

# *Oxygraph System for Photosynthesis & Respiration Measurement in Liquid-Phase.*

*InfoSheet*



Instruments

Hansatech

- Clear cast acrylic DW1 oxygen electrode unit with integral electrode sensor.*
- Integral stirrer unit drives a magnetic follower to ensure adequate sample mixing.*
- Computer controlled oxygen electrode system with direct on-screen display of traces.*
- Custom Windows® software for instrument control & data analysis.*
- System expansion to 8 channels via purchase of additional components.*

*“Oxygraph respirometer provides an affordable and convenient method of measuring oxygen evolution or consumption from samples during photosynthesis or respiration in liquid suspensions of 200µl - 2.5ml.”*

*Instrumentation for Cellular Respiration & Photosynthesis Studies.*

### Electrode Units.



Oxygraph is compatible with all Hansatech liquid and gas-phase electrode units for cellular respiration and photosynthetic applications. The Oxygraph system is supplied as standard with the DW1/AD liquid-phase electrode chamber.

Liquid-phase electrode units mount directly onto the integral magnetic stirrer of the Oxygraph control unit ensuring that the sample is continuously stirred during measurement by a magnetic follower in the reaction vessel. Typical sample volumes are between 200µl and 2.5mls in DW1, DW1/AD and DW2/2 and larger sample volumes of up to 20ml in DW3.

Gas-phase electrode units, in conjunction with the Oxygraph, allow oxygen evolution / uptake assays to be performed on leaf discs, excised needles, algae mosses, lichens etc.

Further details of the electrode unit range can be obtained by contacting Hansatech Instruments.

### Electrode Disc.

All electrode units feature an integral Clark type polarographic oxygen sensor. When fitted, the dome of the electrode forms the floor of the reaction vessel providing a sensitive and rapid response to small changes in oxygen tension within the reaction mixture.

The electrode comprises a central platinum cathode and a silver anode. Preparation of the electrode includes the addition of electrolyte and the application of a thin oxygen permeable P.T.F.E. membrane to the electrode dome. Once prepared and positioned in the electrode unit, the electrode is connected to the Oxygraph control circuitry which applies a small polarising voltage between the electrodes. In the presence of oxygen, a small current is generated proportional to oxygen activity in the reaction mixture.



### Hardware.



Oxygraph comprises a robust yet lightweight enclosure containing the integrated electronics and magnetic stirrer and an external 12V DC supply. The control unit connects to a PC via the serial port and uses bi-directional RS232 communications for instrument control from the PC keyboard and data acquisition to the PC. There is no requirement for separate data loggers, internal PC interfaces or A/D cards. Laptop, notebook or mini-notebook computers are therefore just as suitable as a desktop PC and provide the solution for a highly portable compact system whenever bench space is limited.

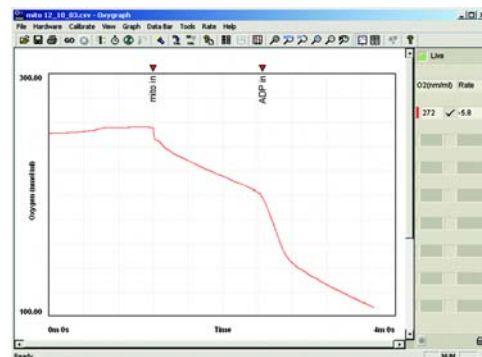
### System Expansion.

The Oxygraph system may be cost-effectively upgraded to multi-channel capability. Each Oxygraph unit features a buffered serial link connector which allows easy addition and configuration of further units in a "daisy chain" to form a sophisticated multi-channel system capable of simultaneous independent monitoring of up to 8 oxygen channels from a single PC.

### Software.

Oxygraph is supplied with a comprehensive Windows software package. The software controls all aspects of the Oxygraph hardware and provides mouse control of all major hardware functions during measurement.

System calibration is achieved by following a series of on screen prompts. Once calibrated, the oxygen signal is logged to the PC at user definable intervals and presented either as a real-time trace in user defined calibrated units or as a digital panel meter. Data analysis tools are provided for spot measurement of trace values. A rate measurement tool provides easy estimation of oxygen rates over any user-defined interval.



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