

ICE Oxford Lemon VTI User Manual

Startup:

1. Pump the vacuum jacket out for 24 hours or until it reaches 3×10^{-5} torr.
2. The system can be cooled with nothing in the sample well or it can have in place the dil. Fridge or the sample stick. It depends on the needs of the experiment how to choose to cool it down. In any of the cases the sample well should be pumped and purged 3 times with helium and left with -5psi of exchange gas.
3. Before opening the dump if any of the helium system lines have been disconnected, use a turbo pump to pump out the lines.
4. Have the ICE program running, close the needle valve, make sure all temperatures are reading correctly (VTI, sample stick if in use, 50K plate, sock/coldhead).
5. Test the through put of the needle valve.
 - a. Turn on the recirculating pump
 - b. Open the valves from the dump to the recirculating lines
 - c. Open the needle valve in 10% increments recording the pressure.
 - d. Make sure you have full flow before cooling.
6. Set the flow to be automated at 15mbar
7. Set the temperature to the desired temperature (1.5K or 8K depending on which insert you have in at the time).
8. Turn on the compressor (note this machine needs a 60A receptacle to run).
9. Frequently check back to make sure it is properly cooling. If it is not you will need to give it more attention with setting a needle valve setting and making sure the pressure stays high enough (15mbar or higher but not higher than 100mbar).

During Operation:

Operation is done through the computer program by entering a set point. This currently can only be done manually. The program does not work with ICP or ICE software.

Best practices for the machine would be to let it cool down to less than 50K before applying any heat if possible. This will cause less wear on the coldhead. The operating range varies from machine to machine, consult the log for details.

1. The compressor should remain on at all times, even when heating to room temperatures. This is to keep the cold stage from overheating.
2. If for any reason the compressor stops running, turn off the heater and contact someone on the user services staff.

Change of Sample:

1. Use helium gas on the manifold to fill sample well.
2. Unclamp the sample stick or dil fridge.
3. Wait for the pressure to cause the stick to “bubble”.
4. Remove the sample stick making sure to leave the o-ring.
5. Insert the new sample stick.
6. Pump and purge the sample well with helium 3 times.
7. Leave the sample well with 180m of 5psi from a standard latex tube.

Shutdown:

1. Close the valve on the manifold on the top of the dump to the foreline to the needle valve.
2. Set needle valve to passive and open needle valve fully to 100%.
3. Watch the analog pressure on the dump. Once the temperature on the sock has begun to rise above 4.5K turn off the compressor.
4. Let the helium return to the dump until the value on the dump reads 940 mbar and the value on the pressure in the return line is less than a mbar
5. Once all the gas has returned to the dump close all the valves on the lemon and on the dump and pumping lines.
6. Turn off the recirculating pump.
7. Monitor the system until it has reached room temperature.
8. Leave needle valve in the open position.

NOTES: If there is a reason that the system needs to be warmed up very quickly you can introduce 2 balloons of nitrogen gas into the vacuum jacket. But remember that the jacket will need to be pumped out afterwards.