Hansatech Instruments

Oxyview System

Oxygen Electrode Measurement Teaching System

- Convenient, low cost system for teaching of photosynthesis research & cellular respiration measurements using the oxygen electrode
- Clear cast acrylic DW1/AD oxygen electrode chamber with integral Clark type polarographic oxygen electrode
- Oxyview electrode control unit with integral magnetic stirrer
- Oxygen content of sample displayed as digital or percentage value
- User-friendly configuration via a responsive 4 button control panel and a series of comprehensive menu screens
- Analogue output for connection to a chart recorder or other external recording device
- Minimal footprint (90 x 135mm) allowing multiple units where bench space is limited

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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.

Support

Purchasers of Hansatech Instruments products can be assured of ongoing support and prompt and efficient attention to enquiries at all times. Customers are encouraged to register their instruments on our website which allows access to our Support Ticketing System in addition to instruments manuals and software upgrades.

Scan the code for further information.

Overview

The Oxyview liquid-phase oxygen electrode teaching system has been designed in response to the ever-increasing demand for a low-cost system for teaching photosynthesis and respiration measurements using oxygen electrode techniques. The system is designed to be used in a busy teaching environment but is equally at home in a modern research facility. The system provides a high degree of flexibility allowing oxygen evolution or consumption to be demonstrated from a wide range of samples from isolated chloroplasts to mitochondria suspensions in assays for both photosynthesis and cellular respiration studies.

The Oxyview system is an ideal solution for practical demonstrations of this significant and highly flexible method of bio-sensing throughout all areas of the biological sciences. It is setup and configured in minutes allowing multiple systems to be used easily amongst large groups for student practicals and techniques sessions.

The system comprises the Oxyview control unit, S1 Clark type electrode disc and DW1/AD liquid-phase electrode chamber with a range of accessories and spares also included (excluding circulating water bath and chart recorder).

Clark Type Oxygen electrodes have been in use in bio-sensing assays since their development in the early 1960's by Prof. Leland Clark. Their use was first demonstrated as an effective tool for monitoring glucose in blood samples. Subsequently, Clark type oxygen electrodes are now used in an enormous number of different bio-sensing applications from measurement of mitochondrial respiration in bio-medical applications and as a probe of photosynthetic performance in plant biology labs.

The OXYV1 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 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 and 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 allowing the overall footprint of the Oxyview system to be minimal (90 x 135mm); convenient when multiple setups are required for teaching programmes in limited space.

The Oxyview has 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 DW1/AD oxygen electrode chamber provides a highly versatile solution to measurements of dissolved oxygen in liquid-phase samples. It can be used for a wide range of applications from basic teaching through to more advanced research assays. Due to the gas-tight plunger assembly, the DW1/AD lends itself particularly well to respiration assays in small sample volumes where any minute diffusion of ambient oxygen into the chamber may cause measurement artefacts.

The DW1/AD oxygen electrode chamber is constructed from clear cast acrylic providing good sample visibility & uniform illumination. Precise temperature control of the sample and electrode disc can be achieved by connecting the water jacket of the DW1/AD to a thermoregulated circulating water bath.

The sample is housed within a borosilicate glass reaction vessel which has a variable sample volume of between 0.2 and 2.5ml controlled by the gas-tight adjustable plunger assembly. This plunger has a stoppered central precision bore allowing additions/subtractions to be made to/from the reaction mixture using a standard Hamilton type syringe.

Technical Specifications

OXYV1 Oxyview Electrode Control Unit

Measuring Range:	0 - 100% oxygen
Min. O_2 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:	Coarse: x1, x2, x5, x10, x20, x50, x100. Fine: 1mV steps
Back off:	Signal back off in 1mV steps
Integral Test Resistor:	Yes
Signal Inputs:	Electrode disc input
Signal Output:	0 - 5V analogue electrode signal
Dimensions:	90 x 135 x 85mm. Weight: 320g
Power Supply:	95 - 260V universal input mains supply. Output 12V DC 2.5A

DW1/AD Oxygen Electrode Chamber

Suitability:	Liquid-phase respiration/photosynthesis
Construction:	Clear cast acrylic
Sample chamber:	Precision bore, borosilicate glass tube
Sample volume:	0.2 - 2.5ml
Temperature control:	Water jacket connected to temperature controlled circulating water bath
Dimensions (D x H):	65 x 105mm. Weight 100g
Plunger:	Variable plunger assembly with central bore for sample additions

S1 Oxygen Electrode Disc

Electrode type:	Clark type polarographic oxygen sensor
Electrode output:	Typically 1µA at 21% O_2
Residual current:	Typically 0.02µA in 0% O_2
Response time:	10 - 90% typically < 5 seconds
Oxygen Consumption:	Typically <0.015µmol/hr^{-1}

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