Denton e-beam evaporator - instructions for manual operation

Log in on Reservation System
Start logbook notations.

Loading sample and pumping down:
1. Close HI-VAC and WAIT FOR 20 SECONDS.
2. Turn on VENT.
3. Load the sample. MAKE SURE THERE IS NO WATER LEFT ON THE SURFACE OF THE SAMPLE.
4. Close the door, turn off VENT
5. Turn on ROUGH. Let rough until the THERMOCOUPLE GAUGE reads ~ 150 mtorr. Make sure that the knob below the gauge is set to CHAMBER.
6. Turn off ROUGH.
7. Open HI-VAC. THERMOCOUPLE GAUGE will read ~ 0. HIGH VACUUM GAUGE reads the pressure now. The knob below the gauge should be set to CHAMBER and the black switch to READY.
8. Wait for the pressure to be 6 x 10^{-6} torr or lower.

Evaporation:
1. Turn on HIGH VOLTAGE (red button). After turning on the High Voltage, slowly turn up the voltage to 10 kV - this is the operating voltage
2. Set up the thickness monitor.
3. Turn FILAMENT on (red button). Slowly increase current until the beam is visible, then ramp up at not faster than 10 mA per minute.
   The Sweep function should be used with Cr and SiO_2. If you are not using the Sweep function, skip down to step 6.
4. Turn on the XY Sweep control, and with the setting on Man, adjust beam to the center of the crucible.
5. Adjust the sweep so that the entire inside of the crucible is “swept” by the beam.
6. Resume slowly increasing the current to the desired setting. The pressure in the chamber will rise. If it goes above 1 x 10^{-5} Torr, the e-gun will shut down. Wait for the pressure to go down and repeat step #6 again until the metal steadily evaporates.
7. To evaporate on the sample, press START, ZERO, and MANUAL on the thickness monitor.
8. After desired thickness is reached, press STOP on the thickness monitor.
9. Bring the current down to 0. If you need to evaporate another metal, wait for 5 minutes to cool the crucible, then move to the next crucible and repeat steps 2 through 6.
10. Turn down the High Voltage to zero. Turn off High Voltage (green button).
11. Turn off FILAMENT (green button) and wait for 5 minutes for the crucible to cool down.

Venting the chamber:
1. Close HI-VAC and WAIT FOR 20 SECONDS.
2. Turn on VENT.
3. Unload the sample. Remove crucibles that normally do not stay inside.
4. Close the door, turn off VENT and turn on ROUGH. Let rough until the THERMO-COUPLE GAUGE reads ~ 150 mtorr.
5. Turn off ROUGH.
6. Open HI-VAC. THERMOCOUPLE GAUGE will read ~ 0. HIGH VACUUM GAUGE reads the pressure now. Push the black switch to READY.
7. COMPLETE THE LOGBOOK AND CLEAN AFTER YOURSELF.
8. Report any problems or unusual behavior to the staff immediately.