

# SUPERSPOT™ MK III

## UV SPOTCURE SYSTEM

Model: VSM3003

# TECHNICAL REFERENCE MANUAL

This product conforms  
to  
CE Standards



See Appendix A for details

## AUV/LESCO

*A Division of American Ultraviolet Company*

WWW.LESCOUV.COM

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Torrance, CA 90505



REV.  
P

10/6/10



# American Ultraviolet™

*UV is all we do SINCE 1960*

## WARRANTY AUV/LESCO EQUIPMENT POLICY

### **UV STANDARD PRODUCT WARRANTY:**

All ultraviolet equipment manufactured by American Ultraviolet West/LESCO (AUV West/LESCO) is warranted to be free from defects in material and workmanship under normal and proper use for one (1) full year from the date of original shipment. As of October 9, 2008 normal use is based on an 8-hour work day, 5 days a week (8\*5\*52=2080Hrs). AUV West/LESCO will repair or replace at its option any defective parts (**excluding consumables listed below**) when returned to AUV/LESCO by the purchaser within the warranty period using a Return Material Authorization (RMA) number provided by AUV West/LESCO. The purchaser is responsible for all transportation charges for shipping the equipment to and from AUV West/LESCO. Equipment may not be returned, whether for warranty or other purposes, without an RMA number. Any equipment that is received without obtaining an RMA number will be refused and returned to the purchaser at their expense. AUV West/LESCO assumes no expense or liability for repairs made outside its plant without the written consent of an authorized AUV West/LESCO representative, or for any labor costs which are so incurred. AUV West/LESCO will not be liable for any consequential costs or damages of any kind.

If it is not feasible for the purchaser to return the equipment to AUV West/LESCO for repair, then by mutual consent the purchaser will cover the expenses for an authorized AUV West/LESCO service representative to travel to the equipment's location to perform a diagnostic evaluation and any necessary repairs. Warranty period for any and all equipment which is repaired while under original equipment warranty will remain one (1) full year from date of original shipment. Any repairs made after the original equipment warranty period has expired are warranted for ninety (90) days from the date the repaired equipment is shipped back to the purchaser. After all warranties have expired, the diagnostic evaluation fee for all non-warranty equipment is \$150.00.

### **PARTS AND ACCESSORIES WARRANTY:**

AUV West/LESCO warrants all spare parts and accessories which are purchased separately from UV equipment to be free from defects in material and workmanship under normal and proper use for a period of 60 days. **Consumable items not covered under the warranty include Bulbs, I.R. Filters, Fan Filters, Reflectors, and Lightguides.**

### **CONDITIONS OF WARRANTY:**

For above warranty on AUV West/LESCO equipment to be enforceable, the purchaser must:

1. Be the original owner and provide proof of purchase. All warranties are non-transferable.
2. Obtain pre-authorization by calling AUV West/LESCO for RMA number at 310-784-2930.
3. Return any items suspected of being defective to AUV West/LESCO for diagnostic evaluation and possible repair. All returns must be correctly packaged and shipped via an appropriate courier. AUV West/LESCO is not liable for any damage or charges incurred as a result of improper packaging and shipping by the purchaser.
4. Keep accurate records of the time elapsed from installation to removal in sufficient detail to determine the running time and environment of equipment in question. The purchaser will allow AUV West/LESCO to verify such records if necessary.

### **EXCLUSIONS:**

The following will void all AUV West/LESCO warranties stated above:

- Defects resulting from improper installation or use
- Unauthorized service
- Tampering with equipment
- Lack of preventative maintenance
- Acts of God, or other circumstances beyond the control of AUV West/LESCO

There are no warranties, expressed or implied, except as stated above or provided in writing by an authorized AUV/LESCO representative.



# American Ultraviolet™

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## Warranty AUV/LESCO 1000-Hour SST Bulb Policy

### **BULB WARRANTY:**

American Ultraviolet West/LESCO (AUV West/LESCO) warranties its UV Super Spot Technology (SST) premium bulbs for 1000 hours of operation when used with AUV West/LESCO manufactured products listed below. AUV West/LESCO designs and manufactures its SST bulbs for exceptionally long service life at higher than conventional intensities. However, there are no performance guarantees beyond that the bulb will successfully ignite and maintain power; system specifications are only estimates. Bulb performance is also dependent upon the extent of degradation in the I.R. Filter and Reflector, so those components must be checked prior to concluding a defect exists in the bulb. Only bulbs supplied by AUV West/LESCO and specifically used in well-maintained AUV West/LESCO SST products are covered by this warranty. Qualifying AUV West/LESCO products:

System	Model#	Bulb#
MKIII	VSM3003	LPB1008
MAX100	VSM3002	LPB1008
MAXHP	VSM3002HP	LPB2001
Rocket LP	VRM3002	LPB1003

System	Model#	Bulb#
Rocket 225	VRM2002	LPB1002
Spectrum 100	VZM1001	LPB1014
Green Spot II	VSM5001	LPB1014

### **CONDITIONS OF WARRANTY:**

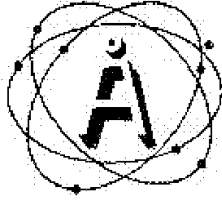
For above warranty on AUV West/LESCO bulb to be enforceable, the purchaser must:

1. Have completed the Lamp Hour Control Log inside the SST User Manual. If necessary, additional copies of the Lamp Hour Control Log can be obtained by contacting a service representative at 310-784-2930. There will be no warranty coverage for any bulb received without a Lamp Hour Control Log completed by the purchaser. The purchaser will allow AUV West/LESCO to verify such records if necessary.
2. Obtain pre-authorization by calling AUV West/LESCO for RMA number at 310-784-2930. Bulbs received without an RMA number will be returned at the purchaser's expense.
3. All returns must be correctly packaged and shipped via an appropriate courier. AUV West/LESCO is not liable for any damage or charges incurred as a result of improper packaging and shipping by the purchaser. All transportation charges to and from AUV West/LESCO are the responsibility of the purchaser.
4. All bulbs are warranted to successfully ignite and maintain power (no flickering) for the first 200 hours at full replacement.
5. Warranty period for 201 through 1000 hours is pro-rated. Providing an authorized AUV West/LESCO representative has determined a bulb is defective, the purchaser will be credited against the replacement price of the warranted bulb starting at 90% credit (@ 201 hours) pro-rated through 0% credit (@ 1000 hours).
6. There are no performance guarantees, expressed or implied, by AUV West/LESCO for UV SST bulbs; the above conditions for replacement and pro-rating are based solely on manufacturing defects, not performance. System specifications for performance are estimates only.
7. AUV West/LESCO is not liable for costs or damages of any kind due to unauthorized repairs.

### **EXCLUSIONS:**

- Excessive lamp start/restart operations (>2 starts/day)
- Failure due to mechanical damage, breakage, mishandling, or dropping the system
- Contamination of quartz bulb envelope by oils, foreign material or other contaminants
- Damage resulting from corrosive or caustic environments
- Failure resulting from tampering with functions not intended for operator access such as polarity reversal, internal voltage, or control assemblies
- Neglect, damage by acts of God, or any other uncontrollable circumstances
- Failure to follow recommended maintenance procedures for unit airflow and cleanliness

This warranty applies to the bulb only and supersedes all previous warranties. There are no warranties, expressed or implied, except as stated above.



# AUV West/LESCO

Division of American Ultraviolet Company

## LAMP CONTROL LOG

Company Name:		<b>EIT Radiometer Only (AIB1001)</b>	Calibration Due Date:	S/N:
Contact:		<b>Intensity measured at calibration test fixture (VSM9001)</b>	First measure intensity using quartz fixture, then using lightguide. Difference in intensity measurement will indicate possible defects/damage in lightguide.	
Tel./Email:				

*Reading should always be taken first time bulb is used. Lamp Hour Meter should be reset for each new bulb before recording data.* Under normal usage of 8hrs/day, 5days/wk, readings should be taken every 2 weeks. Otherwise, if less frequent usage, readings should be taken whenever bulb is used.

<b>MKIII Measurement Procedure</b>
1. Adjust FEEDBACK SET potentiometer 20 turn C.C.W.
2. Set timer to 1.5sec.
3. Insert VSM9001
4. Use EIT Radiometer to measure output.
EX: Sample 3x reading and average, then record

<b>Max Measurement Procedure</b>
1. Set intensity to LOWEST value
2. Insert VSM9001
3. Set timer to 1.5sec.
4. Use EIT Radiometer to measure output.
EX: Sample 3x reading and average, then record

Spot Cure Model:		Spot Cure S/N:					
Bulb Model:		Bulb S/N:					
Date							
# Hours Indicated							
Intensity Reading							
Date							
# Hours Indicated							
Intensity Reading							
Date							
# Hours Indicated							
Intensity Reading							

*Recommended to change lamp when intensity reaches 70% of original at the source in Low Power Idle or Stand-by. Contact AUV/Lesco for RA# to return warranty bulbs (under 1000hrs) with low intensity.*

\_\_\_\_\_ Date \_\_\_\_\_ RA#  
 Contact Signature (for Warranty Return)

23555 Telo Avenue, Torrance, CA 90505 Ph. (310) 784-2930/(800) 615-3726 Fax (310) 784-2929

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## 1.0. General Information

### 1.1. Scope of Manual

This manual provides the information necessary for operating and maintaining the AUV/LESCO SUPERSPOT MK III UV spot curing system. It contains descriptions of the major components, safety requirements and references to pertinent mechanical and electrical drawings.

Throughout this manual, precautions necessary to prevent injury to personnel are preceded by the heading **WARNING**; precautions necessary to prevent damage to equipment are preceded by the heading **CAUTION**. See examples below.

**\*\* WARNING \*\***  
*(Precaution Information pertaining to the subject)*

**\*\* CAUTION \*\***  
*(Beware information)*

### 1.2. System Description

The MK III UV spot cure system is designed to provide an intense concentration of UV light for the purpose of curing (photo polymerizing) UV sensitive materials. The MK III is essentially an illuminator utilizing a UV light source whose output is collected and focused into one end of a flexible light guide. The shutter is located between the light source and the lightguide entrance point. The shutter is activated by either a footswitch or an automation process control, which is connected to the I/O port. The duration of UV emission is controlled by either the built-in timer or the remote operation.

The SUPERSPOT MK III consists of:

- UV intensity up to 20 W/cm<sup>2</sup> peak intensity in UVA, over 25 Watts total
- Stainless steel housing with Solid-state bi-level DC power supply
- 100 watt short-arc (point source) DC mercury vapor lamp
- I/O connector for automation applications
- Elliptical focusing reflector
- Automatic timer controlling shutter opening duration
- Lamp operating-hour meter
- "Timer/Manual" select switch
- Shutter actuating footswitch
- Liquid filled 1 Meter flexible lightguide with 5mm tip diameter (optional)
- Cooling system for the lamp/reflector assembly and the power supply
- IR filter for reduced heat transmission
- Optical Feedback for constant intensity and process control (optional)

## 2.0. Safety

The AUV/LESCO UV SPOTCURE system has been designed to operate safely. Hundreds of AUV/LESCO UV curing systems are in operation in a wide variety of industrial environments worldwide without any worker safety problems or health hazards. However, this equipment can present worker safety problems if care is not taken to install and operate it correctly.

***IT IS VERY IMPORTANT THAT ALL PERSONNEL USING THE EQUIPMENT  
BECOME FAMILIAR WITH THIS SAFETY INFORMATION.***

The following information is provided concerning various aspects of worker safety with this equipment. Because some features of the system may be new to personnel using the equipment, an attempt has been made to provide a fairly extensive background on these issues as well as to reference, where feasible, further information or U.S. Government Standards.

With care in installation and operation, coupled with adequate worker training, no unusual safety problems should arise.

### 2.1. Ultraviolet Radiation

Ultraviolet radiation (UV), which is emitted during normal operation of AUV/LESCO SPOTCURE systems, can be dangerous to the eyes and skin. All personnel within close vicinity of direct UV light should be required to wear goggles with UV certified lenses or remain behind UV blocking light shielding. Personnel should also be prevented from allowing any skin surface from coming within close proximity of the high intensity light output(s).

Additionally, it is never advisable to stare directly at any high intensity light source, whether visible or ultraviolet, for prolonged periods unless precautions have been taken to reduce both visible and ultraviolet light to safe levels. Discomfort from excessive eye exposure to UV light typically occurs about six hours after exposure. Personnel who experience eye pain after possible exposure to direct UV light should see a doctor immediately. Highly focused radiation, whether UV or visible light, can ignite paper and similar combustible materials if brought in direct contact at or near the focal point. Care should be taken to avoid this.

The American Conference of Governmental and Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) published guidelines on threshold exposure. These values are related to the different UV spectra and time of exposure.

There is no present US government standard on worker exposure to UV light. However, there is a NIOSH document, "Criteria for a Recommended Standard - Occupational Exposure to Ultraviolet Radiation" (No. HSM 73-11009), and several useful publications are available from the Bureau of Radiological Health of the Food and Drug Administration.



## 2.2. Power up

Always verify the correct voltage setting of the unit before applying power. Damage to the power supply can occur if wrong voltage is applied even momentarily. The UV bulb may also be affected. Verify the proper setting following Section 4.3

**\*\* CAUTION \*\***

Disconnect power from system or unplug system from wall or VAC power source before connecting the footswitch adapter.

## 3.0. Components Description

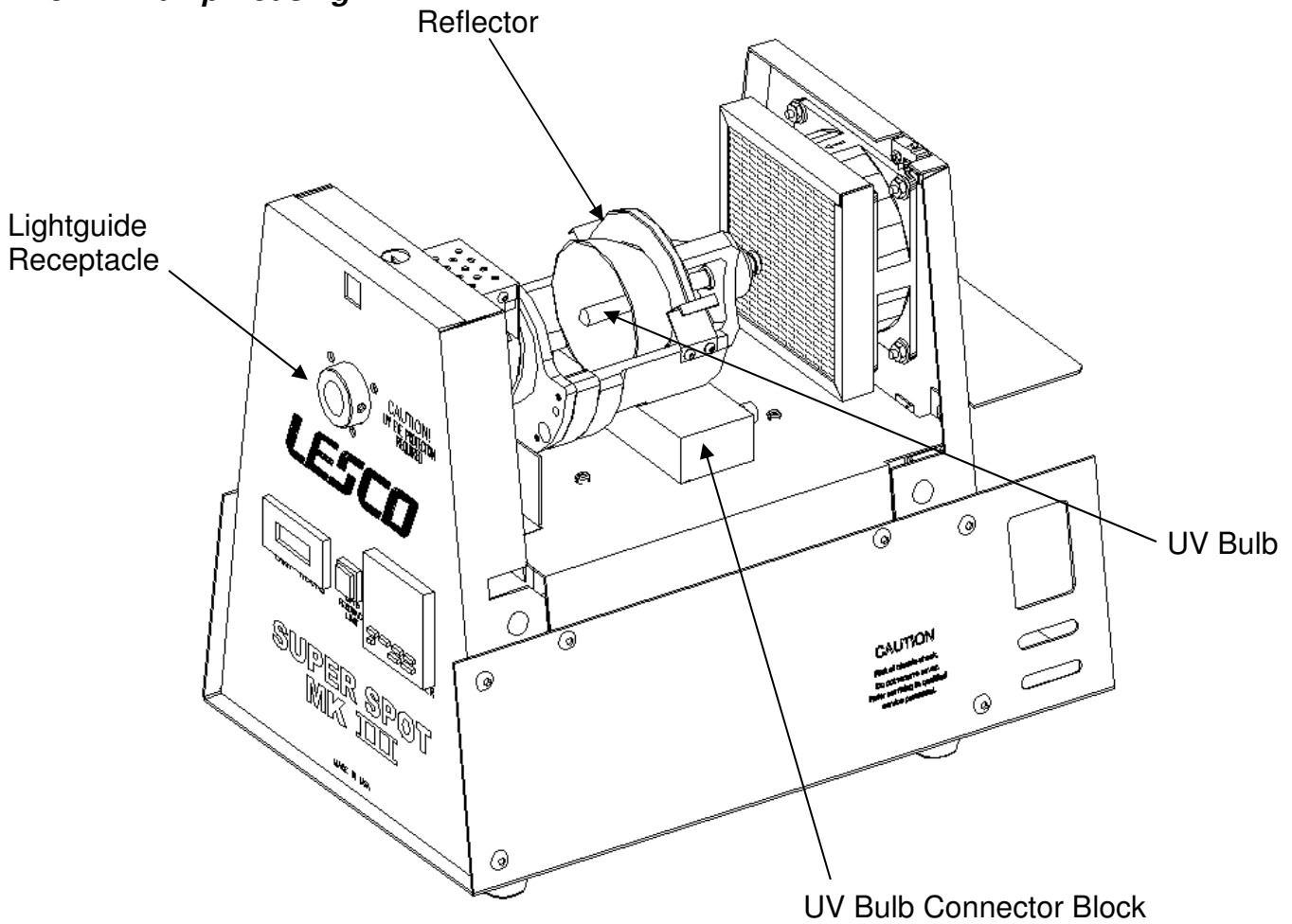
### 3.1. Housing

The MK III housing is made of stainless steel, making the equipment suitable for clean room operations and allowing for easy cleaning. The housing consists of 3 main sections:

1. Chassis - The vertical design allows for more efficient use of counter-top space. The optical assembly is located in the upper compartment. The top cover is secured by loosening four quarter-turn, captive, Phillips head fasteners. The power supply and all the controls and accessories are located in the bottom housing.
2. Lamp Housing - The top cover is secured by four quarter-turn, captive Phillips head fasteners. Removing it allows access to the bulb, reflector, and the IR filter assemblies.
3. Bottom Cabinet – The bottom side cover is fastened by six Allen head screws. Removing it allows access to the power supply for voltage setting. There are no serviceable parts inside.

The housing compartment features a recessed rear panel with air vents on the top and sides. These vents provide air access to the cooling fans even if the MK III is operated while pushed all the way against a wall.

### 3.1.1. Lamp Housing



This area contains the optical transmission assembly, bulb, reflector, optical feedback sensor and electrical lamp connections. The function of each component in the lamp housing is described below.

### **3.1.2. UV Bulb**

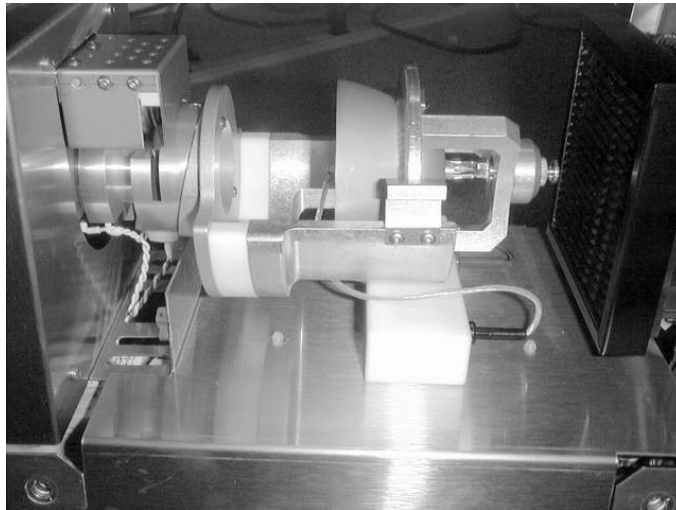
The UV bulb is an efficient 100-watt short arc DC mercury vapor lamp. The lamp needs a high voltage ignition pulse in order to start. Once ignited, it requires one or two minutes to reach its operating voltage and current. This period is referred to as the "warm-up" time. Maximum bulb life is obtained when the lamp operates without interruption, 24 hours a day.

Frequent ON-OFF operations shorten bulb life. The deterioration varies with duty cycle (number of operating hours per start) and with electrode temperature at the time of start (cold strike vs. hot or warm restrike), rendering it impossible to assign a conclusive value to bulb life under intermittent operation.

As a general rule, it is recommended that if the unit is to be used again within the next 4 hours, it should be left ON with the shutter closed.

### **3.1.3. Bulb Connection**

The black lead wire coming from the bulb and the red lead wire from the reflector holder assembly correspond to the same colored sockets located in the reflector support block. Please ensure the black lead wire runs through the access hole on the bottom of the reflector holder as pictured below.



**Bulb Connection**

**\*\*\*CAUTION\*\*\***

Do not touch the quartz (glass) portion of the bulb with bare hands or fingers. Skin oils can cause premature lamp failure or explosion. If hand oils accidentally contact the bulb, wipe clean with Isopropyl alcohol and lint free cloth.

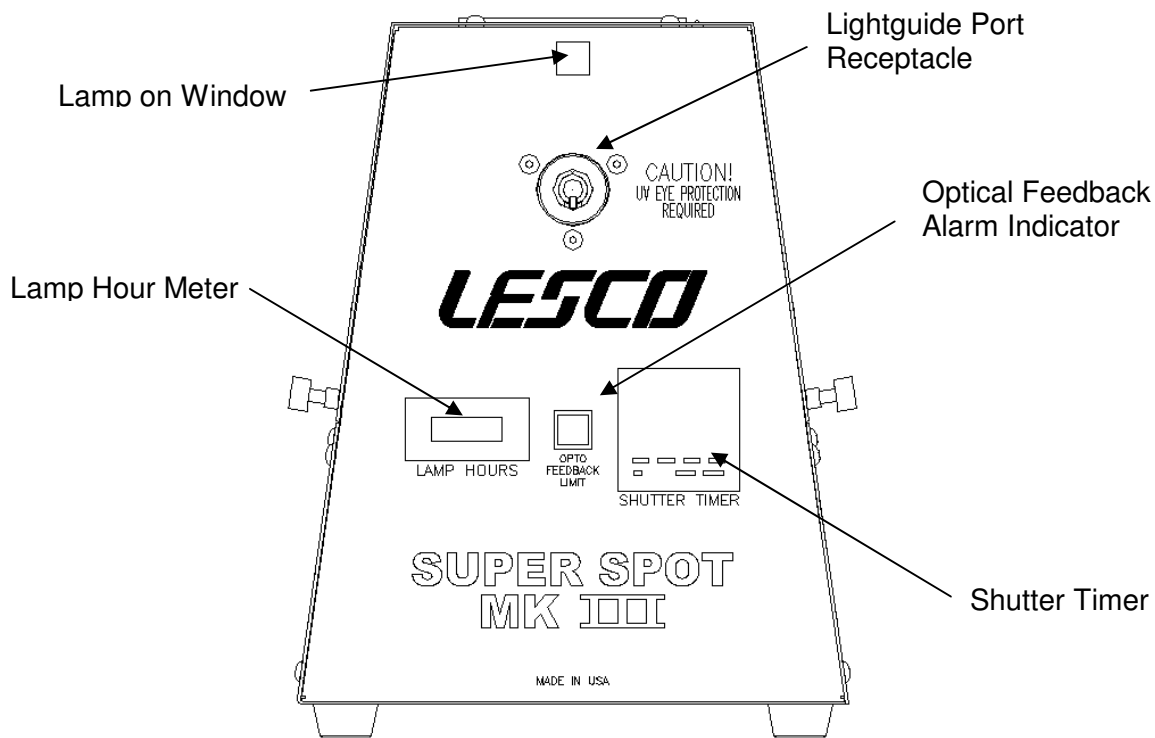
#### **3.1.4. Focusing Reflector**

The reflector is a high precision, first surface elliptical reflector used to gather and focus the highest concentration of energy from the bulb.

#### **3.1.5. Bulb Reflector Module**

The Bulb Reflector Module is a detachable assembly consisting of the bulb, metal holder and an elliptical reflector. The bulb is optically aligned within the reflector. The precision based bulb and reflector holder assembly allows for simple replacement of bulbs without expensive or difficult re-alignment.

## 3.2. Front Panel



### 3.2.1. Lamp Hour Meter

The lamp hour meter mounted on the front panel records the cumulative number of lamp operating hours. The lamp hour meter is calibrated in 0.1-hour (6 minutes) increments, and displays from 0.1 to 9999.9 hours. The hour meter can be reset to zero by a push-button switch located at the rear panel of the unit. After installing a new bulb (with the power on) reset the hour meter using the push button switch located on the back panel.

### 3.2.2. Lightguide Receptacle

The Lightguide Receptacle is a precision mechanical assembly that aligns the bulb, bulb reflector assembly and lightguide for optimal focal point location. It also supports the shutter assembly, optical feedback sensor, lightguide safety switch and infrared filter.

The lightguide transmits UV energy most efficiently when it is straight. Bends in the lightguide decrease UV transmission. For best results, keep the bend radius at 5" or more. Bends tighter than 4" arm to arm (2" radius) may cause irreversible damage.

### 3.2.3. Automatic Shutter Timer

The timer, located in the lower chassis compartment, is mounted on the front panel so that it is visible and can be set from the outside. Setting of the timer is done by pushing four miniature thumb switches, each controlling one digit of a four-digit clock. The timer can be set in .01-second increments for exposure time of .01 second to 99.99 seconds.

### 3.2.4. Bi-Level Power Supply

The bi-level power supply is a solid state, high frequency switching DC supply suitable for operation on 110V and 220V  $\pm$  10%, 50/60 Hz. The power supply provides the high voltage pulse necessary to ignite the lamp and the operating voltage for continuous lamp operation. The power supply also provides a 24 VDC source for the cooling fans and the shutter solenoid.

### **3.2.5. Shutter Assembly**

The shutter assembly is a positive open, spring return rotary solenoid connected to the shutter plate for efficient control and safety of the shutter open cycle. The shutter is also connected to an interlock switch located on the lightguide receptacle where the end of the lightguide is inserted. This switch disables the shutter in the closed position to ensure that there is no unintentional exposure if the lightguide is missing or improperly inserted into the MK III.

### **3.2.6. Timer/Manual Selector Switch**

The Timer/Manual toggle switch is located next to the bottom-cooling fan on the recessed panel at the rear of the unit. In the "Timer" position, pressing the footswitch triggers the timer and opens the shutter. The shutter automatically closes when the timer reaches the preset duration. In the "Manual" position, the timer is inoperative and the shutter stays open as long as the footswitch is pressed down or the signal is held on.

### **3.2.7. Footswitch**

The remote footswitch is equipped with a 6-foot cable, which plugs into a receptacle at the rear panel of the MK III. The footswitch is used to activate the timer when operated in the Timed-Exposure mode, or the shutter when operated in the Manual operation mode.

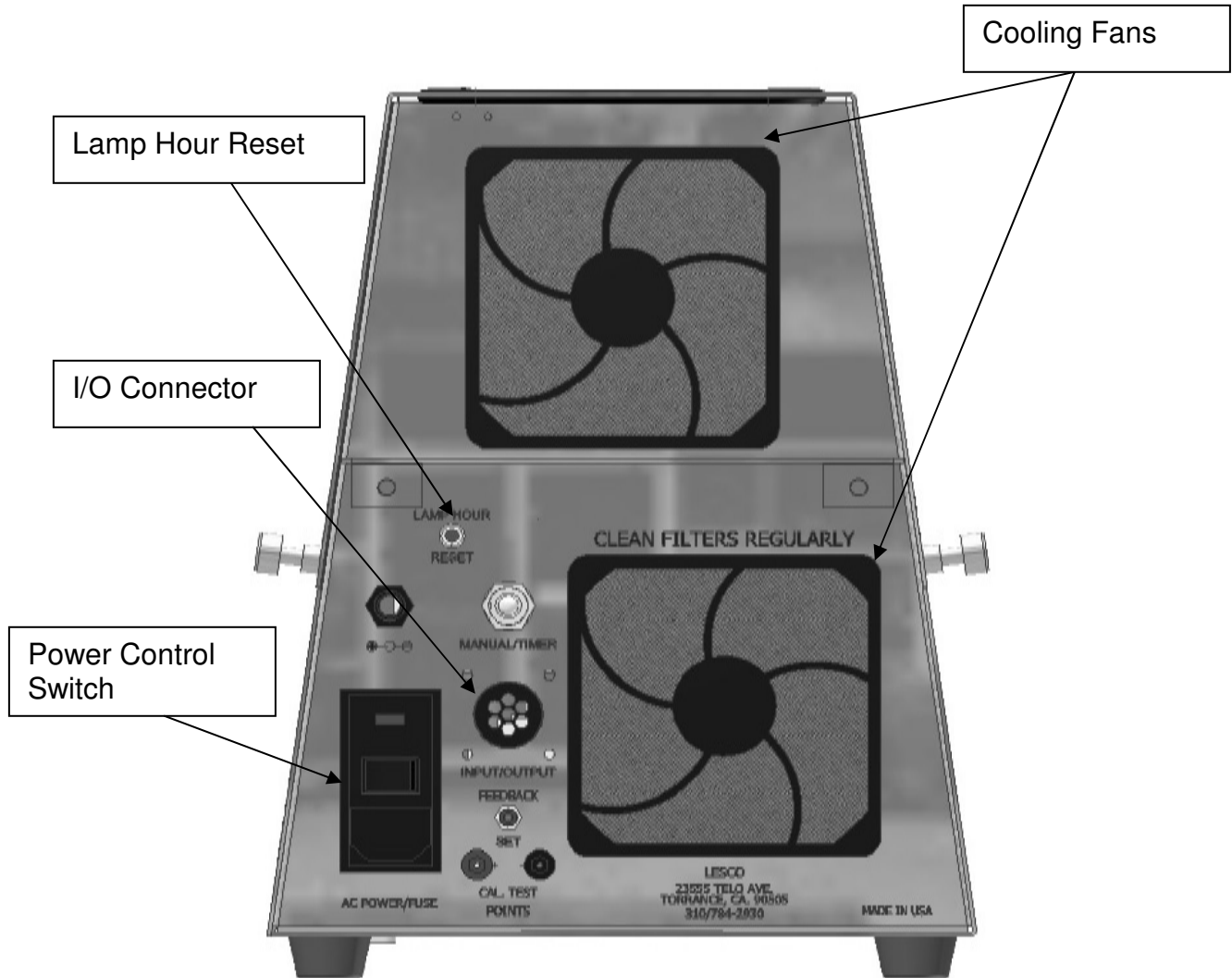
**\*\* CAUTION \*\***

Disconnect power from system or unplug system from wall or VAC power source before connecting the footswitch adapter.

### **3.2.8. Power Cord**

The MK III comes with a 6 foot, 3 prong 110V shielded power cord, which plugs into a receptacle located at the rear panel. 220V power cords are available on request.

### 3.3. Back Panel



**\*\* CAUTION \*\***  
*Do not cover chassis ventilation slots.*

#### 3.3.1. Cooling Fans

The fan system is used to maintain the optimum temperature of the Lamp while cooling the optics and electronics. The bottom fan is used for intake and the upper fan is used for exhaust.

### 3.3.2. Power Control Switch

This contains the power switch, power cord socket (IEC type) and main fuse.

<b>** WARNING **</b>	
<i>For continued protection against risk of fire, replace only with the same type and rating of fuse.</i>	
<u>Input volts</u>	<u>Fuse rating</u>
100-120	4A T, 250 VAC, Slow Blow
220-250	2A T, 250 VAC, Slow Blow

### 3.3.3. IR Filter

The heat filter is located at the lamp-facing end of the lightguide socket, also called the nosepiece. Accessible from the upper chassis compartment, it is mounted in a “cassette” type filter holder and easily removable toward the side of the nosepiece assembly. Many different types of filters are available, offering different radiation bands to fit specific applications. The filter function is to screen out the unwanted radiation from the focused light provided by the reflector, thus protecting the lightguide as well as the work surface from excessive heat.

### 3.3.4. Optical Feedback Sensor (Optional)

The optical feedback sensor is located on the lightguide socket receptacle monitoring the energy at the entrance of the light guide. This signal is sent to the control circuit of the power supply, which internally monitors the intensity set point. The power supply will make the power adjustments to maintain that intensity set point.

The sensor is specially designed to respond to the UV radiation band, allowing it to detect minute differences in the output of the bulb, as well as the performance of the reflector and the IR filter. Its response frequencies extend from the UVA to the UVB and UVC bands, allowing it to run with all the IR filters available.



## 4.0. Installation/Start Up

Before unpacking the system, inspect the shipping container for any damage such as broken corners, deformity, holes and/or tears.

After unpacking the system, examine the equipment for any damage, i.e. unusual dents or rattling of components.

Should there be any major damage immediately inform the shipping company and AUV/LESCO. **Note:** Any delay in reporting damage may invalidate the claim. Make sure to keep the shipping container in case there is a need to ship the system back to AUV/LESCO.

### 4.1. System Components

Make sure all the following has been received:

- \* **SUPERSPOT MK III unit**
- \* **100-Watt Bulb**
- \* **Power Cord**
- \* **Flexible Lightguide (optional)**
- \* **Footswitch with 6 foot lead and phone jack**
- \* **UV Protection Goggles**
- \* **SUPERSPOT MK III Manual**

The MKIII must never be placed with the front panel facing downwards. This places the cathode of the lamp in an unfavorable orientation and will cause premature bulb failure.

**\*\* CAUTION \*\***

*Do not cover chassis ventilation slots.*

#### 4.1.1. Footswitch and Goggles

Plug the footswitch into the phone jack receptacle at the rear panel. Plug the female end of the power cord into the power cord receptacle at the rear panel. Plug the other end of the cord into the appropriate outlet (110V power cord supplied with unit, unless otherwise specified). Before turning the unit ON, make sure you are wearing UV protective goggles/glasses and cotton or latex gloves.

**\*\* CAUTION \*\***

*Disconnect power from system or unplug system from wall or VAC power source before connecting the footswitch adapter.*

#### 4.1.2. Set Timer

Set the exposure timer to the desired exposure duration (0.01 to 99.99 sec.) by pushing the miniature thumb switches. If one intends to operate in the "Manual" mode, make sure the "Timer/Manual" switch is in the "Manual" position. See section 3.2.3.

#### 4.1.3. Lightguide

Plug the lightguide into receptacle. Make sure the lightguide is pushed in until one feels the spring-loaded retainer snap into the retaining groove (if using standard lightguide).

#### 4.1.4. Reset Hour Meter

With the power ON, make sure the lamp hour meter is at zero. If not, zero the hour meter by pushing in, with the aid of a pencil, the recessed reset button located at the rear of the unit. Turn the unit OFF after the hour meter is zeroed.

**\*\* WARNING \*\***

*When the unit is operating and the shutter is open, a concentrated beam of UV light is emitted from the light exit port. UV light is hazardous to the eyes and skin. Never open the shutter without wearing protective goggles. Never expose skin to direct UV radiation.*

**\*\* CAUTION \*\***

*Front or top window is made of UV absorbing polycarbonate. If the window is cracked, broken, or missing, do not operate the unit. Exposure to UV light is hazardous to the eyes and skin.*

#### 4.1.5. Turn Unit On

Turn the unit ON by pushing the ON/OFF switch on the front panel to the "ON" position. The lamp will ignite. In a few seconds, the lamp will begin to emit light, which can be observed from the top or front window. Both fans located at the rear panel of the unit will come on.

**Note:** If the lamp does not ignite within 15 seconds, turn the unit OFF for 10 seconds and retry.

**\*\* CAUTION \*\***

*Forced air-cooling is necessary for proper operation of lamp and power supply. DO NOT OPERATE unit unless both fans are ON.*

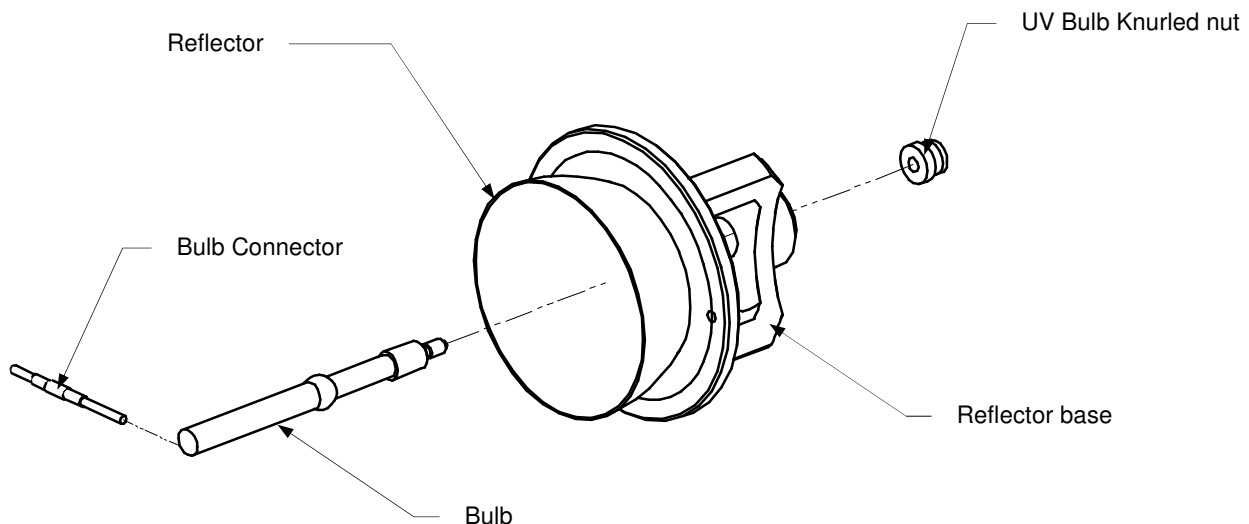
## 4.2. Bulb Installation

**\*\* WARNING \*\***

*Disconnect power and unplug unit from wall before installing or removing lamp or servicing unit.*

The following procedures will allow for proper operation of the MKIII system.

1. Using a Phillips screwdriver, loosen the four quick connects that are on the sides of the top cover.
2. Lift the cover straight up off of the chassis. This will allow access into the bulb reflector assembly.
3. Remove the packing material from the bulb and the nut from the bulb base. Then insert the bulb into the base of the reflector. Be careful not to touch the bulb with your bare fingers. Use alcohol to clean it if necessary.
4. Replace the nut on the end of the bulb and tighten against the reflector base. Then, using serrated pliers tighten the nut 1/8 to 1/4 turns.



**\*\* CAUTION \*\***

*Bulb surface is hot during normal operation. Avoid contact.*

5. Plug the leads into the matching colored sockets and replace the housing. **(NOTE:** Be certain the black bulb lead wire is **NOT** pinched between the housing and retainer clips. Lead wire should be free of pressed contact from bulb to socket.) Re-attach the cover to the main unit. Next connect the power cord to the rear of the MKIII and into the power outlet.
6. Insert the lightguide into the receptacle located in the upper center section of the front control panel of the MKIII.

**\*\* WARNING \*\***

*Do not look into the emitting end of the lightguide. Use proper shielding at all times. Safety glasses are provided with each system. Avoid exposing skin to UV light. Shielded UV enclosures and safety glasses are available for purchase from AUV/LESCO.*

**\*\* CAUTION \*\***

*Check input voltage and set input power module switch before plug in.*

**\*\* CAUTION \*\***

*Disconnect power from system or unplug system from wall or VAC power source before connecting the footswitch adapter.*

7. Turn on the power switch located on the back of the MKIII above the power cord receptacle; the system takes two minutes to warm up. If for some reason the bulb does not light (indicated in the bulb-on window), turn the power off then on again to strike the bulb.

### 4.3. Voltage Setting

**\*\* WARNING \*\***

*Disconnect power and unplug unit from wall before installing or removing lamp or servicing unit*

**\*\* WARNING \*\***

*Risk of electrical shock, do not remove cover.  
Refer servicing to qualified service personnel*

**\*\* CAUTION \*\***

*Check input voltage and set input power module switch before plug in.*

**\*\* CAUTION \*\***

*Disconnect power from system or unplug system from wall or VAC power source before connecting the footswitch adapter.*

Verify the voltage of the power line the MKIII will be connected to.

Remove the bottom cover by undoing the six button head screws. The voltage selector connector is located on the motherboard of the power supply near the front of the unit. See Figure 1 on the next page.

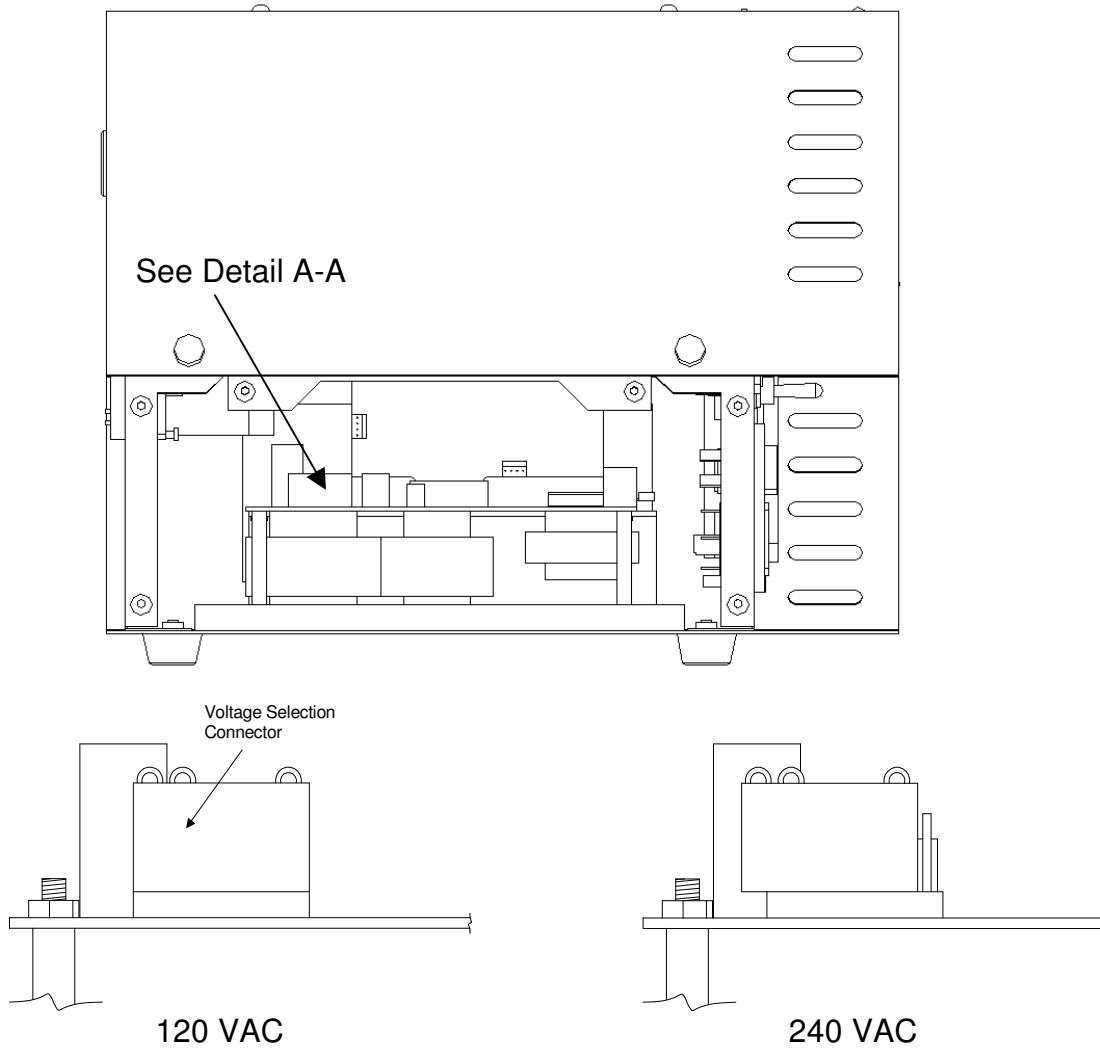
The factory setting is 120 VAC and it corresponds when the connector is aligned with the socket. To convert the unit for 220 VAC simply remove the jumper connector and reinstall it leaving the rear pin empty. See Figure 1A. Voltage Setting.

**\*\* WARNING \*\***

*For continued protection against risk of fire,  
replace only with the same type and rating of fuse.*

<u>Input volts</u>	<u>Fuse rating</u>
100-120	4A T, 250 VAC, Slow Blow
220-250	2A T, 250 VAC, Slow Blow

Figure 1.



Detail A-A

To change from 120VAC to 240VAC input, move the connector shown in Detail A-A 1 pin position forward as shown above.

Figure 1A. Voltage Setting.

## 4.4. Manual Operation

### 4.4.1. Toggle Switch

In the Manual operation mode, the shutter remains open and UV light is continuously emitted from the light exit end of the lightguide for as long as the footswitch is depressed. If operating in the Manual mode, make sure that the shutter selector switch is in the "Manual" position. See section 3.2.6.

### 4.4.2. Cure Cycle Operation

**\*\*WARNING\*\***

*UV light is hazardous to the eyes and skin. Do not operate the unit without UV protective goggles and gloves. Make sure no one is exposed to or is in a position to look at the light emitted from the light guide unless they are also protected with UV protection goggles.*

To expose substrate to UV light, turn the unit ON following the procedure outlined in section 4.1.5. Hold light-exit end of lightguide away from substrate (make certain lightguide end-tip does not come in contact with material), and press down on footswitch. Shutter will open, and UV light will be emitted from the lightguide. To end UV emission, release pressure from the footswitch (if in "Manual" mode) or wait for timed shutter open period to expire.

### 4.4.3. Proper Light Exposure

UV light is most effective when it is perpendicular to the work surface; the effectiveness drops to 50% when the angle of incidence is 60 degrees from the work surface, dropping to zero when the light only grazes the work surface.

The UV light is emitted from the standard lightguide exit port in a 60° cone. Therefore, the further away the lightguide is from the work surface, the lower the energy density (milliwatts per square cm) and the higher the exposure time necessary to achieve the desired results.

**Note:** The bulb lifetime depends on the number of times it has been turned ON and OFF. Turning the lamp ON, and the subsequent warm-up period until the lamp comes to full power, degrades the bulb considerably more than continuous operation. For best results, keep the lamp operating throughout the work shift.

**Note:** After the lamp has been turned off, it needs to cool down before it can be ignited again. Allow approximately 2 minutes before one attempts to restrike the lamp.

**\*\*CAUTION\*\***

*Repeated attempts to restrike the lamp before it has cooled down sufficiently may damage the power supply.*

## 4.5. Timed Exposure Operation

### 4.5.1. Toggle Switch

In the Timed Exposure mode, shutter opening is triggered by momentarily depressing the footswitch and the shutter will stay open for the duration determined by the setting of the Automatic Shutter Timer. It will close automatically when the set time has elapsed. If operating in the Timed Exposure mode, make sure that shutter selector switch is in the "Timer" position. See section 3.2.6.

### 4.5.2. Cure Cycle Operation

**\*\*WARNING\*\***

*UV light is hazardous to the eyes and skin. Do not operate the unit without UV protective goggles and gloves. Make sure no one is exposed to or is in a position to look at the light emitted from the light guide unless they are also protected with UV protection goggles.*

To expose substrate to a timed dose of UV light, turn the unit ON. Set the automatic timer to the desired exposure time, as outlined in section 4.1.2. Hold the light-exit end of the lightguide and depress the footswitch momentarily. The shutter will open, and UV light will be emitted from light exit port. The shutter will close automatically when the preset time has elapsed.

### 4.5.3. Proper Light Exposure

UV light is most effective when it is perpendicular to the work surface; the effectiveness drops to 50% when the angle of incidence is 60 degrees from the work surface, dropping to zero when the light only grazes the work surface.

The UV light is emitted from the lightguide exit port in a 60° cone. Therefore, the further away the lightguide is from the work surface, the lower the energy density (milliwatts per square cm) and the higher the exposure time necessary to achieve the desired results.

**Note:** The lamp lifetime depends on the number of times it has been turned ON and OFF. Turning the lamp ON, and the subsequent warm-up period until the lamp comes to full power, degrades the lamp considerably more than continuous operation. For best results, keep the lamp operating throughout the work shift.

**Note:** After the lamp has been turned off, it needs to cool down before it can be ignited again. Allow approximately 2 minutes before one attempts to restrike the lamp.

**\*\*CAUTION\*\***

*Repeated attempts to restrike the lamp before it has cooled down sufficiently may damage the power supply.*



## 5.0. Calibration

### 5.1. *Optical Feedback Operation*

Optical Feedback is designed to maintain constant exposure intensity over the lifetime of the bulb for tight process control. It automatically compensates for the normal decay of the bulb during its operating life, achieving a constant output to maintain uniform total energy per cure cycle. A UV sensor is used to monitor the output intensity creating a reference voltage that the power supply maintains by modulating the power delivered to the bulb.

The variable power supply has a working dynamic range of electric power. When the shutter is closed the bulb idles at the low limit of this power range. Once the shutter is opened, the power supply will increase its output to reach the preset intensity level. If the control circuit fails to achieve this preset value, the POWER ALARM indicator will illuminate, after 5 seconds. This usually indicates a worn bulb, but always inspect the reflector and filter to make sure they are not reducing the bulb output.

#### 5.1.1. *Optical Feedback setting*

The Optical Feedback circuit can be set by adjusting the potentiometer located in the rear of the unit while measuring the output of the lightguide with a calibrated NIST traceable radiometer. Turning the potentiometer counter clockwise will lower the output while turning it clockwise will increase it. Using this method it is possible to determine the range of operation of the bulb by finding its Maximum and Minimum UV output values.

Adjusting the pot to the Maximum output (radiometer reading) will trip the Power Alarm indicator when the shutter is open. The closer the UV output is set to its Maximum value the less reserve the power supply will have to compensate for the bulb's gradual decay. The closer the setting is to the Minimum UV output, the more reserve power is available to compensate the bulb. The Power Alarm indicates that the power supply no longer has any reserve left to compensate the bulb. Replace the bulb and recalibrate the unit when the Power Alert is on, to maintain the required UV output.

#### 5.1.2. *Optical Feedback Calibration*

**\*\* WARNING \*\***

*Risk of electrical shock, voltage present between test probes and chassis ground.*

*Refer servicing to qualified service personnel*

Calibration needs to be performed when a new bulb or any optical element (bulb, filter and reflector) is assembled into the unit.

1. Close the housing after replacing the bulb, reflector, filter, and/or UV sensor. Turn the system on, attach the lightguide, and allow the lamp to warm up for 5 minutes. Insert +/- leads of DC voltmeter (not included) in the calibration test points located on rear panel. Using a small straight blade screwdriver, turn the feedback set pot 20 turns to the **Left** or **Counter-Clockwise**.
2. Select the manual position for the manual/timer switch. Install the footswitch in the rear panel jack. Insert the lightguide into a radiometer, open the shutter using the footswitch and hold open. Read the radiometer and the voltmeter and slowly turn the potentiometer clockwise. The values will start increasing, indicating the optical feedback is engaged in its operating range.
3. Keep on turning the potentiometer clockwise until both values do not increase any more. The difference between the two radiometer readings limit values is the working range of the unit. Any value within this range can be set and will be held for the operating life of the bulb.
4. Set the unit to the desired UV output. Monitor the DC voltmeter; this reading indicates the reference voltage for this particular bulb, unit and UV output. This test point value will remain the same while the optical feedback circuit is controlling the output of the bulb. Set the unit to auto mode. The unit is ready for use.

***NO FURTHER ADJUSTMENT IS REQUIRED.***

*To maximize bulb life the output intensity setting should be as far as possible from the upper output limit. This would allow more reserve to compensate for bulb output decay.*

## **5.2. Optical Feedback Problems**

1. Setting the reference voltage too low (outside the operating range of the optical feedback circuit) will set the power supply at its minimum limit, running the bulb at constant power. As the bulb decays the power supply will not compensate (even though it has plenty of reserve) because the reference voltage is outside of the desired range. **It is recommended to set the reference voltage at least 10% above the minimum value.**
2. Setting the reference voltage too high causes the power supply (and bulb) to run at its high power limit. The life of the bulb is minimized, as is the time in optical feedback control. As the bulb decays the power supply has little or no reserve to compensate for the bulb decay and the Power Alarm indicator is triggered. **It is recommended to set reference voltage at least 10% below the maximum value.**
3. Changing lightguides after calibrating a unit will affect the previous settings, giving either a false high or low amount of UV light to the sensor. This causes the power supply to modulate the bulb power to an incorrect value. **Recalibrate if a different lightguide is inserted into the unit.**
4. If the unit fails to calibrate, fails to adjust or the high limit is never found, check the optical feedback signal gain. Set the unit to its lowest setting (turn the potentiometer full CCW 20 turns), insert light guide, open the shutter and read the voltmeter. The value should be less than 6.5 Vdc. If the value is higher, please consult the factory for instructions. **Check the low limit test point voltage is less than 6.5 Vdc.**

## 6.0. Maintenance

### 6.1. Housing

The MK III is a simple, rugged unit and does not require complicated routine maintenance. Routine maintenance consists of keeping the unit clean, periodical cleaning of air filters, and periodical UV output measurements to ensure that the unit performs optimally.

### 6.2. Cleaning

**\*\*WARNING\*\***

***Make sure the main power switch is turned off and the power cord is unplugged before cleaning the unit.***

To clean, unplug the unit and wipe down outer surfaces with a damp, clean cloth. If necessary, use mild detergent, acetone, or alcohol. Let unit air dry before applying power.

**\*\*CAUTION\*\***

***Use of any other chemical may result in rust or tarnish to the surface, and void the warranty.***

#### 6.2.1. Air Filter Cleaning

The MK III has two fans located at the rear panel; each of the fans is equipped with a removable air filter. To remove the air filter, snap off the flexible plastic fan cover. The air filter is easily removable from the fan opening. Wash the filter with warm water and air dry. When dry, place the filter inside the plastic fan cover and snap shut over fan.

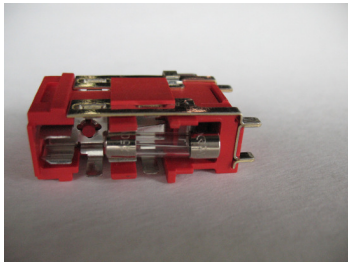
### 6.3. Fuse Replacement

The external fuse is above the power switch on the rear panel. Remove power cord and open the power control switch cover and small red drawer located above the power switch using a small flat screwdriver.

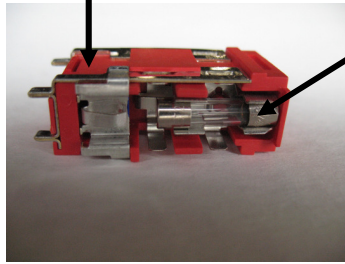


**For 120vac**

Fuse 4A in first line

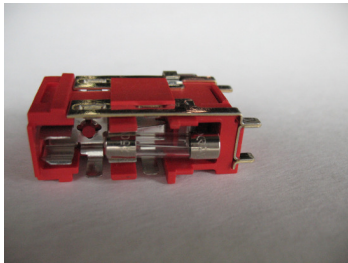


Jumpered in second line. Spare fuse 4A

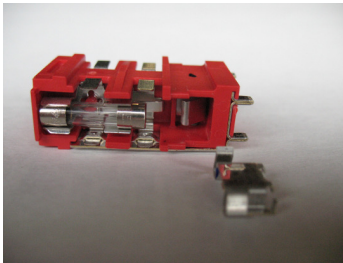


**For 220vac**

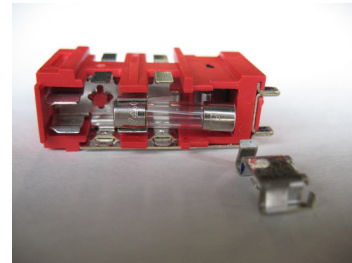
Fuse 2A in first line



Remove the jumper

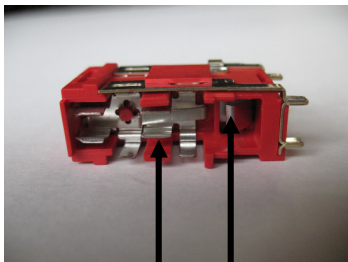


Install a 2A fuse in second line



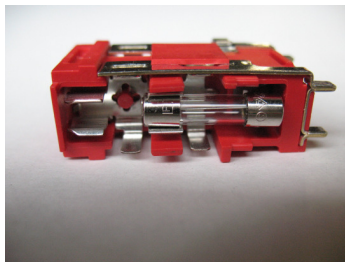
**Correct fuse placement in holder**

**No fuse**

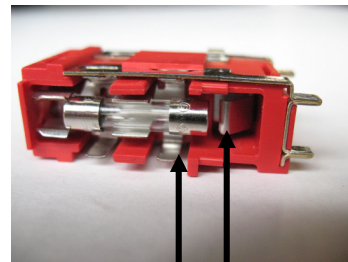


Contacts

**Correct**



**Incorrect**



Fuse not making contact

## **6.4. Optical Components**

The optical components are the reflector assembly, the shutter, the IR filter and the lightguide.

## **6.5. Reflector Assembly**

The reflector is a highly important component of the “optical train” since the light produced by the bulb must first be collected by the reflector. When the reflector is new, it has a very high efficiency, but with time and temperature, it slowly decays to lower levels. Always inspect the reflector when replacing bulbs. A discoloration or lack of a clear shiny surface indicates a worn out reflector. We recommend replacing the reflector assembly every 6-12 bulb changes or earlier if required. Many factors influence its performance, such as air humidity, room temperature, and potential corrosives/particulates content within the ambient air.

## **6.6. Shutter**

The shutter is actuated by a high MTBF (mean time before failure) rotary solenoid. Under normal operating conditions, it should not need any maintenance or replacement. On high duty cycle applications it should be replaced to prevent failures or mis-operation every 10 million operations.

## **6.7. IR Filter**

The IR filter is a specially coated, high quality quartz plate. The filter is a highly critical component since all light must pass through it before being transmitted by the lightguide.

There are several different filters available for each application. Please consult AUV/LESCO for your best choice.

Always check the filter when re-lamping by removing the filter holder. Make sure the coating side of the IR filter faces the lamp/bulb. Inspect it for blemishes and/or cracks. It is recommended to replace the filter every four to eight bulb changes or when necessary.

## **6.8. Lightguides**

AUV/LESCO lightguides are available in either “liquid-filled” (LF) or “fiber optic” (FO) types.

## **6.9. Liquid-filled**

The standard lightguide shipped with most AUV/LESCO SUPERSPOT cure products is a 1M x 5mm LF model. This device allows flexible delivery of high intensities of light with approximately 80% transmission efficiency in the UV “A” and visible ranges. 1.5M and longer LF versions are available as are bifurcated (dual outputs), trifurcated (3 outputs), cuadfurcated (4 outputs), and 8mm or 3mm diameter models. AUV/LESCO will also

quote a variety of custom guides for special purposes. These include special models optimized for high transmission in the UV "B" and UV "C" range (230 to 390 nm). Contact AUV/LESCO factory for price and delivery of special products.

AUV/LESCO's precision-built LF lightguides are high quality optical instruments, but their performance will naturally degrade with time. If cared for properly and under normal operating conditions, the user can expect anywhere from perhaps 1 to 2 years of use from a LF lightguide. However, normal degradation will be greatly accelerated with aggressive radiation and/or extreme heat levels. For a given dosage, it is well established that high intensity for short exposure time periods is the preferred method of effecting maximum cure strength. This is true for the great majority of applications and will not normally damage the guides.

However, care must be taken to minimize very high intensity levels for sustained periods of exposure time. Also, the special IR reduction filter in AUV/LESCO SUPERSPOT cure systems must not be removed. If either of these conditions occurs, the LF lightguide will suffer irreparable damage or have its service life reduced dramatically. Special duty AUV/LESCO FO lightguides are available for extreme intensity/dosage applications (contact factory at 1-800-615-3726).

Never bend a light guide radically (i.e. - over 90° over a 12" radius for a LF). Be extremely careful not to scratch, mar or accidentally apply curable material to the guide end tips. Clean the quartz end tips with alcohol on a regular basis and check transmission levels at least every 100 operating hours (more often if end tips are not fixtured).

## 6.10. Fiber-optic

AUV/LESCO fiber optic (FO) lightguides are used for applications where long run lengths, tight end clearances, or multiple outputs are required. FO lightguides are available in almost endless configurations for specialized applications. Popular standard products are Bi-, tri- and quadfurcated guides, although AUV/LESCO FO lightguides can be ordered with 10 or more output ends arranged in circular, line or any random configurations.

Your Fiber Optic Light Guide (FOLG) is designed to provide a long life of dependable and consistent UV energy transmission. In order to sustain the high levels of throughput and extend its useful life, the FOLG must be properly maintained.

Following are some general maintenance guidelines for your reference. If you need any additional help or have further questions, please contact AUV/LESCO with your request.

1. Inspect the FOLG regularly. A visual inspection of its ends will detect most problems associated with build up of residues or signs of deterioration. To inspect it, use a bright incandescent lamp. It is better to cover the opposite end to prevent back illumination. The surface should look black and very shiny. If it looks dull or not glossy, there is residue on it and it should be cleaned.
2. Never use a sharp object to clean the fiber surfaces. Use only high quality solvents. We recommend using reagent grade acetone. Do not use regular acetone as it may leave residues.

3. Use a clean Q-tip or Clean-wipe to scrub the surface when applying the solvent. Make sure no material “bleeds” from the surface, as this is an indication that there has been mechanical damage.
4. Be careful not to expose the mono-coil jacket (black flexible tubing) surface to the acetone. Do not use any solvents that can dilute epoxy adhesives. Use alcohol to clean any deposits on the mono-coil surface.
5. If the fiber surfaces cannot be cleaned or continue to release material, please return the FOLG to AUV/LESCO for repair. It may be necessary to re-polish the surfaces or rebuild the ends.
6. Always inspect the IR filter in the Super Spot unit, since it is essential for the protection of the proximal (entrance) end of the FOLG. Using the FOLG with a damaged, broken, or removed filter will cause serious damage to the fiber.

Following these general guidelines and proper preventive maintenance will give you the expected long life of your FOLG. Please make sure you keep it clean and working properly to benefit from its unmatched performance.

#### **6.10.1. All Lightguides**

All lightguides can be damaged or suffer impaired light transmission if not used properly. Transmission losses can be easily determined by using a AUV/LESCO Quartz Calibration Fixture and radiometer. FOLG have lower transmission efficiency than LFLG, usually in the 30 to 40% range, but their operating life is several times longer, making them a very cost effective delivery method. To check the percentage transmission, consider the Calibration Fixture transmission as 100%. Simply divide the FOLG reading by the Calibration Fixture value to compare results with previous readings. In Optical Feedback units, the level potentiometer must be set to minimum to override its operation. Reset the UV output level after checking transmission.

## **7.0. Drawings/Schematics**

The following section is a set of drawings and schematics complete with specifications for the MKIII system and accessories.

### **7.1. Main Schematic**

**MKIII with VUM1022-HP Interface**

**MKIII with VUM1022 Interface**

### **7.2. Input / Output Connector Wiring**

**I/O Interface Option, VUM1022-HP**

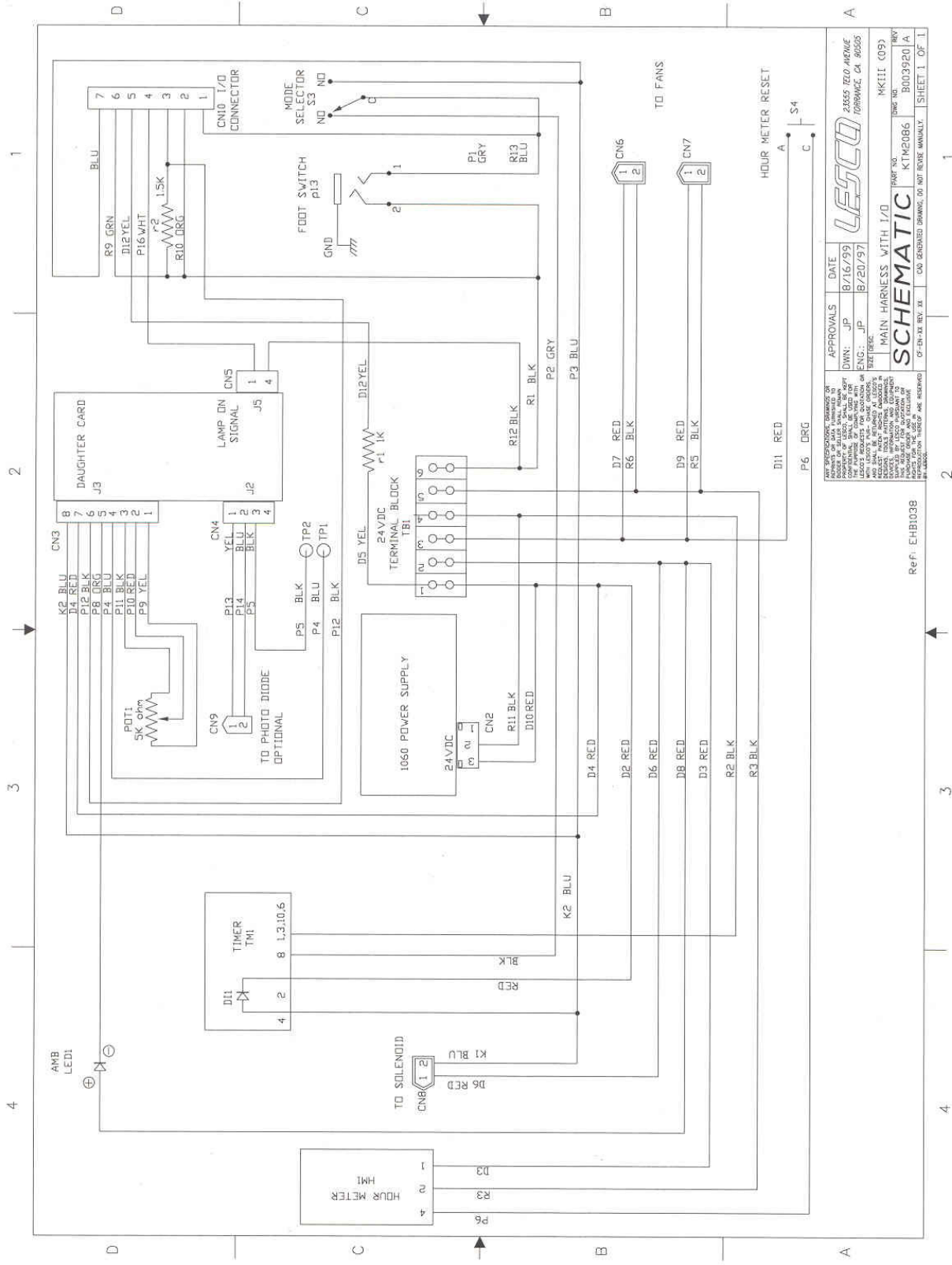
**I/O Interface Option, VUM1022**

**I/O Interface w/ Safety Shutter Option, VUM1020**

**I/O Interface Lamp On & Power Alert Option, VUM1024**

**Shutter Active Input Wiring**



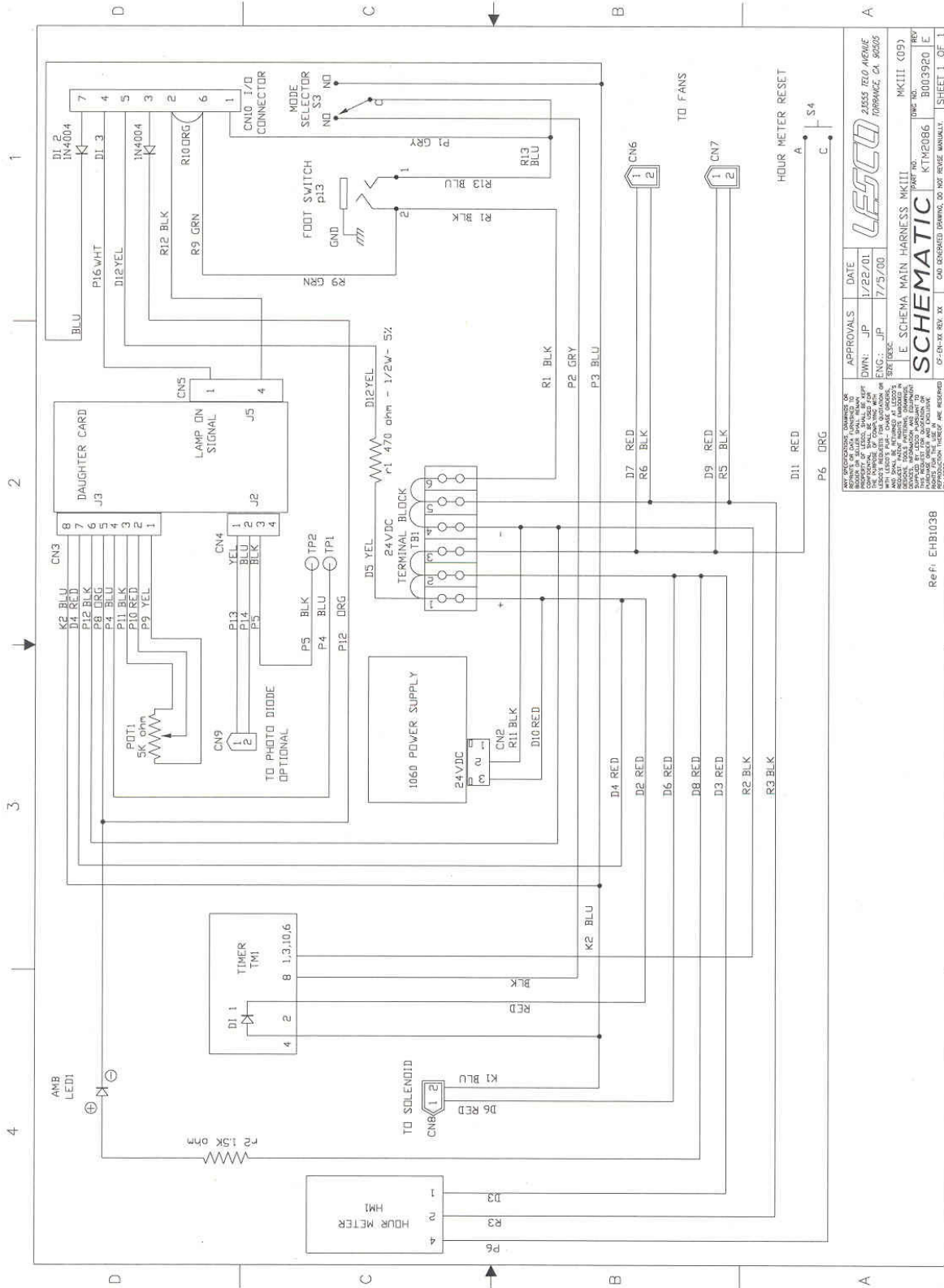


APPROVALS	DATE
DWY: JP	8/16/99
ENG: JP	8/20/97

28555 TEO AVENUE  
 TORRANCE, CA 90505  
**LESCO**  
 MKIII (09)  
 MAIN HARNESS WITH 1/0  
 PART NO. B003920 A  
 KTM2086  
 SCHEMATIC  
 OF EN-XX REV. XX. CANNOT BE REPRODUCED OR COPIED WITHOUT THE WRITTEN PERMISSION OF LEPTON.

Ref: EHB1038

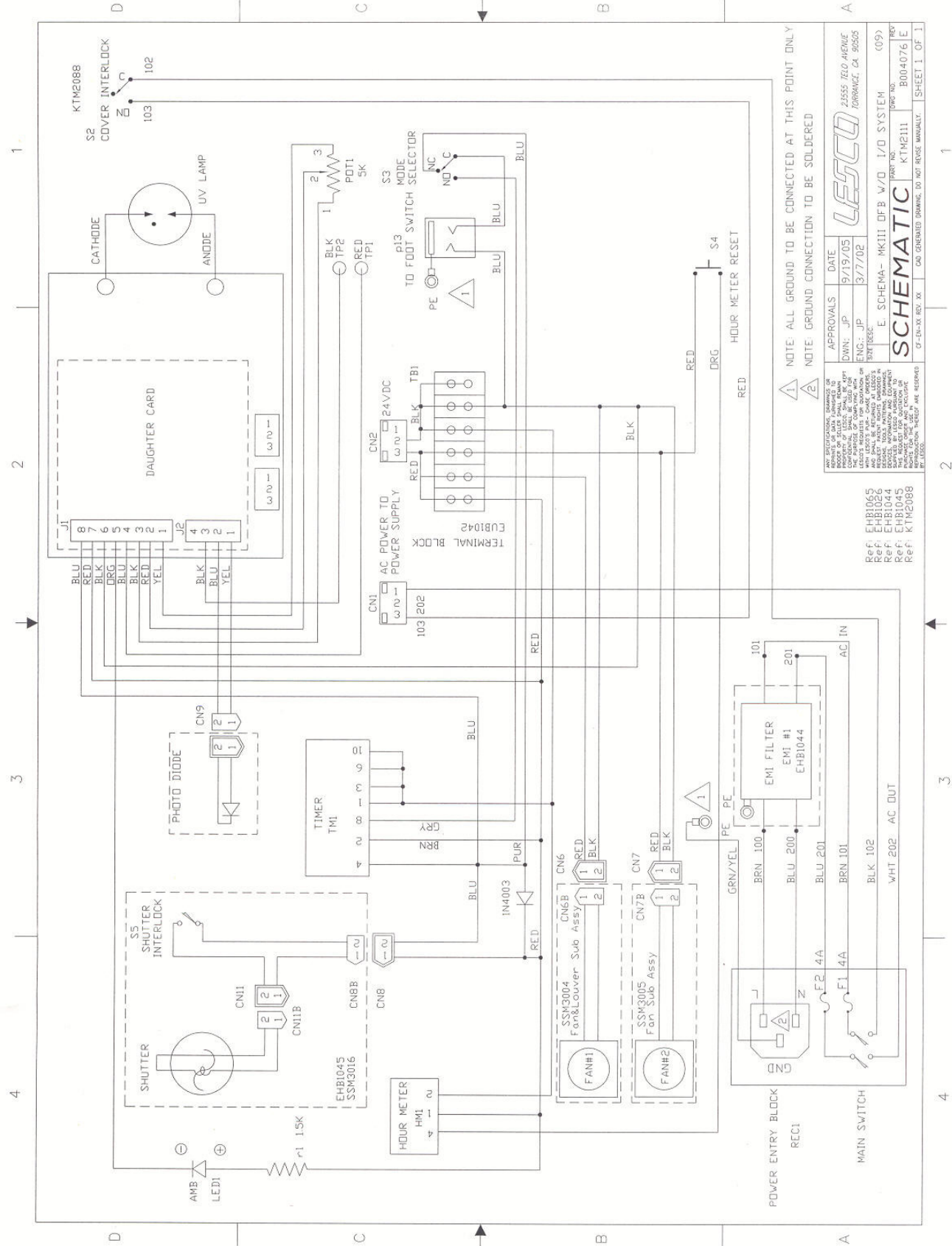
1 OF 1



APPROVALS	DATE
DWN: JP	1/22/01
ENG: JP	7/5/00

E-Schema Main Harness MKIII  
 SCHEMATIC  
 PART NO. KTM2086  
 REV. NO. B003920 E  
 MKIII (09)

Ref: EHB1038



NOTE: ALL GROUND TO BE CONNECTED AT THIS POINT ONLY  
 NOTE: GROUND CONNECTION TO BE SOLDERED

APPROVALS	DATE
DWN: JP	9/19/05
ENG: JP	3/7/02
EXT: JSS	

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 Ref: EHB1026  
 Ref: EHB1044  
 Ref: EHB1045  
 Ref: KTM2088

**SCHEMATIC** KTM2111 (W/P NO. B004076) (09)  
 E. SCHEMA - MKIII DFB W/D I/O SYSTEM

LESICO 2855 YOLO AVENUE  
 TAYLORVILLE, GA 30058

OF 14-XX REV. XX CO. GENERATED DRAWING DO NOT REUSE MANUALLY (SHEET 1 OF 1)

## 7.2. Input / Output Connector Wiring

### 7.2.1. I/O Interface Option, VUM1022-HP

	DESCRIPTION	FUNCTION
2	INPUT COMMON	
1	INPUT – CONTINUITY BETWEEN PINS 1 & 2 WILL ACTIVATE SHUTTER	SHUTTER TRIGGER
3	OUTPUT -- PIN 3, 18VDC TO PIN 6 WHEN POWER ALERT CONDITION EXISTS*	POWER ALERT
5	+ 24VDC SUPPLY 25mA MAX	
7	OUTPUT – 24 VDC BETWEEN PIN 5 & PIN 7 WHEN THE SHUTTER IS OPEN	SHUTTER OPEN
6	OUTPUT COMMON	ALARM SHUTTER & LAMP ON
4	OUTPUT – PINS 4 TO PIN 6 WHEN LAMP ON	LAMP ON INDICATOR

**NOTE:** LIMIT CURRENT THROUGH OUTPUTS 3, 4 & 7 TO 30mA MAX.  
 \* OUTPUT PULSING 1Hz WHEN ALARM IS ON.

**7.2.2. I/O Interface Option, VUM1022**

	<b>DESCRIPTION</b>	<b>FUNCTION</b>
1	INPUT - CONTINUITY BETWEEN PINS 1 & 2 WILL ACTIVATE SHUTTER	SHUTTER TRIGGER
2	INPUT COMMON	
3	OUTPUT - PIN 3 TO PIN 6 WHEN POWER ALERT CONDITION EXISTS *	POWER ALERT
4	OUTPUT - PINS 4 TO PIN 6 WHEN LAMP ON	LAMP ON INDICATOR
5	+ 24VDC SUPPLY 25mA MAX	
6	OUTPUT COMMON	ALARM SHUTTER & LAMP ON
7	OUTPUT - PIN 7 TO PIN 6 WHEN THE SHUTTER IS OPEN	SHUTTER OPEN

**NOTE:** LIMIT CURRENT THROUGH OUTPUTS 3, 4 & 7 TO 30mA MAX.  
 \* OUTPUT PULSING 1Hz WHEN ALARM IS ON.

**7.2.3. I/O Interface w/ Safety Shutter Option, VUM1020**

	<b>DESCRIPTION</b>	<b>FUNCTION</b>
1	INPUT – CONTINUITY BETWEEN PINS 1 & 6 WILL ACTIVATE SHUTTER	SHUTTER TRIGGER
2	SHUTTER SAFETY INTERLOCK 250mA INDUCTIVE LOAD	HARNESS SHUTTER INTLK
3	OUTPUT - PIN 3 TO PIN 6 WHEN POWER ALERT CONDITION EXISTS *	POWER ALERT
4	SHUTTER SAFETY INTERLOCK 250mA INDUCTIVE LOAD	HARNESS SHUTTER INTLK
5	+ 24 VDC SUPPLY 25mA MAX	
6	OUTPUT COMMON	ALARM SHUTTER & LAMP ON
7	OUTPUT – PIN 7 TO PIN 6 WHEN THE SHUTTER IS OPEN	SHUTTER OPEN

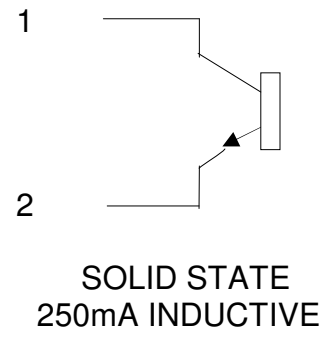
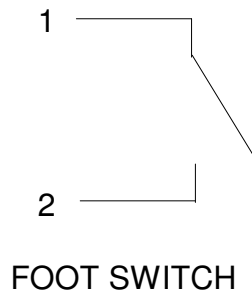
**NOTE:** LIMIT CURRENT THROUGH OUTPUTS 3 & 7 TO 30mA MAX.  
\* OUTPUT PULSING 1Hz WHEN ALARM IS ON.

**7.2.4. I/O Lamp On & Power Alert Option, VUM1024**

	DESCRIPTION	FUNCTION
2		
1		
3	OUTPUT - PIN 3 TO PIN 6 WHEN POWER ALERT CONDITION EXISTS *	POWER ALERT
5		
7		
6	OUTPUT COMMON	ALARM & LAMP ON
4	OUTPUT – PINS 4 TO PIN 6 WHEN LAMP ON	LAMP ON INDICATOR

**NOTE:** LIMIT CURRENT THROUGH OUTPUTS 3 & 4 TO 30mA MAX.  
 \* OUTPUT PULSING 1Hz WHEN ALARM IS ON.

### 7.2.5. Shutter Activate Input Wiring





## 8.0. Accessories

### 8.1. Standard Replacement Parts

To order replacement parts please call the AUV/LESCO spare parts dept. in Torrance, CA. TOLL FREE (800) 615-3726 or (310) 784-2930.

2 Amp, 120V AC input fuse	EFB1008
4 Amp, 240V AC input fuse	EFB1007
Foot Pedal	EVB2115
IR Filter	OFB1004
Photo diode	EHB1065
Replacement Reflector 100W	SSM3031
Replacement Bulb 100 watt	LPB1008
Replacement Fan Filters (pack of 5)	KFB1003
Solenoid	EHB1045
UV Safety Glasses	VXB1001
AUV/LESCO SPOTCURE Intensity Meter	AIB1001

### 8.2. Optional Liquid-filled Lightguides

5mm x 1M	OLB1003
5mm x 1.5M	OLB1004
5mm x 3M	OLB1009
Dual 2 x 3mm x 1M	OLB1001
Dual 2 x 3mm x 1.5M	OLB1002
Trifurcated 3 x 3mm x 1.5M	OLB1012
8mm x 1M	OLB1008
8mm x 1.5M	OLB1010

NOTE: The above Liquid-filled lightguides should not be used at maximum intensity.

#### **Fiber Optic Lightguides**

UV transmitting lightguides fabricated to specific applications are available upon request. AUV/LESCO FO lightguides are designed with proprietary technology to withstand the extreme intensities generated by MKIII and MAX systems. They are capable of delivering this high intensity to precision-tolerated cure sites. Please call AUV/LESCO for pricing information.

## 9.0. Troubleshooting

**\*\*\* WARNING \*\*\***

**PARTS MAY BE HOT.** If unit was running allow time for cool down.  
Exercise care when touching internal optical parts.

**\*\*\* WARNING: HIGH VOLTAGE \*\*\***

High voltage may be present in bulb terminal connections.  
Allow 2 minutes time to bleed down capacitor voltage.

**\*\* CAUTION \*\***

*Disconnect power from system or unplug system from wall or VAC power source before connecting the footswitch adapter.*

<u>Fault</u>	<u>Action</u>
<b>Unit Does Not Turn On</b>	<p>Check power availability at the selected power outlet.</p> <p>Check that power cord is properly connected.</p> <p>Make certain voltage, phasing, and frequency are correct.</p> <p>Check the fuse.</p> <p>Check that the top cover is installed properly and is pressing down on the safety interlock switch (top of rear panel).</p>
<b>Unit Blows Fuses</b>	<p>Verify AC operating voltage configuration 120/220 VAC. If unit is configured for 120VAC and 220VAC power is applied, the unit will blow fuses. Power supply may be damaged. Check AC voltage jumper and apply correct voltage. Retest power supply. Replace power supply if necessary.</p> <p>Perform visual examination of wiring harness. Any obvious electrical shorts (disconnected terminals, etc.) touching the chassis will cause the fuse to blow. Insulate, repair and retest power supply. Replace power supply if necessary.</p> <p>Check for electrical short from photo diode sub-assembly to chassis. If photo diode is shorted to chassis, this will cause fuse to blow and possibly damage the power supply.</p> <p>Replace photo diode sub-assembly and check for electrical short to chassis before applying power. Retest power supply. Replace power supply if necessary.</p> <p>Open circuit voltage (no bulb). Open circuit voltage should rise to approx. +2340 Vds for a few seconds, then drop to approx. +330 Vdc. If power supply blows fuses without a</p>

load, then power supply components, wiring or shorts may be the problem. Perform visual inspection of power supply components and wiring. Retest power supply. Replace power supply if necessary.

### **Unit Blows Fuses & Bulbs**

If power supply blows fuses and bulbs but checks OK without a bulb installed, the power supply DC current regulator is not working. Replace power supply.

### **Bulb Fails to Ignite**

*(Power is on, fans running and front panel illuminated.)*

Verify the proper installation of the bulb/reflector assembly.

Check both lamp connections and ensure the lamp connector is properly plugged in.

Turn the unit off for 20 seconds, and then restart. Repeat this procedure until the lamp lights, not to exceed five attempts.

Replace bulb. If still no lamp ignition, replace power supply.

### **Shutter does not Open**

Verify footswitch is plugged in (if applicable) and is in proper operation following procedures in section 9.5. above. Turn power OFF. Remove bottom cover. Disconnect solenoid connector from main harness.

Verify shutter is mechanically free & operable by lifting shutter from rest and allowing it to return. If broken, stuck or pinching at friction point, adjust fasteners to relieve friction or replace.

Verify that the lightguide is properly pushed into the lightguide socket and that the ball plunger is in the detent groove. MKIII unit safety system disallows shutter operation if no lightguide is sensed by interlock switch within nosepiece.

Set the unit to "Manual" mode. Turn the power ON. With a DC voltmeter, verify 24 VDC are present on the harness side of the solenoid connector and the footswitch is depressed. If no power is present, replace the harness. If power is present, replace the solenoid.

### **Low UV Output**

Confirm all elements of optical train (bulb, reflector, shutter, and IR filter) are intact and functioning correctly by taking

radiometer reading with calibrated radiometer and AUV/LESCO Quartz Test Fixture.

Verify that the lightguide is properly pushed completely into the lightguide socket (and that the ball plunger is in the detent groove if applicable.)

Verify that both ends of the lightguide are clean. (See section on Lightguides) Clean quartz surfaces with reagent grade isopropyl alcohol (IPA) using a cotton swab or equivalent means. If damage cannot be removed, please send the lightguide back to AUV/LESCO for re-polishing.

Set the UV intensity to minimum in the front panel. Measure the UV intensity with regular procedure. Radiometer measurement through lightguide should be approximately 10% to 20% less than through quartz if lightguide is standard 5mm x 1M LFLG type without radical bends.

If radiometer measurement through lightguide is substantially less, replace lightguide (see Lightguides section of this manual or AUV/LESCO website).

**WARNING: Bulbs are extremely hot when first shut off and can cause severe burns!**

Disconnect and remove the lamp; inspect the bulb visually. (**Note:** Do not touch quartz surfaces, particularly if hot. Fingerprints/body oils will shorten lamp life.) If it is discolored or cloudy, or has excessive hours, replace the lamp. Insure correct seating of bulb in reflector housing.

Check the IR filter for scratches, cracks, fingerprints, solarization or other visual problems. Replace if noted

Check reflector surface quality. Confirm highly reflective (shiny) surface and correct seating within cradle assembly. Check reflector for any discoloration (yellowing or blue-ish). Replace reflector if found.

If intensity is still low after all above checks have been done and unit has been dropped or jarred prior to low intensity readings, optical alignment problems may exist. Contact factory.

## Fans Do Not Work

Check for obstructions to the fan blades.

Disconnect the AC power. Remove the top or bottom cover, depending on which fan is not operating. [**Note:** If the top fan does not work, disconnect UV lamp before proceeding!]

Disconnect the fan connector, plug system power in, turn the unit on, press top cover interlock switch when applicable, and check for 24 VDC in the harness side of the connector. If 24 VDC is present, then change the fan. If no voltage is present, replace the power supply.

### **Timer Not Running**

*(Power is on, fans are running and front panel is on.)*

Verify that the footswitch is plugged in.

Unplug the footswitch. With the footswitch depressed, check the male plug contacts for continuity. If there is no continuity when the footswitch is depressed, replace the footswitch.

## Appendix A – Agency Approvals

# Certificate of Conformance

Q534001WCx5

Page 1 of 3

Product Names: (1) Super Spot Mark III  
(2) Super Spot MAX  
(3) Super Spot MAX HP

Model Numbers: (1) VSM3001  
(2) VSM3003

Applicant: Lesco Lightwave Energy Systems Company, Inc.  
23555 Telo Avenue  
Torrance, California 90505 USA  
Telephone: 310.784.2930  
Facsimile: 310.784.2929  
Website: www.lescouv.com

Location Certified: Lesco Lightwave Energy Systems Company, Inc.  
23555 Telo Avenue  
Torrance, California 90505 USA  
Telephone: 310.784.2930  
Facsimile: 310.784.2929  
Website: www.lescouv.com

Manufacturing Location: Lesco Lightwave Energy Systems Company, Inc.  
23555 Telo Avenue  
Torrance, California 90505 USA  
Telephone: 310.784.2930  
Facsimile: 310.784.2929  
Website: www.lescouv.com

Pulver Laboratories Control Number: 5340X

## Equipment Category

- 1) Industrial, Scientific, and Medical Equipment
- 2) Measurement, Control, and Laboratory Equipment

## European Union Declaration of Conformity

Pulver Laboratories Inc. assessed a sample of this Equipment Under Test against the Essential Health and Safety Requirements of the Machinery Directive. Based on conformity with the Machinery Directive, the Equipment Under Test is deemed in compliance with the **Machinery Directive (89/392/EEC) and the Council Directives amending the Machinery Directive (91/368/EEC and 93/44/EEC)**. In addition, the Equipment Under Test complies with the requirements of the **Low Voltage Directive (73/23/EEC) and the EMC Directive (89/336/EEC)**.

The Pulver Laboratories Product Certification Label appearing on the above models indicates conformance to the Product Safety and Radio Frequency Interference standards and criteria listed in this Certificate of Conformance.

**PULVER LABORATORIES INC.**  
ELECTROMAGNETIC SHIELDS



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www.PulverLabs.com Fax 408.399.7001  
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Q534001WCx5

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## Tested and evaluated to the following standards:

### Radio Frequency Interference Standards

#### Federal Communications Commission (FCC, USA)

Category Classification Class A - Commercial and Industrial

- Federal Communications Commission Rules and Regulations located in the Code of Federal Regulations, 47 CFR, Part 2 entitled Frequency Allocations and Radio Treaty Matters; General Rules and Regulations; and Part 15 entitled Radio Frequency Devices, 12 July 2004 Edition.
- American National Standards Institute standard number C63.4-2001 entitled Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

#### Industry Canada (ICAN)

Category Classification Class A - Commercial and Industrial

- Industry Canada Interference-Causing Equipment Standard ICES-003, Issue 3, 22 Nov 97, entitled "Interference-Causing Equipment for Digital Apparatus".
- Industry Canada Radio Interference Regulation Amendment dated 15 September 1988 (Radio Act Registration SOR / 88-475).
- Canadian Standards Association CAN3-C108.3.1-M84 (R2000): Limits and Measurement Methods Of Electromagnetic noise from AC Power Systems.
- Canadian Standards Association (CSA) C108.8-M1983 (R2000): Electromagnetic Emissions for Data Processing Equipment and Electronic Office Machines.

#### European Community (EC)

Category Classification Class A - Commercial and Industrial

- EN 55011: 2003. Specification for Limits and methods of measurement of radio disturbance characteristics of industrial, scientific, and medical (ISM) radio-frequency equipment.

#### Electrostatic Discharge Testing

- EN 61000-4-2: 95 (IEC61000-4-2) entitled Electromagnetic Compatibility (EMC) Part 4: Testing and Measurement Techniques - Section 2. Electrostatic Discharge Immunity Test Basic EMC Publication.

#### RF Plane Wave Testing

- EN 61000-4-3: 95 (IEC61000-4-3) entitled Electromagnetic compatibility for industrial-process measurement and control equipment. Part 3: Radiated electromagnetic field.

#### Electrical Fast Transient Testing

- EN 61000-4-4: 95 (IEC61000-4-4) entitled Electromagnetic compatibility for industrial-process measurement and control equipment. Part 4: Electrical fast transient requirements.

#### Product Safety Standards

- American National Standards Institute / National Fire Protection Agency 70-2002. National Electrical Code.
- American National Standards Institute / National Fire Protection Agency 79-2002 Electrical Standard for Industrial Machinery.
- American National Standards Institute / Underwriters Laboratories Inc. 508-1998 Industrial Control Equipment.
- American National Standards Institute / Underwriters Laboratories Inc. 508C- Power Conversion Equipment. First Edition, 22 December 1993 with revisions to 24 June 1996.

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- EN 60204-1: 1998 entitled Safety of Machinery - Electrical Equipment of Machines: Part 1: General Requirements, published by the European Committee for Electrotechnical Standardization (CENELEC).
- EN 292-2: 1991 entitled Safety of Machinery - Basic concepts, general principles for design: Part 2: Technical principles and specifications published by the European Committee for Electrotechnical Standardization (CENELEC).
- EN 61010-1: 1993 entitled Safety requirements for electrical equipment for measurement, control, and laboratory use, published by the European Committee for Electrotechnical Standardization (CENELEC).

### Referenced Test Standards

- EN50082-1: 1998 entitled Electromagnetic Compatibility – generic immunity standard; Part 1. Residential, commercial, and light industry.
- EN50082-2 : Immunity standards: Pertains to (1) power mains signaling equipment, (2) industrial electronic power and control equipment and (3) industrial, scientific and medical equipment designed to generate r-f energy.

When manufactured in accordance with PULVER LABORATORIES Evaluation Report Numbers Q534001W.DWG, Q534002W.DWG, Q534003W.DWG, Q534004W.DWG, and Q534005W.DWG, Q534006W.DWG, Q534007W.DWG, Q534017W.DWG, Q534018W.DWG, and Q534019W.DWG the models meet the requirements of the following countries:

#### 100 VAC nominal mains - Japan

**115 / 120 VAC nominal mains** - Bahamas, Brazil, Canada, Columbia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Philippines, Taiwan, United States of America, Venezuela, Virgin Islands

**220 / 240 / 250 VAC nominal mains** - Argentina, Australia, Austria, Bahamas, Belgium, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Denmark, Dominican Republic, Ecuador, Egypt, Finland, France, Germany, Greece, Guatemala, Haiti, Honduras, Hong Kong, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Kuwait, Luxembourg, Malaysia, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Panama, Paraguay, People's Republic of China, Peru, Philippines, Portugal, Singapore, Saudi Arabia, South Africa, Spain, Sweden, Switzerland, Syria, Taiwan, Thailand, Turkey, United Kingdom, United States of America, Uruguay, Venezuela, Virgin Islands

To assure continued product safety conformance, PLI evaluates newly manufactured products at the facilities of Lesco Lightwave Energy Systems Company, Inc. every three months. For Radio Frequency Interference conformance, PLI evaluates products every six months. This Follow Up Service exists whenever the PLI Product Certification Label appears on the product.

If the Pulver Laboratories Product Certification Label is not on the product, the PLI Follow-Up Service to evaluate manufactured products may not be in place; and, therefore, this Certificate of Conformance issued by PLI shows that the one product evaluated met the standards. It does not indicate all manufactured products meet the standards unless the Certification Label is on the products.

Date: 14 Jan 2005  
Pulver Laboratories Inc.  
Lee J. Pulver  
President  
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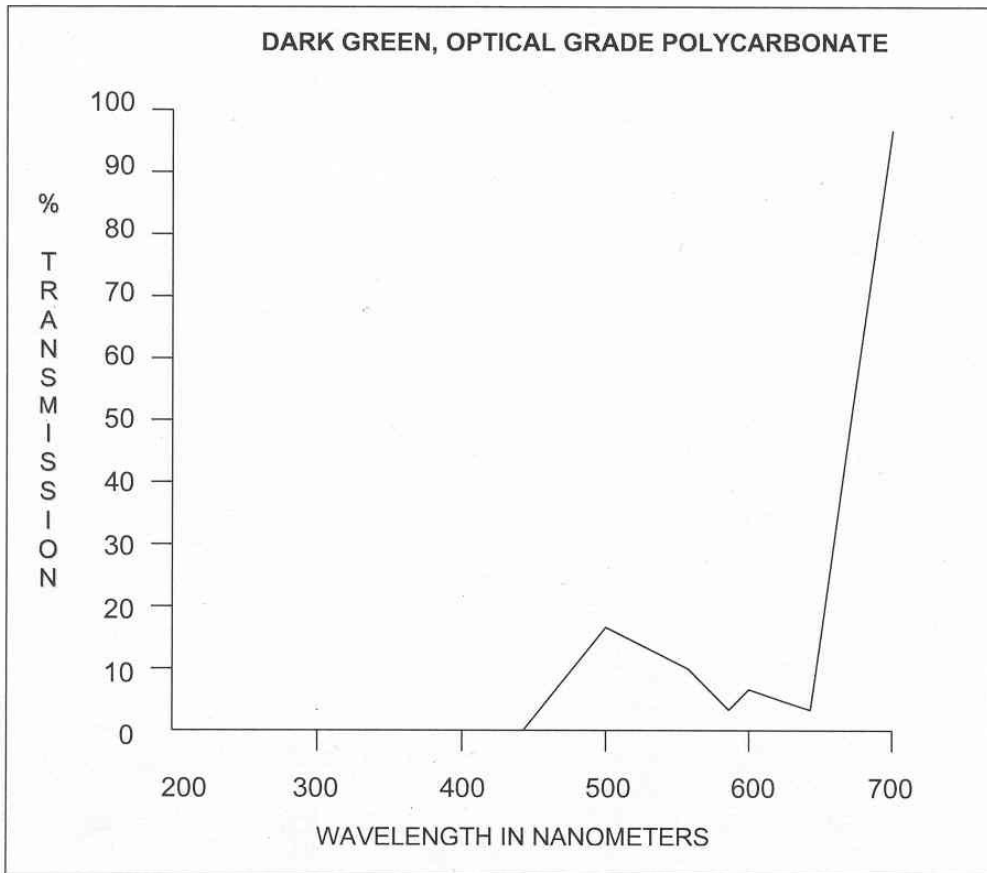
Fax 408.399.7001  
Voice 408.399.7000

## Appendix B – UV Protective Eye Glasses

### UV PROTECTIVE EYE GLASSES

Eye protection glasses cannot completely eliminate the possibility of eye damage under all circumstances, but UV protective eyeglasses are designed to provide quality aids to eye protection against most commonly encountered hazards. These lenses are made of hi-impact polycarbonate with a scratch resistant coating and are impact resistant.

These tinted lenses meet ANSI Z87.1-1989 standards and absorb 100% of solar ultraviolet radiation as defined by ANSI Z87.1-1989. They have been accepted by OSHA as being in compliance with 29 CFR 1910 if used and maintained properly. Inspect glasses frequently and clean with a mild soap solution. Do not clean them with solvents. Scratched, pitted or damage lenses reduce visibility and protective ability. Replace immediately when damage is evident.

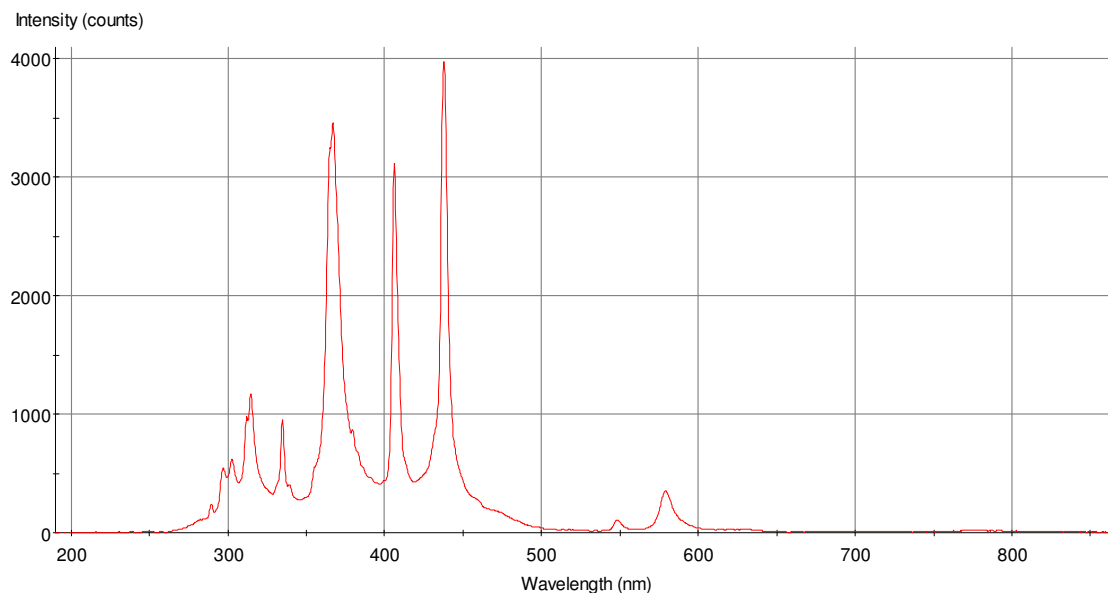


UV RADIATION	VISIBLE LIGHT	INFRARED RADIATION
200 300 380	500 600 700 780	

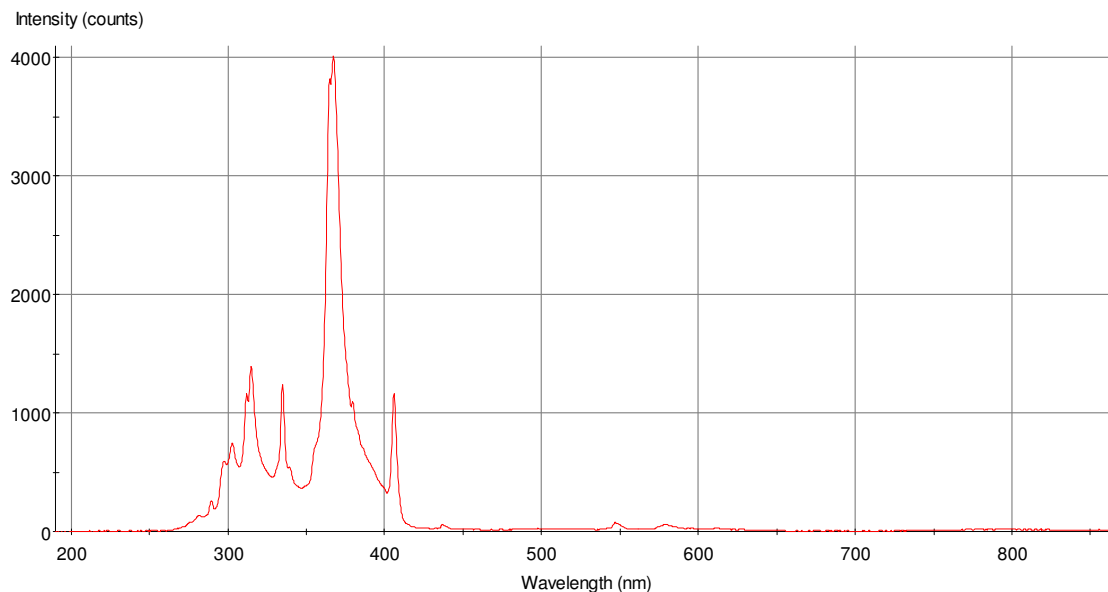
## IR Filter Description

Presented here are the different spectral output graphs of our various filters on the UV Spot Cure series.

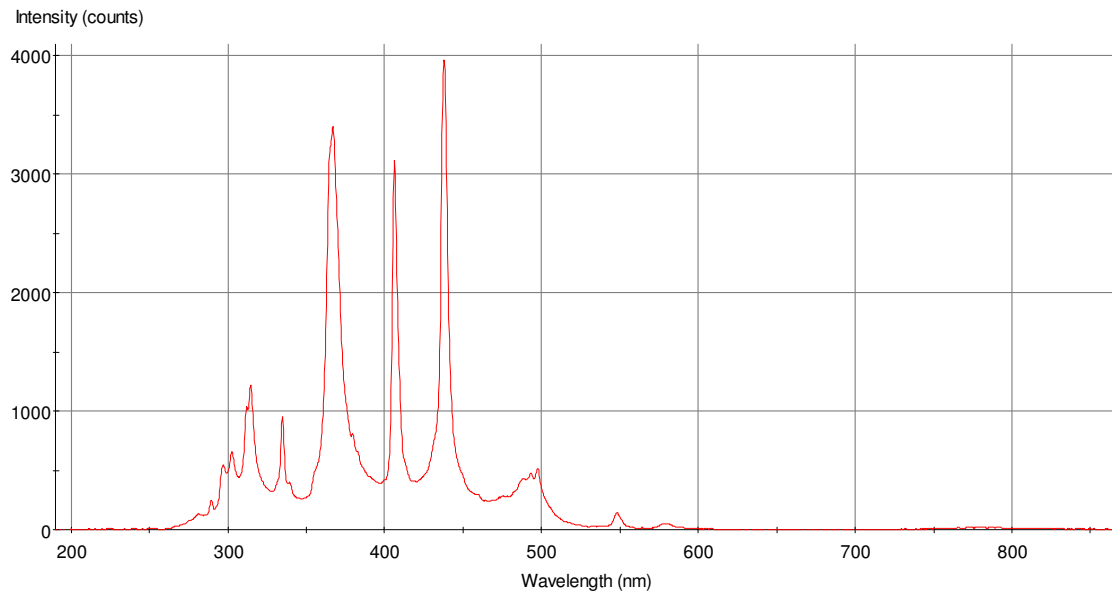
### Filter OFB1004 280nm-480nm



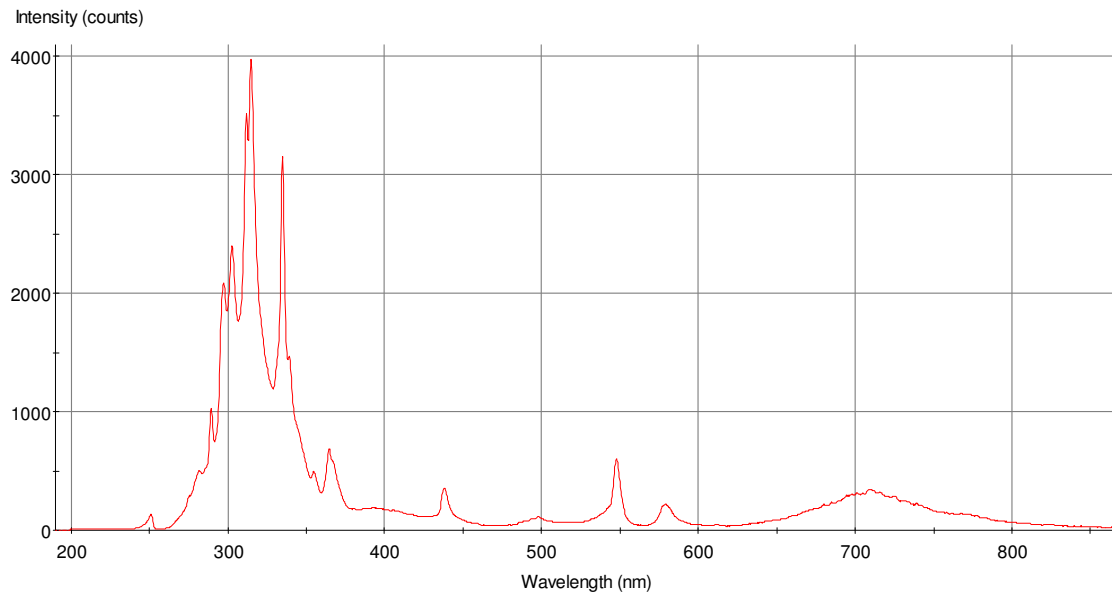
### Filter OFB1008 280nm-400nm



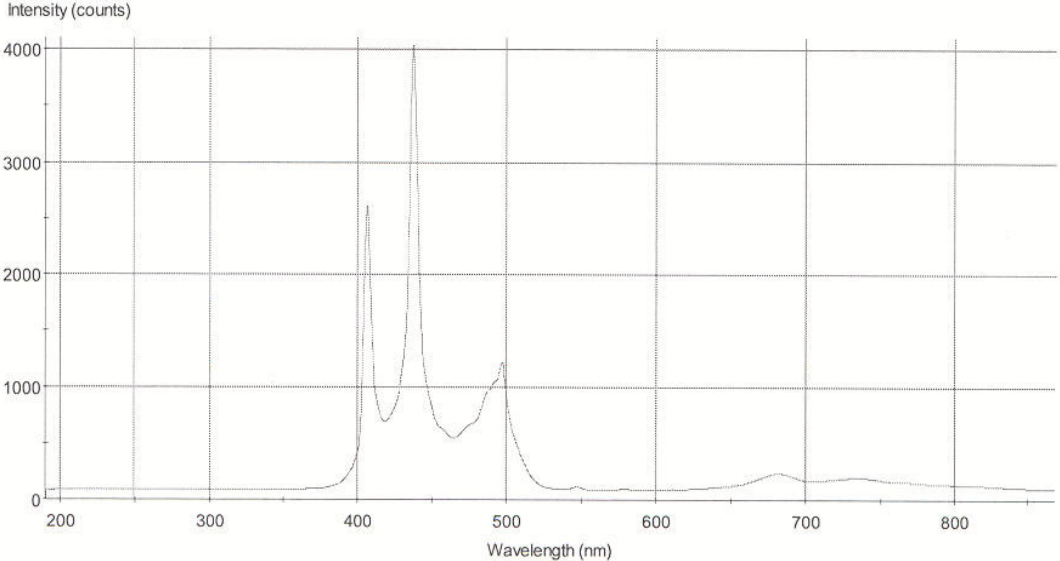
### Filter OFB1013 275nm-500nm



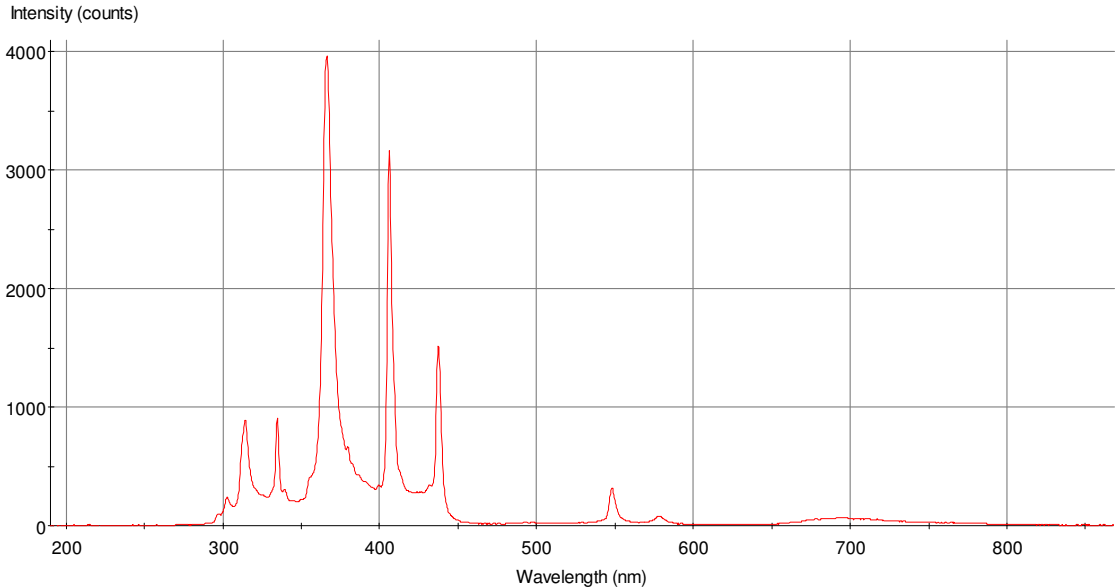
### Filter OFB1014 280nm-320nm



### Filter OFB1019 400nm-500nm



### Filter OFB1021 320nm-420nm



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*E-mail: [Sales@lescouv.com](mailto:Sales@lescouv.com)*