



part of the Breeze Group 

OxyCycler C42

Dynamic O₂ and CO₂ Controller



Applications:

- Chronic Intermittent Hypoxia (CIH)
- Obstructive Sleep Apnea (OSA)
- Hyperoxia
- Hypercapnia
- Retinopathy
- Acidosis
- Cancer studies
- Oxidative stress
- Stem cell studies
- **Many more!**

Versatile O₂ and CO₂ Tool

The OxyCycler C42 is a dual channel gas controller for control of O₂ (0.1-99.9%) and CO₂ (0.1-20.0%).

Dynamic and Pre-Programmable

Capable of enabling multiple setpoints, ranges, and number of cycles, the OxyCycler C42 makes complex oxygen cycling easy. It works within any semi-sealed incubator subchamber, including the BioSpherix C-Chamber, and can control multiple chambers simultaneously.

Efficient Operation

The OxyCycler C42 controller remotely senses gas levels inside the host chamber. It precisely infuses gases to increase or decrease concentrations of O₂ and CO₂ as needed. Efficient, closed-loop control ensures accuracy without waste, so gas is used only when necessary.



Scan to read how OxyCycler C42 is used in research



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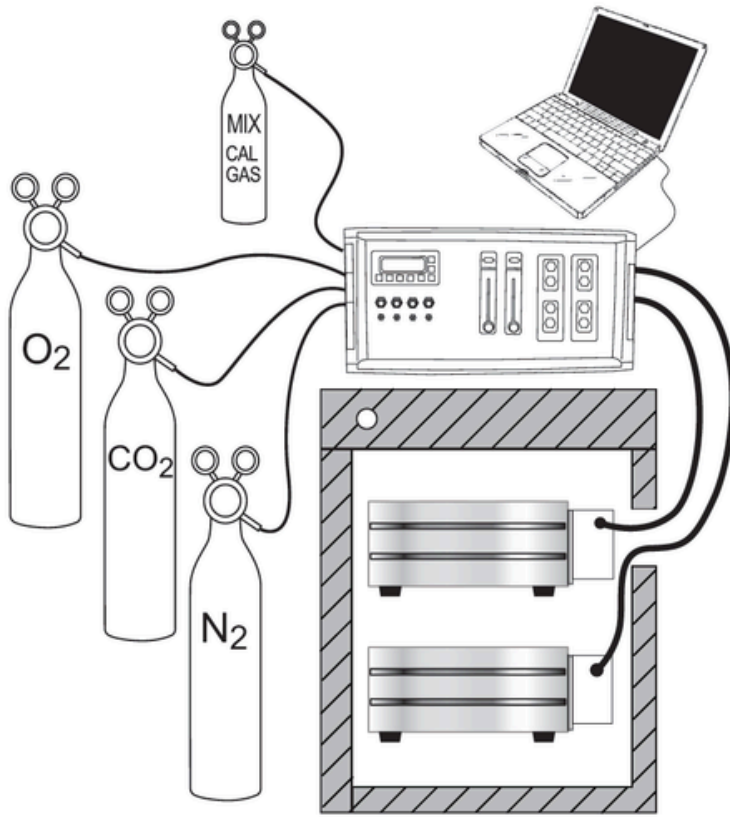


[Youtube.com/@Cytocentric](https://www.youtube.com/@Cytocentric)

OxyCycler C42

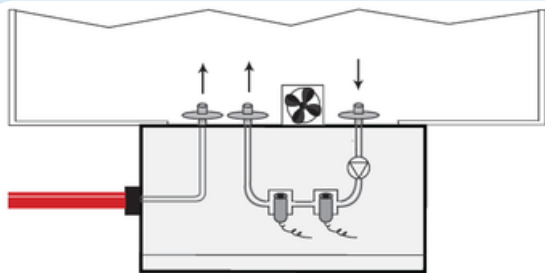
The OxyCycler® C42 is typically configured as a dual subchamber system for experimental and control conditions. The isolated subchambers are housed within a third-party CO₂-only or temperature-controlled incubator.

The system uses three control gases, O₂, N₂, and CO₂, and is compatible with all standard BioSpherix subchambers which connect via flexible umbilicals.



Installation

1. Set the OxyCycler C42 on or near C-Chamber and plug it in to standard outlet.
2. Hook up sensor and gas infusion tube and insert both into chamber.
3. Attach up 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.

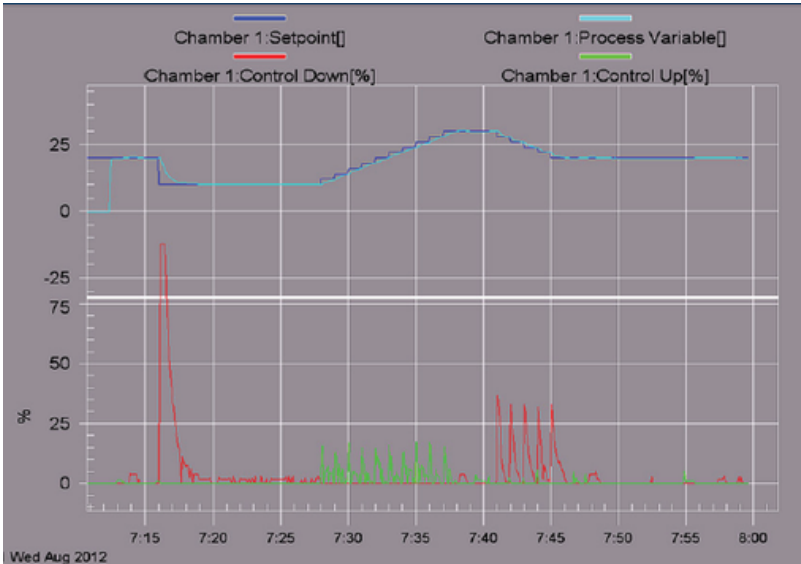


C42 POD

The OxyCycler C42 features a pod-based sensor architecture that isolates gas-sensing components from the cell culture environment. Chamber gas is sampled through a sterile filter, routed to the external pod for measurement, and returned to the chamber through a second sterile filter. This closed, side-stream sampling design minimizes contamination risk to both the chamber and the sensor loop.



OxyCycler C42



- Each chamber can run the same profile simultaneously or stagger profiles to begin at different times.
- Profiles can have 1 to 20 setpoints with rates between setpoints ranging from 0-999 minutes.
- Profiles can be cycled continuously up to 99 times.

Front Panel



1. Digital Controller: Displays process values and provides manual user interface to control gas infusion
2. Bleed Valves: Bleeds gases out gas supply lines. Calibration cup for sensor attaches here
3. ZERO Calibration Gas Flowmeter: Used for calibration
4. SPAN Calibration Gas Flowmeter: Used for calibration

Back Panel

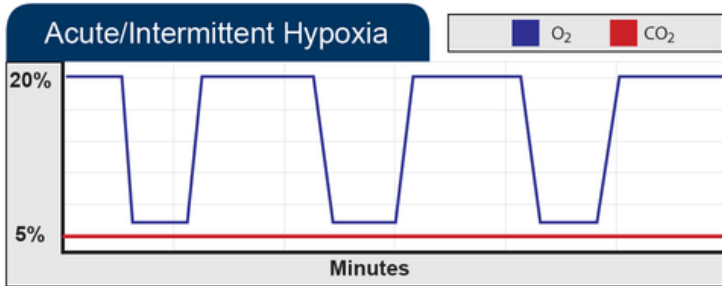


1. Communications Cables: Relay information for the sensors and provides power to the sample draw pump
2. RS-485 Communications Cables: Cable attachments to computer and additional controller unit
3. Alarm Receptacle
4. Accessory Receptacle: 10 pin input jack
5. Power Receptacle (12VDC)
6. Ground Stud
7. Supply Gas Hose Inputs: $\frac{3}{8}$ " ID tubing from gas sources. Handles pressure up to 25 PSIG
8. Umbilicals: Delivers infusion and calibration gas to the chamber

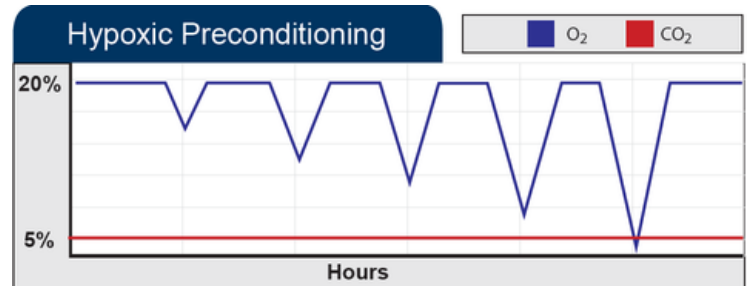


OxyCycler C42

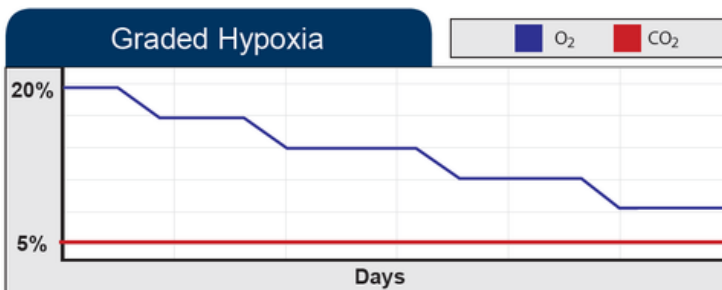
Oxygen Control Scenarios



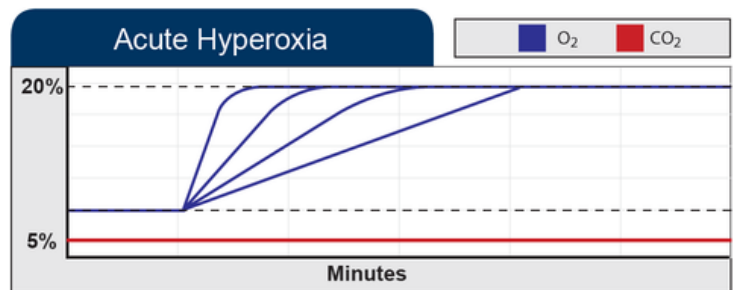
Hypoxic stress can be used to model key aspects of severe diseases such as heart attack, stroke, asthma, and epilepsy. The frequency, duration, and severity of oxygen deprivation can all be precisely controlled.



Preconditioning cells to hypoxic conditions can improve their resilience, as implanted cells are likely to experience low oxygen levels. This approach may also confer protection against ischemic injury.



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.



Sudden increases in oxygen levels can damage cells. The OxyCycler C42 enables precise modeling of oxygen toxicity across a range of scenarios, from recreational oxygen use by athletes to therapeutic oxygen administration in critical care, and other acute high-oxygen exposures. The rate of oxygen increase is adjustable: rapid shifts can overwhelm cellular antioxidants, while slower increases can precondition cells to enhance antioxidant defenses.



OxyCycler C42

Electrical Requirements

Electrical Power: 12 VDC, 6.6AMP

Physical Specifications

Weight: 17 lbs (controller only)

Controller Dimensions: 8 1/3"H x 12 3/4"W x 14 1/2"D

Actuator Pod Dimensions: 4.4"H x 7.1"W x 3.75"D

Gas Control Performance

Control Range: 0.1-99.9% O₂, 0.1-20% CO₂

Accuracy: O₂ ±1% (at constant temperature and pressure), ±2% (over entire temperature range). CO₂ ±1.5% of range, or 2% of reading (whichever is greater)

Resolution: 0.1%

Alarms & Safety

Alarm Output: 12V output adaptable to external systems

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: 1-12 SCFH

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, CO₂, and/or N₂

Gas Supply Line: 3/8" ID hose pressure rated to 25 PSIG, 95A durometer

Gas Supply Line Pressure: 1-25 PSIG

Gas Supply Hose Fitting: 3/8" ID one-touch fitting

Sensor Specifications

Sensor Cable Length: 12'

Sensor Cable Diameter: 6mm

Operation Parameters

Host Chamber Temperature: 5-40°C

Host Sensor Humidity: 0-95%, non-condensing

