

## Rapidox 3100D Dual Gas Zirconia O<sub>2</sub> / H<sub>2</sub>O Version



### 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 oxygen range 0 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 30 seconds for a 90% response to a step change oxygen and dew-point gas compositions. The dew-point sensors are OEM modules provided by Michell Instruments. Their response times vary depending on the wetness of the gas.

At the heart of the Rapidox 3100D is a top-of-the-range Nitto motor-driven diaphragm vacuum pump. 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 (10<sup>-20</sup> ppm to 100% oxygen).
- H<sub>2</sub>O dew-point ranges -100°C to +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.
- Internal pressure sensor fitted for automatic pressure correction.
- Optional printer, carry handle & transport case available
- Works on any worldwide mains voltage 90-260 Vac

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#### Cambridge Sensotec Ltd.

Unit 29 Stephenson Road  
St Ives  
Cambs  
PE27 3WJ  
England

#### Telephone

+44 (0)1480 462142

#### Facsimile

+44 (0)1480 466032

#### Mobile

+44 (0)7866 624236

#### Email

sales@cambridge-sensotec.co.uk

#### Web

www.cambridge-sensotec.co.uk

## Applications

- Glove box 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	90-260Vac, 50/60Hz
Analyser dimensions	350mm x 263mm x 150mm
Weight	7 kg
Display	16 x 2 character (9mm) back lit LCD
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 option available): data streamed on demand
Calibration	Requires 1 or 2 user selectable gas mixtures
Sample pump	24Vdc motor-driven diaphragm pump
Thermocouple	Type K 0-1250°C accuracy ± 1%

Technical Data: Sensor & Pump	
Maximum free air Displacement	7 litres per minute (user adjustable)
Noise level	44db (max) at 1 meter
Maximum inlet temperature	50°C
Life expectancy O <sub>2</sub>	> 17,500 hours
O <sub>2</sub> sensor range	10 <sup>-20</sup> ppm to 100% O <sub>2</sub>
Response time O <sub>2</sub> (gas flow rate 1ltr.min <sup>-1</sup> )	Approximately 5 secs for a 90% step change
Accuracy O <sub>2</sub>	±1% of the actual oxygen concentration
O <sub>2</sub> sensor stability	±2% of reading per month
H <sub>2</sub> O sensor range of measurement	-100°C TO 20°C dp
H <sub>2</sub> O sensor accuracy	± 2°C dp
Response time (gas flow rate 1ltr.min <sup>-1</sup> )	Approximately 10 minutes for a 90% step change in dew-point
H <sub>2</sub> O sensor life expectancy	> 5 years
Sample connections	6mm ID / 4mm OD nipple type

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