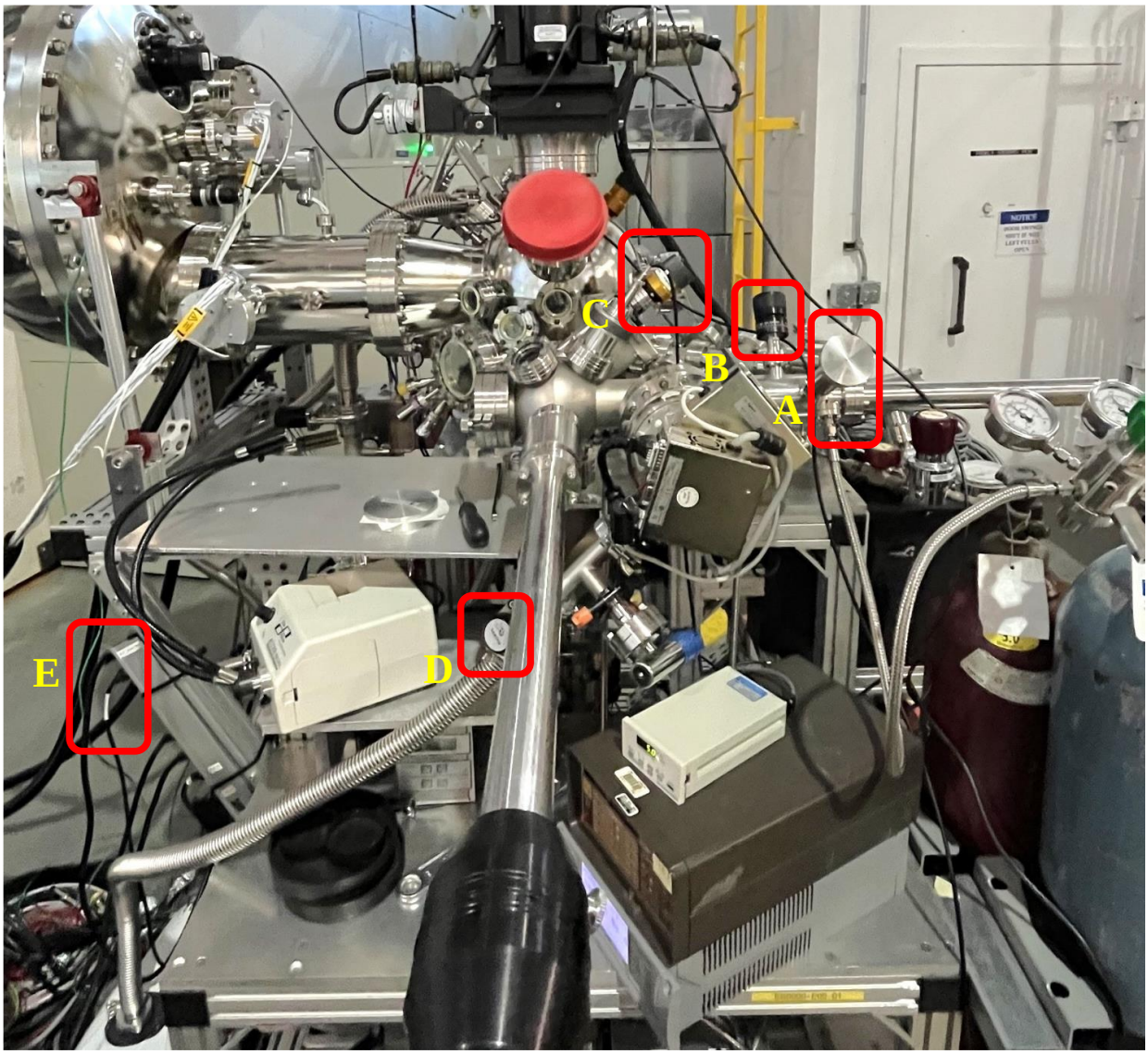
Loading Samples into the XPS Endstation

Component Reference:

- **A:** Nitrogen gas valve
- **B:** Sample rack knob
- **C:** Gate valve between main chamber and load-lock
- **D:** Roughing pump valve knob
- **E:** Turbo pump power cord plug



Part 1: Loading Sample Plates into the Load-Lock

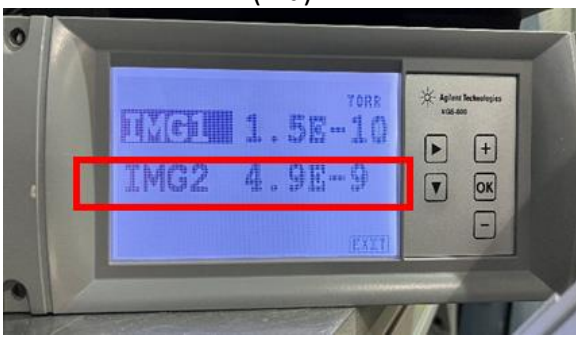
1. Ensure the Gate Valve is Closed

Before venting the load-lock with nitrogen gas, **confirm that the gate valve (C)** between the **main chamber and load-lock** is **fully closed**.

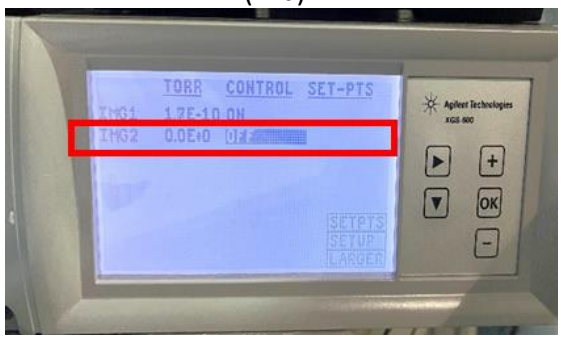
2. Turn Off the Ion Gauge (IMG2)

a) On the ion gauge controller, use the drop-down arrow to select **IMG2**, which shows the **load-lock pressure**.
b) Press the **"-"** button until "off" appears, then press **"OK"** to turn it off. The IMG2 pressure reading should drop to **zero**.

(2-a)



(2-b)

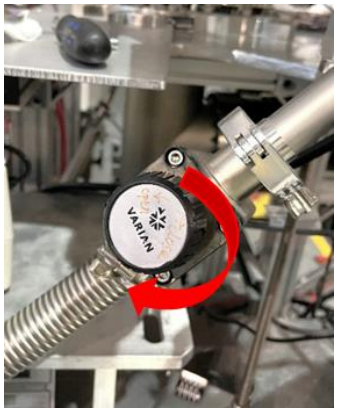


3. Unplug the Turbo Pump

Disconnect the **LL-labelled power cord** of the turbo pump from the electric outlet.

4. Close the Roughing Pump Valve

Turn the **roughing pump valve (D) clockwise** to close it.



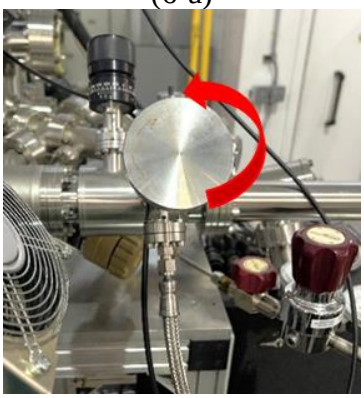
5. Open the Nitrogen Gas Cylinder

Turn the cylinder valve **counter-clockwise** to fully open it. Check the **Swagelok gauge** to ensure the pressure is around **20 psi**.

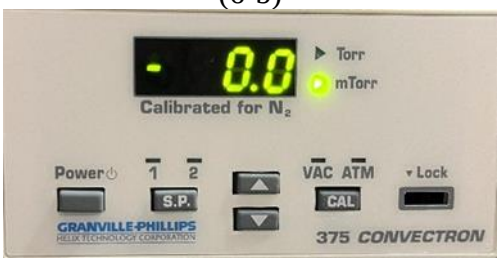
6. Introduce Nitrogen Gas

Slowly open the **nitrogen valve (A) counter-clockwise** (6-a). Use the **TCG controller** (6-b) to monitor the pressure and introduce nitrogen at a rate of **1–2 Torr per second**.

(6-a)



(6-b)



7. Vent the Load-Lock

Loosen the **load-lock door knob** (counter-clockwise) and wait for the TCG controller to show a pressure of approximately **700 Torr**.

8. Open the Load-Lock Door

Once pressure exceeds 700 Torr, use a screwdriver to **gently open the load-lock door**.
Keep nitrogen flowing while the door is open.

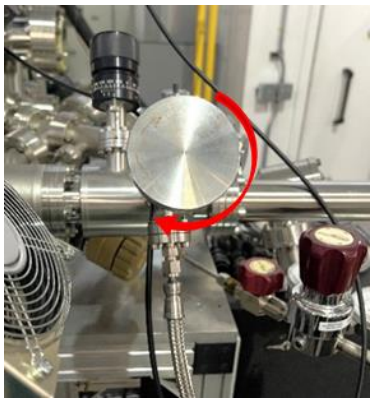
9. Load the Sample Plates

Turn the **sample rack knob (B)** to extend the rack. Load up to **5 sample plates**, ensuring each is securely fixed.

Note: Before closing the load-lock door, **clean the door and O-ring** using a Kimwipe lightly moistened with **methanol**.

10. Close the Load-Lock

Fully close the **nitrogen valve (A)** (clockwise), then close and **finger-tighten** the load-lock door.

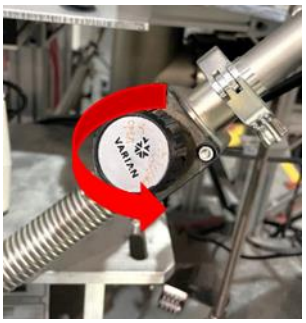


11. Restart the Pumping Process

a) Close the **nitrogen gas cylinder** (clockwise).
b) Open the **roughing pump valve (D)** (counter-clockwise).

(11-a)

(11-b)



12. Wait for Initial Vacuum

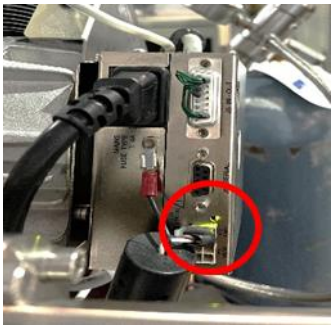
Monitor the **TCG controller** until pressure drops below **100 mTorr**.

13. Reconnect the Turbo Pump

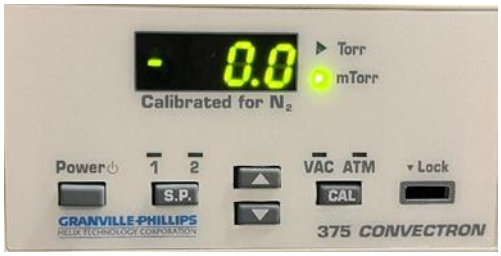
Plug in the turbo pump's power cord.

a) A **green light** will flash on the turbo pump, then stabilize.
b) Wait until the TCG controller reads approximately **-0.0 mTorr**.

(13-a)

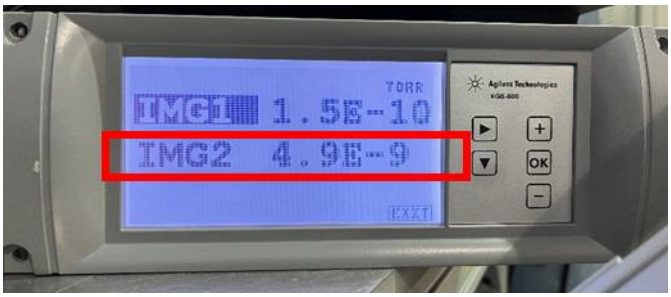


(13-b)



14. Turn On the Ion Gauge (IMG2)

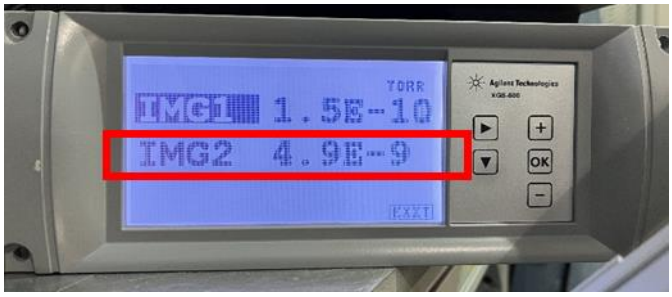
- Select **IMG2** on the controller.
- Press the **"+"** button, then **"OK"** to turn it on.
- Wait until IMG2 shows a pressure of **10^{-8} Torr or lower** before proceeding.



Part 2: Transferring a Sample Plate to the Main Chamber

1. Check Load-Lock Vacuum

Ensure **IMG2 pressure** reads **≤ 10^{-8} Torr**.

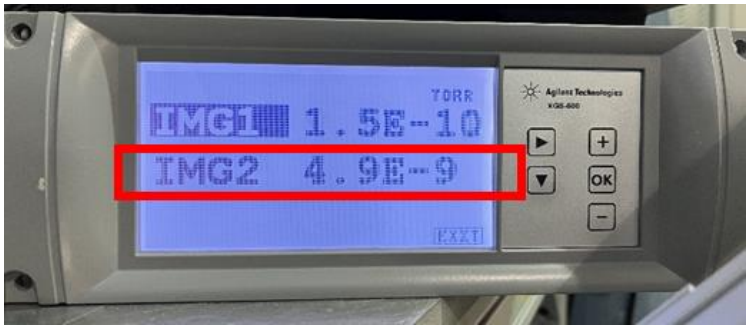


2. Open the Gate Valve

Open the **gate valve (C)** (counter-clockwise) between the **main chamber and load-lock**.

3. Confirm Main Chamber Vacuum

Verify **IMG1 pressure** remains around **10^{-9} to 10^{-10} Torr**.



4. Use the Transfer Arm

Use the **transfer arm** to retrieve a sample plate. Insert it into the **main chamber carefully**, keeping the arm steady and avoiding rotation.

Note: Only **one sample plate** may be transferred at a time.

5. Mount the Sample

Align the sample holder using the **sample rack knob (B)** and gently insert the plate into the rack.

6. Retract and Close

Return the transfer arm to its original position and **close the gate valve** between the main chamber and load-lock.

7. Ready for Measurement

Your sample is now loaded, and the system is ready for measurement.

Last Updated: May 01, 2025