOR ADDITIONAL TECHNICAL INFORMATION.

4.3 Checking your Tank

▲ WARNING: VERY HIGH FLOWS MAY PRESSURISE THE SENSOR AND INACCURATE READINGS OR SENSOR DAMAGE WILL RESULT.

The Analox O2 EII Pro comes complete with a unique sampling dome which allows you to directly apply the analyser to the outlet on your nitrox tank.

- 1. Ensure the sensor saver is removed. Push the sampling dome into the sensor aperture.
- 2. Ensure the Analox O2 EII Pro has been calibrated as per the instructions in Section 3.2.
- 3. Very slowly open the pillar valve with your right hand until gas can just be heard quietly hissing out.



Open the tank until the nitrox is gently hissing out

4. Once the pillar valve has been opened and the nitrox is heard gently hissing, hold the O2 EII Pro in your left hand and press the sampling dome firmly against the tank outlet.



Take a direct reading from your tank

CAUTION: OPEN TANK VALVE EXTREMELY CAREFULLY BEFORE THE O2 EII PRO IS APPLIED

- 5. Close the pillar valve after fifteen seconds when a stable reading is observed on the O2 EII Pro.
- 6. If in doubt repeat the procedure taking care to ensure a very low gas flow.

7. For ease of use when sampling several tanks, the O2 EII Pro is fitted with a hold feature. Once a stable reading has been observed, press the on button to hold this reading. The O2 EII Pro can then be moved away from the tank to enable you to record the O2 reading. To cancel the reading press the on button once.



Reading held

8. It is important to 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% O2 you should therefore take the reading or press the hold button while flow is ON.

4.4 BCD Adaptor

- ▲ WARNING: IF A FLOW RATE IN EXCESS OF 2 LITRES PER MINUTE IS PASSED OVER THIS SENSOR WHEN TAKING A READING, THIS WILL PRESSURISE THE SENSOR AND MAKE THE READING INACCURATE.
- NOTE: BEST ACCURACY IS ACHIEVED WITH A FLOW BETWEEN 0.5 TO 1 LITRES PER MINUTE. IT IS THE USERS' RESPONSIBILITY TO PURCHASE THE CORRECT CONNECTION EQUIPMENT IN ORDER TO DO SO. FOR MORE INFORMATION PLEASE CONTACT US.

4.5 Taking a reading from your BCD.

Tank contents can be checked either during setup of rig or just before dive.

1. Connect the BCD to the tank.



Connecting the BCD to the tank

- 2. Prior to fitting the tank hose to the BCD connect the tubing (Listed in the Accessories table) to the spigot on the dome adaptor on the O2 EII Pro.
- 3. Connect the other end of the tubing to the analyser flow restrictor.



Connecting the BCD tubing to the flow restrictor

4. Connect the analyser flow restrictor to the tank hose



Connecting the flow restrictor to the tank hose

- 5. Allow the O2 EII Pro reading to settle and then take a reading by pressing the power button.
- 6. Disconnect your O2 EII Pro from the BCD and connect the tank hose back up to the BCD.

You are now ready to dive.

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4.6 Accessories

The O2 EII Pro can be supplied with any of the following accessories;

Item			Description	Part Number
Storage Case:			Storage Case; compact water proof case ideal for protecting your O2 EII Pro.	SA2EIIMINICASE
Sensor Saver:			Sensor Saver; push in cap to reduce the sensors exposure to oxygen and extend its life.	Pack of 5: SSP1
	U		These are available in packs of 5&10.	Pack of 10 : SSP2
Dome Adaptor Barb):	(With	Hose	Dome Adaptor; push in dome with Barb fitting to receive sample direct from tank or from BCD (Via barb fitting).	MO2-475
Dome Adaptor Barb):	(Without	Hose	Dome Adaptor; push in dome to receive sample direct from tank	MO2-422
Replacement Metre):	Tubing	(Per	Tubing; to connect from Barb fitting to BCD to pass the sample across.	1817-5000

5 Quick Check

Symptom:	Condition:	Action:
`L' Symbol	Low Battery	Change Battery
No Display	Switched off	Switch on
	Bad connection	Check Battery connection
		Return to supplier
Zero Reading	Sensor disconnected	Check connection
	Sensor expired	Change sensor
	No oxygen	Check in air and ensure sensor saver is removed
Reading erratic	Pressure on sensor	Check flow
	Radio transmission	Move unit away
	Sensor old or faulty	Change sensor
	Condensation on sensor	Dry sensor face
Reading does not	Reading held	Press on button to unfreeze
change when calibration knob is	Sensor failure	Change sensor
turned	Faulty connections	Return to supplier
Display segments missing	Display faulty	Return to supplier
Will not calibrate	Sensor faulty	Change sensor
	Sensor not in air	Check EII Pro adaptor is fitted correctly
	High altitude	Please refer to website
Reading drifts	Rapid temperature change	Do not move analyser from one temperature to another immediately before use

6 After Sales Service

6.1 Battery Replacement

- 1. Loosen the 4 screws located on the front cover. The gasket seal is designed to prevent water leaking into the O2 EII Pro as a result the seal may be tight. Loosen the seal by moving the lid from side to side, and then carefully lift the cover.
- 2. Slide the battery out of its holder and disconnect the lead.
- 3. Connect the lead to the new battery and slide the battery into its holder, under the battery clip
- 4. Replace the cover carefully taking care that the sensor locates properly, and that you do not trap any wires. Screw down until you feel the gasket tighten; do not over tighten the screws.

6.2 Sensor Replacement

- 1. Replacement part number for your sensor is: 9100-9220-9B
- 2. Loosen the 4 screws located on the front cover. The gasket seal is designed to prevent water leaking into the O2 EII Pro as a result the seal may be tight. Loosen the seal by moving the lid from side to side, and then and carefully lift the cover.
- 3. Disconnect the connector from the back of the sensor.
- 4. Unscrew the sensor from the front cover.
- 5. Dispose of the old sensor according to local regulations for lead and potassium hydroxide solution.
- 6. Remove the new sensor from its pack and check it for leaks, check the sensor has a rubber o-ring fitted at the base of the thread on the front of the sensor. Screw the sensor into the front cover tightly and connect to the EII connector. An arrow on the back of the sensor shows where the connector should be fitted. Make sure the metal prongs on the connector are facing the sensor and push in firmly.
- Replace the cover carefully taking care that the sensor locates properly and that you do not trap any wires. Screw down until you feel the gasket tighten; do not over tighten the screws.
- 8. Push on the EII adapter.

6.3 General Care

Although designed to be water resistant the O2 EII Pro should not be intentionally immersed in liquid or left outside unprotected.

The O2 EII Pro is built to resist the effects of day to day shocks and drops but remember it is a precision oxygen analyser and should be looked after carefully to give long trouble free service.

To clean the O2 EII Pro use a damp soft cloth.

Protect the O2 EII Pro from long periods of direct sunlight and do not subject it too high or low temperature extremes.

The sensor in the O2 EII Pro is an electrochemical device and contains a caustic electrolyte. Always check to make sure that it is not leaking and do not allow it onto any part of your body or clothing. In the event that you do come into contact with the electrolyte wash the contaminated part with copious amounts of water see Section 6.0, Safety Information.

Analox 9100-9220-9B type Oxygen Sensor:

CAUTION: IF AFTER HANDLING THE SENSOR YOUR FINGERS OR OTHER PARTS OF YOUR BODY FEEL SLIPPERY OR STINGS WASH WITH A LOT OF WATER. IF STINGING PERSISTS GET MEDICAL ATTENTION! REFER SECTION 7.0, SAFETY INFORMATION



6.4 Sensor Handling Information

O2 EII Pro oxygen sensors are normally supplied in sealed packs. Before the pack 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. If anybody comes into contact with the electrolyte, please refer to Section 6.0, Safety Information.

7 Safety Information

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

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.

The sensor contains KOH potassium hydroxide solution which is hazardous. In the event of an accident, use the following first aid procedures

Body Part:	Effect:	First Aid Procedures:
Skin	Contact could result in a chemical burn.	Immediately flush the skin thoroughly with water for at least 15 minutes.
	Persons with pre-existing skin disorders may be more susceptible to	Remove contaminated clothing and wash before re-use.
	the effects of the substance.	Obtain medical advice if continued irritation.
Ingestion	Corrosive. May cause sore throat, abdominal pain, nausea, and severe	If swallowed DO NOT INDUCE VOMITING.
	burns of the mouth, throat, and stomach, and may be fatal.	Wash out mouth thoroughly with water and give plenty of water to drink.
		Obtain medical advice immediately!
Eye	Persons with pre-existing eye problems may be more susceptible to	Irrigate thoroughly with water for at least 15 minutes.
	the effects of the substance.	Obtain medical advice immediately!
	Corrosive. May cause redness, pain, blurred vision, and eye burns.	
	Contact can result in the permanent loss of sight.	
Inhalation	Persons with pre-existing impaired	Remove to fresh air.
	respiratory function may be more susceptible to the effects of the	Rest and keep warm.
	substance.	Obtain medical advice if applicable.
	Inhalation is not an expected hazard unless heated to high temperatures.	
	Mist or vapour inhalation can cause irritation to the nose, throat, and upper respiratory tract.	

8 Warranty Information

We provide the following warranties for the Analox O2 EII Pro:

- A 3 year electronics warranty.
- A 3 year graded sensor warranty.

1 year	Free replacement
12 to 18 months	75% credit towards a replacement sensor
18 to 24 months	50% credit towards a replacement sensor
24 to 36 months	25% credit towards a replacement sensor

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 whichever 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

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

15 Ellerbeck Court

Stokesley Business Park Stokesley, North Yorkshire

TS9 5PT

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.

9 Specification

Range	0.1 to 100% O2
Accuracy	\pm 1% of reading, \pm 0.2% of O2
Resolution	0.1% Oxygen
Warm Up Time	< 5 seconds
Response Time	90% in less than 15 seconds
Sensor Type	Analox 9100-9220-9B type electro-chemical sensor
Sensor Life	4 to 5 years in air 36 month graded warranty
Battery	9V Alkaline (PP3)
Battery Life	Approximately 1 year
Operating Temperature	-5 to 50°C / 23 to 122°F
Storage Temperature	-20 to 50°C / -4 to 122°F
Pressure	Sensitive to the partial pressure of Oxygen.
Temperature Effect	0.1% O2/ °C 0.055% O2/ °F
Weight	Weight225g 8oz
Dimensions	130 (l) x 70 (w) x 55 (d) mm 5 ¼ (l) x 2 ¾ (w) x 2 ¼ (d) inches
Ingress Protection	IP65/ NEMA 4

If you have any comments or queries about the O2 EII Pro please contact us;

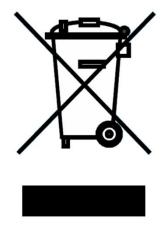
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Oxygen Compensation Chart for Moisture in 10 the Atmosphere

ATMOSPHERE OXYGEI	7	NT IN F	PERCENT IN RELATION TO TEMPERATURE AND RELATIVE HUMIDIT	NTOT	EMPER	ATURE	AND R	ELATIVI	E HUMII	DITY
TEMP F	32	40	50	60	70	80	60	100	110	120
TEMP C	0	4	10	16	21	27	32	38	43	49
RELATIVE HUMIDITY				ATMO	SPHERIC	νхо	GEN PE	PERCENT		
10		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		20.8	20.8	20.8	20.7	20.7	20.6	20.5	20.4	20.2
40		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		20.5	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		20.4	20.2	19.9	19.5	19.1	18.5
H ₂ 0 at 100% RH	0.6	0.8	1.2	1.8	2.5	3.4	4.7	6.5	8.6	11.5

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11 Disposal



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.

12 Declaration of Conformity

