Thermal Evaporator
(Edwards Auto 306)
Basic User Manual
Before Getting Started

- Water recirculator 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 $< 2 \times 10^{-5}$ 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.