



Leafview 1

Entry Level System for the Measurement of Photosynthesis & Respiration in Gas-Phase Samples

- ✓ LD1/2 electrode unit suitable for leaf discs up to 10cm² cut from whole leaves, algae or moss etc
- ✓ Oxygen electrode control & signal acquisition via Oxyview control unit
- ✓ LS2 intensity adjustable by insertion of neutral density filters
- ✓ 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



Hansatech Instruments

Hansatech Instruments is a small, British, scientific instrument company located in the heart of rural Norfolk. For over 40 years, our efforts have been concentrated towards the design & manufacture of high quality instrumentation for teaching and research in the fields of cellular respiration and photosynthesis. Our instruments are now in use in a wide range of programs in more than 100 countries throughout the world and have gained an enviable reputation for quality, reliability and excellent price/performance.



Products

Hansatech Instruments product range covers a wide range of applications in the fields of photosynthesis and cellular respiration. We manufacture oxygen measurement systems based on Clark type polarographic oxygen sensors, chlorophyll fluorescence measurement systems for both continuous excitation and pulse-modulated measurement techniques and optical instrumentation for the measurement of sample chlorophyll content.



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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 10cm². 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).

The OXYV1 Oxyview control unit has been designed as a convenient oxygen electrode control unit for the teaching of photosynthesis and cellular respiration. 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 back-off and gain settings. Once configured, the Oxyview control unit provides an accurate and stable reading of the oxygen evolution/uptake from the sample.

The 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. The overall footprint of the Oxyview 1 system is minimal (90 x 135mm) and therefore convenient when multiple setups are required for teaching programmes in limited space.

The LD1/2 leaf-disc electrode chamber is a simple device for measuring oxygen exchange from a 10cm² 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 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.

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

2 slots are provided to accept 50mm square optical filters or a manual shutter plate. A range of light intensity steps may be achieved by adding permutations of the 4 A5 neutral density filters supplied (0.1,0.3,0.6 and 1.0 O.D.) to attenuate the light intensity. Maximum sample illumination intensities vary depending on the type of electrode chamber in use.

Technical Specifications

OXYV1 Oxyview Electrode Control Unit

Measuring Range:	0 - 100% oxygen
Min. O₂ Resolution:	10 x 10 ⁻⁶ μmols/ml at 20 °C
Magnetic Stirrer:	Manually operated between 250 - 900rpm in % steps
Polarising Voltage:	Selectable between 0.4 - 0.9V (0.7V recommended default)
Gain:	Signal gain in 2 modes: Coarse gain x1, x2, x5, x10, x20, x50, x100. Fine gain in 1mV steps
Back off:	Signal back off in 1mV steps
Integral Test Resistor:	Yes
Signal Inputs:	Electrode disc input
Signal Output:	0 - 5V analogue output of electrode signal
Dimensions (w x d x h):	90 x 135 x 85mm. Weight: 320g
Power Supply:	95 - 260V universal input mains supply. Output 12V DC 2.5A

LD1/2 Oxygen Electrode Chamber

Suitability:	Gas-phase respiration/ photosynthesis
Construction:	Black acetal
Sample Chamber:	Leaf chamber (7.5cc)
Sample Area:	10cm ²
Optical Ports:	Cast acrylic top window
Temperature Control:	Water jacket connected to circulating water bath
Dimensions (d x h):	95 x 75mm. Weight: 350g

S1 Oxygen Electrode Disc

Electrode Type:	Clark type polarographic oxygen sensor
Electrode Output:	1μA at 21% O ₂
Residual current:	Typically 0.02μA in 0% O ₂
Response Time:	10 - 90% typically < 5s
Oxygen Consumption:	Typically <0.015μmol hr ⁻¹

LS2 Halogen 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 x 65 x 75mm. Weight 1.0kg Power supply: 86 x 150 x 140mm. Weight 1.4kg
Max. Intensity in LD1/2:	1800 μmolm ⁻² s ⁻¹