

Lyophilizer

Prepared by Nick Wang

Equipment: Labconco Freeze Dry Sys/Lyph Lock 4.5

- Description
 - This system will lyophilize 4.5L of material before defrosting is needed. The 10 ports include 4 ½” and 6 ¾” for connecting to the sample bottles. (currently, we only have 4 ports open) The clear acrylic lid permits viewing frost buildup on condenser coil. This unit is mobile and is easily transported or relocated. The water removal system can evacuate 2L of water per day
- Specifications
 - Dimensions: (cm) 61Dx45.7Wx48-1/2H
 - Power requirements: 115VAC 60Hz 6.8A
 - Operating temperature: to -54°C (-65°F)
 - Condenser Rating: ½ hp
 - Weight: 68kg



Training: Nick (nxw52@case.edu)

Usage:

1. Startup:

Caution: If the machine is turned off, please talk to me first before starting up! The machine is likely turned off for defrosting.

Before startup, make sure all the ports are turned to vent, the lid is in position above the vacuum chamber and the water drain is plugged.



To startup, turn the refrigerator to “On-Man - Vac”. Wait a few minutes, and then turn on the vacuum on when the temperature is -40°C or less. For our machine, the temperature should drop to -48°C and 12×10^{-3} M Bar when both the vacuum and the refrigerator is turned on.



2. Use:

Caution: Only water/ice based samples can be used in the lyophilizer. No solvents!! Solvents will damage the pump!

Sample preparation

Before putting into the lyophilizer, the sample needs to thoroughly frozen using liquid nitrogen. All samples placed in lyophilizer should be frozen solid. Liquid samples cannot be placed in the lyophilizer. All samples placed in lyophilizer should not be enclosed in a sealed/tight lid, instead use a kimwipe secured by rubber band.



Sample Loading

Caution: Only add samples when vacuum is $33\text{E-}3$ M Bar or less.

The prepared sample should be placed into a sample bottle. Make sure the bottle cap/top is securely recapped after sample loading.

Before loading the your bottle, if there are other bottles already on the vacuum chamber, turns the dials on its ports to half way between vent and vac. This minimizes interference of loading new samples to already existing samples.

Load your sample bottle to a correct sized empty port. Once the sample is secured, turn the dial on the port from vent to vac slowly. Immediately, you should be able to hear the pump vacuuming the sample bottle. At this point the pressure display will increase dramatically, but in a few minutes, the pressure should drop back to initial values. If multiple sample bottles are to be added, only add addition bottles when the pressure is below $133\text{E-}3$ M Bar or less. Once all the samples have been added, turn back all the non-empty port dials back to vac so all samples on the lyophilizer will continue to freeze dry.



Sample Removal

To remove any samples, turn the dial on the desired port from vac to vent. Then removed the entire sample bottle before removing the sample inside the bottom

3. Turnoff

Caution: do not turn off lyophilizer after every use, only turn off to defrost, drain or repair.

Break the vacuum first, then off vacuum pump and then refrigeration

4. Defrost

When the ice build up in the vacuum chamber is significant, (you see lots of ice around the coils) the lyophilizer needs to be defrosted. To defrost, turn off the lyophilizer, remove the lid, and carefully remove the wooden support inside the vacuum chamber. Allow the ice build up to melt (you can also pour hot water on the ice, but only fill to the top of the stainless steal coil, if overfilled, water will enter the vacuum tube and drain into the pump). Once the ice has melted, clean and dry the vacuum chamber. Replace the wooden support and lid before starting up the lyophilizer again

5. Other maintenance

Drain water often to prevent build up

Check vacuum oil levels and condition frequently and change oil when necessary to ensure pump is functioning well.

Trouble Shooting:

Pump is on, but pressure will not decrease – make sure all the empty ports are on vent. If pressure still will not decrease, check seal around the ports and ensure no leak

Need Help?

Talk to Nick