

Typical Operating Procedure

- Open compressed N₂ at main tank. [Fig 1]

Note: There are currently three valves as shown in Fig 1.
- Switch SYSTEM VENT to ON (up). [Fig 2c]
- Once READY indicator illuminates, [Fig 3a] wait 1 min.
- Hold HOIST in RAISE position [Fig 3a] while switching off SYSTEM VENT (down) [Fig 2c]. Raise hoist until it clears four threaded posts.
- Remove platen *with gloved hands* and place on clean, smooth surface, clip-side up.

Note: Carefully vacuum debris on chamber floor using portable vacuum cleaner.

Note: The e-beam shutter may stick. Press SHUTTER [Fig 4e] a few times to “exercise” it. Leave shutter in closed position.
- Judiciously fasten samples to platen.

Note: Do not use hardware not approved for system.
- Tighten all platen hardware. Remove unused hardware.
- Carefully blow compressed N₂ across samples to remove unwanted debris.
- Carefully return platen to chamber. Align crystal monitor shadow over crystal monitor in chamber.
- Note crystal health [Fig 4]. Change crystal if necessary

Note: See *Quartz Crystal Replacement* manual.
- Switch to manual index control and normal rotation. [Fig 6b]
- Rotate to each crucible pocket [Fig 6c] to be used, ensure each is filled.

Note: A current list of metals is posted on rack.
- Center first pocket in source window by rotating indexer [Fig 6c] both clockwise and counterclockwise.

Note: Indexer has a “drag” that tends to require user to “wind” and “unwind” crucible platen to center crucible in window. If platen is rotated one cycle in normal direction, switch indexer to reverse [Fig 6b] and rotate one cycle.
- Switch indexer to AUTO. [Fig 6b]
- Inspect large flange upon which hoist rests for any signs of debris. Remove debris to assure proper seal.
- Hold HOIST switch in LOWER position. [Fig 3a]

Note: When hoist is near bottom of descent, rotate upper chamber as needed to center on flange, and completely lower chamber.
- Switch ROUGH VALVE [Fig 2a] to ON (up) position.
- Allow chamber to pump to $\sim 2 \times 10^{-3}$ Torr.
- Switch ROUGH VALVE [Fig 2a] to OFF (down) position.
- Switch Hi-Vac to ON (up) position.
- After approximately 30 minutes, ion gauge may be safely switched on by pressing ION button [Fig 5]. After 1 min, record vacuum pressure in logbook.
- When vacuum pressure has reached $\sim 2 \times 10^{-6}$ Torr, open



Fig 1

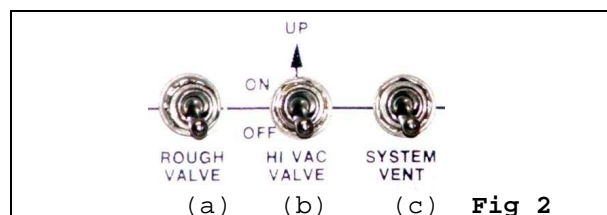
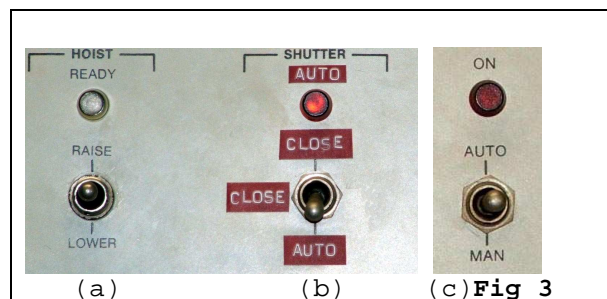


Fig 2



(a) (b) (c) Fig 3



Fig 4 (a) (b) (c) (d) (e)



Fig 5

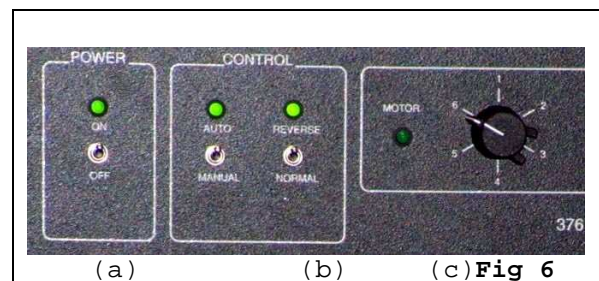
water supply (S), then water return (R) valves located on wall near control rack.

23. Switch ON main power [Fig 8a] and wait 2 min.
24. Press ON button [Fig 8b] for e-beam emission.
25. Press START button [Fig 4a].
26. Choose program [Fig 7] making any necessary changes.
27. Press START [Fig 4a] to begin deposition.

Note: If maximum power alarm sounds, press RESET on deposition control panel to continue deposition. Record any such events, including percent power at which alarm occurs, in logbook. Alarm may sound several times during deposition.

Note: If shutter gets stuck during deposition, press ABORT [Fig 4b] on control panel and start over.

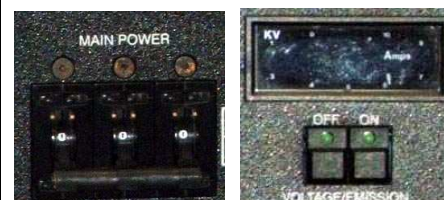
28. Wait for PROCESS READY on LCD panel. [Fig 7]
29. Press OFF button [Fig 8b] on e-beam control panel.
30. Press OFF button [Fig 5] on ion gauge controller.
31. Wait 2 minutes.
32. Turn main power switch off. [Fig 8a]
33. Close water supply (S) and water return (R) valves.
34. Switch Hi-Vac to OFF (down) position. [Fig 2b]
35. Ensure compressed N₂ is opened at main tank. [Fig 1]
36. Switch SYSTEM VENT to ON (up) position. [Fig 2c]
37. After READY indicator illuminates [Fig 3a] wait 1 min.
38. Hold HOIST switch in RAISE position, [Fig 3a] and switch SYSTEM VENT to OFF (down) position. [Fig 2c]
39. Once hoist is above four threaded posts, remove platen and place on clean flat surface.
40. Carefully remove samples.
41. Securely fasten all screws and return platen to chamber.
42. Hold HOIST at LOWER position [Fig 3a] until chamber is centered and sealed.
43. Switch ROUGH VALVE to ON (up) position. [Fig 2a]
44. Wait 5 minutes.
45. Switch ROUGH VALVE to OFF (down) position. [Fig 2a]
46. Close N₂ valves at tank [Fig 1] if not in use by others in the lab.



(a) (b) (c) Fig 6



Fig 7



(a) (b) Fig 8

Note: It is best to leave vacuum systems under vacuum when not in use for extended periods of time.