

## Rapidox 3100D Dual Gas Portable Gas Analyser



### Description

The Rapidox 3100D dual gas O<sub>2</sub> / H<sub>2</sub>O (moisture) analyser allows fast and accurate oxygen analysis over the full oxygen range (10e-20ppm to 100% O<sub>2</sub>) and a range of H<sub>2</sub>O concentrations (measured in terms of dew-point) from -100°C to +20°C dp.

The analyser provides continuous on-line analysis, with a typical response time less than 5 seconds for a 90% response to a step change oxygen gas compositions and 30 seconds for dew-point. The dew-point sensors are OEM modules provided by either Michell Instruments or Alpha Moisture depending on range requested.

At the heart of the Rapidox 3100D is a top-of-the-range linear-piston vacuum pump manufactured by Nitto; a world leader in pump technology. The pumps are exceptionally quiet (40 dB/m or less). The flow of gas can be adjusted using the flow gauge / needle valve on the front panel of the analyser. Typical flow rate is 1 litre per minute.

The oxygen sensor head is located inside the analyser and comprises a zirconia ceramic tube that needs to be heated up to 650°C before it will conduct oxygen ions. An internal pressure sensor compensates for small changes in gas pressure to keep the readings stable. The dew-point sensors are high precision transmitters that are fully factory calibrated and is supplied with its own Calibration Certificate, providing direct traceability to both UK (NPL) and US (NIST) Humidity Standards. The sensor is certified at thirteen dew-point levels across its operating range against a certified reference hygrometer, using a mass-flow humidity generator system as a source of reference calibration gas.

The analyser is packed with features including fully programmable alarm circuits, programmable analogue outputs, easy calibration (user selectable gases), RS232 / RS485 communications, independent type K thermocouple and a full set of communications / data-logging software. Full data logging of O<sub>2</sub> & H<sub>2</sub>O together with temperature and pressure is possible using the MS-Excel compatible logging software.

### Features

- Continuous dual-gas sampling via powerful internally located linear piston pump
- Flow rate controlled by needle valve / flow gauge on front panel
- Very fast O<sub>2</sub> measurement response (around 5 seconds for a 90% response).
- Full O<sub>2</sub> measurement range available (10e-20 ppm to 100% oxygen).
- User-specified H<sub>2</sub>O dew-point ranges available (-100°C / +20°C or -65°C / +20°C).
- H<sub>2</sub>O dew-point can be displayed in terms of °C dp, °F dp or ppmv.
- Independent type K thermocouple fitted as standard. Range 0-1250°C.
- Easy to calibrate by the user using ANY TWO gases.
- RS232 / RS485, 0-5V and 4-20mA current loop outputs (both user programmable).
- Windows data logging software with MS-Excel compatible graphing.
- Programmable alarms (low and high condition) with reply outputs, audible & visual warning.

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## Applications

- Laboratory scale furnace experiments where the control and monitoring of residual oxygen is critical
- Applications where extremely dry gases must be used
- Industrial Gas Production
- Gases used in electronics production and medical applications
- Catalytic reformer cycle
- Moisture in natural gas
- Moisture in high-voltage switchgear quench gases
- Monitoring of desiccant dryers for compressed air or plastic moulding apparatus

Technical Data: Analyser	
Voltage	110 / 220V ac 50/60 Hz
Analyser dimension	350mm X 263mm X 150mm
Weight	6 kg
Display	16 X 2 character (9mm) back lit
Warm up time	3-4 minutes at 20°C
Operating temperature	5°C to 35°C
Voltage Outputs	* 0-5V linear (user programmable)
Current outputs	* 4-20mA linear (user programmable)
Digital outputs	* RS232 / RS485: data streamed every 0.1 second
Calibration	Requires 2 user-selectable gas Compositions (air is default plus another)
Sample Pump	Mains powered linear piston pump
Thermocouple	Type K fitted to standard compensated plug Range 0-1250°C accuracy ± 1%

Technical Data: Sensors and Pump	
Maximum free air Displacement	2.5 litres per minute
Noise level	40db (max) at 1 meter
Maximum inlet temperature	60°C
O <sub>2</sub> sensor life expectancy	> 35000 hours
O <sub>2</sub> range of measurement	10e <sup>-20</sup> ppm to 100% O <sub>2</sub>
Response time (gas flow rate 1ltr.min <sup>-1</sup> )	approximately 5 secs for a 90% step change
Accuracy	± 1% of the actual oxygen concentration
H <sub>2</sub> O sensor range of measurement	-100°C TO 20°C dp
H <sub>2</sub> O sensor accuracy	± 2% of Full Scale
H <sub>2</sub> O gas temperature range	-40°C to +60°C
H <sub>2</sub> O sensor life	> 5 years

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