

# GAS Control

## User's Guide



### Gas Controller for miniature incubators

- Gas Control throughout the experiment
- Media pH control
- Compatible with any perfusion system
- Miniature incubators for any microscope
- Compatible with Imaging systems

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# Specifications

**Range** 750 SCCM max output flow, other ranges available upon request

**Input**  
150PSI max

**Size (Controller) :** 8Wx4Hx9D in.

**Power Supply**  
94 to 234 V AC, 50/60 Hz 35W

**Input Port**  
4mm O.D. tubing (10-32 threaded)  
includes adapter for 1/4in. O.D. tubing

**Output Port**  
1/8in O.D. tubing (10-32 threaded)

# Introduction

The complete system comes with a controller, tubing to connect to miniature incubators, and fitting to connect to a source of a gas mixture (CO<sub>2</sub>/O<sub>2</sub> cylinder or a wall outlet). A source of pressurized gas is required to operate the system. The gas source needs to be regulated, since the maximum pressure of input should not exceed 150 PSI. The controller ships adjusted for input pressure 40 PSI. During operation, the controller is continuously supplying gas flow inside the incubator.

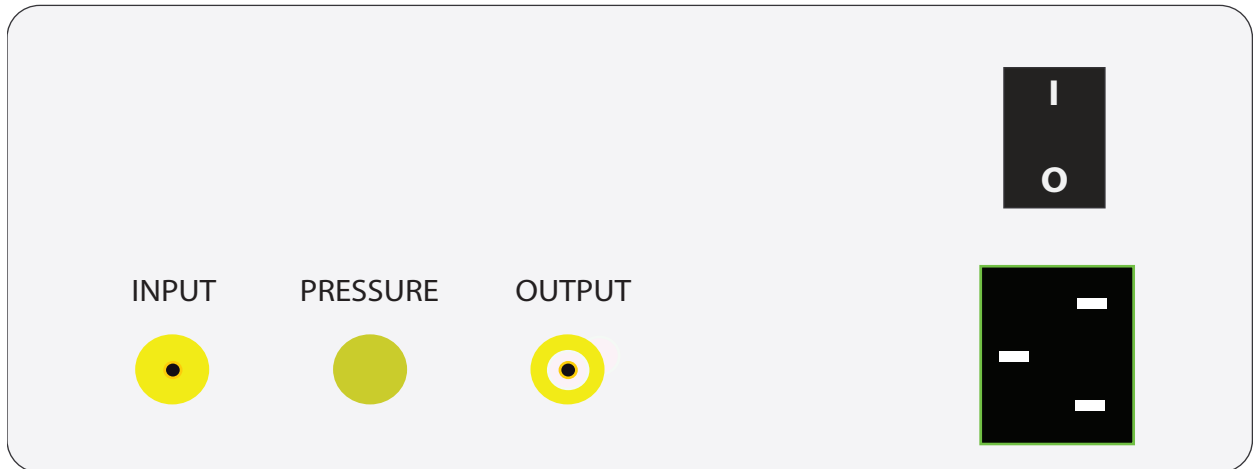
# Installation Guide

**1** Using provided fitting and clamps, connect the gas source (cylinder or wall outlet) to the controller. Some tubing and additional fitting might be required to connect to your source as designs vary. Usually some luer-lock fitting or other easy-connect adapters are used to splice different diameter tubing connecting your source to 4mm O.D. translucent tubing, which fits inside INPUT port on the back of the controller. After splicing provided 4mm tubing to the gas source, simply push the tubing inside INPUT port all way, and slightly pull back to clamp. In order to disconnect the source, push YELLOW rim inside the connector, and pull the tubing out. Make sure the regulator on the source does not show more than 150 PSI of output pressure. Pressures around 40 PSI should be sufficient to operate the system. The controller ships tuned to work with 40 PSI input pressure

Similarly, insert a piece of 1/8in. O.D. BLACK tubing inside OUTPUT port on the back of the controller, and connect the other end of tubing to the incubator, or heated humidifier CO2-500ML. If a humidifier is used, connect the output of humidifier to the incubator. Make sure the provided check-valve is connected between the water bath or the incubator lid and the controller. Otherwise, you might have back flow of liquid inside the controller, which can result to the controller damage.

Connect power cable. Plug the power cable into wall outlet.





**2** Turn the controller ON. The display will show INPUT CLOSED. Rotate the front knob clock-wise to open INPUT port. Although the controller ships adjusted for use with your incubator, it can be re-adjusted using the procedure below.

1. By pressing the front button, go to menus to adjust SET flow rate (0-750) and AC gain (usually 1%).
2. Open the source of gas. Note: the input pressure should not exceed 150 PSI (usually 40 PSI is enough). Rotate the front button to open the input port - the display will show:

“initializing”

2. Press the front button until the display will show input pressure:

Pin PSI    1.0

Rotate the pressure regulator on the back clock-wise to adjust this reading to around 1 PSI (higher pressure might be required for higher flow rates).

3. The controller automatically adjusts DC gain. If no output gas flow (bubbles) is observed, the input pressure on the back of the controller can be increases (clock-wise rotation). Note: for low flow rates, very low pressure is needed, but pressure can be increased for higher flow rates.

**3** The flow rate can be increased if you have indications that the larger enclosures do not get enough CO<sub>2</sub> to fill all the volume. **IMPORTANT:** small incubators require only very little flow of CO<sub>2</sub> gas.

## USING THE FRONT DISPLAY CONTROLS

Rotate the knob clock-wise to open the INPUT port, and rotate other direction to close - the display will show

INPUT CLOSED

Press the knob to get to flow rate settings and rotate to adjust:

SET FLOW SCCM            200

Press again to go to DC level setting and rotate to adjust. Note: this setting is adjusted automatically upon opening the gas INPUT, but can be manually adjusted to stabilize flow rate at SET level faster:

DC%                        35

Press again to go to AC level settings and rotate to adjust:

AC%                        1

Press again to see the input pressure inside the controller:

input PSI                 1.0

the display will switch to the normal state after 5sec, or after pressing the knob again.

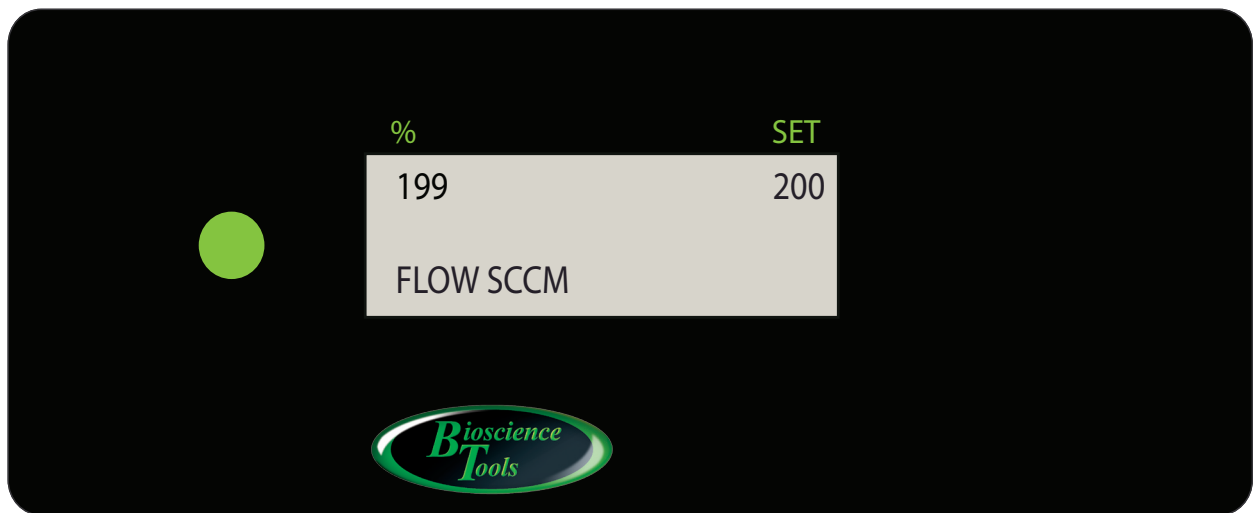
## ERROR MESSAGES:

INPUT LOW - gas source might not be connected or input pressure is LOW (increase using the regulator on the back of the controller).

INPUT HIGH - input pressure is too high, decrease using regulator on the back of the controller.

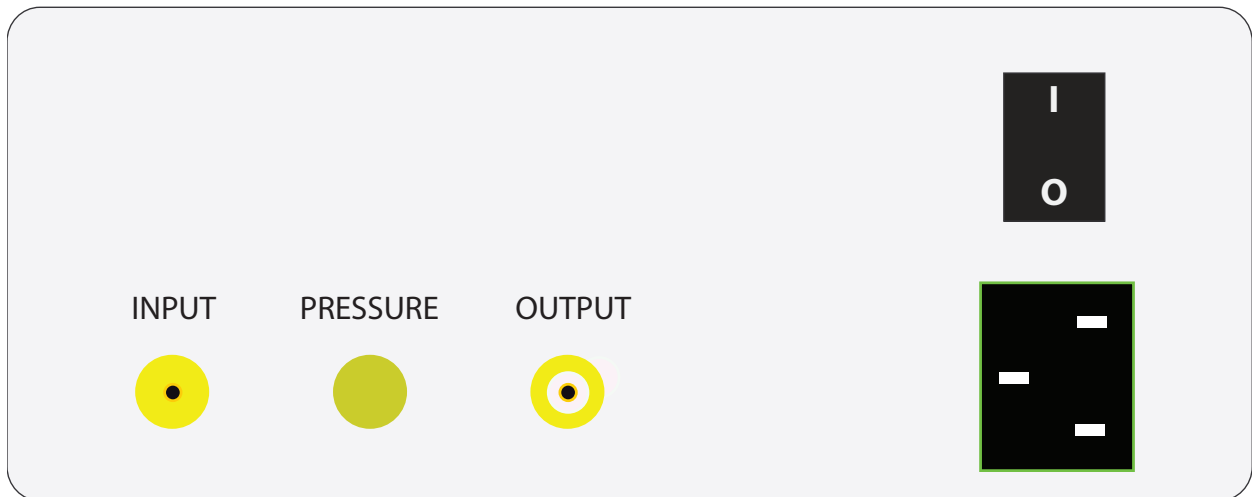
FLOW LOW - flow rate cannot reach SET level. Increase input pressure on the back of the controller.

## Front Panel Controls



<b>Front Panel Controls</b>	
Knob	Sets gas FLOW rate, DC level and AC level.

## Inputs, Outputs and Back Panel controls



Inputs & Outputs	
INPUT port	Connects to a source of gas. Maximum input pressure is 150 PSI.
OUTPUT port	Connects to the incubator to supply gas mixture.
PRESSURE regulator	Adjust input pressure inside the controller.

Back Panel Controls	
Input Pressure regulator	Turn CLOCK-wise to increase inside pressure and turn ANTI-clockwise to reduce available pressure..



## Using Heated Humidifier CO2-500ML

A heated humidifier can be used to pre-heat and saturate the gas mixture with water, before the mixture enters the incubator. The humidifier consists of a heated base and a reservoir, which needs to be filled with distilled water. Fill the reservoir just enough to observe bubbles of gas coming out of input tubing, which has a female luer connector. The input tubing should be connected to BLACK output tubing coming out from a CO2 controller., with the check-valve placed between After connecting tubing, place the reservoir on the base.

Plug provided DC power adapter into the base and a wall power outlet. Turn the humidifier ON - an LED indicator will be ON. Let the base to warm up to facilitate water evaporation. After gas mixture enters the reservoir, it will be heated and mixed with water vapors.

NOTE: You can use the reservoir as an indicator of gas mixture flow rate. Usually, enough gas flow is provided to the incubator, as long as you can observe slow but continuous stream of bubbles coming up from the inflow tubing.

Using provided tubing, or any other tubing, connect the outflow MALE luer port to the incubator. Turn the CO2 controller ON to provide gas flow inside the incubator.

## Warranty

This product is warranted to be free from defects in material and workmanship for the duration of one year. Normal wear, or damage resulting from abuse, accident, alteration, misuse, service by an unauthorized party or shipping damage, are excluded from this warranty and are not covered. Bioscience Tools will repair or replace the defective product covered by this warranty free of charge if it is returned, postage prepaid, to Bioscience Tools, ph: 1-877-853-9755.

