



DEPARTMENT OF ELECTRICAL ENGINEERING

PVA PS 210 USER MANUAL

CAUTION:

1. Wear gloves when touching anything that will go in the chamber.
2. The wafers and wafer boat can become VERY HOT. Be careful when removing items from the system!

COMMENTS:

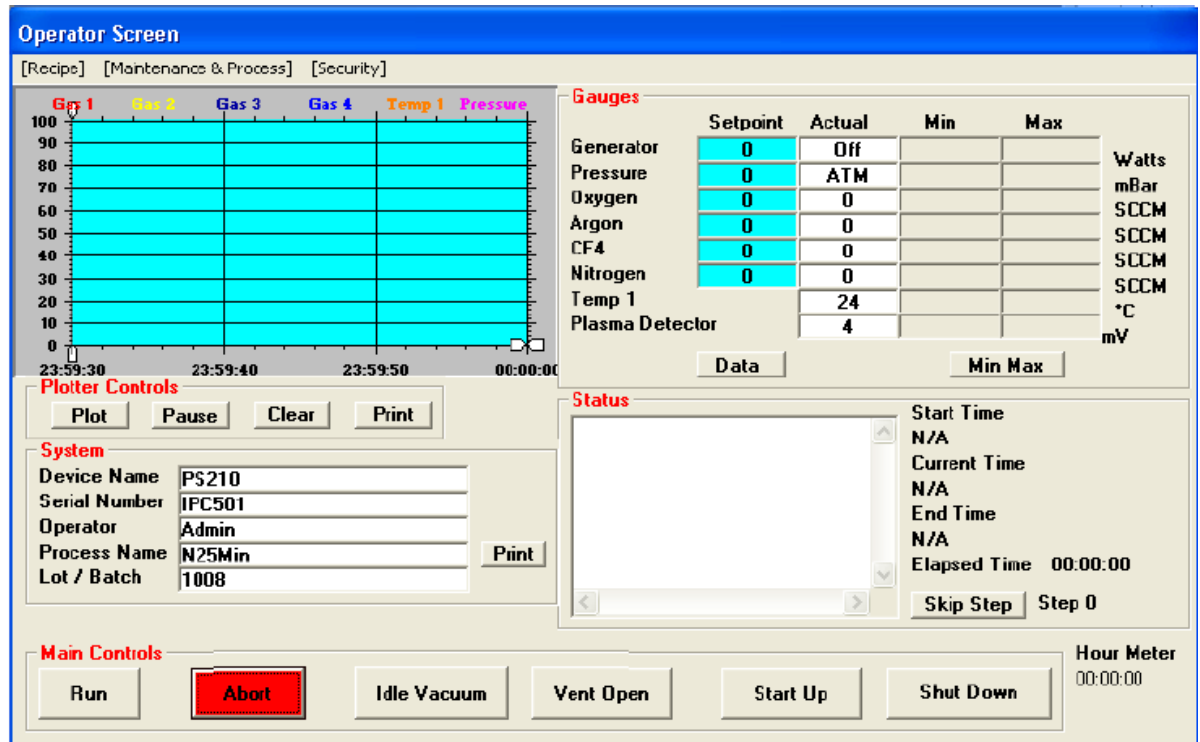
The PS 210 is a general purpose plasma system generally used to remove photoresist and other carbon sources from wafers. The system utilizes 2.45 GHz Microwave power and can control pressure between 210 and 2100 mT. It is capable of flowing 500 sccms of O₂ and applying up to 600 Watts of microwave power. The system is generally used for the following applications:

- * Plasma surface modification
- * Plasma cleaning of organic surfaces
- * Bond strength enhancement
- * Plasma etch applications
- * Plasma asher applications
- * Increased or decreased wettability
- * Any other plasma system application



RUNNING A RECIPE:

1. Enable the system in iLab
2. Start the mechanical pump by pressing the “START” button located on the rear of the machine
3. Select the “Recipe” tab and select your recipe. It should show in the Process Name Row on the system software



4. Click "Vent Open". When the "Do you want to purge?" dialog box appears click "No".
5. Allow system to vent to Atmosphere and open door
 - DO Not lean on door
 - DO Not Open Door Up past 90 degrees
 - Install Faraday Cage if necessary
6. Load your wafers into the boat leaving at least one empty space between each wafer.
7. Close the door. While holding the door shut, click "Run" and wait until the vacuum system pulls the door closed.
8. The system will now control the pressure, gas flow and power. After the recipe has finished, "Recipe Completed" will appear in the "Status" box.
9. Open the door and remove your wafers. Be careful as they may be VERY HOT.
10. Close the door. Select "Idle" from the "Recipe" menu. Select "Run".
11. The "Idle" recipe will pump the chamber down to < 100 mTorr and then close the vacuum valve.
12. Once the "Recipe Completed" appears, turn the mechanical pump off by pressing the "STOP" button located on the rear of the machine.
13. Disable the machine in the iLab.

WRITING A RECIPE:

1. If the system is off, press the green power button on the front of the machine and wait for the computer to boot. If the Windows desktop is showing, proceed to step 3.
2. Open the “Start” menu and select “PS210 Tools”.
3. Enter the username (Proc) and password (Proc00X). The password must be changed frequently and will be updated to the next number (i.e. Proc001, Proc002, etc.)
4. Once the software opens, select “Tools” and “Recipe Designer”.
5. Recipes for the PS210 consist of a series of steps. For each step can vary “Controls”, “Termination” and “Alarms”. “Controls” is used to determine what the system is doing regarding pump, vent, gas flow, pressure regulation and power settings. “Termination” determines what will cause the step to end and proceed to the next step. “Alarms” allows parameter specific alarms to be generated.
6. It is easier to edit existing recipes than to create new ones. To load a pre-existing recipe select “Data” and “Load Recipe”.
7. Most recipes created for the PVA will consist of 8 steps:
 1. A pump-down step using the “fast” vacuum setting. This step will terminate when the desired pressure is reached.
 2. A gas-flow stabilization step. During this step the generator power is selected and “remote” is enabled. This allows the magnetron to warm up. Termination is accomplished by time or pressure range.
 3. A process step. Pressure regulation (if chosen) is accomplished by a throttle valve. Gas flow, pressure and microwave power will determine the etch rate for this step. Termination is controlled by time.
 4. A purge step. Purge step has the same gas flows as the previous step while simultaneously pumping on the chamber. Termination is controlled by time (> 1 min.)
 5. Pump down step. Pump down the chamber using the “fast” vacuum setting for 1 minute.
 6. Slow venting is done by enabling the “slow vent” control with Vacuum “closed” for 45 secs.
 7. Fast venting is done by enabling the “fast vent” control with vacuum “closed for 15 Secs.
 8. An “end” step. This step turns off all gas flows, power settings and pressure regulation and the “End of Recipe” check-box is selected.
 9. **Important!** Regardless of process, all recipes must include a gas and power-stabilization step of at least 1 minute and a purge step of at least 1 minute.

8. Each step must be turned-on by selecting the “Active step” check-box at the bottom of the screen.
9. Once you have created your recipe, select “Data” and “Save Recipe”. Be sure not to overwrite any recipes you have modified!
10. Close the Recipe Designer by pressing the X button in the upper right-hand corner and then select “Securities” and “Logout” from the Configuration Menu.

STARTING THE SOFTWARE:

1. If the system is off, press the green power button on the front of the machine and wait for the computer to boot. If the Windows desktop is showing, proceed to step 4.
2. The computer has a touch screen and a keyboard. Open the “PS210 Controller” icon on the desktop by “double-clicking” the touch screen.
3. Enter the username (Proc) and password (Proc0XX). The password must be changed frequently and will be updated to the next number (i.e. Proc001, Proc011, etc.)

General Information:

For problems, clarifications of procedures, or general information pertaining to this machine, please contact lab staffs.

staff-ndnf-list@nd.edu
