

VN202 mkII

Oxygen Analyser and Pump Box



User Manual

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Precautions

Please read these instructions fully prior to attempting to use the **VM202 mkII Oxygen Analyser** and the **Gas Analyser Pump Box** to prevent damage to the equipment and/or erroneous readings.

Do not allow the analyser or pump box to become wet.

Do not use the Gas Analyser Pump Box to draw samples of flammable gases or oxygen-enriched gases i.e. gases with an oxygen concentration in excess of 21%.

Always check the calibration prior to use to avoid erroneous readings.

After using the pump box to draw sample of gas, always flush the pump box with ambient air, following the procedure detailed later in this manual, to remove the sample gas from the pump box. If the sensor is left exposed to low-oxygen concentrations for prolonged periods, the performance of the sensor may be adversely affected.

Do not use the pump box to sample gases that may contain dirt, liquids or other particles that may damage the pump. If the pump box is required to sample under such conditions, a disposable filter is available that can be connected between the sampling line and the pump box to protect the pump.

If the analyser or pump box is not to be used for extended periods (i.e. months at a time), remove the batteries from the instruments. It is not necessary to remove the sensor from the pump box.

The analyser features an automatic switch-off function, which returns the unit to stand-by after approximately 3 to 4 minutes of operation to preserve battery life. If the analyser switches off when in use, it can be switched back on without affecting the calibration.

With the exception of battery replacement, there are no user serviceable parts inside. If either instrument is not functioning correctly, please contact Viamed for technical support.

Do not dispose of instruments, batteries or oxygen sensors in domestic waste. If you do not have access to an approved WEEE disposal scheme, Viamed can dispose of equipment via an approved WEEE scheme on your behalf.

Introduction

The **VN202 mkII Oxygen Analyser** (referred to in this manual as the 'analyser') uses an oxygen sensor to measure the oxygen in a gas sample.

The analyser is used in conjunction with the Gas Analyser Pump Box (referred to in this manual as the 'pump box') with the analyser attached to the top of the pump box using heavy-duty hook and loop fastener [fig.1].

The analyser is easy to use with either hand and has large, easily-read digits.

The analyser is powered by 2 x AA / MN1500 / LR6 1.5V alkaline batteries, with an estimated life of 12-18 months with daily usage. The batteries are housed in a separate compartment from the sealed electronics and can be changed without the use of a tool.

The **Gas Analyser Pump Box** uses 3 x AA / MN1500 / LR6 1.5V alkaline batteries, with an estimated life of 30 hours continuous use.

The pump box uses the proven R-17AV oxygen sensor with integral temperature compensation, which is mounted internally. The pump box is connected electronically to the analyser using a short cable with a 3.5 mm jack plug, which can be disconnected to allow them to be separated.

Sampling tubing is connected to the pump box using a Luer-Lok™ connector. A sampling probe or needle is connected to the sampling tubing.



Fig.1 – VN202 mkII Oxygen Analyser with Gas Analyser Pump Box

Inserting the batteries

Insert the batteries into the pump box and the analyser prior to use.

To insert the batteries into the analyser, separate the analyser from the pump box and remove the battery door from the rear of the analyser. Insert 2 x AA / MN1500 / LR6 1.5V alkaline batteries, observing the correct polarity [fig.2]. Replace the battery door.



Fig.2 – Battery location in the VN202 mkII Oxygen Analyser

To insert the batteries into the pump box, remove the bottom panel by first removing the 4 screws, then disconnect the jack plug from the sensor to allow access to the batteries.

Insert 3 x AA / MN1500 / LR6 1.5V alkaline batteries, observing the correct polarity and reconnect the jack plug to the sensor [fig.3]. Replace the bottom panel.

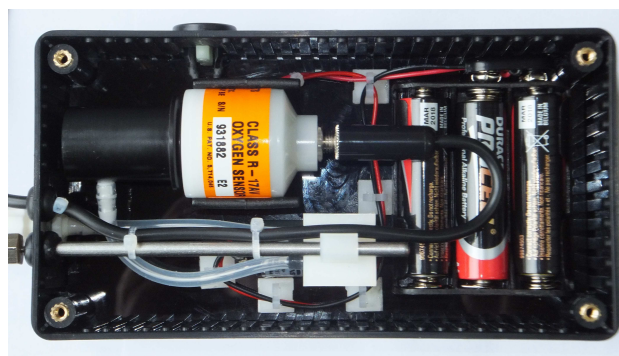


Fig.3 – Battery location in the Gas Analyser Pump Box

Re-attach the analyser to the pump box using the hook and loop fastener.



Caution: incorrectly inserted batteries may cause damage to the equipment.

Preparing the instruments for use

With the analyser mounted on the top of the pump box, connect the 3.5 mm jack plug that exits the pump box into the jack socket on the analyser [fig.4].



Fig.4 – Connecting the pump box to the analyser

Ensure that the sampling tubing has a Luer-Lok™ connector attached to each end [fig.5]. Connect the Luer-Lok™ connector to the pump box [fig.4].



Fig.5 – Luer-Lok™ connector

Prior to taking a gas sample, connect a sampling needle to the sampling tube.



Caution: Risk of injury: the sampling needle is very sharp!

Test the pump box by pressing the pump activation button, which is the grey button located on the left-hand side of the pump box. The pump should be heard to activate.

To test for suction at the needle, angle the tip of the needle so that the flat side of the sharpened edge is parallel to a lightweight surface, such as a small piece of paper, and press lightly: some adhesion should be observable.

If the pump fails to activate, check that the batteries are correctly inserted.

If the pump activates but fails to generate suction, check the connections between the tubing, the Luer-Lok™ and the sampling needle. If neither appears to be the cause, check the pump box internally for disconnected tubing. Internal tubing should be connected to the Luer-Lok™ connector inside the pump box and runs to the sampling chamber as can be seen in fig.3. Ensure that the tubing is not kinked.

Calibrating the analyser prior to use

Turn the analyser on by pressing the ON/OFF button on the front of the instrument.

The LCD display will briefly display a software revision number, before displaying a reading.

If the displayed reading is 00.0, check that the analyser is connected to the pump box by way of the 3.5 mm jack plug on the end of the cable that exits the pump box.

If the display still reads 00.0, open the pump box and check that the sensor is connected to the internal 3.5 mm jack plug: if it is connected, the sensor may have expired, in which case, contact Viamed for technical support.

With the sampling needle exposed to ambient air, activate the pump for at least 5 seconds to draw air into the sampling chamber inside the pump box.

The reading on the display may initially change but should settle to a steady reading within approximately 10 seconds.

Release the pump activation button to deactivate the pump.

Once the reading is stable, calibrate the analyser using the CALIBRATION knob on the front of the analyser, turning it clockwise or anti-clockwise as required until a reading of **20.9% ($\pm 0.1\%$)** is obtained [fig.6].



Fig.6 – Analyser display after calibration

As a final check, briefly activate the pump to ensure that the reading does not change, if it does, then adjust the calibration accordingly back to 20.9%.

Taking a sample from sealed packaging

The VN202 mkII Oxygen Analyser and Pump Box can be used to take and analyse gas samples from sealed packaging, providing the needle can be easily inserted through the packaging.

With the sampling needle exposed to ambient air, activate the pump briefly and check the calibration of the analyser still reads **20.9% ($\pm 0.1\%$)**. Recalibrate the analyser if required.

Insert the sampling needle into the packaging with the aim of piercing a hole no larger than the needle so as to prevent air from entering. Ensure that the needle tip is freely exposed to the available gas and is not penetrating any of the contents of the packaging.

Activate the pump to start drawing the gas sample, a response should be seen on the analyser display in approximately 1 second if using 60 cm of tubing.

Keep the pump running for around 5 seconds to flush out the sampling chamber within the pump box and observe the % OXYGEN reading, which, if non-oxygen gases are present in the packaging, should be steadily falling.

Stop the pump and wait a further 5 seconds for the reading to stabilise, then reactivate the pump for a further 5 seconds to ensure that a steady reading is obtained.



IMPORTANT:

Refer to your organisation's quality assurance procedures to determine whether the measured fill percentage is adequate.

Once the sampling procedure has been completed, remove the sampling probe and expose it to ambient air, activate the pump for 5 to 10 seconds to flush out the sampling chamber with air. Observe the % OXYGEN reading, which will steadily return to approximately 20.9%

Switch off the analyser after use. Note: if the analyser automatically switches off when in use, it can be switched back on without affecting the calibration.

VN202 mkII oxygen analyser specification	
Measurement Range	0% to 100% oxygen
Measurement Resolution	0.1%
Response Time	90% step change < 10 s
Battery Type	2 x AA / MN1500 / LR6 1.5V
Battery Life	12 – 18 months (with typical usage)
Sensor Type	R-17AV (Galvanic)
Sensor Lifespan	Expected 36 - 48 months (with typical usage)
Sensor Output	9.0 mV - 13.0 mV in air at 25 °C at sea level
Sensor Accuracy	± 1% of full scale at constant temperature and pressure
Dimensions	59 mm x 142 mm x 26 mm
Weight	105 g excluding batteries
Storage Temperature	0 °C to 50 °C (10 °C to 50 °C recommended)
Operating Temperature	0 °C to 40 °C
Ingress Protection Rating	IP65 NEMA 4
ISO Standards	ISO EN 9001:2008
EMC CE	ISO EN 60601-1-2
RoHS	Complies with RoHS
WEEE	Complies with WEEE (registration no. WEE/DJ1953ZR)

Specifications subject to change

Gas analyser pump box specification	
Response Time (60cm x 2.4mm tubing)	< 0.5 s
Gas Flow Rate (60cm x 2.4mm tubing)	2 m/s
Battery Type	3 x AA / MN1500 / LR6 1.5V
Battery Life	> 30 hours continuous run time
Battery Life (as number of samples)	> 10,000 samples of 10 seconds each
Sensor Type	R-17AV (Galvanic)
Sensor Lifespan	Expected 36 - 48 months (with typical usage)
Sensor Output	9.0 mV - 13.0 mV in air at 25 °C at sea level
Sensor Accuracy	± 1% of full scale at constant temperature and pressure
Dimensions	150 mm x 80 mm x 50 mm
Weight	250 g excluding batteries, sensor and sampling probe
Storage Temperature	0 °C to 50 °C (10 °C to 50 °C recommended)
Operating Temperature	0 °C to 40 °C
Ingress Protection Rating	IP20
RoHS	Complies with RoHS
WEEE	Complies with WEEE (registration no. WEE/DJ1953ZR)

Specifications subject to change

Warranty

Viamed warranty ensures that goods are free from defects of manufacture for a period of one year from the date of shipment from Viamed. Liability shall be limited solely to the replacement and repair of the goods and shall not include shipping costs or other incidental damages.

This warranty is null and void if any items are subjected to misuse, negligence, accident, or repairs other than those performed by Viamed or an authorised service centre.

Company Details

All products are supplied in accordance with our quality system accreditations:
BS EN ISO 9001:2008 and ISO 13485:2003.

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