



**Innovative Products for Aquatic Biology Research**



- Aquatic Respirometry
- Fibre-Optic pCO<sub>2</sub>, pO<sub>2</sub> and pH
- Swim Tunnels
- Video Tracking
- Fish Physiology
- Micro Chambers and Sensors
- Animal Behavior
- Bio Telemetry

## Measure oxygen consumption in aquatic organisms

Products range from research-grade data acquisition systems, sensors, chambers, swim tunnels, pumps, tubing and fittings, to low cost teaching packages.



### Measuring Principle

Automated Intermittent Flow Respirometry for unbeaten time resolution and long-term measurements

### Jump Start Respirometry

Use our single or multi-channel systems for automated oxygen consumption measurements in aquatic organisms.

Systems include user-friendly windows software and USB instrumentation for automated data acquisition, analysis, graphs, statistics, and control of pumps for stop flow respirometry and devices for water temperature or oxygen saturation.

### Features

- Oxygen measured by conventional or fibre optic sensors.
- Oxygen measured in % air sat., % oxygen sat., kPa or mmHg.
- On-the-fly calculations of oxygen consumption rates.
- On-the-fly calculations of  $r^2$  statistic.
- On-the-fly solid blocking correction of swimming speed.
- Stop-and-Continue function for a quick restart of experiments.
- 10 real-time graphs.



Data acquisition instrument

### Teaching Package

We offer an affordable educational package for measuring oxygen production or respiration in aquatic plants and animals.

The system is complete with quality sensors, chamber, software and USB instrumentation for automated measurements every 3-5 min.

Suggested topics are cellular respiration, photosynthesis and water quality.

Chamber for teaching



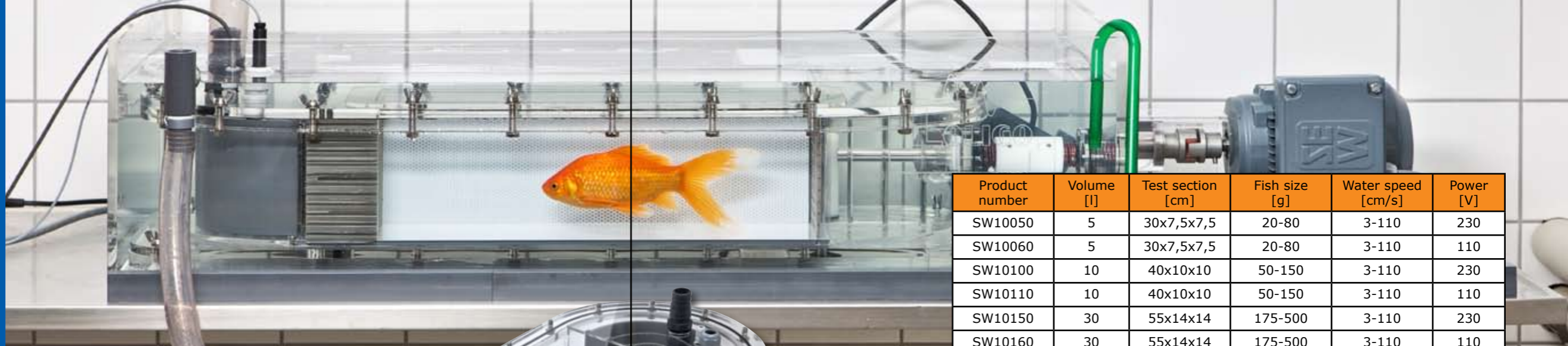
### Respirometer Chambers

We specialize in chambers built to match the dimensions and respiration of your experimental animals. From a single egg or larvae to adult tuna fish.

- Static chambers for inactive fish or invertebrates (0.1-100 L).
- Micro glass chambers for a single egg, larvae, embryo or juvenile (1/2-50 mL).
- Special-made chambers for special applications or organisms (? L).
- Swim tunnel respirometers (turn page for more details).

## Swim Tunnel Respirometers

The Loligo swim tunnel respirometers have been developed for measuring the physiology, energetics, behavior, biomechanics and kinematics of swimming fish, and through years of research and laboratory use. Applications also include flow visualization studies and public display of swimming animals.



Product number	Volume [l]	Test section [cm]	Fish size [g]	Water speed [cm/s]	Power [V]
SW10050	5	30x7,5x7,5	20-80	3-110	230
SW10060	5	30x7,5x7,5	20-80	3-110	110
SW10100	10	40x10x10	50-150	3-110	230
SW10110	10	40x10x10	50-150	3-110	110
SW10150	30	55x14x14	175-500	3-110	230
SW10160	30	55x14x14	175-500	3-110	110
SW10200	90	70x20x20	450-1500	5-150	230
SW10210	90	70x20x20	450-1500	5-150	110
SW10250	150	87,5x25x25	750-5000	10-225	3x230
SW10275	150	87,5x25x25	750-5000	10-225	3x230

Large Swim Tunnels

The unique and compact design allows adequate space for natural movements and at the same time a low volume required for reliable oxygen consumption measurements.

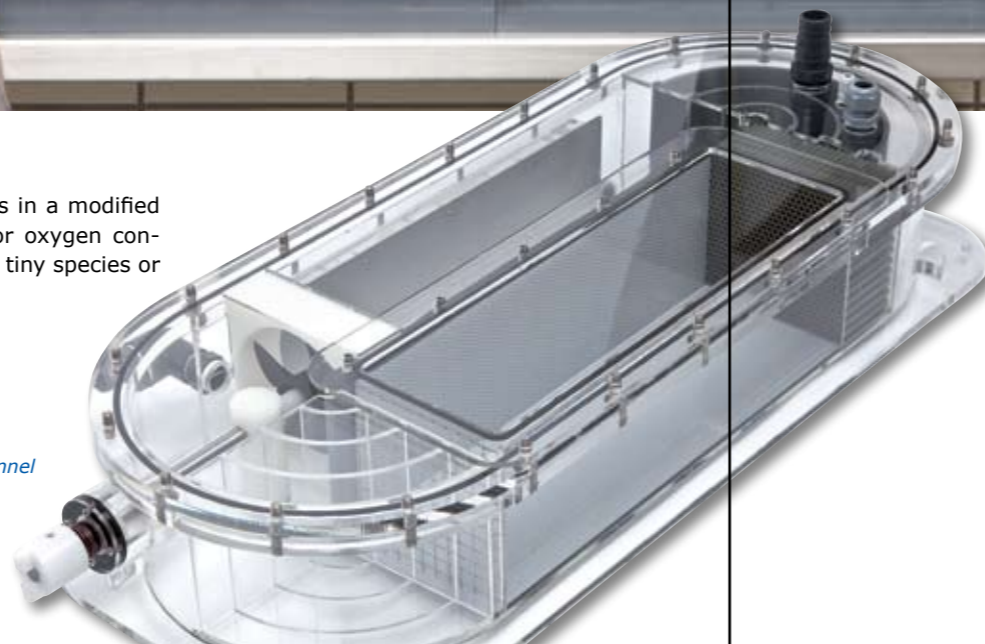
### Mini Swim Tunnels

Our miniature swim tunnels in a modified Blazka design are made for oxygen consumption measurements in tiny species or single larvae/juvenile.

Polished acrylic materials and square walls makes for excellent instrumentation and observation of animals from above and from the side.

A surrounding temperature bath, external motor and build-in heat exchanger, allow accurate control of water temperatures at all times.

30 litres Swim Tunnel



Product number	Volume [ml]	Test section [mm]	Fish size [g]	Water speed [cm/s]	Power [V]
SW10000	170	ID26,4 x L100	1-4	3-37	230
SW10020	170	ID26,4 x L100	1-4	3-37	110
SW10030	1500	ID55 x L200	4-12	3-50	230
SW10040	1500	ID55 x L200	4-12	3-50	110

Mini Swim Tunnels

## Sensors and Instruments

Measure or control water temperature, O<sub>2</sub>, CO<sub>2</sub>, pH, salinity, flow etc.



- Fibre-optic instruments and sensors for pO<sub>2</sub>, pCO<sub>2</sub> or pH. Single, four and 10-channel instruments incl. software for Windows. Many types of micro and mini sensors for invasive physiology, biofilm, sediment, respirometry and water quality including non-invasive sensor spot technology.
- Packages for monitoring and controlling water temperature, O<sub>2</sub> and CO<sub>2</sub>. Rugged sensors and instruments with

display and digital relays for keeping water quality parameters at preset levels in fish tanks etc.



Oxygen analyzer



### Animal Behavior Analysis

1. Video tracking software.
2. Video research equipment (IR lighting, high speed cameras, microscope cameras, lenses etc.).
3. ShuttleBox systems for preferred temperature, oxygen or salinity, ChoiceTanks etc.).
4. PIT/RFID technology (biocompatible tags and readers).
5. Bio telemetry (acoustic transmitters for oxygen, temp, depth).

Shuttle Box for preference temperature studies

- Polarographic amplifiers, supplies and electrodes for O<sub>2</sub>, CO<sub>2</sub> and pH, identical in design to the discontinued ones from Radiometer Copenhagen and Cameron Instruments Co.
- Handheld battery-operated instruments with probes for monitoring and logging flow, pH, CO<sub>2</sub>, O<sub>2</sub>, temperature, conductivity etc. in the field or in the lab.



Instrument suitcase



Loligo Systems  
Niels Pedersens Allé 2  
DK-8830 Tjele, Denmark

Phone +45 8999 2545  
Fax +45 8999 2599  
mail@loligosystems.com

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