Aquation®
Water Quality • Plant Health • Environment Assessment

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Photosynthesis – Respiration System

Aquation's **Submersible Photosynthesis-Respiration System** (Respirometer) is designed for measuring *in situ* metabolic rates of marine and aquatic organisms. The system monitors dissolved oxygen concentration, temperature and irradiance (as PAR) for at least 24 hours. Variable fluorescence (as ϕ_{II}) and pH can also be measured.

Benefits

- Fully waterproof for use up to 30 m depth
- Rugged design: 316 stainless steel for strength and corrosion resistance; acetal for lightweight
- Lightweight and portable: the system can be easily carried and setup in the field
- Easy-to-use software with an uncluttered interface
- Modular, simply add more modules if required (1 module monitors 2 chambers)
- Includes flush and stir pumps
- System designed to include Aquation fluorescence sensors

Aquation's Submersible Photosynthesis-Respiration System is a portable and rugged system for convenient measurement of metabolic rates *in situ*.

When used with chambers containing the plant, animal or assemblage of interest, the Respirometer describes plant productivity (or respiration at night), or animal respiration rates in terms of oxygen produced or consumed. This information provides a good proxy for ecosystem health.

The automated design enables continuous measurements over 24+ hours that would otherwise require an operator in the field. This automated function significantly reduces the risk of personnel being exposed to hazardous environments, and enables field operators to focus on more important tasks.

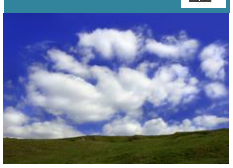
See over for further detail.

Field Studies

Pollution Studies

Plant Stress Analysis

Environmental Analysis



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Submersible Respirometer

Features and Specifications:

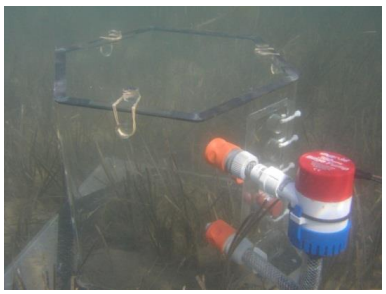
- Submersible: to 30 m depth
- Dissolved Oxygen: Optical dissolved oxygen sensor and temperature probe.
- Irradiance: PAR measured using LiCor LI192SA and 193SA
- Controller: 316 Stainless Steel, can control up to 8 sensors
- Operating temperature: 0 °C to 45 °C
- Storage temperature: -5 °C to 60 °C
- Automated function: Measurements made according to program; stir pump is continually on, flush pump is periodically on according to program.
- Pumps: Submersible, 12V
- Interface: Submersible Datalogger is programmed with a PC via a USB connection; program commences when System is turned on.
- Software: easy to use graphical user interface; fully flexible functions enable a wide range of settings and custom programs.
- Power: Submersible Datalogger: 18 V/9.0 Ah NiMH. Power Tube: 12 V/ 14.4 Ah. Charger: 110-240V AC 50-60Hz

The Respirometer is used in the field with an Aquation Submersible Datalogger, providing power, control and logging capacity to the system.

Additional measurements include modulated chlorophyll fluorescence using Aquation Classic or Shutter Fluorescence Sensors, pH using specially designed gel-filled (or ISFET) electrodes, irradiance as PAR using LiCor sensors, and ambient temperature using a range of available sensors.

Periodic flushing of the chambers is controlled by the Submersible Datalogger, and both flush pumps and always-on stirring pumps are powered by the external Power Tube power supply.

Aquation technology has been used in Antarctic waters, to depths exceeding 200 m in the tropical Pacific, in temperate waters of Australia and Europe, and in forest studies in the US.



UV-transparent incubation chamber

Power Tubes for 8-chamber system

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