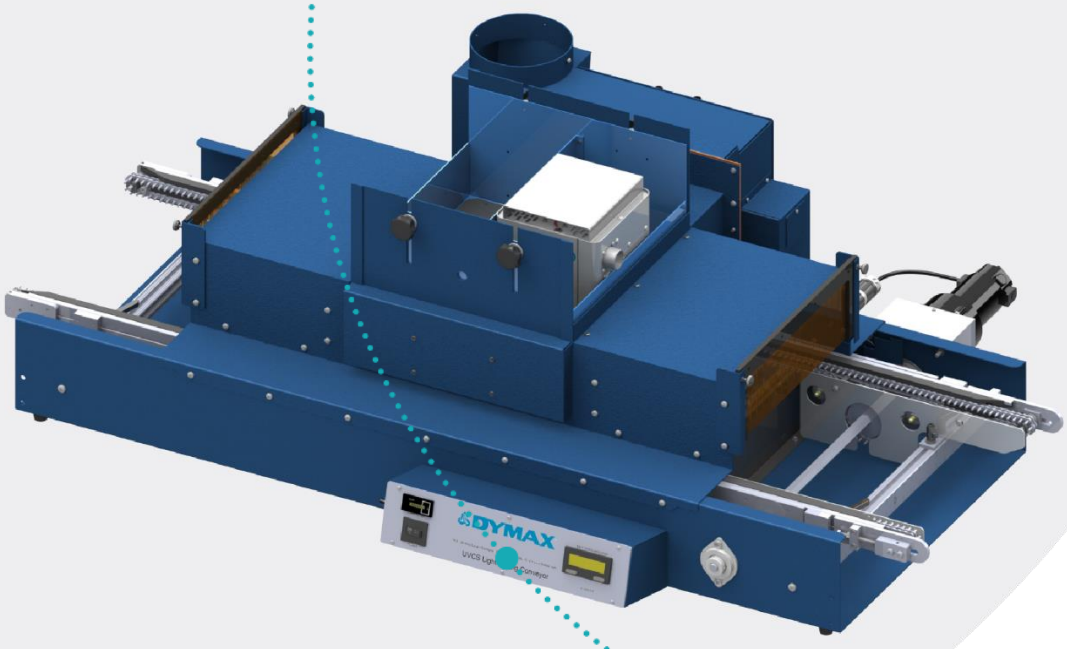


Edge-Carry

UV Light-Curing Conveyor
User Guide

DYMAX®

About Dymax

UV/Visible light-curable adhesives. Systems for light curing, fluid dispensing, and fluid packaging.

Dymax manufactures industrial, light-curable, epoxy, and activator-cured adhesives. We also manufacture a complete line of manual fluid dispensing systems, automatic fluid dispensing systems, and light-curing systems. Light-curing systems include LED light sources, spot, flood, and conveyor systems designed for compatibility and high performance with Dymax adhesives.

Dymax adhesives and light-curing systems optimize the speed of automated assembly, allow for 100% in-line inspection, and increase throughput. System designs enable stand-alone configuration or integration into your existing assembly line.

Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application, and use is strictly limited to that contained in the Dymax standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to ensure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation by offering equipment trial rental and leasing programs to assist in such testing and evaluations. Data sheets are available for valve controllers or pressure pots upon request.

Contents

Introduction

This guide describes how to use the Dymax Edge-Carry Conveyor. Sections in this guide describe how to assemble, use, and maintain the conveyor safely and efficiently.

Intended Audience

Dymax prepared this user guide for experienced process engineers, technicians, and manufacturing personnel. If you are new to UV light curing and do not understand the instructions, contact Dymax Application Engineering to answer your questions before using the equipment.

Where to Get Help

Dymax Customer Support and Application Engineering teams are available in the United States, Monday through Friday, from 8:00 a.m. to 5:30 p.m. Eastern Standard Time. You can also email Dymax at info@dymax.com. Contact information for additional Dymax locations can be found on the back cover of this user guide.

Additional resources are available to ensure a trouble-free experience with our products:

- Detailed product information on www.dymax.com
- Dymax adhesive Product Data Sheets (PDS) on our website
- Material Safety Data Sheets (SDS) provided with shipments of Dymax adhesives

Safety

WARNING! *If you use this light-curing system without first reading and understanding the information in this user guide, injury can result from exposure to high-intensity light. To reduce the risk of injury, read and ensure you understand the information in this user guide before assembling and operating a Dymax UV conveyor system.*

To use this conveyor system safely, it must be set up and operated in accordance with the instructions given by Dymax. Using the system in any other manner will impair the protection of the system. Dymax assumes no liability for any changes that may impair the protection of the system.

General Safety Considerations

The Edge-Carry conveyor is designed to maximize operator safety and minimize exposure to light-curing energy. To use the unit safely, it must be set up and operated in accordance with the instructions in this user guide. All users of Dymax equipment should read and understand this user guide before assembling and using the equipment.

To learn about the safe handling and use of light-curable formulations, obtain and read the SDS for each product. Dymax includes an SDS with each adhesive sold. In addition, fluid product SDS can be requested through the Dymax website.

Dymax UV Light-Curing System Safety Considerations

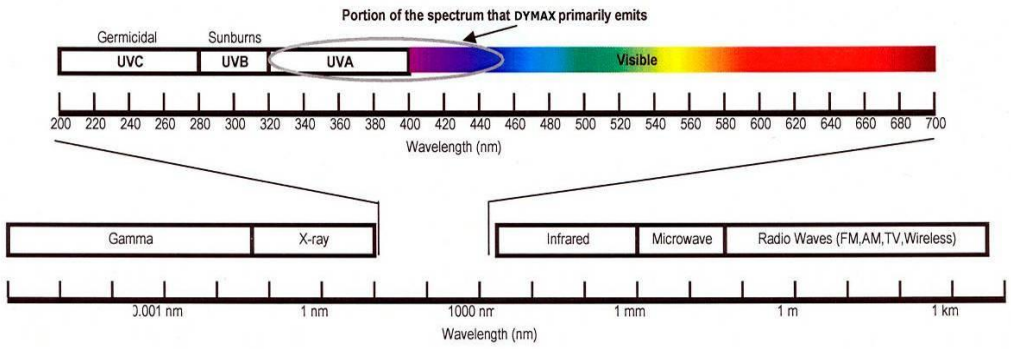
Dymax UV light-curing technology has been used successfully for over 30 years. The fast cure, one-component nature of our UV light-curing technology has made it the process of choice for many manufacturers requiring a "cure on demand" assembly process. Operators must understand these four concepts to use the UV light source safely: UV exposure, high-temperature surfaces, ozone, and bright, visible light. Each is described below.

UV Exposure

Standard Dymax UV light-curing systems have been designed primarily to emit UVA energy (Figure 1). UVA energy is generally considered the safest of the three UV ranges: UVA, UVB, and UVC. Although OSHA does not currently regulate UV light exposure in the workplace, the American Conference of Governmental Industrial Hygienists (ACGIH) does recommend Threshold Limit Values (TLVs) for ultraviolet light.

The strictest interpretation of the TLV (over the UVA range) for workers' eyes and skin allows continuous exposure up to 1 mW/cm^2 (intensity). Unless you are placing bare hands into the curing area, it is unusual to exceed these limits. To put 1 mW/cm^2 limit into perspective, a cloudless summer day will typically exceed 3 mW/cm^2 of UVA light, and also include the more dangerous UVB light (primarily responsible for sun tans, sun burns, and skin cancer) as well.

Figure 1.
UV Spectrum



Checking the Workstation

The human eye cannot detect "pure" UV light, only visible light. A radiometer should be used to measure stray UV light to confirm the safety of a UV light-curing process. A workstation that exposes an operator to more than 1 mW/cm^2 of UVA continuously should be redesigned.

Protecting Operators

Light-curing technology 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 — Sheet metal (aluminum, steel, stainless steel, etc) should be coated black or black anodized to minimize reflection of UV and visible light toward operators.

Rigid Plastic Film — Transparent or translucent/UV-blocking plastics (typically polycarbonate or acrylic) are commonly used to create shielding where some level of transparency is also desired. These rigid plastic films are available wither 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, call for assistance.

High-Temperature Surfaces

Surfaces exposed to high-intensity curing lights may rise in temperature. The intensity, distance, exposure time, cooling fans, and composition of the surface can all affect the rise in 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 lamps (UVA type) generate an insignificant amount of UVC and therefore essentially no ozone. Some UV light-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 (O_2) split into oxygen atoms (O) and recombine with O_2 to create ozone O_3. The current, long-term ozone concentration limit recommended by ACGIH, NIOSH, and OSHA is 0.1 ppm (0.2 mg/m^3).

Bright, Visible Light

The bright, visible light energy emitted by UV light-curing systems can cause eye strain if proper eye protection or shielding is not used. The proper use of tinted eye protection and/or opaque/tinted shielding can be utilized to reduce eye strain and 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.

Product Overview

Description of the Edge-Carry Conveyor

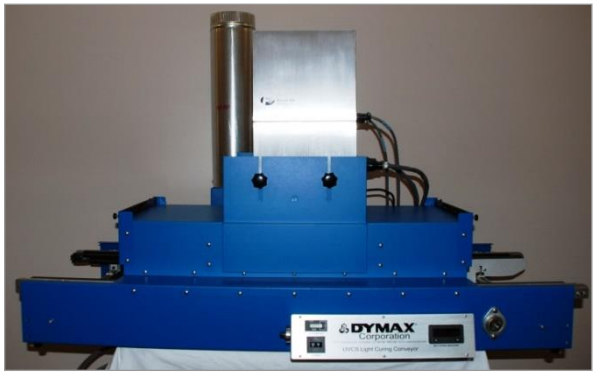
The Edge-Carry UV light-curing conveyor system is designed to provide reliable and consistent processing of UV/Visible light-reactive adhesives and coatings. The conveyor is available in a 120 or 200-240 volt model. Dymax 5000-EC, 2000-EC, 1200-EC Series or Fusion microwave lamps may be installed on either voltage model. Standard features include a direct drive motor, an integrated adjustable cooling system, and an adjustable chain carrier. The conveyor 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 2.
Conveyor with Dymax Lamps Installed

Figure 3.
Conveyor with Fusion Lamps Installed



Specifications

General

For Systems Using Dymax EC-Series Flood Lamps

- 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) which contains the reflector, UV lamp, lamp bases, high-voltage starter, and one circular connector.
- Connection cable between the power supply and lamp/reflector assembly housing.
- A power cord.
- 400 Watt metal halide UV lamp, optional mercury vapor (PN 36970), or visible-spectrum lamps (PN 36658) are available upon request.

For Systems Using Fusion Lamps

- A transformer-based lamp power supply that allows external electrical inputs and provides power to the microwave lamp located in the reflector assembly housing. The power supply contains the on/off power switch, control, and interlock circuitry. The power supply also houses its own cooling fans. The rear panel has an AC power receptacle and connections for the lamp, conveyor interlocks, and slave unit control.
- The lamp power supply allows adjustment for different voltage and frequency conditions suitable for virtually any electrical system in the world. Switching between 50 and 60 HZ frequency operation requires movement of capacitor jumpers in the power supplies. See the fusion lamp technical manual for specific instructions.
- A power cord.
- Fusion “D” lamps (PN 36399) are standard. “H” lamps (PN 36441) and “V” lamps (PN 38146) are available upon request.

Electrical Specifications

Table 1.
Electrical Requirements

Property	Specification
Conveyor Voltage Requirements	115 or 220 VAC, 50 or 60 HZ
Conveyor Current Requirements	See Table 5
Lamp/Power Supply Input Voltage	100-240 VAC (continuous) Dymax lamp systems 208-240 VAC Fusion lamp systems
Input Current	See Table 6 for individual model numbers
Conveyor & Lamp Total Input Current	See Table 7

Physical Specifications

Table 2.
Physical Requirements

Property	Specification
Model*	UVCS Edge Carry
Cure Width	Up to 12 inches (305 mm)
Number of Lamps	One Dymax 1200-EC or 2000-EC lamps; Up to four Dymax 5000-EC lamps
	Up to two Fusion F300 series lamps
Motor Drive	Direct
Chain Speed	1.0 – 32.0 FPM (0.304 – 9.73 m/min.)
Chain Speed (Special Order)	0.5 FPM – 32 FPM (0.15 – 9.73 m/min)
Chain Speed Display	Red digits, 1 decimal place
Lamp Focus Adjustment	4.0" - 7.5" (102 -191 mm)
Maximum Part Height	6 inches (152 mm)**
Exhaust System	1 integral centrifugal blower

*Sixteen different configurations of conveyor are available. Table 3 and Table 4 show all of the possible choices.

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

The Edge-Carry Conveyor has an adjustable chain width. Different lamp installations can irradiate between 6" and 12" of that width.

Table 3.
Model Number Structure

Conveyor Model	Lamp Mfg.	Lamp Model	Lamp Quantity	Power
Edge Carry (EC)	Dymax (D)	5 (5000-EC)	1-4	115 / 200
		2 (2000-EC)		
		1 (1200-EC)		
	Fusion (F)	F300	1 to 2	208 through 240

There are 16 distinct model numbers (not including special models) and Table 4 indicates what components are used in each model.

Table 4.
Lamp Configurations

		Lamp Quantity	Lamp Choices							Blower Motor	
			5000-EC			2000-EC	1200-EC	Fusion		115V	200-230V
Item	Part Number	Model Number	1	2	4	1	1	1	2		
1	40324	EC-D-5-1-120	v							v	
2*	40325	EC-D-5-2A-120		v						v	
3	40326	EC-D-5-2B-120		v						v	
4	40327	EC-D-5-4-120			v					v	
5	40328	EC-D-5-1-220	v								v
6	40329	EC-D-5-2A-220		v							v
7	40275	EC-D-5-2B-220		v							v
8	40331	EC-D-5-4-220			v						v
9	40332	EC-D-2-1-120				v				v	
10	40333	EC-D-2-1-220				v					v
11	40334	EC-D-1-1-120					v			v	
12	40335	EC-D-1-1-220					v				v
13	40336	EC-F-1-220						v			v
14	40280	EC-F-2-220							v		v
15	40338	EC-0-0-120								v	
16	40339	EC-0-0-220									v

Legend: EC – D – 2 – 1 – 120

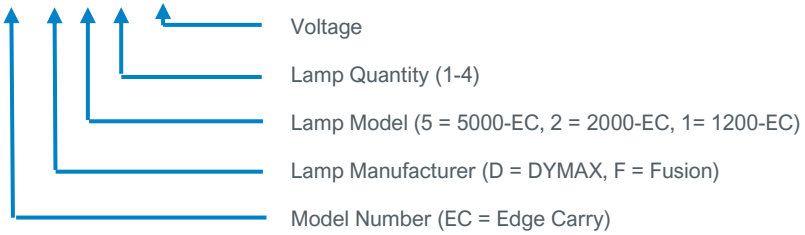


Table 5.
Conveyor AC Current Values (Start/Run Current)

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

Table 6.
Lamp System AC Current Requirements

Product	AC Current @ 115VAC	AC Current @ 220VAC	Max Quantity on Conveyor
5000-EC	6.3A	3.15A	4
2000-EC	6.3A	3.15A	1
1200-EC	6.3A	3.15A	1
Fusion	****	15.0A	2

Table 7.
Total Current for Conveyor and Lamps

Item	Model Number	Total Conveyor & Lamp Current
1	EC-D-5-1-120	8.7
2	EC-D-5-2A-120	15.0
3	EC-D-5-2B-120	15.0
4	EC -D-5-4-120	27.6
5	EC-D-5-1-220	4.4
6	EC-D-5-2A-220	7.5
7	EC-D-5-2B-220	7.5
8	EC-D-5-4-220	13.8
9	EC-D-2-1-120	8.7
10	EC-D-2-1-220	4.4
11	EC-D-1-1-220	8.7
12	EC-D-1-1-220	4.4
13	EC-F-1-230	16.2
14	EC-F-2-230	31.2

Unpacking

Unpacking and Inspecting Your Shipment

Your conveyor arrived in one or two boxes. Inspect the boxes for damage and notify the shipper of box damage immediately.

Open each box and check for equipment damage. If parts are damaged, notify the shipper and submit a claim for the damaged parts. Contact Dymax so that new parts can be shipped to you immediately.

Check that the parts included in your order match those listed below. If parts are missing, contact your local Dymax representative or Dymax Customer Support to resolve the problem.

Parts Included

- Edge-Carry Conveyor
- Lamp and power source options dependent on model number ordered (listed in Table 2)
- Two pairs UV goggles
- Dymax Edge-Carry Conveyor User Guide

Setup and Interconnect

Conveyors Using Dymax EC-Series Flood Lamps

Refer to the Dymax EC-Series Flood Lamp User Guide for detailed Irradiator and Power Supply information.

1. Uncrate and assemble the Conveyor's optional Mounting Cart if purchased.
2. Uncrate the Conveyor and remove the protective coverings.
3. Place the Conveyor on a convenient work surface or if purchased, on the optional Mounting Cart.
4. Install the Exhaust Ventilation Stack on the Blower Motor's Outlet Flange (Figure 4). Secure the Exhaust Ventilation Stack with the three fasteners provided.
5. Unpack the EC UVCS Flood Lamp System(s) (Figure 5). Each Flood Lamp System includes a Power Supply, Reflector Assembly, a 400-Watt Lamp, Lamp Connector Cord, and a Power Cord.

Figure 4.
Exhaust Ventilation on Blower Motor's Outlet Flange

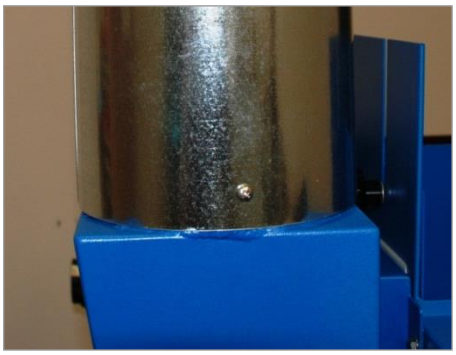


Figure 5.
Flood Lamp System Components (5000-EC shown)

6. Install two Temperature Control Plates and a Temperature Indicating Strip in the Reflector Housing as shown in Figure 6-Figure 9.

   NOTE: *Reflector Housings shipped with a conveyor will have the Temperature Control Plates and Temperature Indicating Strip already installed.*

Figure 6.
5000-EC Reflector Housing

Figure 7.
Add Temperature Indicating Strip

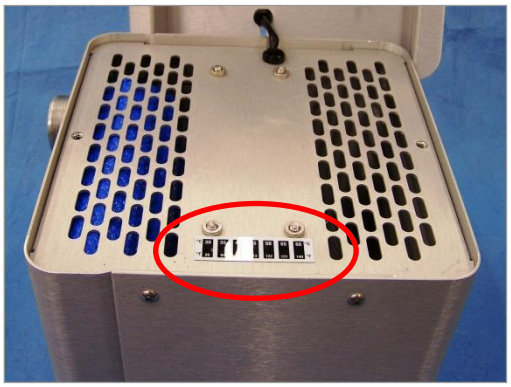


Figure 8.
Add First Temperature Control Plate

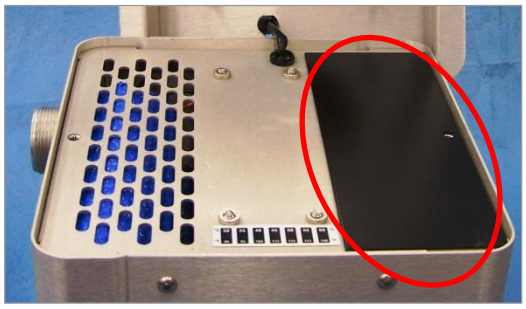
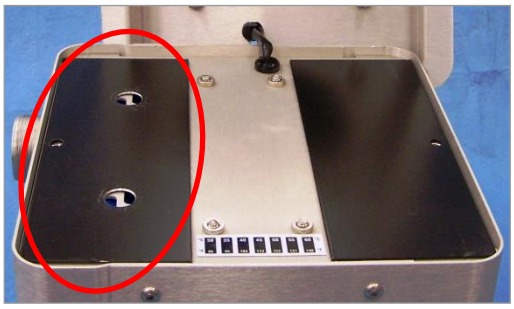


Figure 9.
Add Second Temperature Control Plate

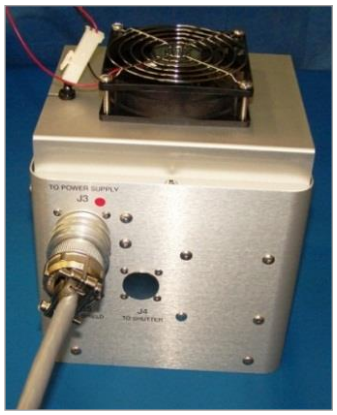


7. Install the Lamp into the Reflector Housing ensuring that the Lamp is properly seated (Figure 10).

8. Attach the Connector Cord to the back of each Reflector (Figure 11).

Figure 10.
Lamp Installed in Reflector Housing

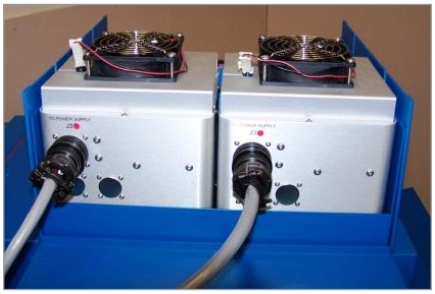
Figure 11.
Back of Reflector with Connection Cord



9. Install the two Reflector Assemblies into the Conveyor's Upper Lamp Support Brackets. Adjust the position of the Lamps and tighten the four Securing Knobs. Configuration 2A (lamps in-line) and 2B (lamps side-by-side) are shown below. Up to four Lamps may be mounted into the Support Bracket.

Figure 12.
2A Lamp Configuration

Figure 13.
2B Lamp Configuration



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

Figure 14.
Lamp Power Supply (Rear Panel)

11. Adjust the Conveyor's Chain by loosening the four "L" handle locks. Slide the Chain Rails to the desired position in the Conveyor's Frame. A Graduated Scale is provided at each end of the Conveyor to aid in Conveyor adjustment.

Conveyors Using Fusion Flood Lamps

Refer to the Fusion lamp manual for detailed Irradiator and Power Supply information.

1. Uncrate and assemble the Conveyor as described in instructions 1 and 2 of the Setup and Interconnect Section.

2. Unpack the Fusion Lamp Assembly(ies) (Figure 15). Each Lamp Assembly includes an Irradiator (Lamp) and Lamp Connector Cord. For dual Fusion units, the Master Lamp Assembly includes an RF Detector, RF Detector Connector Cord, and Master to Slave Power Supply Connector Cords.

   CAUTION: *Each Fusion Lamp Assembly has a fine mesh RF Screen covering the Lamp Face. Great care should be taken during installation and handling of these units to avoid puncturing or damaging the Screen. RF energy can be released, and system shutdown can occur if the Screen is damaged in any way.*

3. Inspect the Microwave Screen (Figure 16) on the bottom of the Irradiator. No rips or tears are acceptable.

Figure 15.
Fusion Lamp Assembly

Figure 16.
Microwave Screen

4. Mount the Irradiator(s) into the conveyor's Lamp Support (Figure 17 and Figure 18). Take particular care not to damage the protective Screen Covering the lamp end of the Irradiator.

Figure 17.
One Irradiator Mounted

Figure 18.
Two Irradiators Mounted

5. Install the RF Detector in the Bracket on the back of the conveyor (if not already installed). Attach the RF Detector's Connector Cord to the RF Detector (Figure 20).

Figure 19.
One Irradiator Mounted (Close Up)

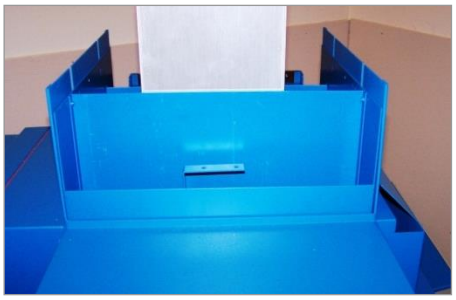
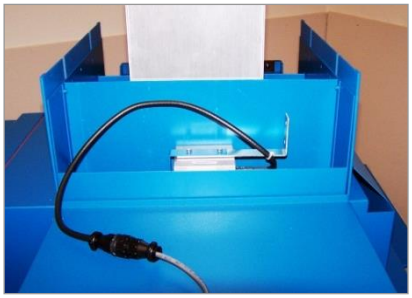


Figure 20.
RF Dectector's Connector Cord



6. Connect the Irradiator Cable(s) to the Irradiators (Figure 21 & Figure 22).

Figure 21.
Connect Irradiator Cables to Irradiator (1)

Figure 22.
Connect Irradiator Cables to Irradiators (2**)**

7. Unpack the Power Supply(ies) (Figure 23). A 220-Volt Power Cord is provided with each Power Supply. The Power Supplies may be configured for either 50 Hz or 60 Hz operation and for 208-, 220-, 230-, or 240-Volt operation. Changing between 50 and 60 Hz operation requires repositioning of two Capacitor Jumpers in each Power Supply. The Power Supply's shipping box is labeled with the voltage and frequency set at the factory. Detailed Power Supply setup instructions are provided in the Fusion Lamp technical manual.

Figure 23.
Power Supplies

8. Position the Power Supply(ies) on the conveyor's Mounting Stand or in a location near the conveyor if the Mounting Stand was not purchased.

9. Attach the Connector Cable leading from the RF Detector to the J-105A Receptacle on the back of the Master Power Supply.

10. Attach the Cables leading from the back of the conveyor to the J-105B and J-106 Receptacles of the Master Power Supply. These Cables are labeled to aid in assembly.

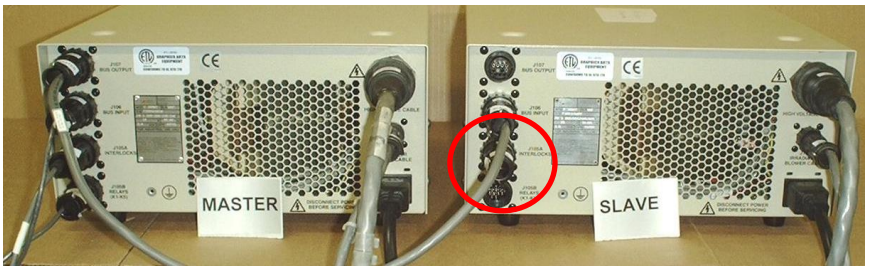
11. For dual Fusion Lamps, install the Jumper Plug in J-105A of the Slave Power Supply. Connect the Jumper Cable between J-107 of the Master Power Supply and J-106 of the Slave Power Supply. (Figure 24)

Figure 24.
Power Supplies

12. Connect the other end of the Irradiator Cable to the J-103 and J-104 Receptacles of the Power Supply(ies).

13. Connect the Power Cord to the back of the Power Supply and to a 208-240 volt (as appropriate) Power Source. For Dual Fusion units, the J-105A Jumper must be installed in the Slave Power Supply (Figure 25).

Figure 25.
Power Supplies



14. Plug in the Conveyor and turn it on. When the Conveyor is operating and the Chain is in motion, turn the Power Supply on by closing the Breakers (Figure 26) on both of the Power Supply's Front Panels.

15. Turn the Irradiators on by pressing the Lamp On Button (Figure 27) of the Master Power Supply. Both the Master and the Slave Power Supplies will go through a warm-up cycle. The Blower inside the Irradiators will turn on and the Lamps will ignite. The Lamps reach full intensity within five seconds after ignition.

Figure 26.
Breakers

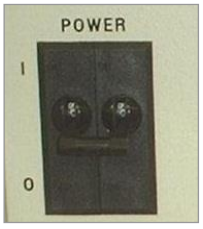
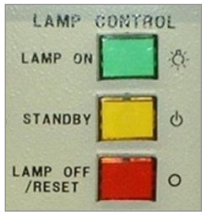


Figure 27.
Lamp On Button



16. Your UVCS-F Conveyor is now ready for operation.

Belt Speed Adjustment

1. Turn the Conveyor on by means of the Power Switch. Adjust Chain speed by unlocking and turning the Speed Control Knob (Figure 28). Chain speed is indicated on the Belt Speed Indicator Display (Figure 29). The Chain Speed Knob is a Ten-Turn Potentiometer and is equipped with a lock.

Figure 28.
Speed Control Knob

Figure 29.
Belt Speed Indicator Display

2. When the Conveyor is operating, and the Chain is in motion, turn each Power Supply on. Allow five minutes for the Lamps to reach full output intensity. If required, adjust the speed of the Exhaust Blower as required to optimize Lamp temperature.

3. The Exhaust Blower is factory set during final system testing for the Conveyor model ordered. If adjustment is required, remove the Access Panel (Figure 30) from the front of the Exhaust Blower Housing, unlock the Potentiometer Knob (Figure 31 & Figure 32), adjust the Exhaust Blower speed setting, and relock the Speed Control Knob. The range of the Exhaust Blower Potentiometer is 0.0 to 0.85 turns. Reinstall the Access Plate when adjustments are complete.

4. The Edge Carry Conveyor is ready for operation.

Figure 30.
Remove Access Panel

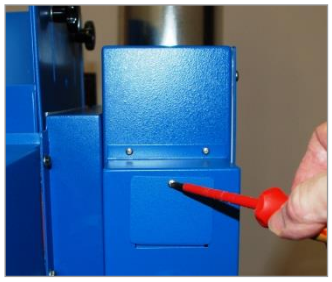
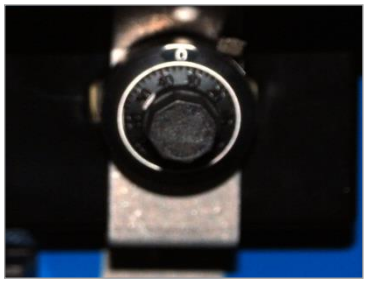


Figure 31.
Unlock Potentiometer Knob

Figure 32.
Potentiometer Knob



Conveyor Configurations

Conveyors with Dymax 5000-EC Lamps may be configured in a one lamp, two-lamp, or four-lamp configuration. The Lamp Cradle will accommodate up to four 5000-EC Lamps. Spacers and Block-Off Plates cover the unused lamp locations. Conveyors with 1200-EC or 2000-EC Lamps are single-lamp configuration only.

Conveyors using Fusion lamps can be configured for one or two Fusion Lamps.

2A Lamp Configuration: Two 5000-EC Lamps In-Line

Install four Spacers into the Lamp Cradle (Figure 33).

Install the two 5000-EC Lamps into the Lamp Cradle (Figure 34).

Figure 33.
Lamp Cradle w/Spacers Installed

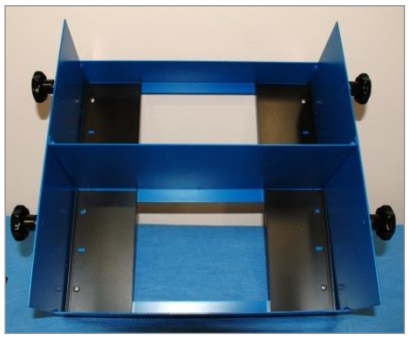


Figure 34.
Lamp Cradle w/5000-ECs Installed

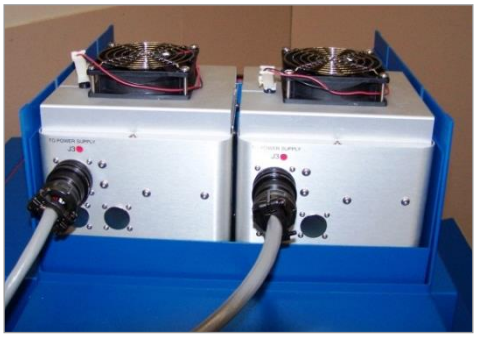
2B Lamp Configuration: Two 5000-EC Lamps Side-By-Side

Starting with an empty Lamp Cradle, install the Large Spacer in one of the two Cradle Bays (Figure 35).

Install the two 5000-EC Lamps in the 2B configuration (Figure 36).

Figure 35.
Large Spacer in Cradle

Figure 36.
2B Lamp Configuration



Four 5000-EC Lamp Configuration

Starting with an empty Lamp Cradle, install the four 5000-EC Lamps into the Lamp Cradle.

Figure 37.
Empty Lamp Cradle

Figure 38.
Four Lamp Configuration

Single 2000-EC or 1200-EC Lamp Configuration

Starting with an empty Lamp Cradle (Figure 39), relocate the Center Divider Plate (Figure 40) and install the Lamp Spacers as shown in Figure 41.

Install the 2000-EC or 1200-EC Reflector into the Lamp Cradle.

Figure 39.
Empty Lamp Cradle

Figure 40.
Move Center Divider Plate

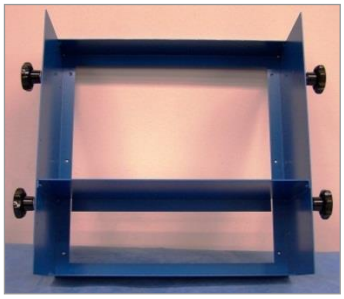
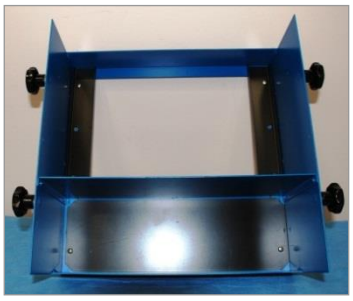


Figure 41.
Install Spacers



Dual Fusion Lamp Configuration

Remove any Lamp Cradle Spacers. Relocate the Cradle Center Divider Plate and install the Fusion Lamp Brackets and the RF Detector Support (Figure 43).

Install the RF Detector, the Fusion Lamps and Power Supplies as described in the Fusion Lamp Setup Section of this manual. Adjust the speed of the Exhaust Blower by setting the Speed Control Knob as described in the Conveyor Operation Section of this manual. The Dual-Fusion Conveyor also requires installation of a Heat Guard on the front surface of the Conveyor.

Figure 42.
Empty Lamp Cradle

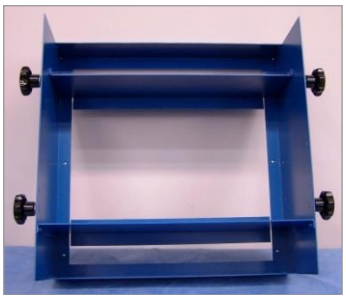


Figure 43.
Install Spacers & RF Detector Support

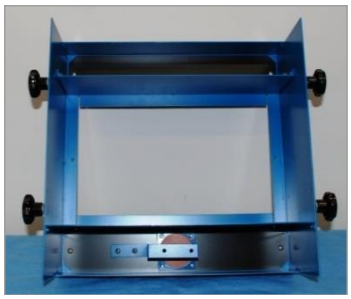


Figure 44.
Install Lamps

Single Fusion Lamp Configuration

Remove any Lamp Cradle Spacers. Relocate the Center Divider Plate. Install the Fusion Lamp Brackets and the RF Detector Support (Figure 46).

Install the RF Detector, the Fusion Lamps, and Power Supplies as described in the Setup and Interconnect Section (Figure 47).

Adjust the speed of the Exhaust Blower by setting the Speed Control Knob as described in the Conveyor Operation Section of this user guide.

Figure 45.
Empty Lamp Cradle

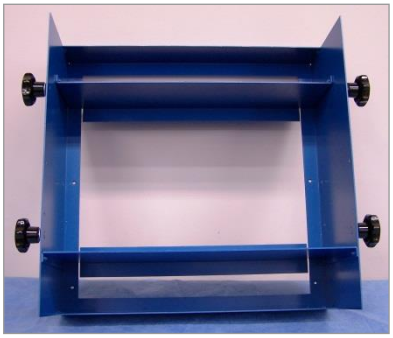


Figure 46.
Lamp Brackets & RF Detector Support

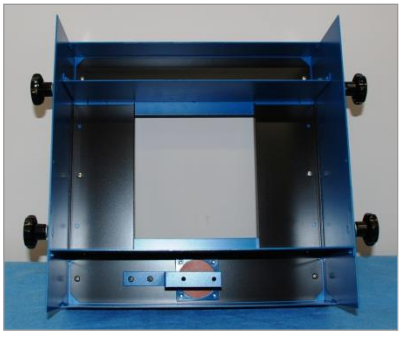


Figure 47.
Install Lamps

Conveyor Operation

Conveyors Using Dymax EC-Series Lamp Systems

1. Install all safety accessories to protect operator from UV light emissions.
2. Apply power to the conveyor and turn it on.
3. Using the Speed Control Knob (Figure 48), unlock the Knob and adjust the Chain 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).

Figure 48.
Speed Control Knob

Figure 49.
Front Control Panel with Belt Speed Indicator Display

4. If any adjustments are needed for Chain positioning or Chain tension, refer to the Maintenance Section.
5. Adjust the height of the Lamps to the desired distance (Figure 50).

Figure 50.
Conveyor Adjusted to Various Lamp Heights

Note: If needed, the Angle Support (Figure 51) can be removed to gain extra travel. To remove it:

- *Remove the flood lamps from the conveyor (Figure 52).*
- *Disconnect the Angle Support by removing the three screws and sliding it out from the under the conveyor's edge (Figure 53).*
- *Remount the flood lamps in the conveyor (Figure 54).*

Figure 51.
Angle Support

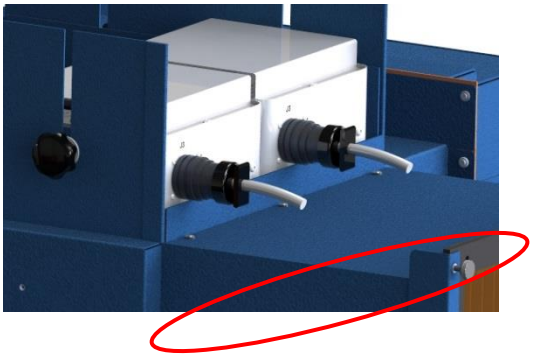


Figure 52.
Remove Flood Lamps

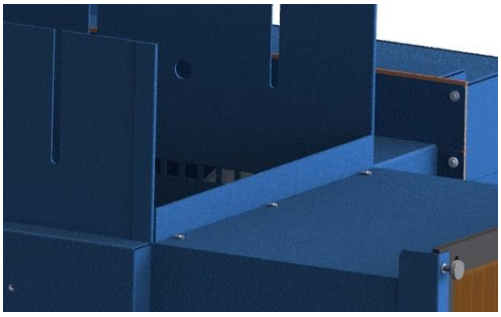


Figure 53.
Disconnect Support Angle

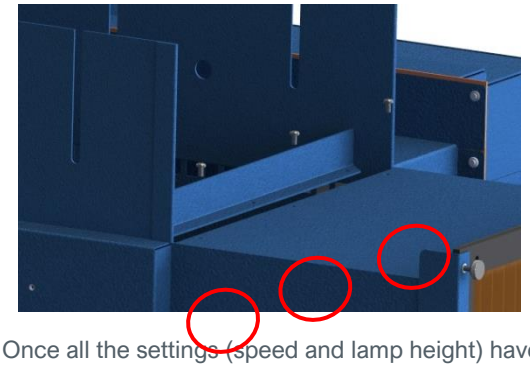
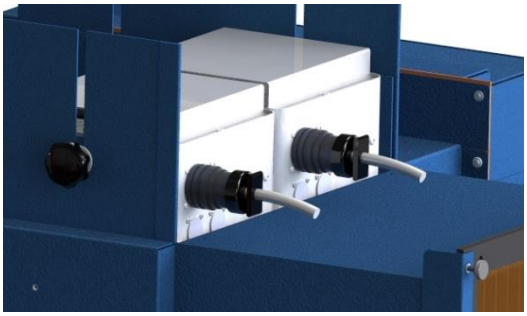


Figure 54.
Reinstall Flood Lamps



6. Once all the settings (speed and lamp height) have been properly set, the Conveyor is ready for operation.
7. Apply power to the Lamps and turn them on.

Additional Information

The conveyor has an adjustable Exhaust Blower. The Exhaust 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 Chain. This air flow provides a small hold-down force to keep light objects from moving while traveling on the Chain. The Exhaust Blower speed, when adjusted, provides minor changes to this hold-down airflow. Adjusting the height of the Entrance and Exit UV Curtains also affects cooling air to the Lamps and hold-down force to a lesser degree.

UV Curtain height should be set to the height of the products to be placed on the Conveyor. The Exhaust Blower Speed can then be adjusted for optimum Lamp temperature. For 5000-EC Lamps, a Temperature Indicator Strip is attached to the appropriate location on the Reflector Housing. The optimum operating temperature is from 115°F to 145°F, 0-80% relative humidity, non-condensing.

Figure 58 shows a typical Temperature Indicator Strip reading a representative temperature. The Exhaust Blower speed is set at the factory at approximately 170 CFM during final system testing for the Conveyor model ordered. Customers should do a final blower speed adjustment based on their installation cooling setup and operating environment to meet Temperature Strip compliance. If adjustment is required, remove the access panel from the front of the Exhaust Blower Housing, unlock the Blower Speed Potentiometer and turn it to change Exhaust Blower speed.

If the lamps continue to run hot after adjusting the Exhaust Blower speed, a reflector cooling fan and skirt assembly (PN 38320) is available. The fan connects to the 24Vdc harness available on the reflector.

Figure 55.
Remove Access Panel

Figure 56.
Unlock Potentiometer Knob

Figure 57.
Potentiometer Knob (Close Up)

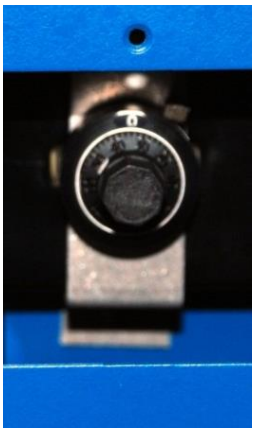
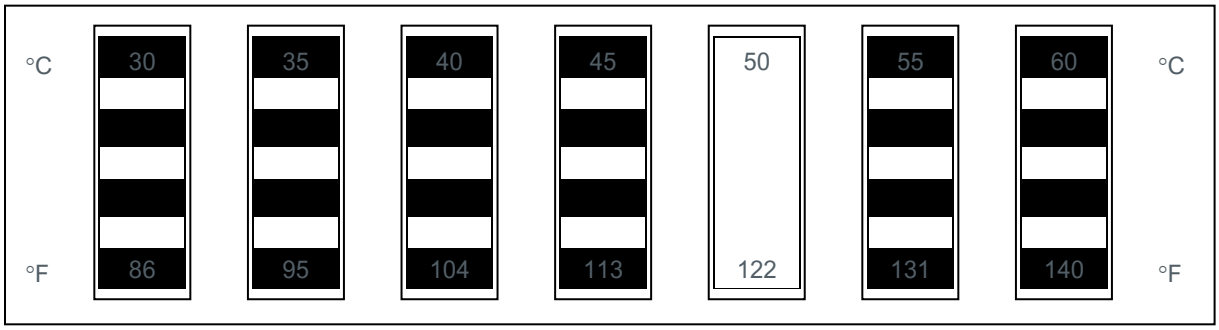


Figure 58.
Temperature Indicator Sticker for 5000-Series Lamps*



*The Conveyor must be operating and the Conveyor Chain must be in motion before the Lamps are turned on.

Conveyors Using Fusion Lamp Systems

1. Install all safety accessories to protect operator from UV light emissions.
2. Apply power to the Conveyor and turn it on.
3. Using the Speed Control Knob, unlock the Knob and adjust the 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).

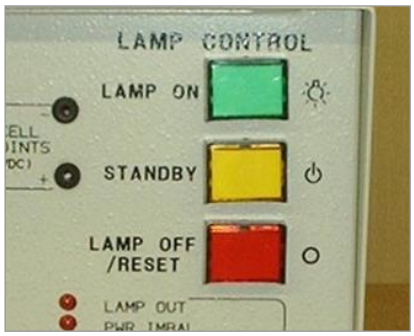
Figure 59.
Speed Control Knob

Figure 60.
Front Control Panel with Belt Speed Indicator Display

4. If any adjustments are needed for the Chain position or tension, refer to the Maintenance Section.
5. Adjust the height of the Lamps to the desired distance.
6. Once all the settings (speed and lamp height) have been properly set, the Conveyor is ready for operation.
7. Plug in the Conveyor and turn it on. When the Conveyor is operating, and the Chain is in motion, turn the Power Supply on by closing the Breaker(s) on both of the Power Supply's Front Panels (Figure 61).
8. Turn the Irradiators on by pressing the "Lamp On" Button (Figure 62) of the Master Power Supply. Both the Master and the Slave Power Supplies will go through a warm-up cycle. The Blower inside the Irradiators will turn on and the Lamps will ignite. The Lamps reach full intensity within five seconds after ignition. Your UVCS-F Conveyor is now ready for operation.

Figure 61.
Breakers

Figure 62.
Lamp Control Buttons



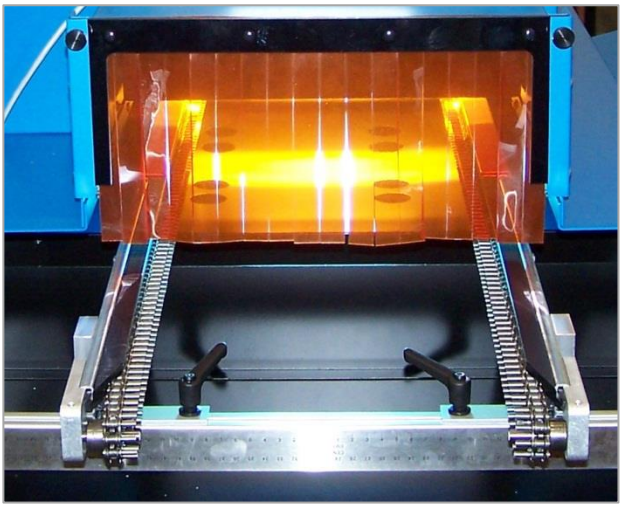
NOTE: *The Fusion Power Supplies are interlocked with the Conveyor so that the Conveyor must be operating and the Conveyor Chain in motion before the Lamps will ignite.*

Maintenance

Chain Carrier Position Adjustment

All Dymax Edge-Carry Conveyors are factory adjusted to the normal Chain position for the Lamp combination ordered. If adjustment is desired, this is done via four “L” Handles. To adjust tracking, simply loosen the four “L” Handles. Position the Chain as required and tighten the four “L” Handles. A Scale is provided at each end of the Conveyor to assist in adjustment.

Figure 63.
“L” Handles and Scale



Chain Tension Adjustment

If Chain Tension Adjustment is required, loosen the two Lock Screws on the Idler Sprocket (Figure 64) with a 4 mm screwdriver. Loosen the Lock Nut with a 10 mm wrench (Figure 65). Turn the Tension Adjustment Screw to achieve the proper tension (Figure 66). Tighten the Idler Sprocket Lock Screws and the Tension Adjustment Lock Nut when adjustment is completed.

Figure 64.
Loosen Lock Screws

Figure 65.
Loosen Lock Nut

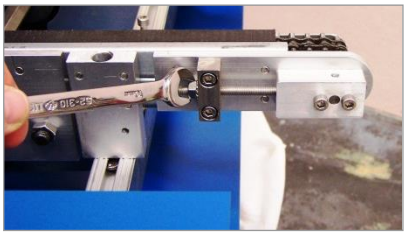


Figure 66.
Turn the Tension Adjustment Screw

Troubleshooting

Table 8.
Troubleshooting Chart for the EC-Series Flood Lamps

Problem	Possible Cause	Testing	Corrective Action
Lamp Will Not Ignite or Lamp Flickers, Won't Maintain Operation	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).
	Lamp Beyond Useful Life	Replace Lamp with known good Lamp and re-test unit.	Replace Lamp if defective (typical Lamp life = 2,000 hours).
	Power Supply Board Failed	Check UV output voltage on Power Supply Board. Set Oscilloscope to: 20ms/div 100V/div	Replace power supply board if defective.
	Igniter Malfunctioned	Verify open circuit voltage from Igniter. Set Oscilloscope to: 50us/div 1000V/div	Replace if defective.
EC Power Supply Blows Input Fuse	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.
UV Intensity Appears To Be Low	Lamp Beyond Its Useful Life	Use a Radiometer to measure actual output intensity. Consult manual for proper output.	Replace Lamp if beyond useful life (Typical Lamp life = 2,000 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 for contaminants (should be a clean, shiny surface).	Clean Reflector with a soft, lint-free cloth and isopropyl alcohol or equivalent.
	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.
	Reflector temperature is too low (5000-EC Flood Lamps).	Verify Reflector temperature is between 115° F and 145° F as measured at the temperature indicator on top of the Reflector Housing.	Adjust Conveyor Temperature Control Plates or add/remove Reflector Ventilation Plates as necessary to achieve proper temperatures.

Table 9.
Troubleshooting Chart for the Edge-Carry Conveyor

Problem	Possible Cause	Testing	Corrective Action
Conveyor Not Operating	Main Line Circuit Breaker deployed	Toggle Power Switch off then on to reset the Circuit Breaker.	Find out why Breaker is deploying.
	Improperly fastened connections	Check all connections.	Properly fasten Power Cord.
	Fuses for Motor Controller blown	Remove Fuses from Fuse Holders (located in the left side of Control Box of unit) and check with an Ohmmeter.	Replace, if defective.
Chain is Too Loose	Chain is hung up	Inspect the Chain for any signs of a mechanical bind.	Resolve bind and continue operation.
	Chain tension needs adjustment	Visually inspect the Chain for excessive slack.	Loosen the Locknut on the Chain Tension Adjustment Screw. Tighten the Chain by turning the Adjustment Screw. Tighten the Locknut when adjustment is complete.

Spare Parts and Accessories

EC-Series Flood Lamp Replacement Parts

Item	Part Number
Lamps	
Lamp, Metal Halide 400 Watt UV (Standard)	38560
Lamp, Mercury Vapor 400 Watt UV (Optional)	36970
Lamp, Visible 400 Watt (Optional)	36658
Misc.	
Fuse, F 6.25 Amp	35141
Filter, Glass UV (2000-EC Only)	35899
Lamp Base Replacement Kits	35979
Switch, Power	36288
Cooling Fan Skirt Assembly	38320

Fusion Lamp Replacement Parts

Item	Part Number
Lamps	
D Lamp UV (Standard)	36399
H Lamp (Optional)	36411
V Lamp (Optional)	38146
Misc.	
Fusion Lamp Filter Kit	36560
Fusion Irradiator RF Screen Kit	37010
Fusion Lamp/Power Supply	36402

Conveyor Replacement Parts/Accessories

Item	Part Number
Blowers	
Blower, 115 VAC	40146
Blower, 220 VAC,	40147
Misc.	
Circuit Breaker, 115 VAC	39128
DC Motor Controller Resistor	40178
DC Motor Controller	40179
DC Motor Speed Indicator Sensor	39136
Red Lion Counter Timer 50020	39132
Red Lion 12 V Power Supply	39133
Hour Meter	35981
Gear motor, 90 VDC	43391
Knob, Controller, Speed	40143
Potentiometer, Conveyor Speed	40006
Potentiometer, Exhaust Blower Speed	40149
Curtain Assembly (2 Required)	39207
Solid Acrylic Shield (2 Required)	39205

Definition of Terms

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 Luminance.

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

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.

Lamp - 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).

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

Ozone - oxidizing agent (O_3) produced by the action of Ultraviolet radiant energy (below 185 nm) or electrical corona discharge of oxygen on air.

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 lamps (bulbs) 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 lamp 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⊕) - predominately produced by Dymax flood lamps.

2. Ultraviolet B (UV-B) - UV of medium wavelength from within approximately 320 to 280 nm - Dymax flood Lamps produce some amount of their energy within this bandwidth.

3. Ultraviolet C (UV-C) - UV of short wavelength below 280 nm (we say from 280 to 200 nm) – a large amount of this energy is present in the sunlight.

4. Visible – Light that can be seen 400-700 nm.

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

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components (excluding lamps and Fuses) with proof of purchase and purchase date. Unauthorized repair, modification, or improper use of equipment may void your warranty benefits. 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.

IMPORTANT NOTE: *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 ABOVE ARE LIMITED TO THIS AUTHORIZATION.*

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