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Pressure Controller Operating Instructions

General Description

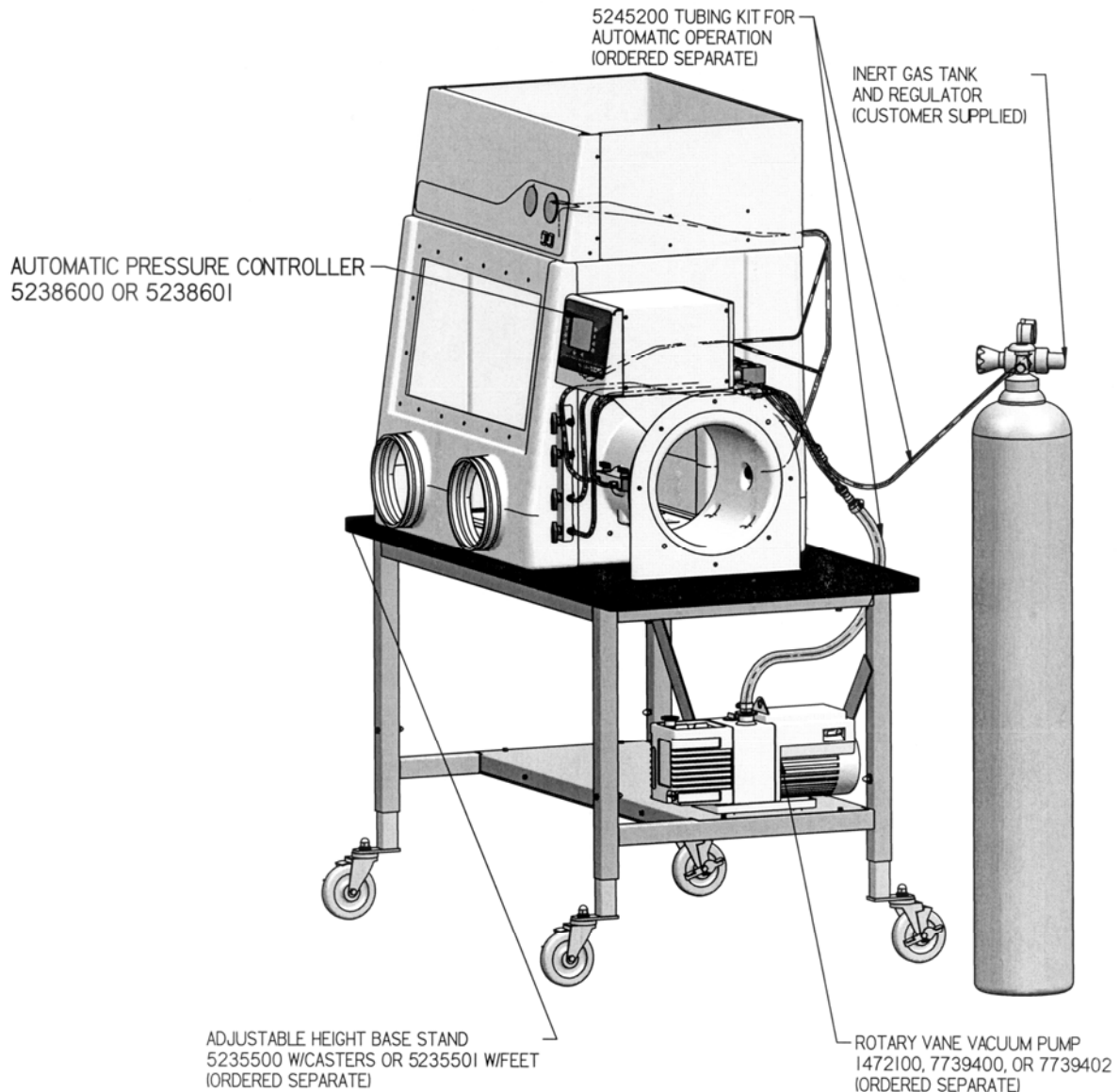
These operating instructions are designed for the operation of the Pressure Controller used with Labconco's Precise Glove Boxes. The Pressure Controller performs three automatic modes on the glove box. First, it cycles the purging/filling process in the main glove box chamber and transfer chamber up to 199 cycles. Second, it regulates vacuum/pressure between -5 and +5 inches of water gauge in the main glove box chamber through the glove box pressure control program mode. Third, it regulates vacuum in the transfer chamber between 0 and -29 inches of mercury during the purging/filling process.

Models covered in these operating instructions:

5238600, Glove Box Pressure Controller, 100/115 volt, 50/60Hz
5238601, Glove Box Pressure Controller, 230 volt, 50/60Hz

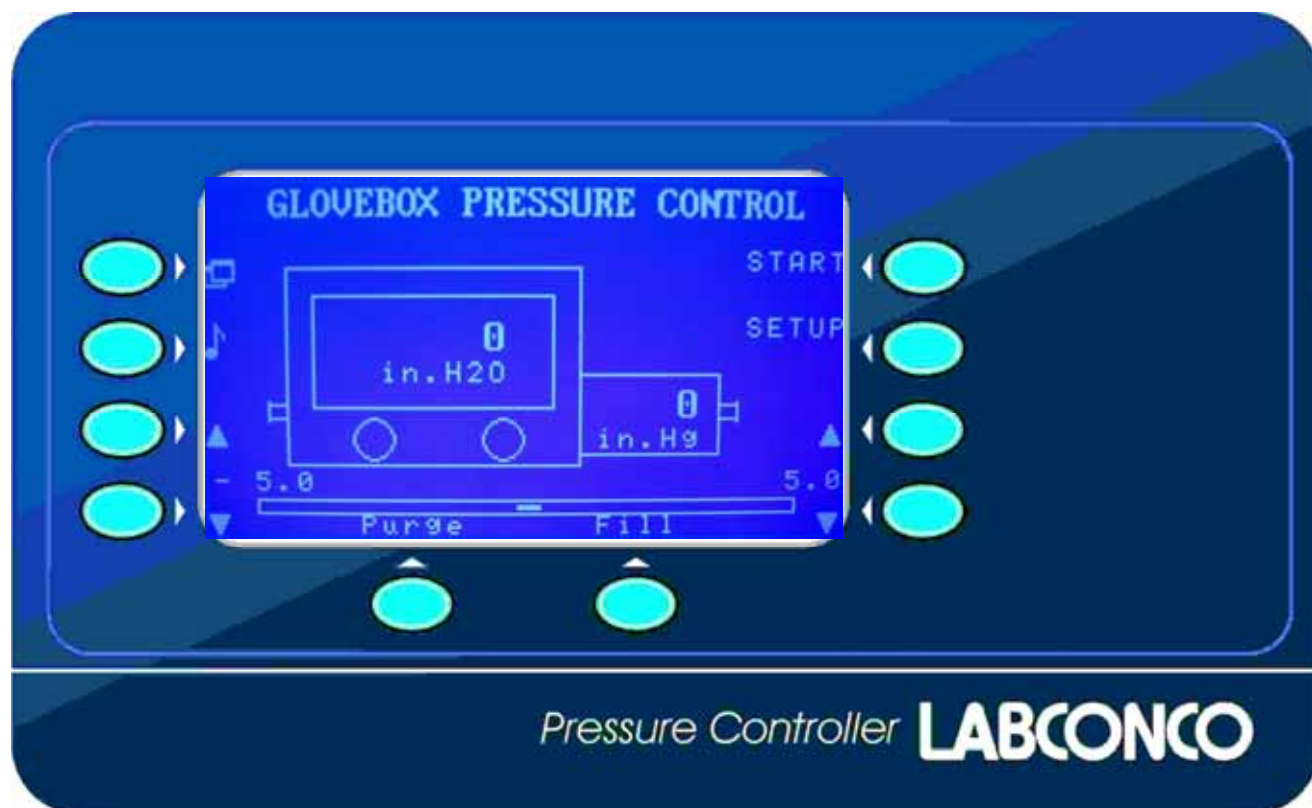
Setup

Connect the Glove Box Controller using the Labconco connections/tubing kit #5245200 (ordered separately). Follow the separate mechanical installation instructions included with the Pressure Controller and also listed on pages 14 through 19 of these operating instructions. When completed, the installed system should look like the diagram below.



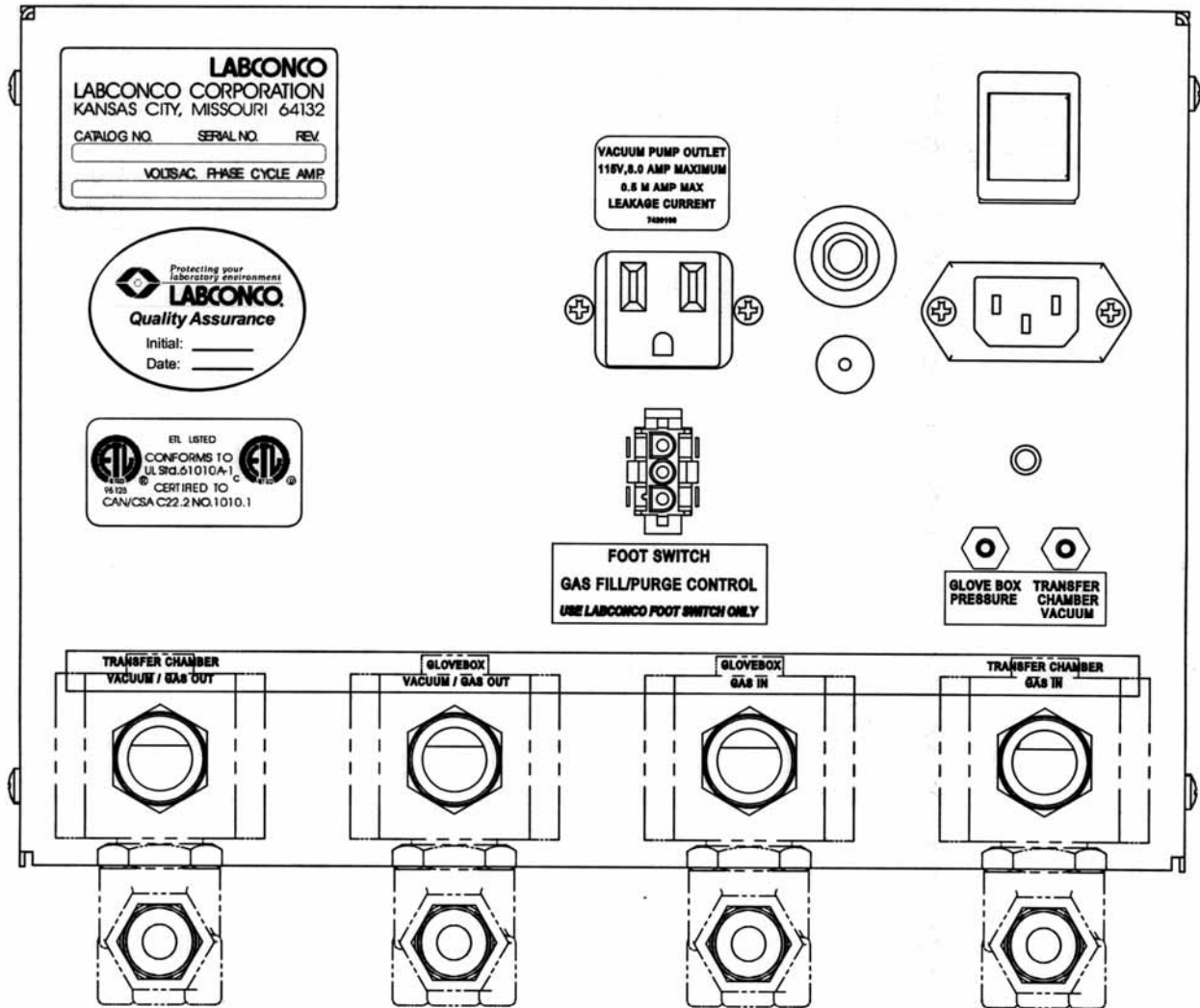
Front Panel Description

The front panel includes a large display screen and touchpad keys that are adjacent to the LCD display. The operation of these keys will be defined by text on the display screen (LCD). Each key may perform a different operation depending on the control mode selected.



Rear Panel Description

The rear panel includes the power inlet and circuit breakers, power on/off switch, the outlet receptacle for plugging in a vacuum pump (the receptacle varies for 115 volt and 230 volt models), and electrical connection for the glove box pressure control footswitch. The 4 electric solenoid valves that provide control of the glove box Main Chamber gas in/gas out, and Transfer Chamber gas in/gas out are also located on the rear panel. See the separate mechanical installation instructions for plumbing connections to these valves. For your convenience, the separate mechanical and plumbing installation instructions are also located at the back of these operating instructions on pages 14 through 19.

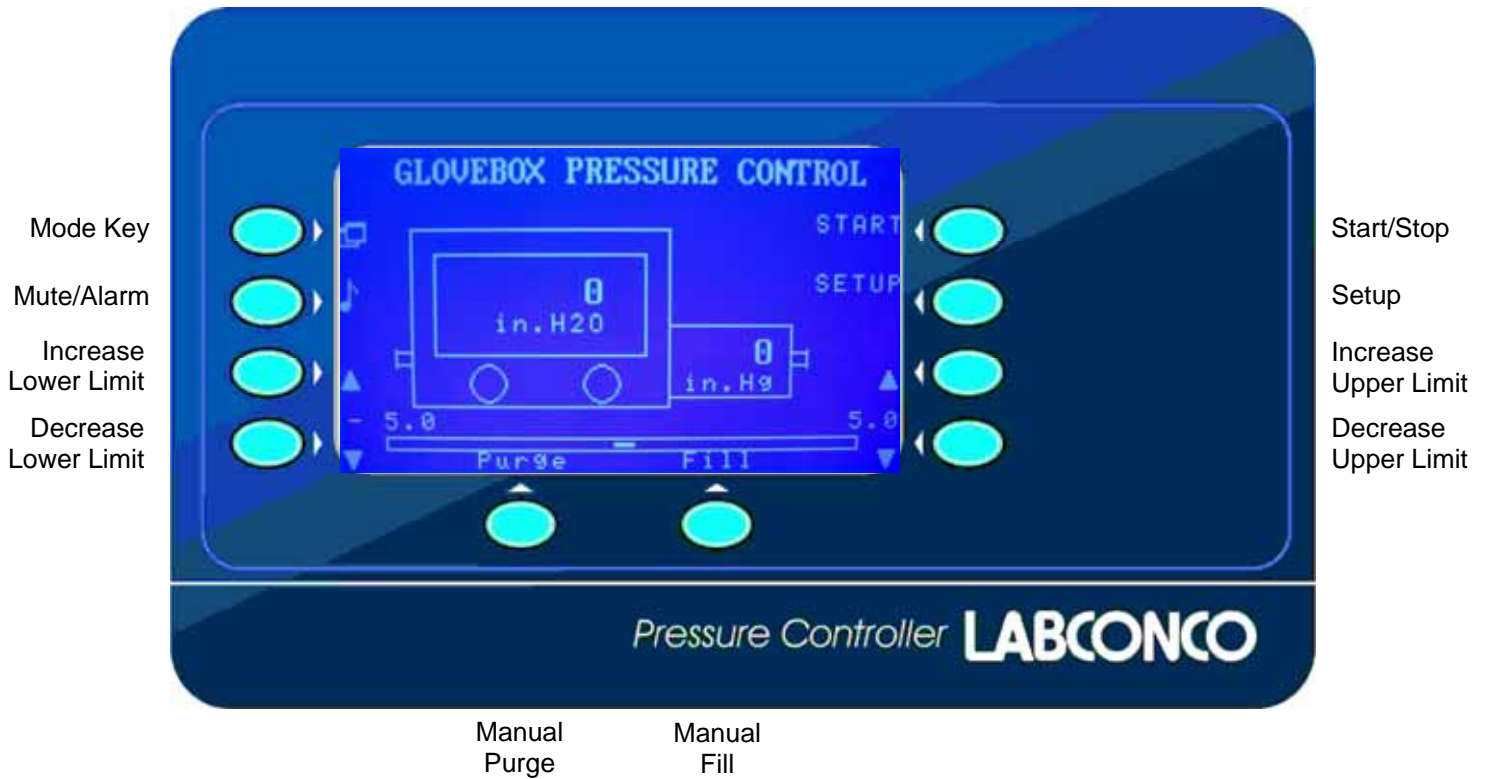


Main Modes of Operation

The Labconco Glove Box Pressure Controller display has four main screens that provide access to the 4 modes of operation listed below. The operation modes are covered in the next sections of this document.

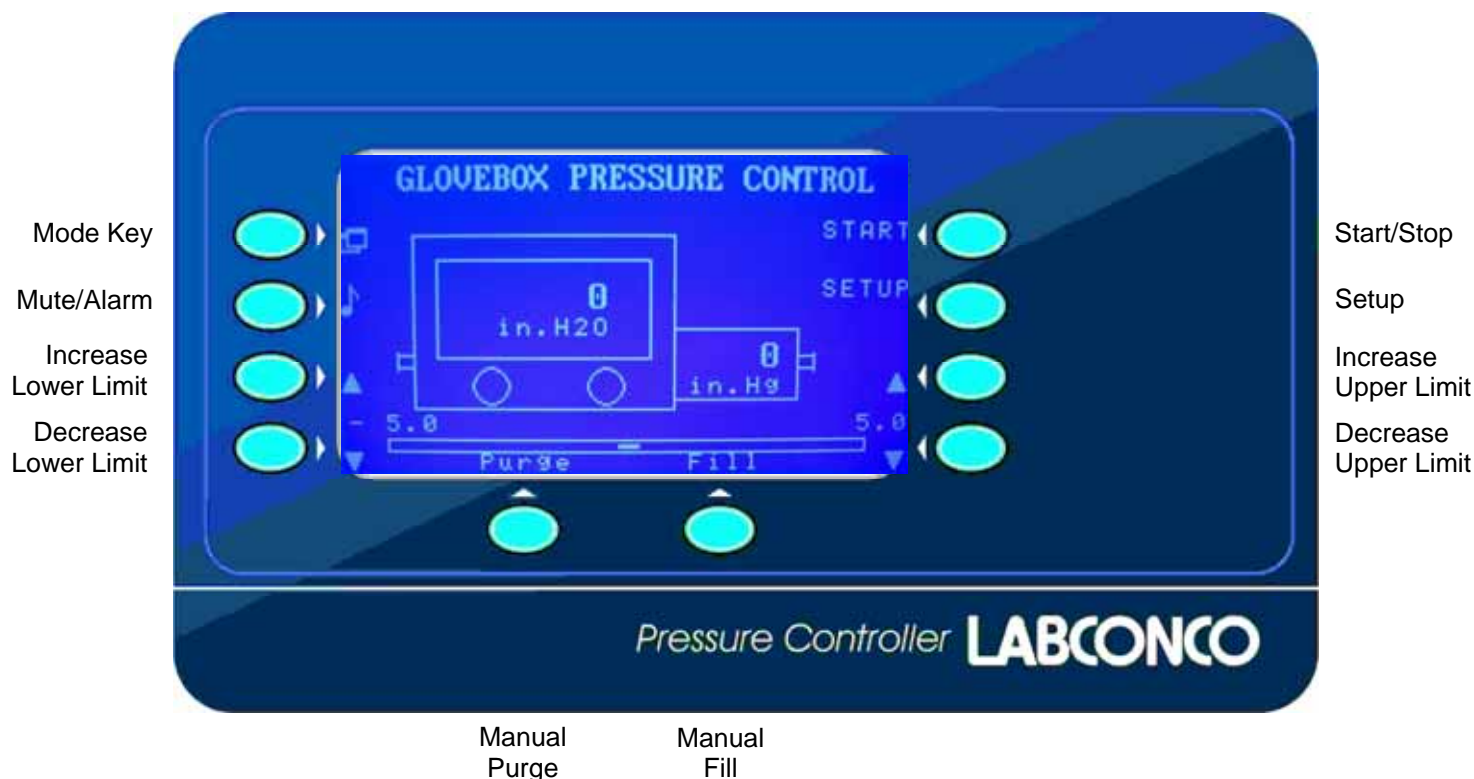
- 1.) Glove Box Pressure Control Mode
- 2.) Glove Box Purge and Fill Mode
- 3.) Transfer Chamber Purge and Fill Mode
- 4.) Setup Mode

Press the Mode key at the upper-left hand corner of the display screen to switch between each of these four operation modes. Please be aware that if one of the glove box modes is running/started, other glove box operation modes cannot be used. For example, if the Glove Box Pressure Control mode has started (using the start key), the menu page for the Glove Box Purge/Fill mode cannot be used – this prevents operational control conflicts from occurring at the same time.



Glove Box Pressure Control – Operation Mode 1

The Pressure Control mode will allow the user to set a high pressure limit up to +5 inches water column and a low pressure limit to -5 inches water column [± 12.6 mBar or ± 1245 Pacals]. Set these high and low pressure limits with the keys adjacent to the “up” and “down” arrows on the display. Once these limits are set, and the START key is pressed, the Pressure Controller will automatically control the gas inlet valve, gas outlet valve, and the power to the outlet receptacle for a vacuum pump. Pressure in the Glove Box Main Chamber will be displayed inside the glove box icon on the display screen.

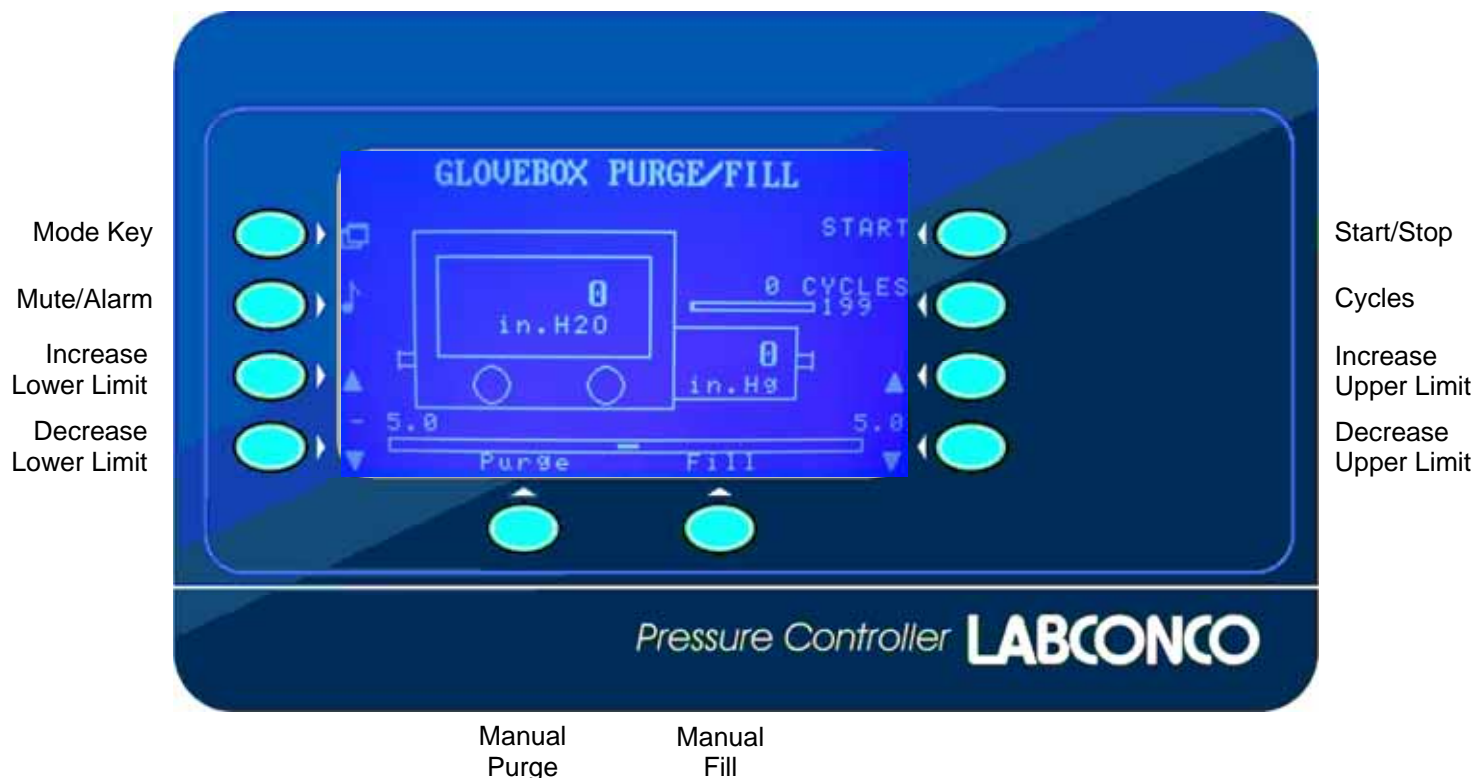


Manual control keys for “PURGE” and “FILL” (located along the bottom of the display) will allow the corresponding valves to be controlled by the user to increase or decrease the pressure inside the glove box. **Note: These manual keys will not operate the valves when the pressure is outside the limits of ± 5 inches of water [± 12.6 mBar].** A three-position footswitch is included with the Automatic Pressure Controller. The footswitch provides manual foot control of the gas inlet and vacuum outlet valves. The pressure inside the glove box will be displayed inside the glove box icon on the display screen.

An audio alarm will actuate if the pressure exceeds the maximum limits of ± 5 inches of water. An “alarm reset” key (identified by the musical icon) is provided to mute this alarm. The alarm will reset automatically when the pressure returns within ± 5 inches [± 12.6 mBar].

Glove Box Purge/Fill – Operation Mode 2

The Glove Box Purge/Fill mode uses the same solenoid valves on the glove box that are used in the Pressure Control Mode. The Pressure Control mode will be temporarily suspended while a “Purge/Fill” command is being executed.

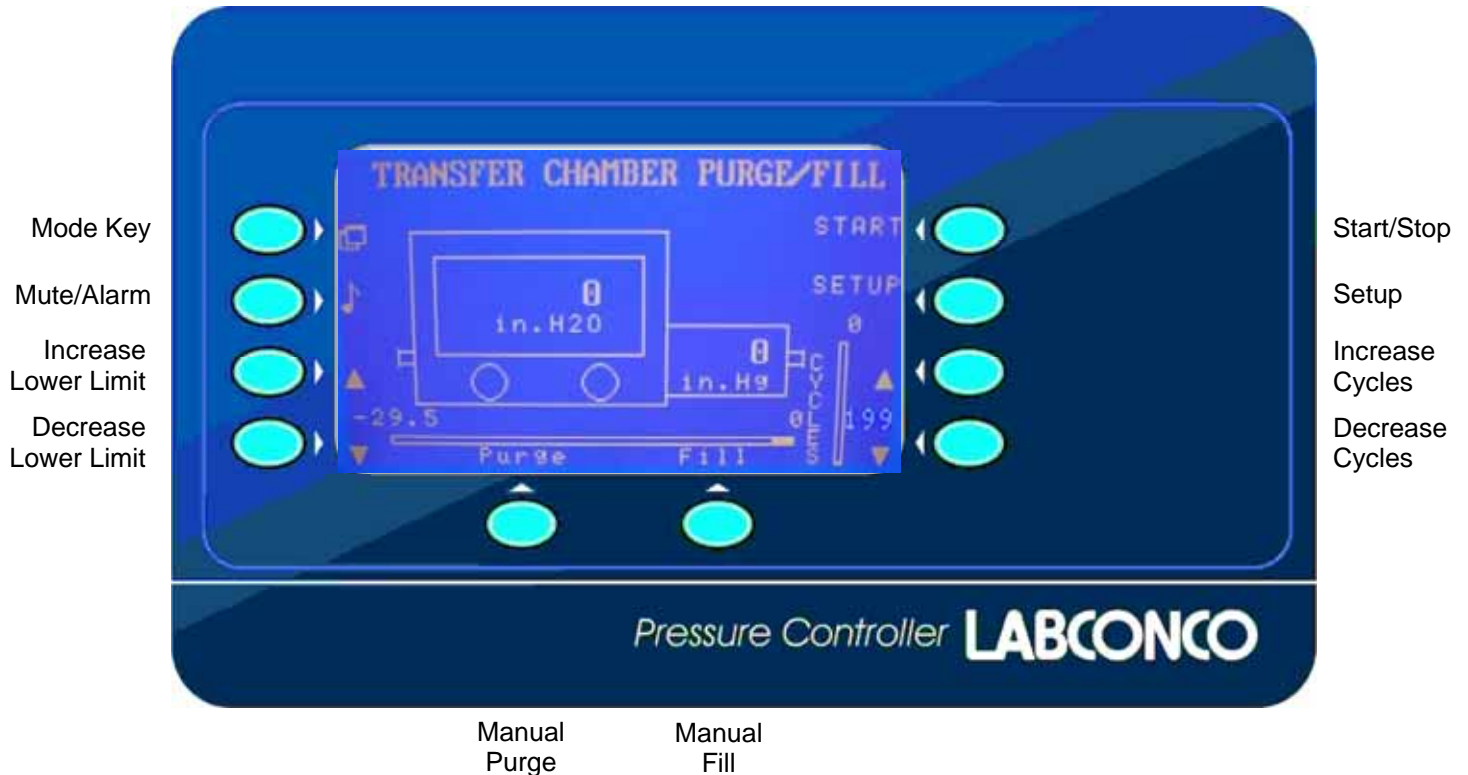


Note that this display screen looks similar to the Pressure Control mode described previously. However, the “SETUP” key has changed to a “Cycles” key. Up to 199 cycles can be set for automatic “Purge/Fill” of the glove box main chamber by holding the “Cycles” key. To decrease the number cycles, press the “Cycles” key to 199 cycles and go around again until a lower cycle quantity appears. Use this display screen to also set the low pressure level for purging and the high pressure level for filling by adjusting the upper and lower limit keys. The Labconco Pressure Controller allows the glove box Main Chamber pressure levels to be set to +/- 5 inches of water column [+/- 12.6 mBar]. Once the pressure limits and number of cycles have been selected, press the key adjacent to “Start,” and the automated purge and fill process will begin and continue for the number of cycles selected. Each cycle number will be displayed during the process. To cancel the automated purge and fill process, press the key adjacent to “Stop” and the process will be stopped.

Note that when the “Glove Box Purge/Fill” mode is in operation, there are no keys available to allow for system setup as the “Cycles” key replaced the “SETUP” key. Use the “Mode” key in the upper left hand corner adjacent to the icon to return to the “Glove Box Pressure Control” screen to use the “Select” mode.

Transfer Chamber Purge and Fill – Operation Mode 3

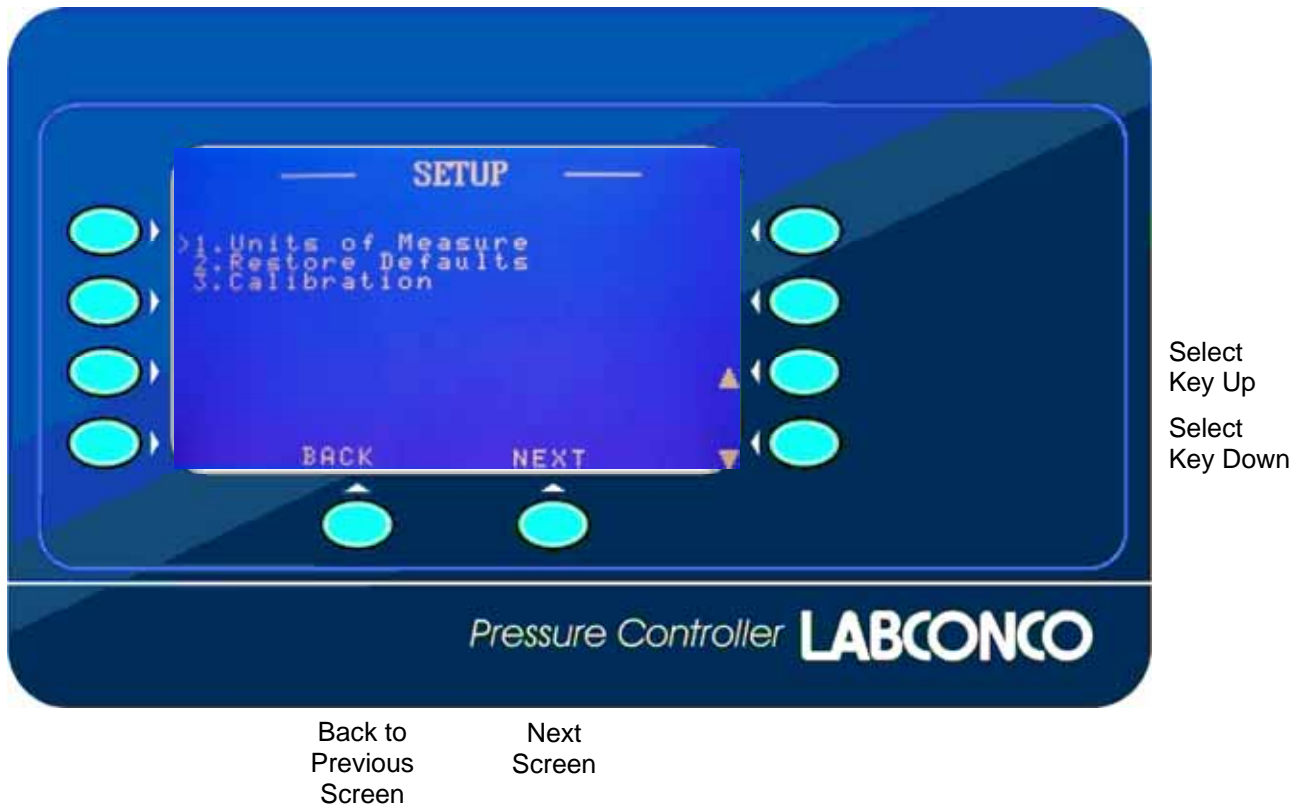
The Transfer Chamber Purge/Fill mode controls the pressure exchange inside the transfer chamber. Pressure in the transfer chamber will be displayed inside the transfer chamber icon on the display screen. This operation mode controls the gas inlet and gas outlet solenoid valves connected to the transfer chamber.



The user may select up to 199 “Purge/Fill” cycles by adjusting the cycles increase and decrease arrow keys. The user can select the level of pressure inside the transfer chamber during each purge between 0 and -29.5 inches of Mercury/Hg [0 -999 mBars] by adjusting the lower limit keys. Once the lower pressure limit and number of cycles have been selected, press the key adjacent to “Start,” and the automated purge and fill process will begin and continue for the number of cycles selected. Each cycle will be displayed during the process. To cancel the automated purge and fill process, press the key adjacent to “Stop” and the process will be stopped.

Setup Menu – Operation Mode 4

Pressing the key opposite the word “Setup,” allows access to the setup operation mode. In the setup mode, the user may select their preferred units of pressure that are displayed, restore settings back to the default state, or calibrate the pressure sensors. The keys adjacent to the up and down arrows on the lower right of the display are used to select one of the three options. After toggling up or down, push the NEXT key to select the option.



Option 1

Units of Measure: If this option is selected, the key adjacent to “Next” is used to select pressure units of inches of water/inches of mercury or mBar.

Helpful conversions are as follows:

- 1 mBar = .39 inches of water column
- 1 mbar = .0292 inches of mercury
- 1 inch of water = 2.52 mBar = .0737 inches of mercury
- 1 inch of mercury = 34.25 mBar

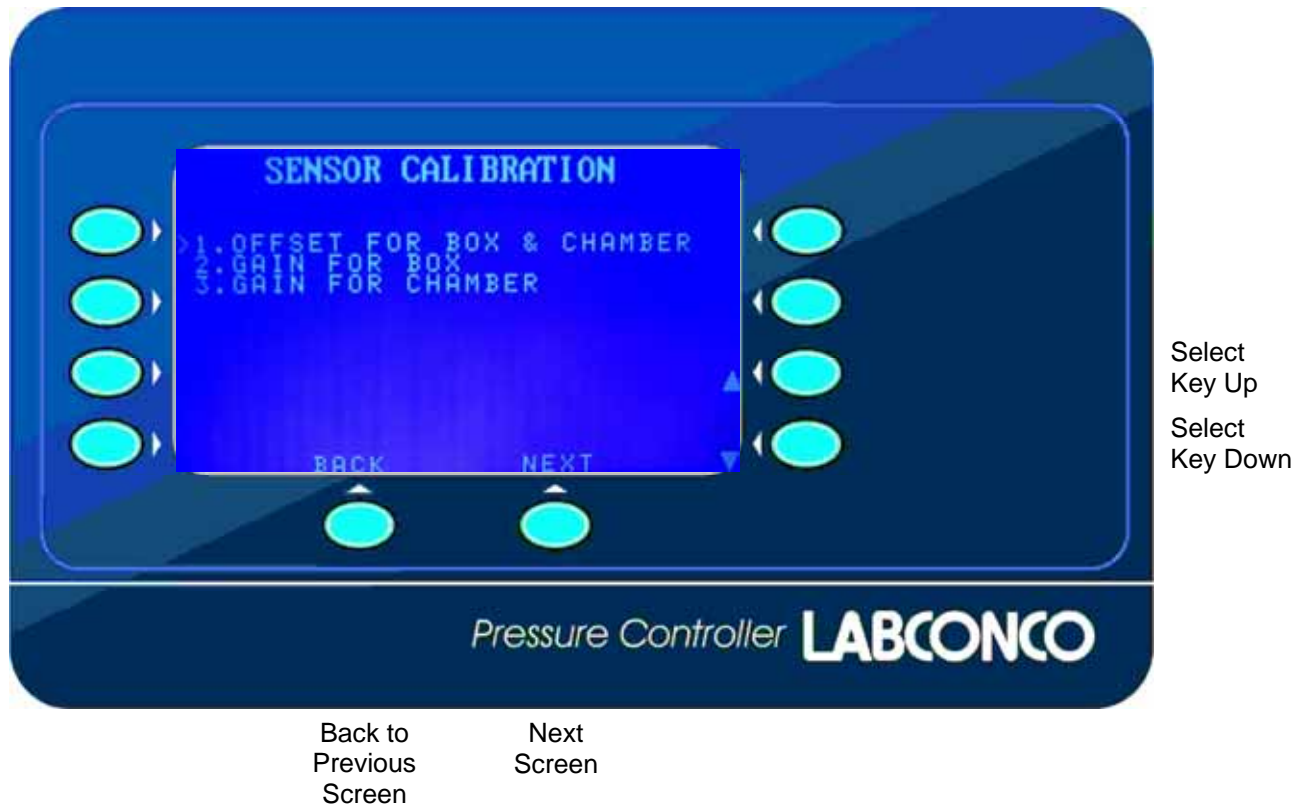
All pressures are measured with respect to atmosphere pressure.

Option 2

Restore Defaults: The restore defaults option restores all control settings to the initial programmed settings which are listed in the back of these operating instructions.

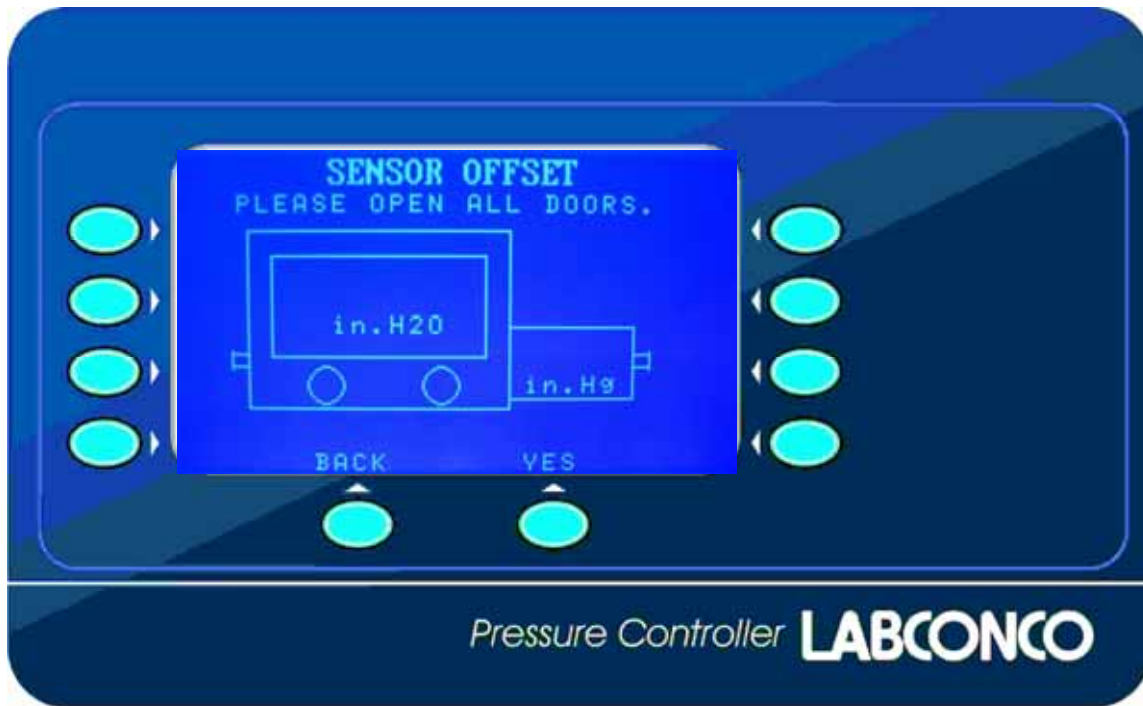
Option 3

Calibration: The pressure sensors inside the controller can be calibrated using atmospheric pressure (single point calibration) or atmospheric pressure and a specific pressure level (two point calibration). Two point calibration provides increased accuracy; however, Labconco recommends that only the single point calibration be used because it does not require a calibrated pressure measurement standard. When “Calibration” is selected, the display screen below appears. The keys adjacent to the up and down arrows on the lower right of the display are used to select one of the options. After toggling up or down, push the NEXT key to select the option.



Note: If option 2 or 3 above is selected, **an accurate**, traceable pressure measuring device **must be** connected to the Labconco pressure sensors. Consult Labconco for further instructions for this type of calibration.

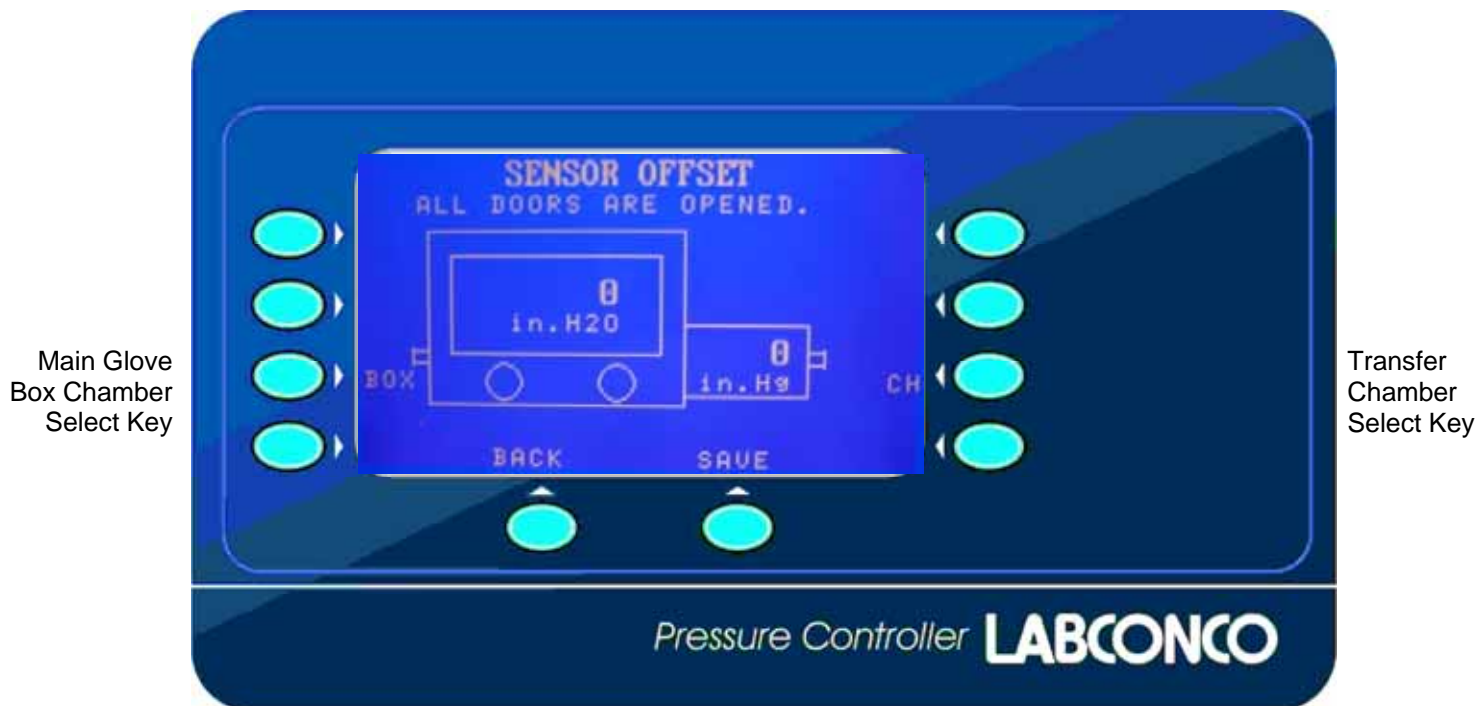
Option 1 above is normally selected. Both doors must be open so atmospheric pressure is available to both the glove box main chamber and transfer chamber. Select the NEXT key to advance the screen to sensor offset for Option 1. The display screen changes are shown on the next page for Option 1.



Back to Previous Screen	Yes, All Doors Open
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To calibrate the pressure sensors for both chambers, the doors must be open so that atmospheric pressure is present at both sensors. This is the “zero point” for both sensors. Both pressure gauges on the glove box will also read “zero.”

With both doors open, press the key adjacent to “Yes.” Once this is done, the following display screen on the next page appears:



Back to	Save
Previous	Zero
Screen	Point

This display screen confirms that the doors are open and the sensors are ready for auto-zeroing. First, select the Main Glove Box Chamber key (Box) and wait for complete calibration to zero pressure. Next, select the Transfer Chamber key (CH) and wait for complete calibration to zero pressure. Once the key adjacent to “Save” is pressed, the new sensor offset values for both chambers are stored, and this pressure becomes the zero point for both chambers. Select the back key two times when calibration is complete to return to the three main modes of operation.

Pressure Control Foot Switch (Labconco #5243600)

The three position (increase gas/fill, off, purge/decrease gas) foot switch should be plugged into the back panel of the Labconco Pressure Controller. The Foot Switch has the same effect as pressing the Purge and Fill keys on the display panel. The action of the Foot Switch depends on what mode of operation is shown on the display. If the transfer chamber screen is shown on the display, the Foot Switch will control the Transfer Chamber gas in and gas out valves. If the display shows the Glove Box Pressure Control or the Glove Box Purge/Fill, the Foot Switch will control the Glove Box Main Chamber gas in and gas out valves. The foot switch will not work when the pressure/vacuum inside has exceeded the user preset limits shown on the display.

Labconco Glove Box Controller Specifications

Glove Box Pressure Control	Operating Range	Default Settings
Pressure Control Limits	-5 inches of water column to +5 inches of water column; [+/- 12.6 mBar]	+/- 5 inches of water column; [+/- 12.6 mBar].
Manual Control Available	Purge (Gas out); Fill (Gas in)	
Audio Alarm level	Whenever pressure outside limits	
Glove Box Purge/Fill		
Purge/Fill Pressure Limit	+/- 5 inches of water column; [+/- 12.6 mBar].	+/- 5 inches of water column; [+/- 12.6 mBar].
Manual Control Available	Purge (Gas out); Fill (Gas in)	
Number of Purge/Fill Cycles	0 to 199	1
Audio Alarm level	Whenever pressure outside limits	
Transfer Chamber Purge/Fill		
Purge Pressure Limit	-29.5 inches of Mercury/Hg [-999 mBars]	-29.5 inches of Mercury/Hg [-999 mBars]
Fill Pressure Limit	0 inches of Mercury/Hg [0 mBars](atmosphere)	0 inches of Mercury/Hg [0 mBars](atmosphere)
Number of Purge/Fill Cycles	0 to 199	1
Audio Alarm level	-29.5 inches of Mercury/Hg [-999 mBars]	Whenever pressure/vacuum outside limits

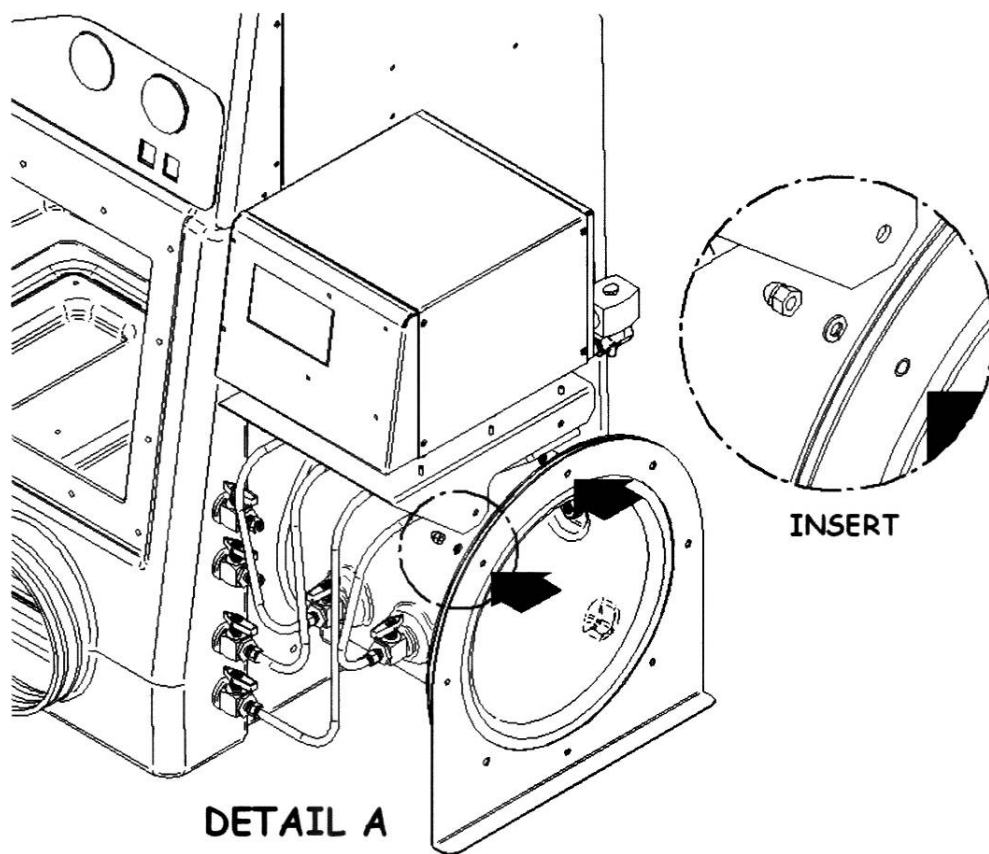
Mechanical and Plumbing Installation Instructions

NOTE: The Pressure Controller is configured to mount on the Glove Box. If your use is better served in the benchtop configuration, a benchtop mounting bracket (#5239100) can be ordered separately.

Glove Box Mounting:

Installation

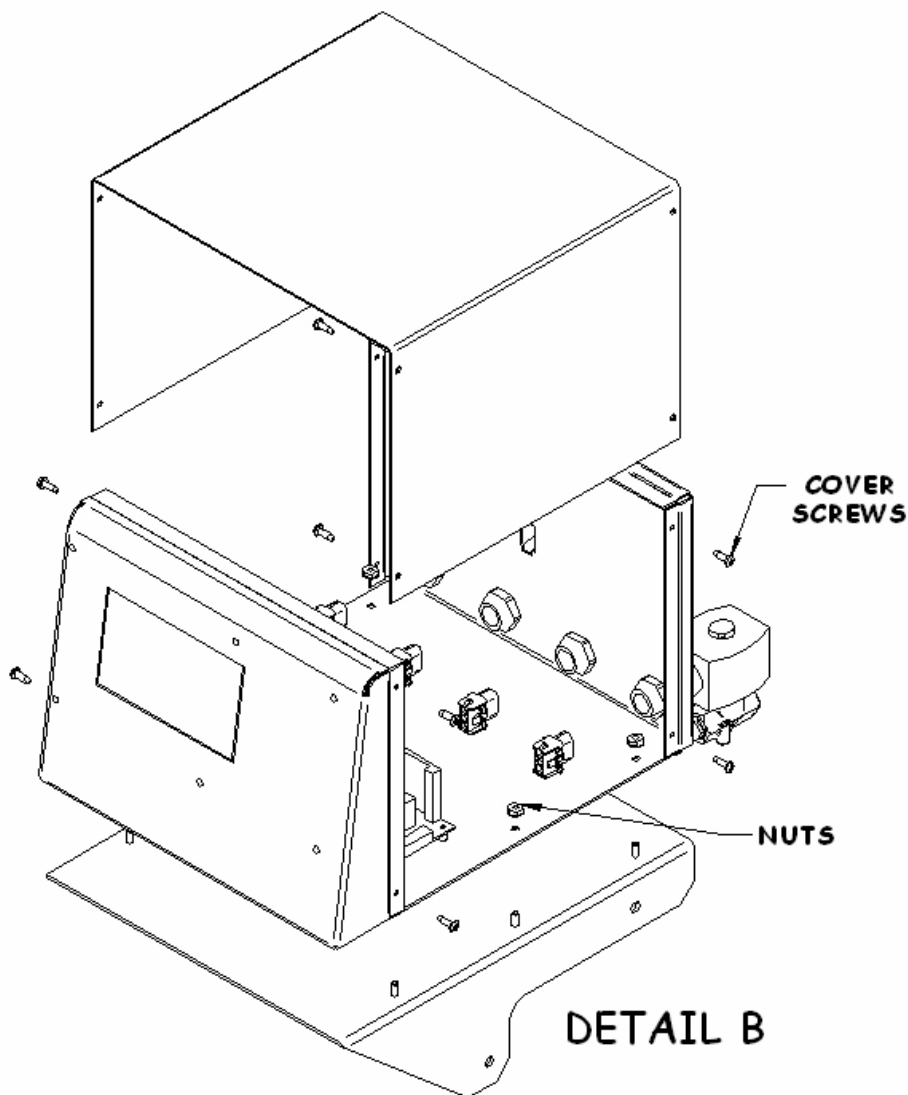
1. Remove the two acorn nuts and lock washers as shown in Detail A insert. Place the Pressure Controller assembly over the studs as shown and secure with the previously removed nuts and washers.
2. See the plumbing installation section for the Glove Box mounting.



Benchtop Mounting:

Installation (Detail B)

1. Disconnect the power source from the Pressure Controller.
2. Remove the Glove Box mounting bracket and attach the Benchtop mounting bracket.
3. Remove the eight screws that attach the Pressure Controller Cover to the Pressure Controller. Lift the cover straight up and set aside.
4. Remove the six nuts securing the Pressure Controller to the Glove Box bracket.
5. Next, place the Pressure Controller on top of the Benchtop Mounting Bracket, attach with the six nuts previously removed securing the Pressure Controller to the Benchtop Mounting Bracket.
6. See plumbing installation section for benchtop mounting.

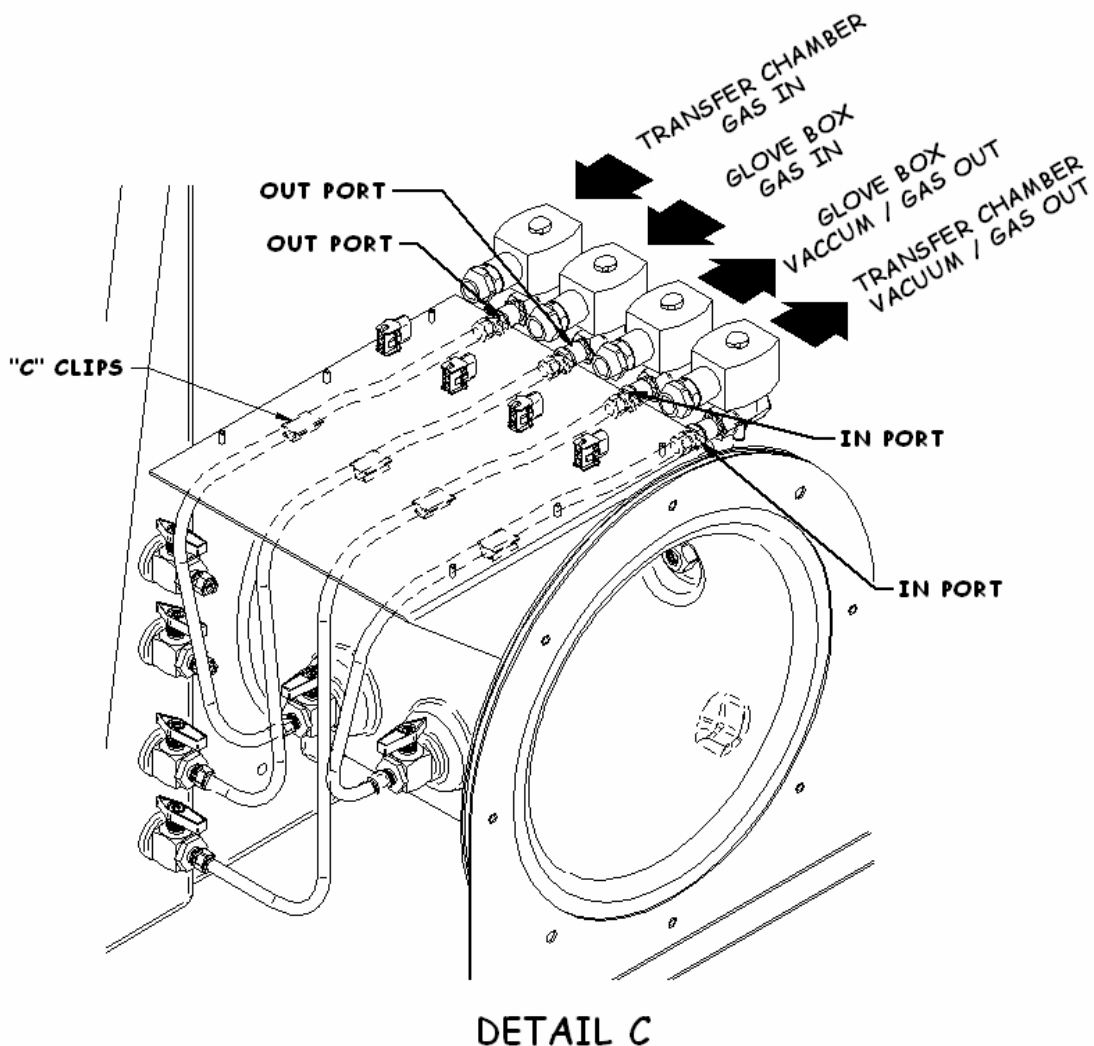


Plumbing:

Always install the polyvinyl tubing to the solenoid valves on the pressure controller before placing at the benchtop location. Refer to Detail C for valve inlet and outlet order.

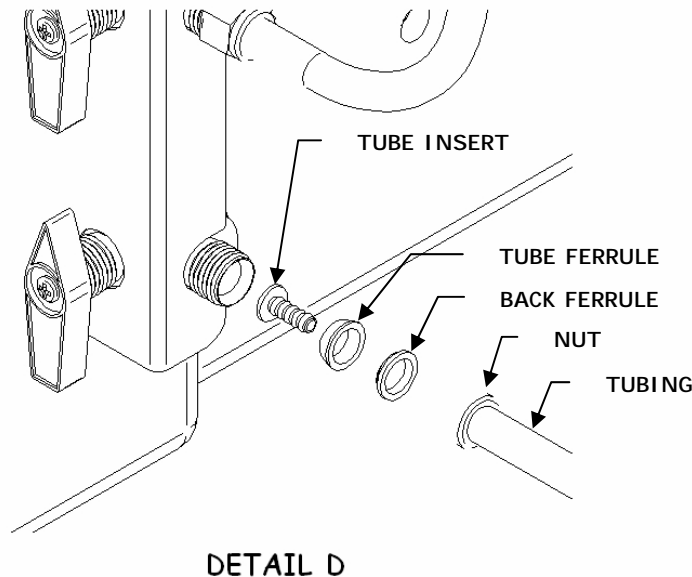
Glove Box Installation

1. The Pressure Controller has been pre-plumbed for installation in the Glove Box configuration.
2. Route the tubing to the Glove Box and Transfer Chamber as shown in Detail C. **Note: Tube routing maybe dependent upon your application. Always insure that the tubing is routed to the correct solenoid valve on the Pressure Controller as stated on the back of the unit.**
3. See Detail D for proper tube installation to the valves on the Glove Box and Transfer Chamber.



Benchtop Installation: With the Pressure Controller temporary located at the benchtop location proceed as follows.

1. Measure the distance between the solenoid valves of the Pressure Controller and the valves on the glove box. Cut the 3/16 ID tubing (the larger of the tubing in your kit) to the measured lengths.
2. The solenoid valves are embossed with IN or OUT port on the body of the valve, to indicate the direction of flow. Install the cut lengths of the tubing to the correct port of the solenoid valve as shown in Detail C.
3. Secure the tubes to the underside of the mounting bracket using the “C” clips provided and place at the approximate locations shown in Detail C.
4. Route the tubing to the Glove Box and Transfer Chamber as shown in Detail C. **Note: Tube routing maybe dependent upon your application. Always insure that the tubing is routed to the correct solenoid valve on the Pressure Controller as stated on the back of the unit.**
5. See Detail D for proper tube installation to the valves on the Glove Box and Transfer Chamber.



Sensor Integration:

The Pressure Controller must be integrated to the glove box. This connection allows your Pressure Controller to monitor the condition of the glove box chamber and transfer chamber.

Installation

1. Your kit comes with extra length of polyvinyl tubing so you can integrate the Pressure Controller with the glove box. This integration requires you to splice into the existing tubing of your Glove Box, install a bulkhead fitting and new tubing.

2. Bulkhead Fitting

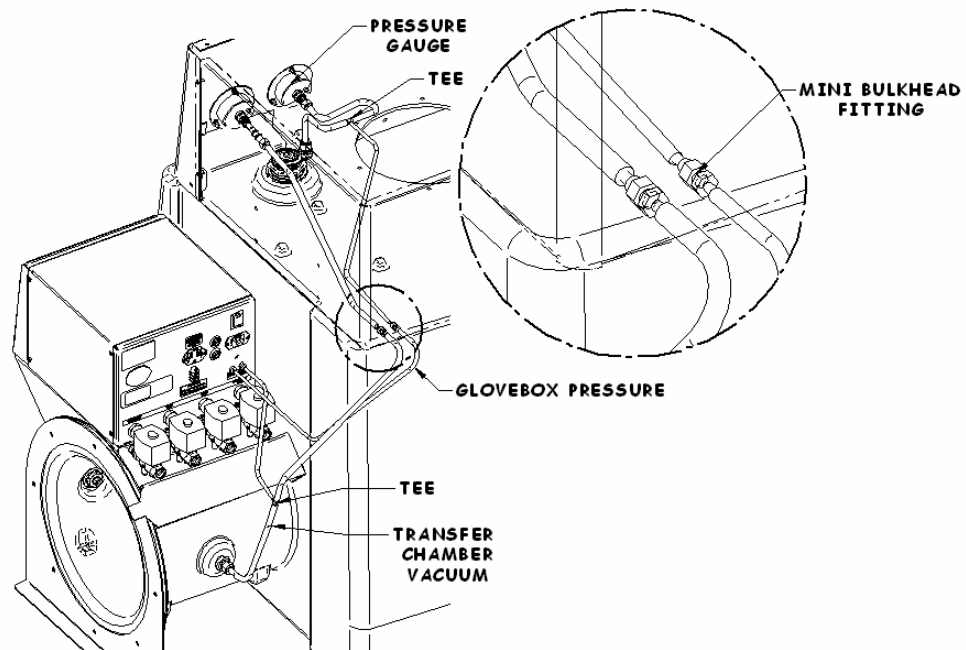
- a. Locate the brass mini bulkhead fitting in your kit and install the fitting at the opening provided on the back wall of the glove box wrapper (see Detail E).

3. Glove Box Pressure

- a. Locate the line that comes from the pressure gauge (see Detail E) to the fitting installed at the top of your glove box. This gauge is labeled on the front panel and is the one on your right when looking at the back of the front panel (see Detail E). ***This line is also a contaminated line on existing glove boxes and the appropriate precautions should be taken.***
- b. Make a cut in the line about halfway between the gauge and the fitting. Join the cut lengths together with the brass tee that came with you kit.
- c. Measure and cut a length of the 3/32 ID polyvinyl tubing (the smaller of the tubing) and connect the spliced tee to the mini bulkhead fitting on the back of the Glove Box wrapper.
- d. Again, measure and cut a length of the same tubing and connect it between the mini bulkhead fitting on the glove box wrapper and the port labeled “Glove Box Pressure” on the back of the Pressure Controller (see Detail E).

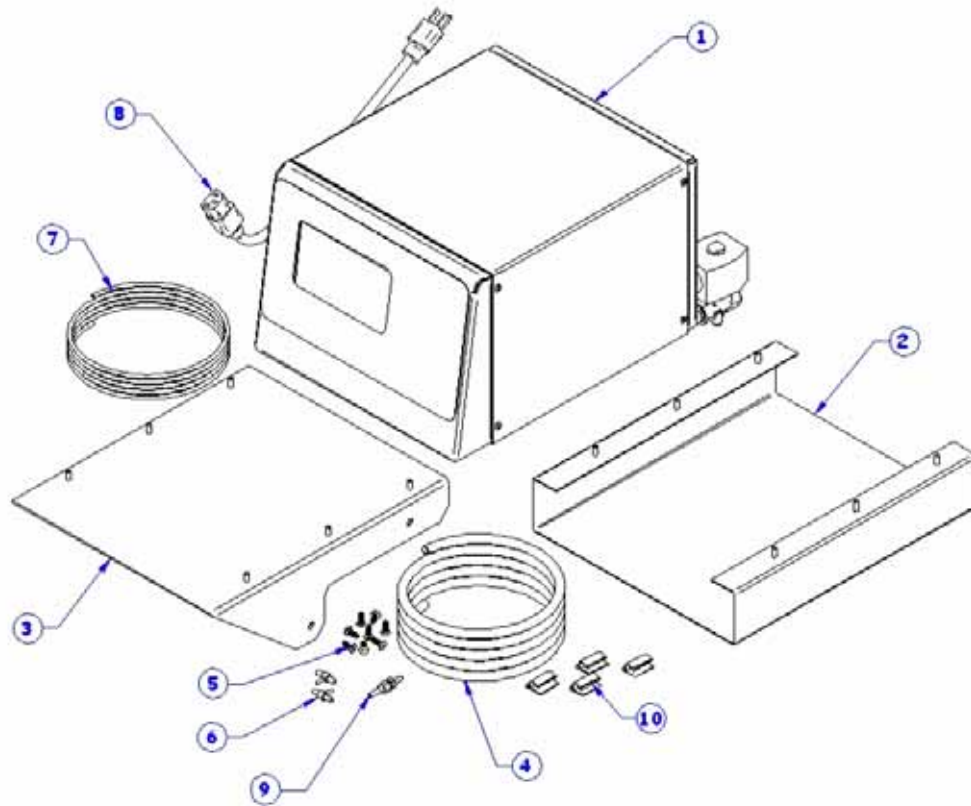
4. Transfer Chamber Vacuum

- a. Locate the existing line that comes from the back of your glove box wrapper to the transfer chamber fitting (see Detail E).
- b. Make a cut in the line at a point near or within 12 inches of the transfer chamber fitting and join the line together with a brass tee that came with your kit.
- c. Measure and cut a length of the 3/32 ID polyvinyl tubing (the smaller of the tubing) and connect the spliced tee to the port labeled “Transfer Chamber Vacuum” on the back of the Pressure Controller (see Detail E).



DETAIL E

Parts List:



	Part No.	Description
1	5239800	Pressure Controller 115V
1	5239801	Pressure Controller 230V
2	5239100	Benchtop bracket (ordered separately)
3	5237000	Glove Box bracket
4	1539500	3/16 ID Polyvinyl Tubing
5	1409900	Tube Inserts
6	1407400	Brass Tee
7	1554304	3/32 ID Polyvinyl Tubing
8	1337100	Power Cord – 115V
8	1338000	Power Cord – 230V
9	1449400	Mini Bulkhead Fitting
10	1937700	“C” Clips

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Warranty

Labconco provides a warranty on all parts and factory workmanship. The warranty includes areas of defective material and workmanship, provided such defect results from normal and proper use of the equipment.

The warranty for all Labconco products will expire one year from date of installation or two years from date of shipment from Labconco, whichever is sooner, except the following;

- Purifier® Delta® Series Biological Safety Cabinets and PuriCare® Lab Animal Research Stations carry a three-year warranty from date of installation or four years from date of shipment from Labconco, whichever is sooner.
- SteamScrubber® & FlaskScrubber® Glassware Washers carry a two-year warranty from date of installation or three years from date of shipment from Labconco, whichever is sooner.
- Blood Drawing Chairs carry a ten year warranty.
- Carts carry a lifetime warranty.
- Glassware is not warranted from breakage when dropped or mishandled.

This limited warranty covers parts and labor, but not transportation and insurance charges. In the event of a warranty claim, contact Labconco Corporation or the dealer who sold you the product. If the cause is determined to be a manufacturing fault, the dealer or Labconco Corporation will repair or replace all defective parts to restore the unit to operation. Under no circumstances shall Labconco Corporation be liable for indirect, consequential, or special damages of any kind. This statement may be altered by a specific published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments. Lamps and filters are not covered by this warranty. Damage due to corrosion or accidental breakage is not covered.

Returned or Damaged Goods

Do not return goods without the prior authorization from Labconco. Unauthorized returns will not be accepted. If your shipment was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damages.

The United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Limitation of Liability

The disposal and/or emission of substances used in connection with this equipment may be governed by various federal, state, or local regulations. All users of this equipment are required to become familiar with any regulations that apply in the user's area concerning the dumping of waste materials in or upon water, land, or air and to comply with such regulations. Labconco Corporation is held harmless with respect to user's compliance with such regulations.

Contacting Labconco Corporation

If you have questions that are not addressed in this manual, or if you need technical assistance, contact Labconco's Customer Service Department or Labconco's Product Service Department at 1-800-821-5525 or 1-816-333-8811, between the hours of 7:00 a.m. and 6:00 p.m., Central Standard Time.