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Description

The Zeta® Conveyor 7415 is a convenient, adjustable system that accommodates the Fusion F300S/SQ six-inch ultraviolet lamp. Process development and testing and small-scale production UV curing are typical applications.

The F300S/SQ lamp is controlled by a switch on the conveyor. A zero-speed sensor protects the belt. During operation, belt speed is controlled from the front of the conveyor and displayed on a digital readout. The conveyor is configured to operate at speeds between 3.3 and 23.0 ft/min, from right to left.

The system can be reconfigured for operating between 0.3 and 7.2 ft./min. by reversing the drive pulleys (see page 11).

Nominal cure width is 152 mm (6 in.). Entry/exit light shield doors can be adjusted to accommodate objects up to approximately 70 mm (2.75 in.) high. The lamp can be rotated to any angle in relation to belt direction of travel. The rotating mechanism also varies the focal distance between the lamp and the part to be cured.

An integral, internal exhaust blower pulls air through the open-weave Kevlar® belt, holding objects in place and providing cooling for the system.

The conveyor operates on 110-120 VAC, 50/60 Hz power.

Figure 1
Operating the Conveyor

After the system is installed and connected according to the instructions in this manual, operation is simple:

1. Be sure the Lamp Remote Control switch on the conveyor is set to STANDBY. Turn on power to the lamp and conveyor.

2. Turn the P300M power supply Power switch to ON. Turn the Lamp Control switch to LAMP ON.

3. Set the belt speed dial on the conveyor.

4. Turn the conveyor switch to REMOTE LAMP ON.

The belt will begin to move. After a warmup delay of ten seconds, the lamp will come on.

Optional Accessories (See Replacement Parts and Accessories on page 12 for part numbers.)

Depending on the requirements of your application, several accessories for the Loctite® Conveyor may be added to the system. Part numbers for these items will be found at the end of this manual.

- The lamp produces hot air during operation. To protect the materials to be cured, obtain a Quartz Deflector Kit. A quartz plate is inserted in a frame which rests in the lamp boot.

- To connect the exhaust outlet of the conveyor to the building duct system, use the optional plenum. Hardware to fit the exhaust outlet mounting holes is provided with the conveyor.

- Depending on the operating conditions and environment, sight shields may be required to block UV light escaping from the sides or end of the in-feed or out-feed path.
Preparing the Conveyor for Use

Space and Clearance Requirements

Refer to the outline drawing in Figure 2 for the dimensions of the conveyor.

Utility Requirements

Electrical Power

The conveyor draws one Amp of current. The F300S/SQ lamp system requires its own circuit, as specified in the manual, installed as provided in local electrical codes.

Exhaust Connection

The I300M lamp produces a small amount of ozone on startup, and Loctite, therefore, recommends that the conveyor and lamp be ducted to the outside. Conveyor exhaust is through the back of the housing. Fasteners required to connect ducting are provided with the conveyor. The optional exhaust plenum can be turned to connect either upward or downward.
Figure 2
F300S/SQ Lamp System Requirements

Check the lamp system manual for complete specifications and installation requirements. The RF detector provided with the lamp system will be mounted on the conveyor and connected as described in the Setup section of this manual.

Setup

Removing the Conveyor Cover for Access

1. Remove the lamp from the boot. Set it down carefully on a smooth surface, to avoid damaging the screen.

2. If the power cord is plugged into the conveyor, disconnect it.

3. Remove four M5x12 truss head Phillips screws, one at each corner of the housing. Lift the cover straight up over the boot.

**Factory configuration for voltage is 110 - 120 VAC. If your voltage is different, you need to change the settings as follows:**

Setting the Supply Voltage Switch

Switch SW1, located on the printed wiring board (PWB), must be set to the appropriate range to match the supply voltage. Slide the switch to 115 for the lower range, or to 230 for the upper range.
Setting Blower Connections for Voltage

To operate on the alternate voltage, move only the wire from the BLWR-115V or BLWR-230 terminal on TB1 on the PWB. Reconnect it to the appropriate terminal. Do not move the BLWR-COM wire.

Lamp Interconnect Cable P106

The conveyor LAMP ON switch signals the P300 power supply through the remote control cable that projects through a grommet on the back of the conveyor. The connector plugs into J106 on the back of the P300 power supply.

Mounting the RF Detector

The lamp system includes a Fusion RF-1 Detector and cable. Remove the steel L-shaped mounting bracket from the detector and discard it; a bracket has already been installed on the conveyor. The detector is mounted at the right rear of the conveyor.

Install the detector as follows:

a. Pull the connector end of the detector through the wire tie on the preinstalled L-shaped bracket.

b. Mount the detector on the bracket with the black plastic cone pointing toward the red silicone rubber RF port cover, and with the RF cable pointing down.

c. Tighten the wire tie, leaving some slack on the detector side.

d. Pull the connector end through the exit hole.

Conveyor Speed (Drive Pulley Swap)

The conveyor is shipped configured to operate at the higher of two possible speed ranges. To operate at the other speed range, reverse the position of the belt drive pulleys. Refer to Service Procedures.

Reinstalling the Conveyor Cover

Lower the cover over the conveyor and re-fasten it with the four screws.

Exhaust Connection

Connect the conveyor exhaust to the duct using the hardware provided.

F300S/SQ Lamp System Installation

Follow manual instructions to install and connect the power supply and irradiator. Switch S1-2 on the control card inside the power supply must be set to NO to allow the conveyor to control the lamp remotely.
Connect P20 on the end of the RF Detector cable to J20 on the end of cable H790 (provided with the lamp system). Plug P105A into J105A on the back of the power supply. Plug the remote control cable from the conveyor into J106 on the power supply.

Connecting Electrical Supply to the Conveyor

A standard power cord with three-prong plug is provided for 110-120 VAC installations. The customer must provide the appropriate plug to connect to the local electrical supply if the conveyor is to be configured for 200-240 VAC installations.

Installing the Lamp in the Conveyor Boot

The lamp may be placed in the boot in either direction. No fastening is required. Connect the lamp to the power supply following the instructions in the F300S/SQ manual.

Adjusting the Conveyor for Your Application Requirements

Setting the Operating Speed

The speed control dial indicates percent of full speed. The actual speed is determined by the motor and pulley configuration. Until you determine the speed required by your application, start the conveyor at the 50% setting on the dial.

Lamp Rotation

The boot can be rotated to change the orientation of the lamp in relation to the direction of belt travel. The bulb is perpendicular to the belt when the reference grooves on the boot are aligned with one of the 0° marks on the cover dial. This position is shown in the photograph at the beginning of this manual.

Entry and Exit Light Shield Doors

The doors must be adjusted each time the focus height is changed, or when a different height product is run through the conveyor. Grasp the external lip of the door and slide it up or down.

Depending on the installation, you may want to order sight shields to minimize light leakage. (See Accessories in table under Replacement Parts and Accessories on Page 12.)

Focus Height Adjustment

The cables must be disconnected from the lamp OR the lamp may be removed from the boot during adjustment. Remove the lamp if you wish to measure the distance from the lamp support surface to the desired focal plane.

When the boot is turned fully clockwise, focus is at the surface of the conveyor belt. The focus height can be increased to a maximum of 76 mm (3 in.) by turning the boot counterclockwise. One complete (360°) revolution equals one half of an inch of vertical motion. One half (180°) of a revolution will raise or lower the lamp one fourth of an inch.
CAUTION: Do not raise the boot so far that the lamp is no longer seated securely in the conveyor.

Diagnosing Conveyor Problems

For faults associated with the lamp system, refer to the Troubleshooting section of the F300S/SQ manual.

SYMPTOM: The conveyor motor does not run.

CAUSES:
1. The speed control knob is set too low, or is set at zero.
2. Check fuses F2 (115 V) and F3 (230 V) located on the PWB (see Appendix B) and motor controller fuse.
3. The power source does not match the system settings.
4. Motor connections are loose.

ACTION:
1. Rotate the knob to a higher speed setting.
2. Replace the fuse.
3. Check line voltage and the internal voltage switch setting.
4. Check that all connections are secure.

SYMPTOM: The motor stalls or runs at very low speed when the control knob is turned fully clockwise.

CAUSES:
1. Supply voltage is low or does not match the system settings.
2. The motor is overloaded.
3. Motor connections are loose.

ACTION:
1. Input voltage should not be below 104 VAC (190 VAC for 220-240 V systems).
2. Reduce the load on the belt. Either loosen the belt tension or check for and remove the cause of a jam.
3. Check that all electrical connections are secure.

For further technical information and support, contact Loctite Technical Service at: 1-800-LOCTITE (1-800-562-8483).
Service Procedures

Direction of Belt Travel

Direction of belt travel cannot be reversed by modifications in the field. Several components must be replaced. Consult Loctite Technical Services for the required modifications. Reversing the rotation of the motor WILL NOT give satisfactory results.

Adjusting Motor Drive Belt Tension

1. Disconnect power and remove the cover.

2. To test the motor drive belt for proper tension, apply moderate pressure between the rollers. The deflection should be about 2.5 mm (0.1 in.).

3. If adjustment is necessary, loosen the four #10-32 motor mounting screws. Move the motor pulley to adjust the tension and tighten the four screws.

Adjusting Conveyor Belt Tension

1. With the machine turned off, place a hand on each roller and slide the belt to the center.

2. To test for proper belt tension, apply moderate finger pressure between a roller and the slider bed as shown. The deflection should be about 3-5 mm (0.19 in.)

3. Adjust, if necessary, using both M4 adjustment screws on the end of the machine. DO NOT OVER-TIGHTEN THE BELT. Excessive tension will prevent it from operating properly and may cause damage to the belt. The tension should be loose enough so that the belt will slip on the drive roller when belt motion is prevented by an obstruction.

Adjusting Conveyor Belt Tracking

1. Turn the machine on and set the speed at 50%.

   **CAUTION:** If the belt jams, turn the conveyor off immediately, loosen the belt tension adjustment screws and slide the belt toward the center of both rollers.

2. To adjust the tracking, use the two M4 roller adjustment screws accessible through the holes on the ends of the machine (see Figure 2). If the belt is tracking to the right side, tighten the right adjustment screw and loosen the left screw the
same amount. If it is tracking to the left side, tighten the left screw and loosen the right screw. Do not over-tighten either side.

3. If necessary, readjust the tension as discussed above. Several attempts may be necessary.

Removing the Conveyor Belt

**WARNING:** Disconnect power to the machine.

1. Unplug the power cord from the conveyor and remove the cover.

2. Remove two M4 roller adjustment screws on the right end of the machine.

3. Remove six M4x10 screws fastening the heat shield and lift off the head shield.

4. Slide the belt until the seam is accessible.

5. Push the Teflon® coated steel pin toward one side of the belt so that the bent end can be straightened. Pull the pin out.

6. Pull the belt out from underneath the conveyor.

Belt Installation

1. Insert either end of a new belt into either end of the conveyor. Feed the belt through the conveyor until the ends can be retrieved.

**CAUTION:** Ensure the belt does not interfere with any wires inside the conveyor bed.

2. Put the ends of the belt together on the conveyor bed and align them so that the eyelets interlace.

3. Bend one end of the pin and insert the other (straightened) end of the pin through the aligned eyelets until the straight end emerges. Make certain not to miss any loops.

4. Bend the straight end of the pin around so that the bend goes in the opposite direction from that of the bend at the other end. (this will make the pin into a flattened S shape.) Weave the end of the pin into the loops as shown, ensuring that the end loops through both ends of the belt.
5. Replace the heat shield and cover. Be careful not to pinch the harness or cable of the sides of the conveyor.

**Replacing the Motor Drive Belt**

1. Unplug the power cord and remove the cover.

2. Loosen (but do not remove) four #10-32 screws that mount the motor. See Figure 2.

3. Hold the motor pulley and move the motor toward the roller as far as possible.

4. Slip the belt off the pulleys.

5. Carefully place the new belt on the pulleys.

6. Move the motor back to operating position. Adjust the conveyor belt tension as described previously in *Adjusting Conveyor Belt Tension*.

**Replacing the Drive Pulleys or Changing Speed Range**

1. Unplug the power cord and remove the cover.

2. Remove the belt as described above.

3. Loosen the set screws on both pulleys. Remove the pulleys.

   **Pulley position determines the belt speed range.** For the higher speed range, the larger pulley will be on the motor shaft, hub toward the motor; and the smaller pulley on the roller shaft, facing.

   For the lower speed range, the smaller pulley will be on the motor shaft, facing in; and the larger pulley on the roller shaft, facing out.

4. Referring to the previous information, place one pulley on the roller shaft, with its hub facing away from the conveyor.

5. Put the other pulley on the motor shaft, with its hub facing the motor.

6. The motor shaft has a flat, the roller shaft has a detent. Align each pulley set screw with the flat or detent. Tighten the set screw.

7. Reinstall and re-tension the belt as described previously.

**Replacing Fuses**

Remove the cover. Fuses F1-F3 are on the interface board. The other fuse is on the motor controller board (Figure 3).

---

**CAUTION:** The replacement fuse must be the same type, slow-blow or fast-acting (250 V), as the original.
## Replacement Parts and Accessories

### Loctite® Zeta® 7415 UV Conveyor

#### Recommended Standard Loctite® Replacement Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPST Rocker Switch, 0.4 VA, 20 V</td>
<td>983876</td>
</tr>
<tr>
<td>Motor Controller</td>
<td>983463</td>
</tr>
<tr>
<td>Roller Assembly Kit, Including Bearings</td>
<td>983461</td>
</tr>
<tr>
<td>Drive Belt and Pulley Kit</td>
<td>983460</td>
</tr>
<tr>
<td>Drive Motor, PMDC, 11 RPM</td>
<td>983459</td>
</tr>
<tr>
<td>Tachometer, LED</td>
<td>983875</td>
</tr>
<tr>
<td>Conveyor Belt, Kevlar®</td>
<td>983457</td>
</tr>
</tbody>
</table>

#### Recommended Loctite® Accessory Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Deflection Kit, High Grade Quartz</td>
<td>983466</td>
</tr>
<tr>
<td>Sight Shield, Snap in, Tunnel Style</td>
<td>983465</td>
</tr>
<tr>
<td>Sight Shield, Snap in, Box End Style</td>
<td>983464</td>
</tr>
<tr>
<td>Exhaust Plenum</td>
<td>983462</td>
</tr>
</tbody>
</table>

#### Recommended Commercially Available Replacement Parts

- Fuse, 3AG Slo-Blo, 1 A, 250 V (F1, F2)
- Fuse, 3AG Fast-Acting, 0.5 A, 250 V (F3)
- Fuse, 3AG Fast Acting, 8.0 A, 250 V (F4)
- Fuse, 3AG Slo-Blo, 0.5 A, 250 V (Motor Controller)
Warranty

Loctite expressly warrants that all products referred to in this Instruction manual for the ZETA® Conveyor 7415 (hereafter called "Products") shall be free from defects in materials and workmanship. Liability for Loctite shall be limited, as its option, to replacing those Products which shown to be defective in either materials or workmanship or to credit the purchaser the amount of the purchase price thereof (plus freight and insurance charges paid therefore by the user). The purchaser’s sole and exclusive remedy for breach of warranty shall be such replacement or credit.

A claim of defect in materials or workmanship in any Products shall be allowed only when it is submitted in writing within one month after discovery of the defect or after the time the defect should reasonably have been discovered and in any event, within one year after the delivery of the Products to the purchaser. No such claim shall be allowed in respect of the products which have been neglected or improperly stored. Transported, handled, installed, connected, operated, used or maintained or in the event of unauthorized modification of the Products including, where products, parts or attachments for use in connection with the Products are available from Loctite, the use of products, parts or attachments which are not manufactured by Loctite.

No Products shall be returned to Loctite for any reason without prior written approval from Loctite. Products shall be returned freight prepaid, in accordance with instructions from Loctite.

NO WARRANTY IS EXTENDED TO ANY EQUIPMENT WHICH HAS BEEN ALTERED, MISUSED, NEGLECTED, OR DAMAGED BY ACCIDENT, OR IF THE SYSTEM USED TO DISPENSE ANY LIQUID MATERIAL OTHER THAN LOCTITE CORPORATION PRODUCTS.

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Appendix A: Adjusting the Motor Speed Controller

It is not usually necessary to adjust the motor speed controller. However, if the controller must be replaced, the new device must be set up for operation in the conveyor.

WARNING: If adjustments are made under power, insulated adjustment tools must be used and eye protection must be worn.

The speed controller has been factory adjusted to provide zero-to-full speed using the speed control knob. Minimum and Maximum speed trimpots are provided to change the speed range from other than zero-to-full speed. The acceleration (ACCEL) trimpot is provided to allow for smooth start over an adjustable time period each time the AC power is applied or the speed pot is rotated. The DECEL trimpot controls the amount of ramp-down time when the speed pot is adjusted to a lower speed. The Current Limit (CL, or torque output) adjustment is factory set to approximately 1.5 times the motor rating. The IR Compensation (IR) is factory adjusted to provide excellent motor regulation under normal operation.

Figure 1
ACCEL/DECEL trimpot adjustment

For the IR compensation and CL trimpot settings to be correct, the proper Plug-in Horsepower Resistor® of 0.25 Ohm must be installed.

The following procedures should be followed in order to adjust all trimpot functions.

CAUTION: Adjusting the acceleration time below 0.5 sec increases inrush current. It may be necessary to measure the peak inrush current and consult Loctite Technical Service since field magnet demagnetization may occur.

Adjusting the Trim pots

A. Belt Acceleration

To adjust the speed at which the belt accelerates, use the trimpot labeled “ACCEL” on the left edge of the speed control board. To increase the acceleration time, turn the trimpot clockwise (CW). To decrease the acceleration time, turn the trimpot counterclockwise (CCW).
B. Belt Deceleration

To adjust the speed at which the belt decelerates, use the trimpot labeled “DECEL” on the left edge of the speed control board. To increase the deceleration time, turn the trimpot CW. To decrease the deceleration time, turn the trimpot CCW.

*The deceleration time should never be set so that the belt stops during the deceleration period. This will adversely affect the Zero belt speed detection circuit.*

C. Minimum Speed Adjustment

To adjust the minimum speed of the belt, use the trimpot located in the lower left of the speed controller labeled MIN. First, set the belt speed control knob to the slowest position (fully CCW). Then adjust the trimpot to the desired level. To increase the minimum belt speed, turn the trimpot CW. To decrease the minimum speed, turn the trimpot CCW.

*Adjustments that allow the belt to stop when the belt speed control is turned fully CCW will adversely affect the Zero belt speed detection circuit. The minimum speed adjustment will affect the maximum belt speed.*

D. Maximum Speed Adjustment

To adjust the maximum speed of the belt, use the trimpot located in the lower left of the speed controller labeled MAX. First, set the belt speed control knob to the fastest position (fully CW). Then, adjust the trimpot to the desired level. To increase the maximum belt speed, turn the trimpot CW. To decrease the maximum belt speed, turn the trimpot CCW.

*After adjusting the maximum belt speed, it is necessary to readjust the minimum belt speed.*

**CAUTION:** Do not attempt to adjust the maximum speed above the rated motor RPM since unstable motor operation may occur.

E. Current Limit (CL/Torque Adjustment)

The CL circuitry is provided to protect the motor and control against overloads. The CL also limits the inrush current to a safe level during startup. The CL is factory set to approximately 1.5 times the full load rating of the motor. (The CL trimpot is nominally set to approximately 65% of full CW rotation.)

To re-set the CL trimpot to factory specifications, adjust as follows:

1. Set the speed control knob at approximately 30-50% CW rotation. Set the CL trimpot to full CCW position.

2. Connect a DC ammeter in series with the red armature lead.
3. Lock the motor shaft (be sure the CL pot is in full CCW position). Apply power and rotate the CL pot CW slowly until DC ammeter reads 1.5 times motor rating. Do not exceed two times the motor rating, max. CW position.

F. IR Compensation Adjustment

IR compensation is provided to substantially improve load regulation. If the load presented to the motor does not vary substantially, the IR adjustment may be set at minimum level (approximately 1/4 of full setting). The control is factory adjusted to approximately 3% regulation. If superior performance is desired (less than 1% speed change of base speed from no load to full load), then the IR compensation should be adjusted as follows:

**Excessive IR compensation will cause the control to become unstable, which causes motor cogging.**

1. Set the IR compensation trimpot at approximately 25% of CW rotation. Run the motor unloaded at approximately 1/3 speed and record RPM.

2. Run the motor with maximum load and adjust the IR compensation trimpot so that the motor speed under load equals the unloaded speed per step 1.

3. Remove the load and recheck unloaded RPM. If unloaded RPM has shifted, repeat procedure for more exact regulation.

The speed controller is now compensated to provide minimal speed change under large variations of applied load.
"OFF" POSITION.
5V" POSITION.
"RESET" POSITION.
ARNESS ASSEMBLIES 514851, 529701.
MOTOR CONTROLLER, 8.2K
PARALLEL WITH R17 SHOULD
Wires Attached As

SOURCE DOCUMENT B-529870 REV-A