1 SCOPE

The purpose of this document is to detail the use of the PE 2400B. All users are expected to have read and understood this document. It is not a substitute for in-person training on the system and is not sufficient to qualify a user on the system. Failure to follow guidelines in this document may result in loss of privileges.

2 REFERENCE DOCUMENTS

- Material Safety Data Sheet
- Appropriate Tool Manuals

3 DEFINITIONS

n/a

4 TOOLS AND MATERIALS

4.1 General Description – The PE 2400B is a DC sputtering system with a manually operated vacuum system.

5 SAFETY PRECAUTIONS

5.1 Hazards to the operator

5.1.1 Voltage – The PE2400B employs AC, DC and RF energies that are dangerous and may be fatal to personnel. Do not attempt to defeat protective interlock systems.

5.1.2 Compressed Gases – The PE2400B is operated with compressed gases. Do not attempt to defeat protective interlock systems. Evacuate the area immediately if the presence of these gases is suspected and notify SMFL staff member.

5.1.3 Mechanical Hazards – Drive assemblies have sufficient power to cause injury. Keep hands, fingers, clothing and tools clear of moving parts.

5.2 Hazards to the tool

5.2.1 Since the vacuum system is manually operated, it is important to operate in the proper sequence to avoid damage and downtime.
6 INSTRUCTIONS

6.1 Initial State Check

6.1.1 In Service Chase 2725 make sure the PE2400B nitrogen is on.
6.1.2 Swipe in on the card swipe system.
6.1.3 Record the base pressure from the Varian Vacuum Ionization Gauge. If the gauge is not on, press PWR and then press and hold ON. The range should be set to the log scale.
6.1.4 On the Ultek Auto Pumpdown Control make sure the key is in Manual and the switches are in the following positions:
   6.1.4.1 Gas down.
   6.1.4.2 Throttle Valve down.
   6.1.4.3 HiVac Pump up.
   6.1.4.4 HiVac Valve up.
   6.1.4.5 Foreline Valve down.
   6.1.4.6 Roughing Valve down.
   6.1.4.7 Mechanical Pump up.
   6.1.4.8 Vent Valve down.

6.2 Resetting the System

6.2.1 If the system needs to be reset contact a staff member.

6.3 Operating the system

6.3.1 Vent and Open the Chamber

   6.3.1.1 Turn off the Varian Vacuum Ionization Gauge with PWR button.
   6.3.1.2 Close the Hi-Vac Valve by turning the switch down.
   6.3.1.3 Open the Vent Valve by turning the switch up.
   6.3.1.4 Manually open the green valve on the right side of the chamber.
   6.3.1.5 Wait for the chamber to vent. You should see a separation where the seal is.
   6.3.1.6 Press and hold the Hoist Up switch.
   6.3.1.7 Load the substrates so they are not under the target that will be used.
6.3.2 Closing and Pumping down the Chamber

6.3.2.1 Clean the o-ring with IPA.
6.3.2.2 Press and hold the Hoist Down switch.
6.3.2.3 Manually close the green valve on the right side of the chamber.
6.3.2.4 Turn off the Vent Valve by turning the switch down.
6.3.2.5 Rough pump the chamber by turning the Roughing Valve switch up.
6.3.2.6 Let it pump for about 10 minutes and then turn the Roughing Valve switch down. The Millennia readout should say P1 4-3.
6.3.2.7 Open the Hi-Vac Valve by turning the switch up.
6.3.2.8 Turn on the Varian Vacuum Ionization Gauge with the PWR button. Press and hold the Ion Gauge On button. Make sure it is on the log scale.
6.3.2.9 Pump to the E-6 range.

6.3.3 Pre-Sputtering

6.3.3.1 Turn off the Varian Vacuum Ionization Gauge.
6.3.3.2 Turn the Gas switch up.
6.3.3.3 Turn the Throttle switch up.
6.3.3.4 Open the Argon switch on the top left of the system.
6.3.3.5 Set the flow on the MKS to 20 sccm.
6.3.3.6 Make sure the target selection is correct.
6.3.3.7 Turn on the breaker to the ENI system.
   6.3.3.7.1 If display reads INTLK OPEN, then press FAULT RESET button. If display still reads INTLK OPEN, then seek assistance from the Equipment Engineer.
   6.3.3.7.2 Make sure that ENI system is in the DC mode. Press Menu until RPG Menu is displayed. Press Item until Pulse Mode is displayed. If Pulse Mode is On, turn it Off with the rotary knob. Press Exit when finished.
   6.3.3.7.3 The display on line 2 of the ENI system should end with “s”. If not press RUN MODE button until “s” is displayed.
   6.3.3.7.4 Turn the rotary knob to set pre-sputter time in seconds.
   6.3.3.7.5 Press the RUN MODE button until the second line of the display ends with Constant Run in straight DC power mode or “ns” in pulsed DC power mode. Turn the rotary knob to the pre-sputter power value that matches your desired sputter power.
   6.3.3.7.6 Press the RUN MODE button several times until line 2 on the ENI ends in “s” again.
   6.3.3.7.7 Press the ON/OFF button to distribute power to the target. The power will shut off after the programmed time.
6.3.4 Sputtering

6.3.4.1 Turn on the Nova PD Speed Control to start the platen rotating.
6.3.4.2 The ENI should still be on after the pre-sputter.
   6.3.4.2.1 The display on line 2 of the ENI system should end with “s”.
       If not press RUN MODE button until “s” is displayed.
   6.3.4.2.2 Turn the rotary knob to the desired pre-sputter time is seconds.
   6.3.4.2.3 Press the RUN MODE button until the second line of the display ends with Constant Run in straight DC power mode or “ns” in pulsed DC power mode. Turn the rotary knob to the pre-sputter power value that matches your desired sputter power.
   6.3.4.2.4 Press the RUN MODE button several times until line 2 on the DC Power Supply ends in “s” again.
   6.3.4.2.5 Press the ON/OFF button to distribute power to the target.
   6.3.4.2.6 When the sputtering is finished, turn off the breaker to the ENI.

6.3.5 Unloading the Chamber

6.3.5.1 Turn off the Nova PD Speed Control.
6.3.5.2 Turn off the Argon on the top left of the tool.
6.3.5.3 Turn Gas switch down.
6.3.5.4 Turn Throttle switch down.
6.3.5.5 Turn Hi-Vac Valve down.
6.3.5.6 Turn the Vent switch up and manually open the green valve on the side.
6.3.5.7 Wait for the chamber to vent. You should see a separation where the seal is.
6.3.5.8 Press and hold the Hoist Up switch.
6.3.5.9 Remove the substrates.

6.3.6 Pump Chamber back down

6.3.6.1 Press and hold the Hoist Down switch
6.3.6.2 Manually close the green valve on the right side of the chamber.
6.3.6.3 Turn off the Vent Valve by turning the switch down.
6.3.6.4 Rough pump the chamber by turning the Roughing Valve switch up.
6.3.6.5 Let it pump for about 10 minutes and then turn the Roughing Valve switch down.
6.3.6.6 Open the Hi-Vac Valve by turning the switch up.
6.3.6.7 Turn on the Varian Vacuum Ionization Gauge with the PWR button.
       Press and hold the Ion Gauge On button. Make sure it is on the log scale.
6.4 Errors during Run
6.4.1 If there are any difficulties with the run contact a staff member.

7 APPROPRIATE USES OF THE TOOL

REVISION RECORD

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<tr>
<th>Summary of Changes</th>
<th>Originator</th>
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<td>Original Issue</td>
<td>Sean O’Brien</td>
<td>A-01/02/07</td>
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