



UV-100 Ultraviolet Curing Unit

Principle of operation

The UV-100 ultraviolet curing system consists of a powerful UV light source (Mercury Vapor lamp) and power supply (Ballast), a reflector housing (Irradiator), a conveyor, and a control enclosure. The UV unit generates the desired ultraviolet light as well as large amounts of visible light and an undesired side effect of IR or infra-red (heat) energy. The Ultraviolet or UV energy is used to cure special inks and coatings that contain monomers that are sensitive to UV energy. Monomers cross link quickly when exposed, resulting in nearly instant curing of UV coatings.

Safety Precautions --- READ BEFORE OPERATING UNIT!

UV exposure

The Ultraviolet light or UV that is generated by your UV curing unit can be very harmful to the eyes and skin. Blindness or skin burns can result from the improper use of UV equipment. Under no circumstances allow anyone to directly view the UV light. A certain amount of light will emit from each end of the conveyor. Position your UV unit so that the light emitting from the end of the unit does not shine at the operator or other personnel. Keep the unit at a level of 27" or less to minimize the UV visibility. Persons working with and around this type equipment must wear special safety glasses that filter out most of the stray UV light, however do not rely on these glasses to look directly at the light. Special UV glasses are available from most safety supply houses. The UV curing unit enclosure and irradiator have very high voltage sources. Do not open or remove the irradiator for any reason (such as to replace or inspect the lamp) or open the main enclosure unless the power to the machine is off and locked out. The irradiator may be hot during operation take care not to burn yourself on the hot metal surfaces. Keep a properly selected fire extinguisher nearby.

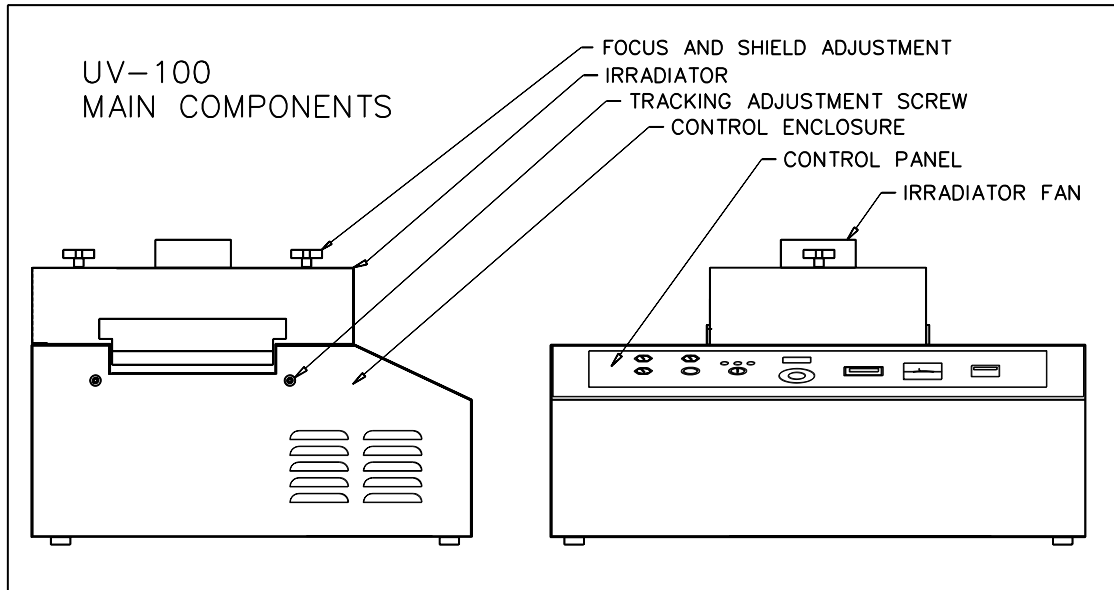
Training and supervision

Because of the above inherent safety issues it is important that only properly trained personnel operate this equipment. Use this manual as a starter training manual for your operators. Make sure that your operators know what to do if there is a problem. Use proper lock out procedures when servicing the UV-100 curing unit.

Feeding and suitability of application

Care should be taken in determining what kind of products can be cured through the UV unit. Paper or other flammable materials should first be tested without UV power to make sure they feed reliably throughout the unit. Materials must be kept away from the sides of the conveyor belt or they may jam in the conveyor tunnel. If something does jam in the conveyor turn off the UV power immediately. A flammable product stopped under the UV lamp could start a fire in the UV unit. It is advisable to keep a fire extinguisher nearby for this reason. Remember to disconnect the power before opening the irradiator or control panel.

UV-100 Operation



Power up procedure

- 1.) Turn the power on switch to on. The main fan and the power settings lights should go on indicating that main power is present.
- 2.) Turn the UV power switch to on. UV light should begin to increase and lamp amperage will register on the ammeter. Never look directly at the UV light.
- 3.) Set the UV intensity switch to either 200 or 300 watts per inch.

Power down procedure

To shut your UV unit down the following procedure should be used to avoid heat damage to the irradiator and lamp.

- 1.) Turn the UV lamp power switch off first.
 - 2.) After waiting at least five minutes for the unit to cool down, turn off the main power.
- Do not try to re-start a Hot UV unit after shutting down. The Mercury in the lamp must be relatively cool to re-start. Allow adequate cooling time. (5-10 minutes).

Watts per inch switch

The UV intensity switch controls setting from 125, 200 or 300 watts per inch. A higher setting results in greater intensity of UV output. Use the lowest setting that will reliably cure the coating at a given speed to reduce power consumption. The Lamp may not start properly when trying to start at the stand by setting of 125 watts per inch. Use the 125 watts per inch when curing fast cure materials and as a standby setting when taking breaks.

Speed adjustment

Adjust the speed control to the desired speed. Use the fastest setting that will properly cure your coating. Slower settings reduce the life of the conveyor belt. If the belt jams or stops for any reason the belt may be damaged from over heating.

Over heat light

The over temperature indicator lamp will light when the irradiator temperature exceeds 150 F. The UV will not shut down automatically. The operator must first turn off the UV power and then after a cool down period shut the main power off. Fix the problem before re-starting.

Irradiator temperature gauge

The irradiator temperature indicator allows the operator to monitor the interior temperature of the UV unit in the irradiator. The temperature of the irradiator will vary greatly, do not be alarmed at temperatures under 140 degrees F..

The Ammeter

The Ammeter helps the operator determine when the lamp may be degrading and need replacement. A lower than normal ampere reading is an indication that the lamp may need replacement. See the following chart to determine a normal ampere rating.

The Hourmeter

The Hour meter is provide to indicate proper maintenance duration's such as lamp replacement (500 to 2,000 hours depending on type of use) Lamp inspection (every 200 hours) and reflector replacement 4,000 hours.

Belt direction

When setting the direction of the belt travel, hesitate at the center position of the switch for a second to allow the belt to stop before completing the rotation of the switch. This wait precaution and switching only at slower speed keeps the speed controller from overloading and causing a blown fuse or speed control damage.

Belt speed adjustment

The conveyor is driven by a 90 VDC variable speed supply. To adjust the belt speed turn the speed adjustment knob clockwise to increase speed. The dial indicates rough speed in feet per inch. If your unit is equipped with the tachometer option the display will read out the actual belt speed in feet per minute.

Belt tracking adjustment

belt racking adjustments are made by first loosening the two pairs of allen screws located on the end you normally load from preferably the left end. Then tighten the belt tensioning screw on the side of the belt that is rubbing on the conveyor bed. Make these adjustment with the conveyor running at a fairly fast speed and the UV power off, you will be able to notice the improvement immediately. Take care not to over-tighten the belt. The belt should be slightly loose. Proper belt tracking is important. An improperly aligned belt (one that rubs constantly) will wear out quickly.

Shielding and focus adjustments

The UV-100 unit has adjustment knobs on the top that raise and lower the lamp and light shielding simultaneously. when the lamp is in the lowest position it is focused for products between .001 and .125 inches thick. Turn the knobs clockwise (God's perspective) to raise the UV lamp to accommodate thicker materials Adjust the two knobs equally to avoid jamming the slide mechanism. Use the lowest setting that will allow your product to pass through reliably to reduce stray light and to provide a focused beam of UV energy.

The irradiator fan

The irradiator fan is connected to a temperature switch that will turn the fan on at the proper temperature after warm up automatically.

Main exhaust fan

A fan is built into the UV unit that helps to hold the substrate down, cools the control enclosure and draws away potentially harmful vapors and ozone from the curing tunnel. Make sure that the fan exhaust is not blocked. Connect the exhaust to an outside vent in accordance with local, state and federal laws and in such a manner as to not restrict the proper operation of the exhaust system.

Maintenance

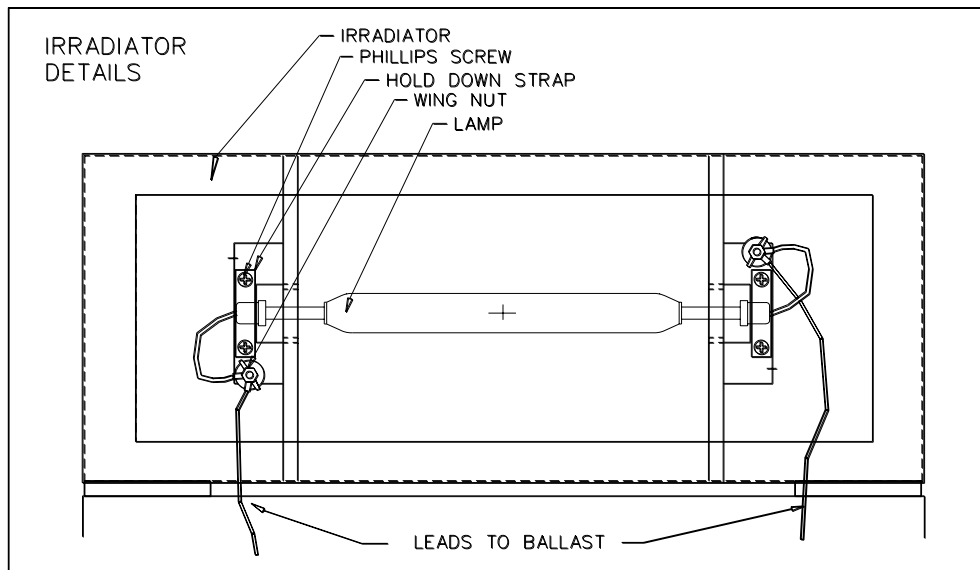
Lamps are replaced by following this procedure:

- 1.) Follow the power down procedure
- 2.) Disconnect power to the machine
- 3.) Allow ample time for the unit to cool (30 minutes).
- 4.) Unlatch the black clamps on the left side of the irradiator.
- 5.) Pivot the irradiator to the right until it stops at the One O'clock position.
- 6.) Locate and remove the small wing nuts that secure the lamp leads.
- 7.) Locate the large Philips screws on the hold down strap, loosen one and remove the other screw.
- 8.) Pivot the hold down clamp out of the way on the remaining screw.
- 9.) Remove the lamp by lifting it straight out of the holder.

To install the new lamp reverse the procedure above.

Important Notes:

- 1.) Do not handle the glass surfaces of the lamp with your bare hands (oils from your hands can damage the glass at high temperatures) If the lamp is not clean, clean it with alcohol.
- 2.) The hold down strap should not hold the lamp end too tightly. The lamp strap allows the lamp to expand and contract with temperature changes.



Normal Ampere Draw

Watts per inch	Lamp Condition		
	Cool	Warm	Consider lamp replacement
125	3-3.2amps	3.1amps	-
200	8.5 amps	7.5-8.1 amps	-
300	9.5 amps	8-8.6 amps	7.8 amps

Standard Replacement Parts

UV lamps	S6808A4C
Conveyor belt	L57-30B-10.25-64.87 T
Reflector	UV-100-105