BioSpherix

part of the Breeze Group

# ProCO$_2$ P120

## Compact CO$_2$ Controller


**Compatible with:**

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

**Applications:**

- Hypercapnia
- Acidosis
- Hypoxia
- Retinopathy
- Ischemia
- Environmental studies
- Gene regulation
- Endocrinology
- **Many more!**

### Versatile CO$_2$ Tool

The ProCO$_2$ P120 is a versatile, compact carbon dioxide controller designed for CO$_2$-sensitive applications. It offers a control range of 0.1–20.0% CO$_2$, covering most physiologic concentrations.

### Flexible Functionality

The ProCO$_2$ P120 is designed to fit and control CO$_2$ within any semi-sealable enclosure, offering flexible integration across a wide range of systems and applications.

### Efficient Operation

The ProCO$_2$ P120 remotely senses CO$_2$ levels inside the host chamber. Efficient, closed-loop control ensures accuracy without waste. Continuous feedback from the CO$_2$ sensor allows the ProCO$_2$ P120 to regulate gas infusion precisely to the setpoint, so gas is used only when necessary.

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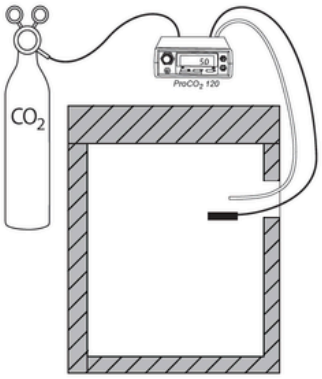
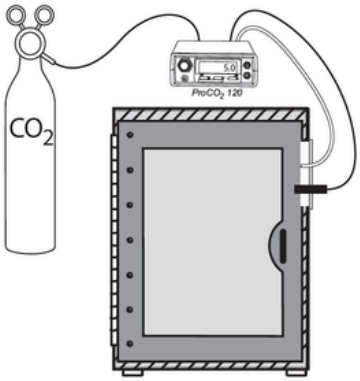
# ProCO$_2$ P120

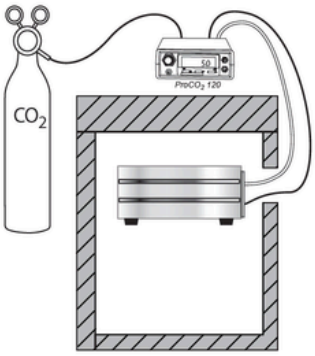
ProCO2 P120 can control any semi-sealable chamber by one of the methods shown below. Installation may vary based on chamber.




Direct insertion of sensor/tubing shown on standard incubator




Enclosure via adapter plate shown on BioSpherix A-Chamber

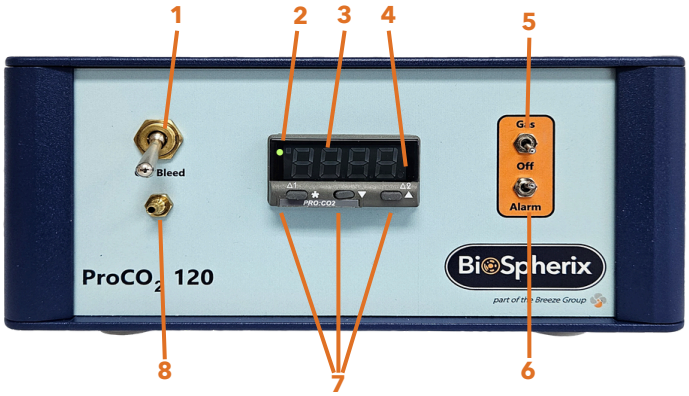



Subchamber via adapter plate shown on BioSpherix C-Chamber

## Installation

1. Set ProCO$_2$ P120 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.
5. Change or monitor $CO_2$ levels via buttons underneath the display.

## Front Panel



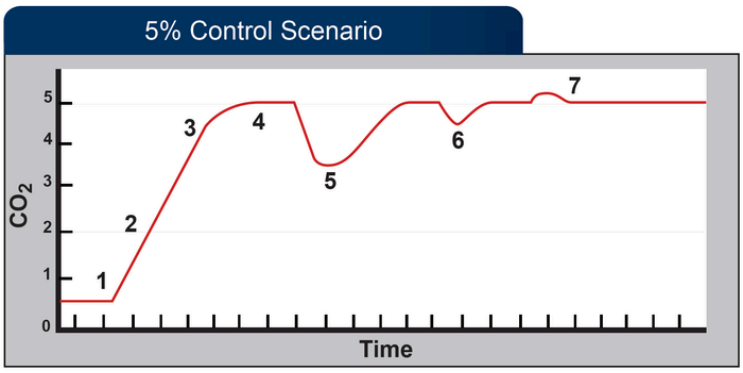

1. Bleed Valve: Bleeds gas out of gas supply line
2. Control Indicator Light: On when gas is infused
3. Digital Display: Continuously displays current gas level, control status, and alarm status in all chambers
4. Alarm Indicator Light: Flashes during alarm
5. Gas Switch: Manual gas shut off
6. Alarm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

## Back Panel


1. Power Connection (12VDC)
2. Sensor Input Jack: Locking sensor cable connects here by finger tightened locking nut
3. Supply Gas Connector: 1/4" OD hose from gas sources. Pressure rated to 25 PSIG
4. Control Push Connector: 1/4" OD hose connects infusion tubing to host chamber

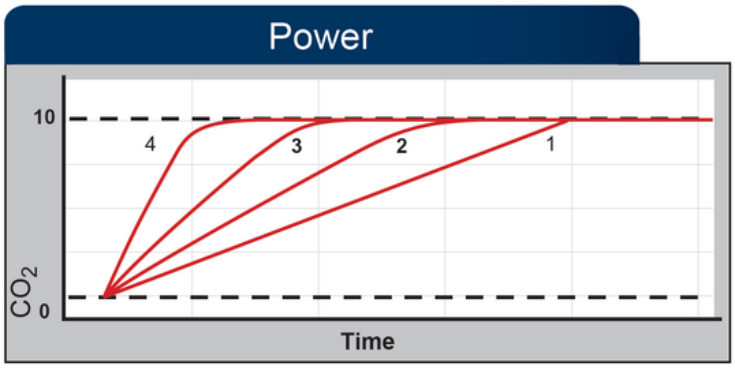
# ProCO$_2$ P120

## Control Scenarios

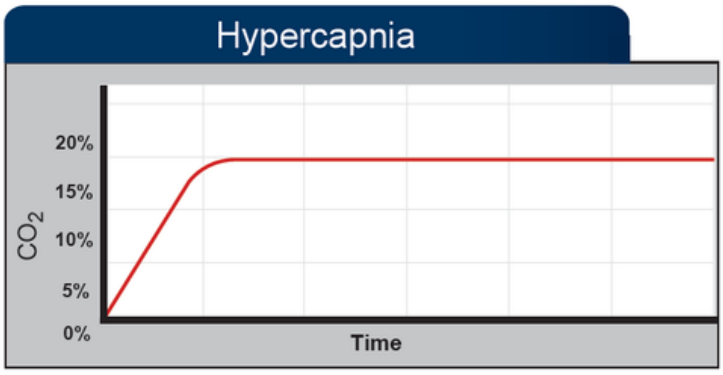



1. Chamber $CO_2$ is the same as ambient air
2. Environmental control starts. ProCO$_2$ P120 infuses $CO_2$ to raise chamber levels.
3. $CO_2$ is taken to setpoint.
4. Steady-state control at setpoint is established. Infusion of control gas matches chamber leakage to hold $CO_2$ level constant. Gas consumption is a function of chamber leakage.
5. Door of chamber is opened and closed, disrupting steady-state. Disturbance is detected and chamber $CO_2$ is promptly returned to setpoint.
6. Door is unlatched, increasing gas leakage. ProCO$_2$ P120 re-establishes steady set point. Consumption increases in proportion to leakage.
7. Door is re-latched, reducing leakage. The ProCO$_2$ P120 re-establishes steady-state at setpoint. Gas consumption goes back down to normal levels, while $CO_2$ stays level.

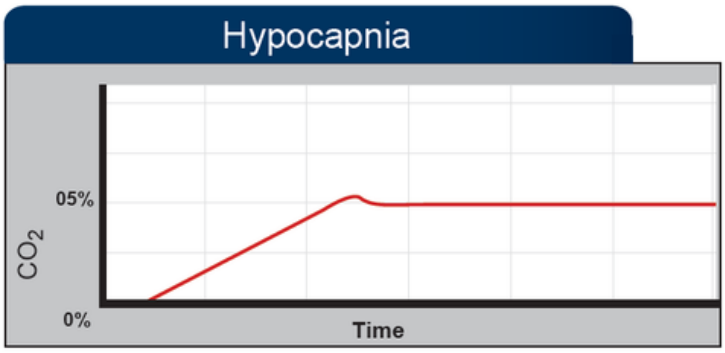
Visit our YouTube channel for calibration and installation how-to's




Power is a function of 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 28 SCFH.




Hypercapnia can be simulated by infusing $CO_2$ to the desired setpoint.




5% $CO_2$ is a typical concentration in hypocapnic cell culture environments.

# ProCO$_2$ P120

## Electrical Requirements

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

## Physical Specifications

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

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

## $CO_2$ Control Performance

**Control Range:** 0.1-20% $CO_2$

**Accuracy:** ±0.3% (at 0%) to ±0.7% (at 20%) (25°C, 1013hPa)

**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

## Sensor Specifications

**Sensor Cable Length:** 6'8"

**Sensor Cable Diameter:** 6mm

## 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 $CO_2$ or $N_2$

**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 $CO_2$:** 0.1-20% (depending on sensor)

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