CO2 O2 Control

User's Guide

CO2 & O2 Controller for miniature incubators

- Precise CO2 & O2 Control throughout the experiment
- Media pH control
- Compatible with any perfusion system
- Miniature incubators for any microscope
- Compatible with Imaging systems

Bioscience Tools

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Specifications

Range 0 to 20% CO2; ships calibrated to provide 5% level of CO2 inside miniature incubators;
0 to 20% O2 (taken from the air)
up to 750 SCCM output flow

Input
300PSI max

Power Supply
94 to 234 V AC, 50/60 Hz 75W

Input Port
4mm O.D. tubing (10-32 threaded)
includes adapters for different size tubing

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

Size (Controller) : 12Wx6Hx8D in.

Introduction

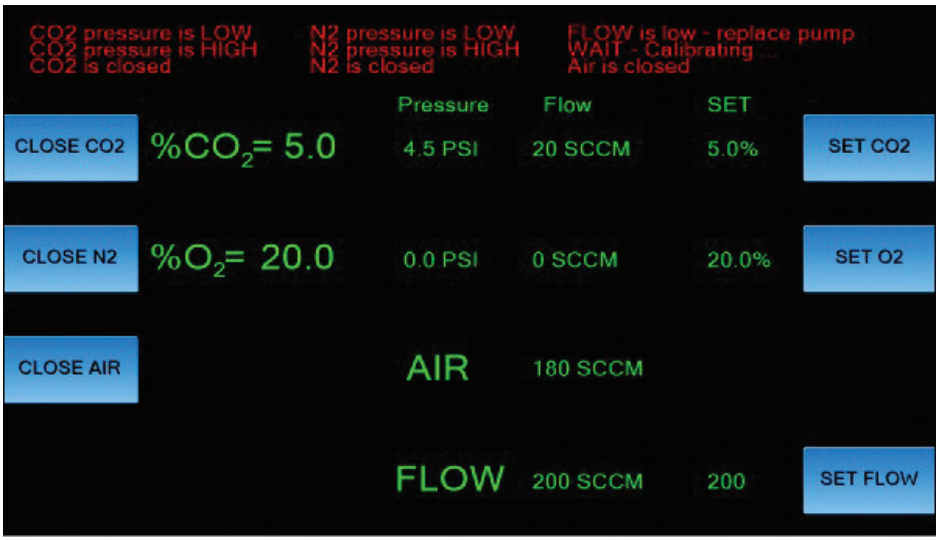
The controller ships with tubing to connect to miniature incubators, and fitting to connect to a source of CO2/N2 (a cylinder, for example, or a wall outlet). A source of CO2/N2 is required to operate the system. The CO2 and N2 sources need to be regulated, since the input pressure should not exceed 300 PSI. The controller ships adjusted for 40 PSI input pressure. During operation, the controller is continuously monitoring CO2 and O2 content of the output gas mixture.

Installation Guide

1 Using provided fitting and clamps, connect CO2 (and N2, if planning to reduce O2 concentration) 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 ports on the back of the controller. After splicing provided 4mm tubing to CO2/N2 source, simply push the tubing inside INPUT ports 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 CO2/N2 source does not show more than 300 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.

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



2 Turn the controller ON. After brief self-calibration procedure, shown as "WAIT - calibrating...", the display will show concentrations of CO2 and O2 in the output mixture and start making the mixture according to factory settings of 5% CO2 and 20% O2.

CO2 % 0.0
O2 % 20.5

To adjust settings touch SET CO2 button, for example, CLEAR the old settings and ENTER the new one (the same for O2 and FLOW settings).

IMPORTANT: If you are not planning to reduce O2 concentration in the output mixture - you should leave O2% setting at 20.0%

3 ERROR MESSAGES:

AIR CLOSED - the air source is closed.

CO2 LOW - CO2 source might not be connected. If connected, rotate CO2 pressure regulator on the back clock-wise slowly until the message disappears.

CO2 HIGH - the input CO2 pressure is too high. Rotate CO2 pressure regulator on the back anti-clock-wise until the message disappears.

CO2 CLOSED - CO2 input is closed.

N2 LOW - N2 source might not be connected. If connected, rotate N2 pressure regulator on the back clock-wise slowly until the message disappears.

N2 HIGH - the input N2 pressure is too high. Rotate N2 pressure regulator on the back anti-clock-wise until the message disappears.

N2 CLOSED - N2 input is closed

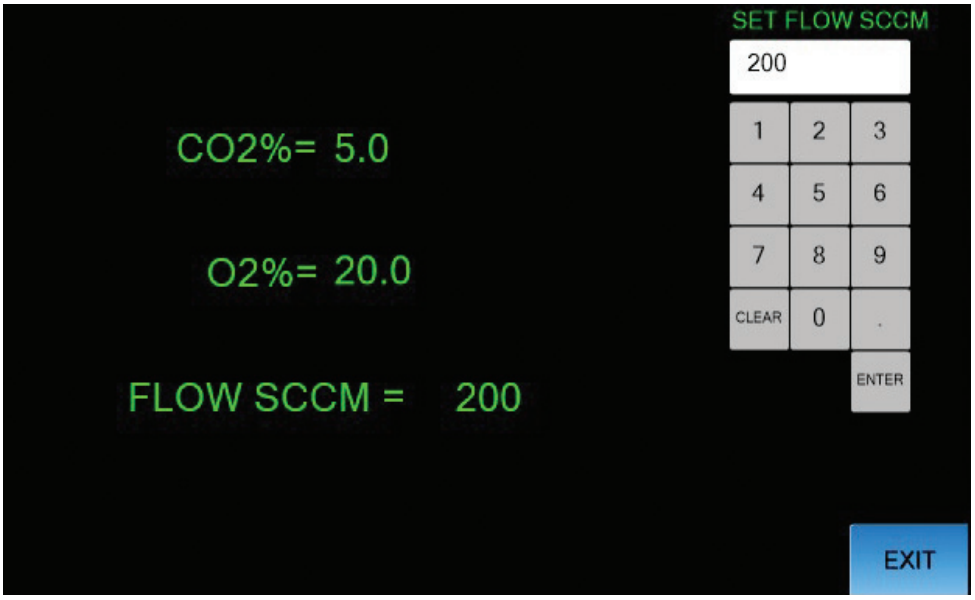
REPLACE THE PUMP - the air pump needs to be replaced.

4 The controller also allows you to see other measured parameters:

1. Air, CO2, N2 and output flow rates in SCCM.

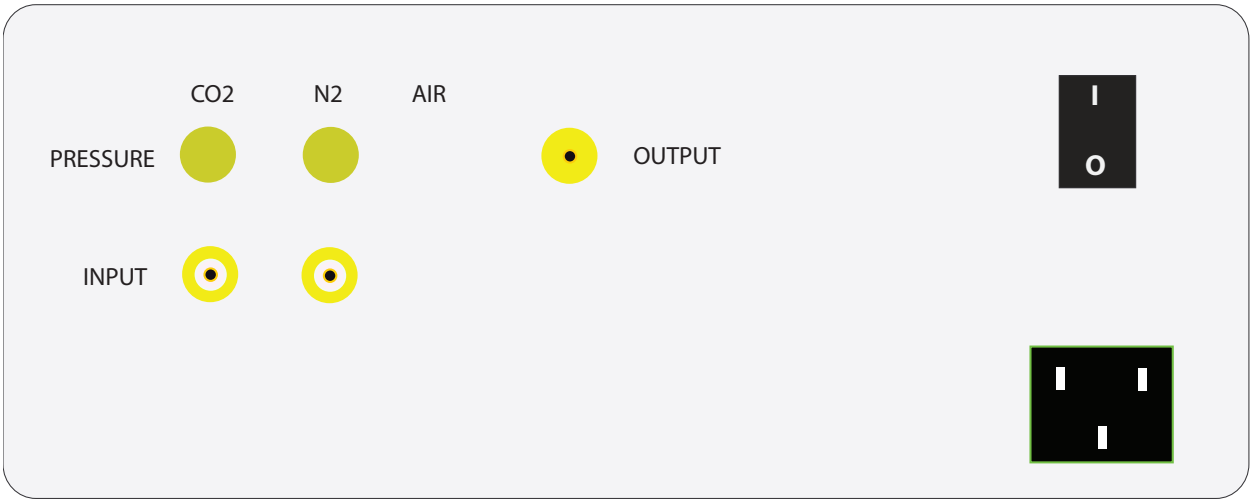
2. The input pressure for CO2 and N2 gases.

Front Panel Controls



To adjust settings touch SET CO2 button, for example, CLEAR the old settings and ENTER the new one (the same for O2 and FLOW)

Inputs, Outputs and Back Panel controls



Inputs & Outputs	
INPUT ports	Connects to a source of CO2/N2. Maximum input pressure is 300 PSI.
OUTPUT port	Connects to the incubator to supply CO2/N2/O2 mixture.
PRESSURE regulators	Adjust input pressure inside the controller.

Back Panel Controls	
Input Pressure regulators	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.