



part of the Breeze Group 

# ProOx P110

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



### Compatible with:

- Incubators
- Gloveboxes
- Refrigerators
- in vivo enclosures
- Plant chambers
- Bagged areas
- Ice boxes
- Tents
- Others

### Applications:

- Hyperoxia
- Hypoxia
- Retinopathy
- Ischemia
- Neurology
- Vascularization
- Metabolism
- Gene expression
- **Many more!**

### Versatile O<sub>2</sub> Tool

The ProOx P110 is a compact oxygen controller with a flexible 0.1-99.9% O<sub>2</sub> control range, supporting a wide range of applications.

### Flexible Functionality

The ProOx P110 is designed to fit and control oxygen levels within any semi-sealable enclosure, with quick and easy integration across a wide range of systems.

### Efficient Operation

The ProOx P110 remotely senses oxygen levels inside the host chamber. It precisely infuses O<sub>2</sub> gas to increase concentration, or nitrogen to displace and reduce levels as needed. Efficient, closed-loop control and continuous feedback from the sensor ensures accuracy without waste.



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



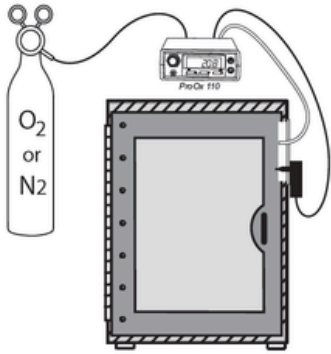
[Sales@BioSpherix.com](mailto:Sales@BioSpherix.com)



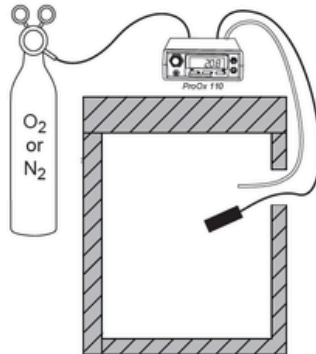
[Youtube.com/@Cytocentric](https://www.youtube.com/@Cytocentric)

# ProOx P110

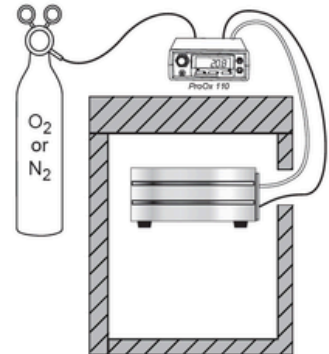
ProOx P110 can control any semi-sealable chamber by one of the methods shown below. Installation may vary based on chamber.



Control via adapter plate as shown on BioSpherix A-Chamber



Direct insertion of sensor tubing as shown on generic enclosure chamber

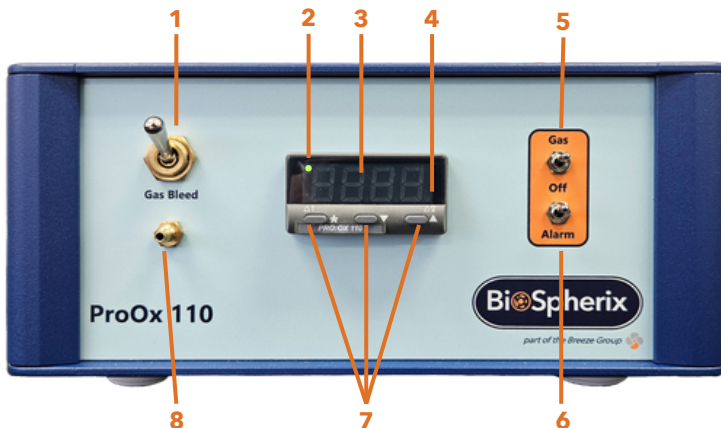


Subchamber via adapter plate shown on BioSpherix C-Chamber

## Installation

1. Set ProOx P110 on or near incubator or chamber and plug it in to standard outlet.
2. Hook up sensor and gas infusion tube and insert both into chamber.
3. Attach gas supply. Compressed gas is recommended for low consumption applications, and liquid for medium to high consumption.
4. Turn on controller by flipping the switch on the front panel. Use buttons to control O<sub>2</sub> levels.

### Front Panel



1. Bleed Valve Switch: Bleeds gas out of supply line
2. Control Indicator Light: On when gas is infused
3. Digital Display: Continuously displays current gas level, control status, and alarm status in all chambers
4. Alarm Indicator Light: Flashes during alarm
5. Gas Switch: Manual gas shut off
6. Alarm Switch: Manual alarm shut off
7. Control keys
8. Bleed Barb: 1/8" hose barb where gas bleeds out from bleed valve

### Back Panel



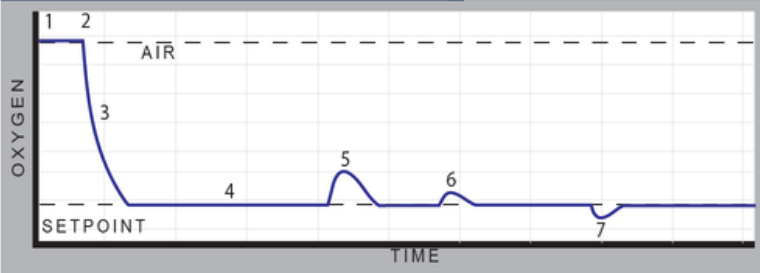
1. Power Connection (12VDC)
2. Sensor Input Jack: Locking sensor cable connects here by finger-tightened locking nut
3. Gas Supply Inlet: 1/4" OD connection for control gas supply line. Pressure rated to 25 PSIG
4. Control Gas Outlet: 1/4" OD connection for infusion tubing to host chamber



# ProOx P110

## Control Scenarios

### Hypoxia Control Scenario

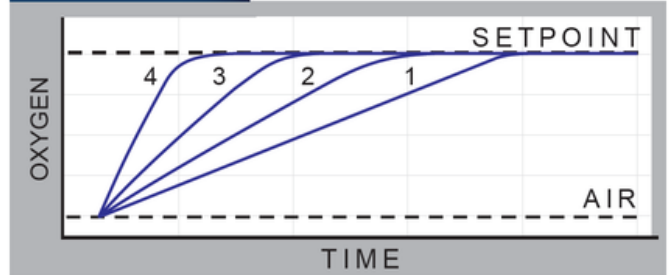


1. Chamber  $O_2$  is ambient air (21%  $O_2$ ).
2. Environmental control starts. Infusion of nitrogen starts to displace oxygen.
3.  $O_2$  is taken to setpoint.
4. Steady-state control at setpoint is established. Gas consumption is a function of chamber leakage.
5. Door of chamber is suddenly opened and closed, disrupting steady-state. Disturbance is detected and chamber  $O_2$  is promptly returned to setpoint.
6. Door is unlatched, increasing gas leakage. ProOx P110 re-establishes steady set point.
7. Door is latched, reducing leakage. Steady-state is established at setpoint.

To check calibration, remove the sensor from the chamber and read against room air (~21%  $O_2$ ). Then, verify against the control gas (0% nitrogen or 100% oxygen) using the front-panel bleed valve if needed. No third-party oxygen analyzers are required.

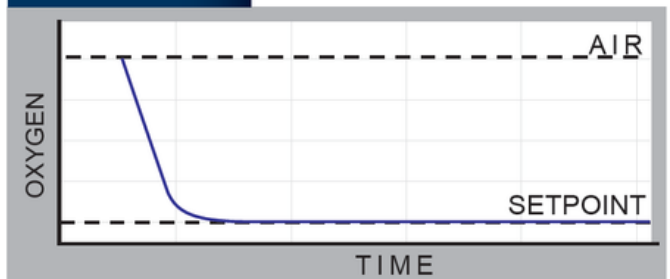


### Power



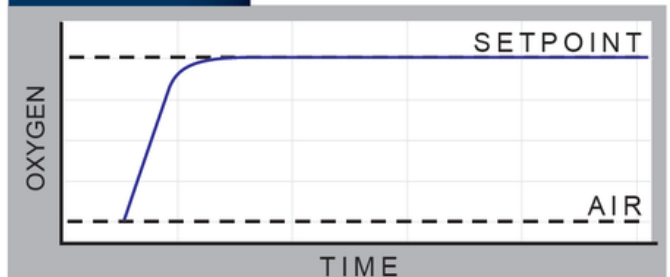
Power is a function of the infusion rate of control gas: the higher the infusion rate, the faster to setpoint. Above: infusion rate  $4 > 3 > 2 > 1$ . Infusion rate is a function of control gas supply pressure. The higher the pressure, the higher the infusion rate. Maximum 25 PSIG provides up to 28 SCFH.

### 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 P110

## Electrical Requirements

**Electrical Power:** 12 VDC at 2.5A

## Physical Specifications

**Weight:** 3.9 lbs (controller only)

**Dimensions:** 4 3/8"H x 8 7/8"W x 9"D (controller only)

## O<sub>2</sub> Control Performance

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

**Accuracy:** ±1% (at constant temperature and pressure), and ±2% full scale over operating temperature range

**Resolution:** 0.1%

## Alarms & Safety

**Alarm Output:** Audible (40 dB), visible flashing indicator

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

## Sensor Specifications

**Sensor Cable Length:** 10'

**Sensor Cable Diameter:** 4mm

## Gas Delivery & Tubing

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

**Infusion Tubing Hose Fitting:** 1/4" OD one-touch fitting

**Infusion Tubing Diameter:** 1/4" OD x 1/8" ID

**Infusion Tubing Length:** 2x10' (custom lengths available)

## Gas Supply & Compatibility

**Gas Source:** compressed gas tanks, liquid dewar

**Gas Supply:** pressurized O<sub>2</sub> or N<sub>2</sub>

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

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

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

## Operation Parameters

**Host Chamber Temperature:** 5-40°C

**Host Chamber CO<sub>2</sub>:** 0-100% (depending on sensor)

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

