Metal Depositon Chamber

User manual

SAFETY INFORMATION - The Metal deposition chamber is designed for safe and efficient operation when used properly and in accordance with this manual. Failure to observe the following precautions could result in serious personal injury:

- The Metal Deposition Chamber is an electrical instrument. To avoid electric shock, please observe all standard precautions.
- Deposition Chamber should not be used **without proper cleaning** of chamber.
- Connections between boat and electrodes should be proper otherwise there will be no flow of current.
- Don't touch the outside connections.
- Do not open the chamber door when the chamber is under vacuum.

Operation:-

1. Switch on main power.
2. Switch on water tab check out let.
3. Switch on main switch.
4. Switch in MCB.
5. Switch on rotary pump.
6. Switch on pirani gauge and select GH1 for backing and GH2 for roughing.
7. In backing vacuum should be < 0.020 bar then closed backing valve and open roughing valve and select GH2 in pirani gauge and roughing vacuum should be < 0.020 bar.
   [GH2- show the vacuum pressure in chamber and GH1- show pressure between the roughing and backing created by rotary pump.]
8. Close the roughing valve, open the backing valve, check the GH1 (<0.020 bar) once reached.

9. Switch on the chiller for supply the water.
10. Switch on the diffusion pump, wait for 45 minutes.
11. Roughing and Backing will never be ON at same time and whenever diffusion pump will be ON then backing valve will be ON. During these 45 minutes, the diffusion will ready to create vacuum, mean is oil will heat up.
12. Open the high vacuum valve.
13. Wait till reaching high vacuum < 10^{-6} bar in the penning gauge. (use the liquid nitrogen).
14. Switch on the 'LT' varying the current in Amp meter. [for Al 25A for 15 sec]
15. Switch on the DTM and wait for 40 seconds.
16. Then press STP and then press STR
17. Now rotate LT control clockwise.
18. See the LT meter. LT meter show value of current in Amp

[RATE- shows deposition rate

Thickness- shows thickness of film

DNT- density of Metal (shows in thickness column)
INC- increase the number
DEC- Decrease the number]

19. Once evaporation of material is "over" and the deposition is complete, now shut down system.
20. Prees the STP and off the DTM.
21. Rotate LT control anticlockwise.
22. Current value should be zero and off the LT.
23. Close the high vacuum valve.
24. Switch off the Diffusion pump and penning gauge then then wait for 30 minutes.
25. Close the backing valve.
26. Switch off rotary pump and switch off pirani gauge.
27. Switch off main switch and water connection.

For plasma cleaning-

After the step 7-

1. Close the backing valve and open the roughing valve. Check GH2 (<0.020 bar) reached.
2. Switch on HT and now rotate to button HT control button.
3. Read HT meter and see the chamber upto glow. [Primary current must be < 50 Amp for 1 min.]
4. Wait 5 minutes and after then switch off HT.

Close roughing and open the backing valve

NOTE-

1. In 15-20 days, open the gas ballast button for remove moisture (in back side).
2. Before start the instrument, chamber should be proper clean.
3. Check the water in chiller.
4. Check the thickness monitor if it needs to be changed.
5. Check the oil in the rotary pump.
6. Use the vacuum grease frequently.
7. Check the connection outside and inside the chamber before starting the instrument.