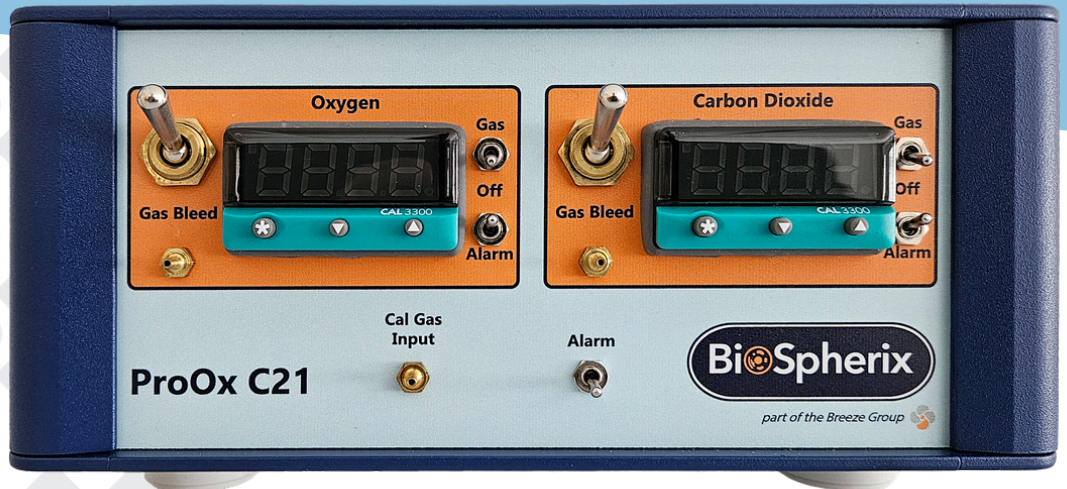




part of the Breeze Group 

# ProOx C21

## Compact O<sub>2</sub> and CO<sub>2</sub> Controller



### Applications:

- Hypoxia
- Hyperoxia
- Physioxia
- Cancer studies
- Organoids
- Oxidative stress
- Stem cell studies
- Neurodegeneration
- Cardiology
- Reoxygenation
- **Many more!**



Scan to read how the ProOx C21 is used in research

### Versatile Gas Control

The ProOx C21 efficiently controls oxygen (0.1-99.9%) and carbon dioxide (0.1-20.0%).

### Flexible Application

The ProOx C21 works with bench-top incubators. When combined with the BioSpherix C-Chamber, The ProOx C21 can simulate and effectively maintain the desired gas levels for continuous and accurate physiologic control, upgrading your existing lab space without additional footprint.

### Efficient Design

The ProOx C21 remotely senses gas levels and precisely infuses O<sub>2</sub>, CO<sub>2</sub>, or N<sub>2</sub> to reach and maintain setpoints. Closed-loop control ensures accuracy without waste, so gas is used only when necessary. A unique, double-filtered sensor design mitigates potential contamination at the source.



[www.BioSpherix.com](http://www.BioSpherix.com)

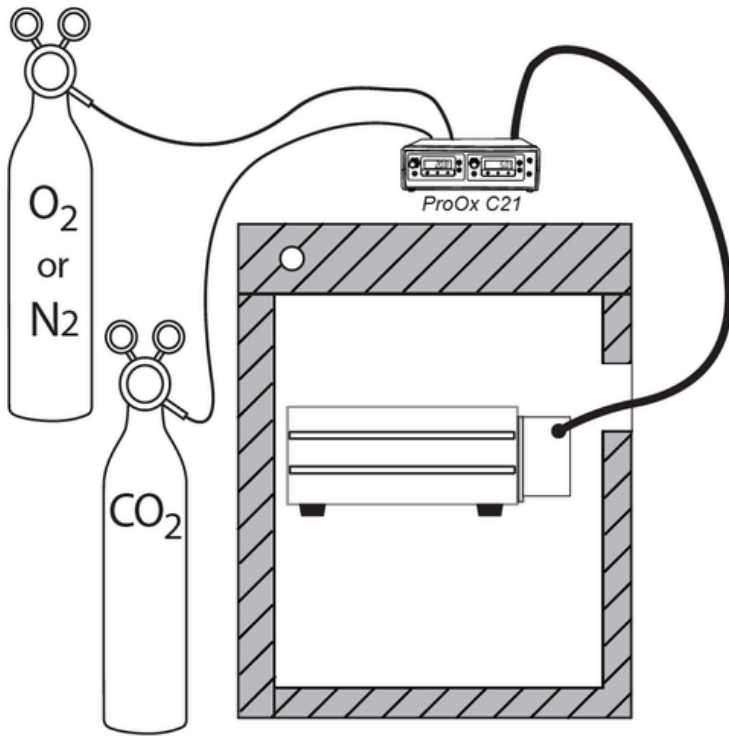


[Sales@BioSpherix.com](mailto:Sales@BioSpherix.com)



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

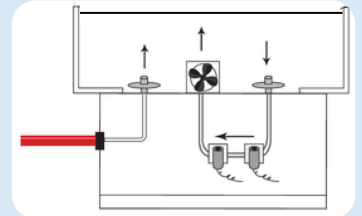
# ProOx C21



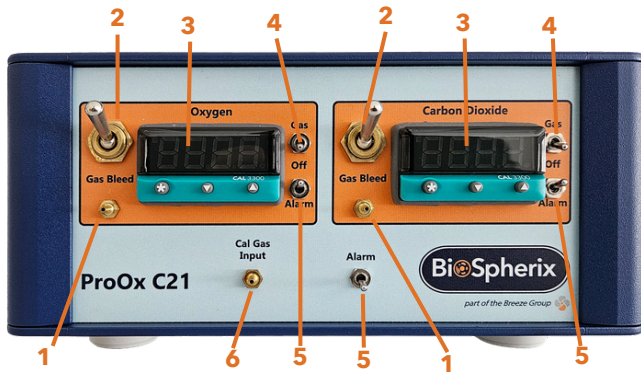
## Installation

1. Set the ProOx C21 on or near incubator and plug it in to standard outlet.
2. Hook up sensor and gas infusion tube and insert both into C-Chamber.
3. Attach gas supply. Compressed gas is recommended for low consumption applications, liquid for medium consumption, and generator for high consumption.
4. Turn on controller by flipping the switch on the front panel.
5. Change gas levels via buttons underneath the display.

An external accessory pod houses double-filtered O<sub>2</sub> and CO<sub>2</sub> sensors, delivering sterile, filtered gas to the chamber.

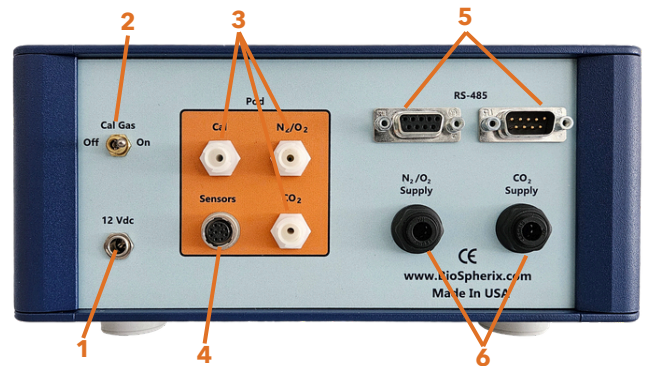


## Front Panel



1. Bleed Bars: Attaches to calibration cup for sensor calibration
2. Bleed Valves: Bleeds gases from gas supply lines
3. Digital Display: Continuously displays current gas level, control status, and alarm status in all chambers
4. Gas Switch: Manual gas shut off
5. Alarm Switch: Manual alarm shut off
6. Cal Gas Input: Barb for calibration

## Back Panel



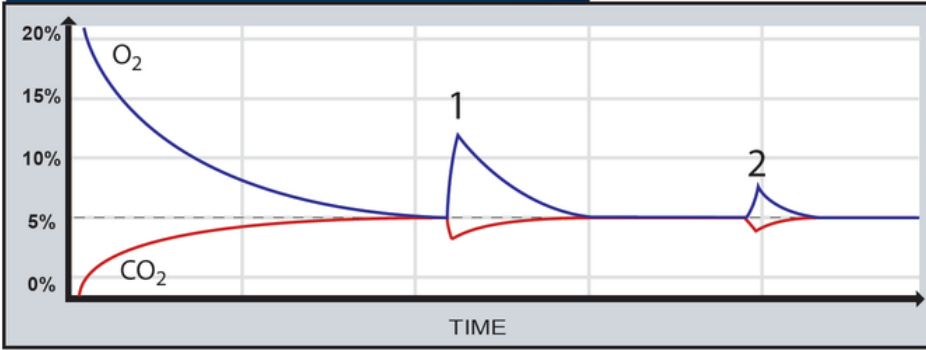
1. Power Connection (12VDC)
2. Calibration Switch: Turns gas flow on and off for calibration
3. Connecting Infusion Tubes: Attaches the 1/16" ID infusion tubes to the "CAL" N<sub>2</sub>/O<sub>2</sub> and CO<sub>2</sub>
4. Communication Cable: Relays information for the sensors and provides power to the sample draw pump
5. RS-485 Connections: One cable attaches to a computer and the other cable attaches to another unit, allowing communication with the computer
6. Supply Gas Hose Barb: Barbs for 1/4" ID hose from gas sources. Handles pressure up to 25 PSIG



# ProOx C21

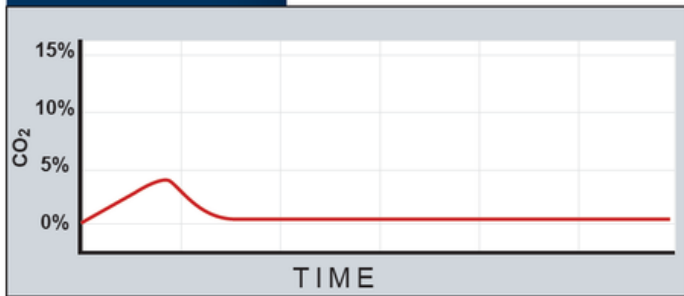
## Control Scenarios

### 5% CO<sub>2</sub> and 5% O<sub>2</sub> Control



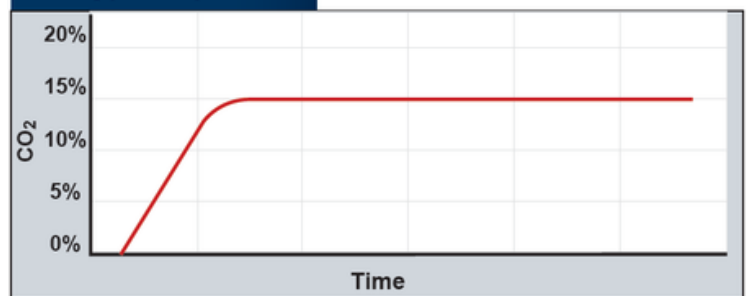
1. Incubator door is opened and closed briefly, allowing room air to enter and deviate concentration from setpoint. Automatic feedback from the ProOx C21 returns gas levels to setpoint.
2. Door is left unlatched, increasing chamber leakage. ProOx C21 returns gas levels to setpoint, though overall gas consumption increases to accommodate increased load.

### Hypocapnia



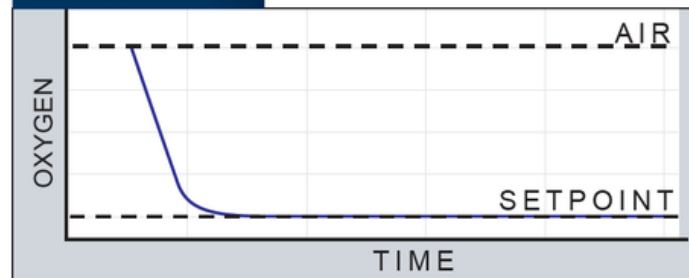
Hypocapnia can be simulated by infusing nitrogen into the incubator or incubator subchamber to the desired setpoint.

### Hypercapnia



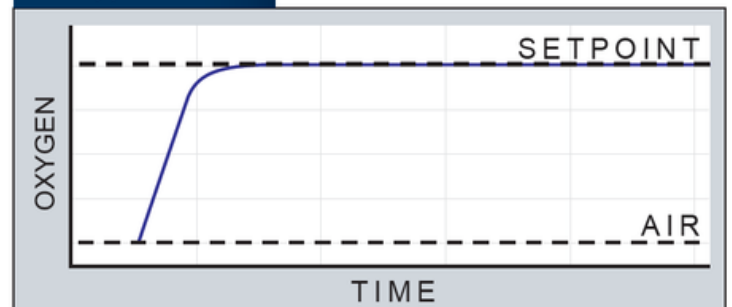
Hypercapnia can be simulated by infusing carbon dioxide to the desired setpoint.

### Hypoxia



In hypoxic conditions, nitrogen serves as the control gas. Setpoints range from 0.1% to 20.7% oxygen.

### Hyperoxia



In hyperoxic conditions, oxygen serves as the control gas. Setpoints range from 20.9% to 99.9% oxygen.



# ProOx C21

## Electrical Requirements

**Electrical Power:** 12 VDC, 2.5AMP

## Physical Specifications

**Weight:** 4.7 lbs (controller only)

**Controller Dimensions:** 4  $\frac{3}{8}$ "H x 8  $\frac{7}{8}$ "W x 9"D

## Gas Control Performance

**Control Range:** 0.1-99.9% O<sub>2</sub>, 0.1-20% CO<sub>2</sub>

**Accuracy:** O<sub>2</sub>  $\pm$ 1% (at constant temperature and pressure),  $\pm$ 2% (over entire temperature range). CO<sub>2</sub>  $\pm$ 1.5% of range, or 2% of reading (whichever is greater)

**Resolution:** 0.1%

## Alarms & Safety

**Alarm Output:** audible (40dB), flashing indicator

**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:** 1-14 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 CO<sub>2</sub>, and/or O<sub>2</sub>, N<sub>2</sub>

**Gas Supply Line:** 1/4" ID, 95A pressure rated to 25 PSIG

**Gas Supply Line Pressure:** 1-25 PSIG

**Gas Supply Hose Fitting:** 1/4" one-touch fitting

## Sensor Specifications

**Sensor Cable Length:** 12'

**Sensor Cable Diameter:** 6mm

## Operation Parameters

**Host Chamber Temperature:** 5-40°C

**Host Chamber CO<sub>2</sub>:** 0.1-20%

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

