

Use of the Gatan Dry Pumping Station



The chamber should always be left under vacuum!
Cryoholders should be stored in the station under vacuum when not in use.

The dry pumping station is primarily used for three purposes:

1. It is a safe place to store the Gatan cold holders when they are not being used. The proper way to store the holders is to leave them in the station under vacuum.
2. It is used to regenerate the zeolite desiccant in the cryoholder dewars. This is necessary so that the vacuum in the holders can be maintained which is important for holding a constant temperature when doing cryomicroscopy.
3. It is used to warm up the cold holders and to pump off the frost buildup that happens when the holder is removed from the microscope vacuum.

Turning on the Dry Pumping Station

1. All valves (1,2,3) should be closed.
2. To take out or to insert holder, open V1 & V3 to vent the chamber. When it vents the holder or the blanking plug may be pulled out.
3. Place the holder (or plug) into the specimen holder chamber.
4. Make sure that all valves on the station and on the holder are closed.
5. Turn on the power switch and wait until the LED on the right turns from yellow to green. The Penning gauge meter should quickly read 10^{-5} Torr.

Warming up a Holder

This procedure is usually done immediately after removing the holder from the microscope.

1. Make sure that the pumping station is running down to proper vacuum, and that the holder is properly connected (follow turning on procedure).
2. Turn on the SmartSet controller.
3. Plug the control cord into the holder.
4. Turn the knob until you get to the **Start Warm-up Cycle** option. Push the knob to select the option.
5. Hit the button labeled [**Yes**].
6. If the LED light on the dry pumping station is green open the butterfly valve V2.
7. Open butterfly valve V1.
8. When the cycle is complete and the vacuum is back to 10^{-5} Torr close valves V1, V2 and V3.
9. Turn off the dry pumping station and the SmartSet controller.

Shut down procedure

1. Close all valves (V1, V2 and V3).
2. Turn the power off. Remember that the station's pumps will be vented, that is why all the valves should be closed to keep the station under vacuum

Running the Zeolite Cycle to Regenerate a Holder

Note: Gatan recommends running the zeolite cycle about once every week. The standard procedure is to run the cycle overnight before cryo work on the F20.

1. Make sure that the station is running, down to proper vacuum, and that the holder is properly connected (follow turning on procedure). Connect the plastic tubing from the pumping station (V3) to the port underneath the vacuum valve of the cryo-holder dewar.
2. Turn on the SmartSet controller.
3. Plug the control cord into the holder.
4. If the LED light on the dry pumping station is green open the butterfly valve V2.
5. Open butterfly valve V1 and wait for vacuum to get 10^{-5} Torr.
6. Open V3 to max. The pumping station will then evacuate the line to the holder and the LED light may momentarily turn to yellow. Wait until it changes back to green (10^{-5} Torr).
7. Open the valve on the holder (do not pull it out).
8. The zeolite cycle would not run if the holder is colder than room temperature. The temperature in the room is sometimes cool enough that the controller gives a temperature error message. If this happens run the warmup cycle for a few minutes until the temperature in the holder is above 20° C. Then hit a button to cancel that

cycle and continue.

9. Turn the knob until you get to the **Start Zeolite Cycle** option. Push the knob to select the option.
10. If you plan on running the cycle for the default two hour period hit the button labeled [**Yes**]. If you want a longer cycle period push the knob. An asterisk will appear in front of the two hour default time on the display. Turn the knob till the desired time and hit [**Yes**].
11. When the cycle is complete close the valves in the opposite order that you opened them: the valve on the holder, then V3, V1, and finally V2.
12. Turn off the dry pumping station and the SmartSet controller.