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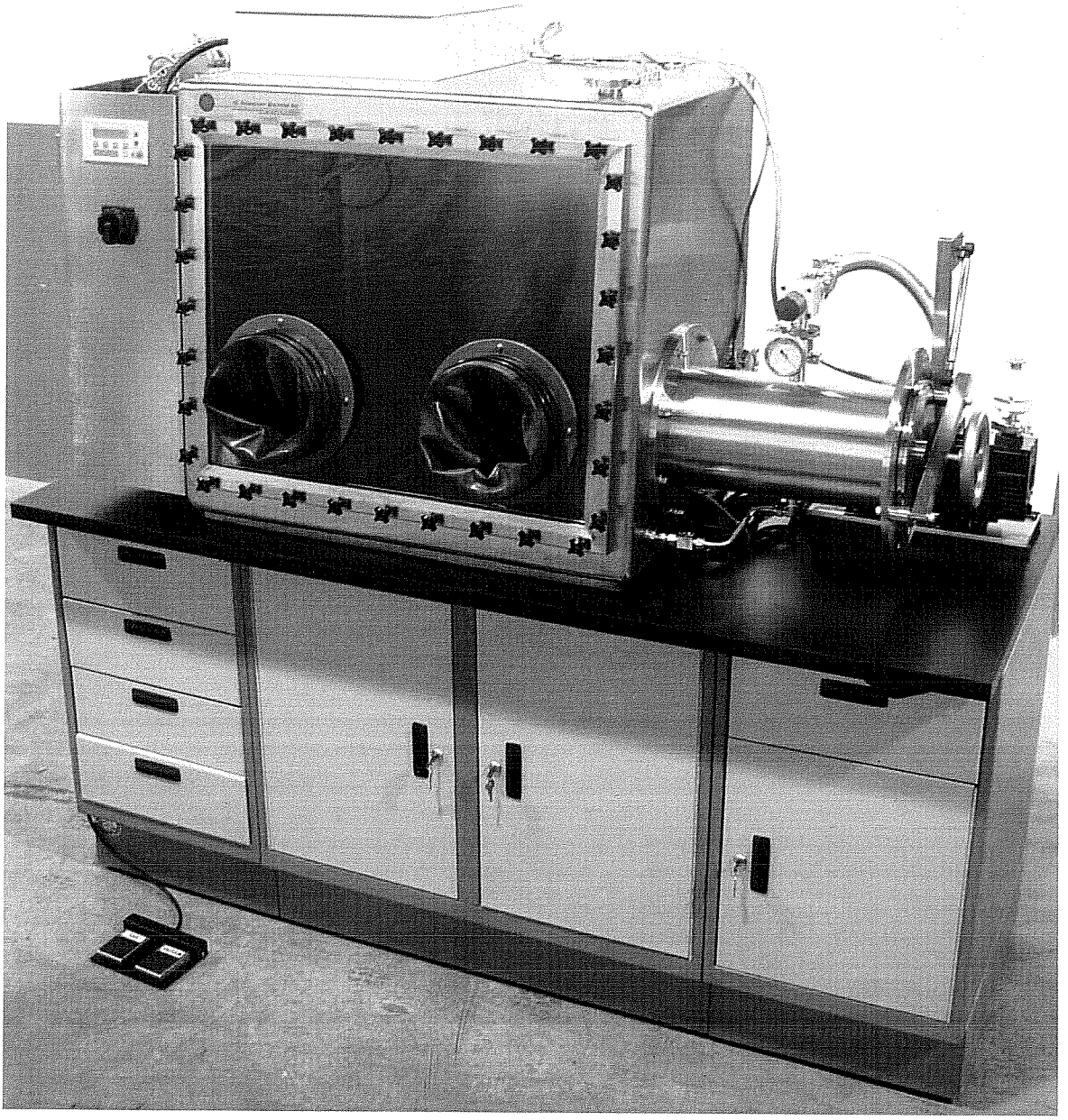
LCBT-120 Bench Top Glovebox

Operation Manual



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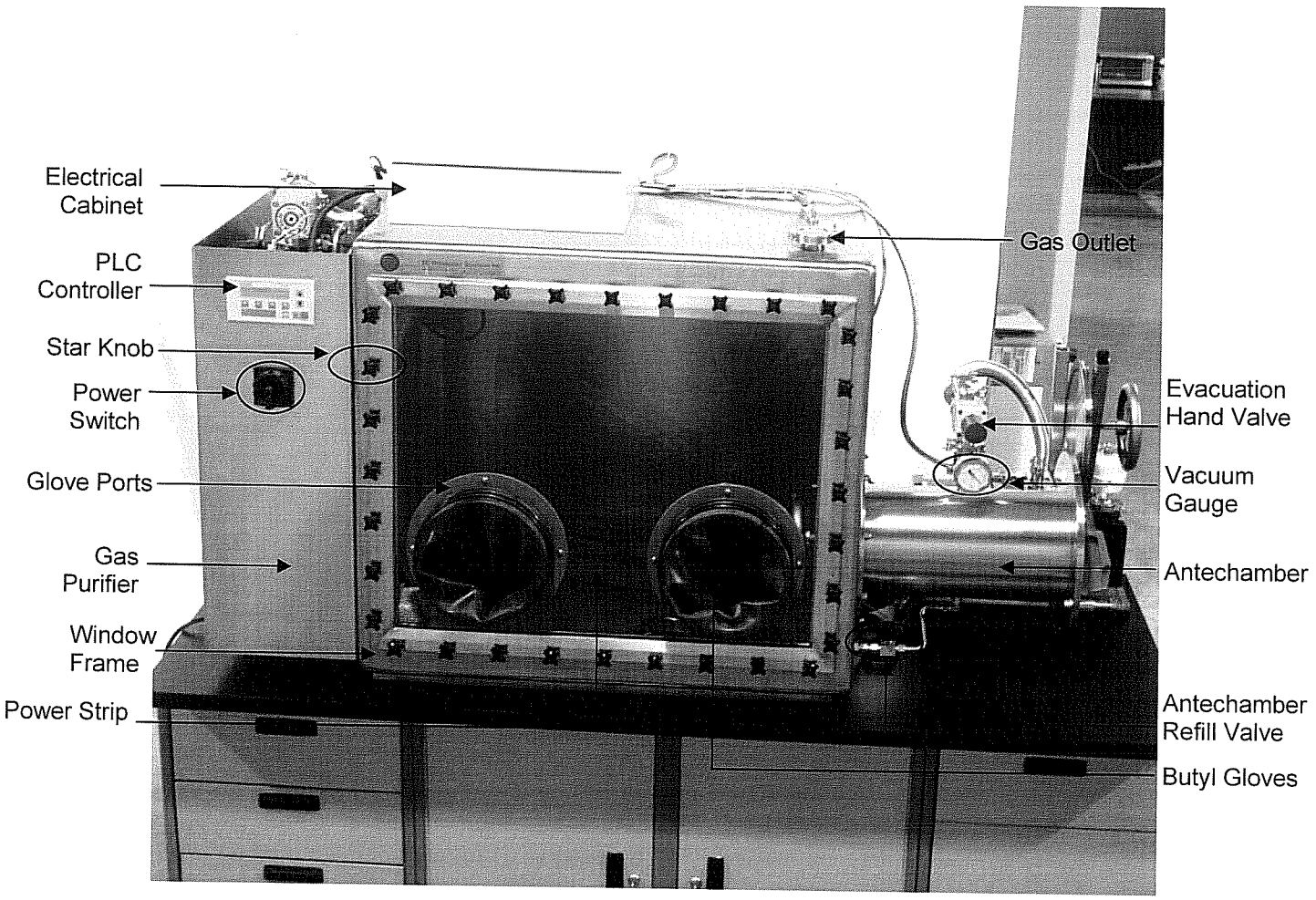
LCBT-120 Bench Top Glovebox Operation Manual

Section 1: System Overview



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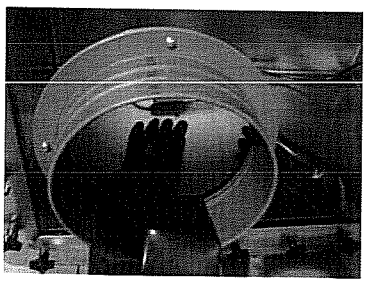
Section 2: Installation Instructions

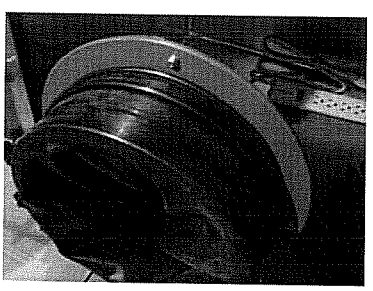
2.1 Attach Gloves



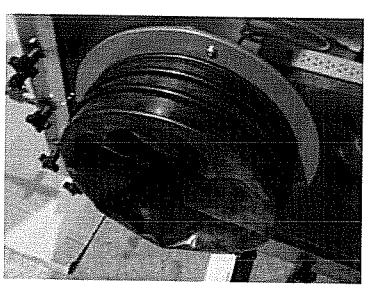
-Place glove onto the glove port.

-Move the glove forward until it meets the glove port flange.

-Place hand in glove and align glove hand in a comfortable position (i.e. thumb facing up).



-Place first glove o-ring in first glove port groove.



-Place second glove o-ring in second glove port groove.

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2.2 Glovebox Connections

Gas Connections:

System will be supplied with reinforced Tygon tubing already attached to the gas purifier.

Find the tube labeled Inert Gas and connect this tube to your inert gas supply.

NOTE: ⅜" Tygon tube should be connected to inert gas at 60 psi.

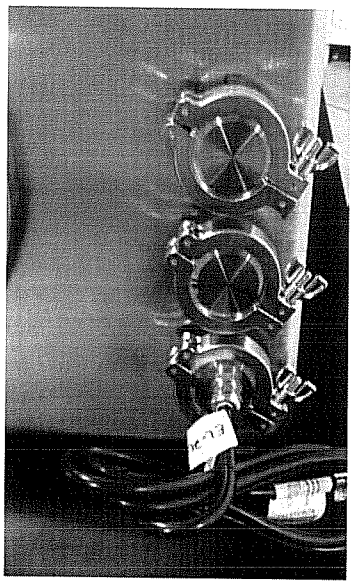
Find the tube labeled Regeneration Gas and connect this tube to your regeneration gas supply.

NOTE: ⅜" Tygon tube should be connected to regeneration gas at 10 psi. Regeneration gas consists of a 3-5% hydrogen balance with nitrogen or argon.

Power Connections:

System will have a 115V power cord coming from the back of the purifier.

Plug cord into a standard 115V, 15 Amp outlet.



Electrical Feedthrough

-US locations plug in electrical feedthrough into 115V power supply.

-International locations plug the electrical feedthrough into 220V power supply.

Vacuum Pump

Plug in vacuum pump to power outlet coming from glovebox system.

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Other Connections: Various components of glovebox will need to be attached to the system. These components have been number labeled to show connection points. Match corresponding numbers (i.e. 1 to 1, 2 to 2, and so on).

Vent Connections: Regeneration Out Vent

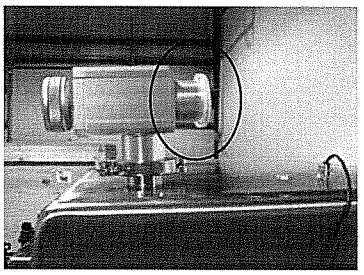
When regenerating the system the regeneration gas will vent out a ⅜" Tygon tube coming from the bottom of the purifier. This line will be labeled Regeneration Gas Exhaust.

NOTE: It is recommended that this line be vented.

Vacuum Pump Exhaust

Vacuum pump exhaust is located on the top of the vacuum pump. This is a KF25 connection.

NOTE: It is recommended that this line be vented.



Manual / Automatic Purge Valve

Manual / automatic purge valve is located on top of the glovebox. This is a KF40 port (1 ½" diameter).

NOTE: It is recommended that this line be vented.

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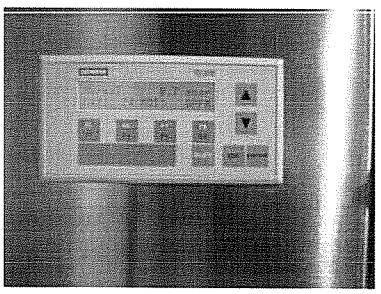
Section 3: Operational Instructions

3.1 Purge System

3.1.1 Purging without a Purge Valve



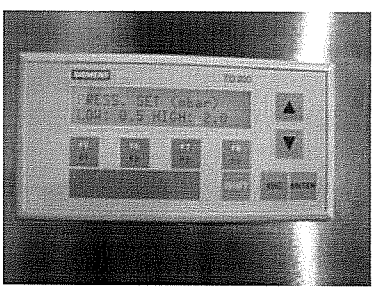
1. From Normal Operation Mode verify circulation is turned off.

   -If circulation is on press Shift F4 to turn circulation off.

2. From Main Menu check pressure settings. Pressure settings should be set to positive values.

   To verify settings are positive follow these steps:

   -Press Esc
   -When PLC shows User Mode press Enter
   -When PLC shows Service Mode press Enter
   -Arrow down until you reach the Pressure Setting Menu.
   (Low Set Point = 0.5, High Set Point = 2.0)
   -To adjust pressure setting press Enter
   -When Password Required displays enter password; password is 2905
   -Use the arrow ↑ key to select the first digit then press Enter
   -Repeat the above set until all four digits have been entered
   -Adjust set points
   -Set Low Set Point using ↑ or ↓ arrow keys to increase or decrease values then press Enter
   -Set High Set Point using ↑ or ↓ arrow keys to increase or decrease values then press Enter
   -Press Esc. Twice to return to Main Menu



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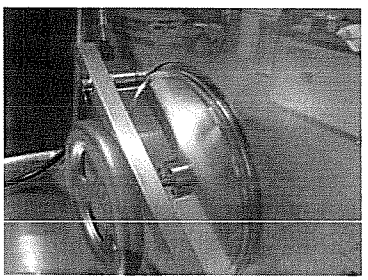

3. If pressure set points are okay; crack open inside antechamber door.

4. Crack open outside antechamber door.

5. As the outside antechamber door is opened you will hear the gas inlet valve opening and closing.

   -Open outside antechamber door until gas inlet valve stays open.

6. If purging at start-up (glovebox is at room air) you will need to purge for approximately 45 minutes and/or 1-1 ½ cylinders of gas before turning on circulation.

7. When purging is complete follow these steps:

   -Close inside antechamber door
   -Close outside antechamber door
   -Start/Restart circulation by pressing Shift F4

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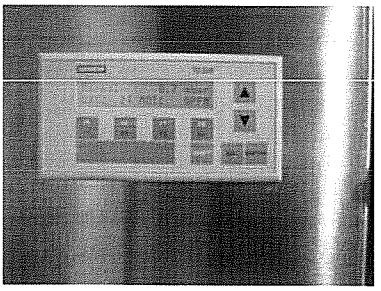
3.1 Purge System

3.1.2 Purging with a Purge Valve



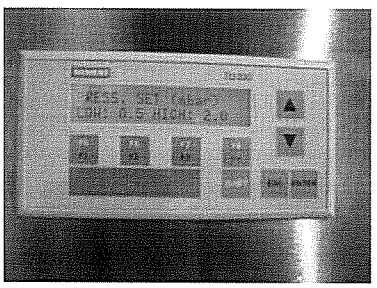
1. From Normal Operation Mode verify circulation is turned off.

   -If circulation is on press Shift F4 to turn circulation off.

2. From Main Menu check pressure settings. Pressure settings should be set to positive values.

   To verify settings are positive follow these steps:

   -Press Esc
   -When PLC shows User Mode press Enter
   -When PLC shows Service Mode press Enter
   -Arrow down until you reach the Pressure Setting Menu.
   (Low Set Point = 0.5, High Set Point = 2.0)
   -To adjust pressure setting press Enter
   -When Password Required displays enter password; password is 2905
   -Use the arrow ↑ key to select the first digit then press Enter
   -Repeat the above set until all four digits have been entered
   -Adjust set points
   -Set Low Set Point using ↑ or ↓ arrow keys to increase or decrease values then press Enter
   -Set High Set Point using ↑ or ↓ arrow keys to increase or decrease values then press Enter
   -Press Esc. Twice to return to Main Menu



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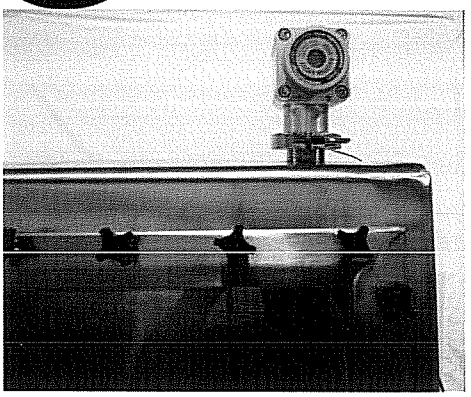


3. Open purge valve until you hear gas inlet valve come on and stay on.

4. If purging at start-up (glovebox is at room air) you will need to purge for approximately 45 minutes and/or 1-1 ½ cylinders of gas before turning on circulation.

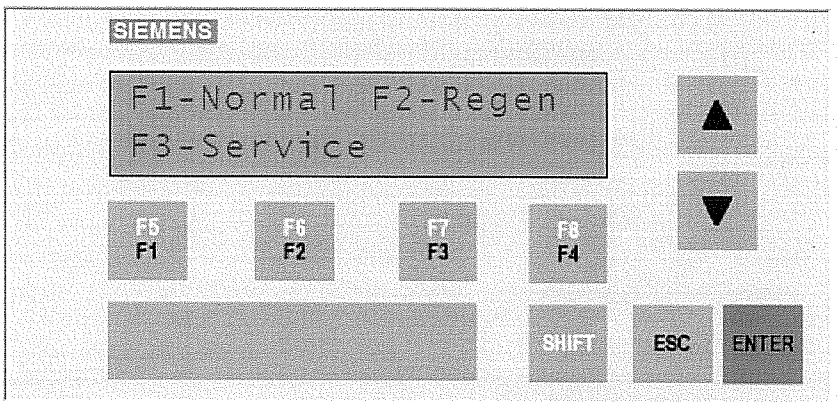
5. When purging is complete follow these steps:

   -Close Purge Valve
   -Start/Restart circulation by pressing Shift F4

3.2 Normal / Circulation Mode

-Normal mode is the everyday Normal Mode for the glovebox. Normal Mode starts the pressure control function and allows for glovebox circulation.

-When the systems power is turned on the display will show the following screen:



-To enter Normal Mode push the F1 key. To exit Normal Mode push the F1 key again.

Pressure Control

1. Press F1 to enter Normal Mode
2. Pressure settings have been preset at the factory to a Low Set Point of .5 mbar and a High Set Point of 3.0 mbar.

NOTE: This is a typical pressure range.

3. The system has been supplied with foot pedals to help control the pressure between the high and low set point.

   Use the foot pedals to help control the pressure when inserting and removing hands from gloves.

Circulation Mode

1. To start circulation of the glovebox environment through the filter column press Shift F4.
2. To turn off circulation mode press Shift F4.

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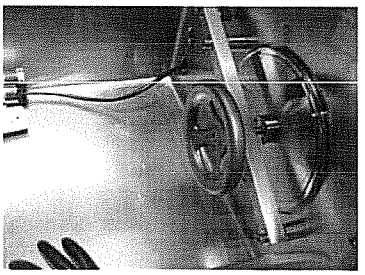
3.3 Antechamber Operation

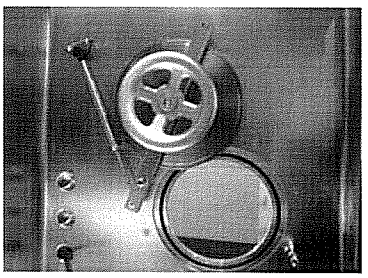
3.3.1 Antechamber Door Operation



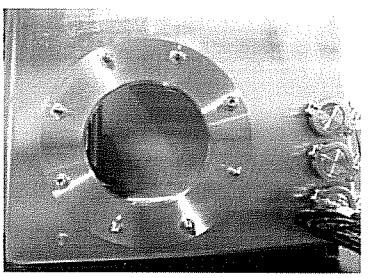
1. Place right hand in glove and turn door handle counter clockwise.

2. Spin door handle completely until door makes contact with door arm.

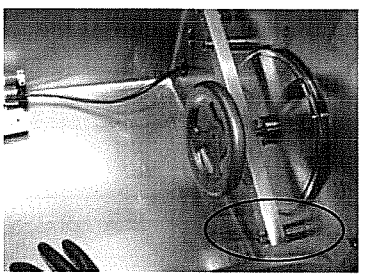
   NOTE: This is important so door does not make contact with side wall of glovebox and damage sealing surface.



3. Push door arm upwards until door shock pulls door open.



4. Pass required material/parts through the access port.



5. Grasp door handle and pull in a downward motion until door arm meets door pin.

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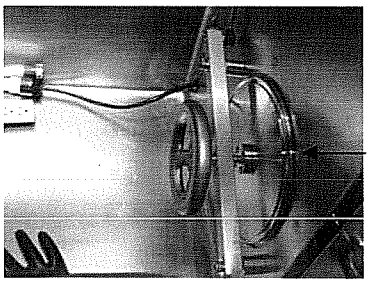

6. Turn door handle clockwise until it meets door gasket.

CAUTION: Do not over tighten.

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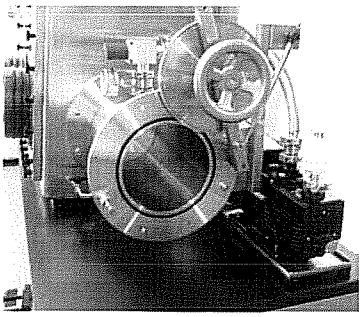
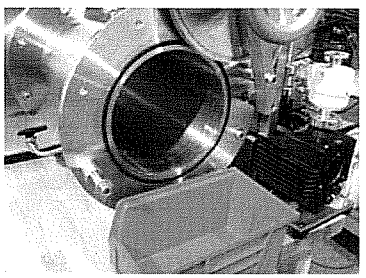
3.3 Antechamber Operation

3.3.2 Antechamber Door Operation

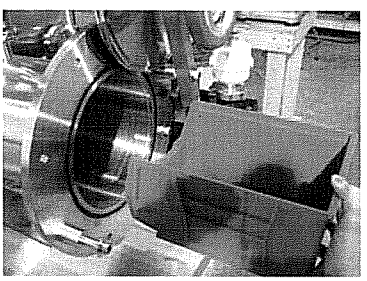
3.3.2.1 Bringing Items into Glovebox



1. Open outside antechamber door.



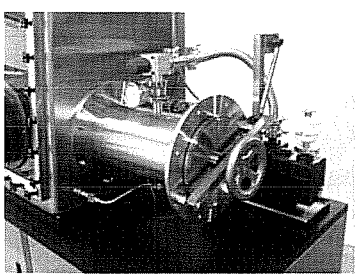
2. Load green bin with desired material.



3. Place green bin inside antechamber.

   Bin should be loaded into chamber short side first.

4. Push the bin all the way into antechamber until it touches inside antechamber door.



5. Close outside antechamber door.

CAUTION: Do not over tighten.

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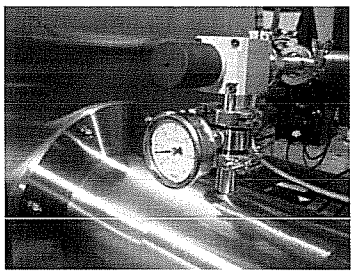
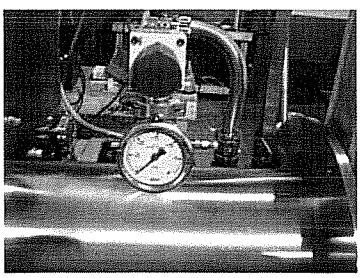


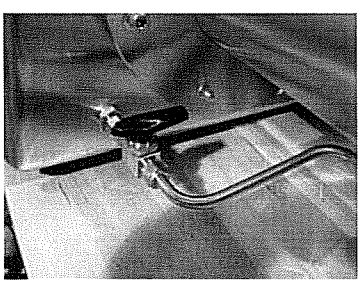
6. Turn evacuation hand valve, located on top of antechamber, to the left.

   Antechamber will begin to evacuate.

   Continue to evacuate until the vacuum gauge reads -30.



7. Close evacuation valve by turning evacuation hand valve to the right.

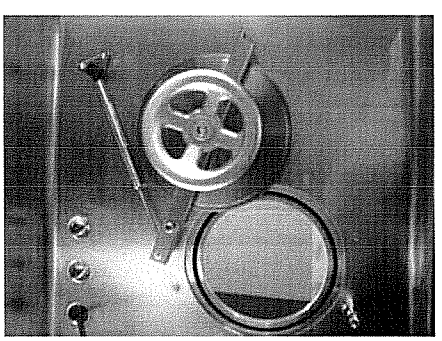


8. Refill antechamber using Swagelok refill valve.

   Continue to refill until the vacuum gauge reads 0.

9. Repeat the above cycle two (2) more times for a total of three (3) evacuation/refill cycles.

   NOTE: Before opening the inside door make sure vacuum gauge reads zero (0) & evacuation and refills valves are closed.



10. Open inside door, remove green bin, and close antechamber door.

    NOTE: When opening the inside door, spin door handle completely until door makes contact with door arm. This is important so door does not make contact with side wall of glovebox and damage sealing surface.

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3.3 Antechamber Operation

3.3.2 Antechamber Door Operation

3.3.2.2 Removing Items from Glovebox

1. Determine whether the antechamber has room air or inert gas in it.
2. If inert gas follow these steps:

   -Open inside antechamber door.
   -Load green bin into antechamber.
   -Close inside antechamber door.
   -Open outside antechamber door.
   -Remove green bin.
3. If room air follow these steps:

   -Evacuate and refill the antechamber three (3) times.
   Refer to Section 3.3.1, Steps 6-9 for the evacuation/refill process.

   NOTE: This will ensure the antechamber has inert gas in it.

   -Open inside antechamber door.
   -Load green bin into antechamber.
   -Close inside antechamber door.
   -Open outside antechamber door.
   -Remove green bin.

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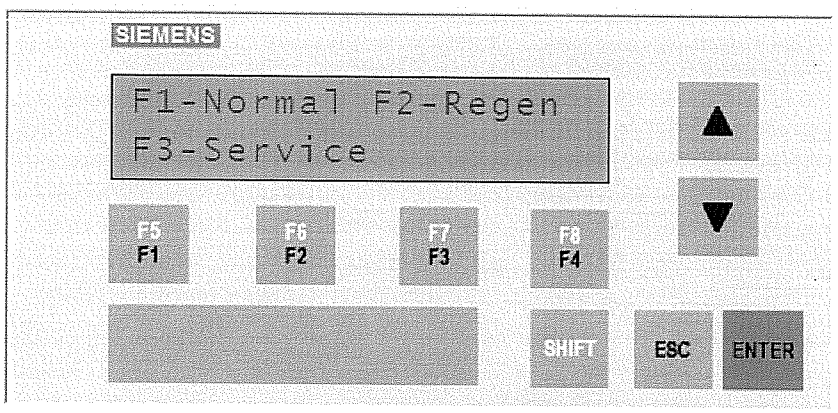
3.4 Regeneration Mode

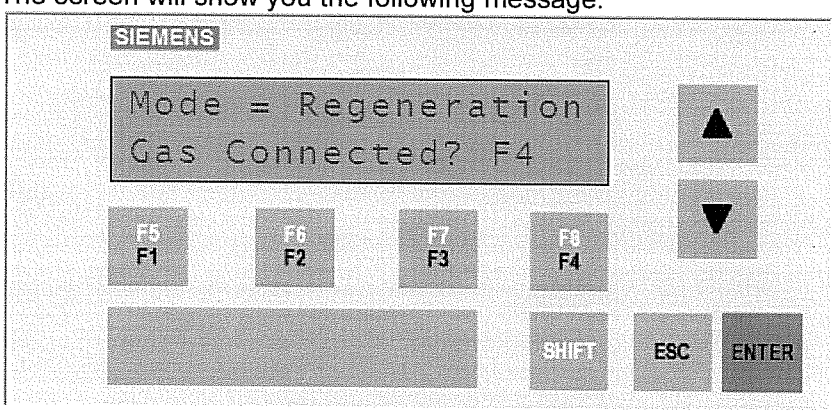
-Regeneration Mode is for reactivating the filter material. It can only be activated if the system is not in one of the other modes.

From the main screen:



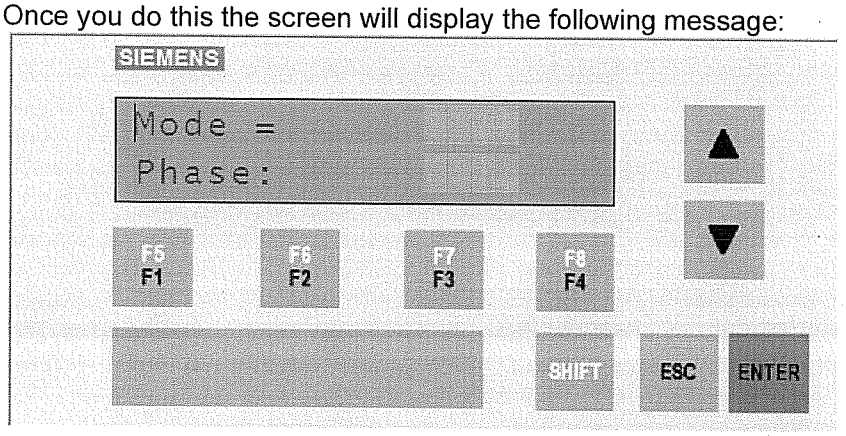
-Push F2 to enter the Regeneration Mode.

The screen will show you the following message:



-Once you have connected your regeneration gas you need to confirm this message by pressing the F4 key.

Once you do this the screen will display the following message:



Displays Service or Regeneration mode and regeneration phase. When the regeneration cycle is finished, press the F3 key if in Regeneration mode or the F3 key if in Service mode. This will allow the operator to return to Normal Operation Mode.

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The regeneration process takes (14) hours and has (4) phases. Each phase will be displayed as the program progresses from one phase to the other.

The first phase is the heating phase which lasts (4) hours.

NOTE: You may smell a slight odor at this time. This is normal.

The second phase is the purging phase which lasts (3) hours.

The third phase is the evacuation phase which lasts (3) hours.

The fourth phase is the cooling phase which lasts (4) hours.

When the regeneration is complete the display will show a message that the regeneration has been completed. Press the F3 key to exit.

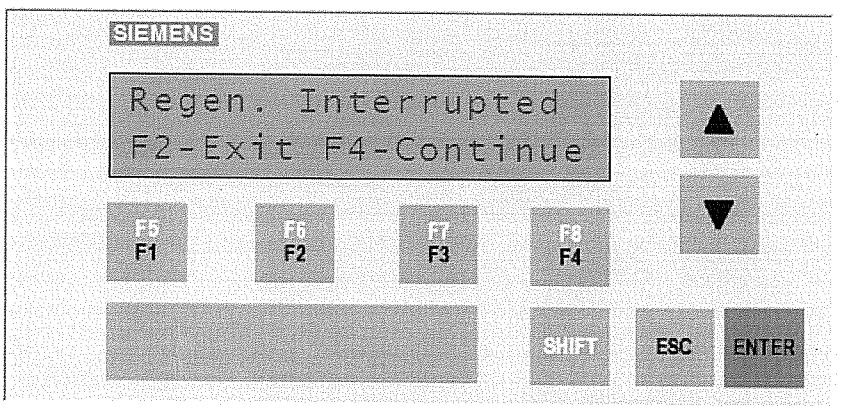
This will bring you back to the Main Menu.

To interrupt the regeneration process, press the F3 key at any time. Caution should be used at this time.

If the system has been heating for over (1) hour, the system should be allowed to cool for at least (2) hours before the regeneration is restarted.

If the system has pasted the heating phase, the system should cool for (6) hours before restarting the regeneration.

Please call LC Technology at (603) 926-5400 if you have any questions about interrupting the regeneration or restarting the system.



This shows that the regeneration has been interrupted due to the system being shut down during the regeneration cycle. Pressing the F4 button allows the cycle to continue while F2 exits the interrupted cycle and the Regeneration mode.

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3.5 Service Mode

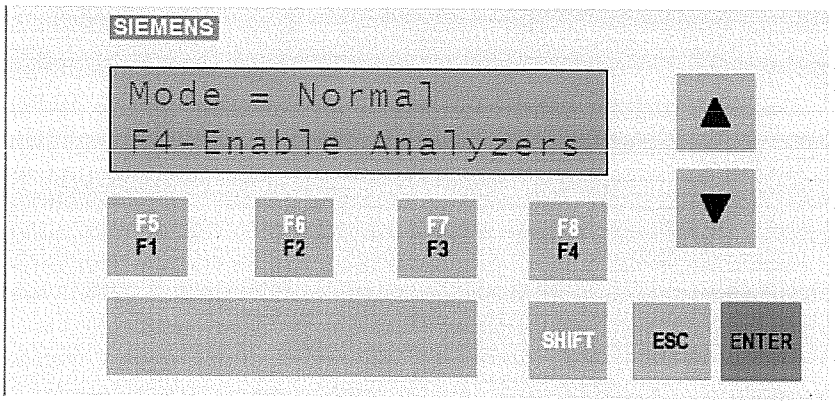
The Service Mode is to alter set points in the program. These set points have been preset by the factory and should not be altered without contacting LC Technology.

The set points can be viewed by pressing the F3 key and then scroll down using the arrow keys.

All settings are password protected.

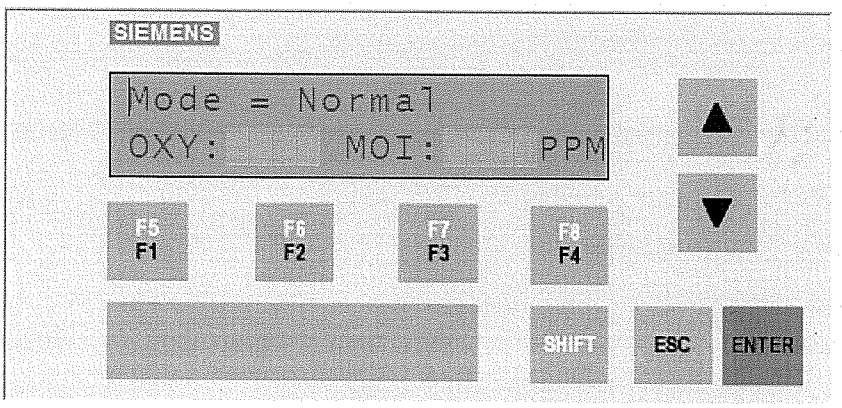
There is a feature in this section that allows the operator to step through the Regeneration cycle. This is for testing/service personnel and should not be used unless instructed by LC Technology. Please call us at (603) 926-5400 before using this function.

3.6 Analyzers



Your system may be equipped with oxygen and moisture analyzers. If it is equipped with anaiyzers you can activate them by pressing the F4 key.

The display will read as follows:

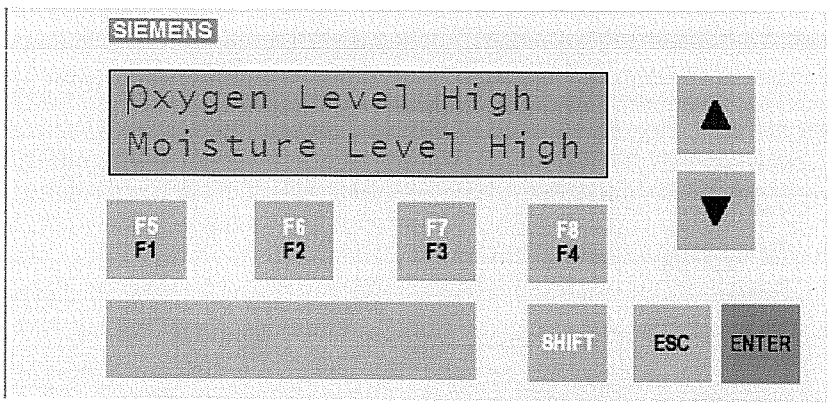


Normal operation screen with the analyzers enabled. Pressing the F4 key will disable the analyzers and bring up the Normal Mode Enable Analyzers screen.

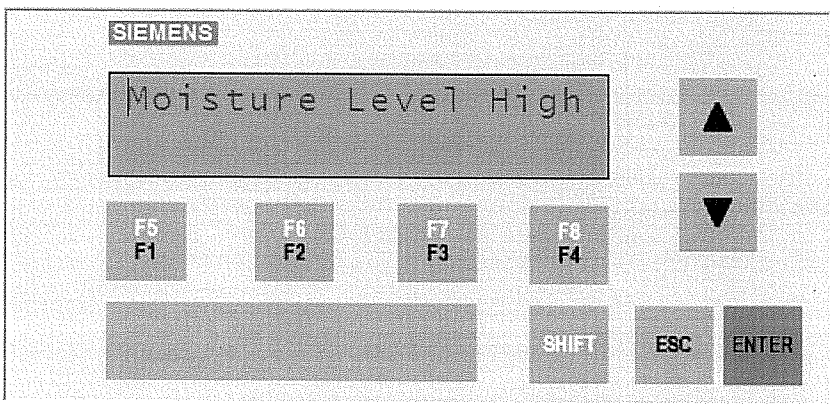
To exit Normal Operation Mode to enter Service or Regeneration Mode, press the F1 key while in Normal Operation Mode.

3.7 Alarm Messages

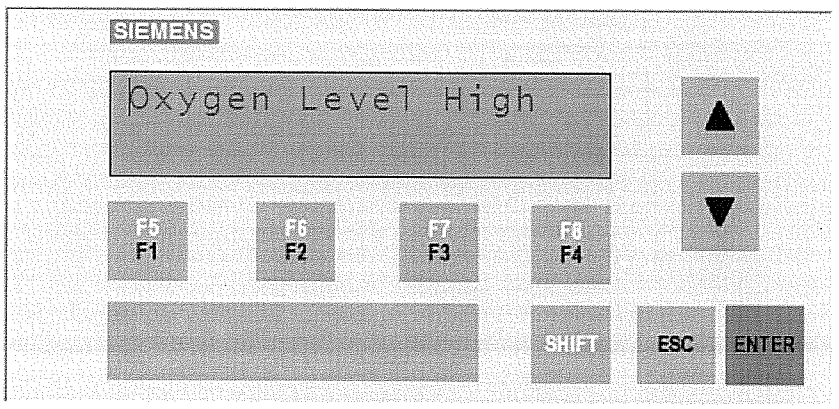
The alarm levels are set in the Service Mode for both the oxygen and moisture analyzers. If the reading on the PLC is above the alarm set point it will display the following messages.



This alarm displays when both levels are too high.



The moisture level high alarm displays when the moisture level in PPM is over the alarm setpoint.



The oxygen level high alarm displays when the oxygen level in PPM is over the alarm setpoint.

Once the level of H2O and O2 is below the alarm level the messages will automatically clear.

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Inlet/Outlet Valves Not Open

This means the gas pressure to the system is set too low.

NOTE: This may also mean you have run out of gas.

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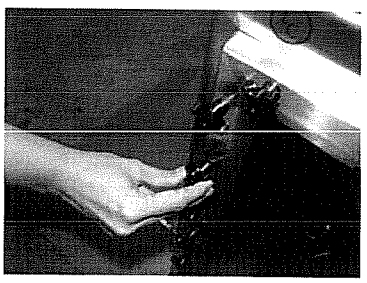
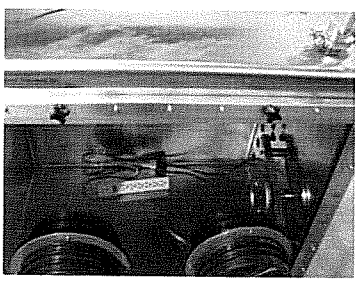
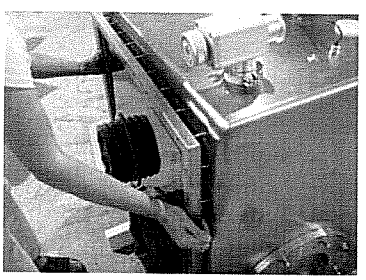
3.8 Window Removal



4. Undo all star knobs with the exception of two (2) at the top and two (2) at the bottom.



5. Remove the remaining star knobs being careful not to let the window and window frame fall.



6. Remove the window frame and set aside.

7. Remove window and complete required work.

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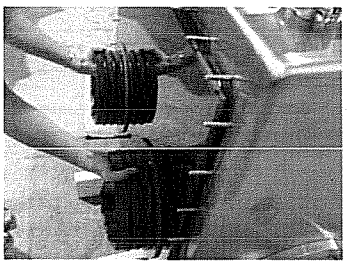
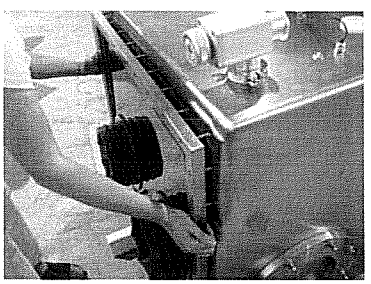
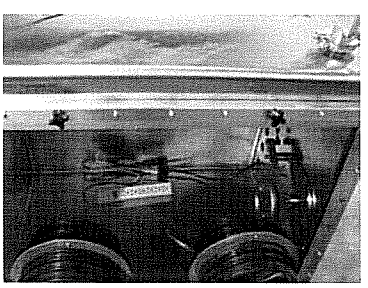
3.9 Window Replacement



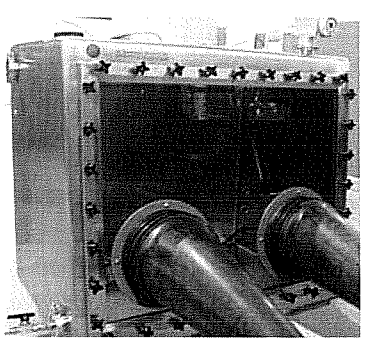
1. Place window on bottom window studs and push window forward into position against gasket.



2. Replace window frame.

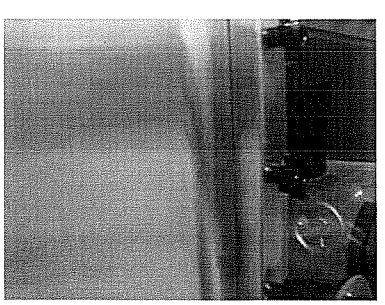


3. Replace top two (2) and bottom two (2) star knobs.



4. Replace remaining star knobs.

   NOTE: Do not tighten until all knobs have been started.



5. Tighten star knobs until window frame contacts glovebox.