



# **CROSSLINKER MANUAL 800 & 1500 SERIES**

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## 1.0 General Information

### 1.1 Introduction

Thank you for choosing Ultra-Lum, Inc. for your Instrument needs. We here at Ultra-Lum Inc. strive to build quality into each and every product we manufacture. We all hope that the product purchased meets and exceeds your goals and expectations. Please feel free to contact us with any questions as our knowledgeable Sales and Customer Support staff are ready and willing to work with you. We can be contacted at the following location:

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Web Site ..... [www.ultralum.com](http://www.ultralum.com)

The Ultra-Lum, Inc. Electronic Ultraviolet Crosslinker product line provides fast, efficient, and safe DNA or RNA crosslinking to nitrocellulose, nylon, or reinforced nitrocellulose. Studies indicate that Ultraviolet energy can be used as an alternative to convection oven baking. UV crosslinking is accomplished in seconds as compared to two or more hours using the convection oven baking process. Ultra-Lum's UV Crosslinkers are designed to optimize the UV energy thus ensuring membranes are crosslinked consistently. Ultra-Lum's UV crosslinkers are designed to deliver the proper UV wavelength and energy while correcting for the inherent Intensity Fluctuations that occur with UV lamp operation. The unique Patented Electronic High Frequency Lamp Power Supply Ballast design eliminates start up lamp flicker, produces 10 to 15 percent higher intensity and extends UV lamp life. This higher Intensity reduces crosslinking time and increases crosslinking accuracy. The Internal microprocessor controlled optical feedback system continuously and cumulatively measures UV energy within the crosslinker chamber and automatically adjusts to variations in UV lamp intensity that occur during start up and as the UV lamps age. When used in the UV Energy Mode the UV lamps automatically shut off once the desired energy value (mJoules) has been reached. In addition, the UV crosslinkers have an exclusive Intensity Function which provides real time displayed UV lamp Intensity (mW/cm<sup>2</sup>). This allows monitoring of the UV lamp intensity at any time without disrupting the any of the modes of operation. In addition, it eliminates the guesswork involved when calculating the required crosslinking time. Although the UV crosslinker has been specifically designed for crosslinking applications they can also be used for a myriad of other UV applications, such as EPROM erasing, sterilization, curing of epoxies, and many more.

## 1.2 Unpacking and inspection

- 1.2.1 Opening the shipping container.
  - 1.2.1.1 Using a utility knife cut through the packing tape that secures the flaps together.
- 1.2.2 Carefully remove the crosslinker from the container and place the container aside.
  - 1.2.2.1 We suggest saving the container for later instrument storage, moving from one lab to another, or returning the unit for re-calibration and / or service if required.
- 1.2.3 Inspect the unit for damage
  - 1.2.3.1 Broken UV lamps
  - 1.2.3.2 Dented or damaged enclosure
  - 1.2.3.3 Anything that might be considered unacceptable.
- 1.2.4 Ensure that all of the items purchased are accounted for. Listed here are the standard items that ship with each unit.
  - 1.2.4.1 120 VAC Line cord .....58-0004-01
  - 1.2.4.2 240 VAC Line cord .....58-0006-01
  - 1.2.4.3 Operation manual.....81-0005-19
- 1.2.5 If any Items are missing or damaged please contact customer service so that the apparent problems may be addressed.

## 1.3 Warranty

Ultra-Lum, Inc. Products are guaranteed to be free of defects in materials, workmanship, and manufacture for a period of two (2) years from the date purchased. Consumable and disposable products including but not limited to Ultraviolet lamps are guaranteed to be free from defects in materials and manufacture for a period of ninety (90) days from the date purchased. If a product failure should occur during the warranty periods listed above Ultra-Lum, Inc. will examine the inoperative product and have the option of repairing or replacing any parts which in the judgment of Ultra-Lum, Inc. were originally defective or became so under conditions of normal usage and service.

No warranty shall apply to any product or part thereof that has been subjected to accident, negligence, alteration, abuse, or misuse by the end-user. However, Ultra-Lum, Inc. makes no warranties, whatsoever, with respect to parts not supplied by Ultra-Lum Inc. or that have been installed, used or serviced, other than in strict compliance with the instructions appearing in the operating manual supplied by Ultra-Lum, Inc.

In no event shall Ultra-Lum, Inc. be responsible to the end user for any incidental or consequential damages, whether foreseeable or not, including but not limited to property damage, inability to use equipment, lost business, lost profits, or inconvenience arising out of or connected with the use of products supplied by Ultra-Lum, Inc., nor is Ultra-Lum, Inc. liable for or responsible for any personal injuries occurring as a result of the use, installation, or servicing of products.

## 2.0 Specifications

### 2.1 Safety Precautions

#### 2.1.1 **CAUTION:** Dangerous Ultraviolet Radiation



- 2.1.1.1 The UV Crosslinker is a powerful source of Dangerous Ultraviolet radiation. It is **VERY IMPORTANT** to protect your eyes and skin from exposure.
- 2.1.1.2 The **clear view port window** blocks all of the dangerous Ultraviolet radiation from exiting the UV crosslinker.
- 2.1.1.3 The UV Crosslinker has been designed to eliminate possible exposure to Ultraviolet radiation by providing two (2) door interlock safety switches. If the door is opened while the Ultraviolet lamps are on the UV Crosslinker circuitry automatically shuts the lamps off.
- 2.1.1.4 To resume operation once the door has been opened the user needs to press the start (S) button located on the keypad.
- 2.1.1.5 **DO NOT** attempt to **override** the safety **interlock switches**, as this will cause undesired exposure to dangerous Ultraviolet radiation.

#### 2.1.2 **CAUTION:** Electrical Exposure



- 2.1.2.1 Do not attempt to operate the UV Crosslinker with the enclosure cover removed as this will expose the user to the **HIGH VOLTAGE** lamp power supply output circuitry as well as the **HIGH VOLTAGE** AC main's circuitry.
- 2.1.2.2 When lamp replacement is required, ensure that the AC mains line cord is **NOT** plugged into the AC wall receptacle. If the AC line cord is plugged in, there may be **DANGEROUS HIGH VOLTAGE** present at the lamp connectors.
- 2.1.2.3 Never operate the system in or near water or environments with high levels of moisture in the air.

#### 2.1.3 **CAUTION:** Mercury Notification

- 2.1.3.1 THE LAMPS IN THESE PRODUCTS CONTAIN MERCURY—DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS.

## 2.2 Safety Features

### 2.2.1 AC Mains Switch

2.2.1.1 The AC Mains power switch can be used at any time to stop all of the operations.

### 2.2.2 Stop / Reset button

2.2.2.1 The Stop / Reset ("R") button will stop any of the activated modes of operation.

2.2.2.2 To resume from where the operation was stopped press the Start ("S") button.

2.2.2.3 To restart the operation from the beginning Press the Stop / Reset ("R") button.

### 2.2.3 Open Chamber Door UV Interlock

2.2.3.1 If the Chamber door is opened at any time during any of the modes of operation the operation will stop and the UV lamps will shut off.

2.2.3.2 After the Door is closed the Crosslinker operation modes and UV lamps remain off.

2.2.3.3 To restart from where the operation was stopped press the Start ("S") button.

2.2.3.4 To restart the operation from the beginning press the Stop / Reset ("R") button.

2.2.3.5 Please DO NOT bypass or defeat this interlock.

### 2.2.4 Chamber View Port Window

2.2.4.1 The sealed chamber protects the user from Ultraviolet Radiation.

2.2.4.2 The chamber View Port Window will protect the user's eyes and body from Ultraviolet Radiation.

## 2.3 Electrical Ratings

2.3.1 Input AC Line Voltage ..... 100VAC, 115VAC, or 230VAC

2.3.2 AC Line Frequency ..... 50 / 60Hz

2.3.3 Dual Fuse Rating:

2.3.3.1 For the 800 Series.....2A 250VAC, T (Time Delay), 5x20mm

2.3.3.2 For the 1500 Series.....3A 250VAC, T (Time Delay), 5x20mm

## 2.4 Mechanical

2.4.1 For the 800 Series UV Crosslinker (metric measure)

2.4.1.1 Exterior Dimensions ..... 13.5" D x 10.5" H x 12.5" W (34cm x 27 cm x 32 cm)

2.4.1.2 Interior Dimensions ..... 12 " D x 6" H x 10" W (31cm x 15cm x 26cm)

2.4.1.3 Weight .....23lbs (10.4Kg)

2.4.2 For the 1500 Series UV Crosslinker (metric measure)

2.4.2.1 Exterior Dimensions ..... 16.5" D x 11.8" H x 21.5" W (42cm x 30cm x 55cm)

2.4.2.2 Interior Dimensions.....14.5" D x 6" H x 19" W (37cm x 15cm 49cm)

2.4.2.3 Weight.....35lbs (16kg)

2.4.3 Cord Inlet ..... IEC Style AC Line Power Entry Module

**2.5 Environmental Conditions for Instrument Operation**

- 2.5.1 Humidity ..... 5 – 95%
- 2.5.2 Weight ..... 35lbs (16kg)

**2.6 Replacement Components**

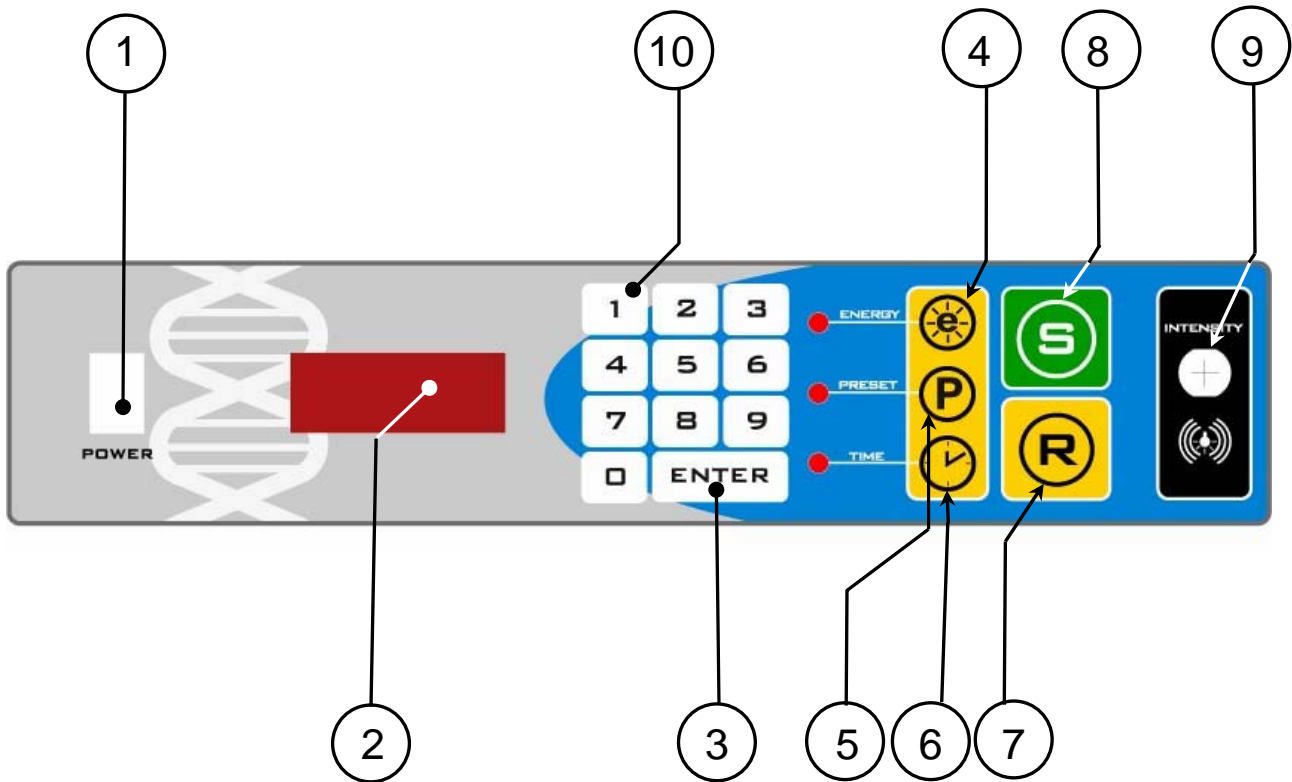
- 2.6.1 8 Watt UVA Ultraviolet Lamp ..... 990-1080-03
- 2.6.2 8 Watt UVB Ultraviolet Lamp ..... 990-1080-02
- 2.6.3 8 Watt UVC Ultraviolet Lamp ..... 990-1080-01
- 2.6.4 15 Watt UVA Ultraviolet Lamp ..... 990-1050-03
- 2.6.5 15 Watt UVB Ultraviolet Lamp ..... 990-1050-02
- 2.6.6 15 Watt UVC Ultraviolet Lamp ..... 990-1050-01
- 2.6.7 Fuse 2A 250VAC T ..... 56-0010-04
- 2.6.8 Fuse 3A 250VAC T ..... 56-0010-03
- 2.6.9 120 VAC Line cord ..... 58-0004-01
- 2.6.10 240 VAC Line cord ..... 58-0006-01
- 2.6.11 For 1500 Series, large sample tray ..... 20-0002-15
- 2.6.12 For 800 Series, small sample tray ..... 20-0001-96
- 2.6.13 Operation Manual ..... 81-0005-19

**2.7 Accessories**

- 2.7.1 None available at this time

## 2.8 Keypad Symbols and Controls Defined

1. AC Mains Power switch
2. LED 4 Digit Display
3. Enter Key
4. Energy Key
5. Preset Key
6. Time Key
7. Stop / Reset Key
8. Start Key
9. Intensity Push button switch
10. Numeric Section



## 3.0 Operating Instructions

### 3.1 Setting up the UV Crosslinker

- 3.1.1 Place the UV Crosslinker on a suitable work surface. The work surface should be clean and dry.
- 3.1.2 The UV Crosslinker has been designed to operate on the 100 VAC, 115 VAC, or 230 VAC line from 47 to 63 Hz.
- 3.1.3 Plug the appropriate AC line cord into the power entry module located in the back of Crosslinker.
- 3.1.4 Plug the other end of the AC line cord into the appropriate AC line wall receptacle.
- 3.1.5 Turn on the AC mains power switch located on the left side of the front panel.
- 3.1.6 The UV Crosslinker display will go through a start up sequence and cycle through all digits of the display. The display then flashes twice and beeps once, signaling the user that the start up sequence is complete. This occurs each and every time the UV Crosslinker is turned on.
- 3.1.7 The UV Crosslinker is now ready for operation.

### 3.2 Using the Energy Mode

- 3.2.1 The ENERGY Mode controls the amount of Ultraviolet radiation dosage a sample will be exposed to. In this mode the UV Crosslinker operates using an optical feed back sensor located in the upper center section on the right sidewall of the reflector that's mounted within the UV Crosslinker chamber.
  - 3.2.1.1 It is VERY IMPORTANT that this sensor not be blocked or become contaminated with foreign material.
  - 3.2.1.2 If this occurs then the sensors transmission to Ultraviolet light will be reduced resulting in a dysfunctional UV Crosslinker.
- 3.2.2 This mode allows the user to set any value of Energy from 0.1 mJoules to 999.9 mJoules.
- 3.2.3 To access this mode simply press the Energy ("e") key on the keypad and the ENERGY LED will light.
- 3.2.4 To change the value of the ENERGY displayed. Enter the desired value using the numeric section of the keypad.
  - 3.2.4.1 Upon pressing the first key the Display will flash at approximately one (1) second intervals.
  - 3.2.4.2 While the display is flashing continue entering the desired value of energy in mJoules into the display and press the ENTER key to complete the entry.
  - 3.2.4.3 Once the value has been entered it is automatically saved to memory and will remain there until it is changed even after the unit is powered down.
- 3.2.5 Place the sample into the center of the UV Crosslinker chamber and close the chamber door.
- 3.2.6 Press the START ("S") key on the keypad to begin the ENERGY cycle.
  - 3.2.6.1 If for any reason the door is opened during the cycle the lamps will automatically shut off and the display will flash the message "door".
  - 3.2.6.2 In order to resume operation from where the UV Crosslinker left off you will need to close the chamber door and then press the START ("S") KEY on the key pad.
  - 3.2.6.3 To restart the cycle from the beginning press the RESET ("R") key.
- 3.2.7 If the door remains closed or the cycle was restarted after a door open event occurred the unit will operate until the value of Energy on the display reaches zero.
  - 3.2.7.1 The UV Crosslinker will then beep 3 times and the display will flash the message "End" which is an indication that the ENERGY cycle is complete.
  - 3.2.7.2 Press the RESET ("R") key to clear the message

3.2.8 Repeat the ENERGY cycle as required.

### 3.3 Using the Time Mode

- 3.3.1 The TIME mode allows the user to enter any value of TIME from 0.1 minutes to 999.9 minutes. Upon start up the lamps light and operate over the entered time period and shut off after the time period is complete. The display reads the TIME for the cycle as it decrements to zero.
- 3.3.2 To access this mode press the TIME (“clock symbol”) key on the keypad and the TIME LED will light.
- 3.3.3 To change the value of TIME displayed. Enter the desired value using the numeric section of the keypad.
- 3.3.3.1 Upon pressing the first key the Display will flash at approximately one (1) second intervals.
- 3.3.3.2 While the display is flashing continue entering the desired value of TIME in minutes into the display and press the ENTER key to complete the entry.
- 3.3.3.3 Once the value has been entered it is automatically saved to memory and will remain there until it is changed even after the unit is powered down.
- 3.3.4 Place your sample into the center section of the UV Crosslinker chamber and close the chamber door.
- 3.3.5 Press the START (“S”) key on the keypad to begin the TIME cycle.
- 3.3.5.1 If for any reason the door is opened after starting the cycle the lamps will automatically shut off and the display will flash the message “door”.
- 3.3.5.2 In order to resume operation from where the UV Crosslinker left off you will need to close the chamber door and then press the START (“S”) key on the keypad.
- 3.3.5.3 To restart the cycle from the beginning press the RESET (“R”) key.
- 3.3.6 If the door remains closed, or the cycle was restarted after a door open event occurred the unit will operate until the value of TIME on the display reaches zero.
- 3.3.6.1 The UV Crosslinker will then beep 3 times and the display will flash “End” indicating the end of the time cycle.
- 3.3.6.2 Press the RESET (“R”) key to clear the displayed message.
- 3.3.7 Repeat the TIME cycle as required.

### 3.4 Useful Formulas for the Time Mode

- 3.4.1 Some applications may require higher dosages of Ultraviolet radiation than the UV Crosslinker Energy mode can provide (Energy mode maximum = 999.9 millijoules). In cases like these the TIME mode would best fit the application. In order to use the time mode simply apply the Time in Seconds equation as shown below and then expose your sample for the calculated time.
- 3.4.2 To figure out the **Energy in joules** use the following Equation:
- $$\text{Energy} = \text{Power} \times \text{Time}$$
- $$(\text{Joules}/\text{cm}^2) = (\text{Watts}/\text{cm}^2) \times \text{seconds}$$
- 3.4.3 To figure out the **Time in Seconds** use the following Equation:
- $$\text{Time} = \text{Energy} / \text{Power}$$
- $$\text{Seconds} = (\text{Joules} / \text{cm}^2) / (\text{Watts} / \text{cm}^2)$$

### 3.5 Using the Preset Mode

3.5.1 The Preset Mode provides the user with the option of using factory-preset values of Time and Energy. These factory-preset values are as follow:

3.4.1.1 ENERGY ..... 120.0 mJoules

3.4.1.2 TIME ..... 5.0 minutes

3.5.2 To use this mode press the PRESET ("P") key on the key pad and then press either the TIME ("Clock symbol") key or the ENERGY ("e") key on the keypad.

3.5.3 The Preset value of the chosen mode will be displayed.

3.5.4 Press the START ("S") key on the keypad to begin the chosen cycle.

3.5.5 Refer to the following sections for operation of your chosen mode:

3.5.5.1 Section 3.2 Using the Energy Mode

3.5.5.2 Section 3.3 Using the Time Mode

3.5.6 Changing the factory-preset values. If desired, the user may change these values.

3.5.7 To change a value stored in the Preset memory press the desired mode key, either the ENERGY ("e") or the TIME ("CLOCK SYMBOL") keys. Then,

3.5.7.1 Press and hold the PRESET ("P") key for approximately 5 seconds. The display will flash at approximately one (1) second intervals.

3.5.7.2 Enter the desired value using the numeric section of the keypad.

3.5.7.3 Press the ENTER key to complete the entry.

3.5.7.4 Once the value has been entered it is automatically saved to memory and will remain there until it is changed even after the unit is powered down.

3.4.8 Repeat use of the PRESET mode as required.

### 3.6 Using the Lamp Intensity Function

3.6.1 The Lamp Intensity Function displays the Intensity of the Ultraviolet lamps in the UV Crosslinker chamber.

3.6.2 To access this feature, press and hold the INTENSITY ("\*\*") push button switch located to the right of the keypad keys.

3.6.2.1 While the button is being pushed the Ultraviolet Lamps Intensity will be displayed in (mW/cm<sup>2</sup>).

3.6.2.2 The Intensity Function can be accessed at anytime before and during any of the UV Crosslinker modes of operation.

3.6.3 Repeat the Lamp Intensity Function as required.

## 4.0 Care and Maintenance

### 4.1 Cleaning Recommendations

- 4.1.1 Clean all interior and exterior surfaces using a mild non-abrasive cleaner such as Glass cleaner and soft paper towels.
- 4.1.2 Clean the Feed Back Photo diode window using a mild non-abrasive cleaner such as glass cleaner and soft paper towels or tissue.

### 4.2 UV lamp replacement

- 4.2.1 All lamps should be replaced even though only one or more lamps fail to light. This ensures that the Intensity level remains uniform across the floor of the UV Crosslinker chamber.
  - 4.2.1.1 Turn off the AC mains switch
  - 4.2.1.2 Unplug the AC line cord from the wall receptacle.
  - 4.2.1.3 The lamp needs to be rotated in the socket to remove or replace, to remove the lamp rotate until the lamp pin entry slot on the lamp sockets is vertical.
  - 4.2.1.4 To install the lamps ensure that the lamp or lamps are seated correctly in the lamp sockets.
  - 4.2.1.5 In order to correctly seat the lamp insert the lamp into the lamp sockets rotate the lamp in the sockets so that the entry slot on the lamp sockets is horizontal and a snapping feeling occurs.
  - 4.2.1.6 Plug the AC line cord back into the wall receptacle.
  - 4.2.1.7 Turn ON the AC Mains switch.
  - 4.2.1.8 Check to see if all of the lamps have lit.
  - 4.2.1.9 If not repeat or refer to the Trouble Shooting section of this manual.
- 4.2.2 If the lamps are being changed to a different wavelength type lamp (UVA, UVB, or UVC) then the UV Crosslinker must be returned for re-calibration with the new lamps installed.

## 5.0 Service

### 5.1 Trouble shooting

#### 5.1.1 **Problem:** Unit does not operate.

5.1.1.1 Check the fuse and replace if necessary. Refer to Fuse Replacement section 5.2 of this manual for further instructions.

#### 5.1.2 **Problem:** One or more lamps won't light with the AC mains power switch on and display and mode indicator LED's are illuminated.

##### 5.1.2.1 **First Check:** Turn off the AC mains switch.

5.1.2.1.1 Unplug the AC line cord from the wall receptacle.

5.1.2.1.2 The lamp needs to be rotated in the socket to remove or replace.

5.1.2.1.3 Ensure that the lamp or lamps are seated correctly in the lamp sockets. In order to correctly seat the lamp, rotate the lamp in the socket so that the entry slot on the connector is horizontal and a snapping feeling occurs.

5.1.2.1.4 Plug the AC line cord back into the wall receptacle.

5.1.2.1.5 Turn ON the AC Mains switch.

5.1.2.1.6 If the Lamps still don't light, repeat the procedure, but this time, swap out a lamp that lights with one that does not light.

5.1.2.1.6.1 If the problem follows the lamp, then the lamp should be replaced.

5.1.2.1.6.2 If problem appears to be in all or one lamp position, then go to the Fuse Inspection and Replacement section of this manual.

##### 5.1.2.2 **Second Check:** Checking the lamp filament continuity. If the lamp appears to be defective, often the failure mode is in the filament section of the lamps.

5.1.2.2.1 Turn off the AC Mains switch.

5.1.2.2.2 Unplug the AC Line cord from the wall receptacle.

5.1.2.2.3 Remove the suspect lamp or lamps from the UV Crosslinker.

5.1.2.2.4 The lamp is designed with a filament between the pins at each end of the lamp.

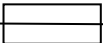
5.1.2.2.5 Using an Ohmmeter, measure the resistance between the pins at each end of the lamp.

5.1.2.2.6 The Ohmmeter reading should be approximately within 10 and 50 ohms.

5.1.2.2.7 When a filament failure occurs, the reading is infinite and indicates that the lamp needs to be replaced.

5.1.2.2.8 Contact customer service for replacement parts.

## 5.2 Fuse Replacement

- 5.2.1  This symbol represents the fuse and is located on rear panel unit on a label with the fuse type and rating.
- 5.2.2 Remove the AC line cord from the back of UV Crosslinker.
- 5.2.3 Remove the Fuse drawer from the Input AC module.
- 5.2.4 Remove the fuses.
- 5.2.5 Visually inspect the fuses for blackening or an internally open fuse link.
- 5.2.6 If all visual inspection looks good then continuity check the fuse by measuring it's resistance using an Ohmmeter. The resistance should be less than 1 ohm.
- 5.2.6.1 If any of these signs are detected replace both the fuses.
- 5.2.6.2 Refer to **Section 2.4** to determine the correct fuse rating.
- 5.2.7 Place the replacement fuses into the fuse drawer.
- 5.2.8 Install the fuse drawer in the Input AC line module.
- 5.2.9 Plug the AC line cord into the Input AC line module.
- 5.2.10 Start and operate the UV Crosslinker.

## 5.3 Customer Service

### 5.3.1 Contact Information

Ultra-Lum, Inc.  
1480 N. Claremont Blvd.  
Claremont, Ca 91711

Phone ..... 909-399-3694  
Toll free in USA ..... 800-809-6559  
Fax ..... 909-482-0527

Email ..... [Info@ultralum.com](mailto:Info@ultralum.com)  
Web Site ..... [www.ultralum.com](http://www.ultralum.com)

For software technical support, contact the software manufacturer.

## 6.0 Application Information

### 6.1 DNA Nicking using UV

- 6.1.1 Wollrath, D. & Davis, R.W. 1987. Resolution of DNA molecules greater than 5 megabases by contour-clamped homogenous electrical fields. *Nucleic Acids Research*. **15** (19): 7865-7867
- 6.1.2 Harding, Fiona A., Cohen, Nicholas and Litman, Gary W., Immunoglobulin Heavy Chain Gene Organization and Complexity in the Skate, *Raja erinaces*. *Nucleic Acids Research*. **18**(4), 1015-1020 (1990).

### 6.2 Crosslinking DNA and RNA

- 6.2.1 Khankijan, E.W., 1987. Optimized hybridization of DNA; blotted and fixed to nitrocellulose and Nylon Membranes. *Biotechnology*. **5**: 165-167.
- 6.2.2 Khankijan, E.W., 1986. UV crosslinking of RNA to nylon membrane enhances hybridization signals. *Molecular Biology*. Report **11**: 107-115.
- 6.2.3 Reed, K.C. & Mann, D.A., Rapid transfer of DNA from agarose gels to nylon membranes. *Nucleic Acid Research*. **13**: 7207-7221.

### 6.3 UV Sterilization

- 6.3.1 Reich, R.R. & Anderson, H.D., August 1985. Laboratory Application of Ultraviolet irradiation. *Medical Device Diagnostic Industry*. 52-58.
- 6.3.2 Reich, R.R. & Anderson, H.D., January 1986. Sterilization of Membrane filters with Ultraviolet Irradiation. *Pharmaceutical Manufacturing*. 12-15.
- 6.3.3 Sarkar, Gobinda, and Sommer, Steve S., Parameters affecting susceptibility of PCR Contamination to UV Inactivation, *Biotechniques* **10**(5), 591-593 (1991).

### 6.4 RecA Mutations

- 6.4.1 Maniatis, T. Maintenance and testing of Bacteriophaga Lysogens. *Molecular Cloning: A Laboratory Manual*. 258-259 (Cold Spring Harbor Laboratory).
- 6.4.2 Whittaker, P.A. & Southern, E.M. 1986. Ultraviolet Radiation of DNS: a way of generating partial digests for rapid restriction site mapping. *Gene*. **41**: 129-134.

7.0 Appendix

7.1 Specific Part Identifier Chart

Part Number	Model	Wavelength	Chamber Size (cm)	Number of Lamps	Dual Fuse Rating, 250VAC T 5x20mm (Amps)
<b>800 Series, uses 8 watt lamps</b>					
930-0021-01	CEX-800	UVC	31x25x26	6	2A
930-0021-02	BEX-800	UVB			
930-0021-03	AEX-800	UVA			
<b>1500 Series, uses 15W lamps</b>					
930-0022-01	CEX-1500	UVC	37x15x49	6	3A
930-0022-02	BEX-1500	UVB			
930-0022-03	AEX-1500	UVA			

**7.1.1 Declaration of Conformity for CE (European Community)**



Application of Council Directive: 89/336/EEC and 73/23/EEC

Standards To Which  
Conformity Is Declared:

EN61010-1:2001  
EN61326:1998  
EN55011 Class A Group 1  
EN61000-4-2  
EN61000-4-3  
EN61000-4-4  
EN61000-4-5  
EN61000-4-6  
EN61000-4-11  
EN61000-3-2:2001  
EN61000-3-3:2000

Manufacturer's Name: Ultra-Lum Inc.

Manufacturer's Address: 1480 N. Claremont Blvd.  
Claremont, CA 91711  
909-399-3694

Equipment Description: Cross Linker

Equipment Class: Laboratory, Measurement, &  
Process Control Equipment:  
Normal Environment

Model Numbers: AEX, BEX, CEX 800 and  
1500 Series



Claremont, CA U.S.A

Place:

Signature:

Steven G. Boland

Full Name:

COO

Position:

FORM: EN218, REV A, 12-19-05 LOC: C: \ACADIULFORM.

CONTROLLED