

# UVCS Version 2.0

For use with Dymax Flood Lamps



UVCS UV Light-Curing Conveyor System (Shown with Two Dymax 5000-EC Lamps)

## Operation Manual

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The Dymax UVCS UV Light-Curing Conveyor System was developed and manufactured by the Dymax engineering team. Before shipping, your conveyor system was tested to ensure peak operating performance.

The proper set up and operation of this Conveyor System will maximize safety and user-friendly integration, providing optimum yield and productivity.

**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 system or its individual components.

If you encounter a problem, have any questions, or would like to provide suggestions or recommendations, please contact Dymax Applications Engineering or Customer Service.

## **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 the carrier.

Check all boxes for contents and write down any serial numbers for further reference. You may wish to retain the 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.

System Includes:

- UVCS Conveyor Unit
- Lamp and Power Source
- Two Pairs UV Goggles
- Operation Manual

**NOTE: REPORT ANY SHORTAGE TO DYMAX CORPORATION CUSTOMER SERVICE.**

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

## SAFETY

Dymax ultraviolet light-curing technology has been used successfully for over 30 years. The fast cure, one component nature of our UV light-curing technology has made it the process of choice for many manufacturers requiring a "cure-on-demand" assembly process. There are four common questions/concerns related to UV light-curing systems: UV exposure, high-temperature surfaces, ozone, and bright, visible light.

### UV EXPOSURE

Standard Dymax UV light-curing systems and bulbs have been designed to primarily emit UVA light (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/cm<sup>2</sup> (intensity), continuous exposure. Unless workers are placing bare hands into the curing area, it is unusual to exceed these limits. To put 1 mW/cm<sup>2</sup> limit into perspective, cloudless summer days in Connecticut regularly exceed 3 mW/cm<sup>2</sup> of UVA light and also include the more dangerous UVB light (primarily responsible for sun tans, sun burns, and skin cancer) as well.

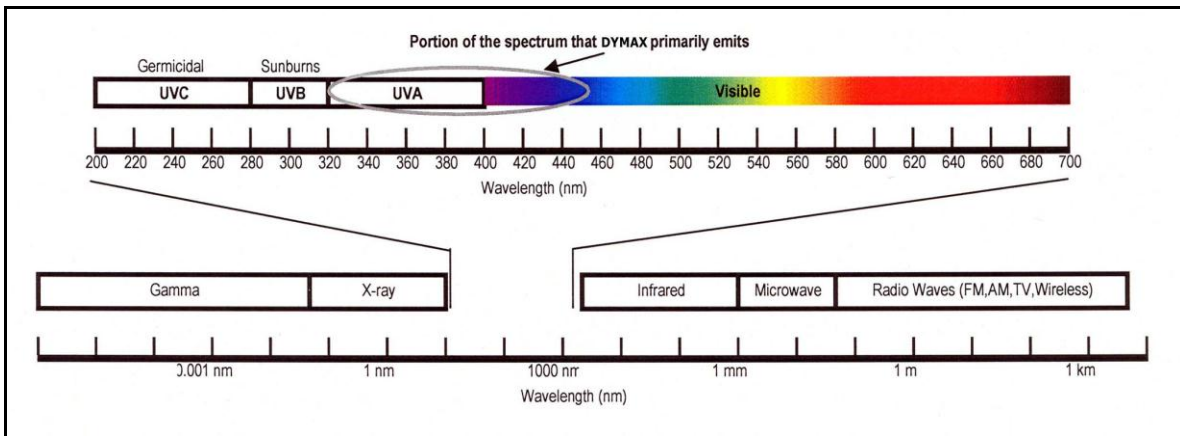


Chart 1. Spectrum of Light

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/cm<sup>2</sup> 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 light-curing systems. Both clear and tinted UV-blocking eye protection is available from Dymax.
- **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.

## **HIGH-TEMPERATURE SURFACES**

Surfaces exposed to high-intensity UV light 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 and training for operators.

## **OZONE**

Standard Dymax bulbs (UVA type) generate an insignificant amount of UVC and therefore essentially no ozone. Some UV light-curing systems, like those used to cure UV-curable inks, emit primarily “shortwave” (UVB and UVC) energy. Upon exposure to UVC light (specifically <240 nm), oxygen molecules (O<sub>2</sub>) split into oxygen atoms (O) and recombine with O<sub>2</sub> to create ozone O<sub>3</sub>. The current, long-term ozone concentration limit recommended by ACGIH, NIOSH, and OSHA is 0.1 ppm (0.2mg/m<sup>3</sup>).

## **BRIGHT, VISIBLE LIGHT**

The bright, visible light emitted by some UV light-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 light-curing systems.

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## GENERAL INFORMATION

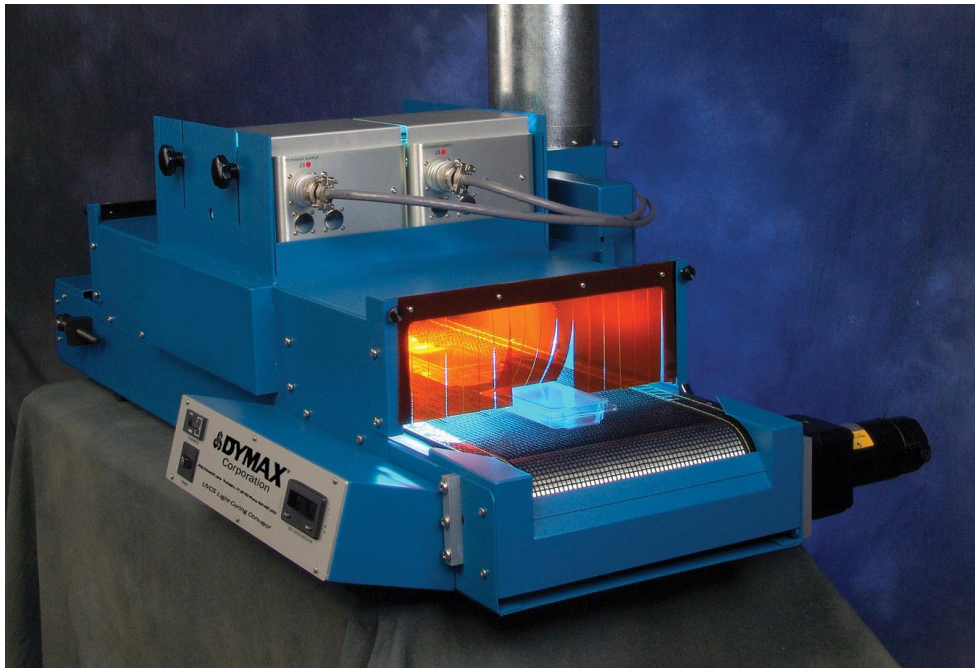
The Dymax UVCS UV Light-Curing Conveyor System is designed to provide reliable and consistent processing of UV-reactive adhesives and coatings.

The conveyor is available in a 120 volt or a 200-240 volt model. Dymax 5000-EC, 2000-EC, and 1200-EC Flood Lamp Systems are auto voltage select. The Conveyor's standard features include a Direct Drive Motor, an integrated adjustable Cooling System, and a UV-Resistant Belt.

The UVCS is designed for bench- or table-top operations. The self-contained Cooling System and integral UV-Light Shielding allow it to be placed virtually anywhere space permits.

Dymax UV light sources are capable of curing a wide variety of UV-curable adhesives, coatings, and inks. They have extensive use in a variety of applications such as bonding, potting, sealing, and encapsulating. These light sources offer exceptional versatility and expandability to accommodate most process demands.

A large number of accessories are available for the base Conveyor. These items address safety, as well as functional flexibility, which is depicted and discussed in this manual.



**Figure 1.** UVCS Light-Curing Conveyor System (shown with two 5000-EC Lamps)



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## SYSTEM COMPONENTS DESCRIPTION

### 1200-EC

The Dymax 1200-EC is a focused-beam UV Lamp used for the curing of UV light-curable 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. This kit removes excessive heat and ventilates 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.

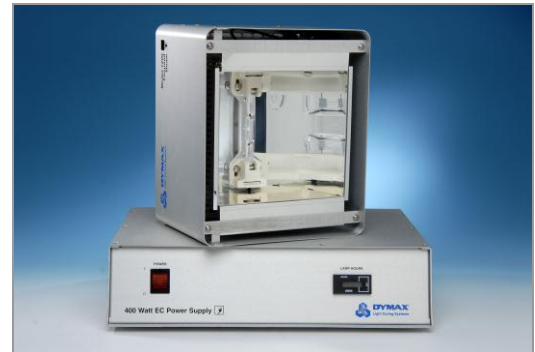


Figure 2. 1200-EC Lamp & Power Supply

### 2000-EC

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

An optional 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 UV Filter, extensive shielding associated with many Lamps can be minimized.

The 2000-EC employs convection cooling. An optional Fan Ventilation Kit is available. This kit removes excessive heat due to the Lamp's possible proximity to other heat sources and removes vapors from under the Lamp/Reflector Assembly Housing during curing of UV light-curable materials. Refer to the spare parts/options section of this manual for more information on the Fan Ventilation Kit.



Figure 3. 2000-EC Lamp & Power Supply

### 5000-EC

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

The 5000-EC provides more than twice the output intensity of a 2000-EC Flood Lamp, allowing for faster curing capability and the additional ability to cure conformal coating resins.

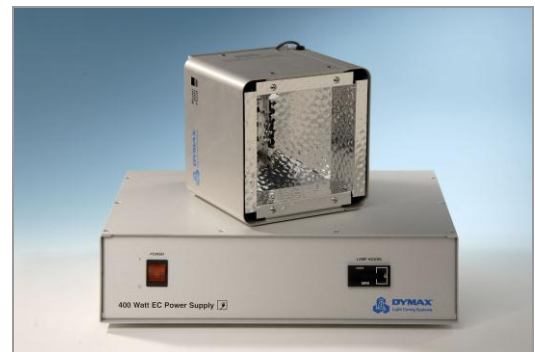


Figure 4. 5000-EC Lamp & Power Supply

# SPECIFICATIONS

## GENERAL

- A solid-state Lamp 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 Fans and power distribution for optional accessories. The rear panel has an integrally fused AC Power Receptacle, and a 14-Pin Female Amp Connector.
- The Solid-State Lamp Power Supply yields reliable and stabilized Lamp voltage in virtually any electrical system in the world. No other adjustment or settings are required other than ensuring a properly wire configured plug is employed to the system. 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 in flood lamp manual) which contains the Reflector, Bulb, Lamp Bases, high-voltage Starter, and three circular Connectors.
- Connection Cable between the Power Supply and Lamp/Reflector Assembly Housing.
- An AC Input Power Cord.
- 400 Watt Metal Halide UV Lamp; optional Mercury Vapor (PN 36970), or Visible Spectrum Lamps (PN 36658) are available upon request.

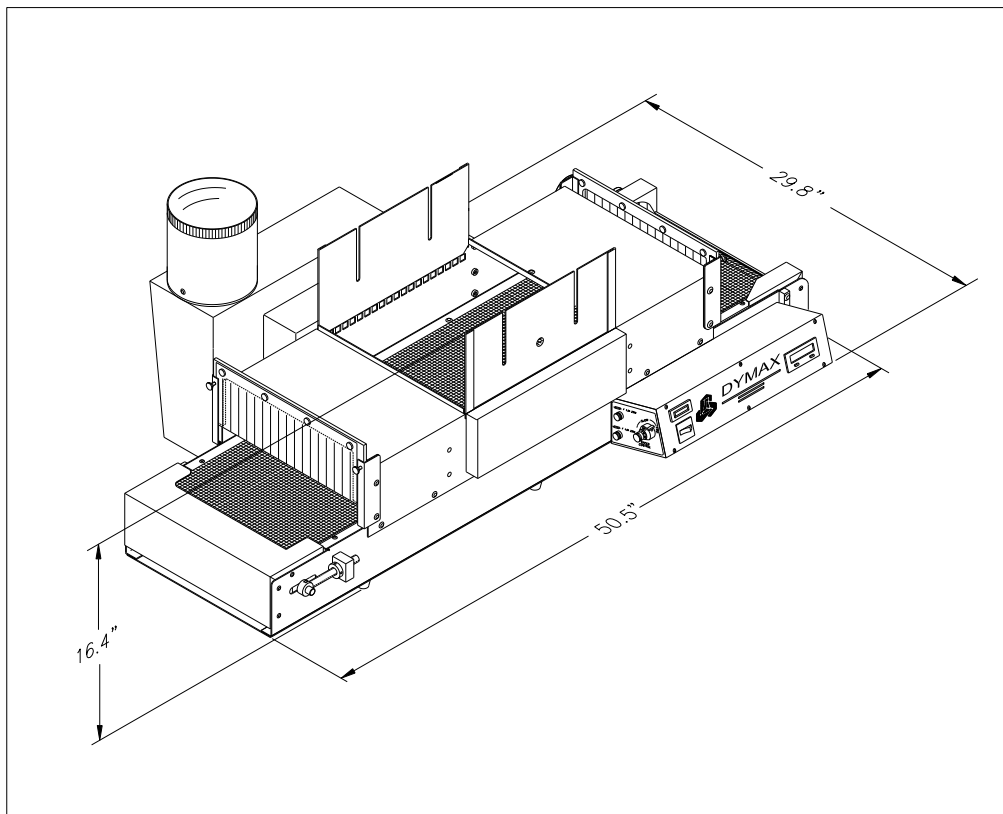


Figure 5. UVCS Conveyor Dimensions



**GENERAL SPECIFICATIONS:**

**Table 1.** Electrical Specifications

<b>Voltage Requirements</b>	115 or 220 VAC, 50 or 60 HZ
<b>Current Requirements</b>	Defined in Table # 3
<b>Lamp/Power Supply Input Voltage</b>	100-240 VAC (continuous) Dymax Lamp systems
<b>Input Current</b>	Defined in Table # 5 for individual model numbers
<b>Conveyor and Lamps Total Input Current</b>	Defined by Table # 4

**Table 2.** Physical Specifications

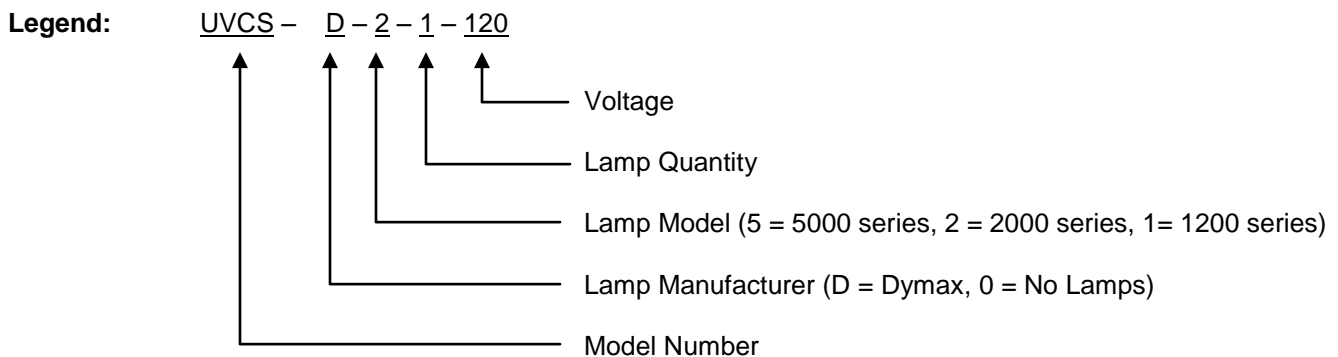
<b>Model</b>	UVCS Version 2.0
<b>Cure Width</b>	6" - 12" [152 - 305 mm]
<b>Lamp Configurations</b>	Single Dymax 1200-EC Single Dymax 2000-EC Up to four Dymax 5000-EC
<b>Motor Drive</b>	Direct
<b>Belt Speed</b>	0.8 - 32.0 FPM [.304 - 9.73 m/min.]
<b>Belt Speed Display</b>	Red LED, 1 decimal place
<b>Lamp Focus Adjustment</b>	2.1" - 4.5" [53.3 mm - 114 mm]
<b>Maximum Part Height</b>	4.5" [114 mm]*
<b>Exhaust System</b>	1 Integral Centrifugal Blower

\* Larger part heights are achievable with the installation of optional riser kits.

The UVCS-Series Conveyor has a 12" belt width. Different Lamp installations can use between 6" and 12" of that belt width. Table 3 defines the descriptive nomenclature which makes up the part number.

**Table 3.** Model Number Nomenclature

Conveyor Model	Lamp Mfg.	Lamp Model	Lamp Quantity	Voltage
UVCS	D (Dymax)	1 (1200-EC)	1-4	100 through 240
		2 (2000-EC)		
		5 (5000-EC)		



There are 12 known distinct model numbers (not including special configurations) that contain Dymax Lamps and 2 model numbers containing Zero Lamps. Table 3 indicates what components are used in each model.

**Table 4.** Conveyor Configurations

			5000 -EC			2000-EC	1200-EC
Lamp Quantity			1	2	4	1	1
Item	Model Number	Part Number					
1	UVCS-D-5-1-120	39060	v				
2*	UVCS-D-5-2A-120	39070		v			
3	UVCS-D-5-2B-120	39080		v			
4	UVCS-D-5-4-120	39100			v		
5	UVCS-D-5-1-220	39065	v				
6*	UVCS-D-5-2A-230	39075		v			
7	UVCS-D-5-2B-230	39085		v			
8	UVCS-D-5-4-230	39105			v		
9	UVCS-D-2-1-120	39250				v	
10	UVCS-D-2-1-230	39135				v	
11	UVCS-D-1-1-120	39140					v
12	UVCS-D-1-1-230	39145					v
13	UVCS-0-0-120	39290					
14	UVCS-0-0-230	39291					

\*When two (2) Dymax 5000's are used, specify whether in-line (2A) or side-by-side (2B) configuration

**Table 5.** Conveyor AC Current Values (Start/Run Current)

Reading	At 115 VAC 50/60 Hz	At 200-230 VAC 50/60 Hz
Total Conveyor	4.8 A / 2.4A rms	2.4 A / 1.2 A rms
Fan	2.0 A rms	1.0 A rms
Motor Control	400mA rms	200mA rms
Freq. Counter	Not measurable	Not measurable

**Table 6.** UVCS Conveyor System Lamp System AC Current Requirements

Lamp System	AC Current at 115 VAC	AC Current at 220 VAC	Max Quantity on Conveyor
Dymax 5000-EC	6.3A	3.15A	4
Dymax 2000-EC	6.3A	3.15A	1
Dymax 1200-EC	6.3A	3.15A	1

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**Table 7.** Total Current (Conveyor and Lamps)

<b>Item</b>	<b>Model Number</b>	<b>Total Conveyor and Lamp Current</b>
<b>1</b>	UVCS-D-5-1-120	8.7 A
<b>2</b>	UVCS-D-5-2A-120	15.0 A
<b>3</b>	UVCS-D-5-2B-120	15.0 A
<b>4</b>	UVCS-D-5-4-120	27.6 A
<b>5</b>	UVCS-D-5-1-230	4.4 A
<b>6</b>	UVCS-D-5-2A-230	7.5 A
<b>7</b>	UVCS-D-5-2B-230	7.5 A
<b>8</b>	UVCS-D-5-4-230	13.8 A
<b>9</b>	UVCS-D-2-1-120	8.7 A
<b>10</b>	UVCS-D-2-1-230	4.4 A
<b>11</b>	UVCS-D-1-1-230	8.7 A
<b>12</b>	UVCS-D-1-1-230	4.4 A

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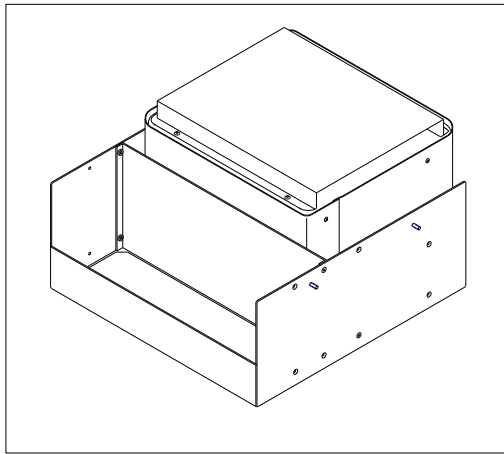
# LAMP CONFIGURATIONS

## DYMAX 1200-EC/2000-EC LAMPS

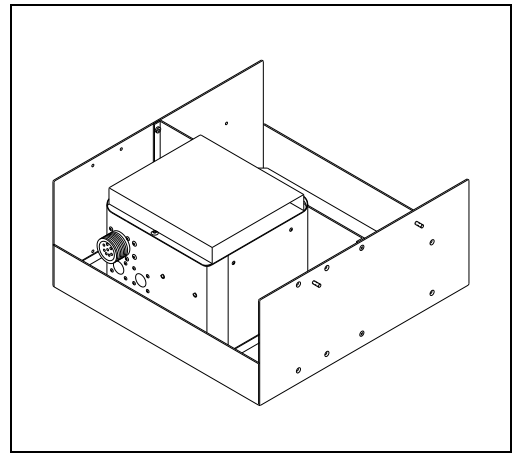
Conveyors with Dymax 1200-EC or 2000-EC Lamps are single-Lamp configuration only (Figure 6).

## DYMAX 5000-EC LAMPS

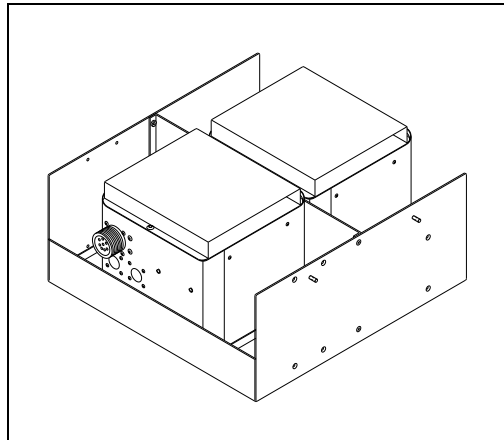
Conveyors with Dymax 5000-EC Flood Lamps may be configured in a one-Lamp (Figure 7), two-Lamp (Figure 8), or four-Lamp (Figure 9) configuration. Dual-Lamp configurations can be set up in-line for 6" wide curing (2A) or side-by-side for 12" wide curing (2B). Spacers and Block-Off Plates cover the unused Lamp locations. Additional Lamps can be purchased and added to existing UVCS Conveyor Systems.



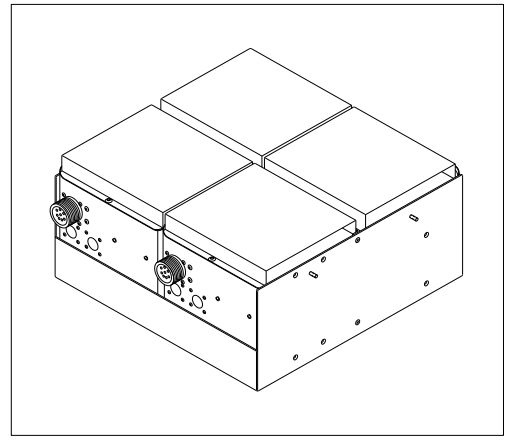
**Figure 6.** Single 1200-EC/2000-EC Configuration  
Models: UVCS-D1-1-120 & UVCS-D1-1-230 (1200-EC)  
UVCS-D2-1-120 & UVCS-D2-1-230 (2000-EC)



**Figure 7.** Single 5000-EC Configuration  
Models: UVCS-D5-1-120 & UVCS-D5-1-230



**Figure 8.** Dual 5000-EC Configuration (2A Shown)  
Models: UVCS-D5-2A-120, UVCS-D5-2B-120,  
UVCS-D5-2A-230, & UVCS-D5-2B-230



**Figure 9.** Four 5000-EC Configuration  
Models: UVCS-D5-4-120 & UVCS-D5-4-230

## LAMP INSTALLATION AND INTERCONNECT

1. If purchased, uncrate and assemble the optional Conveyor Mounting Cart (Figure 10) prior to unpacking the Conveyor.
2. Remove the protective coverings from the Conveyor. Place the Conveyor on the Conveyor Mounting Cart or on a convenient work surface. Install the Exhaust Ventilation Stack on the Blower Motor's Outlet Flange. Secure the Exhaust Ventilation Stack with the 3 fasteners provided (Figure 11).
3. Unpack the Lamp(s) (a single 1200-EC or 2000-EC Lamp or up four 5000-EC Lamps). Each Flood Lamp System includes a Power Supply, Reflector Assembly, 400 Watt Bulb, Lamp Connector Cord, and a Power Cord. (Figure 12)



Figure 10. Optional Mounting Cart



Figure 11. Secure Exhaust Ventilation Stack



Figure 12. Unpack Lamp (5000-EC Shown)

4. Install the Bulb into the Reflector Housing ensuring that the Bulb is properly seated (Figure 13). Consult the Flood Lamp System manual for details on installing Bulbs.
5. Attach the Lamp Connector Cord to the back of each Reflector (Figure 14).
6. Install the Reflector Assemblies into the Conveyor's Upper Lamp Support Brackets (Figures 15 & 16). Adjust the position of the Lamps and tighten the four Lamp Securing Knobs. Configuration 2A (lamps in-line) and 2B (lamps side-by-side) are shown below (Figures 15 & 16). Up to four Lamps may be mounted into the Support Bracket.



Figure 13. Install Bulb in Reflector Housing



Figure 14. Attach the Lamp Connector Cord



Figure 15. 2A Configuration

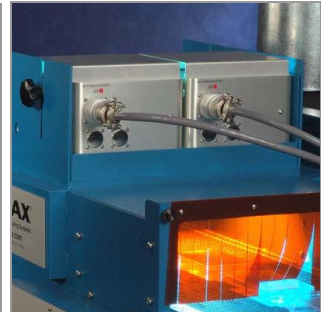


Figure 16. 2B Configuration

7. Attach the Lamp Connector Cable leading from each Reflector to the rear of each Power Supply (Figure 17). Connect the Conveyor Power Cord to a 110-120V AC power source (200-230V AC for 230V units). Connect each Power Supply's Power Cord to a 100-240V AC power source.



Figure 17. Attach Lamp Connector Cable to Power Supply

## OPERATION

1. Install all safety accessories to protect operator from UV-light emissions.
2. Apply power to the UVCS Conveyor and turn it on.
3. Unlock the Speed Control Knob (Figure 18) and adjust the Conveyor's speed for the desired setting. The Speed Control Knob is a 10-Turn Potentiometer and allows speed adjustment from approximately 0.8 FPM to 32 FPM (feet per minute). The speed is shown on the Belt Speed Indicator Display on the Conveyor's Control Panel (Figure 19).



Figure 18. Speed Control Knob



Figure 19. Conveyor Control Panel with Belt Speed Indicator Display

4. If any adjustments are needed for the Belt alignment, refer to the Maintenance Section of this manual.
5. Adjust the height of the Lamps to the desired distance (Figures 20-22). Height is adjustable from 2.1 inches to 4.5 inches.



Figure 20-22. Lamps Adjusted to Various Heights

6. Once the speed and lamp height settings have been properly set, the Conveyor is ready for operation of the Lamps.

**NOTE:** The Conveyor must be operating and the Conveyor Belt must be in motion before the Lamp(s) is turned on. This prevents Belt overheating and damage that can result if the Belt is stationary when the Lamp(s) is running.

7. Apply power to the UVCS Lamps and turn them on.
8. The Blower controls the amount of cooling air provided to the Lamp Assemblies to keep them at proper operating temperatures. A small percentage of the cooling air is also diverted downward through the Conveyor Belt. This air flow provides a small hold-down force to keep light objects from moving while traveling on the Belt. The speed of the Exhaust Blower is set at the factory during final system testing for the Conveyor model ordered.



9. If the speed of the Exhaust Blower requires adjustment, remove the Access Panel from the front of the Exhaust Blower Housing (Figure 23). Unlock the Blower Speed Control Potentiometer (Figure 24) and adjust the speed setting. Relock the Blower Speed Control Potentiometer. The range of the Blower Speed Control Potentiometer is 0.0 to 0.85 turns. Table 8 shows the approximate settings for the speed of the Exhaust Blower. For 5000-EC Flood Lamps, a Temperature Indicator Strip (Temperature Strip Indicator Kit PN 38693) is attached to the Reflector Housing. Figure 26 shows a typical Temperature Indicator Strip reading a representative temperature. The optimum operating temperature is from 115°F to 145°F.



Figure 23. Remove Access Panel



Figure 24. Blower Speed Control



Figure 25. Blower Speed Control (Close Up)

Table 8. Blower Speed Potentiometer and UV Curtain Height Settings for Optimum Bulb Cooling

Model Number	Blower Potentiometer Setting		
Lamp Height	1"	3"	4.5"
UVCS-D-5-1-120/230	0.0	0.27	0.45
UVCS-D-5-2A/2B-120/230	0.15	0.35	0.45
UVCS-D-5-4-120/230	0.45	0.54	0.80

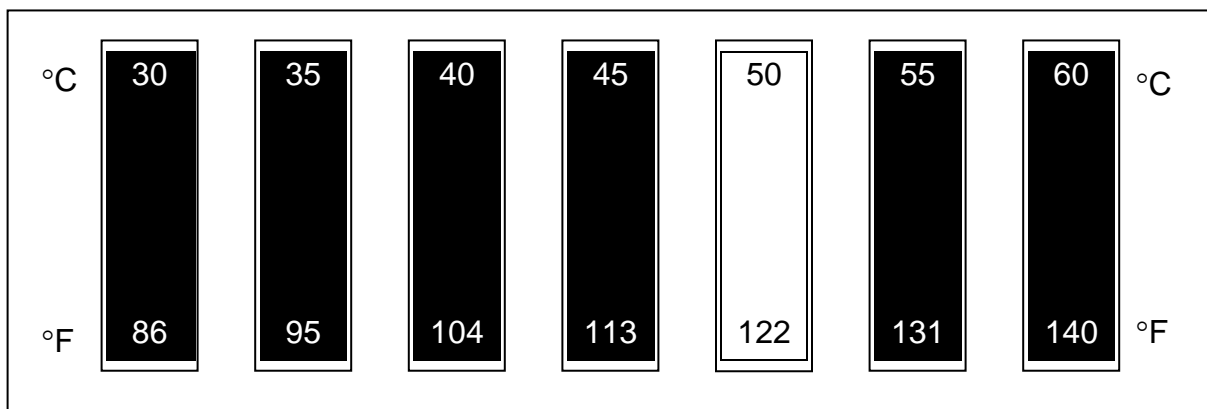


Figure 26. Temperature Indicator Strip (PN 38693) for the Dymax 5000-EC Flood Lamps

10. The Conveyor is ready for operation.

# MAINTENANCE

## BELT TRACKING ADJUSTMENT

All Dymax UVCS Conveyors are factory adjusted to provide proper tracking of the Belt. Should further adjustments become necessary, this is done via the two knurled Tracking Adjustment Knobs located at the input end of the Conveyor. To adjust the Belt tracking, simply tighten the side to which the Belt is tracking.

**NOTE:** Do not over tighten the Belt. This will lead to accelerated degradation of the Belt.

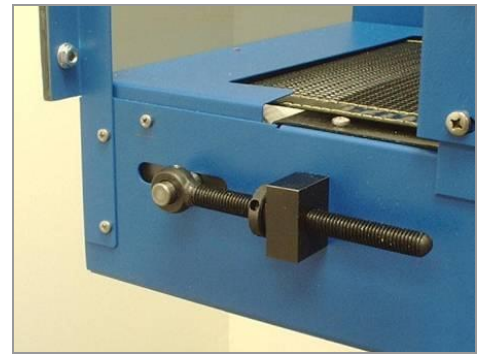


Figure 27. Tracking Adjustment Knob

## BELT REPLACEMENT

1. Remove the Pinch Guard from the motor side of the Conveyor by removing the two M4x8 Screws (Figure 28) on the front side of the Conveyor and the M4x25 Screw (Figure 30) from the motor drive side of the Conveyor. Remove the Motor Box Cover (Figure 29) to obtain access to the M4x25 Screw.

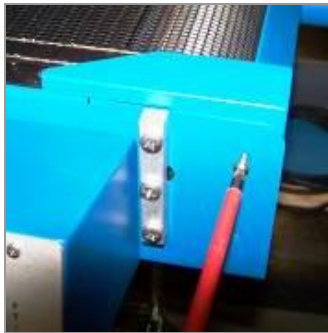


Figure 28. Remove M4x8 Screw

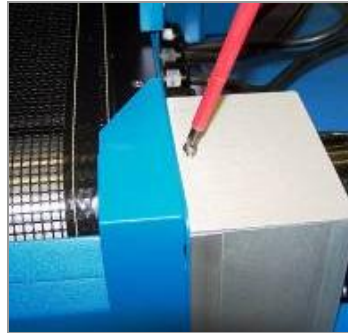


Figure 29. Remove Motor Box Cover



Figure 30. Remove M4x25 Screw

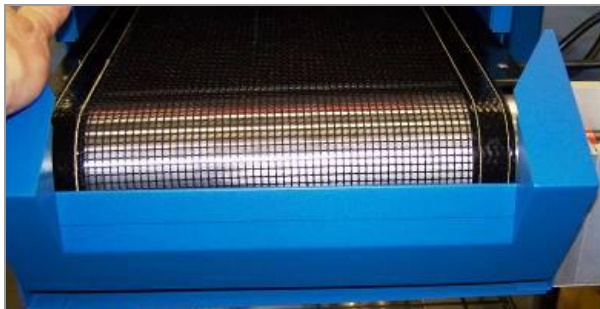


Figure 31. Pinch Guard Removed

2. Remove all tension from the belt by fully backing off the Belt Adjustment Knobs (Figures 32-34).



Figure 32-34. Back Off the Belt Adjustment Knob

3. Position the Belt splice to the end of the Conveyor (Figure 35). Remove the Fiberglass Rod that ties the ends of the Belt together (Figure 36). Remove the Belt.
4. Run the new Belt around the Conveyor Frame (Figure 37).
5. Install the Fiberglass Rod through the Belt loops.
6. Apply some adhesive to both ends of the Fiberglass Rod to prevent it from moving during Conveyor operation (Figure 38).



Figure 35. Place Splice at the End of the Conveyor

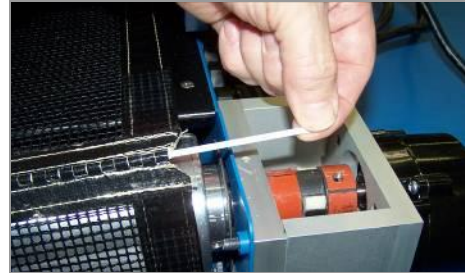


Figure 36. Remove Fiberglass Rod



Figure 37. Run New Belt Around Conveyor Frame

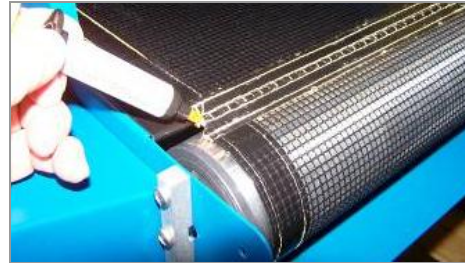


Figure 38. Apply Adhesive to Fiberglass Rod

7. Tighten the Belt Tension Knobs (Figure 39) finger tight to remove excess slack from the Belt. The Belt should be loose enough to be moved across the two Rollers by hand when the Conveyor is not running.

**CAUTION:** Excessive tightening of the Belt will result in early Belt failure. Since the two Conveyor Rollers have a crown in the middle, only minimum tightening is necessary.



Figure 39. Tighten Belt Tension Knob

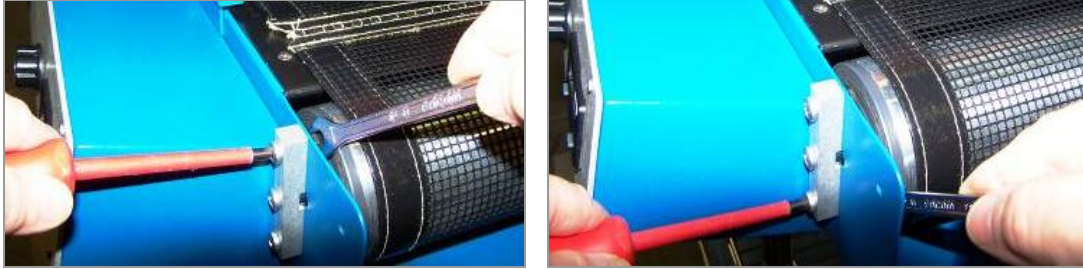


Figure 40. Stopping Belt by Hand

8. Start the Conveyor and adjust the Belt Tensioning Knobs until the Belt runs in the center of the loading end. The Belt should be able to be stopped by hand when the Conveyor is running (Figure 40). If stopping the Belt stalls the Conveyor Motor, the Belt is too tight and must be loosened.

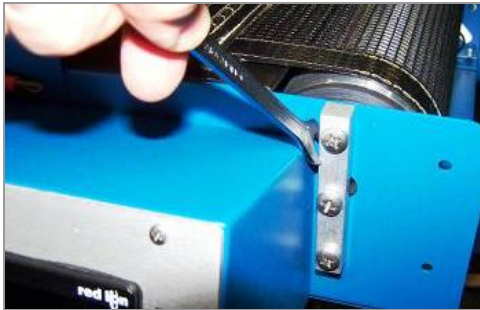


9. When the Belt runs in the center of the loading end, observe the Belt position at the Motor End. If the Belt runs too far to one side on the Motor end, adjust the Motor Pulley as follows:
  - a. Turn the Conveyor off.
  - b. Remove the Belt tension by loosening the two Belt Tensioning Knobs.
  - c. Loosen the two Drive Roller Shaft Support Fasteners located on the front of the Conveyor Frame enough to slightly move the Shaft Assembly (Figures 41 & 42).



**Figure 41 & 42.** Remove Drive Roller Shaft Support Fasteners

- d. Move the Shaft Assembly slightly to realign the Drive Roller and center the Belt (Figure 43). Tighten the bolts when adjustment is complete (Figure 44).



**Figure 43.** Move Shaft Assembly to Center Belt



**Figure 44.** Tighten Bolts

- e. Turn the Conveyor on and adjust the Belt Tension Knobs until the Belt is properly tightened. Make sure that the Belt runs in the center of the Conveyor on both the loading and unloading end. Repeat this step as necessary to align the Belt.
  - f. Reinstall the Pinch Guards on both ends of the Conveyor (Figures 45 & 46). This step is critical to Belt Speed Sensor operation. The Pinch Guard on the unloading side of the Conveyor contains a Shield for the Sensor to prevent damage if the Belt contacts it while operating.



**Figure 45.** Reinstall Pinch Guard



**Figure 46.** Reinstall Pinch Guard

## TROUBLESHOOTING

**NOTE:** Only qualified maintenance personnel should attempt the following procedures.

### CONVEYOR TROUBLESHOOTING

Problem	Possible Cause	Testing	Corrective Action
<b>Conveyor Not Operating</b>	Main Line Circuit Breaker deployed	Toggle Power Switch off, then on, to reset the Circuit Breaker.	Check the amp rating of the Breaker. Compare it to Table 6.
	Improperly fastened connections	Check all connections.	Properly fasten Power Cord.
	Fuses for Motor Controller blown	Remove the Fuses from the Fuse Holders (located in the left side of Control Box) and check with an Ohmmeter.	Replace if defective.
	Belt is hung up	Inspect the Belt for any signs of a mechanical bind. Observe Belt tension.	Resolve bind. Tighten the Belt if it is slipping on the Drive Roller.
	Tension too low on Belt (Power Switch lights and Motor turns but Belt does not move)	Verify that the Drive Shaft and Drive Rollers are operating.	Use the Tracking Adjustment Knobs to increase the tension on the Belt. Both Knobs will have to be turned the same amount to not affect the alignment.
<b>Belt Tracks to One Side</b>	Belt Adjustment Knobs are out of position	Visually inspect the Belt. The Belt will track to one side.	Tighten the Adjustment Knob (located on the side to which the Belt is tracking towards) until the Belt tracks straight. Only minor adjustments should be made at one time.

## LAMP TROUBLESHOOTING

Problem	Possible Cause	Testing	Corrective Action
<b>Lamp Will Not Ignite, Lamp Flickers, or Lamp Won't Maintain Operation</b>	Improperly fastened connections	Visually inspect all connections to and from the Power Supply.	Secure all connections.
	Main Line Fuse blown	Remove Fuse from Power Receptacle and check with an Ohmmeter.	Replace Fuse 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).
	Bulb beyond useful life	Replace Bulb with known good Bulb and re-test unit.	Replace Bulb if defective (typical Bulb life = 2,000 hours).
	Power Supply Board failed	Check UV output voltage on the Power Supply Board. Set Oscilloscope to: 20 ms/div 100 V/div	Replace Power Supply Board if defective.
	Igniter malfunctioned	Verify open circuit voltage from Igniter. Set Oscilloscope to: 50 us/div 1000 V/div	Replace if defective.
	See Lamp user's manual for additional information. Contact Dymax for additional support.		
<b>EC Power Supply Blows Input Fuse</b>	Malfunction in the Power Supply Board	Remove power. Disconnect the Lamp/Reflector Assembly from the Power Supply. Replace the Fuse. Apply power. If the Fuse blows, the Power Supply is defective.	Replace the Power Supply Board.
<b>UV Intensity Appears To Be Low</b>	Bulb beyond its useful life	Use a Radiometer (Dymax ACCU-CAL™ 50) to measure actual output intensity. Consult manual for proper output.	Replace Bulb if beyond useful life (typical life = 2,000 hours).
	Quartz Envelope on Bulb contaminated	Visually inspect the Bulb for signs of contamination (Quartz envelope MUST be free from ANY contamination).	Clean the Bulb with a soft, lint-free cloth and isopropyl alcohol. The Bulb 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 the Reflector with a soft, lint-free cloth and isopropyl alcohol or equivalent.
	Reflector temperature is too low (5000-EC lamps only).	Verify that the Reflector temperature is between 115°F and 145°F as show on the Temperature Indicator on top of the Reflector Housing.	Adjust the speed of the Conveyor Blower (slower for Lamps running cold, faster for Lamps running hot). Add or remove Lamp Reflector Ventilation Plates as necessary to achieve proper temperatures.



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## SPARE PARTS & ACCESSORIES

### CONVEYOR SPARE PARTS

ITEM	PART#
Blower, 115 VAC	40146
Blower, 220 VAC	40147
Circuit Breaker, 115 VAC	39128
Curtain Assembly (2 Required)	39207
DC Motor Controller	40179
DC Motor Controller Resistor	40178
DC Motor Speed Indicator Sensor	39136
Gear Motor, 90 VDC	39285
Hour Meter	35981
Mesh Belt	39134
Mesh Belt, Fine	39772
Pinch Guard, Conveyor Discharge	39119
Pinch Guard, Conveyor Inlet	39118
Potentiometer, Conveyor Speed	40006
Potentiometer, Exhaust Blower Speed	40149
Red Lion Counter Timer 50020	39132
Red Lion 12V Power Supply	39133
Shield, Solid Acrylic (2 Required)	39205
Speed Controller Knob	40143

### DYMAX FLOOD LAMP SPARE PARTS

ITEM	PART#
Fuse, F 6.25 Amp*	35141
Lamp, Mercury Vapor 400 Watt UV (Optional)	36970
Lamp, Metal Halide 400 Watt UV (Standard)*	38560
Lamp, Visible 400 Watt (Optional)	36658
Lamp Base Replacement Kits*	35979
Power Switch	36288
UV Filter, Glass (2000-EC only)*	35899

### CONVEYOR ACCESSORIES

ITEM	PART#
Conveyor Rolling Cart Kit	39215
Riser Kit, 2"	39218
Riser Kit, 6"	39280
Shield Extension Kit*	39209
Temperature Strip Indicator Kit	38693

\*One Extension Shield Kit required for each end of the Conveyor.

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## DEFINITION OF TERMS

**Bulb** - light source 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 of visible light energy is called Luminance (see below).

**Luminance** - luminous flux (energy of visible light) incident per unit area, and measured in **Lx** (lux) or **Lumen/cm<sup>2</sup>**.

**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).

1. **Ultraviolet A (UV-A)** - UV of long wavelength from within approximately 400 to 320 nm 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 (280 to 200nm) – a large amount of this energy is present in the sunlight.
4. **Visible** - light that can be seen 400 to 700 nm.

**Dose** - is irradiance integrated over time, or irradiance ( $W/cm^2$ ) x Time (s) = Dose (Joules/cm<sup>2</sup>). 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 (O<sub>3</sub>) 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.

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## 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.

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.



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