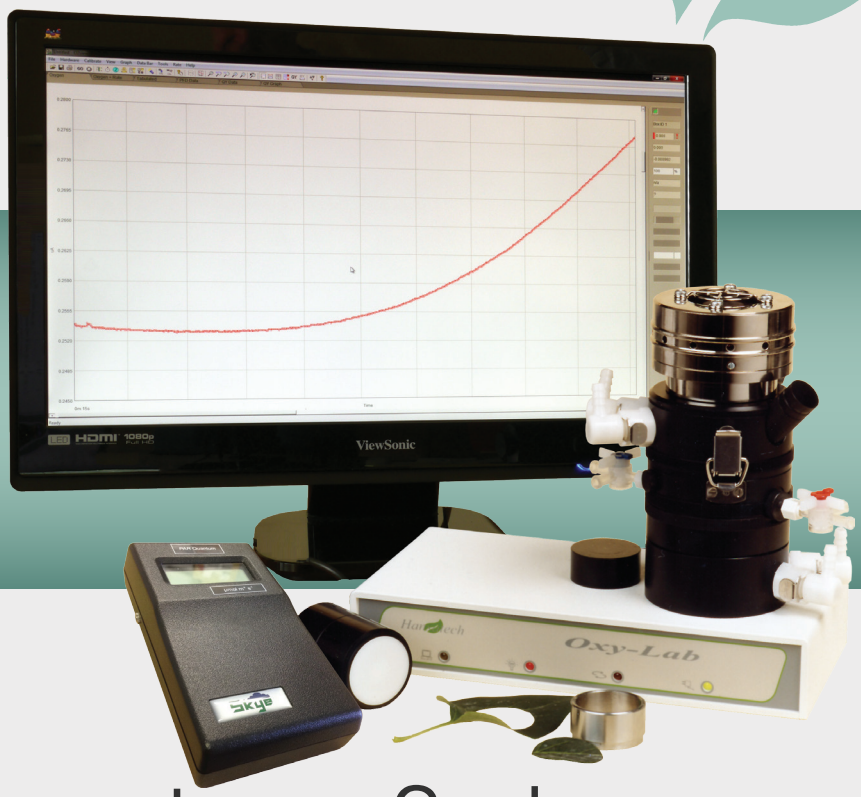
Hansatech Instruments



Leaflab 2

Advanced System for the Study of Photosynthesis & Respiration in Gas-Phase Samples

- Convenient, system for the advanced study of photosynthesis & respiration measurements in gas-phase samples under illumination
- LD2/3 chamber for leaf discs up to 10cm² from leaves, algae or moss etc
- Double water jacket provides enhanced temperature control of sample & electrode disc
- Illuminated by LH36/2R red LED array located on the upper optical port
- Electrode control & direct signal acquisition to a PC via the Oxylab control unit
- QSRED red filtered PAR sensor for light source calibration
- Windows® software control over all hardware functions & data acquisition

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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

Leaflab 2 facilitates advanced studies of photosynthesis and respiration from solid-state samples. The system is ideally suited to busy research facilities where demands on equipment performance are high but is equally at home in teaching environments for under & post-grad plant biology studies of the photosynthetic processes. Samples typically consist of leaf discs which are either cut from a broad leaf or made up of a "mat" of other material such as excised needles, algae, mosses, lichens etc to form a circular disc of 10cm^2.

The system comprises the Oxylab electrode control unit, S1 Clark type electrode disc, LD2/3 advanced gas-phase electrode chamber, LH36/2R high intensity red LED light source, QSRED large are quantum sensor (red filtered for 550 – 750nm waveband) and O_2view control and data acquisition software. A range of accessories and spares are also included (excluding Windows® PC). The Oxylab control unit connects to the serial port of a Windows® PC either directly or using a HAN/USB adapter (for newer PC's with no serial ports).

The Oxylab oxygen electrode control unit operates in conjunction with the user-friendly O_2view software to provide PC control of oxygen uptake or evolution measurements from the S1 Clark type oxygen electrode. Up to 2 individual Oxylab control units may be connected to a PC providing a convenient method of comparing signals from 2 channels simultaneously. Additionally, Oxylab may be configured to accept an optional auxiliary input signal (e.g. temperature, pH, chlorophyll fluorescence, TPP+ or other specific ion electrodes etc) using the appropriate accessory apparatus therefore extending the flexibility of the system.

The LD2/3 leaf-disc electrode chamber has a double water jacket ensuring superior temperature control of the sample and S1 electrode disc when linked to a temperature controlled circulating water bath. 2 gas ports provide both a calibration and flow-through capability for rapid changes in the gaseous environment above the sample. A clear cast acrylic top window allows illumination of the sample via the LH36/2R LED light source with 2 further optical ports provided for additional illumination, insertion of a quantum sensor and/or insertion of the fibre optic cable from the FMS 1/FMS 2 modulated fluorimeters allowing simultaneous measurement of chlorophyll fluorescence.

Oxylab provides automation of complex light intensity changes during light response assays in conjunction with the LH36/2R light source. This light housing consists of an array of 36 red LED's centred on 650nm. The array provides a uniform, stable light output up to a maximum intensity of 750 µmolm^{-2}s^{-1}. An integral cooling fan automatically switches on as necessary to cool the housing ensuring stability of the light intensity. Light tables (or photon flux density tables) are created within the O_2view software via a user-friendly interface. The output of the LH36/2R is calibrated prior to measurement using the QSRED red filtered quantum sensor which is supplied with the system.

O_2view Windows® software controls all major hardware and data acquisition functions including signal gain and back-off and simple calibration routines. Data from the S1 electrode disc and optional auxiliary signal are plotted as a chart recorder emulations in realtime with post-measurement data analysis tools included within the program. Completed experiments are saved in .CSV (Comma Separated Values) format which then may be opened directly in other Windows® data analysis applications such as Excel®.

Technical Specifications

OXYL1 Oxylab Electrode Control Unit

Measuring Range:	0 - 40% oxygen
Min. O2 Resolution:	10 x 10^{-6} µmols/ml at 20 °C
Magnetic Stirrer:	150 - 900 rpm
Polarising Voltage:	700 mV
Gain:	Up to x50 (10 bit resolution)
Back off:	12 bit resolution
Integral Test Resistor:	Yes
Acquisition Rate:	0.2 - 10 readings/s
Signal Inputs:	Electrode disc, Aux., QTP1 probe
Communications:	RS232. USB via HAN/USB adapter
Dimensions (w x d x h):	250 x 126 x 65mm - 650g
Power Supply:	95 - 260V universal input mains supply. Output 12V DC 2.5A

LD2/3 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, optical port (16mm dia), fluorimetry port (FMS1 & 2)
Temperature Control:	Double water jacket connected to circulating water bath
Dimensions (w x h):	100mm (d) x 130mm (h) - 650g

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}

LH36/2R LED Light Source

Lamp Type:	36 x red LED (650nm peak)
Power Supply:	Powered by Oxylab oxygen electrode control unit
Intensity Adjustment:	Automatic intensity control via Oxylab oxygen electrode control unit & software
Dimensions:	74 (dia) x 52 mm (h)
Weight:	270g
Max. Intensity:	750 µmolm^{-2}s^{-1} in LD1/2 & LD2/3 900 µmolm^{-2}s^{-1} in DW3

QSRED Quantum Sensor

Measuring Range:	0 - 2000 µmolm^{-2}s^{-1} in 3 ranges (0 - 20.00, 0 - 200.0, 0 - 2000) in the 550 - 750nm waveband
Resolution:	1 µmolm^{-2}s^{-1} at 0 - 2000 0.1 µmolm^{-2}s^{-1} at 0 - 200.0 0.01 µmolm^{-2}s^{-1} at 0 - 20.00
PAR Sensor:	Silicon photodiode/optical filter combination with white acetal diffuser (37mm dia)
Signal Display:	Handheld display unit with LCD. 0 - 2V analogue output of measured values
Power Requirement:	1 x 9V PP3 cell
Dimensions Display:	146 (h) x 78 (w) x 35mm (d).
Weight:	238g (including battery).

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