

COOL CURE 365 LITE

UV LED SYSTEM

TECHNICAL REFERENCE MANUAL

Model: FLM1005

™

AUV/LESCO

A Division of American Ultraviolet Company

WWW.LESCOUV.COM

2355 Telo Avenue
Torrance, CA 90505



REV.

A

11/21/2016

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 (2) full years from the date of original shipment. As of November 29, 2011, normal use is based on an 8-hour work day, 5 days a week (8*5*104=4160Hrs). 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 (2) full years 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 LED Chip, Fan Filters and Light guides.**

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.

AUV/LESCO FIBER OPTIC & LIQUID LIGHT GUIDES WARRANTY POLICY

WARRANTY:

New fiber optic and new liquid light guides manufactured and sold by **AUV/LESCO** are warranted to be free from defects in material and workmanship under normal and proper use for 60 days from date of original shipment. This warranty applies solely to defects in material or workmanship. AUV/LESCO will repair or replace at its option, any defective fiber optic or liquid light guides when returned to AUV/LESCO by the purchaser, all transportation paid by the purchaser, within one year from date of original shipment. The light guides may not be returned, whether for warranty or other purposes, without a RMA (Return Material Authorization) number.

AUV/LESCO will assume no expense or liability for repairs made outside its plant without written consent by AUV/LESCO, or for any labor costs, which are so incurred.

For liquid light guides manufactured by manufacturers other than AUV/LESCO, AUV/LESCO will extend to the purchaser any warranty it receives from them, and AUV/LESCO will not be responsible for any incurred expenses outside of such warranty.

AUV/LESCO will not be liable for any consequential costs or damages of any kind.

CONDITIONS OF WARRANTY:

For above warranty on AUV/LESCO fiber optic and liquid light guides to be enforceable, the purchaser must:

1. Return any light guides claimed to be defective for inspection and action by AUV/LESCO. All returns must be pre-authorized, correctly packaged and shipped, and accompanied by a RMA (Returned Material Authorization) number.
2. Keep accurate records of elapsed time, time of installation or removal in sufficient detail, to determine the running time and environment of the light guide in question. The purchaser will allow AUV/LESCO to verify such records if necessary.

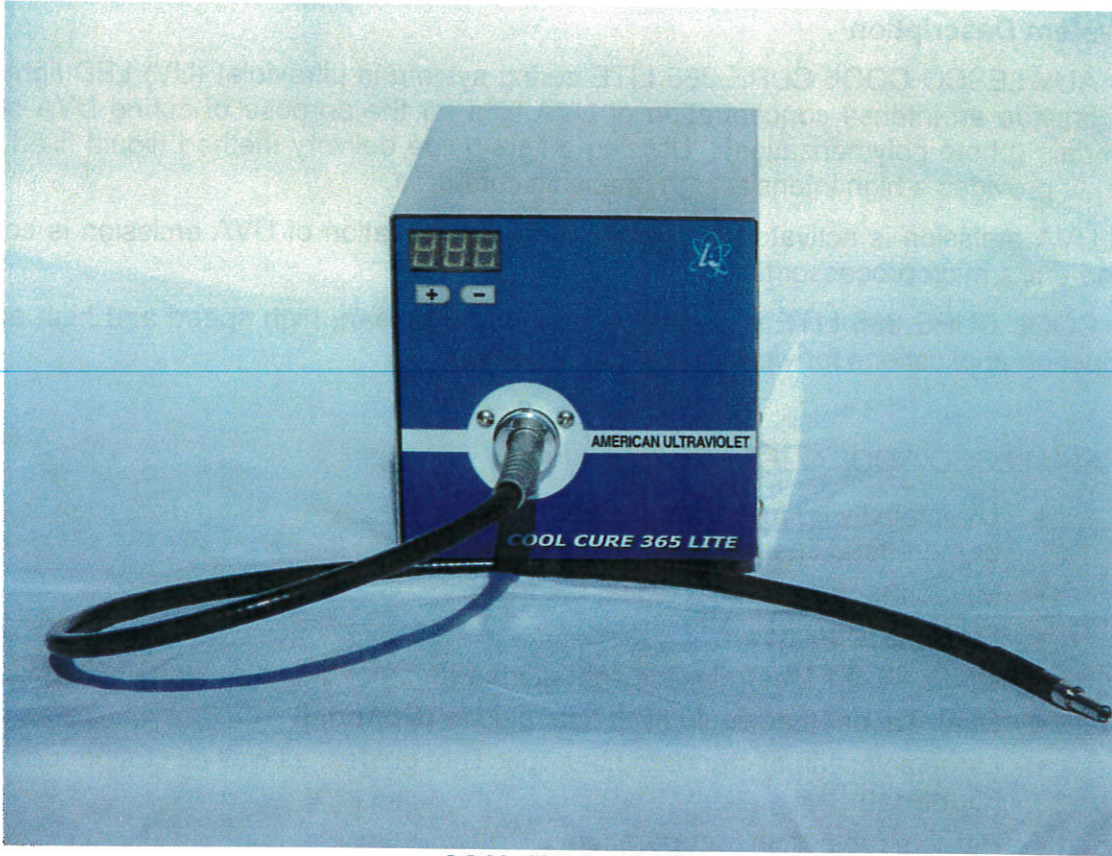
The following will void AUV/LESCO's warranty:

1. Chemical and/or mechanical damage of any kind, damage caused by excessive heat or radiation, scratching, or damage caused by using the light guides outside of the service intended or their operating parameters,
2. Defects resulting from improper installation, storage or use,
3. Tampering with equipment,
4. Lack of maintenance,
5. Service not in accordance with AUV/LESCO *Technical Reference Manual*,
6. Acts of God, or
7. Other circumstances beyond AUV/LESCO's control.

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

Table of Contents

1.0	General Information	4
1.1	Scope of Manual	4
1.2	System Description.....	5
2.0	Safety.....	5
2.1	Ultraviolet Radiation	6
2.2	Power up	6
3.0	Component Descriptions.....	7
3.1	Front Panel.....	7
3.2	Back Panel	9
3.3	Housing	11
4.0	System Components.....	12
5.0	Operation.....	13
5.1	Start up.....	13
5.2	Power Adjustments	13
6.0	Maintenance	14
6.1	Housing	14
6.2	Fuse Replacement	14
6.3	Light guides.....	14
7.0	Drawings/Schematics	16
7.1	COOL CURE 365 LITE Main Schematic.....	17
8.0	Accessories	18
8.1	Standard Replacement Parts	18
8.2	Optional Liquid-filled Light guides.....	18
9.0	Troubleshooting.....	18



COOL CURE 365 LITE

1.0 General Information

1.1 Scope of Manual

This manual provides information necessary for operating and maintaining the AUV/LESCO COOL CURE 365 LITE curing system. It also includes 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 ****

(Precautions necessary to prevent injury to personnel)

**** CAUTION ****

(Precautions necessary to prevent damage to equipment)

1.2 System Description

The AUV/LESCO COOL CURE 365 LITE curing system is ultraviolet (UV) LED light source that provide an intense concentration of UVA light for the purpose of curing UVA sensitive materials (photo polymerization). Utilizing a light guide delivery method (liquid filled or fiber type), it provides a high intensity high precision cure area.

The UVA emission is activated by a footswitch. The duration of UVA emission is controlled by the unit's microprocessor timer.

The COOL CURE 365 LITE is a system designed for clean, high speed and high accuracy production applications for worldwide manufacturing.

The AUV/LESCO COOL CURE 365LITE features:

- UV intensity up to 15 W/cm² in UVA. or more total intensity (Traceable to NIST)
- Membrane keypad with digital readouts
- Stainless steel cover
- Liquid filled 1 Meter flexible light guide with 5mm diameter tip (**OPTIONAL**)
- Dual, Tri, or Quad liquid filled light guides (**Optional**)
- Large selection of standard fiber optic light guides, as well as custom designs (**Optional**)
- Remote footswitch for operation
- Air-cooled LED and power supply with ventilation protection
- No filters required

2.0 Safety

AUV/LESCO LED cure systems have been designed to operate safely. They have been used 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 correctly.

****WARNING****

It is important that all personnel operating this equipment become familiar with this safety information.

The following information is provided concerning various aspects of worker safety with this equipment. All personnel should read this manual to understand the safety issues and government regulations pertaining to this equipment.

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 spot cure systems, can be dangerous to the eyes and skin. All personnel within close proximity 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. Care should be taken to avoid this.

There is no present US government standard on worker exposure to UV light. However, there is a NIOSH (National Institute for Occupational Safety and Health) 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

This unit has an auto ranging power supply allowing it to be used in a voltage range of 90VAC to 260VAC, 50 or 60 Hz. Depending on the voltage used the correct fuse should be placed in the power entry module as indicated on the rear panel label. Refer to section 3.2.3 for more information.

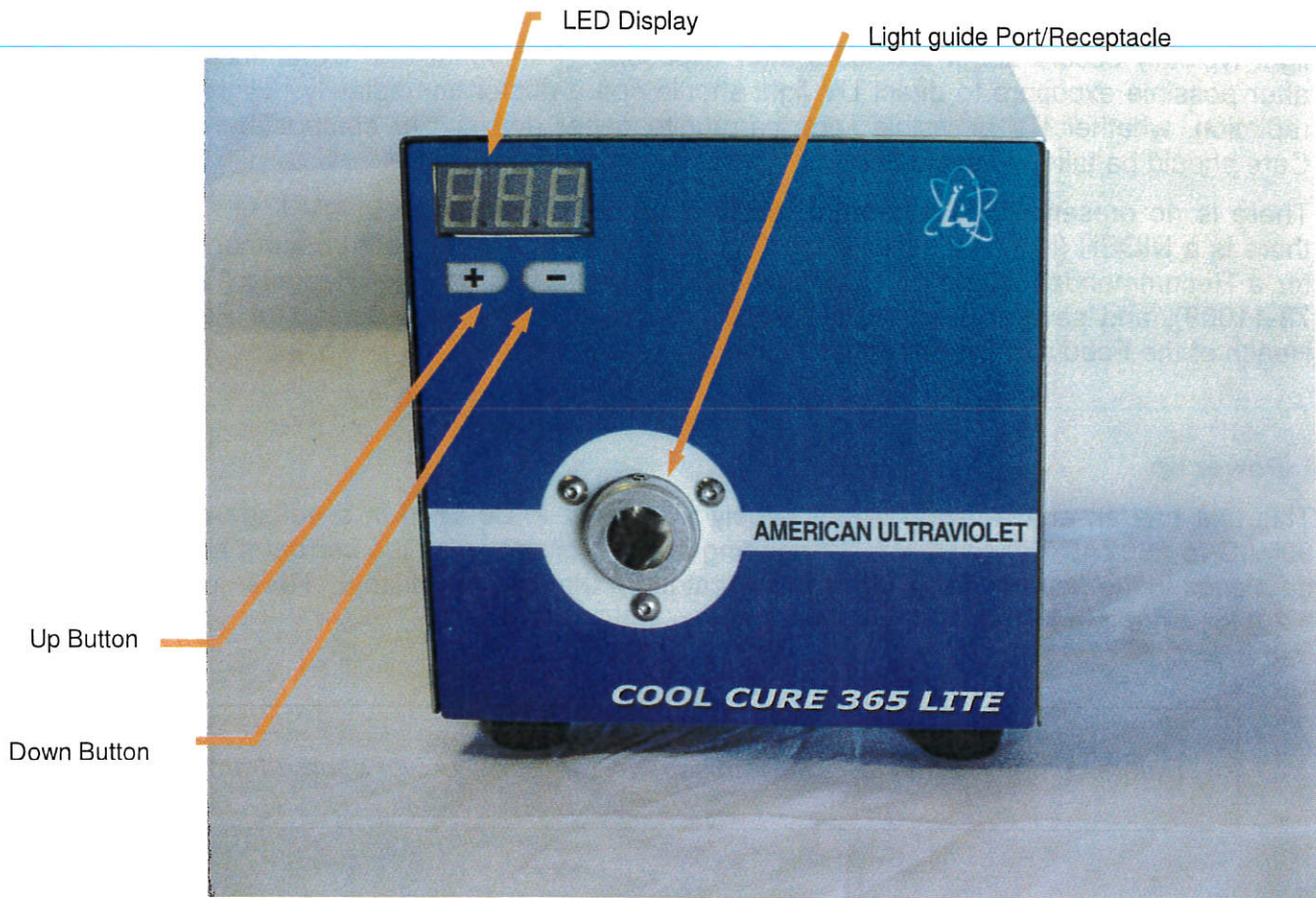
**** CAUTION ****

Before connecting the footswitch, disconnect the VAC power source from the system.

3.0 Component Descriptions

3.1 Front Panel

The front panel is a membrane control pad with an LED display. The keypad controls the timer to the proper curing time of the COOL CURE 365 LITE.



3.1.1 LED Display

The digital display is the user interface to the COOL CURE 365 LITE. It is used to set and view the shutter ON time and system hours. During a cure cycle, the duration will be shown counting down for user viewing.

3.1.2 *UP Button (+)*

The Up Button (+) allows the user to increase the curing time. Get to 99.9 and it rolls over to 00.0

3.1.3 *Down Button (-)*

The Down Button (-) allows the user to decrease the curing time.

3.1.4 *Lamp Hour*

Push the UP/Down keys and the lamp hours will be displayed.

3.1.5 *Reset Lamp Hours*

To reset the lamp hours, turn off power, press and hold any key, turn on power. When reset the display will show r00 (for reset to zero).

3.1.6 *Idle*

In idle, the current cycle time is shown.

3.1.7 *Run*

In run, the counter counts the cycle time down to zero. When zero is reached, the cycle ends, shutter close and the display goes back to the preset time. The unit is immediately ready for a new cycle.

3.1.8 *Cancel Mode*

At any time during the cycle, the footswitch can be held for 5 seconds to cancel the cycle.

3.1.9 *Manual Mode*

Set the time to zero and the shutter (solenoid) follows the footswitch.

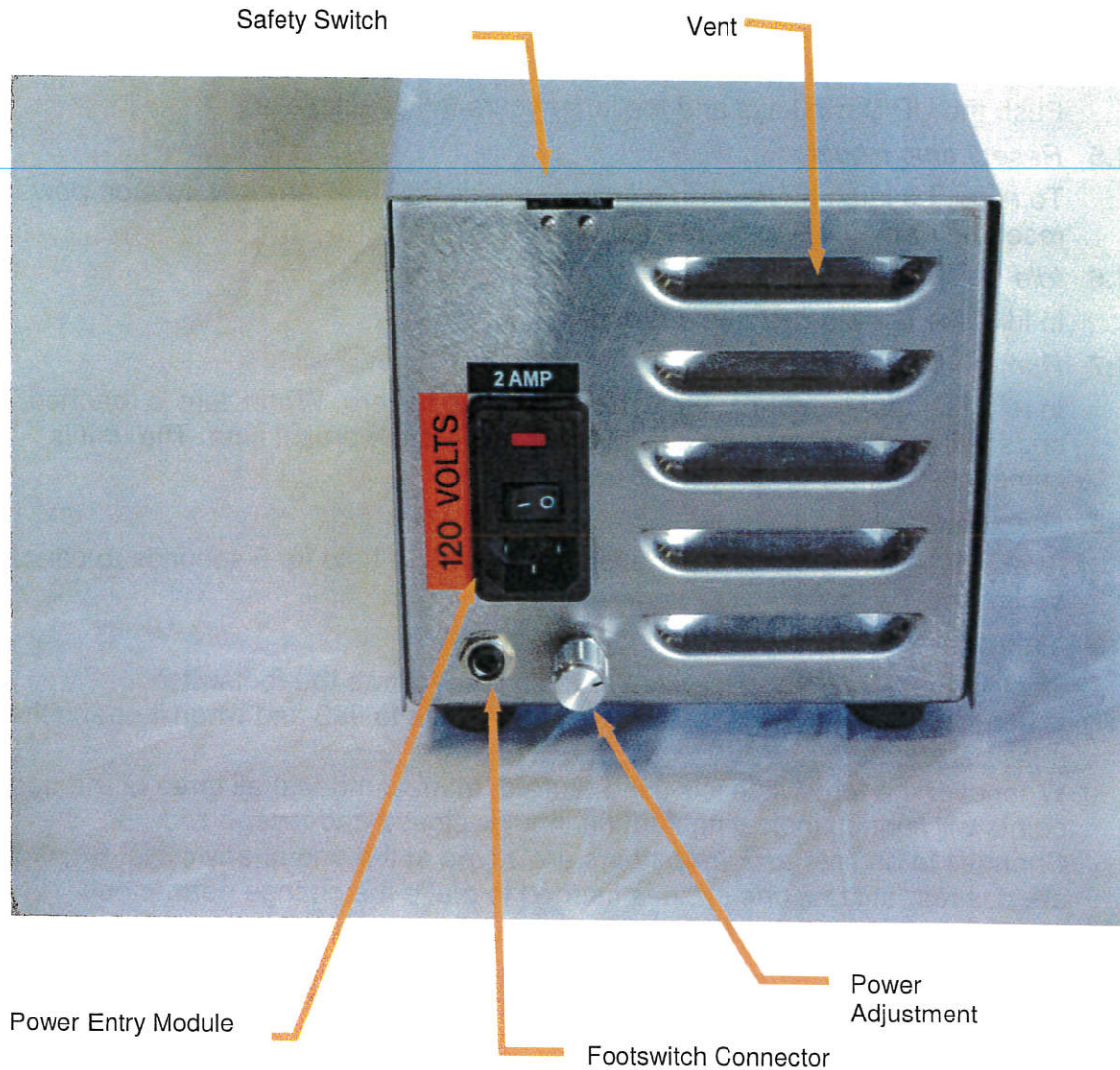
When the footswitch closes, the display switches to 999 and when it opens the display goes back to zero.

Whenever the footswitch is closed (auto or manual modes) all three of the decimal points will light up indicating that the input is closed and recognized.

Changes to on time and lamp hours are saved at the end of any cycle. So, if changes are desired, at least one cycle is needed to make the change permanent.

3.2 Back Panel

The COOL CURE 365 LITE housing is made of a stainless-steel cover and base, making it ideal for clean room applications. The following parts and connections are located on the rear of the system.



**** CAUTION ****
Before connecting the footswitch, disconnect the VAC power source from the system.

3.2.4 Power Entry Module

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

**** 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>
115-120	2A T, 250 VAC, Slow Blow
220-250	1A T, 250 VAC, Slow Blow

3.2.5 Footswitch Connector

A standard stereo phone jack connector is used for the foot pedal plug.

**** CAUTION ****

Before connecting the footswitch, disconnect the VAC power source from the system.

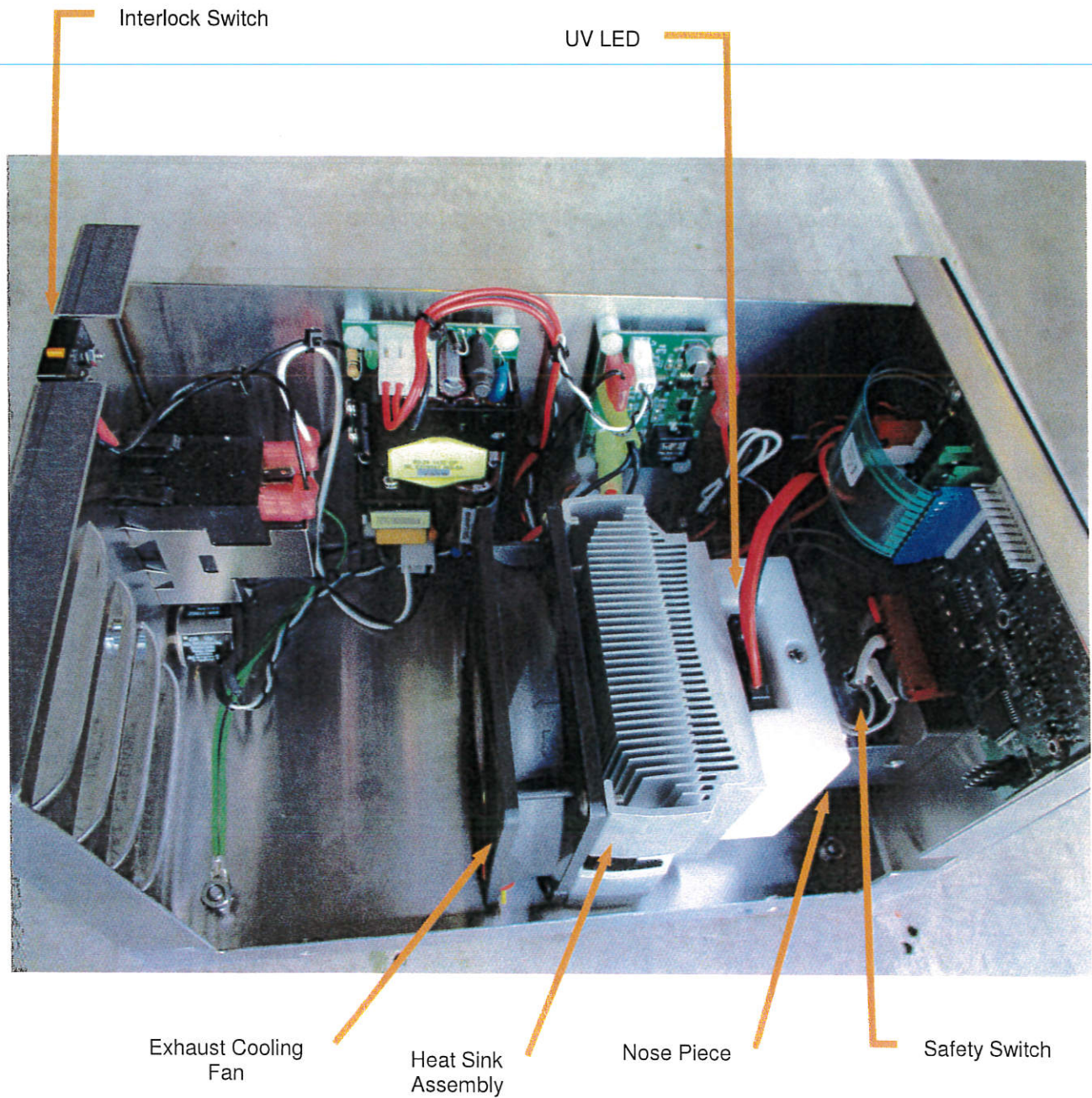
3.2.6 Power Adjustment Knob

A 10-turn potentiometer gives fully adjustment power range from minimum to maximum.

3.3 Housing

The COOL CURE 365 LITE housing is made of stainless steel, making the equipment suitable for clean room operations and allowing for easy cleaning.

This area contains the optical transmission assembly, LED, heat sink assembly and electrical LED connections. The function and relationship of each component in the LED housing is described below:



3.3.1 UV LED

The UV LED is a high power, high flux density LED that is designed for long life at a very high intensity. The LED is mounted integral to the Heat sink for optimum performance.

3.3.2 SAFETY SWITCH

The LED is also connected to an interlock switch located on the light guide receptacle where the proximal end of the light guide is inserted.

This switch disables the LED to ensure there is no unintentional exposure, if the light guide is missing or improperly inserted into the COOL CURE 365/ 390/395.

3.3.3 NOSE PIECE

The Nose piece is a precision mechanical assembly that aligns the LED and light guide for optimal focal point location. It also supports the heat sink assembly, light guide safety switch, and a ball plunger.

Note: Light guide must be pushed in all the way or UV light will not be delivered.

3.3.4 Power Supply

The power supply is a high regulation, auto ranging power supply. It provides power to all components in the COOL CURE 365 LITE.

3.3.5 Interlock Switch

The interlock switch cuts all power to the unit if the top cover is removed. If the top is not properly mounted on the base of the unit, the interlock switch will not be activated, and the unit will not power up.

4.0 System Components

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

After unpacking the system, examine the equipment for any damage i.e. unusual dents or rattling of components. Check components against the packing list to make sure all components were shipped correctly.

Should one find any major damage immediately inform the shipping company and AUV/LESCO Inc. **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.

The COOL CURE 365 LITE comes with the following separately packaged components:

- Light guide (**OPTIONAL**)
- Footswitch
- UV safety glasses
- COOL CURE 365 LITE Manual
- Power Cord

5.0 Operation

5.1 Start up

Turn on the power switch located on the back of the COOL CURE 365 LITE, above the power cord receptacle; the system takes just over a minute to warm up.

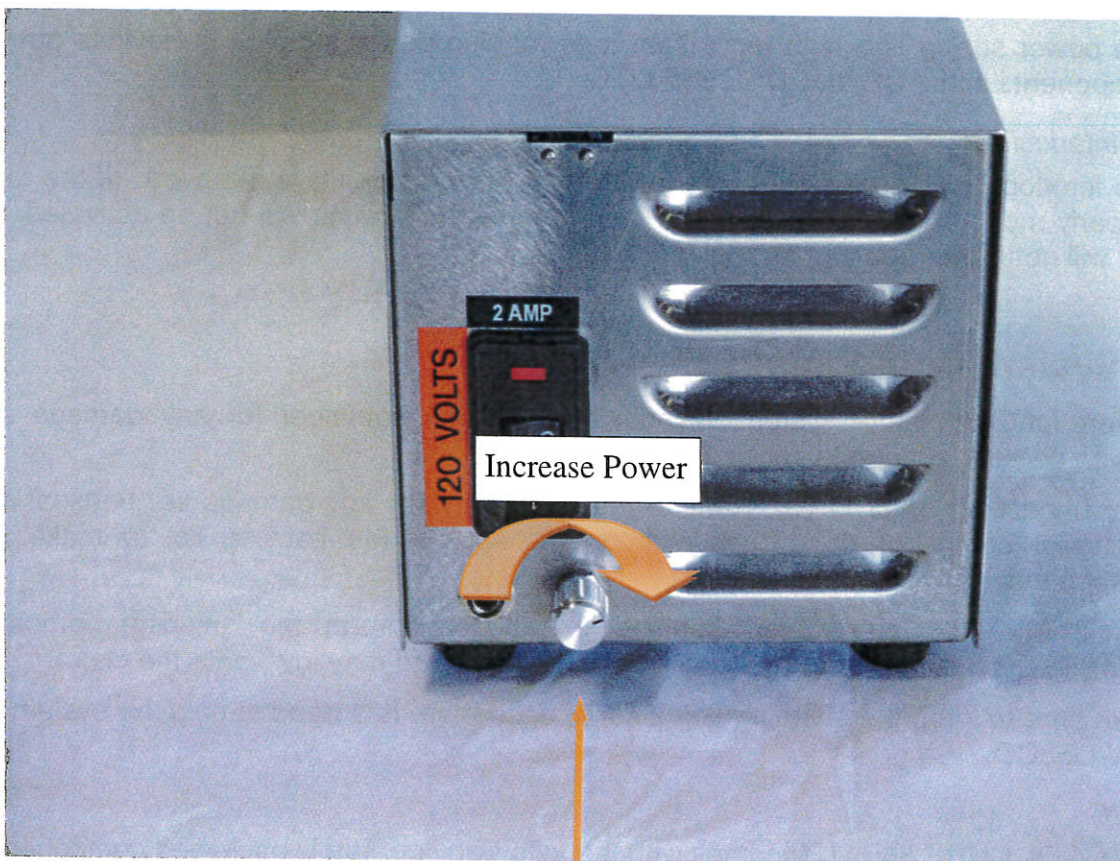
Once the system has completed the warm up cycle the System will be ready for operation.

At this time the timer can be changed. The footswitch can now be pressed to initiate the operation of the machine.

5.2 Power Adjustments

The adjustment control has 10 turns. Make clockwise turns to increase power output (+) and counter clockwise turns to decrease power output (-). The unit is set to full power (completely clockwise position) from factory.

Note: *Radiometer is required in order to determine UV output.*



Power Adjustment

6.0 Maintenance

6.1 Housing

The COOL CURE 365 LITE is a simple, rugged unit and does not require complicated routine maintenance. Routine maintenance consists of keeping the unit clean, periodical cleaning of the air filter, and periodical UV output measurements to ensure that the unit performs optimally.

6.2 Fuse Replacement

The external fuse is below the power-input receptacle on the rear panel. Remove power cord and open the small drawer underneath the receptacle. Using a small screwdriver remove the fuse and replace, then push the drawer shut. Insure that the replacement fuse has the same rating as the blown fuse.

6.3 Light guides

AUV/LESCO light guides are available in either "liquid-filled" (LF) or "fiber optic" (FO) types.

6.3.1 *Liquid-Filled Light guides*

The standard light guide shipped with most AUV/LESCO SUPERSPOT cure products is a 1M x 5mm LF model. This device allows flexible delivery of high intensities of energy with approximately 80% transmission efficiency in the UV "A" and visible ranges. LF light guides come standard in 1M and 1.5M lengths, in single, bifurcated (dual outputs), and trifurcated (3 outputs) orientations. The light guide tips are available in 3mm, 5mm, or 8mm diameter models. AUV/LESCO also offers a variety of custom light guides for special purposes. These include special models optimized for high transmission in the UV "B" and UV "C" range (230 to 390 nm). Custom lengths are also available upon request. Contact AUV/LESCO for price and delivery of special products.

AUV/LESCO's precision-built LF light guides are high quality optical instruments, but their performance will degrade with exposure to UV energy. Under normal operating conditions, the user can expect from 1 to 2 years of use from a LF light guide if cared for properly. However, normal degradation will be greatly accelerated with aggressive radiation and/or extreme heat levels. For a given dosage, it is well established that higher intensity for shorter time periods is the preferred method for producing maximum cure strength for the majority of applications. However, care must be taken to minimize very high intensity levels for sustained periods of exposure time.

The special IR reduction filter in AUV/LESCO SUPERSPOT cure systems must not be removed if working with moderate to high levels of intensity and exposure time. If either of these conditions occurs, the LF light guide may suffer irreparable damage or have its service life reduced dramatically. Special duty AUV/LESCO FO light guides are available for extreme intensity/dosage applications (contact factory at 1-800-615-3726).

6.3.2 Fiber Optic Light guides

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

All light guides can be damaged or suffer impaired light transmission if not used properly. Minimize bending a light guide radically (i.e. – more than 90° over a 6” radius for a LF). Be extremely careful not to scratch, mar or accidentally apply curable material to the guide end tips. One may (and should) 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). Transmission losses can be easily determined by using an AUV/LESCO Quartz Calibration Fixture and radiometer.

Refer to Troubleshooting Section “Low UV Output” for further details.

Light guide Maintenance

Your Fiber Optic Light Guide (FOLG) is designed to provide a long life of dependable and consistent 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.

1. Inspect the FOLG regularly. A visual inspection of the light emitting ends will detect most problems associated with buildup of residues or signs of deterioration. To inspect it, use a bright incandescent LED. It is better to cover the opposite end to prevent back illumination. The surface should look black and very shiny. If it looks dull, 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 free acetone. Do not use regular acetone as it may leave a residue.
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.

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.

7.0 Drawings/Schematics

The following section is a set of drawings and schematics complete with specifications for the COOL CURE 365 LITE system and accessories.

7.1 COOL CURE 365 LITE Main Schematic
(Schematic available upon request.)

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.

1 Amp, 250V AC input fuse	EFB1086
2 Amp, 250V AC input fuse	EFB1008
Foot Pedal	EVB2115
Nosepiece Fan	EPB1100
UV Safety Glasses	VXB1001
AUV/LESCO Spot Cure Intensity Meter	AIB1001
AUV/LESCO Calibration Fixture	VSM9001
Power Supply	E5B1041

8.2 Optional Liquid-filled Light guides

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

Fiber Optic Light guides

UV transmitting light guides fabricated to specific applications are available upon request. Please call AUV/LESCO for pricing information.

9.0 Troubleshooting

***** WARNING *****

Disconnect power and unplug from VAC source before troubleshooting.

***** CAUTION *****

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

***** CAUTION *****

Before connecting the footswitch, disconnect the VAC power source from the system.

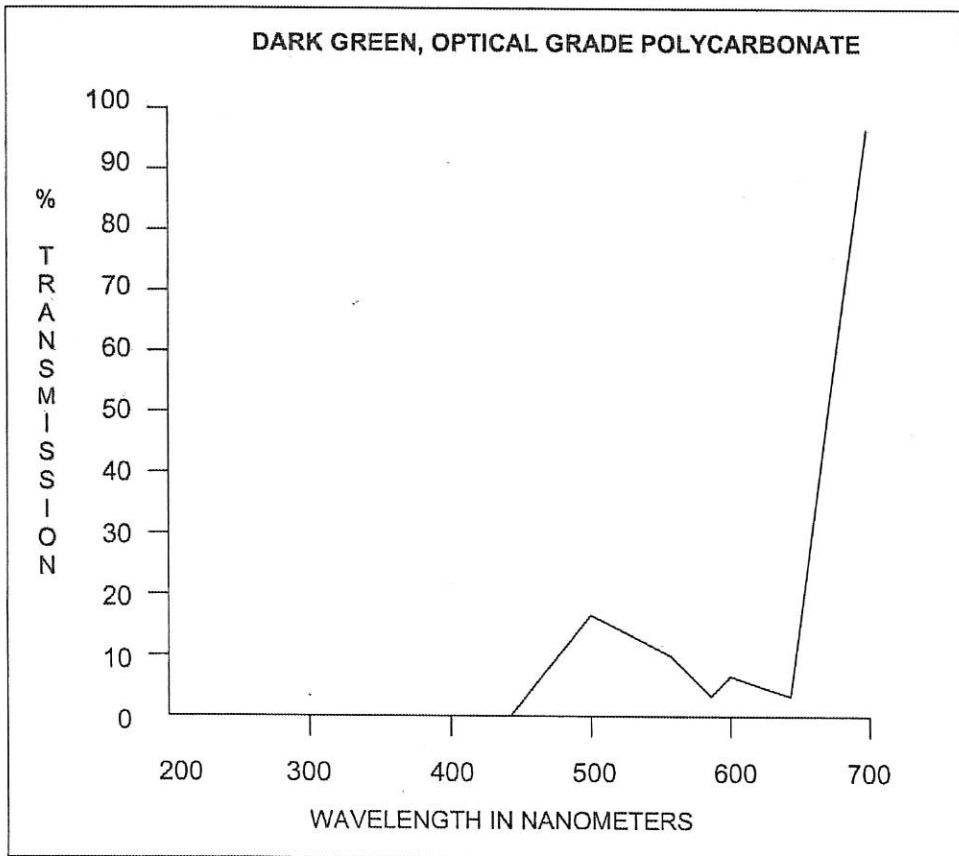
<u>Fault</u>	<u>Action</u>
Unit Does Not Turn On	<p>Check power availability at the selected power outlet.</p> <p>Check that power cord is properly connected.</p> <p>Check the fuse.</p> <p>Check that the top cover is installed properly and is pressing down on the safety interlock switch (top of rear panel).</p>
Unit Blows Fuses	<p>Check fuse for proper rating.</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>
LED does not turn ON	<p>Verify footswitch is plugged in and is in proper operation. Turn power OFF.</p> <p>Verify that the light guide is properly seated into the light guide socket and that the ball plunger is in the detent groove. The COOL CURE 365 LITE unit safety system disallows LED operation if no light guide is sensed by interlock switch within entrance fitting.</p>
Fan Do Not Work	<p>Check for obstructions to the fan blades.</p>
Low UV Output	<p>Confirm LED is intact and functioning correctly by taking radiometer reading with calibrated radiometer and AUV/LESCO Quartz Test Fixture.</p> <p>Verify that the light guide is properly seated completely into the light guide socket (and that the ball plunger is in the detent groove if applicable).</p> <p>Verify that both ends of the light guide are clean. Clean quartz surfaces with reagent free grade acetone using cotton swab or equivalent means. If contamination cannot be removed, please send the light guide back to AUV/LESCO for re-polishing.</p>

Appendix A – 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.

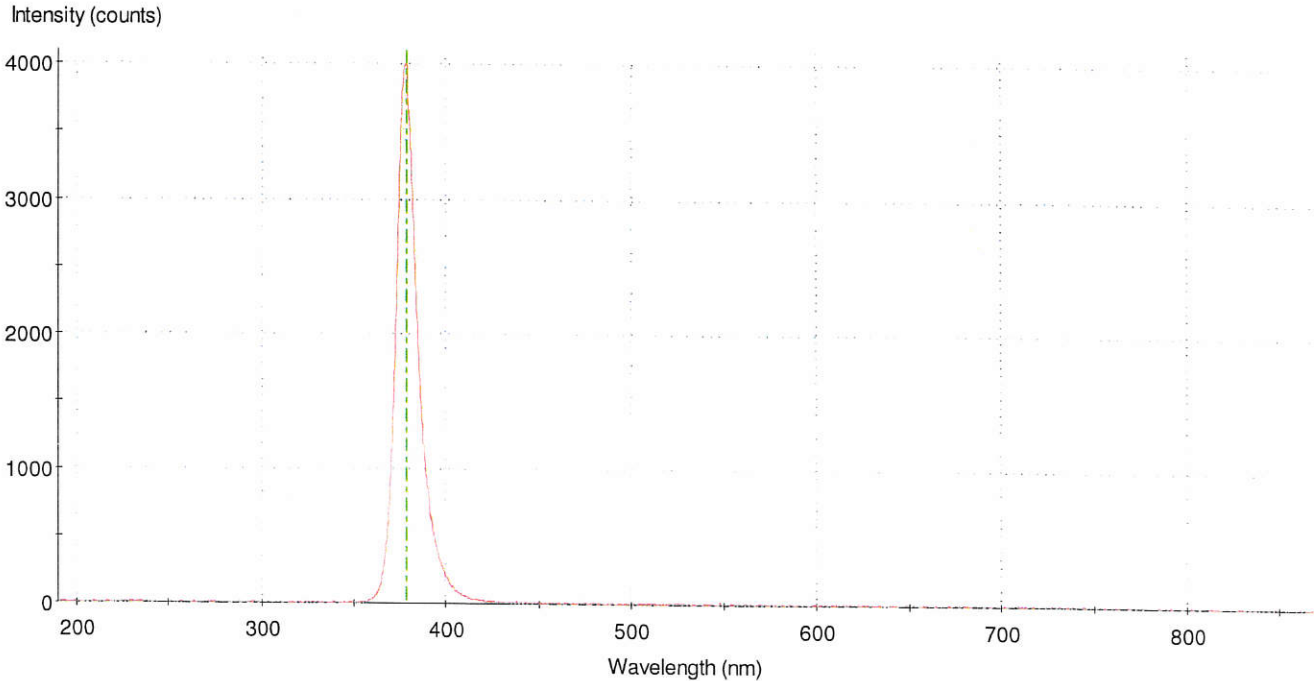
These tinted lenses meet ANSI Z87.1-1989 standards and absorb 100% of solar ultraviolet radiation as defined by ANSI Z87.1-1989. They have been accepted by OSHA as being in compliance with 29 CFR 1910 if used and maintained properly. Inspect glasses frequently and clean with a mild soap solution. Do 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	

Appendix B- LED 365 Spectral Graphs for model: FLM1005

Led 365nm



FOR:

*SPARE PARTS,
SALES, OR
SERVICE*

CALL:

™

AUV/LESCO

A DIVISION OF AMERICAN ULTRAVIOLET COMPANY

*23555 TELO AVENUE
TORRANCE, CA 90505
USA*

PHONE: (310) 784-2930 / (800) 615-3726
FAX: (310) 784-2929 / (800) 905-3726

E-mail: Sales@lescouv.com