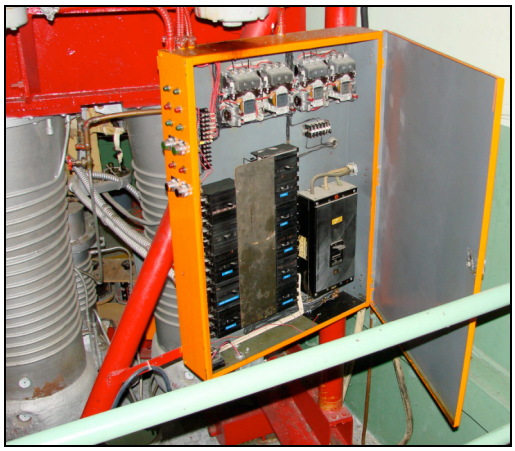
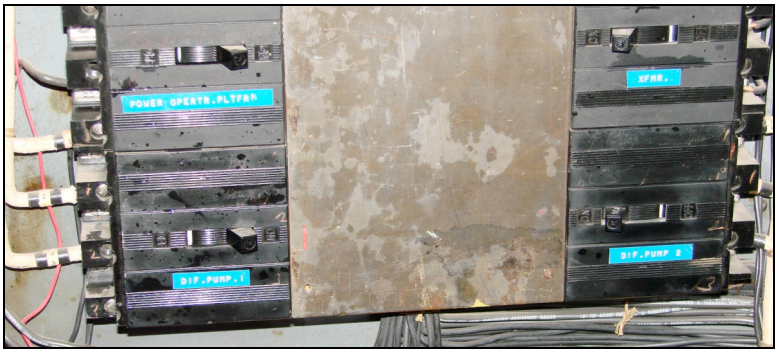
120″ Coating Chamber Operation

Introduction: This chamber is used for coating our Mountain optics. Our plans are to send most optics 40″ and smaller to the coating chamber in Santa Cruz where they can do special coatings. We only coat with aluminum here and we no longer use SiO overcoating because of the light loss from this coating.

Safety: High vacuum, hot surfaces (DP heaters), cold surfaces (cold traps), Ln2 handling for cold trap, dry ice handling for cold trap, high pressure nitrogen gas cylinder use, and ladder use (high work). Use proper safety equipment and safety training for these various conditions.

Setting Up: To start we turn on the DP heaters and turn on the DP cooling water just before we start cleaning the optics to be coated. That way the pumps will be warmed up and pumping when the optics are placed in the tanks.





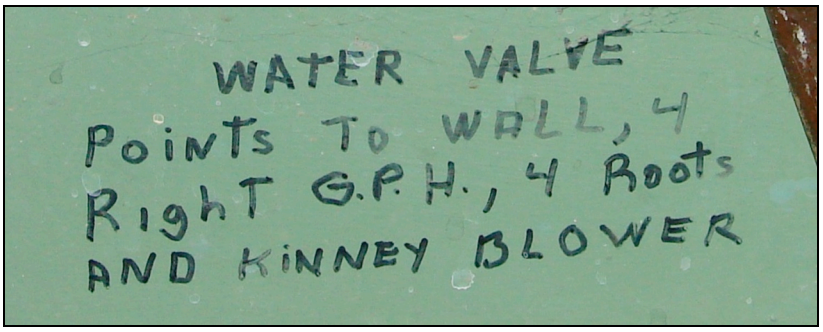
The two bottom breakers are labeled “DIF PUMP 1 & 2”

120″ Coating Chamber Operation

The hose from the sink goes to the Kinney pump. The valve on the wall to the right is the cooling water for the DP's. Open that valve fully. Watch that water is flowing into the bucket from all four cooling lines on the DP's. Run the black drain hose from the white pail to the floor drain in front of the coating chamber.

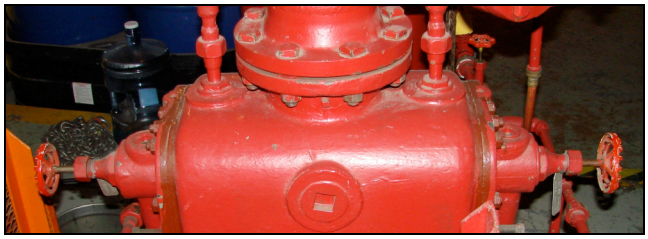
The hose hooks to the Kinney pump just above the pressure regulator and flows out into the drain in the floor. Remove the pipe plug in the drain assembly to see that water is really flowing from the two pipes then replace the pipe plug.

120" Coating Chamber Operation

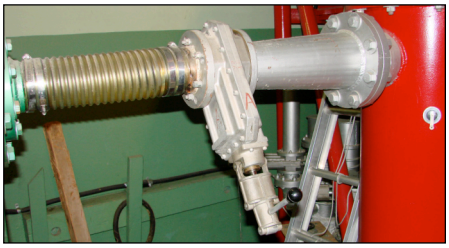


Read the writing on the wall. The faucet over the mop sink cold water valve handle gets pointed to the wall and that provides the flow of cooling water needed for the Kinney and Roots blower. Check the flow at the drain as stated on the previous page.

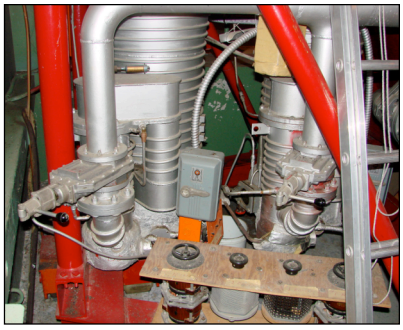
Next turn on the Kinney pump (yellow switch housing) and start pumping on the back side of the diffusion pumps.



Turn on the pump by pushing the start button then close the two back pressure relief valves shown in the picture above. Close both right and left valves by turning them clockwise.



Open the valve located between the Roots blowar and cold trap. (left)

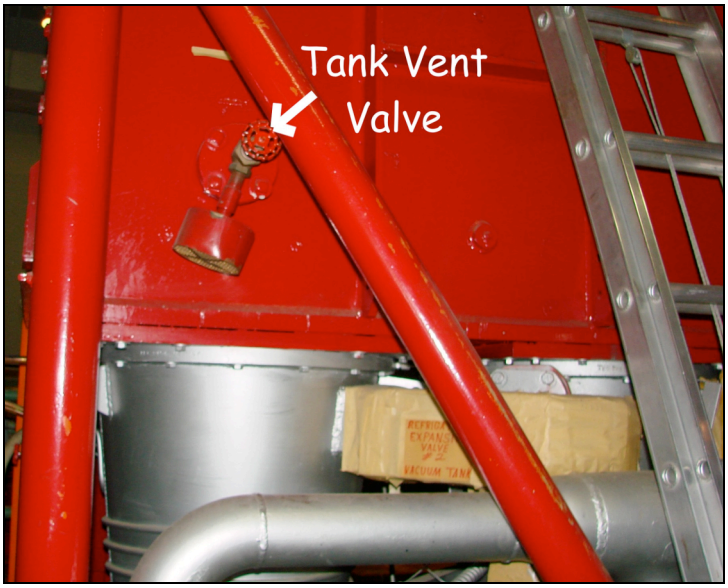


Open the two DP booster valves located to the left of the cold trap. That will help keep the pumps cool while waiting to open the DP main valves.

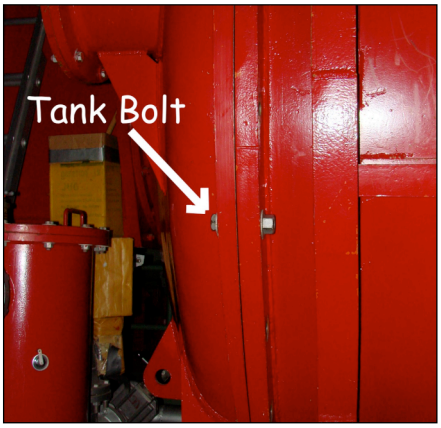
Now its time to fill the cold trap with dry ice pellets to prevent the backflow of oil into the vacuum system.

Climb the ladder enough to remove the cover from the trap and fill the center hole of the trap with the dry ice. Use the stick that is located by the trap to tamp the ice periodically to keep the ice in good contact with the sides of the trap.

120″ Coating Chamber Operation

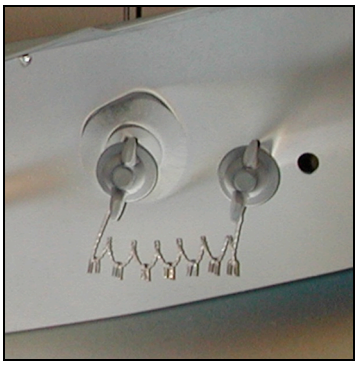


While warming the DP's up you can open the tank by first venting the tank opening the "Tank Vent Valve" then remove the two tank flange bolts that are holding the tank closed.



Load the optic into the tank

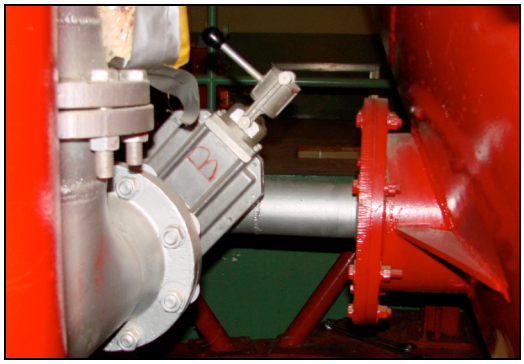
You should have loaded the aluminum staples and checked the integrity of the tungsten elements prior to starting tank operation. See the chapter on tank loading and staple making.



After final cleaning and inspection of the optic in the chamber close and bolt the tank firmly.

- Close the tank vent valve.
- Close the DP booster valves.
- Open the tank roughing valve slowly.
- Turn on the Roots blower.

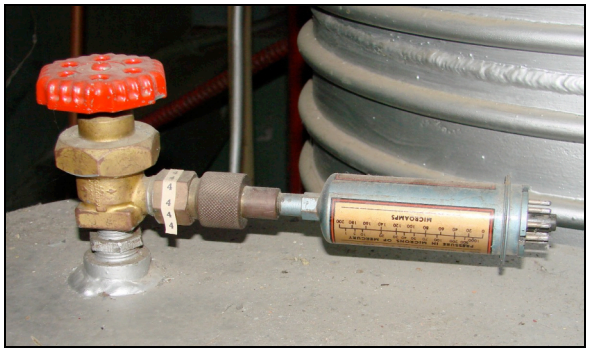
The Kinney pump is still running, now assisted by the Roots blower. The blower starts automatically at the proper vacuum pressure.



Tank roughing valve.

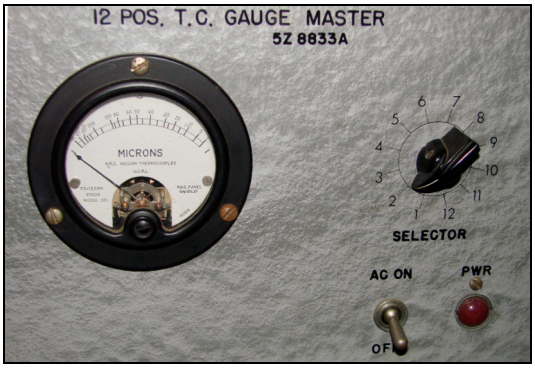
120″ Coating Chamber Operation

Time to hook up the thermocouple vacuum gauge cables on the DP boosters. The cables are coiled up on the part of the tank that rolls on the tracks (south side). See the pictures to the right and below.



TC location on the DP booster.

The readout for the thermocouple gauges is in the rack at the operator platform. Turn on the toggle switch and set the rotary knob to the TC you want to read out. The gauge reads out in microns.



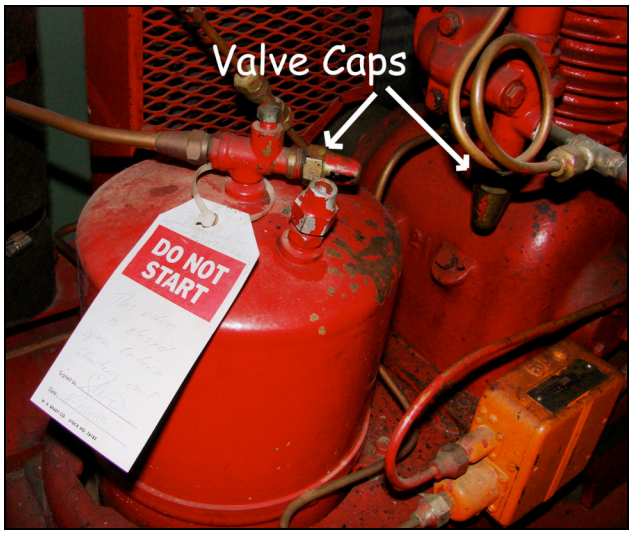
Chiller Pumps – Not currently used.

Refrigeration Pumps

These pumps are not used at the present time because they are low on refrigerant and they don't seem to help the pumping of the chamber that much. If they are needed at some point the system must be recharged.

When in use only one pump is running. The other is a spare.

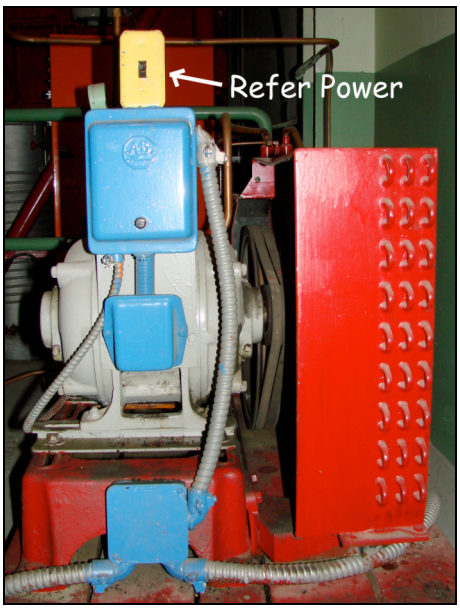
120″ Coating Chamber Operation



Remove the valve caps and using a refrigeration wrench open the valves.

This releases the refrigerant into the system. Turn on the pump. Look at the sight glass and see if there is fluid passing by the window.

When shutting down close the valve on the pump first and wait for all the fluid to leave the sight glass then close the valve on the tank and turn off the pump.

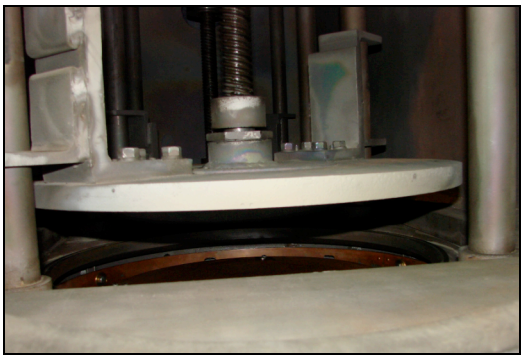


End of chiller Section

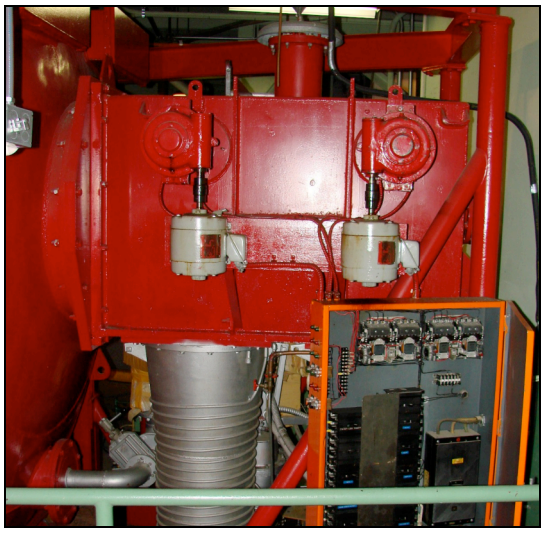
When the Thermocouple reading the tank pressure gets to __ microns its time to turn on the Varian vacuum gauge. The Varian gauge is on top of the rack at the operator's station. The power toggle switch is located and labeled below the meter on one of the rack panels.

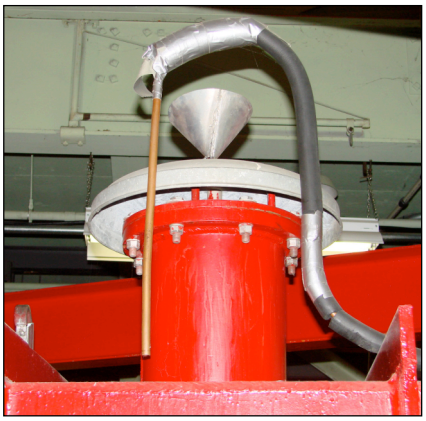
120″ Coating Chamber Operation

Opening DP main valves



This image shows inside one of the DP valves partially open.

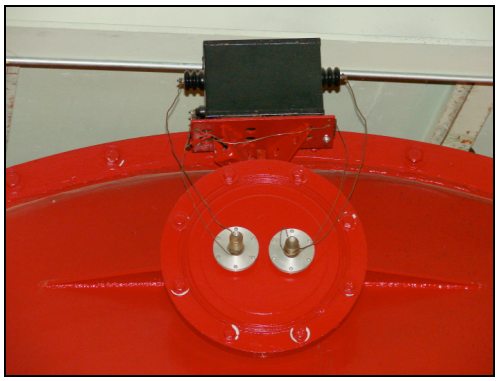


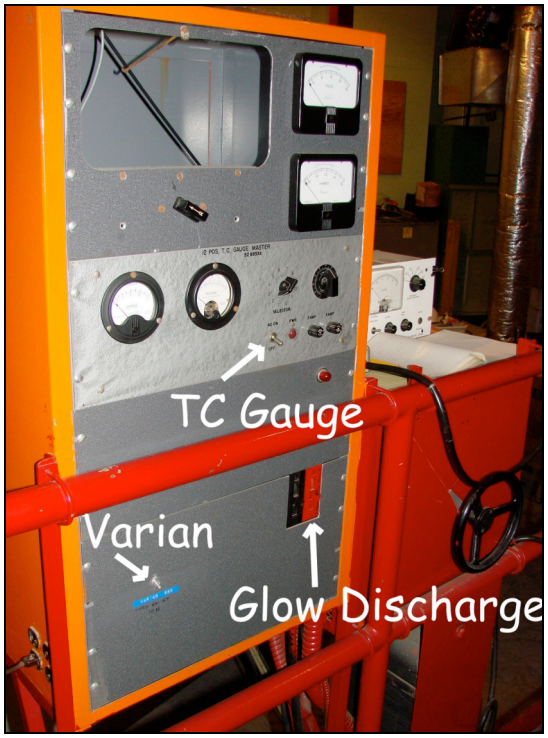


When the DP's are opened its time to fill the tank cold trap with liquid nitrogen. This trap is located on top of the DP valve chamber.

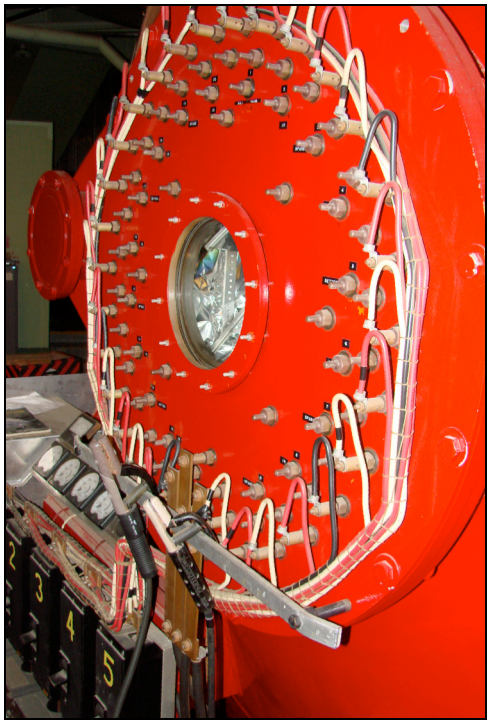
120″ Coating Chamber Operation

The glow discharge ring is wired in the coating chamber on insulators and is connected to the high voltage transformer on the top front of the tank. It is turned on from the control below the gauges.

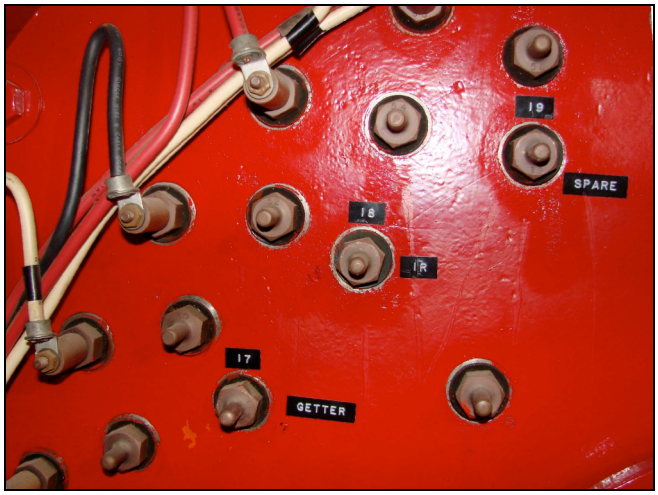




The Control Panel

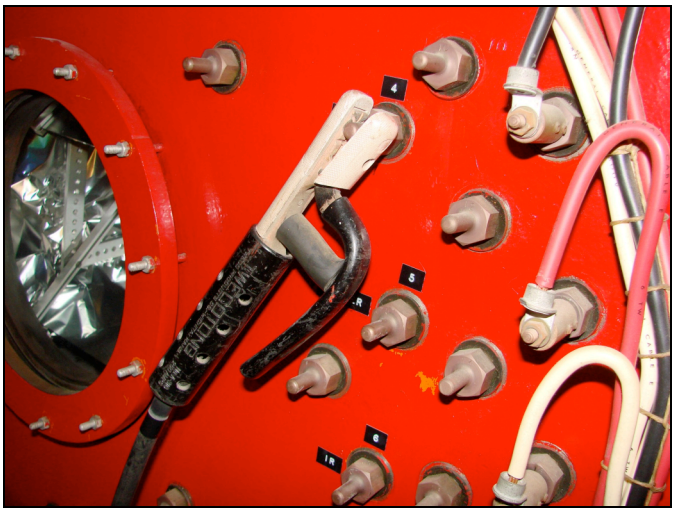


The Inner Ring Connector Plate

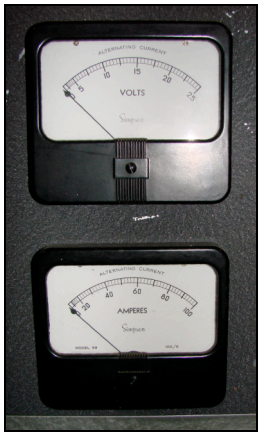


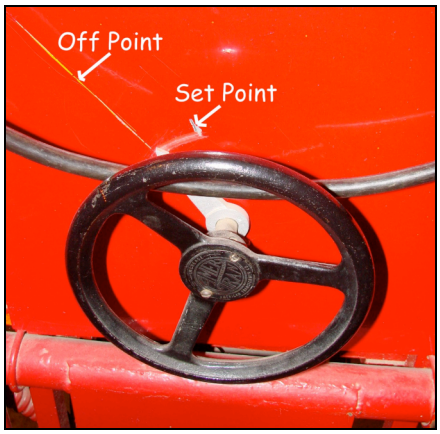
Connectors numbered and labeled.

120″ Coating Chamber Operation



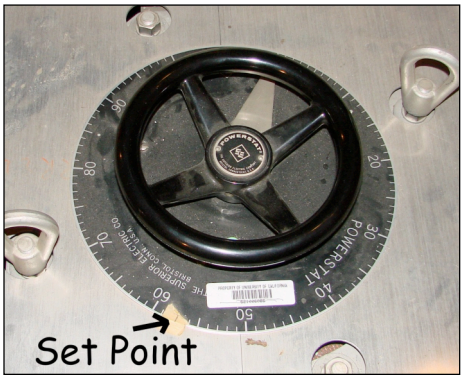
Stinger attached to connector.





Inner ring power-stat and gauges.

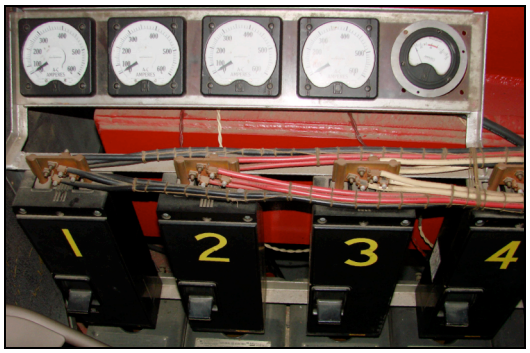
Inner ring power-stat and gauges.



As with the previous power-stat, ramp up slowly from zero to the set point. Hold there till the amperage meter starts to spike then back off enough to keep the meter around the set point amperage.

120″ Coating Chamber Operation

These gauges, switches and power-stat above are located on the chamber platform on the south end. The switches numbered 1-2-3-4 are switched on one at a time and controlled by the power-stat. These switches fire off the outer ring of elements.



To be continued: