

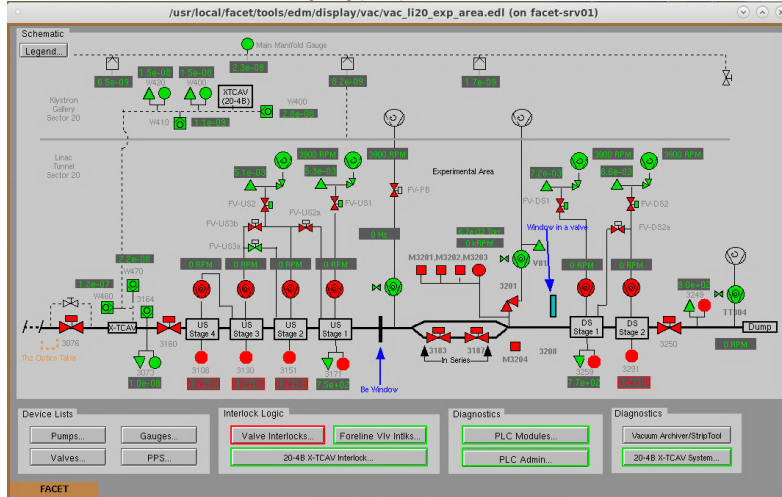
How to restart DPS after IP and TPS pump down

Procedure for starting the DPS system when the IP and US-DPS areas are under rough vacuum < 1Torr from a pump down.

Step-by-step guide

Prep:

1. Pump down the IP and US-DPS simultaneously.
2. Open the LI20 Vacuum page on Epics, then click on the "DPS full schematic..." button near the center of the page. This will open the full schematic that shows the forelines and roughing pumps.

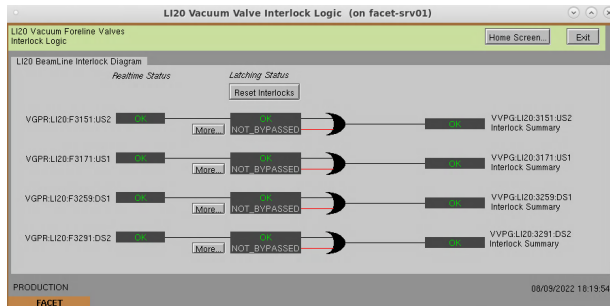


3. Confirm that the roughing pumps are running. The foreline valves should already be closed at this point (FV-US2, FV-US1, FV-DS1, and FV-DS2).
 - a. The picture above shows the correct statuses of roughing pumps and foreline valves.
 - b. If the roughing pumps are not running then click on their symbol and push Run
4. Stop the DPS watcher:
 - a. Go to facethome Matlab GUIs... GOTO Watcher
 - b. Press "stop" beside "Diff. Pumping"



Restart the DS-DPS:

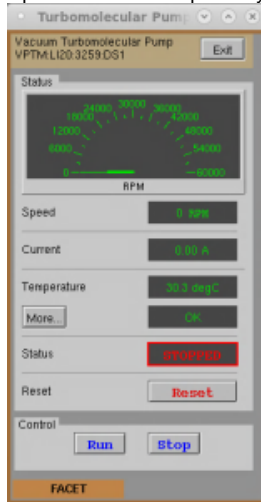
1. When the IP pressure (read on 3259 guage) is < 1 Torr, then start the PB turbo (VPTM:LI20:3175).
2. If the oven turbo (VPTM:LI20:M3202) is already running then you can open valve 3201 now.
 - a. If it is not running, then first start the oven turbo, then open valve 3201.
3. When the 3259 guage reads <1e-2 Torr then you can open the FV-DS1 and FV-DS2 valves to start pumping through the roughing pumps.
 - a. If the foreline closes immediately then the pressure is still too high in the beamline and the interlock tripped
 - b. To clear the foreline interlock:
 - i. Open the "Foreline Vlv Intlks..." page from the DPS full schematic page
 - ii. Push "Reset Interlocks"



iii.

4. Start the turbopumps:

- Open the DS1 turbo panel by clicking on the turbo symbol above "DS Stage 1" Press Run
- Open the DS2 turbo panel by clicking on the turbo symbol above "DS Stage 2" Press Run



c.

- Confirm that the speed continues to increase. It should reach a nominal speed of ~27000 RPM after about 5 minutes and the vacuum should be reading on gauges 3259 and 3291 $<1e-7$ very quickly.
- If the CC gauge 3291 is not reading while the 3259 gauge reads $<1e-5$, then you have to turn 3291 on manually
 - Open the 3291 gauge panel
 - Press "Turn on" beside the words "Cold Cathode HV"
 - Confirm that it powers on after a few seconds

Restart the US-DPS:

- When the 3171 gauge reads $<1e-2$ Torr then you can open the FV-US1 and FV-US2 valves to start pumping through the roughing pumps
- If the foreline closes immediately then the pressure is still too high in the beamline and the interlock tripped
 - To clear the foreline interlock:
 - Open the "Foreline Vlv Intlks..." page from the DPS full schematic page
 - Push "Reset Interlocks"
- Close the manual valve to the TPS Compact (you can now vent and disconnect from the beamline)
- Start the turbos:
 - Open the US1 turbo panel by clicking on the turbo symbol above "US Stage 1" Press Run
 - Open the US2 turbo panel by clicking on the turbo symbol above "US Stage 2" Press Run
 - Open the US3 turbo panel by clicking on the turbo symbol above "US Stage 3" Press Run
 - Open the US4 turbo panel by clicking on the turbo symbol above "US Stage 4" Press Run
- Confirm that the speed continues to increase. It should reach a nominal speed of ~27000 RPM after about 5 minutes and the vacuum should be reading on gauges 3259 and 3291 $<1e-7$ very quickly.
- If the CC gauges 3108, 3130, and 3171 are not reading while the 3259 gauge reads $<1e-5$, then you have to turn 3291 on manually
 - Open the each CC gauge panel
 - Press "Turn on" beside the words "Cold Cathode HV"
 - Confirm that it powers on after a few seconds

Finishing up:

- When the pumps are up to speed **restart the DPS watcher!**
- Open the watcher panel again: (facethome Matlab GUIs... GOTO watcher)
- Press "start" beside Diff. Pumping
- Wait for the red circle to turn green
- Check that all the pumps are still running and foreline valves are open (FV-US1, FV-US2, FV-DS1, and FV-DS2)



Common problems:

1. Turbos shut themselves off Turn off the DPS watcher
2. Valves close themselves Either the interlocks are tripping, or you need to stop the DPS watcher

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