Thermal Evaporator

(Edwards Auto 306)

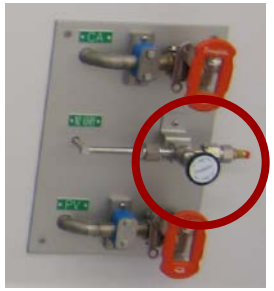
Basic User Manual

3rd Edition Aug 2012 NR

Before Getting Started

- Water recirculater switch should be **ON**

- Auto 306 power switch should be **ON**
- Nitrogen flow at the wall should be **ON**



- Press **VENT**
  - Display Indicates:

- **If system is OFF or if POWER FAIL turn to final page of manual for start up instructions**

Load the Chamber

- Open chamber door.
- Affix sample to holder.
- Place filament heaters into source **1, 2, and/or 3**.
- Filament heater **1** is **ALWAYS** reserved for **Al**.
- Filament heater **3** is **ALWAYS** reserved for **Au, Pt, or Ag**
- **Assure clear line of sight from source to sample and xtal**

Load the Chamber

- Press **CYCLE**

- Wait for the display to read: FINE PUMPING
- When the pressure reading is $\leq 2 \times 10^{-5}$ torr you may begin coating (this may take ~ 30 min).

Layer Thickness Monitor Data

- Ensure power control HT/LT is set to 0.
- If FILM THICKNESS MONITOR reading is not 0, press RUN pause then press RUN again until 0 appears and only LEDs to “crystal” and “nm” are on.
- Assure shutter is set to CLOSED.
- Press DATA to highlight the LAYER.
- Set LAYER to appropriate material for current layer
- Press DATA to check if density and Z values match material

Coat the Sample

- Switch the **HT/LT selector** to **LT** and source to desired material
- **Slowly** rotate the power control on the HT/LT controller to obtain a current that is required for evaporation. While increasing the current, ensure that:
  - Vacuum reading increases
  - The heating filament glows
  - The reading from the display on **THICKNESS MONITOR** increases
- Adjust the current value carefully until you get a satisfactory evaporation rate (~0.1 nm/s).
  - For an adhesion layer, 5 – 10 nm of Cr is sufficient
- When desired thickness is obtained, slowly decrease the current to 0.
- Turn the HT/LT selector to 0.

Coat the Sample – Layer 2

- Assure shutter is set to **CLOSED**(click run to change)
- Press **DATA** until the **LAYER** reading displays then change to 2 with the up or down arrows.
- Continue pressing **DATA** until only the LEDs corresponding to “crystal” and “nm” are on.
- Turn the **HT/LT** selector to **LT** for the second metal layer.
- Note the thickness reading

Coat the Sample – Layer 2

- Set LAYER to appropriate material for current layer
- Turn source to correct number for desired material
- Adjust the current value carefully until you get a satisfactory evaporation rate.
  - For gold, a normal working current is ~ 20 amperes
- When a suitable thickness is obtained, slowly decrease the current to **0** by rotating back the power control knob.
- Turn the HT/LT selector to **0**

Unload the Chamber

- Allow chamber to **cool for 15-30 minutes** before proceeding
- Press **VENT**
  - Display reads: CHAMBER VENT
- Carefully open chamber (do not force open)
- Take out the coated samples **(chamber may be HOT)**
- Carefully close chamber.
- Press **CYCLE**
  - Display reads: FINE PUMPING
- Leave chamber in fine pumping mode

System Startup

- Turn the cooling water switch to **ON** – Do not adjust the flow rate.

- Turn the Auto 306 power switch to **ON**
  - Display Indicates: POWER FAIL
- Press **RESET**
  - Display Indicates: STANDBY
- Press **START**
  - Display Indicates: PUMPS ON → BACKING → TURBO → START → SEALED

Emergency System Shutdown

- With system in high vacuum press **SEAL** then **STOP**
- Wait >30 minutes for turbo pump to slow

- Turn the Auto 306 power switch to **OFF**

- Turn the cooling water switch to **OFF** – Do not adjust the flow rate.