

## Lyophilizer

### Virtis Lyophilizer (PSC 543)

### Labconco Lyophilizer (PSC 543, 637, NSC 460, Kell Hall 405)

**Every time you use the Virtis lyophilizer, you MUST sign the logbook.**

**Make sure white knobs are all turned the correct/closed direction. Closed is with the large white tab lined up with the small black rubber tab.**

**When you turn the vacuum off, release the vacuum by opening one of the ports. If you don't, the oil will be sucked up into the system.**

**Be careful when someone is already using the Lyophilizer – see instructions below (#13).**

**Be sure sample is frozen.**

**Be sure to drain water if the chamber has been defrosted. When you turn the vacuum off, release the vacuum by opening one of the ports. If you don't, the oil will be sucked up into the system.**

**Ice condenser is extremely cold – do not touch.**

**Utilization of acid requires extra cleaning and neutralization after defrost or physical damage will result.**

**Difference between Virtis and Labconco Lyophilizers: Virtis lyophilizer cools down to -110°C, Labconco cools to -80°C.**

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## Virtis Lyophilizer

**\*Vacuum meter is broken (OK, you don't really need it). "Automode" is also out of order.**

1. Check oil level of vacuum pump. Change oil if there is a problem with the lyophilizer holding a vacuum. Dispose of any used oil in the jar next to the pump. Clean up any spills.
2. Get rid of water in a water trap using drain tube every time before use. Snap tubing into drain (on the left side of the lyophilizer). Be sure to remove the tubing, otherwise water will go all over the place.
3. Put manifold (has a lot of black rubber ports) and plastic shield on water trap. The bottom plastic shield may also be off – place over water trap with small rubber rim up.
4. Turn on main power switch. It is behind the machine on the left.
5. Press "Refrig" and wait until temperature goes down to -100 °C. 30min or more. To read actual temp. select "Cond."
6. Press "Vacuum" and wait 30min.

7. To confirm that vacuum is OK, put a freeze dry sample bottle, which contains 3ml of H<sub>2</sub>O and start the vacuum by opening the port. You can visually see that a vacuum seal is formed by looking at the black seal between the manifold and the plastic cover on top. Without a good vacuum, the seal is grayish black and once the seal forms besides the fact that you can't open the plastic lid, the seal is dark black. Note the color of the seal before you start so you can tell the difference. The water should start freezing within a few minutes. If it does not start freezing, air is leaking from somewhere. Find it. Fix it.
8. Put your frozen sample in Freeze Dry bottle and start vacuum by opening port. . If your sample is not frozen, it will start to boil and you will lose it.
9. 30 min later, check your sample to make sure it is still frozen. If not, air is leaking from somewhere. Fix it. If your sample does not remain frozen, it will start to boil and you will lose it.
10. Once sample is dry, close port and remove sample bottle.
11. To turn off, open one valve to release the vacuum. Press "Vacuum" off.
12. Press "Refrige" to stop refrigerator. Remove the head part.
13. **If someone is already on the Lyophilizer** – you can still put your sample on. Close the vacuum valve on the other samples, put your sample bottle on. Open both your sample valve and the other sample valves. **When removing your sample bottle when someone else is also using the Lyophilizer** – close both valves, remove your sample bottle. Open the other sample valves.

When a lot of air is leaking, pump will start smoking. Find leaking part.

## Labconco Lyophilizer

Before starting:

1. Check oil level of vacuum pump. The front panel has magnets, just pull off to check. Change oil if there is a problem with the lyophilizer holding a vacuum or if looks dirty or cloudy. Dispose of any used oil in the jar next to the pump. Clean up any spills.
2. If the chamber has been defrosted or the lyophilizer has been turned off (lid should be to the side), you need to drain the water before proceeding. The drain tube is the black button near the bottom left of lyophilizer. Pull the tubing out, uncap and drain into the jar labeled water waste. Push tube back into hole and make sure recapped well.

Automatic

1. Turn on main power switch – front panel to the left.
2. Press refrigeration AUTO
3. Wait until temperature graph turns green + vacuum graph has one green and one amber lit. The graph is a cascade of lights. When the temp. and vacuum are right – the cascade should be all amber with the lowest light green. For samples that aren't as sensitive, you can put your sample on when the green light on the vacuum is 1 light from the bottom. The refrigeration graph should have the lowest light green.
4. SENSITIVE samples: should be added when only the lowest lamp is green.

5. To turn off: Break vacuum first. Press refrigerator **AUTO**
6. If there are samples already on the machine, put your sample on the valve and open the valve. When you are done, close the valve and remove your sample. If there are other people using the lyophilizer, be very careful that you don't leave the valve open unless either your sample is in place or the valve is closed.

#### Manual

1. Press refrigerator **MAN**
2. Press **VACUUM** when temperature  $\leq -40^{\circ}\text{C}$
14. Add samples when vacuum is  $\leq 133 \times 10^{-3}$  mbar
15. To turn off: Break vacuum first. Press refrigerator **MAN** and press **VACUUM**
16. If there are samples already on the machine, put your sample on the valve and open the valve. When you are done, close the valve and remove your sample. If there are other people using the lyophilizer, be very careful that you don't leave the valve open unless either your sample is in place or the valve is closed.

#### To defrost

1. Check to be sure drain plug is in place.
2. Turn off lyophilizer and let it sit o/n with lid to the side, this is usually long enough for the ice on the condenser to melt.
3. After defrost, clean and dry condenser chamber and drain the water.