



part of the Breeze Group 

OxyCycler A84XOV

Dynamic in vivo O₂ Controller



Applications:

- Obstructive Sleep Apnea (OSA)
- Chronic Intermittent Hypoxia (CIH)
- Retinopathy
- Hypertension
- Vascularization
- Disease modeling
- Cancer studies
- Stem cell studies
- Gene expression
- Aging studies
- **Many more!**

The OxyCycler A84XOV is a precision tool for in vivo research, accurately and reliably regulating O₂ levels from 0.1-99.9%.

Powerful O₂ Tool

Flexible Functionality

The A84XOV can easily create multiple setpoints, durations, and cycling profiles. It works with any semi-sealed incubator subchambers, including BioSpherix A-Chamber, and can control up to four chambers simultaneously. Its intuitive PC interface and built-in data logging make it ideal for animal modeling studies.

Efficient Operation

Operating externally, the controller remotely senses gas levels inside the host chamber. It precisely infuses O₂ gas to increase concentration or nitrogen to displace and reduce O₂ levels as needed. Efficient, closed-loop control ensures accuracy without waste, so gas is used only when necessary.



Scan to read how the OxyCycler A84XOV is used in research



www.BioSpherix.com



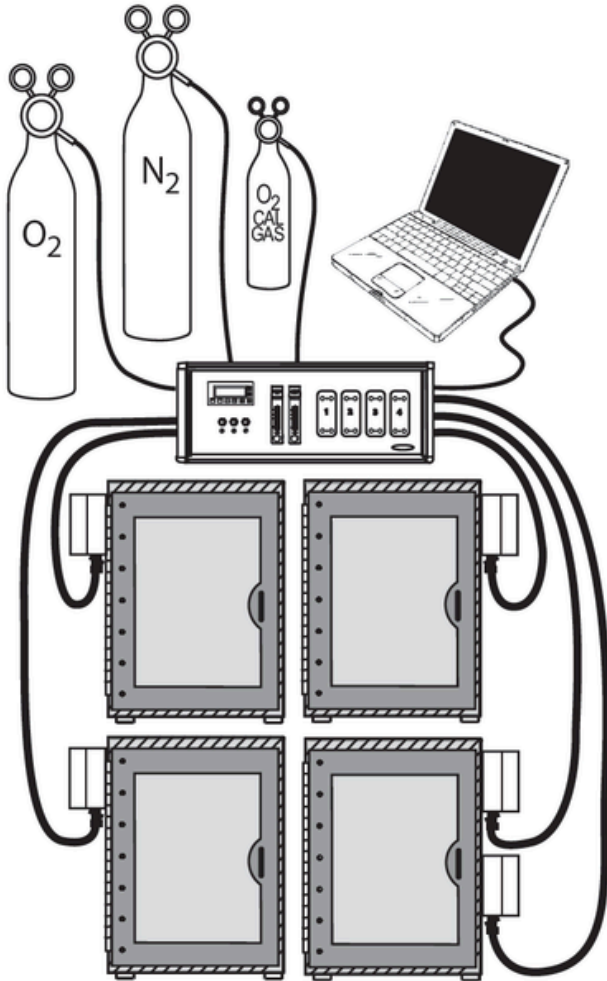
Sales@BioSpherix.com



[Youtube.com/@Cytocentric](https://www.youtube.com/@Cytocentric)

OxyCycler A84XOV

The OxyCycler® A84XOV can connect up to four chambers via flexible tubing. The tip of each umbilical is connected to an actuator pod containing an oxygen sensor, a gas nozzle, fan, and mounting hardware (shown below).



Installation

1. Set the A84XOV on or near A-Chamber and plug it in to standard outlet.
2. Mount each actuator pod to A-Chamber via precut holes and mounting hardware (below).
3. Connect gas supply. Compressed gas is recommended for low consumption applications, and liquid for medium to high consumption.
4. Use computer software to monitor and control gas levels.



The fan infuses air inside the chamber, while an array of ventilation holes (above), forces air circulation and gas homogenization while displacing off-gases, ensuring GLP quality air conditions for animal models.

Dynamic O₂ exposures are programmed with a series of setpoints that can be remotely monitored, adjusted, and reproduced via user-friendly PC software. Data logging ensures that no valuable data is lost.

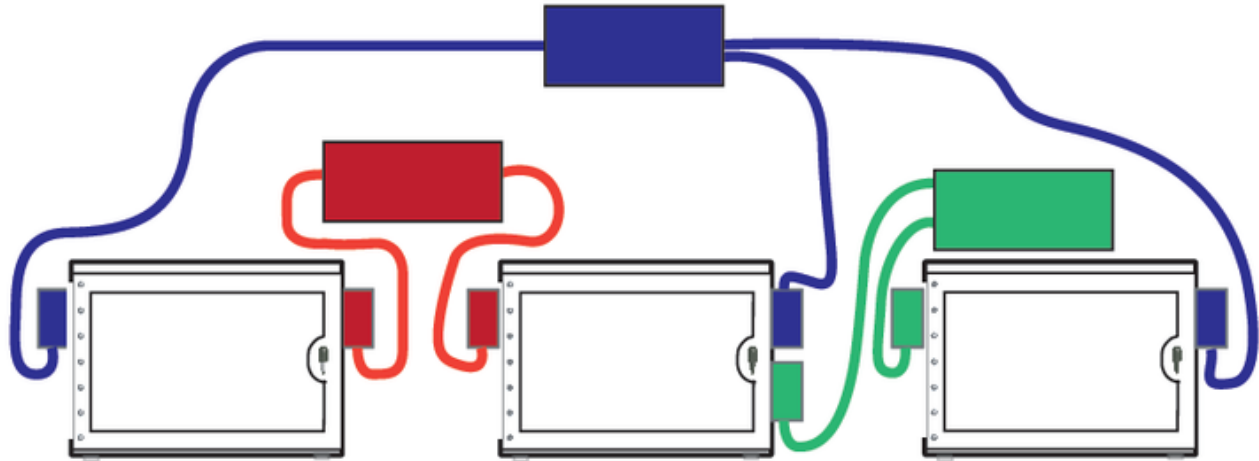
Chamber ventilation can be adjusted by using the sensors in the monitor pod. Monitor pods can also be used to verify that all unwanted off-gases and conditions were mitigated.

Monitor pods are uniquely designed to move easily from chamber to chamber, allowing rapid characterization of new enclosures as needed. Characterizing enclosures prior to experimentation is strongly recommended to ensure all environmental control parameters meet desired specifications.

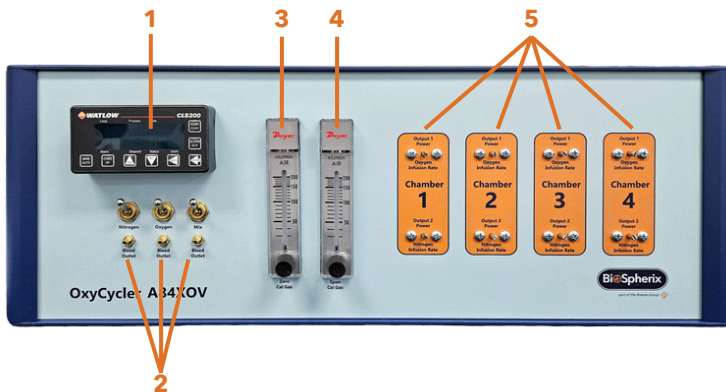


OxyCycler A84XOV

The OxyCycler A84XOV is able to accommodate up to four chambers simultaneously. The modular nature of BioSpherix controllers and chambers allow for a multitude of possible configurations that can support many experimental protocols. For example, the A84XOV can control three chambers alongside two AT series controllers (rendered below), while a fourth chamber can act as a control.



Front Panel



1. Digital Display: Continuously displays current gas level, control status, and alarm status in all chambers. Displays menu items and settings during programming
2. Bleed Valves: Bleeds gases out of gas supply lines
3. ZERO Cal Gas Flowmeter: Used for calibration
4. SPAN Cal Gas Flowmeter: Used for calibration
5. Needle Valves: Sets infusion rate of control gases in each chamber to accommodate different dynamics. Can manually override controller to shut off gas

Back Panel



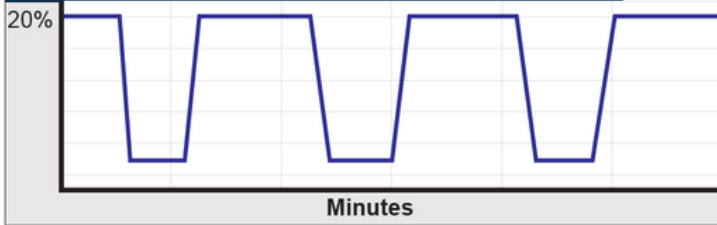
1. Power Connection (12VDC)
2. Ground Stud
3. Actuator Pod Connectors: Flexible tubing connects remote actuator pods to back panel
4. Supply Gas Hose Inputs: 3/8" ID hose from gas sources pressure rated up to 40 PSIG
5. Alarm Receptacle
6. Accessory Port: Allows connection to upgrade option Quick
7. RS-485 Connections: Cable attachments to computer and additional controller unit
8. Monitor Pod Umbilical: Flexible tubing connects remote monitor pod to back panel



OxyCycler A84XOV

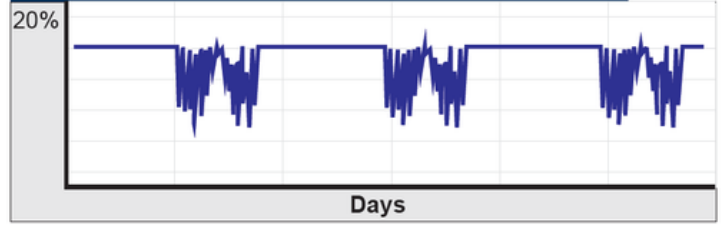
Oxygen Control Scenarios

Acute/Intermittent Hypoxia



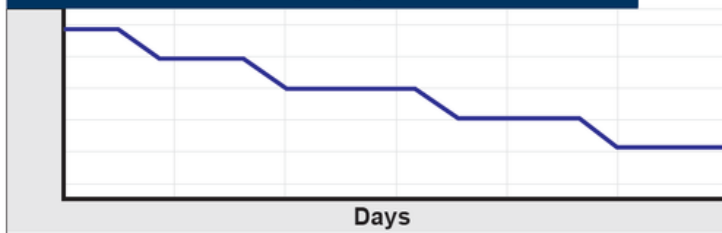
Hypoxic stress can be used to model key aspects of severe diseases such as heart attack, stroke, asthma, and epilepsy. The frequency, duration, and severity of oxygen deprivation can all be precisely controlled.

Episodic Hypoxia



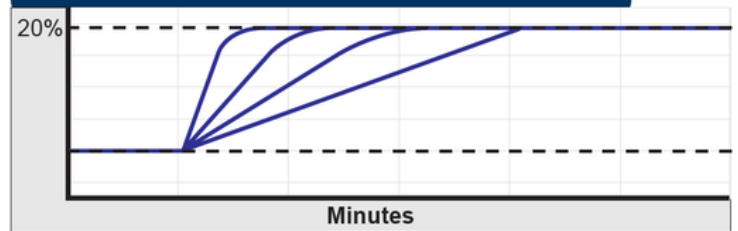
Recurring episodes of hypoxia such as those created by occupational flight, sleep apnea, asthma, and pulmonary infections, are often linked to chronic diseases such as hypertension, diabetes, rheumatoid arthritis, macular degeneration, psoriasis, osteoporosis, etc.

Graded Hypoxia



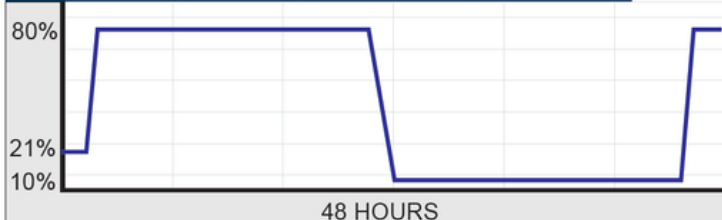
Step reduction in oxygen, such as that during altitude acclimation, is used to gradually condition cells for hypoxic upregulation of gene expression. The rate of change and duration between any two levels is adjustable and repeatable.

Acute Hyperoxia



Sudden increases in oxygen levels can damage cells. Hyperoxia, such as that experienced by athletes, therapeutic oxygen administration in critical care, and other acute high-oxygen exposures, can easily be modeled with the A84XOV. Rapid shifts in oxygen can overwhelm cellular antioxidants, while slower increases can precondition cells to enhance antioxidant defenses.

Hyper/Hypo Swings



Episodic oscillations in hypoxia can cause neovascularization in the neonatal retina, which creates a suitable model for neovascular retinopathies and angiogenesis.



OxyCycler A84XOV

Electrical Requirements

Electrical Power: 12 VDC, 6.6AMP

Physical Specifications

Weight: 29 lbs (controller only)

Controller Dimensions: 8 ¼"H x 21 ¼"W x 18"D

Actuator Pod Dimensions: 7"H x 4.4"W x 4.5"D

Gas Control Performance

Control Range: 0.1-99.9% O₂

Accuracy: O₂ ±1% (constant temperature and pressure)

Resolution: 0.1%

Alarms & Safety

Alarm Output: visible, PC adds auditory and other visible indicators

Alarm Modes: 1) process high 2) process low 3) deviation high 4) deviation low 5) deviation band

Gas Delivery Performance

Gas Infusion Rate: 1-150 SCFH per valve

Gas Consumption: depends on 1) size and leakiness of host chamber 2) frequency and duration of chamber door openings 3) controller setpoint

Gas Supply & Compatibility

Gas Source: compressed gas tanks, liquid dewar

Gas Supply: pressurized O₂ and N₂

Gas Supply Line: ⅜" ID hose pressure rated at 40 PSIG, 95A durometer

Gas Supply Line Pressure: 1-40 PSIG

Gas Supply Hose Fitting: ⅜" ID one-touch fitting

Umbilical Specifications

Umbilical Length: 12' (custom lengths available)

Operation Parameters

Host Chamber Temperature: 0-40°C

Host Sensor Humidity: 5-95%, non-condensing

Host Chamber CO₂: 0-20%



Visit our YouTube channel for calibration and installation how-to's



www.BioSpherix.com



Sales@BioSpherix.com



Youtube.com/@Cytocentric