BioSpherix

part of the Breeze Group

ProOx P360

High-Infusion-Rate O_2 Controller

Compatible with:

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

Applications:

- Hypoxia
- Hyperoxia
- Hypertension
- Retinopathy
- Vascularization
- Pulmonology
- Neonatology
- **Many more!**

Compact O_2 Tool

The ProOx P360 is a comprehensive oxygen controller offering a control range of 0.1–99.9% O_2 for nearly all physiologic applications.

Versatile Application

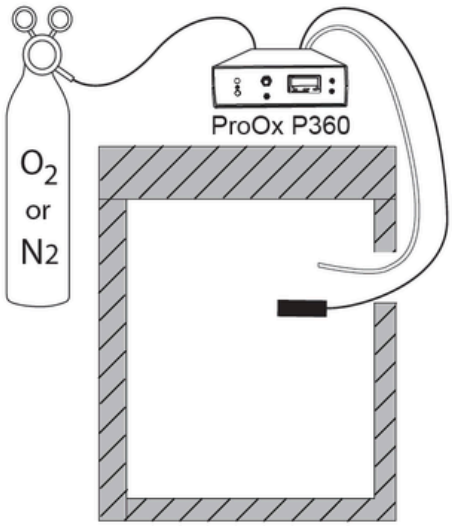
The ProOx 360 is designed to fit and control O_2 within any semi-sealable enclosure, offering flexible integration across a wide range of systems. A high infusion rate makes it ideal for larger chambers.

Efficient Operation

The ProOx 360 remotely senses O_2 levels inside the host chamber. It precisely infuses O_2 gas 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.

ProOx P360

The ProOx 360 is able to control oxygen levels within any semi-sealable chamber, as exemplified in the diagram below. Installation may vary based on chamber type and size.

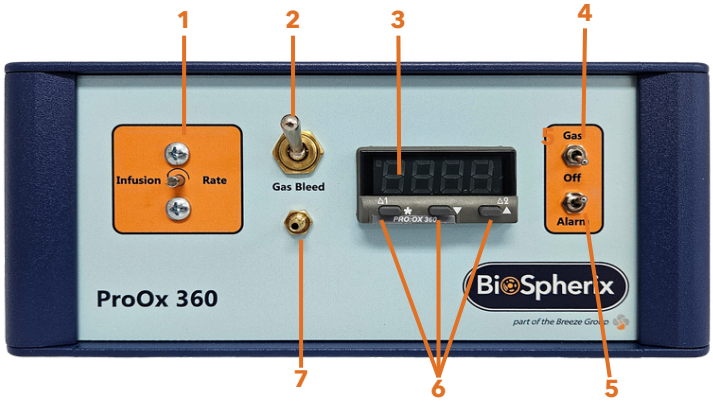


Direct insertion of sensor/tubing shown on standard incubator

Installation

1. Set ProOx 360 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 change or monitor gas levels.

Front Panel



1. Bleed Valve: Bleeds gas out of gas supply line. Used for calibrating sensor and depressurizing gas supply
2. Control Indicator Light: Flashes when gas is infused
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. Control keys
7. Bleed Barb: 1/8” hose barb where gas bleeds out from bleed valve

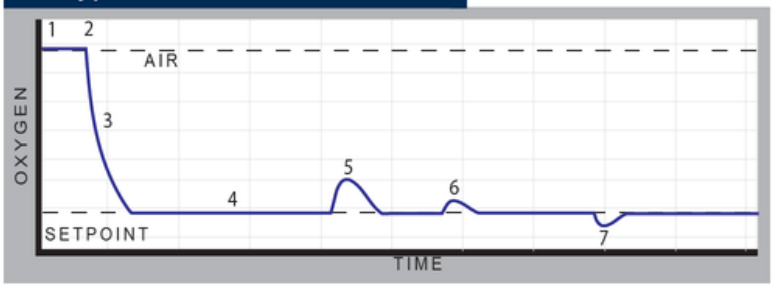
Back Panel

1. Power Connection (12VDC)
2. Sensor Input Jack: Locking sensor cable connects here. Finger tightened locking nut on cable plug secures it
3. Supply Gas Connection: 3/8" OD connection to gas source. Handles pressure up to 25 PSIG
4. Control Gas Outlet: 3/8” OD connection to infusion tubing into host chamber

ProOx P360

Control Scenarios

Hypoxia Control Scenario

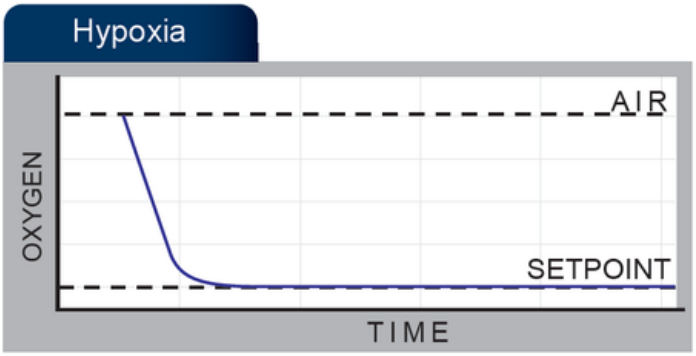


1. Chamber O_2 is ambient air (21% O_2).
2. Environmental control starts. Infusion of nitrogen starts to displace oxygen.
3. O_2 is taken to setpoint.
4. Steady-state control at setpoint is established. Gas consumption is a function of chamber leakage.
5. Door of chamber is suddenly opened and closed, disrupting steady-state. Disturbance is detected and chamber O_2 is promptly returned to setpoint.
6. Door is unlatched, increasing gas leakage. ProOx P360 re-establishes steady set point.
7. Door is latched, reducing leakage. Steady-state is established at setpoint.

Power

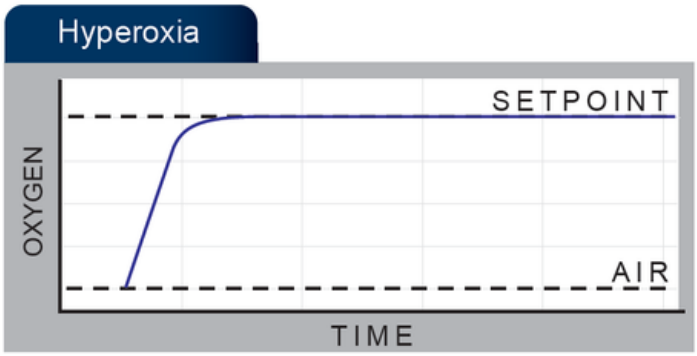
Power is a function of the infusion rate of control gas: the higher the infusion rate, the faster to setpoint. Above: infusion rate 4>3>2>1. Infusion rate is a function of control gas supply pressure. The higher the pressure, the higher the infusion rate. Maximum 40 PSIG provides up to 140 SCFH.

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 P360

Electrical Requirements

Electrical Power: 12 VDC at 2.5A

Physical Specifications

Weight: 4.1lbs (controller only)

Dimensions: 4 ⅜"H x 8 ⅞"W x 9"D (controller only)

O_2 Control Performance

Control Range: 0.1-99.9% O_2

Accuracy: ±1% (at constant temperature and pressure), ±2% (over entire temperature range)

Resolution: 0.1%

Alarms & Safety

Alarm Output: Audible (40 dB), visible flashing indicators

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

Operation Parameters

Host Chamber Temperature: 5-40°C (depending on sensor)

Host Chamber CO_2: 0.1-20% (depending on sensor)

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

Gas Delivery Performance

Gas Infusion Rate: 1-140 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 O_2 or N_2

Gas Supply Line: 3/8" OD hose pressure rated to 40 PSIG, 95A durometer

Gas Supply Line Pressure: 1-40 PSIG

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

Sensor Specifications

Sensor Cable Length: 10'

Sensor Cable Diameter: 4mm

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

www.BioSpherix.com Sales@BioSpherix.com Youtube.com/@Cytocentric