Laurell Spin Coater (PV LAB)

Safety guideline:

The spin processor uses high voltage electrical power, mechanical motion, and varying temperatures in the processing of semiconductors. Safety precautions MUST be followed. Use care when opening or closing lids. Lids are heavy, and if dropped accidentally may cause injury. The chuck on the spin motor can spin in excess of 10,000 rpm. Keep hands and other body parts away from process chamber area.

Equipment Operation

1. Switch on the compressor unit and spin coater from the main power plugs.

2. Open the cover (LID) and centre your wafer on the chuck. Also, CDA (Clean Dry Air) should be displaying on the LCD of the controller indicating there is not vacuum applied yet.

3. Open the valve which connects the CDA to the spin coater, make sure that the pressure meter shows 60-90 Psi (the status will change from CDA to LID indicating that there is enough vacuum and CDA compressor unit will go to sleep mode automatically).
(Without the proper CDA 60-90 Psi the system will not operate)

4. Make sure an external vacuum pump is connected to the vacuum pipe outlet of the spin coater.

5. Press the "Vacuum" button on the control panel. This locks the wafer down on the chuck. The display should flash the up arrow (↑) and a number in front of "VAC" indication on LCD when vacuum is successfully applied. If this number is not over 20.0, DON'T run the spinner (mostly displays maximum no. 25 in case of our lab spin coater). The ↑ shows that the vacuum key was pressed and the ↓ shows that the vacuum key was not pressed.

6. Select the program you want to run by holding the **"Select Process"** button (the key is active when the green LED is illuminated) and using the **UP/DOWN** arrow keys to go through all the programs.

7. If you want to customize existing program or create a new one hold down "**EDIT MODE**" key.

This key is active when the green LED is illuminated. From the "Edit Mode" the user can enter the "Select Process Mode", Run Mode" or "Info Mode". The "Up Arrow (↑)" and "Down Arrow (↓)" keys can be used to move from line-to-line. The "Tab <" (**pg up**) or "Tab >" (**pg dn**) keys can be used to switch the highlighted field into an **"*editable*"** field. The "FWD" or "REV" keys are used to move from step-to step within a program.

8. Apply the material to the wafer. Press the RUN Mode key to enter a selected program from the "Select Process" screen into the "run mode." This made the start key active; pressing this **"START KEY"** will begin processing.

Displayed fields are the operation mode/program name, step-of-steps, vacuum status, set point time, agitation rate, actual wafer RPM, set point RPM and spin rotation direction, valve, sensor and type status for each step of a program. The last line of the display will show the processor status and error messages.

*This "**START key"** is disabled until the vacuum, seal purge, exhaust and lid interlocks are satisfied. This key is active when the green LED is illuminated.*

9. Press the "**VACUUM TAB"** after the running program is completed to release the vacuum. Take down your wafer/sample carefully with the help of a tweezer.

10. Clean the inside surfaces of the spinner, including the drain hole. Clean the chuck also, but do not force compressed air in the centre hole, and don't allow any fluid to leak down either.

11. Leave the machine with the lid open and clean up any mess around it.

Note: The **"STOP KEY"** will **"**Stop" the current program from completing the process program. When running a program in "run" or "edit" mode, the stop key will, when pressed, stop the process from completing the step, the motor will stop spinning and any active valves will close. The step and time is retained and if start is pressed again, the processing will resume where the process stopped. This key is active when the green LED is illuminated.

The **"PAUSE KEY"** will "Pause" the current program from completing the process program. When running a program in the run mode, the "pause" key will, when pressed, pause the process program time from proceeding. The motor will continue to spin, and any active valve will remain on but the remaining time is ignored. The step and time are retained and if "pause" is pressed again, the processing will resume. This key is active when the green LED is illuminated.

Maintenance/Tips/Notes:

- Always use an aluminium foil sheet to properly cover the inside surface of the spinner in order to protect the instrument from precursor contamination.

- Properly clean the chuck of the coater after each use.

- All substrates regardless of size or shape must be centred on the vacuum chuck. Off-centred substrates will cause vibration at high spin speeds and may cause a loss of vacuum.

- It is recommended to clean the process bowl with an appropriate solvent (Acetone, IPA etc.) when processing is completed at the end of the day, but never flood or spray solvent directly into the keypad surface.

- The vacuum path is not designed for any pressure. Air pressure or any liquid forced or drawn into the vacuum chuck will very likely damage the vacuum sensor, seals, motor and electronics.

- There should not be any mechanical intervention during the program running.

- To prevent chemicals from entering into the vacuum path, the chuck and O-ring (black coloured rubber vacuum seal) surface must be clean and defect free. A chuck wet test can be performed to check the integrity of the O-ring seal. Using a clear substrate, place the wafer on the chuck and press the vacuum key. Using a bottle of DI water spray water around the periphery of the substrate where it meets the chuck while manually rotating the chuck. Check to see if there is any leakage across the O-ring.