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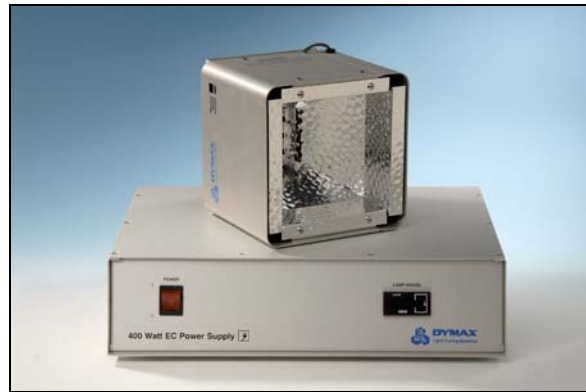
Operation Manual

EC Silver Series

Model 38105 – 2000-EC

Model 38100 – 5000-EC

Model 38110 – 1200-EC



UV Curing Light Source Flood Lamp System



Phone: (860) 482-1010 Fax: (860) 496-0608
www.dymax.com

TM-051
PN 35903
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The enclosed Dymax EC Series UV Curing Light Source and Flood Lamp System was developed and manufactured by the DYMAX team, driven by a desire to best serve your needs. Before shipping, your EC Curing Lamp was thoroughly checked and tested for trouble-free performance.

The proper set up and operation of this Flood Lamp System will maximize safety and user-friendly performance, providing optimum yield of your technological process.

THEREFORE, WE ENCOURAGE YOU TO READ, UNDERSTAND, AND FOLLOW ALL SAFETY AND OPERATING INSTRUCTIONS AND RECOMMENDATIONS COMPILED IN THIS AND OTHER RELATED MANUALS prior to setting up and operating this new Flood Lamp System or its individual components.

If you encounter a problem, have any questions, or would like to help us with your suggestions or recommendations, please contact our Technical or Customer Service Departments at 860-482-1010.

UNPACKING AND INSPECTION

Upon receipt of the unit, carefully remove the contents from the boxes and check for damage. **DYMAX® is not responsible for damage from shipping – all claims for shipping damage should be made with carrier.**

Check all boxes for contents and write down any serial numbers for further reference. You may wish to retain original shipping cartons in case you need to repackage any item for return.

If you observe or experience any problem with your equipment, notify DYMAX Customer Service, your authorized distributor, or your DYMAX Representative immediately.

NOTE: REPORT ANY SHORTAGE TO DYMAX CORPORATION CUSTOMER SERVICE - Phone: (860) 482-1010, Fax: (860) 496-0608

Before continuing with unpacking and installation, please read the following Chapters of this Manual for safety recommendations and installation, operation, and troubleshooting instructions.

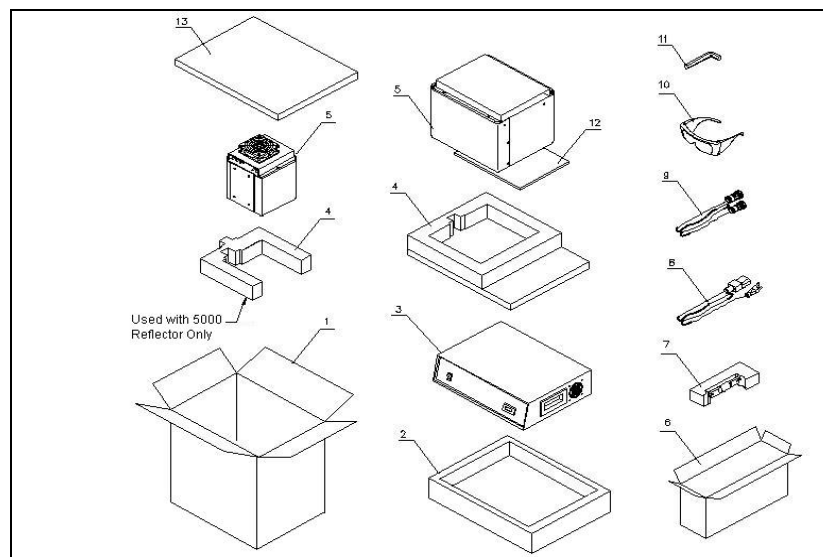


Figure 1. EC Series Unpacking

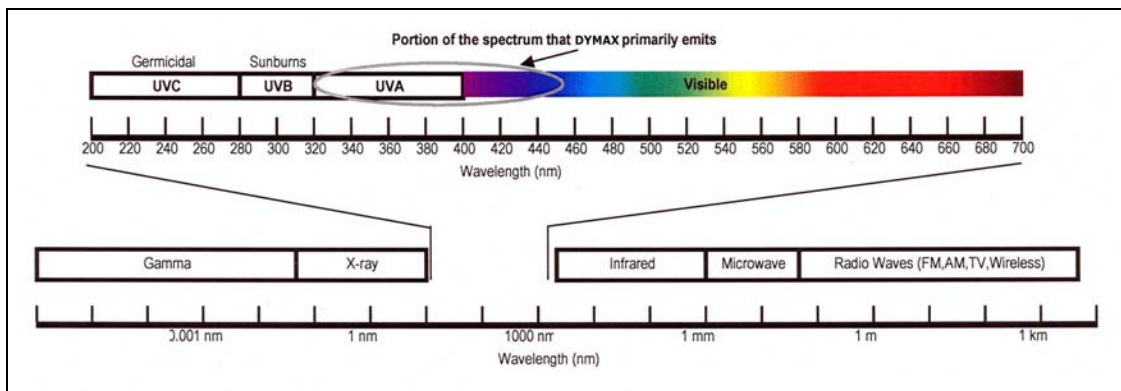
- | | | |
|----------------------|---|----------------------|
| 1 – Box | 5 – Reflector Housing 2000, 1200, or 5000 | 10 – Goggles |
| 2 – Foam, Bottom | 6 – Box, Accessory | 11 – Wrench |
| 3 – Power Supply, EC | 7 – Bulb, 400 Watt Package | 12 – Optional Filter |
| 4 – Foam, Middle | 8 – Cord, Power | 13 – Foam, Top |
| | 9 – Cable, Interconnect, CE | |

SAFETY

DYMAX ultraviolet curing technology has been used successfully for over 25 years. The fast cure, one component nature of our UV curing technology has made it the process of choice for many manufacturers requiring a Cure on Demand™ assembly process. The purpose of this document is to provide information relating to the use of DYMAX UV curing systems. There are four common questions/concerns related to UV curing systems: UV exposure, high temperature surfaces, ozone, and bright visible light.

UV EXPOSURE

Standard DYMAX UV curing systems and bulbs have been designed to primarily emit UVA light³ (as shown in Chart 1). UVA light is generally considered the safest of the three UV ranges: UVA, UVB, and UVC. Although OSHA does not currently regulate ultraviolet light exposure in the workplace, the American Conference of Governmental Industrial Hygienists (ACGIH) does recommend Threshold Limit Values (TLV's) for ultraviolet light. The strictest interpretation of the TLV (over the UVA range) for workers' eyes and skin is 1 mW/cm² (intensity), continuous exposure. Unless workers are placing bare hands into the curing area, it is unusual to exceed these limits. To put 1 mW/cm² limit into perspective, cloudless summer days in Connecticut regularly exceed 3 mW/cm² of UVA light and also include the more dangerous UVB light (primarily responsible for sun tans, sun burns and skin cancer) as well.



The human eye can not detect “pure” UV light, only visible light. A radiometer should be used to measure stray UV light to confirm the safety of a UV curing process. A workstation that exposes an operator to more than 1 mW/cm² of UVA continuously should be redesigned.

UV adhesive curing can be a regulatory compliant, “worker-friendly” manufacturing process when the proper safety equipment and operator training is utilized. There are two ways to protect operators from UV exposure: shield the operator and/or shield the source.

SHIELD THE OPERATOR

- ❖ **UV-Blocking Eye Protection** – *UV-blocking eye protection is recommended when operating UV curing systems. Both clear and tinted UV-blocking eye protection is available from DYMAX (see Table 1).*
- ❖ **UV-Blocking Skin Protection** – *Where the potential exists for UV exposure upon skin, opaque, UV-blocking clothing, gloves, and full-face shields are recommended.*

SHIELD THE SOURCE OF UV

Any substrate that blocks UV light can be used as a shield to protect workers from stray UV light. The following materials can be used to create simple shielding structures or blind corners:

- ❖ **Sheet Metal** – *Aluminum, steel, stainless steel, etc. Sheet metal should be coated black or black anodized to minimize reflection of UV and visible light toward operators.*
- ❖ **Rigid Plastic Film** – *Transparent, UV-blocking plastics (typically polycarbonate or acrylic) are commonly used to create shielding where transparency is also desired. These rigid plastic films are available either water-clear or tinted.*

- ❖ **Flexible Film** – UV-blocking, flexible urethane films can be used to quickly create workstation shielding. This UV-blocking, flexible urethane film is available from DYMAX (see Table 1).

HIGH TEMPERATURE SURFACES

Surfaces exposed to high intensity curing lights will rise in temperature. The intensity, distance, exposure time, cooling fans, and the type/color of the surface can all affect the actual surface temperature. In some cases, exposed surfaces can reach temperatures capable of producing a burn or causing damage to a substrate. In these cases, care must be taken to ensure either a more moderate surface temperature or appropriate protection/training for operators.

OZONE

Standard DYMAX bulbs (UVA type) generate an insignificant amount of UVC and therefore essentially no ozone³. Some UV curing systems, like those used to cure UV inks, emit primarily “shortwave” (UVB and UVC) energy. Upon exposure to UVC light (specifically <240 nm), oxygen molecules (O₂) split into oxygen atoms (O) and recombine with O₂ to create ozone O₃. The current, long-term ozone concentration limit recommended by ACGIH, NIOSH, and OSHA is 0.1 ppm (0.2mg/m³).










BRIGHT, VISIBLE LIGHT

The bright visible light emitted by some UV curing systems can be objectionable to some workers and can cause eyestrain. Tinted eye protection and/or opaque/tinted shielding can be utilized to address this concern.

SUMMARY

UV light sources can be more “worker friendly” than many commonly accepted industrial processes, provided the potential concerns are addressed. Contact your DYMAX representative for information regarding the proper use of DYMAX UV curing systems.

TABLE 1. UV Blocking Eye Protection and Shielding

 <p>Clear Spectacles* No tint PN 35612</p>	 <p>Green Spectacles* Medium tint PN 35614</p>	 <p>Dark Green Spectacles* Maximum tint PN 38349</p>
 <p>Clear Goggles* No tint; for use over eye glasses PN 35284</p>	 <p>Grey Goggles* Medium tint; for use over eye glasses PN 35285</p>	 <p>Dark Green Goggles* Maximum tint; for use with eye glasses PN 35286</p>
 <p>Clear Face Shield** No tint PN 35186</p>	 <p>Dark Green Face Shield** Maximum tint PN 38407</p>	 <p>Flexible Urethane Shielding 8" wide, per linear foot PN 35531</p>

¹ Per manufacturer, 99.9+% UV blocking and meet ANSI Z87.1 and CSA Z94.3 requirements

² Meets ANSI X871.1

³ DYMAX also provides special order “shortwave” bulbs that emit primarily UVB and UVC light. Contact DYMAX directly for information regarding the use of “shortwave” bulbs.

GENERAL

DYMAX EC Series UV (ultraviolet) light sources are general-purpose units for the curing of UV adhesives, coatings and inks. They have extensive use in a wide variety of applications such as bonding, potting, sealing and encapsulating. These light sources are extremely unique in that they offer exceptional versatility and expandability.

The design of these units has been carefully considered to allow the light source to be successfully utilized in a wide variety of manufacturing situations. Further versatility is found in the ability to be configured in a wide variety of production situations.

Each unit is designed and shipped in a unitized configuration for easy bench-top mounting with all controls and functions right at the hands of the operator. Side mounted handles are installed in the power supply housing for portability.

Each unit can also be custom configured for mounting of the lamp/reflector assembly housing in a remote curing location and the power supply can be mounted several feet away within the easy reach of an operator. The lamp/reflector assembly housings have been designed with clean, unobstructed surfaces for maximum ease of installation in existing or specialized equipment.

Several lamp/reflector assembly housings can be mounted side-by-side in a linear configuration (such as on conveyORIZED systems) or a large area array. The power supplies can then be stacked and mounted remotely to provide consolidated operator control.



SPECIFICATIONS

GENERAL:

Each light source consists of the following components:

- A solid-state power supply that allows external electrical inputs and provides power to the lamp located in the lamp/reflector assembly housing. The power supply contains the ON/OFF power switch and hour-meter that are located on the left side of the front panel. The power supply also houses its own cooling fan and power distribution for optional accessories. The rear panel has an integrally fused AC power receptacle and an 8-pin female Amp connector.
- The solid-state power supply yields reliable and stabilized lamp voltage in virtually any electrical system in the world. Other than ensuring a properly configured plug is employed, no other adjustment of settings is required. The power supply also conditions the electrical power to the lamp providing longer, more reliable lamp life.
- A lamp/reflector assembly housing (refer to drawing on specific models) which contains the reflector, UV lamp, lamp sockets, high voltage starter and three circular connectors.
- Connection cable between the power supply and lamp/reflector assembly housing.
- A power cord.
- One (1) pair of UV safety goggles.
- 400 Watt, Metal Halide (optional visible or mercury vapor) UV lamp.
- RoHS compliant

ELECTRICAL SPECIFICATIONS:

Power supply designed for use as follows:

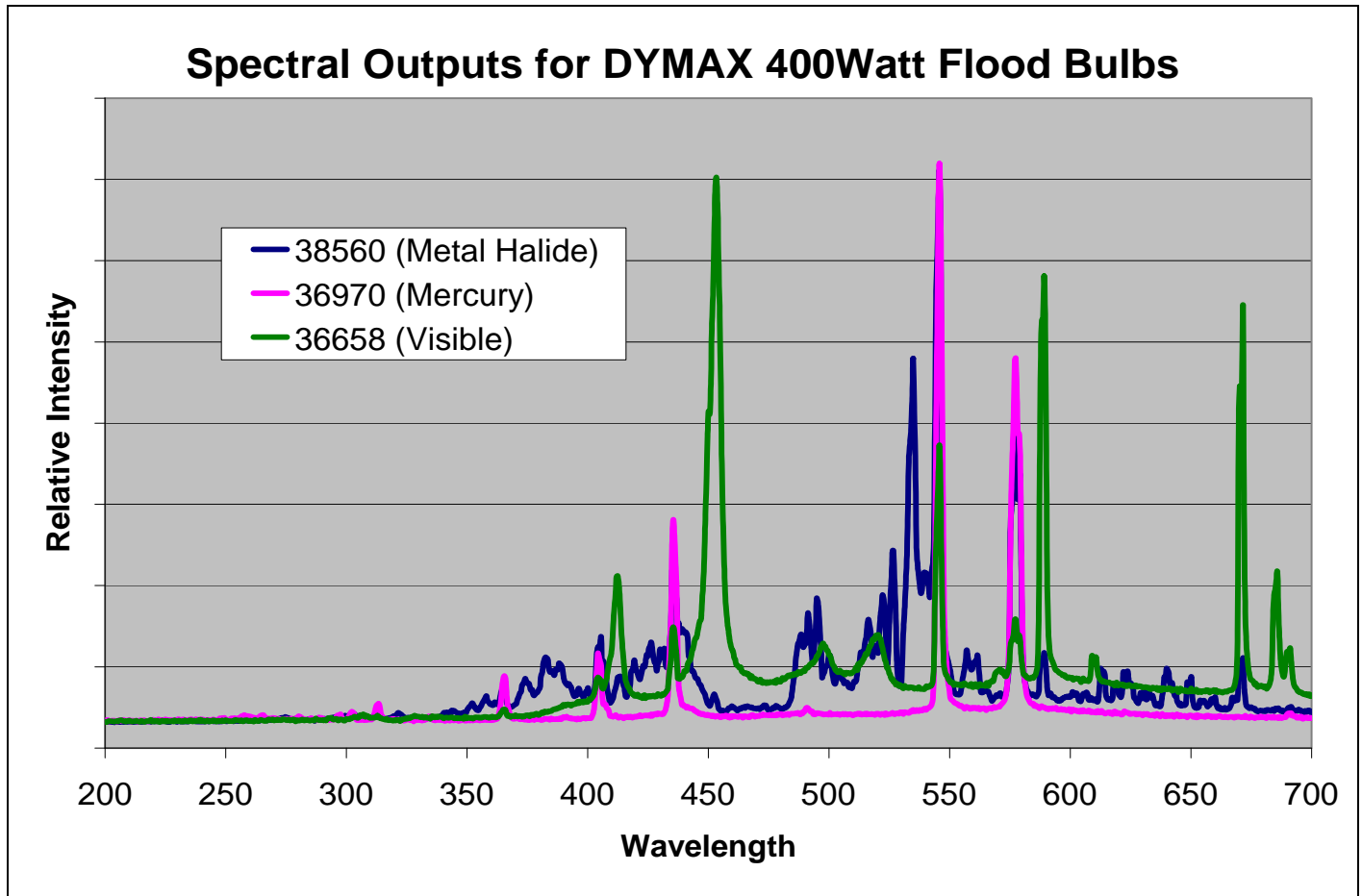
- Factory preset power output range 320-420 watts. Set at 395 watts during manufacture.
- Manually set via adjustment pot located on the power supply module
- Operating temperature 0-50° C
- Storage temperature -20 to 80° C
- Operating humidity 0 to 90% (non condensing)
- Mains Voltage 90-264 VAC
- Line frequency 47-63 Hz
- Current Consumption (max)
 - @115 VAC 8A
 - @ 230VAC 4A
- Inrush current (max) 30A
- Electrical regulation +/- 2.5% for effects of load, line, temperature
- Output protection Short circuit and overload protected
- Auxiliary DC outputs
 - +24V, 1 A available for lamp housing fan and shutters
 - +/-24V, ~0.5A and +6V unregulated

Bulb 400 Watt, metal halide (standard)
400 Watt, mercury vapor (optional)
400 Watt, visible (optional)

PHYSICAL

Overall Unit Dimensions..... (approx.) 16"W x 12"D x 19"H
Power Supply Dimensions (approx.) 16"W x 12"D x 4.25"H
Lamp Life..... 2000 Hours (warranted)
Hour-Meter 99,999.9 Hours (non-resetable)

Bulb Spectral Information



2000 EC:



ELECTRICAL

- See GENERAL specifications.

PHYSICAL

- Lamp/Reflector Assembly Housing Dimensions: (approx.) 10.5" W x 9.0" D x 7.5"H.
- Lamp/Reflector Assembly Housing Weight: (approx.) 3.4 lbs.

- See GENERAL specifications for further information.

Output Intensities (Typical)

WAVELENGTH	INITIAL INTENSITY (mW/cm ²)
UV-A* (365 nm)	105

*Intensity measured using an Accu-Cal 50 radiometer calibrated and traceable to NIST.

5000 EC:



Electrical

- See GENERAL specifications.

Physical

- Lamp/Reflector Assembly Housing Dimensions (approx.) 6.75" W x 6.75" D x 8.0" H.
- Lamp/Reflector Assembly Housing Weight(approx.) 2.7 lbs.
- See GENERAL specifications for further information.

Output Intensities (Typical)

WAVELENGTH	INITIAL INTENSITY (mW/cm ²)
UV-A* (365 nm)	225

* Intensity 3" below bottom edge of lamp/reflector assembly housing measured with an Accu-Cal 50 UV radiometer calibrated and traceable to NIST.

1200 EC:



Electrical

- See GENERAL specifications.

Physical

- Lamp/Reflector Assembly Housing Dimensions. (approx.) 10.5" W x 9.0" D x 7.5" H.
- Lamp/Reflector Assembly Housing Weight (approx.) 3.4 lbs.
- See GENERAL specifications for further information.

Output Intensities (Typical)

WAVELENGTH	INITIAL INTENSITY (mW/cm ²)
UV-A * (365 nm)	400

* Intensity 4.5" from bottom edge of lamp/reflector assembly housing with the beam focused, measured with an Accu-Cal 50 UV radiometer calibrated and traceable to NIST.

INSTALLATION AND SYSTEM INTERCONNECT

The only tool required for this procedure is $\frac{3}{32}$ hex wrench which is provided with the unit.

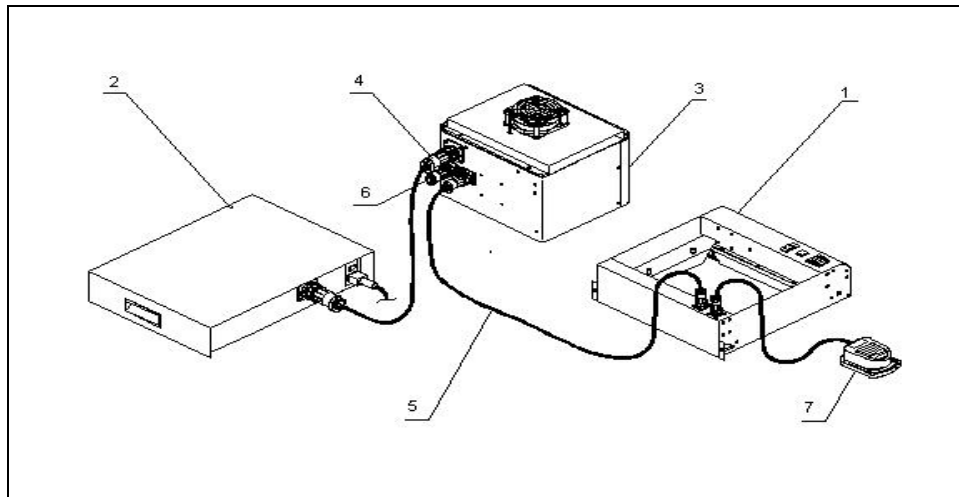


Figure 2 - Interconnection

- 1 – Shutter, Optional
- 2 – Power Supply (8-Pin Connector)
- 3 – Reflector (8-Pin Connector)
- 4 – 8-Pin to 8-Pin Cable
- 5 – Cable Shutter, Optional
- 6 – Plug, Adapter, Optional
- 7 – Foot Pedal, Optional

1. Place the 400 Watt UV lamp into the lamp/reflector assembly housing. Refer to the LAMP REPLACEMENT/INSTALLATION section of this manual.
2. A glass filter is available as an option. This filter glass reduces heat produced by lamp but will also reduce UV output of reflector. To install the optional filter glass (sold only for the 2000 EC):

NOTICE: It is important to wear protective gloves when installing the filter glass! Do not touch the filter with bare fingers! Fingerprints may etch into glass and cause light transmission loss!

- Place the reflector housing up-side down on a flat surface.
- Loosen the four screws in the bracket that hold the reflector to the housing.
- Slide the filter glass under the brackets and adjust it symmetrically over the reflector aperture.
- Tighten the four screws.

-
3. Locate the power supply and reflector housing so that there is free air circulation around sides. Reflector may be mounted to a DYMAX's flood lamp accessories such as mounting stand, lightshield, or shutter. See connecting instruction in operation manual for appropriate DYMAX accessories.

WARNING! ALWAYS OBSERVE SAFETY REQUIREMENTS WHEN WORKING WITH ELECTRICAL EQUIPMENT! ELECTRICAL HAZARD IS PRESENT!

4. After the bulb is inserted and reflector-housing assembly is placed and secured in the designated operation location, proceed with interconnection as follows. Cables and receptacles are coded with color dots to assist in the installation of cables. Connections may vary if using a DYMAX's flood lamp accessories such as a mounting stand, lightshield, or shutter. See connecting instruction in operation manual for appropriate DYMAX accessories.

- Connect the large connector cable to the J3 receptacle on the reflector housing. Coded red.



- Connect the other end of the cable to the lamp power receptacle on rear panel of the power supply. Coded red.



- Make sure that the other DYMAX accessories, if any is also properly connected and operational.
- Plug the AC cord into the power module located in the rear panel of the power supply, and plug the other end of the cord into appropriate external AC source.

Components Description

2000 EC:

The Dymax 2000 EC is a general purpose UV light source with an effective curing area of approximately 8" x 8", making it ideal for batch processing or curing large areas.

An optional special glass UV filter may be installed in the 2000 EC reflector to reduce UV-B and UV-C spectral emissions. When operated correctly using the glass filter, extensive shielding associated with many lamps can be minimized.

The 2000 EC employs convection cooling. An optional fan ventilation kit is also available. This kit removes excessive heat due to the lamp's possible proximity to other heat sources, or to remove vapors from under the lamp/reflector assembly housing during curing of UV materials. (Please refer to the **SPARE PARTS/OPTIONS** section of this manual for more information on the Fan Ventilation Kit.)

5000 EC:

The Dymax 5000 EC is a general purpose UV light source with an effective curing area of approximately 5" x 5". The unit is ideal for small batch processing of UV adhesives and potting compounds.

Comparatively, it provides more than twice the output intensity of a Dymax 2000 EC light source for faster curing capability and the additional ability to cure conformal coating resins.

1200 EC:

The Dymax 1200 EC is a focused beam UV lamp used for the curing of UV adhesives, coatings and inks. The unit's elliptical reflector provides an intense 1" x 6" area of UV energy 4.5" away from the lower edge of the lamp/reflector assembly housing.

The 1200 EC employs convection cooling. An optional Fan Ventilation Kit is available to remove excessive heat and ventilate curing vapors away from the lamp/reflector assembly housing. (Refer to the **SPARE PARTS/OPTIONS** section of this manual for more information on the Fan Ventilation Kit.)

OPERATION

Turn the unit on by pressing the power "ON" switch, located on the left front of the power supply panel. The switch will light up to indicate that the power is ON.

NOTE: WHILE MOST LAMPS TYPICALLY REQUIRE LESS THAN 30 SECONDS TO IGNITE, A NEW LAMP WILL SOMETIMES REQUIRE SEVERAL MINUTES.

After the lamp has ignited, allow 5 minutes for the lamp to reach its maximum output intensity.

LAMP LIFE IS REDUCED APPROXIMATELY ONE HOUR EACH TIME IT IS STARTED. TO AVOID PREMATURE LAMP DETERIORATION, LEAVE THE UNIT ON THROUGH BREAKS, SHORT SHUTDOWNS AND LUNCH HOURS.

These UV light sources are designed for continuous operation.

NOTE: If the power is momentarily lost or the lamp is inadvertently shut off, it must cool down before restarting. This may take 5-10 minutes depending on ambient conditions. The power supply may be left energized while the lamp is cooling. The lamp will re-light when it has cooled sufficiently.

EACH TIME THE LAMP IS TURNED ON, IT SHOULD OPERATE FOR AT LEAST 5 MINUTES TO ALLOW COMPLETE IONIZATION OF ELEMENTS INSIDE THE LAMP. FAILURE TO DO THIS MAY RESULT IN FAILURE OF THE LAMP TO RESTART. REFER TO THE TROUBLE-SHOOTING SECTION OF THIS MANUAL FOR MORE INFORMATION.

MAINTENANCE

LAMP REPLACEMENT PROCEDURE

Every new 400-Watt EC Series UV light source is supplied with a new lamp. When the lamp requires replacement, the following procedure must be followed.

1. Turn the power switch OFF.
2. Disconnect the power supply from the electrical power source.
3. Allow the lamp to cool.

THE LAMP OPERATES AT TEMPERATURES EXCEEDING 500 DEGREES CELSIUS (C). TOUCHING THE LAMP BEFORE SUFFICIENT COOL DOWN TIME IS ALLOWED WILL CAUSE SEVERE BURNS.

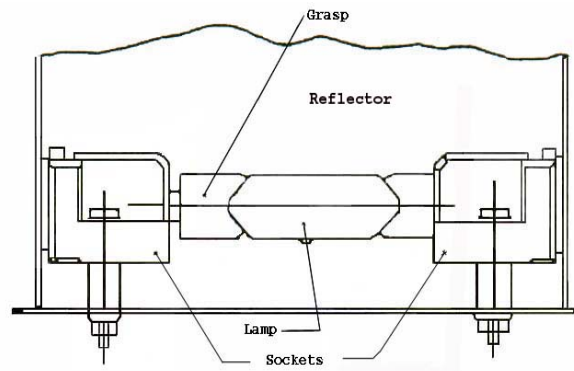
ALWAYS WEAR SAFETY EYE WEAR WHILE REPLACING LAMP.

4. Hold the lamp/reflector assembly housing securely and loosen thumbscrew on the lamp/reflector assembly-housing bracket. Lift the housing off the mounting stand and place upside down on a clean work surface.

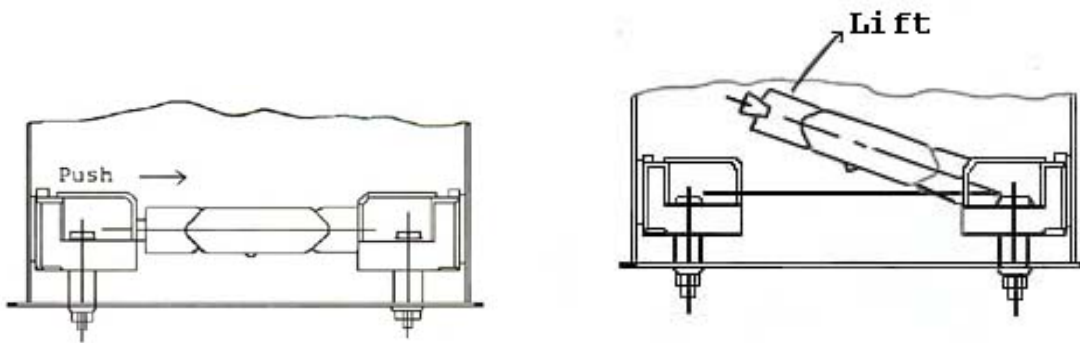
5. Remove the glass filter (if installed in the 2000-EC) by removing one retaining strap held by two (2) 8-32 x 3/8" button head screws with 3/32 hex wrench. If the optional glass filter is installed, loosen the two (2) 8-32 x 3/8" button head screws in the remaining strap so that the filter glass can slide out.
6. Reach into the reflector and GRASP the flat area of lamp, at either end.

CAUTION: ALWAYS USE A SOFT, CLEAN RAG, CLEAN PAPER TOWEL OR GLOVES WHEN HANDLING THE LAMP. SKIN OILS LEFT ON THE LAMP WILL BURN INTO THE QUARTZ, REDUCING OUTPUT INTENSITY.

IF THE LAMP IS INADVERTENTLY TOUCHED, CLEAN LAMP THOROUGHLY WITH A SOFT CLEAN RAG AND ALCOHOL.



7. PUSH lightly on the lamp toward the socket on the opposite end of the lamp so that the end being grasped can be LIFTED clear of the socket as shown below.



8. INSTALL THE NEW LAMP by following steps 5, 6 and 7 in reverse order.

IMPORTANT: Install the lamp such that the seal dimple on the bulge of the glass is facing towards the reflector surface. Avoid touching the quartz tube with your fingers.

NOTE: LAMP HAS NO POLARITY

9. Record the serial number of the unit and the hour-meter reading in the Bulb History Record.
10. Replace the lamp/reflector assembly housing on the mounting stand by engaging the mounting bracket.
11. Secure the thumbscrew when the lamp/reflector assembly housing is at the proper height.
12. Reconnect the power cord to the appropriate power source.
13. Turn Power Switch to "ON" position and allow at least 5 minutes for lamp to warm up before using.

NOTE: IF THE LAMP DOES NOT IGNITE, REFER TO THE TROUBLESHOOTING SECTION OF THIS MANUAL.

LAMP BASE REPLACEMENT KIT

Installation Instructions:

1. Turn off the power.
2. Remove the power cord and connector cord from the unit.
3. Remove the lamp/reflector assembly from the mounting stand and place it on a clean, flat surface with the lamp facing up.
4. Remove the lamp (refer to Lamp Replacement Procedure.)
5. Remove the lamp/reflector assembly from the housing by removing the four screws, two on each side, from the reflector.
6. Remove the two screws, from the side of the unit, holding the ignitor in place (located inside a blue fireproof sleeve) and remove from the sleeve.
7. Loosen the screws and remove the wires from the ignitor at locations marked **N** and **La**.
 - a. The black Teflon wire at location **N** will have to be clipped from the lamp base wire and re-stripped.
8. Remove both lamp bases and install the new lamp bases from the Lamp Base Replacement Kit.
9. Take one of the lamp bases and crimp on a supplied terminal (P/N 35202), this wire will be installed in the **La** location on the ignitor.
10. The remaining lamp base wire will be joined with the black Teflon wire using the supplied terminal (P/N 35218). This wire will be installed in the **N** location on the ignitor.
11. Place the ignitor back into the blue fireproof sleeve and fasten to the side of the housing using the two screws that had been removed in Step #6.
12. Place the reflector back into the housing and fasten with the four remaining screws.
13. Place the lamp back into the unit.

FUSE REPLACEMENT PROCEDURE

The EC Series 400 Watt power supply utilizes two line input fuses. These fuses are external and are located in the power cord receptacle at the rear of the power supply housing. The fuses are 6.25 Amp, slow blow fuses.

WARNING: ELECTRICAL SHOCK HAZARD. EXERCISE EXTREME CARE WHEN REPLACING FUSES. MAKE SURE ONLY QUALIFIED PERSONNEL PERFORM FUSE REPLACEMENT AND THAT ALL POWER SWITCHES ARE "OFF" AND THE POWER CORD IS UNPLUGGED.

Replacing External Fuses:

1. Turn the power supply power switch "OFF."
2. Unplug the power cord from the electrical source.
3. Unplug the power cord from the receptacle at the rear of the power supply housing.



4. Place a small, flat blade screwdriver into the notch at the top of the plug recess and pull the fuse cover downwards approximately 70 degrees. The fuse retainer is exposed and may be removed by pulling it straight out.
5. Slide out the blown fuses and replace with new 6.25 Amp, slow blow fuses.

CAUTION: IT IS IMPORTANT TO REPLACE THIS FUSE WITH THE SAME 6.25 AMP RATED, SLOW BLOW TYPE.

6. Slide the fuse holder back into the receptacle until it is fully seated, then rotate the cover upward until it latches.
7. Install the power cord and connect it to the electrical power source.
8. Turn the power switch "ON."

Cleaning:

Periodically remove and clean the optional glass UV filter if installed. Follow Step 5 in Lamp Replacement Procedure for removal. Clean with any standard glass cleaner or use isopropyl alcohol for heavy deposits. Reinstall the glass filter by following Step 2 of **INSTALLATION** procedure.

NOTE: The optional glass filter for the 2000 EC loses its ability to transmit UV over time. This is due to "solarization" of the glass caused by the intense UV radiation. Cleaning can extend the useful life of the filter, but its transmission should be monitored periodically and replaced as necessary.

FAILURE TO REGULARLY CLEAN THE GLASS UV FILTER WILL RESULT IN REDUCED UV OUTPUT TO THE RESIN BEING CURED, THEREBY INCREASING THE TIME REQUIRED TO ACHIEVE OPTIMUM CURE.

Periodically clean the lamp and reflector surfaces. A soft, clean cloth and any standard glass cleaner should be used. Heavier deposits may require cleaning with isopropyl alcohol.

CAUTION: CLEANING THE REFLECTOR WITH A ROUGH OR DIRTY CLOTH WILL RESULT IN A DULLED SURFACE, THEREBY, REDUCING REFLECTANCE AND DECREASING UV OUTPUT. USE ONLY A SOFT, CLEAN CLOTH.

Any uncured resins spilled onto the light source can be removed with isopropyl alcohol and a clean cloth.

TROUBLESHOOTING

NOTE: ONLY QUALIFIED MAINTENANCE PERSONNEL SHOULD ATTEMPT THE FOLLOWING PROCEDURES:

Problem: Lamp Will Not Ignite Other Symptoms: Lamp Flickers, Won't Maintain Operation

Possible Cause	Troubleshooting Method	Corrective Action
Improperly Fastened Connections	Visually inspect all connections to and from the power supply.	Secure all connections.
Main Line Fuses Blown	Remove fuses from power receptacle and check with an ohmmeter.	Replace fuses, if defective.
Corroded Lamp Bases	Visually inspect the lamp bases for ANY signs of corrosion.	Replace the lamp bases if corrosion exists (both lamp bases should be replaced at the same time).
Lamp Beyond Useful Life	Replace lamp with known good lamp and re-test unit.	Replace lamp if defective (typical lamp life = 2000 hours).
Power Supply Board Failed	Check output voltage on power supply board. Set oscilloscope to: 20ms/div 100V/div	Expected value 290-340Vrms Square Wave. Replace power supply board if defective.
Ignitor Malfunctioned	Verify open circuit voltage from ignitor. Set oscilloscope to: 50us/div 1000V/div	Expected value 4-5KV ignition pulse superimposed on the square wave. Replace if defective.

Problem: Unit Blows Input Fuse

Possible Cause	Troubleshooting Method	Corrective Action
Malfunction in the Power Supply Board	Remove power. Disconnect the lamp/reflector assembly from the power supply. Replace the fuse. Apply power. If fuse blows, power supply is defective.	Replace the power supply board.

Problem: UV Intensity Appears To Be Low

Possible Cause	Troubleshooting Method	Corrective Action
Lamp Beyond Its Useful Life	Use a radiometer (model Dymax Accu-Cal 50) to measure actual output intensity. Consult Manual for proper output.	Replace lamp if beyond useful life (Typical life = 2000 hours).
Quartz Envelope, On Lamp Contaminated	Visually inspect the lamp for signs of contamination (Quartz envelope MUST be free from ANY contamination).	Clean the lamp with a soft, lint-free cloth and isopropyl alcohol. Lamp may have to be replaced if contamination is burned into quartz envelope.
Surfaces Of Reflector May Be Contaminated	Examine reflector surface for contaminants (should be a clean, shiny surface).	Clean reflector with a soft, lint-free cloth and isopropyl alcohol, or equivalent.
Optional Glass Filter Contaminated (2000 EC Only)	Examine glass filter for signs of contamination.	Clean glass filter with a soft, lint-free cloth and isopropyl Alcohol, or equivalent.

NOTE: WHEN CONTACTING DYMAX CORPORATION, AN AUTHORIZED DYMAX DISTRIBUTOR, OR MANUFACTURER'S REPRESENTATIVE, BE SURE TO KNOW AND PROVIDE THE FOLLOWING:

- MODEL NUMBER OF LIGHT SOURCE IN QUESTION.
- SERIAL NUMBER OF LIGHT SOURCE IN QUESTION.
- PRODUCT NUMBER OF ADHESIVE IN QUESTION (IF APPLICABLE).
- LOT NUMBER OF ADHESIVE IN QUESTION (IF APPLICABLE).

ALL RETURNS TO DYMAX CORPORATION MUST BE ACCOMPANIED BY A RETURN AUTHORIZATION NUMBER (RAN). THIS NUMBER MUST BE OBTAINED FROM THE DYMAX CUSTOMER SERVICE CENTER.

SPARE PARTS

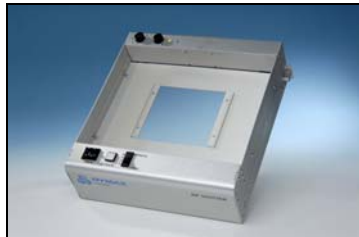
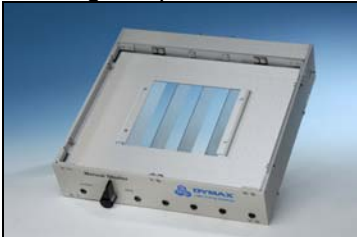
ITEM	PART#
Lamp, Metal Halide 400 Watt UV (Standard)*	38560
Lamp, Mercury Vapor 400 Watt UV (Optional)	36970
Lamp, Visible 400 Watt (Optional)	36658
Fuse, F 6.25 Amp*	35141
Optional Fan Assembly (2000, 1200 EC)	38300
Optional Glass UV Filter (2000 EC only)	35899
Lamp Base Replacement Kits*	35979
Goggles, UV safety (GRAY)	35285
Goggles, UV safety (CLEAR)	35612
Switch, Power	36288
Mounting Stand Kit, 5000 EC	38289
Mounting Stand Kit, 1200/2000 EC	38290

* Recommended spare parts

Options: Several optional accessories are available to enhance efficiency and operation of DYMAX EC Series UV light sources. Contact your authorized Dymax Distributor, Manufacturing Representative or Dymax Technical Service Group for more information on these options.

Manual Louvered Shutter (P/N 35572) & Electric Zip Shutter (P/N 37863)

Safety Enhancing, Timing Devices - The Dymax Electric Zip (retractable) Shutter and Manual Louvered Shutter allow timed light exposure, reduce heat on work area surfaces, as well as reduce operator exposure to UV light.



UV Radiometer (P/N 39561)

Dymax offers an Accu-Cal 50 for monitoring the UV intensity of the EC-Series light sources. This radiometer is calibrated to measure UVA output (320-390 nm) wavelength.



Features include:

- Auto ranging, digital readout (1.0 to 40,000 mW/cm²)
- Measures light intensity in mW/cm²
- Powered by AA batteries (included)
- Stores in molded plastic case (included)

Top Ventilation kit for 1200/2000 EC (P/N 38300)

The standard Dymax EC Series lamps employ convection cooling. In situations where supplemental cooling is required or removal of curing vapors from under the lamp/reflector assembly housing is desired, an optional ventilation kit is available. The kit can either be a fixed metal skirt that fits on the rear or on the top of the lamp/reflector assembly. The top fan skirt for the 2000/1200 is provided with the purchase of a shutter.



DEFINITION OF TERMS

Flood Lamp System - Set of components arranged to generate, collect, condition and direct UV radiant energy to perform curing of engineering adhesives, coatings, and inks within a safe and controlled process. It includes a Lamp Housing and Power Supply and may also include a Shutter, and Workstation, UV Enclosure, or Dymax® Lightshield, and accessories.

Lamp - Light source (bulb or burner) generating Ultraviolet, Visible, and Infrared radiant energy from burning matter stimulated by electrical power conditioned by a proper power supply which is an integral part of a Lamp. A light source is usually placed into a reflector (of various geometry) to increase light source efficiency by collecting and directing radiant energy of selected spectra (for a given curing process).

Intensity - a measure of light energy over the unit of surface area (usually surface at the specified working distance from the bottom of a reflector housing) in W/cm^2 or mW/cm^2 . For the UV portion of light, this measure is often called in literature "irradiance", i.e. radiant energy arriving at a point on a surface per unit area.

Brightness, also known as **Luminance** - description of energy in the visible region of the spectrum (approximately from 400 to 700 nm) and recorded in photometric units. "**Intensity**" (see below) of visible light energy is called Illuminance.

Illuminance - luminous flux (energy of visible light) incident per unit area, and measured in **Lx** (lux) or **Lumen/cm²**.

Ultraviolet (UV) - The invisible region of the spectrum just beyond the violet end of the visible region. Wavelength ranges in general from 1.0 to 400 nm. Dymax® bulbs (burners) do not radiate energy in deep Ultraviolet; there are very minute amounts below 220 nm and practically nothing can be sensed below 200 nm. This is due to the use of an ozone blocking quartz bulb envelope (See Ozone).

Ultraviolet is used beneficially in various fields of industry and medicine. In order to standardize Light Sources used in medicine, in Copenhagen in 1932, The International Congress on Light recommended dividing the ultraviolet spectrum into three spectral parts:

1. **Ultraviolet A (UV-A)** - UV of long wavelength from within approximately 400 to 320nm of the spectral band (4000 to 3200 \oplus) - predominately produced by Dymax Flood Lamps.
2. **Ultraviolet B (UV-B)** - UV of medium wavelength from within approximately 320 to 280nm - Dymax Flood Lamps produce some amount of their energy within this bandwidth.
3. **Ultraviolet C (UV-C)** - UV of short wavelength below 280nm (we say from 280 to 200nm) – a large amount of this energy is present in the Sunlight.

Dose - is irradiance integrated over time, or Irradiance (W/cm^2) x Time (s) = Dose (Joules/cm²). Note: Watt is the power that gives rise to the production of energy at the rate of 1-joule (J) per second (s).

Ozone - oxidizing agent (O₃) produced by the action of Ultraviolet radiant energy (below 185 nm) or electrical corona discharge of oxygen on air.

OSHA 1910.145: "Regulation of Accident prevention Signs and Tags" defines the following headers as:

WARNING – is used when there is a hazardous situation that has some probability of severe injury.

CAUTION - is used to indicate a hazardous situation that may result in minor or moderate injury.

NOTICE - is used to convey a message related directly or indirectly to the safety of personnel, or protection of property.

WARRANTY

CAUTION!

DYMAX[®] CORPORATION RESERVES THE RIGHT TO INVALIDATE ANY WARRANTIES, EXPRESSED OR IMPLIED, DUE TO ANY REPAIRS PERFORMED OR ATTEMPTED ON DYMAX EQUIPMENT WITHOUT WRITTEN AUTHORIZATION FROM DYMAX. THOSE CORRECTIVE ACTIONS LISTED BELOW ARE LIMITED TO THIS AUTHORIZATION.

WARRANTY CARD MUST BE RETURNED OR WARRANTY WILL BE VOID.

Dymax[®] offers a one-year warranty against defects in material and workmanship on all system components *with proof of purchase date*. Unauthorized repair, modification, or improper use of equipment may void warranty. The use of aftermarket replacement parts not supplied or approved by Dymax[®] Corporation, will void any effective warranties and may result in damage to the equipment.

Please register your product
warranty online at:
www.dymax.com/warranty

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

For further assistance with equipment, contact DYMAX Applications Engineering.



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