

Critical Point Dryer User's Manual

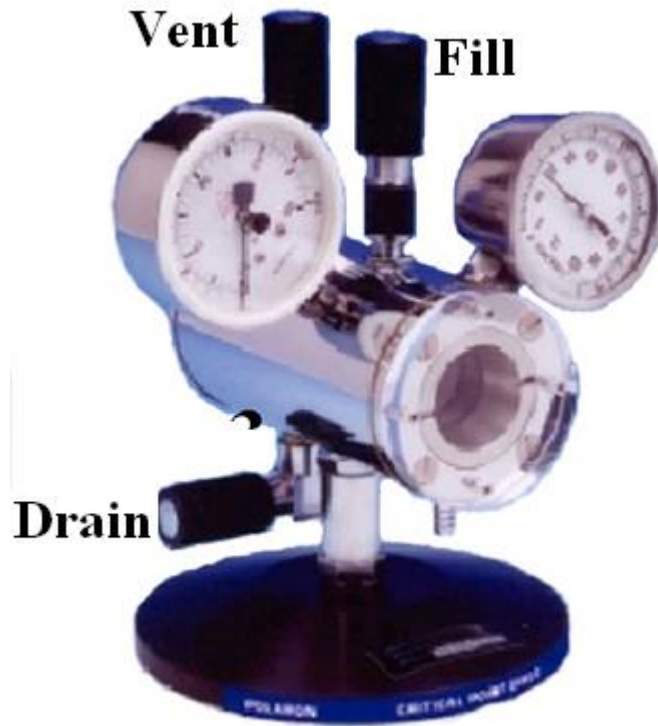
WARNING

The CPD is a pressure vessel and operates at pressures in the range of 800 - 2000 psi which is potentially dangerous if handled carelessly.

WARNING HAZARD TO HEALTH!

Risk of asphyxiation in poorly ventilated rooms.

As carbon dioxide is heavier than air, the concentration of exhaust gas will be greater at ground level and the oxygen concentration correspondingly reduced.



Liquid CO2 Cylinder Turn On Procedure

1. Ensure that the **Fill** valve on the CPD has been closed from the last operation.
2. Enter the subfab and locate the CO2 cylinder
3. Remove the handle from the center storage position
4. Place the handle of the stem of the "LIQUID" valve
5. Open the cylinder "LIQUID" valve and listen for leaks
6. If no leaks are heard proceed into the cleanroom

Prep your sample as needed

1. Ensure the sample does not dry out
2. Place the sample in the transfer boat and fill with the intermediate fluid

Water chiller

1. Turn on the water chiller main power (switch on back of unit)
2. Turn on the Control Power for the chiller (front panel switch)
3. Set the temperature of the chiller to 20 degrees C
 - a. Press the Set button
 - b. Use the Up & Down arrows to set the desired temperature
 - c. Press the Set button again to store the desired set-point
4. Wait until the temperature of the chiller has reached the desired set-point before proceeding

Install the Sample Holder into the CPD

1. Open the **Vent** valve slightly to slowly release any pressure buildup inside the CPD
2. Use the small round rod and slip it into the access door hole on the back of the CPD
3. Loosen the door and remove it from the CPD
4. Inspect the gasket for a smooth surface with no damage
5. Load the transfer boat into the CPD
 - a. Align the boat slot with the internal pin inside the CPD
6. Screw the access door back onto the CPD and tighten with the round rod

Pressuring the CPD with LCO2

1. The **Vent** valve should be slightly opened at this point, this will release any trapped air.
2. Open the **INLET** valve fully; the filling with liquid will be rapid. The filling liquid level can be viewed through the window.
3. Leave the **INLET** valve open, with the **VENT** valve slightly open to maintain the liquid level, and open the **DRAIN** valve to remove the substitution liquid. This flushing action should be continued for 3 minutes.
4. After flushing the chamber fill the chamber and close all gas control valves
5. Open the **Vent** valve slightly and allow the liquid to fall to the level of the top of the sample holder. The CO₂ level should be high enough to cover the sample & sample holder.
6. Adjust the chiller to 40 degrees C and turn on the **INLINE HEATER**. The temperature rise to 35 degrees C should take about 30 minutes.
7. Observe the Liquid CO₂ through the viewing window and at the same time monitor the **TEMPERATURE** and **PRESSURE** gauges.
8. Wait for the pressure to rise to about 1200 PSI and the temperature on the chiller to be 35 degrees C., turn off the **INLINE HEATER**.
9. Gradually open the **VENT** valve to slowly release the pressure within the chamber. Re-condensation of the CO₂ will occur if the chamber is vented too rapidly. The normal time to vent is 15 to 20 minutes. This corresponds to a rate of about 70 PSI/minute drop. As the pressure gets lower the **Vent** valve may need to be adjusted to keep the flow rate constant.
10. When the pressure of the chamber is at atmosphere, unscrew the access door and remove your sample
11. Reinstall the access door on the CPD

Shutting Down the CPD

1. Ensure the sample has been removed from the chamber
2. Ensure the access door has been screwed back on to the CPD
3. Ensure all valves are closed on the CPD
4. Exit the cleanroom, proceed to the subfab
5. Close the CO₂ cylinder and place handle on the center stem of the cylinder
6. Enter the cleanroom and open the **Inlet** valve of the CPD
7. Open the **Vent** valve to slowly release any CO₂ remaining in the lines.
8. Close all valves on the CPD.
9. Turn off the chiller.

NOTE:

Before re-use, the chamber must be cooled to at least 20 degrees C and must also be at a lower temperature than the CO₂ cylinder.