



## LEAFVIEW 1 SYSTEM

- Convenient, entry-level system for the study of photosynthesis & respiration measurements in gas-phase samples under illumination.
- LDI/2 electrode unit suitable for leaf discs up to 10cm<sup>2</sup> cut from whole leaves, algae or moss etc.
- Oxygen electrode control & signal acquisition via Oxyview control unit.
- Oxygen signal output from Oxyview to recording device via 0 - 5V analogue output.
- Upper optical port allows illumination from LS2 high intensity white light source.
- LS2 intensity adjustable by insertion of neutral density filters.

### Overview

Leafview 1 is an entry level system for studies of photosynthesis & respiration from gas-phase, solid-state samples under actinic illumination. The system is ideally suited to teaching environments for under & post-grad plant biology studies of the photosynthetic processes but is equally at home in research facilities where demands on equipment performance are high.

Samples typically consist of leaf discs which are either cut from a broad leaf or made up of a "mat" of smaller leaves to form a circular disc of 10cm<sup>2</sup>. These samples are cut using a supplied leaf disc cutter. Changes in oxygen content of the sealed sample chamber are determined by the integral oxygen electrode mounted in the base of the chamber.

The system comprises the Oxyview control unit, S1 Clark type electrode disc, LD1/2 gas-phase electrode chamber and LS2 high intensity light source with neutral density filters to modify light intensities. All necessary accessories and spares are also included (excluding circulating water bath and chart recorder).

### Components of the System

The Leafview 1 system consists of the following individual items:

#### OXYVI Oxyview Control Unit

The OXYVI Oxyview control unit has been designed as a convenient, low cost oxygen electrode control unit for teaching studies of photosynthesis and cellular respiration using the oxygen electrode measurement technique.

The Oxyview control unit is fully compatible with the range of oxygen electrode chambers produced by Hansatech Instruments thus allowing a wide range of different assays to be performed in both liquid and gas-phases.

The Oxyview is configured and controlled via a front mounted control panel featuring 4 touch-sensitive buttons. Configuration is achieved by navigating through a series of simple menu screens and following the displayed guidelines for each step of the setup process. These configuration steps include setting of the stirrer speed, back-off and gain settings. Once configured, the Oxyview control unit provides an accurate and stable reading of the oxygen content of the sample in question.

The Oxyview control unit has an integral magnetic stirrer for liquid-phase applications allowing the overall footprint of the Oxyview control unit to be minimal (90 x 135mm); convenient when multiple setups are required for teaching programmes in limited space.

The Oxyview control unit is powered by a 12V DC wall cube which connects directly to the rear of the unit. Also at the rear is a 0 - 5V analogue output. This allows the measured values from the control unit to be logged to an external recording device such as a chart recorder or similar datalogger accepting a 0 - 5V analogue input.

source (when connected to the OxyLab electrode control unit) or the LS2 high intensity white light source. A prepared S1 oxygen electrode disc mounts into the base of the LD1/2 with the dome of the electrode forming the floor of the sample chamber.

### SI Oxygen Electrode Disc

The Leafview 1 system is based around the S1 Clark type polarographic oxygen electrode disc. When fitted, the dome of the electrode disc forms the floor of the electrode chamber reaction vessel providing a sensitive and rapid response to small changes in oxygen tension within the sample.



The electrode disc comprises a central platinum cathode and a concentric silver anode. Preparation 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 chamber, the disc is connected to the Oxyview 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 sample.



### LD1/2 Electrode Chamber

The LD1/2 leaf-disc electrode chamber is a simple device for measuring oxygen exchange from a 10cm<sup>2</sup> leaf disc mounted within a sealed, gas-tight chamber.

The LD1/2 is constructed from black acetal with a cast acrylic top window allowing the sample to be evenly illuminated for photosynthesis measurements using either the LH36/2R LED light



### LS2 High Intensity Light Source

The LS2 is a high intensity (100W) tungsten halogen light source which is powered from a stabilised power supply.

The separate lamp housing contains a cooling fan, infrared reducing "Hot-Mirror" and optics to provide light with minimum variation of intensity across the beam and little divergence from parallel.

## Technical Specifications

### OXYVI Oxyview Electrode Control Unit

Measuring Range	0 - 100% oxygen
Min. O <sub>2</sub> Resolution	Typically 10 x 10 <sup>-6</sup> μmols/ml at 20 °C
Integral Magnetic Stirrer	Manually operated between 250 - 900rpm in % steps
Polarising Voltage	Selectable between 0.4 - 0.9V (0.7V recommended default)
Gain/Back Off Control	Signal back off in 1mV steps. Signal gain in 2 modes: Coarse gain x1, x2, x5, x10, x20, x50, x100. Fine gain in 1mV steps
Integral Test Resistor	Yes
Signal Inputs	Electrode disc input
Signal Output	0 - 5V analogue output of electrode signal
Dimensions	90 (w) x 135 (d) x 85mm (h). Weight: 320g
Power Supply	95 - 260V universal input mains supply. Output 12V DC 2.5A
Electrode Chamber Compatibility	All Hansatech Instruments electrode chambers

### SI Oxygen Electrode Disc

Electrode Type	Clark type polarographic oxygen sensor
Electrode Output	Typically 1μA at 21% O <sub>2</sub> . Residual current in 0% O <sub>2</sub> typically 0.02μA
Response Time	10 - 90% typically < 5 seconds
Oxygen Consumption	Typically <0.015μmol hr <sup>-1</sup>

### LS2 High Intensity White Light Source

Lamp Type	100W tungsten-halogen (50W available on request)
Power Supply	Mains, stabilised power supply. 12V DC 10A. 120/240V 60/60Hz
Intensity Adjustment	Via combinations of neutral density filters (4 ND filters supplied)
Dimensions	Light housing: 145 (h) x 65 (w) x 75mm (d). Weight 1.0kg Power supply: 86 (h) x 150 (w) x 140mm (d). Weight 1.4kg
Max. Intensity in Chambers	1800 μmol m <sup>-2</sup> s <sup>-1</sup> (8000 μmol m <sup>-2</sup> s <sup>-1</sup> when using LS/FO adapter and fibre optic cable)

### LD1/2 Oxygen Electrode Chamber

Measurement Suitability	Gas-phase respiration/photosynthesis
Construction	Black acetal
Sample Chamber	Leaf chamber (7.5cc)
Sample Area	10cm <sup>2</sup> leaf-disc
Optical Ports	Cast acrylic top window
Temperature Control	Water jacket connected to thermoregulated circulating water bath
Dimensions	95mm (d) x 75mm (h). Weight: 350gms
Additional Information	Gas-port for calibration