

Discontinued System

OPERATIONS MANUAL

PC-3 ULTRA UV CURING LIGHT SOURCE

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SAFETY

The meanings of **WARNINGS, CAUTIONS, AND NOTES** are:

WARNING

A **WARNING** indicates when failure to follow the instructions could result in injury to personnel.

CAUTION

A **CAUTION** indicates when failure to follow the instructions could result in damage to equipment.

NOTE

A **NOTE** is used to highlight an important procedure, practice or condition.

WARNING

READ, UNDERSTAND AND FOLLOW ALL the safety and operating instructions found in this manual.

Safety Precautions Must Be Observed By All Personnel Working Near Or Around Ultraviolet (UV) Light

UV Terminology

The portion of the Electromagnetic spectrum which falls between x-rays and visible light is called Ultraviolet or UV. Ultraviolet (UV) radiation can be classified into three categories: UV-C, UV-B, and UV-A. UV-C is for the wavelengths below 280 nm, UV-B is for the wavelengths between 280-315 nm, and UV-A denotes wavelengths between 315-380 nm.

Exposure Hazards

Exposure to UV light, even for short periods of time, can be hazardous. The danger depends upon the exposure time, the intensity of the light, the wavelength, and the individual's sensitivity to UV. UV-B and UV-C can be considered the most hazardous to the skin, causing such effects as sunburn. UV-A, UV-B, and UV-C are hazardous to the eyes, which is why eye protection is important when working around UV light.

The lamps produce minimal amounts of ozone during start-up and no ozone during operation. At high concentrations, it can cause discomfort, or at sufficiently high levels, be dangerous.

Safety Guidelines

The National Institute for Occupational Safety and Health (NIOSH) recommends that exposure to UV energy be controlled and limited in the work place.

The total intensity from 320 to 400 nm hitting unprotected skin or eyes should not exceed

1 mW/cm² for periods longer than 1000 seconds. For shorter exposure times, the total radiant energy shall not exceed 1000 mW•sec/cm².

Do not operate the unit without the light guide **installed into the bezel**.

WARNING

With the internal filter installed, the PC-3 Ultra emits UVA and visible light. **Never** look directly at the light source while the unit is in use.

WARNING

EYE PROTECTION

Always wear eye protection when working with or near UV equipment. Use goggles, safety spectacles (glasses) or a face shield to protect your eyes.

- Goggles should completely surround and protect your eyes. Many goggles will also fit over regular glasses. Be sure your goggles fit comfortably.
- Safety spectacles don't fog as easily as goggles and can be worn at all times.
- A face shield protects your entire face, not just your eyes.

SKIN PROTECTION

Individuals exhibit different levels of photosensitivity. Therefore, even minimal periods of exposure of unprotected skin to direct UV light, which can cause sunburn, must be avoided.

- UV barrier creams should be used to protect all exposed skin including the face, neck and arms. UV blocking creams also provide protection to hands with minimal loss of tactile sensitivity or feel. It is, however, necessary to repeat application regularly because the cream wears off.
- Gloves which are opaque to UV light can be worn to protect the hands. Proper glove selection should also include protection from UV curing resins. Consult the resin manufacturer or product data sheets.
- Long sleeved shirts, or a lab coat, will protect the arms.

DESCRIPTION

The PC-3 Ultra is a special purpose UV curing lamp used for small area curing of adhesives, coatings, and potting materials. It emits a 5 mm diameter spot of UV light from a liquid light guide. This guide is hand-held for complete mobility or clamped into position on assembly equipment or work stations for repetitive operations.

The unit consists of a stainless steel housing containing a 50 watt power transformer, circuit protection, lamp/reflector assembly, internal light filter for extended lightguide life, cooling fan, light guide mount, lamp status indicator light, non-resetable hour-meter, and shutter system. Electric shutters are supplied with timed and manual shutter operating modes. The light guide is separate and plugs into the bezel. Light normally is not emitted from the unit when the light guide is removed. But the light can escape when the shutter is activated. That is why it is important to have the liquid guide engaged within the bezel. Light can be emitted from the unit when the light guide is removed from the bezel. Lamps are rated at 500 hours of life.

The light source contains circuitry which allows the user to monitor whether the lamp is operating or not. This circuit will operate with a simple, audible alarm, a visual display, a PLC or a computer system. The software to monitor via a personal computer (IBM compatible) is available upon request from Dymax Corporation.

The power supply operates on line voltages of either 115 or 230 Vac, and 50 or 60 Hz (factory set). AC voltage is stepped down and rectified to DC through a transformer and fullwave bridge rectifier. A separate high voltage winding on the transformer provides ignition voltage for the lamps. A blocking diode is located between the power regulator and the high voltage winding to prevent damage to the regulator circuit. When the lamp ignites, the high voltage is dissipated across the lamp, although the high voltage winding is always energized. If the lamp extinguishes due to a momentary power failure, it will reignite after it cools down if the power switch is left on.

A cooling fan is provided to keep the lamp housing and internal components of the power supply at the optimum operating temperature. The fan must not be covered or otherwise blocked. The UV source is a 50 Watt short arc mercury vapor lamp mounted in a reflector and pre-focused to provide optimum light output. The unit is rated for continuous operation.

SPECIFICATIONS

PC-3 Ultra

SPECIFICATIONS

Voltage*	115 Vac, 60 Hz
Current	2.0 Amp Max.
Fuse	2 Amp 5 x 20 mm IEC 127 Fast Acting
Lamp/Reflector	50 Watt (pre-focused)
Shutter Timer	1 to 99 sec. delay
Foot Switch	Rocker type
Hour-Meter	99,999.9 hours, non-resettable

* 230 Vac and 50, 60 Hz Power Supplies are available.

Output Intensities (Typical)**

<u>WAVELENGTH</u>	
320-390 nm	4.0+ W/cm ²

** Measured with an EIT Spotcure Radiometer. Values in W/cm².

UNPACKING & INSPECTION

Upon receipt of lamp, unpack unit and check for shipping damage. Report damage to freight carrier and make any claim for damage through them.

Check box for contents:

- 1 - PC-3 Ultra Light Source
- 1 - Lamp/Reflector Assembly
- 1 - Power Cord
- 1 - Liquid Light Guide
- 1 - Pair UV Goggles
- 1 - Warranty Card
- 1 - Operation Manual
- 1 - Foot Switch

NOTE

REPORT ANY SHORTAGE TO DYMAX CORPORATION CUSTOMER SERVICE

Phone: (860) 626-6326

Fax: (860) 489-3232

LAMPS ARE SHIPPED WITH THE BULB/REFLECTOR REMOVED TO PREVENT BREAKAGE (REFER TO **LAMP REPLACEMENT/INSTALLATION**).

INSTALLATION

1. Install lamp per **LAMP REPLACEMENT/INSTALLATION**.
2. Connect power cord to rear of unit and plug into a grounded wall outlet.
3. Connect light guide to bezel mount by inserting and snapping into place.
4. Toggle lamp switch to ON (1).
5. Allow lamp to warm up for 4-5 minutes to obtain maximum light output.
6. Locate foot switch where desired; connect to foot pedal outlet.
7. Operate shutter by pressing foot switch. With the shutter selector switch in the manual position, the shutter operates directly from the foot switch. In the timed position, the shutter opening is determined by the setting on the digital display on the left side of the front panel. Simply push the + or - buttons to enter the desired number of seconds the shutter is to remain open.

CAUTION

THIS IS AN ARC, NOT A FILAMENT LAMP. ONCE IGNITED, IT MUST BE LEFT ON FOR A MINIMUM OF 5 MINUTES TO FULLY VAPORIZE ELEMENTS IN THE LAMP. IF NOT, THE LAMP MAY BE DIFFICULT TO REIGNITE.

NOTE

The lamp must cool before it can be reignited. Leave power switch on should the lamp extinguish. This operates the cooling fan and allows the lamp to relight when it has cooled sufficiently. If the lamp fails to ignite, refer to the **TROUBLESHOOTING** section of this manual. Lamp life is reduced approximately one hour each time the lamp is switched on and off. Avoid repeated cycles by leaving unit on through breaks.

LAMP REPLACEMENT/INSTALLATION

WARNING

BEFORE REPLACING THE LAMP, THE UNIT MUST BE "OFF" FOR A MINIMUM OF 5 MINUTES. THIS WILL ALLOW DANGEROUS CHARGES, WHICH ARE PRESENT FOR PROPER LAMP OPERATION, TO BLEED OFF.

LAMP REPLACEMENT MUST BE EXECUTED BY THE TRAINED SERVICE PERSONNEL ONLY!

LAMP REPLACEMENT PROCEDURE

1. Allow the unit to cool before removing the lamp/reflector assembly.
2. **You must** unplug the power cord.
3. Loosen the top housing by removing the top four thumbscrews and slightly loosening the bottom four. Tilt the cover back to access bulb.
4. To remove the old bulb: A) remove the positive electrode wire from electrode board (see Figure 1.1). Do not disconnect the wire from lamp. B) Gently lift the brass negative electrode while lifting the bulb/reflector out.
5. To install a new bulb, simply reverse the steps followed in #4 above. Gently lift the brass negative electrode while positioning the bulb/reflector in the reflector mount.
6. Attach the electrode wire to the positive electrode board (see Figure 1.1).
7. Close the top housing and tighten all screws.
8. Record the serial number of the unit and hour-meter reading on the Bulb History Record and return to Equipment Customer Service.

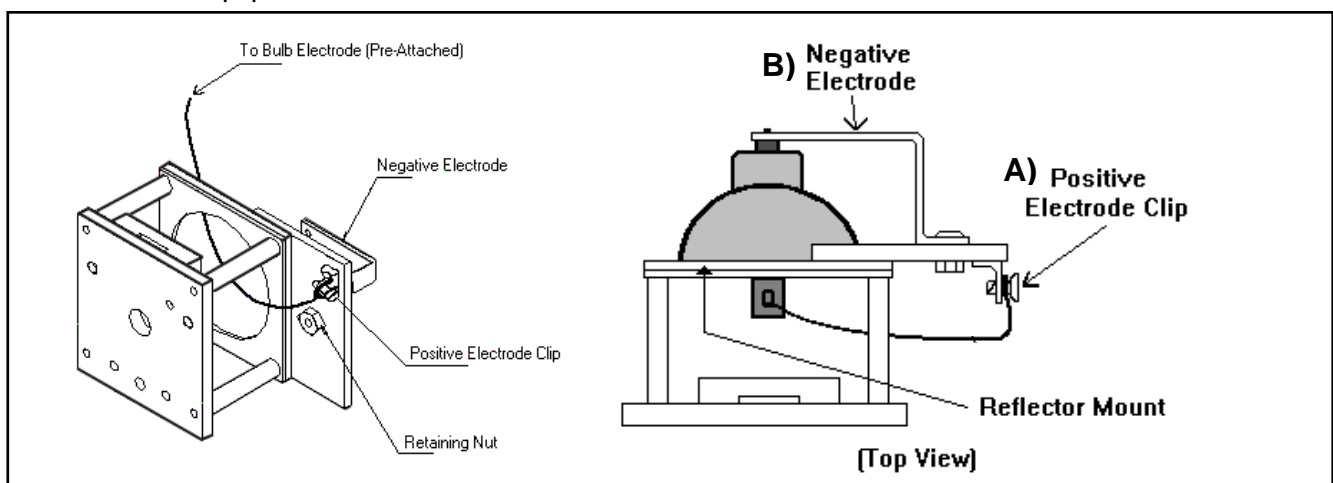


Figure 1.1

LIGHT GUIDE

The unit should not be operated when ambient temperature is above 55°C. Ends of the guide should be kept clean to transmit as much light as possible. Cured adhesive can be removed with razor blade. Avoid sharp bends with the light guide since this reduces light output and damages guide.

TROUBLESHOOTING

WARNING

ONLY QUALIFIED MAINTENANCE PERSONNEL SHOULD ATTEMPT THE FOLLOWING PROCEDURES:

Problem: Lamp Will Not Ignite

Possible Cause	Testing	Corrective Action
Improper connections	Visually inspect all input/output connections (i.e. power cord, lamp).	Secure all connections.
Lamp beyond useful life	Replace with a known good lamp/reflector assembly and re-test unit.	Replace lamp/reflector assembly if defective (typical life = 500 hours).
Corroded negative electrode (brass bracket)	Visually inspect the negative electrode for ANY signs of corrosion.	Replace, if corroded.
Main line fuse blown (nothing in unit operates)	Remove fuse from power receptacle and check with an ohmmeter.	Replace fuse, if defective.
No high voltage off transformer output	Verify ignition voltage of 1200 Vrms off transformer.	Replace transformer, if defective.
Insufficient ignition voltage	Verify ignition voltage across open circuit (should be half rectified shortwave of 1200 Vrms).	Replace defective component (typically blocking diode).
No operating voltage (lamp flickers)	Verify the operating voltage of 20 Vac across bulb with dummy load.	Replace defective component.

Problem: Shutter Fails To Open Other Symptoms: Shutter Remains Open

Possible Cause	Testing	Corrective Action
Shutter mechanism binding	Remove power from unit and manually move the shutter and solenoid up and down (should move freely).	Replace component causing problem.
Solenoid malfunctioned	Measure the voltage being delivered to the solenoid during operation. If good check solenoid resistance (≈ 120 ohms).	Replace solenoid, if defective.
Timer malfunctioned	If shutter operates in manual mode but not in timed mode, timer is defective.	Replace defective timer.

TROUBLESHOOTING

Problem: Low Output Intensity
Other Symptoms: Fails To Cure Adhesive In Allotted Time

Possible Cause	Testing	Corrective Action
Lamp beyond useful life	Use a radiometer (model Dymax Accu-Cal 20) to measure output intensity. Should be more than 50% of initial power.	Replace lamp/reflector assembly if beyond useful life (typical = 500 hours).
Transmission loss in light guide too great	Compare light guide output against new light guide (or use the Dymax Light Guide Simulator - P/N 36987) to determine transmission loss.	Replace light guide.
Contaminants on light guide	Visually examine ends of light guide contaminants.	Clean with isopropyl alcohol (or equivalent) or replace light guide if it can not be cleaned.
Lamp/reflector assembly not installed properly	Visually check to make sure the lamp/reflector assembly is seated flush in the lamp mount assembly (any error in installation could cause a low output).	Properly install lamp/reflector assembly.

SPARE PARTS

PC-3 Ultra

SPARE PARTS

<u>Item</u>	<u>Part Number</u>
Lamp/Reflector Assembly	37123
Fuses: for 115 volt unit 2 Amp IEC 127F	37236
for 230 volt unit 1 Amp IEC 127F	37235
for 100 volt unit 2.5 Amp IEC 127F	37237
Liquid Light Guide, 1 Meter	35102

PC-3 Ultra
ACCESSORIES

<u>Item</u>	<u>Part Number</u>
Liquid Light Guide, 1/2 meter*	35101
Liquid Light Guide, 3 mm x 1 meter	36619
UV Goggles: Yellow	35284
Amber.....	35285
Smoke.....	35286
Face Shield	35186
Dymax Accu-Cal 20 Radiometer	36629
Light Guide Simulator.....	36987

* Longer Light Guides Also Available

WARRANTY

CAUTION

WARRANTY POLICY

DYMAX CORPORATION RESERVES THE RIGHT TO INVALIDATE ANY WARRANTIES, EXPRESSED OR IMPLIED, DUE TO ANY REPAIRS PERFORMED OR ATTEMPTED ON PC-3 ULTRA LIGHT SOURCES WITHOUT WRITTEN AUTHORIZATION FROM DYMAX. THOSE CORRECTIVE ACTIONS LISTED BELOW ARE LIMITED TO THIS AUTHORIZATION.

Light Sources:

Warranty is granted for one year from the date of the equipment shipment from Dymax to the distributor or customer. The warranty start date can be extended to the date of shipment from the distributor stock to the end-user.

Lamps and Lamp Assemblies:

Warranty will be honored only if the defective lamp/reflector assembly is returned with a filled out Bulb History Record. The form will be provided with each lamp/reflector assembly.

The 50 Watt lamp/reflector assemblies are warranted for 500 hours of useful life. Lamps are not warranted against breakage from handling and shipping.

Notice: The data contained in this bulletin which represents typical results, is furnished for information only, and is believed to be reliable. We cannot assume responsibility for results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any product or method mentioned herein and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use thereof. Nothing in this bulletin is to be interpreted as a representation of freedom from domination of patents owned by others, or a license under a Dymax Corporation patent. We recommend that each prospective user test the proposed application before repetitive use, using the data as a guide.