



part of the Breeze Group 

OxyCycler A41OV

Dynamic in vivo O₂ Controller



Applications:

- Hypoxia
- Hyperoxia
- Chronic Intermittent Hypoxia (CIH)
- Obstructive Sleep Apnea (OSA)
- Disease modeling
- Pathology
- **Many more!**



Scan to read how the OxyCycler A41 is used in research

Precision Gas Control

The OxyCycler A41OV is a powerful, single-chamber gas controller for in vivo research that requires dynamic, multi-setpoint O₂ (0.1-99.9%) control.

Flexible Functionality

Powerful and dynamic gas control allows for the simulation of a multitude of natural and artificial conditions for in vivo studies. The A41OV works with any semi-sealed incubator, including the BioSpherix A-Chamber.

Efficient Operation

The OxyCycler A41OV remotely senses gas levels inside the host chamber. It precisely infuses O₂ to increase concentration, or nitrogen to displace and reduce levels as needed. Efficient, closed-loop control ensures accuracy without waste, so gas is used only when necessary.



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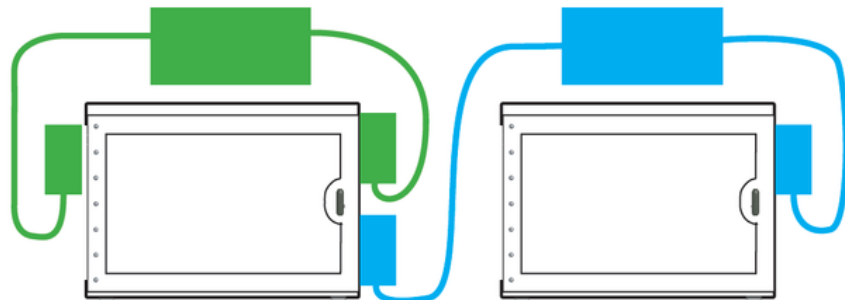


[Youtube.com/@Cytocentric](https://www.youtube.com/@Cytocentric)

OxyCycler A41OV

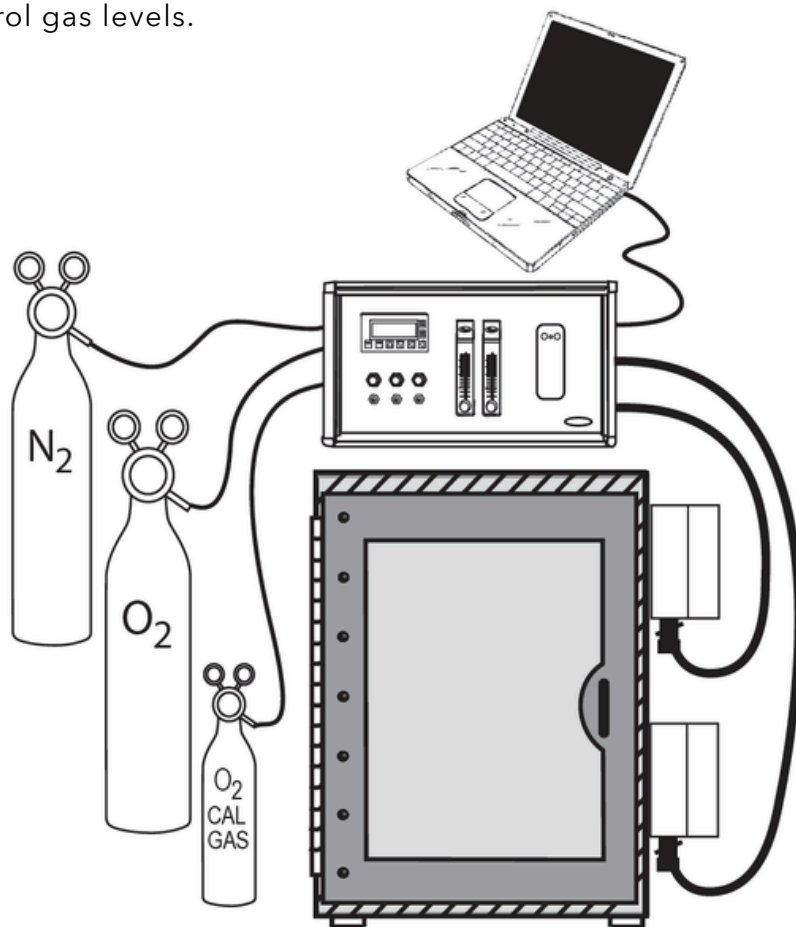
The OxyCycler A41OV can also be paired with other BioSpherix controllers and includes PC software that can be used for real-time trend charting, data logging, and remote operation. This software can create fully customized oxygen and carbon dioxide profiles to match physiological or experimental profiles:

- Staggered or simultaneous run times
- Independent or duplicate programs
- 1-20 programmable setpoints per profile
- 0-999 minutes between setpoints
- 1-99 cycles or continuous looping



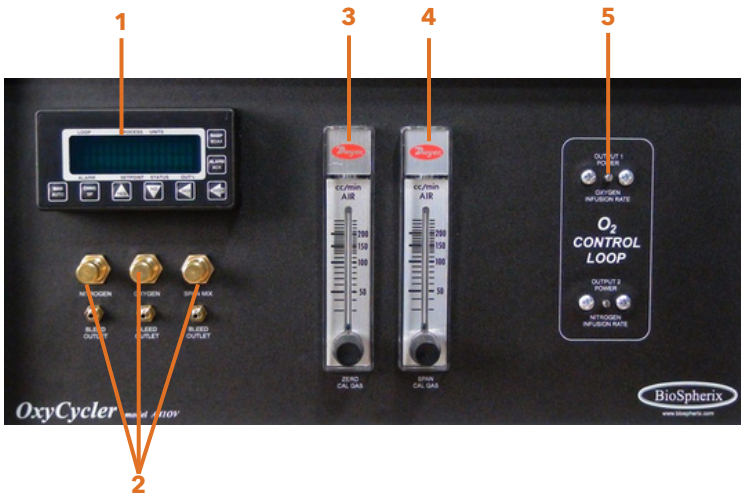
Installation

1. Set the A41OV on or near A-Chamber and plug it in to standard outlet.
2. Mount each actuator pod to its respective 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.



OxyCycler A410V

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



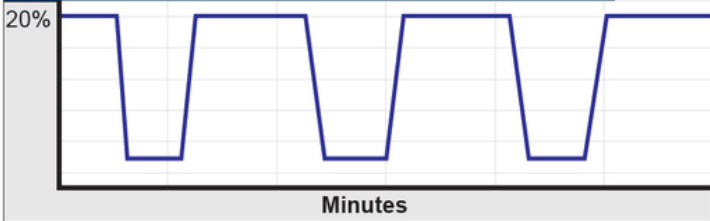
1. Alarm Receptacle
2. RS-485 Connections: Cable attachments to computer and additional controller unit
3. Power Connection (12VDC)
4. Ground Stud: Protects the controller from electrical damage
5. Monitor Pod Umbilical: Flexible tubing connects the remote monitor pod to the back panel
6. Actuator Pod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



OxyCycler A41OV

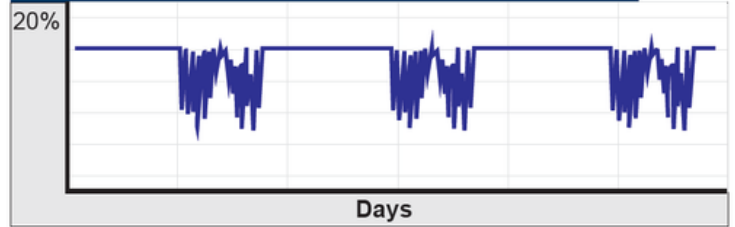
Oxygen Control Scenarios

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



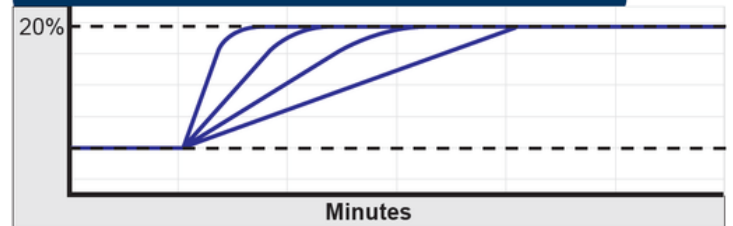
Recurring episodes of hypoxia such as those created by occupational flight, sleep apnea, asthma, and pulmonary infections, are often linked to chronic diseases such as hypertension, diabetes, rheumatoid arthritis, macular degeneration, psoriasis, osteoporosis, etc.

Graded Hypoxia



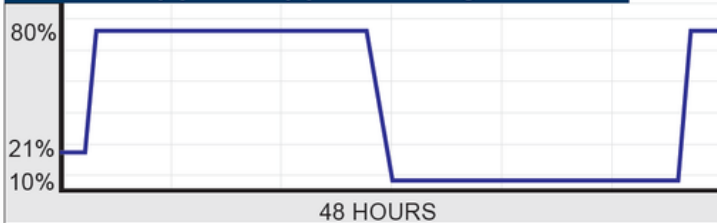
Step reduction in oxygen, such as that during altitude acclimation, is used to gradually condition cells for hypoxic upregulation of gene expression. The rate of change and duration between any two levels is adjustable and repeatable.

Acute Hyperoxia



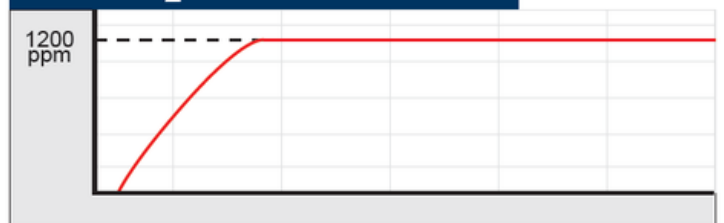
Sudden increases in oxygen levels can damage cells. Hyperoxia, such as that experienced by athletes, therapeutic oxygen administration in critical care, and other acute high-oxygen exposures, can easily be modeled with the A41OV. Rapid shifts in oxygen can overwhelm cellular antioxidants, while slower 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.

CO₂ Limit Control



Excess CO₂ can be flushed while maintaining O₂ protocols.



OxyCycler A41OV

Electrical Requirements

Electrical Power: 12 VDC, 6.6AMP

Physical Specifications

Weight: 27 lbs

Controller Dimensions: 9"H x 17"W x 14.5"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: ±1%

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



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

Gas Delivery Performance

Gas Infusion Rate: 1-150 SCFH per gas per chamber

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, N₂

Gas Supply Line: 1/4" ID hose pressure rated at 40 PSIG

Gas Supply Line Pressure: 0-40 PSIG

Gas Supply Hose Fitting: 1/4" hose barb

Umbilical Specifications

Umbilical Length: 12' (custom lengths available)

Operation Parameters

Host Chamber Temperature: 0-40°C

Host Sensor Humidity: 1-95%, non-condensing

Host Chamber CO₂: 0.1-20%



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