



## **UV CURING LAMP SYSTEM INSTRUCTION MANUAL**



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## **Table of Contents**

1. Principal of Operation .....	2
2. UV Exposure.....	2
3. Never Operate This Equipment .....	2
4. Training & Supervision.....	3
5. Installation.....	3
6. Operation .....	3
7. Lamp Replacement.....	4
8. Lamp Replacement Procedure .....	4
9. Filter Plate Replacement.....	5
10. Technical Information .....	5

## Con-Trol-Cure Scarab 400 Ultraviolet Curing Unit

### 1. Principle of Operation

This Con-Trol-Cure ultraviolet curing system consists of a powerful UV light source (400W metal halide lamp) power supply (110v 60Hz), and a Lighthouse reflector housing (Irradiator). This UV unit generates the desired ultraviolet light as well as a large amount 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. This lamp system is supplied with a special IR filtering UV lens to reduce the amount of IR that is transmitted to the surface of the material being exposed.

### **SAFETY PRECAUTIONS - READ BEFORE OPERATING UNIT!**

### 2. UV Exposure

*Maintenance & repair of this unit should only be performed by qualified personnel.* 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. Position your UV unit so that the light or reflected light emitting from the unit does not shine at the operator or other personnel. Position the irradiator in an area to minimize the UV visibility. Persons working with and around this type of equipment must wear special safety glasses that filter out the stray UV light. However, do not rely on these glasses to look directly at the light. Special UV glasses and other safety supplies are available from UV Process Supply, Inc. 1-800-621-1296.

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 is off & the unit has cooled down. The irradiator may get hot during prolonged operation. Take care not touch the glass or hot metal surfaces.

### 3. Never Operate This Equipment:

- A. Without the UV-A blue filter glass in place and securely fitted in the correct position.
- B. If there is any visible damage to the lamp unit, filter glass, power supply, cables or connectors.
- C. Without the correctly rated fuse fitted into the power 110v connector.
- D. In close proximity to combustible materials. The temperature of the glass can exceed 100<sup>0</sup>C.

Beware when handling materials that have been exposed. Depending on the irradiation time and density of material exposed, they could be hot and cause burns!

The internal pressure of this lamp is relatively high (2 bar). This type of lamp on rare occasion may explode. The risk of explosion is increased as the lamp ages. We strongly recommend replacing the lamp after 500 hours of use.

The metal halide lamp produces very high intensity UV radiation. It is necessary for the operator (and anyone working in the vicinity) to protect their skin & eyes from direct exposure. Protective goggles and protective clothing must be worn while the lamp is in operation.

The Scarab 400 lamp should only be operated facing away from the body to reduce the chances of accidental exposure.

## 4. Training and Supervision

Because of the inherent safety issues it is important that only properly trained personnel operate the Scarab 400. 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. Remember to disconnect the power before opening the irradiator or control panel. Use proper lock out procedures when servicing the UV curing unit.

*\*\*Be careful when handling the lamp that you do not touch the lamp's surface. Hold lamp only by the ceramic end fittings, oils from your hands will burn permanently onto the lamp's surface, reducing lamp efficiency.*

## 5. Installation

The equipment must be handled carefully to avoid damage to the lamp. Vibration or shock to the lamp (especially while hot) may cause premature failure of the lamp.

Ensure that all of the packaging material has been removed before operation

The distance between the lamp and the product to be irradiated will change the amount of UV light that will ultimately be received by the material being cured. Oxygen inhibits UV light's ability to transmit. The greater the distance, the weaker light.

Do not leave this equipment in an area where the ambient temperature will exceed 40°C.

Wherever the lamp is positioned, it is critical that the air inlet vents & cooling extraction fan be completely clear. Blocking the airflow into or out of either of these can cause lamp failure.

Connect the power supply to a 110V/60Hz outlet. Then connect the yellow quick disconnect between the lamp housing & power supply.

It is recommended that the equipment should not be connected to a circuit which has other high energy usage equipment connected to it. If the circuit is overloaded, it may trip the breaker or blow a fuse in that circuit.

## 6. Operation

Position the lamp so that it is pointed at a piece of concrete sheeting, steel pad or concrete floor. The lamp should be in a tilted position so that the bottom two feet & handle are making contact with the floor, pointing away from operators.

Turn the lamp on. You will notice a slight odor in the immediate area of the lamp.

This equipment will produce a small quantity of Ozone gas. This gas is easily recognized by its bleach-like odor. This gas will only be produced in noticeable quantity during the warm up period of the lamp. As pressure builds within the lamp, the quantity of ozone produced drops. Ozone gas is very unstable and reverts back to oxygen when it comes into contact with carbon molecules. Therefore, the more openly ventilated the area, the better. Symptoms of over exposure to ozone gas are similar to the onset of the common cold-- sore throat, sore eyes and headache. This will only occur if you are using an ozone producing UV lamp in a confined area.

The lamp will take approximately 4-5 minutes to reach optimum operating temperature & maximum UV output.

**IMPORTANT NOTES!**

- **NEVER STAND THE LAMP ON ITS FOUR PLASTIC FEET FACING DOWN, OR UPSIDE DOWN ON THE COOLING FAN!**
- **CONSTANTLY SWITCHING THE LAMP ON & OFF WILL GREATLY REDUCE THE LAMP'S OPERATING LIFE.**
- **THE LAMP SHOULD BE OPERATED FOR A MINIMUM OF 15 MINUTES. THE EQUIPMENT SHOULD BE SWITCHED OFF FOR PRODUCTION BREAKS IN EXCESS OF 1 HOUR.**
- **WHEN THE LAMP IS SWITCHED OFF, THE LAMP WILL REQUIRE A COOLING PERIOD OF APPROXIMATELY 10 MINUTES. IF IGNITION OF THE LAMP IS ATTEMPTED WITHIN THIS TIME THE LAMP WILL NOT IGNITE & UNNECESSARY STRAIN WILL BE PLACED ON THE POWER SUPPLY.**

## **7. Lamp Replacement**

Lamps should be changed every 500 hours of operation. This should be monitored carefully by noting the time elapsed on the hour meter located on the top of the power supply enclosure.

Disposal of used UV lamps should be executed in accordance to local waste disposal regulations. It is advisable that you contact your local waste disposal authority.

**IMPORTANT NOTES!**

**AVOID TOUCHING THE QUARTZ TUBE WITH BARE HANDS. THE OILS IN YOUR SKIN WILL CAUSE YOUR FINGERPRINTS TO BURN ONTO THE LAMP'S QUARTZ SURFACE DURING OPERATION. THIS WILL RESULT IN "DEAD SPOTS" THAT WILL INHIBIT THE TRANSMISSION OF UV THROUGH THE QUARTZ.**

## **8. Lamp Replacement Procedure**

1. Disconnect the unit's power supply from the 110V/60Hz supply.
2. Allow the lamp to cool.
3. Disconnect the yellow quick disconnect cable from the power supply.
4. Place the lamp housing on its back on a solid flat surface, with the blue lens facing up.
5. Unscrew the retaining screws that hold the cover plate on
6. Carefully remove the blue UV filter lens (it is free floating to allow for expansion & contraction, so be careful not to drop it), place on a soft cloth to prevent scratching.
7. The lamp is held by spring tension ceramic lamp holders, push the lamp into one of the holders and gently ease the other end out of the holder on the opposite end.
8. Remove the new lamp from its packing materials using either cotton gloves or a clean lint free cloth.
9. Place the new lamp into the spring holder by pushing one end into the holder & then dropping the opposite end into place. A correctly installed lamp will rotate easily in either direction in the holder.
10. Replace the UV filter lens.
11. Replace the cover plate & retaining screws.
12. Re-attach the power cables & the lamp is ready for use.

**AFTER THE LAMP IS INSTALLED IN THE HOLDER, WIPE THE LAMP WITH ALCOHOL USING A SOFT, LINT-FREE CLOTH. NEVER USE DETERGENT OR SOAP.**

## 9. Filter Plate Maintenance

1. Follow the above procedure steps 1 through 6.
2. Use alcohol or water with a soft, lint-free cloth.

## 10. Technical Information

<b>MHL 400 UV LAMP</b>	<b>Ozone free iron doped metal halide lamp</b>
<b>Lamp wattage</b>	<b>400 watts total</b>
<b>Operating life</b>	<b>500 hours</b>
<b>Filter glass</b>	<b>Transmission range 320-450 nm</b>
<b>Effective cure area</b>	<b>12" x 8" at 8" from the surface (larger area can be irradiated if lamp is positioned further away)</b>
<b>Power supply voltage</b>	<b>110V at 60 Hz</b>
<b>Internal fuse rating</b>	<b>5 Amps</b>
<b>Connecting Power Cable</b>	<b>12'</b>
<b>Yellow Quick Disc Cable</b>	<b>6'</b>
<b>Lamp Housing Weight</b>	<b>3.5 lbs</b>