

## NEOCERA PLD INSTRUCTIONS

### Loading/Unloading

1. Set N<sub>2</sub> pressure to about 10kPa
2. Press ↓ on cold cathode controller to turn off gauge
3. Close gate valve
4. Flip **Pump** switch to turn off RP and TMP
5. Open black valve on N<sub>2</sub> line (near regulator)
6. Loosen nuts on port
7. Wait for TMP to reach 500Hz. Solenoid valve will open to vent TMP.
8. Open **Vent** valve
  - a. Note: The pressure needs to be at atmosphere within two minutes.
9. Close the black valve and the **Vent** valve once atmosphere is reached
10. Disconnect power and thermocouple cables and remove heater column

### Pumping Down

1. Insert heater column and secure with nuts
2. Make sure **Process Gas** and **Course** valves are closed
  - a. Open if you're going to grow in process gas
3. Open gate valve
4. Flip **Pump** switch and wait for pressure to drop to ~1 mTorr
5. Press ↑ on cold cathode gauge controller
6. Wait ~30 minutes to reach 10<sup>-6</sup> Torr

### Deposition

1. Move middle mirror in optics tower to zero.
2. Open **Control Target Motors** window in the Neocera PLD program.
3. Use single laser pulses to figure out where to position the turret
4. Use both rotation and rastering (generally target position +- 5-10 degrees)
  - a. Important: Start this before you start heating the substrate. Otherwise the temperature controller program messes up and you go back to room temperature.
5. Turn on process gas flow if you're using one.
6. Turn on the power to the temperature controller and the heater
7. Set to desired substrate temperature and set ramp rate.
  - a. Don't exceed 10C/min
8. After finished depositing, turn off raster and rotation.
9. Ramp the temperature down.
  - a. Note: this isn't useful for temperatures below about 300C.
10. Shut off process gas if needed.

### Process Gas

1. Make sure **Coarse** valve is open before you start pumping down. Gas cylinder should be closed.
2. Pump down the chamber.
3. Close **Coarse** valve.
4. Turn switches on MFC to **On** and **Flow**
5. Adjust flow rate to get desired pressure
  - a. If going above 10 mTorr, almost close the gate valve.