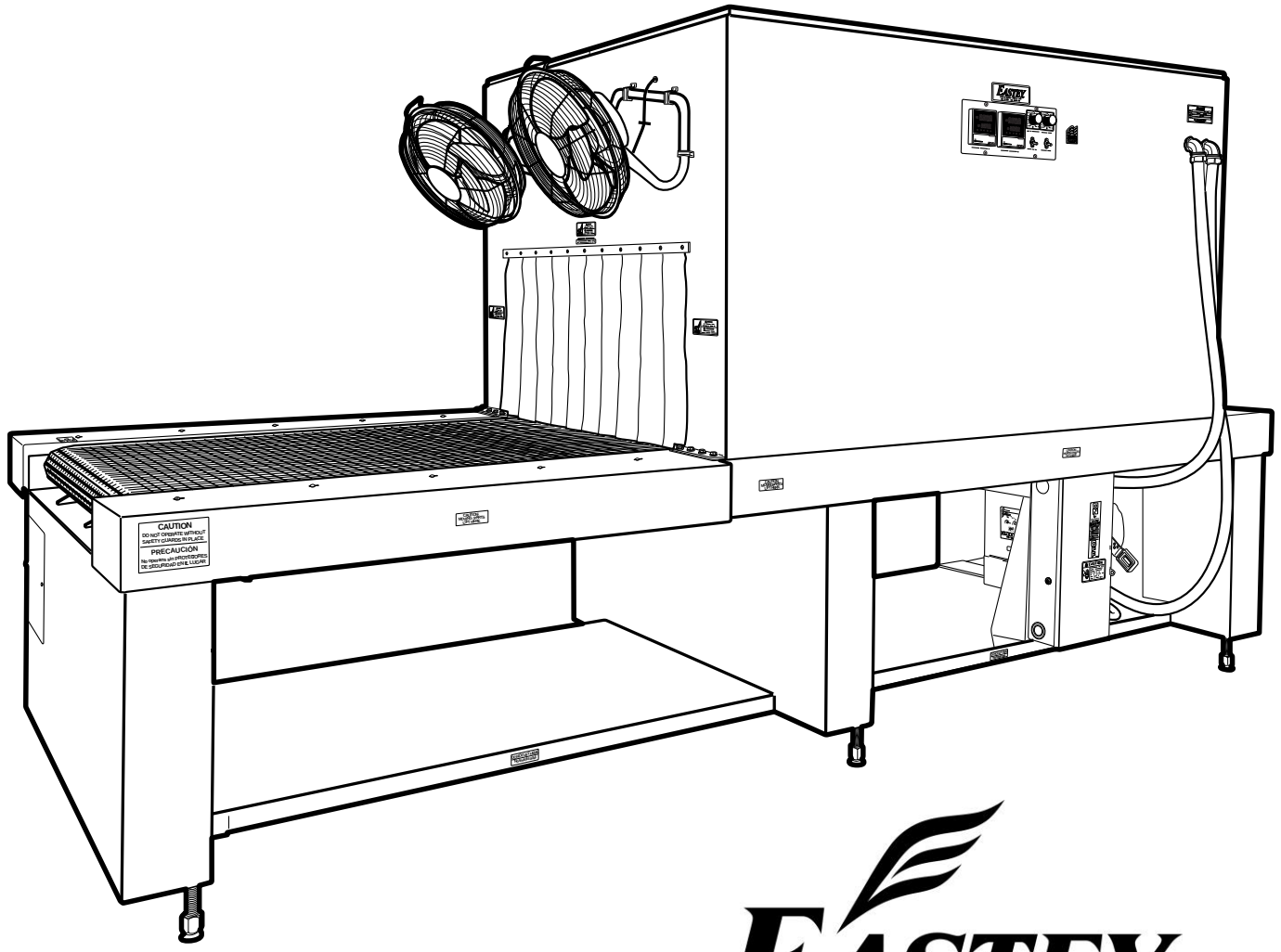
ETB

**ETB2416, ETB2420, ETB3616, ETB3620,
ETB4816, ETB4820, ETB5616, ETB5620,
ETB7016, ETB7020**

Professional Series
Bundling Tunnels

User Guide



EASTEY®

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User Guide

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Contents

Safety

Read this manual carefully and make it available to everyone connected with the supervision, maintenance, or operation of this machine. Additional copies are available on request (Eastey.com/contact-us).

The development of a good safety program that is rigidly enforced is absolutely imperative when involved in the operation of industrial equipment. Our machinery is well designed and includes extremely important safety features. However, proper installation, regular maintenance, and safe operation procedures are of far greater importance for safety of the operator and others than our design. Only properly-trained individuals following rigidly enforced safety rules, as recommended by ANSI and OSHA should be allowed to operate these machines.

Be very careful when operating, adjusting, or servicing this equipment. If in doubt, stop and obtain qualified help before proceeding.

General Safety Precautions

Before installing, operating or servicing this equipment, please read the following precautions carefully:

- Always disconnect electrical power before attempting maintenance for any electrical or moving parts. Do not place hands, head, or any part of the body inside the confines of the machine unless the mechanism is securely fastened and the electrical supply is shut off.

- Do not tamper with electrical wiring. Use only the specified power-supply cable. Use only licensed electricians to check or repair electrical wiring.

- In order to prevent damage to the machinery or injury to personnel, do not increase the factory settings on either the electrical or mechanical overload safety devices. Do not operate a machine if such modifications have been made.

- Keep hands away from moving conveyors and moving parts. Conveyor belts that have become worn or frayed can be hazardous and should be replaced promptly.

- Never operate this or any moving equipment without all covers and guards in place. The internal mechanism of most packaging machinery contains numerous shear, pinch, and in-running nip points, many of which are capable of causing severe injury and permanent disfiguration.

- To minimize the potential for personal injury, always be sure that the machine operators and others working on the machinery are properly trained in the correct usage of the equipment and properly instructed regarding the safety procedures for operation.

- Tunnel sides and conveyor surfaces can become very hot after a period of use. Keep hands away while in operation and use caution if the machine has been running recently.

- Do not make any modifications to either the electrical circuitry or the mechanical assemblies of this machinery. Such modifications may introduce hazards that would not otherwise be associated with this machinery. Eastey Corporation will not be responsible for any consequences resulting from such unauthorized modification. Do not operate a machine if any modification has been made

- This equipment is designed for indoor operation in a typical clean, dry factory environment. Do not operate the machine in any extremely wet or oily environment that may exceed operating specifications. Outdoor use is not recommended.

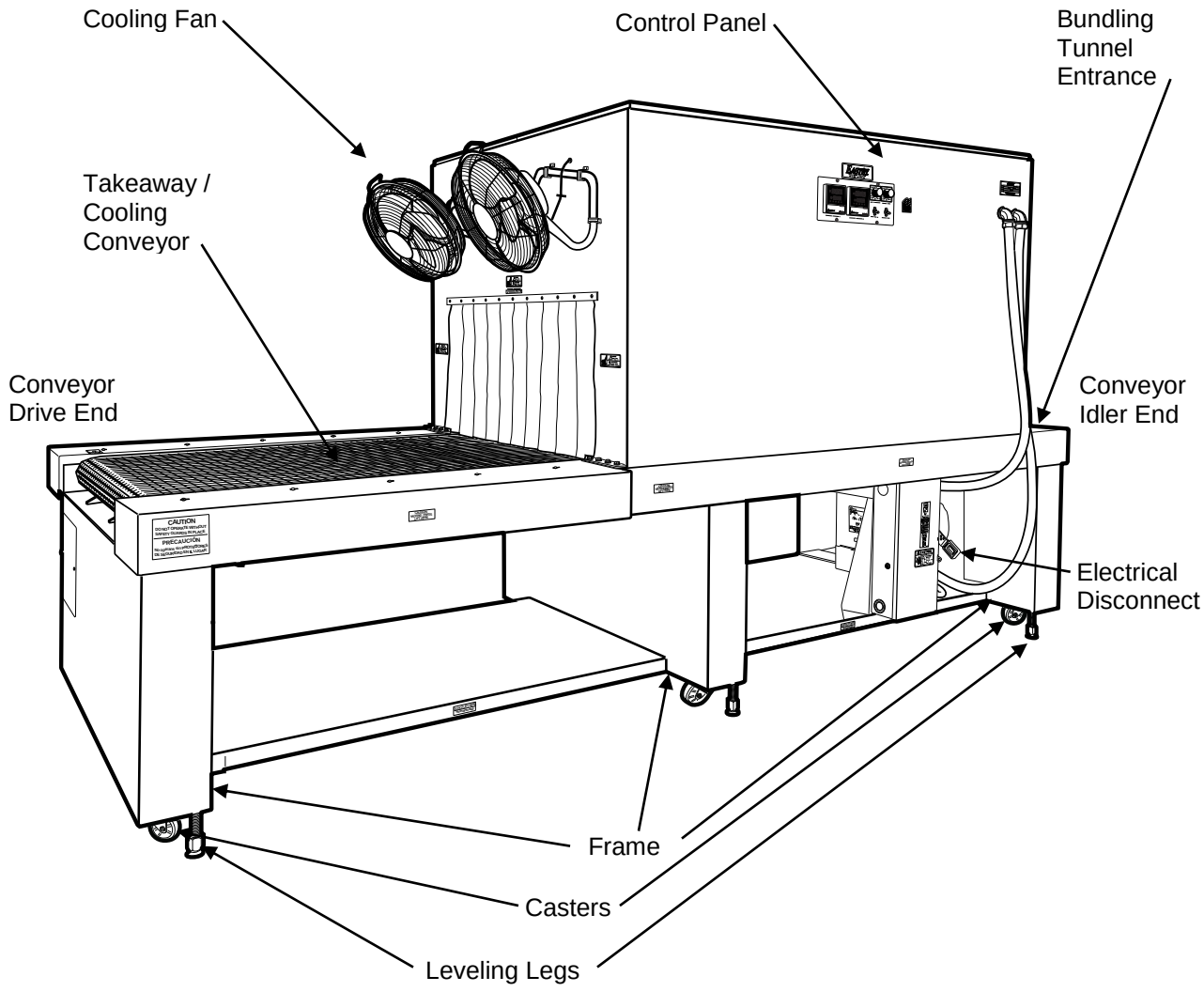
- The use of certain types of plastic films in sealing and/or shrink-wrapping equipment may result in the release of hazardous fumes due to degradation of the film at high temperatures. Before using any plastic film in this equipment, the manufacturer or supplier of the film should be contacted for specific information concerning the potential release of hazardous fumes. Adequate ventilation should be provided at all times.

- Keep combustible materials away from this equipment. The equipment may be a source of ignition.

- Do not wear loose clothing such as ties, scarves, jewelry, etc. Long hair should be pulled back and/or covered while operating this machine.

Introduction

General System Description



Specifications

Table 1 Machine Dimensions

Model Number	Machine Dimensions			Chamber Dimensions			Conveyor Length
	Width	Height	Length	Width	Height	Length	
ETB2416	43 in. 109 cm	56-72 in. 142-182 cm	149 in. 378 cm	24 in. 60 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB2420	43 in. 109 cm	56-72 in. 142-182 cm	149 in. 378 cm	24 in. 60 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB3616	55 in. 139 cm	56-72 in. 142-182 cm	149 in. 378 cm	36 in. 91 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB3620	55 in. 139 cm	56-72 in. 142-182 cm	149 in. 378 cm	36 in. 91 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB4816	67 in. 170 cm	56-72 in. 142-182 cm	149 in. 378 cm	48 in. 121 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB4820	67 in. 170 cm	56-72 in. 142-182 cm	149 in. 378 cm	48 in. 121 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB5616	75 in. 190 cm	56-72 in. 142-182 cm	149 in. 378 cm	56 in. 142 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB5620	75 in. 190 cm	56-72 in. 142-182 cm	149 in. 378 cm	56 in. 142 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB7016	89 in. 226 cm	56-72 in. 142-182 cm	149 in. 378 cm	70 in. 177 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm
ETB7020	89 in. 226 cm	56-72 in. 142-182 cm	149 in. 378 cm	70 in. 177 cm	16-20 in. 40-50 cm	78 in. 198 cm	147 in. 373 cm

Table 2 Standard Power Requirements

Model Number	Standard Power		
	Volts	Amps	Phase
ETB2416	480	30	3
ETB2420	480	30	3
ETB3616	480	50	3
ETB3620	480	50	3
ETB4816	480	100	3
ETB4820	480	100	3
ETB5616	480	100	3
ETB5620	480	100	3
ETB7016	480	100	3
ETB7020	480	100	3

Table 3 Machine Weights

Model Number	Net Weight	Shipping Weight
ETB2416	1900 lbs. 861 kg.	2000 lbs. 908 kg
ETB2420	1900 lbs. 861 kg	2000 lbs. 908 kg
ETB3616	2200 lbs. 997 kg	2300 lbs. 1043 kg
ETB3620	2200 lbs. 997 kg	2300 lbs. 1043 kg
ETB4816	2600 lbs. 1179 kg	2700 lbs. 1224 kg
ETB4820	2600 lbs. 1179 kg	2700 lbs. 1224 kg
ETB5616	2900 lbs. 1315 kg	3000 lbs. 1360 kg
ETB5620	2900 lbs. 1315 kg	3000 lbs. 1360 kg
ETB7016	3200 lbs. 1451 kg	3300 lbs. 1496 kg
ETB7020	3200 lbs. 1451 kg	3300 lbs. 1496 kg

Table 4 Voltage and Phase Options

Voltage / Phase Designator	Volts	Phase
V2	220	3
V4	380	3
V6	480	3

Table 5 Belt Designator

Belt Designator	Belt Type
PB	Plastic Belt

Table 6 Belt Dimensions: High-Temperature Plastic Belt

Model Number	Nominal Width / Belt Width	Conveyor Length	Total Plastic Belt Length	Drive Chain
ETB2416	24 inches 60 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB2420	24 inches 60 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB3616	36 inches 91 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB3620	36 inches 91 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB4816	48 inches 121 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB4820	48 inches 121 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB5616	56 inches 142 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB5620	56 inches 142 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB7016	70 inches 177 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm
ETB7020	70 inches 177 cm	147 in. 373 cm	292 inches 742 cm	37 ¾ inches 95.89 cm

Explanation of Model Numbers

- E = Manufactured by Eastey Enterprises Inc., division of Engage Technologies
- T = Tunnel
- B = Bundler
- _ _ = 24, 36, 48, 56, or 70 — First two digits indicate the nominal width of the conveyor belt in inches: 24, 36, 48, 56, or 70 inch conveyor widths are available. (Chamber width will typically be approximately 2-½ inches wider than the conveyor.)
- _ _ = 16 or 20 — Remaining two digits indicate height of the bundling chamber in inches: 16 inch or 20 inch chamber height.

- _ _ = PB — Indicates plastic belt (plastic belt sections are linked together by metal rods).
- V _ = V2, V4, or V6 — Indicate the Voltage and Phase required for input power. V2 = 220V, three-phase; V4 = 380V, three phase; and V6 = 480V, three-phase. See Table 4 on preceding page.
- Additional letters and numbers after the voltage and phase indicate additional information if required.

Example:

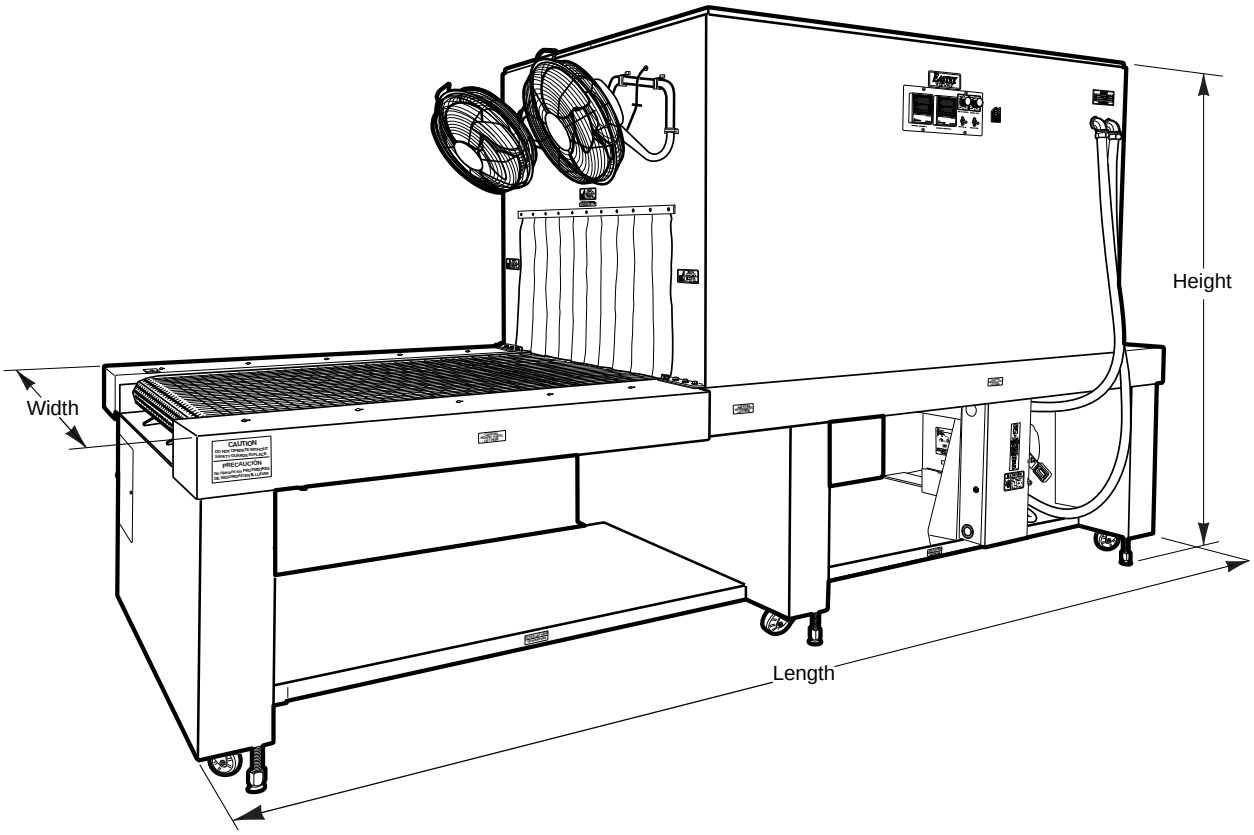
- Model number ETB5620-PBV6-nnnn: ETB indicates that it is an Eastey Tunnel Bundler. 5620 indicates the conveyor width is 56 inches (chamber width is approximately 58-½ inches) and chamber height is 20 inches. PB indicates that the conveyor uses a plastic belt, and V6 indicates 480 volts and three phase. If SP appears in the model number suffix, this indicates it is a custom model (special project) and the numbers following SP (final numbers of the model number) indicate the project number.

Standard features

- Designed to shrink-seal polyethylene film
- All-welded main frame from 12-gauge steel
- 78-inch chamber length to ensure proper shrinking of film
- High temperature belting resists wear
- Adjustable digital solid-state temperature control for a variety of films
- Four-directional air-flow provides positive shrinking
- Variable air-flow for a variety of products and applications
- Large ducting directs more air volume inside the tunnel
- Airflow is extended to the end of the chamber sides
- Four-foot product cooling conveyor at exit end.
- Exit cooling fans accelerate shrinking
- Delayed cool-down and over-temperature protection
- Heavy duty casters for transportation within plant
- Leveling legs provide a sturdy base once in place.
- Custom two-part epoxy finish resists scratching
- Available for 220V, 380V, or 480V, three-phase power input
- Easy to use design requires minimal training and maintenance, and trouble-free operation
- Made in the USA

Dimensions

See the table on page 10 (Machine Dimensions in Specifications table) for overall machine dimensions of width, height, and length.



Unpacking

Thoroughly inspect the equipment and packaging immediately on arrival.

Carefully remove the outer protective shipping wrapper. Inspect the machine for any damage that may have occurred during transit. If goods are received short or in damaged condition, it is important that you notify the carrier's driver before they leave your company and insist on a notation of the loss or damage across the bill of lading. Otherwise no claim can be enforced against the transportation company. Please note that a copy of this document is attached to the outside of every crate.

If concealed loss or damage is discovered, notify your carrier at once and **insist** on an inspection. This is absolutely necessary. A concealed damage report must be made within ten (10) days of delivery of shipment.

Unless you do this, the carrier will not entertain any claim for loss or damage. The agent will make an inspection and grant a concealed damage notation. If you give the transportation company a clear receipt for the goods that have been damaged or lost in transit, you do so at your own risk and expense.

All claims must be filled within **five** (**5**) months of the delivery date or the carrier will not accept them.

We are willing to assist you in every reasonable manner to help you collect claims for loss or damage. However, this willingness on Eastey's part does not make Eastey or its parent or related companies responsible for collections or claims or replacement of equipment damaged or lost in transit.

Installation

Lift the machine up and off of the shipping pallet.

CAUTION! **ETB Professional Series Bundling Tunnels are heavy and require a forklift, floor crane, or several people to move the machine safely. Use proper equipment when lifting the Bundling Tunnel and ensure it is secure and will not shift while being moved off the shipping pallet.**

Place the bundling tunnel in the desired location with the required electrical power source available. (See power requirements for the specific model in the Specifications table.) Make sure the electrical wiring is adequate to provide the required voltage. If the voltage provided is too low, the equipment will not operate correctly.

Selecting the proper location is one of the most important considerations for initial setup. When selecting the location, take into consideration the following factors.

1. Adequate power supply nearby?

2. Where is the bundling tunnel in relation to the power source?

3. Where is the bundling tunnel in relation to the sealer and any conveyor(s) necessary to move wrapped and bundled (finished) product? (Alignment with packaging line.)

4. Convenience for the operator.

Note: **Avoid locating the bundling tunnel in cold or drafty areas, as heat may be unintentionally drawn from the tunnel and reduce its efficiency.**

If there is any doubt, get qualified assistance with your initial installation.

Location Requirements

When installing the bundling tunnel please be aware of the following considerations:

1. The surface on which it is located is flat and level.

2. Conveyor or packing table height.

3. Alignment with packaging line.

When the bundling tunnel is positioned in the operating location you will need access to the control panel.

Provision should be made for finished exiting packages. For example, a table or bin where packages that have been sealed will be placed until they can be picked up or moved out.

Take into consideration the entrance conveyor height in relation adjacent machinery, such as the sealer feeding into it, for example.

The machine should be placed on a flat, level floor so that it does not rock or move. We recommend that the leveling feet be used to level the machine.

Set up the bundling tunnel and move it to its location. The casters allow easy movement over smooth flat surfaces.

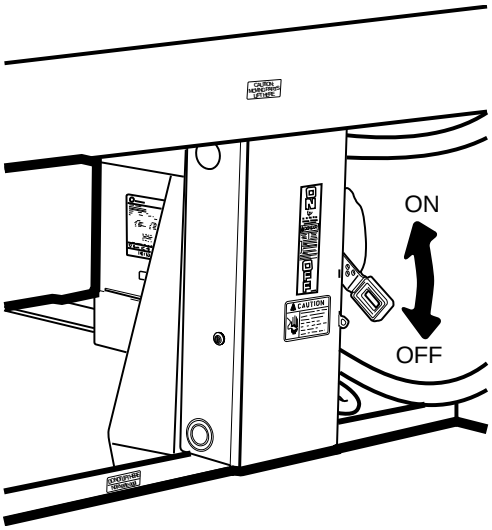
CAUTION! **If the bundling tunnel must be lifted for moving, use proper equipment when lifting and moving it to ensure it is secure and will not shift.**

When the bundling tunnel has been moved to its location, use the leveling legs to level the conveyor and adjust it to its final height. A power cord to the main electrical disconnect switch (with optional electrical plug) should be installed by a licensed electrician.

Refer to instructions in the Operation section for instructions to power up or shut down the machine.

Operation

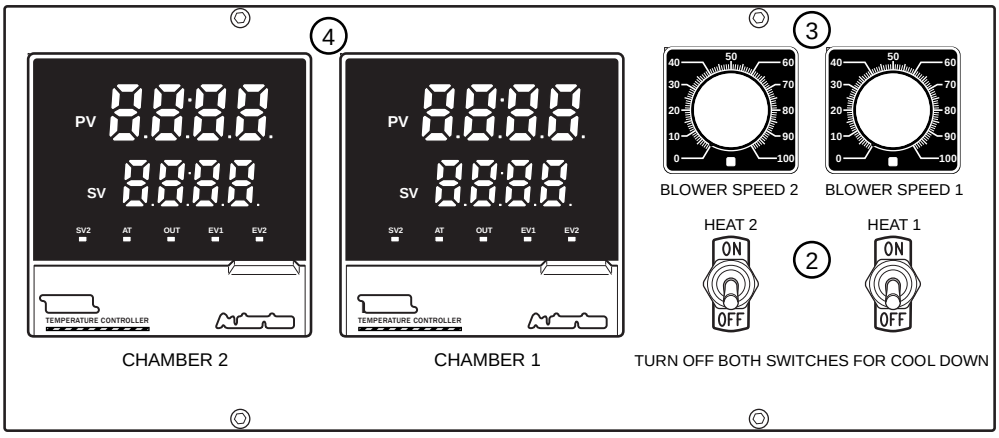
Main Power Disconnect

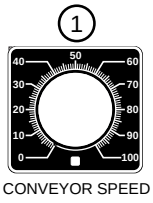


Power — The power disconnect switch is the lever with the orange handle on the right side of the electrical box below the tunnel.

- Lifting the lever to the On position turns on (connects) the system power necessary to power the Eastey Bundling Tunnel.
- Pushing the lever down to the Off position cuts (disconnects) all power to the system.

Control Panel





Controls for the bundling tunnel are located along the front side of the machine as shown in the figure. Controls from right to left are listed below.

1. **Conveyor Speed** — Speed setting dial control for controlling speed of the conveyor.

2. **Heater Banks On-Off Switches** — Toggle switches for turning banks of heaters on or off.

3. **Blower Speed Control(s)** — Speed setting dial control(s) for controlling speed of the blowers. (If only one blower speed dial is required, the “Blower Speed 1”

dial is in the position where “Blower Speed 2” is shown and “Conveyor Speed” dial is relocated to the location shown for “Blower Speed 1” in the Control Panel.

4. **Thermostat Controls** — Temperature settings and current temperature displays for each chamber.

CAUTION! **When the power is turned on be aware of heat inside of the tunnel and hot surfaces and moving belts or rollers.**

Sequence of Operation

1. Turn on power to the bundling tunnel by lifting the main power switch lever to the On position. (The temperature in the tunnel will be displayed on the thermostat controls.)

2. Turn the heater bank toggle switches to the on position. (These switches also control all motors.)

3. Set the conveyor speed control at about midrange until the exact desired conveyor speed is determined later (based on package size and sealer speed).

4. Set the temperature controller to the temperature recommended for your shrink-wrap material. This temperature may need to be adjusted higher or lower until you have achieved shrinkage that is satisfactory. Once the correct temperature for a product has been set, you should not need to adjust the temperature again as long as you are running the same product.

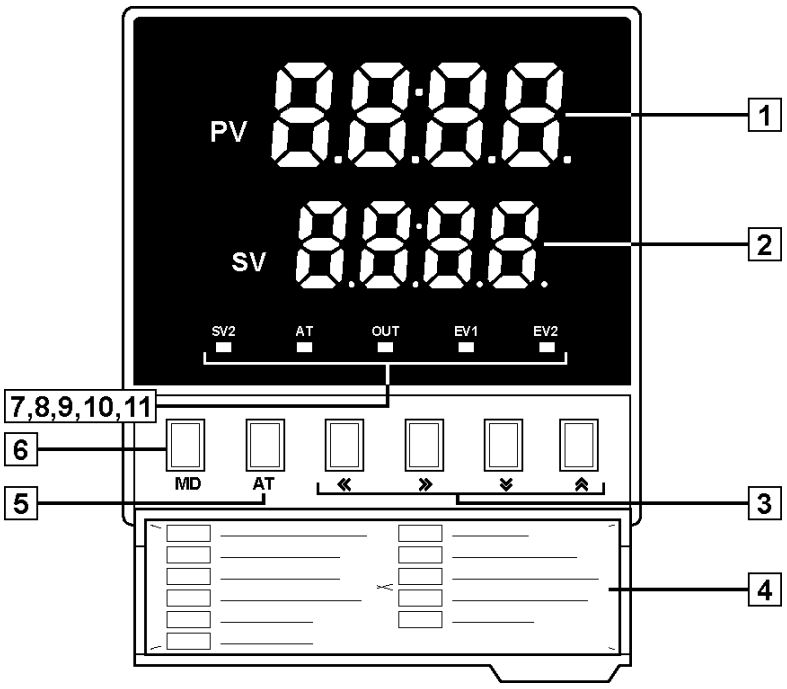
5. Set the motor speed of the blower(s) for proper air flow.

6. Turn on the product cooling fans. There is a three-speed selector switch on each cooling fan. Adjust the cooling fan speed to help shrink the film. (Polyethylene film shrinks as it cools.)

CAUTION! **When shutting down the tunnel, be sure to turn the heater bank switch (or switches) to Off. The tunnel will cool down and then automatically shut off. (Refer to the procedure for setting the cool-down temperature. Temperature will be displayed on the thermostat controls.) Once cool-down temperature is reached and motors have shut down, then turn off the main power switch.**

Adjustments

Temperature Controller Settings (ETC00011)



1. PV = Processing value (red in color).
2. SV = Setting value (green in color).
3. Back («), forward (»), down (⌄), and up (⌃) keys.
4. Programming key access door — Open to access programming keys.
5. AT key: the mode key to execute Auto Tuning function.
6. MD key: the mode key to change items to be set, such as set value, etc.
7. EV2: Event 2 output signal lamp.
8. EV1: Event 1 output signal lamp.
9. OUT: Main output light to indicate when heater banks are on.
10. AT: Signal lamp flashes while unit is auto-tuning.
11. SV2: Not currently used.

To Change the Set Value

1. Press the left-arrow («) button and a digit will begin to flash. The flashing digit indicates the digit whose value can be changed by pressing the down- (»˅) or up-arrow (»˄) buttons.

2. If necessary, press the left- («) or right-arrow (») to shift to the place of the digit that needs to be changed. (The digit to the left or right will begin flashing.)

3. Press up (»˄) or down (»˅), as required to change the flashing digit to the required value.

4. Repeat instructions 2 and 3 above as necessary until all digits have been set to the required value, and then press the MD button. No digits will be flashing, the new value entered is applied.

To adjust the Delay Cool-Down

The SV, for Set Value (also sometimes called the set point), is factory set to 400°. If you change this value, you must make the following adjustment to ensure that your equipment will automatically shut down at 150°.

PV, the Process Value is the actual temperature in the machine. PV and SV are mentioned in this procedure, but they are only displayed at the beginning of the procedure.

1. Press and hold the MD button until SV-1 is displayed.

2. Press the MD button (do not hold it down) repeatedly to scroll through the menu until LOC is displayed.

3. Press the left-arrow key. (ON will begin flashing.)

4. Press the down-arrow key. (ON will turn to OFF and OFF will be flashing.)

5. Press the MD button. (OFF will stop flashing.)

6. Press MD again. (This will bring you back to SV-1.)

7. Press MD again until AL-1 is displayed.

8. AL-1 is set to 250°. Optimum shut-down should be 150°.

Factory settings are as follows:
SV (Set Value, your set point) is set to 400°.
AL-1 is set to 250°

400° - 250° = 150°

To set AL-1 so the machine will shut down at 150°, press the left-arrow key and the right-most digit will flash. Use the up- or down-arrow key to select the digit, and then press the left-arrow key again. Use the up- or down-arrow key to set the digit and repeat until the correct value is displayed. Press MD to lock in the setting.

9. Press MD and scroll through the menu until LOC is displayed.

10. Press the left-arrow key. (OFF will begin flashing.)

11. Press the up-arrow key. (OFF changes to ON, and ON is flashing.)

12. Press MD. (On stops flashing.)

13. Press and hold the MD key until PV and SV temperatures are displayed.

Maintenance

To aid in the high reliability of the bundling tunnel, inspect the machine regularly and perform maintenance as required. Disconnect electrical power before making any repairs. Be very careful when servicing or adjusting this equipment. If in doubt, stop and obtain qualified help before proceeding.

CAUTION! When replacing motors, if the tunnel chamber is below 160 degrees, the heater bank switch may need to be turned on to apply power to motors for testing.

Preventative Maintenance

Perform the following maintenance checks each month.

- ☐ Check and clean the intake screens.
- ☐ On dead roller tunnels, clean and lubricate the conveyor chains. Check the chains and adjust as needed.
- ☐ Check the condition of the silicone covering on the rollers. Repair or replace as necessary.
- ☐ On mesh belt conveyors, check the mesh for material stuck in or on the belt. Check and adjust the belt tension as needed.
- ☐ Check and clean the motor-to-conveyor drive chain. Adjust tension as needed.
- ☐ Check for loose fasteners. Tighten as necessary.
- ☐ Check the condition of the power cord for wear, especially if it is exposed to traffic.
- ☐ Check that the tunnel is able to maintain the set temperatures. If not, refer to the Adjustments Section of this User Guide for instruction.
- ☐ Check that you are able to vary the conveyor speed. If not, refer to the Adjustments Section of this User Guide for instruction.
- ☐ Check for overall wear on dead roller guide rails and starter rails. Repair as needed.
- ☐ On mesh-belt conveyors, check the condition of the wear rails. Replace as needed.
- ☐ Check the condition of all warning and instruction labels. Replace as necessary.

Preventative Maintenance for Modular Plastic Conveyor Belts

Modular plastic conveyor belts typically do not require day-to-day maintenance and are generally trouble-free when installed and operated properly.

Following are a few recommendations to obtain maximum life of the belt and avoid down-time.

- ☐ Check belt tension on a routine basis (weekly or monthly) to ensure proper drive. Adjust screw take-up if necessary. (Belts experience thermal expansion while hot.)

- ☐ Sprocket alignment should be checked before installing the belt to ensure that all the teeth are in line. (A misaligned sprocket can cause the belt to break or go off track.) On round-bore sprockets, it is good practice to check the keyways and tighten keyway setscrews when required.

- ☐ If a small section of the belt or a module breaks, it is important to replace it as soon as possible. Failure to do so could incur further damage to the belt. Try to determine the cause of the break before restarting to avoid the break from happening again.

  Make sure that when you join the belt, the metal connecting rod is locked in with a plastic tab.
  - To replace a belt section See the Belt Assembly and Disassembly section that begins on page 30 and outlines procedures To assemble the belt on page 31 and To disassemble the belt on page 32.
  - Remove a steel connecting rod by pulling it out from the left.
  - To lock the tab in, put the tab in from the top of the belt and press it into place.

- ☐ When performing repairs to the conveyor, it is important to remove or protect the belt to avoid damage from welding sparks or from other tools.

Avoid using the belt for uses other than for what it was specified. If you need to utilize the belt in a different application, consult the manufacturer first.

Conveyor Belt Tension Adjustment

Check the belt tension of the package conveyor occasionally to ensure that it is not excessive, as this will cause unnecessary wear on the conveyor sprockets. The belt should touch the lower rails approximately 11 inches in from the outside edge of the leg.

To check or adjust tension, shut off power to the tunnel, remove the drive end caps, and loosen the two outer jam nuts on the drive end of the conveyor. Adjust the tensioning bolts as required to for correct belt tension. (Belt should touch lower rails approximately 11 inches in from the outside edge of the leg). If there is no more adjustment available through the tensioning bolts, a link can be taken out. To remove a link, loosen the belt by removing two (2) pins. (Remove the plastic keeper tab on the end of the pin.) Eliminate one row of links, pull the conveyor belt together, and reinsert one (1) l pin. A new plastic keeper must be used to hold the pin in place.

For 48-inch width and larger tunnels, loosen center shaft support on drive end and adjust if necessary.

Replacing Conveyor Components

Caution! Disconnect main power source before performing any procedure to replace any conveyor component(s).

Idler, roller shaft, bearings, or sprockets replacement

Refer to the Conveyor belt tension adjustment section above to open up the conveyor belt by removing a set of plastic keeper tabs and pins. Note the location and orientation of sprockets (make a sketch and note measurements if necessary). Loosen the jam nuts on the tensioning bolts at the drive end of the conveyor. Remove the four (4) ¼-20 bolts for the bearings. Slide the shaft left or right and then the shaft and sprockets will come off. Identify and replace any damaged or worn parts and reassemble in reverse order of disassembly.

Drive shaft, bearings, or sprockets replacement

Refer to the Conveyor belt tension adjustment section above to open up the conveyor belt by removing plastic keeper tabs and pins. Remove the drive end caps. Disconnect the conveyor belt by removing the plastic keeper and pin. Note the location and orientation of sprockets (make a sketch and note measurements if necessary). Loosen four (4) set screws on the drive sprockets. Keep the keyway key for the driveshaft and replace as necessary. Slide the shaft left or right. The shaft sprockets must be adjusted for position. All sprockets are fastened to the shaft by set screws. Identify and replace any damaged or worn parts and reassemble in reverse order of disassembly.

Conveyor motor replacement

Shut off the machine and disconnect main power. Remove the drive end cap, disconnect two (2) electrical wires from the drive motor, and disconnect the motor from the drive chain by removing four (4) bolts that hold the drive motor. Remove the sprocket from the old motor and place it on the new drive motor and reassemble parts in the same as they were disassembled. For electrical connections, refer to the electrical schematics.

Replacing Tunnel Components

Heater bank replacement

Shut off the machine and disconnect main power. Remove the side panel cover. Pull insulation out. Marking the wire positions so they can be reconnected in the same positions, remove the wires on the heater bank with a 3/8-inch nut driver, and then set the wires off to the side. Noting the heater bank position so it can be replaced in the same position, remove the heater bank. Reassemble components in the same manner in which they were disassembled.

Important! **Ensure that the heater bank frames are pushed completely in. The end of the frame should be flush with the housing.**

Temperature controller replacement

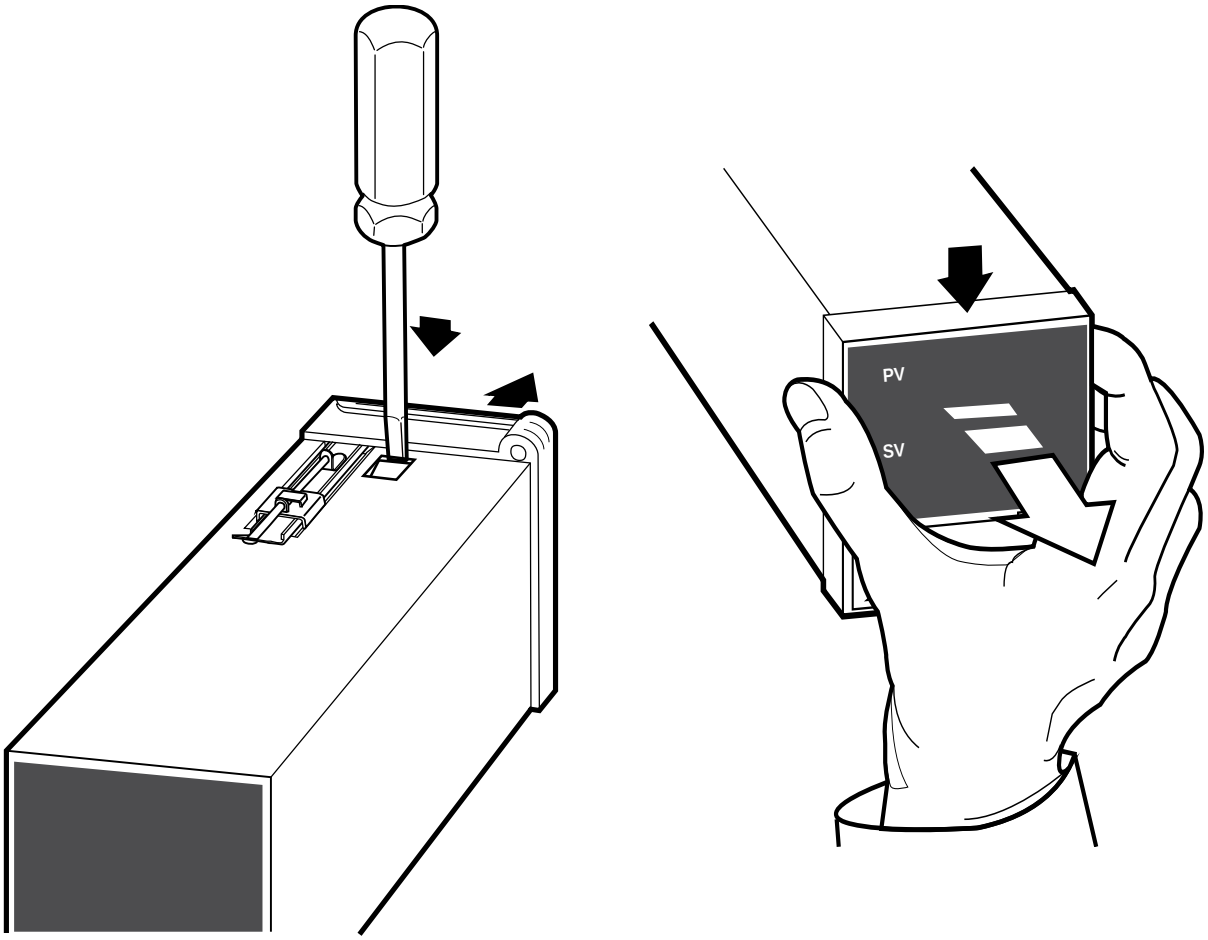
Note: **Shut off power to the machine before opening the panel door on the side of the machine to access internal electronics and temperature controller.**

There are two options for removing the temperature controller.

1. The first and easiest option is to remove and replace only the controller, which reuses the receptacle sleeve and leaves all wiring intact.

2. The second option is to disconnect all wiring and replace the controller and sleeve together.

To reuse the housing and replace only the interior components of the controller, use a flat screwdriver to carefully press down on the tab, inside on top of the controller. (Take care to not break or deform the tab permanently. See the following illustration.) While the tab is depressed, pull on the front face of the controller to slide it out of the housing.



For the second option (to replace entire controller and receptacle), first take note of wire locations (make a sketch and label the wires with tape, if necessary), and then disconnect wires from the temperature controller and thermocouple. Slide the controller and receptacle out of the front of the panel. Replace with a new controller and reconnect wires to the temperature controller and thermocouple. (Refer to notes made during disassembly or the electrical schematic if necessary.)

Warning: If there is no control over heat, interchange the thermocouple wires.
Caution: Do not exceed 500 degrees.

Blower motor replacement

Shut off power to the machine. Remove the top lid on the hood of the tunnel. Disconnect the wires on the blower motor(s). (Note: there may be more than one blower motor.) Remove four (4) 5/16-18 bolts on the motor mount(s). Once the blower housing is out and on the bench, loosen the two (2) set screws holding the blower wheel in place. The blower wheel shaft set screws are installed with thread-locking compound and may require a torch to remove the blower wheel — if force is necessary, apply it between the motor and blower wheel hub. Remove the motor mount bolts and remove

and replace the motor. Rotation on the blower motor needs to be counter-clockwise as viewed from the electrical inlet and hub side. Reassemble the new motor and blower wheel housing and reassemble components in the same manner in which they were disassembled.
Note: Do not rest blower housing on blower wheel! Blower wheel will not work if bent or out of balance.

Blower wheel replacement

Shut off power to the machine. Refer to **Blower motor replacement** instructions above.

Placement of upper wear rails

Shut off power to the machine, move the conveyor by hand if necessary to gain access. Remove the #10-32 screw on the idler end. Replace parts in the same manner in which they were disassembled.

Chamber cooling fan motor replacement

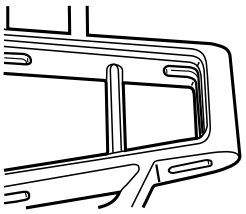
Shut off power to the machine. Remove the top lid of the hood. Disconnect the wires. Remove four (4) ¼-20 screws which hold the cooling fan motor in place. Take the motor out of the machine, replace with the new motor, and reassemble with four (4) ¼-20 screws removed earlier. Reconnect wires to new motor and

Belt Assembly and Disassembly

When repairing or replacing the belt, it is important to orient the belt correctly.

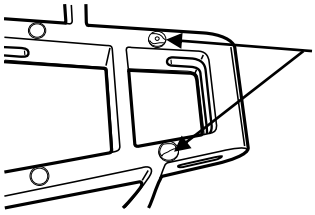
- The top side of the belt is relatively smooth and the ribs are recessed.

Top view



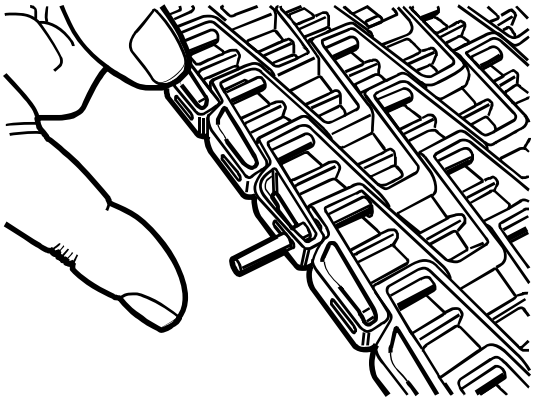
- The bottom side of the belt has metal disks visible and the ribs are flush.

Bottom view

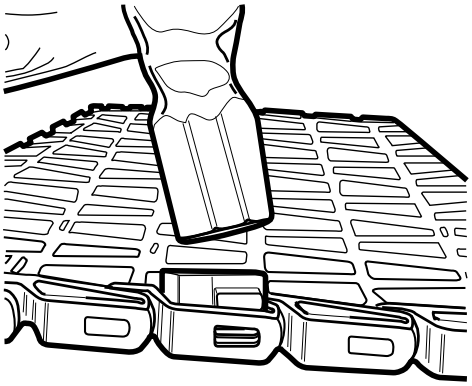


To assemble the belt

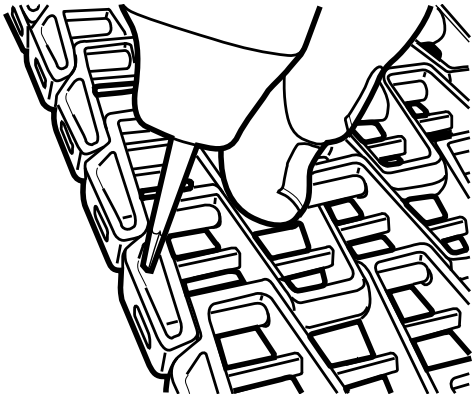
1. Bring ends of the belt together, and aligning holes, insert metal rod through holes for the entire width of the belt.



2. Insert a plastic retainer clip into place to retain the metal rod. Use a hammer, if necessary, to gently tap the retainer clip into place.

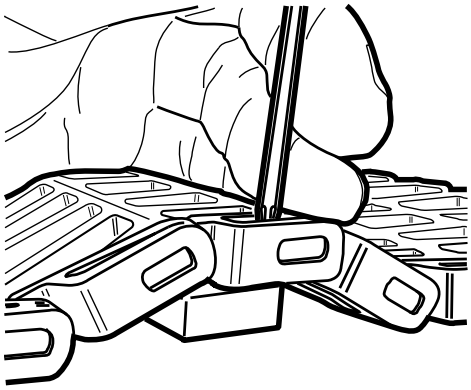


3. Use a flat-blade screwdriver to give the retainer clip a “double click” to finish seating it in place

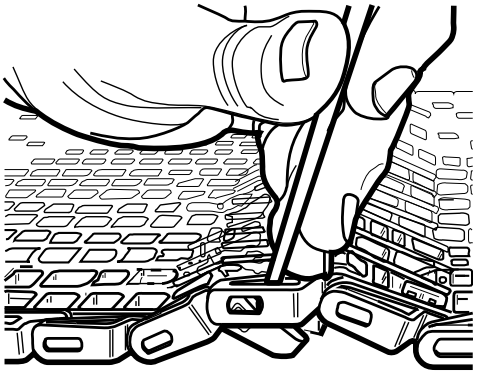


To disassemble the belt

1. Place a block under the belt and place the belt upside-down over the block, so the link to be opened is positioned close to the block.



2. Use a screwdriver to push down on the retainer clip to unseat it.



3. Continue to push down on the retainer clip to move it out of the end link.

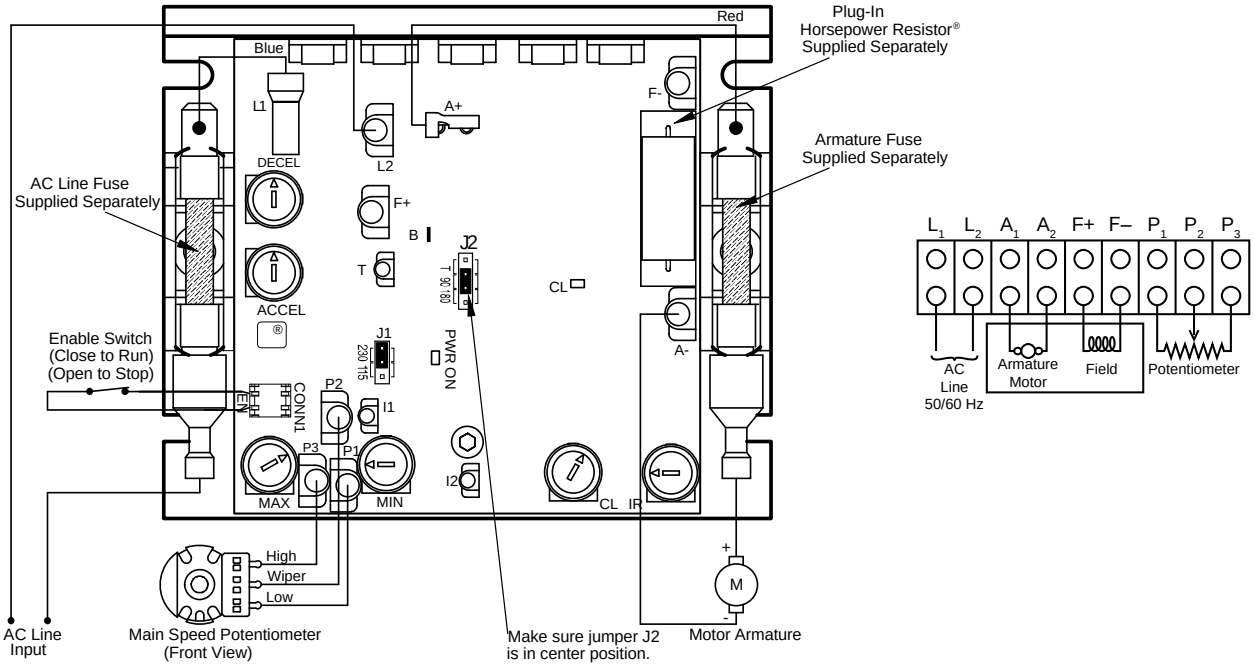
4. Slide the metal rod out to unlink the belt and the belt will unzip.

Troubleshooting

The following illustration shows the D.C. board used in the bundling tunnel. Some of the solutions to problems identified in the troubleshooting table that follows refer to adjustments made by tuning potentiometers on this board.

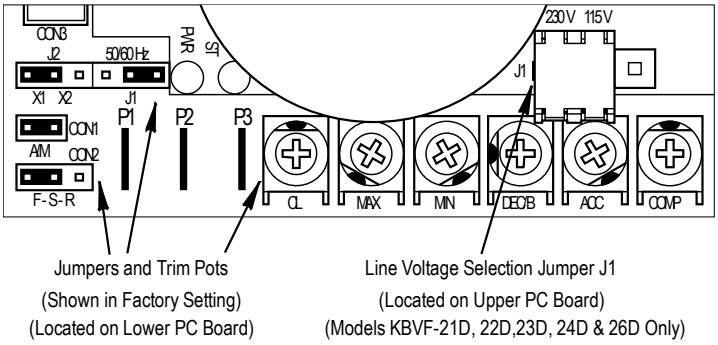
Basic KBMM™ Controller Board Connection Diagram **KBMM™ with Barrier Terminal Kit**

CONTROL LAYOUT & GENERAL CONNECTION DIAGRAM (Model KBMM-225D Shown)
(Note: Control is set for 208/230 VAC line input, 0-180 VDC output with armature feedback)



For more information refer to the *KBMM™ Installation and Operation Manual* (provided by the D.C. board manufacturer).

Problem	Solution
Conveyor not moving	1. The conveyor motor is controlled by a D.C. control board. Input is 220 VAC in and variable 0 to 90 VDC out. 2. Is a green light on? If not, check the input fuse. 3. If fuse is good and a green light is not on, check for 220 VAC on L1 and L2. If there is voltage, check the output DC voltage. 4. Check output fuse. 5. The KBMM-225 has a current overload. Is there a red light on the board? If so, below are some conditions that could cause this light to turn on. • This could be caused by a jammed conveyor. • Locate the ceramic horsepower resistor and check its resistance. If the ohmmeter indicates open (infinite resistance), the resistor is damaged; replace it — but, there is a reason the resistor went out. There will be a point number (for example, .1 or .25) you will need this number when ordering a replacement resistor. • The motor is pulling more amps than the board is allowing. Try adjusting the CL potentiometer on the motor controller board. • Bad idler or drive bearing. 6. If the red light is on, disconnect the drive motor from the drive chain. Power up the machine and operate the motor without any load and see if the red light goes off. If the board works and the red light does not light, it does not mean that the motor is good; it could be weak under load. Check the brushes. Also pull the conveyor by hand, checking to make sure it pulls smoothly and checking for bad bearings. 7. If the light remains on, replace the motor. 8. If the red light is not on and a green light is, with the speed pot set at 100%, check for 90 VDC on terminals A+ and A–. If voltage is not correct, try adjusting the MAX potentiometer to obtain 90 VDC.

Problem	Solution
No air flow	1. Check AC Inverter adjustable speed pot settings below. • C.L.: Set at approximately 12 o'clock. • Max.: All the way counter-clockwise. • Min.: All the way clockwise. • ACC.: All the way clockwise. • Comp.: Set at approximately 12 o'clock. Detail View of Jumpers and Trim Pots  **Important Application Information:** Motor with External Fan Cooling – Most totally-enclosed fan-cooled (TEFC) and open-ventilated 3-phase AC induction motors will overheat if used beyond a limited speed range at full torque. Therefore, it is necessary to reduce motor load as speed is decreased. **Note:** Some fan-cooled motors can be used over a wider speed range. Consult the motor manufacturer for details. ⚠ **WARNING!** Some motors have low speed characteristics which cause overheating and winding failure under light-load or no-load conditions. If the motor is operated in this manner for an extended period of time, it is recommended that the unloaded motor current be checked from 1–15 Hz (60 – 450 RPM) to ensure motor current does not exceed the name-plate rating. Do not use motor if the motor current exceeds the nameplate rating. 2. Check intake screens inside upper chamber to see if they are clogged. 3. Blower motors are controlled by 220 volt single-phase input and three-phase output. (Check lead to lead. Not lead to ground.) 4. Is there a steady green and a slowly-flashing green light? If not, check input fuses. If fuses are good, replace AC inverter. 5. If there is a steady green light and not a slowly-flashing green light, refer to the table that follows for information about what the flashing LEDs indicate.

LED	Drive Status	Color and Flash Sequence	Flash Rate	Color and Sequence After Recovered Fault
	Normal Operation (Run)	Green	1 sec. On / Off	—
	Overload (120% – 160% Full Load	Red	On continuously	Green
	I^2t (Drive Timed Out)	Red	0.25 sec. On / Off	—
	Short Circuit	Red	1 sec On / Off	—
	Under-Voltage	Red / Yellow	0.25 sec. On / Off	Red / Yellow / Green
	Over-Voltage	Red / Yellow	1 sec. On / Off	Red / Yellow / Green
	Stop	Yellow	On continuously	—
	Phase Loss Detection[1,2]	Yellow	0.04 sec. On / 0.06 sec. Off	—
	Communication Error[2]	Green / Red	1 sec. On / Off	Green
PWR (Power)	Bus and Logic Power Supply	Green	On continuously	—

Notes:

1. Phase Loss Detection: Models KBVF-23P, 24P, 29, 45, 48.
2. Requires AC line restart.
3. With DVF Modbus Communication Module Installed.
4. All LED flash rates after recovered faults are 1 sec. On / Off.
5. Drive will require manual restart to return the Status LED color to its normal flashing green state.

Problem	Solution
No air flow (Continued)	6. If one motor is running and one is not, replace the faulty motor. 7. If all motors are not running, check for approx. 220 VAC output voltage. If there is no voltage and the green lights are on and slowly flashing, replace the AC inverter. (Remember this is three-phase: test from lead to lead. Do not test to ground.) U to V, U to W, V to W. If you lose voltage on one of these legs, replace the AC inverter. 8. One bad motor could cause the steady-flashing green light to change. Disconnect all motors and run one motor at a time to find the bad motor. 9. Motors should be running counter-clockwise. Check that all motors are running the correct direction. If not, change the two output terminals to obtain correct phase.

Problem	Solution
No heat	1. Is the display on the temperature controller on? If not, check for 220 Volts on terminals 9 and 10. If there is voltage, replace the temperature controller. 2. If the display is on and SV is set higher than PV, is there a red light on? If not, replace the thermocouple. 3. If there is a red light on, check for 220 VAC from any wire number 8 to terminal 13, and then terminal 14. If no voltage, replace the temperature controller. 4. If there is 220 VAC, check for 220 VAC on coil of heater contactor. If there is voltage and the contactor is not pulling in, replace contactor. 5. If there is no 220 VAC, check heater bank on / off switch. The best way to check this is to disconnect the wires and check resistances (Ohms).
Delay cool-down does not work	Adjust temperature controller TT1 using the menus, Menu #1 and Menu #2, that follow. Refer to adjustment procedure to adjust the Delay Cool-Down setting.

Temperature Controller Default Settings

Menu 1

Temperature Controller 1

In-t	-	JIC.H
Eu-1	-	AL-4
Eu-2	-	AL-5
AL-T	-	AL-B
AT.T	-	TUN1
PIDT	-	PID.F
O-FT	-	HEAT
Unit	-	°F
H-SC	-	450°
L-SC	-	32
Ramp	-	OFF
LOC	-	ON

Temperature Controller 2

In-t	-	JIC.H	(same as 1)
Eu-1	-	AL-0	
Eu-2	-	AL-5	
AL-T	-	AL-B	(same as 1)
AT.T	-	TUN1	(same as 1)
PIDT	-	PID.F	(same as 1)
O-FT	-	HEAT	(same as 1)
Unit	-	°F	(same as 1)
H-SC	-	450°	(same as 1)
L-SC	-	32	(same as 1)
Ramp	-	OFF	(same as 1)
LOC	-	ON	(same as 1)

Menu 2

Temperature Controller 1

Su-2	-	32
AL1	-	250
AL2	-	450
AHYS	-	10
P	-	9.5
I	-	48
D	-	12
T	-	50
IN-B	-	-4
REST	-	2.0
LOC	-	ON

Temperature Controller 2

Su-2	-	32	(same as 1)
AL1	-	N/A	
AL-2	-	450	(same as 1)
AHYS	-	2	
P	-	9.5	(same as 1)
I	-	48	(same as 1)
D	-	12	(same as 1)
T	-	50	(same as 1)
IN-B	-	-4	(same as 1)
REST	-	2.0	(same as 1)
LOC	-	ON	(same as 1)

Parts List

Electrical

Eastey Bundling Shrink Tunnel

Part No.	Description
EAST0349	A/C Speed Control
ETL00301	Contact Auxiliary 3 Pole
ETL00101	60 Amp 220V 3 Pole Contactor
EAST0315A	DC Board Dial Kit
EAST0315	DC Board With Potentiometer
ESC00071	.05 DC Motor Control Resistor Used With ¼ HP Conveyor Drive Motor
ESC00073	.025 DC Motor Control Resistor Used With ½ HP Conveyor Drive Motor
EAST0210	Fuse 1 Amp 3AG
ET000185	Fuse 2.5 Amp Ceramic
ET000186	Fuse 5 Amp Ceramic
ETL00200	Fuse 15 Amp 250V (Medium)
ETL00240	Fuse 15 Amp Ceramic
ET000204	Fuse 4 Amp 240V Glass
ET000205	Fuse 10 Amp 240V Glass
ET000301	Fuse 10 Amp 250V (Medium)
ETL00235	Fuse 50 Amp 250V
ETL00102	60 Amp 250V Fuse
ET820234	Fuse 80 Amp
ET820003	Fuse 100 Amp
ETC00125	Fuse Block 30 Amp 250V
EAST0077	Fuse Holder Small
ETC00204	Large Ground Lug
EAST0034	Relay Base
ET000501	Relay Base For Over Temp
ET000500	Relay For Over Temp
ET820016	Relay Top 240V

Part No.	Description
ETC00311	Switch Heater Bank On/Off
ETC00310	Switch On/Off Plate
ETC00011	Temperature Controller
ETC00021	Thermocouple Temp Probe
ESC00609	Transformer 200VA 220V To 110V

Mechanical

Hood Parts

Part No.	Description
ET240152	24” Curtain Retainer used on ETB24 and ETB56
ET360152	36” Curtain Retainer used on ETB36
ET200152	Curtain Retainer for ETB48
ET700152	70” Curtain Retainer used on ETB70
ESC00541	14” Cooling Fan
ETL00162	Heater Bank Cover
ETC00226	2” White Insulation
ETC00263	1” White Insulation
ETC00304	Blow Cool Motor
SUBA0143-BU	Curtains cut for ETB24
SUBA0144	Curtains cut for ETB36
SUBA1271	Curtains cut for ETB48
SUBA0138	Curtains cut for ETB56
SUBA0139	Curtains cut for ETB70
ETL56198	Blower Motor Mount Frame
ETL00202	Large Blower Wheel
ETL00109	¾ HP 3 Phase Blower Motor
ETL00317	15KW 480V 3 Phase Heater Bank used on ETB24, ETB36, ETB48
ETL00311	16KW 230V 3 Phase Heater Bank ETB24, ETB36, ETB48
ETL00312	18KW 230V 3 Phase Heater Bank ETB56, ETB70
ETL00313	18KW 480V 3 Phase Heater Bank used on ETB56 ETB70
ETC00303	High Temperature Heater Bank Lugs
ETC00302	#8 Gauge High Temperature Heater Bank Wire

Conveyor Parts

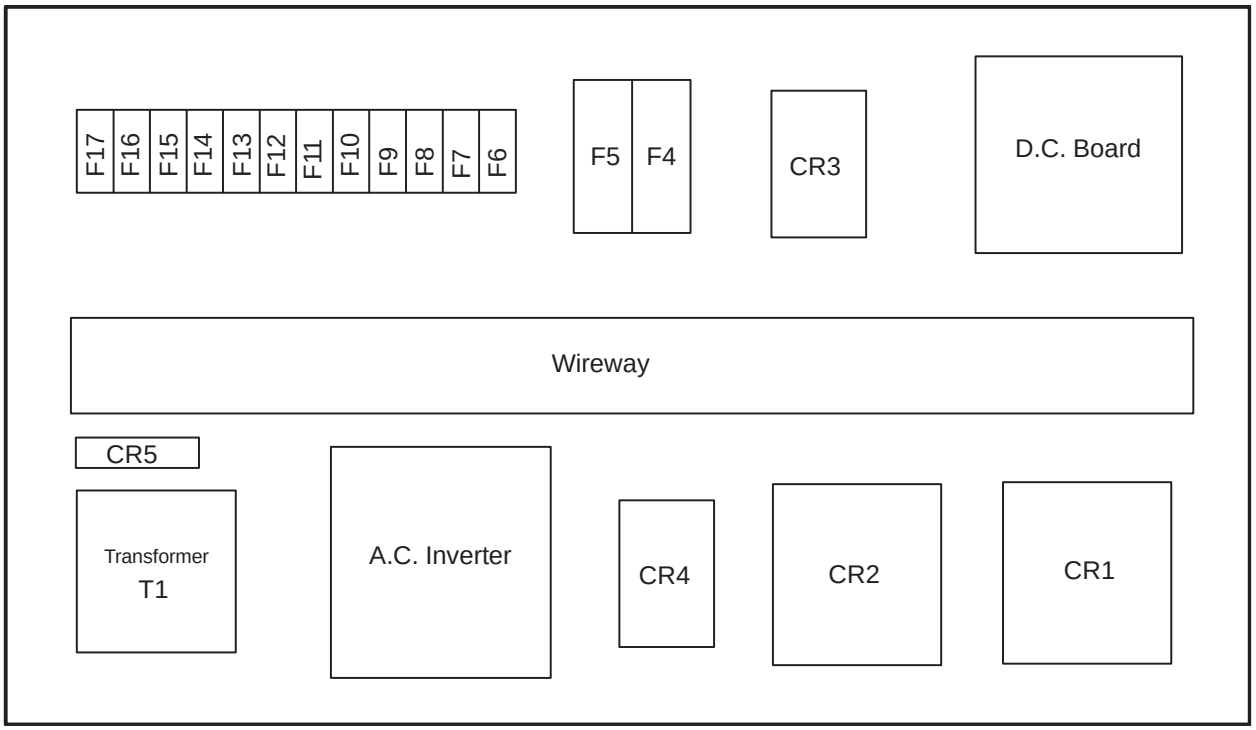
Part No.	Description
ESC00574	Bearing 1” Bore Flanged
ESC00561	Bearing 1” with Grease Fittings
ESC00560	Bearing Frame Holder
ET240317	24” High Temperature OWL Black Belt
ET360318	36” High Temperature OWL Black Belt
ET500317	48” High Temperature OWL Black Belt
ET560317	56” High Temperature OWL Black Belt
ET700317	70” High Temperature OWL Black Belt
ETC00096	#40 Drive Chain
ETC00109	#40 Master Link
TC000421	Channel for Wear Rail Infeed
ETL00221	Channel for Wear Rail Outfeed
ETL00232	Conveyor Drive Motor Mount
B7000125	Conveyor Drive Motor Mount for ½ HP Motor
B2400029	Conveyor Drive Shaft for ETB24
B3600029	Conveyor Drive Shaft for ETB36
B4800029	Conveyor Drive Shaft for ETB48
B5600029	Conveyor Drive Shaft for ETB56
B7000029	Conveyor Drive Shaft for ETB70
ES350026	Conveyor Idler Shaft for ETB24
ES350027	Conveyor Idler Shaft for ETB36
ET500027	Conveyor Idler Shaft for ETB48
ET560067	Conveyor Idler Shaft for ETB56
ET700067	Conveyor Idler Shaft for ETB70
ET000190	30 Amp 3 Pole 480V Disconnect Box
ET820006	60 Amp 3 Pole 600V Disconnect Box
ET820243	100 Amp 3 Pole 600V Disconnect Box
ET820233	100 Amp 3 Pole 240V Disconnect Box
ETL00220	½” Hole Plug
ETC00150	Key for OWL Sprocket
ETL00247	¼ HP 90 RPM Conveyor Drive Motor
BC000247	½ HP 90 RPM Conveyor Drive Motor

Part No.	Description
EAST1004	3/8” Romex Connector
ETC00206	2” High Temperature Sponge Tape
ESC00562	Sprocket 40B18 1” Bore On Drive Shaft
ETC00301	Sprocket Drive 40BS12 5/8” on Motor
EB000523	Sprocket Drive 40BS14 ¾” for ½ HP Motor
ET360308	Sprocket UNI 9 Tooth for OWL Belt
EAST0081	5 Place Terminal Strip
ET000193	Transformer 5KVA
SUBA0104	1” Leveling Leg Assembly
B7000126	Access Cover for ½ HP Motor
ET700126	Access Cover for ¼ HP Motor
BC000061L	End Cap Left
BC000061R	End Cap Right
B2400063	Top Lid Cover ETB24
B3600063	Top Lid Cover ETB36
B4800063	Top Lid Cover ETB48
B5600063	Top Lid Cover ETB56
B7000063	Top Lid Cover ETB70

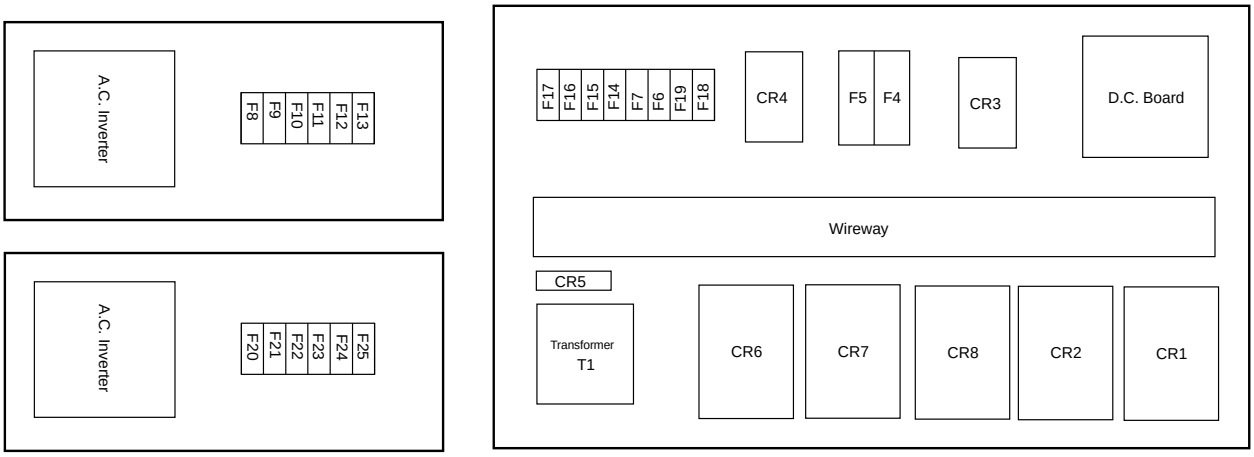
Appendix A: Electrical Schematics

Panel Layout

Panel layout for smaller model tunnels ETB2416, ETB2420, ETB3616 & ETB3620



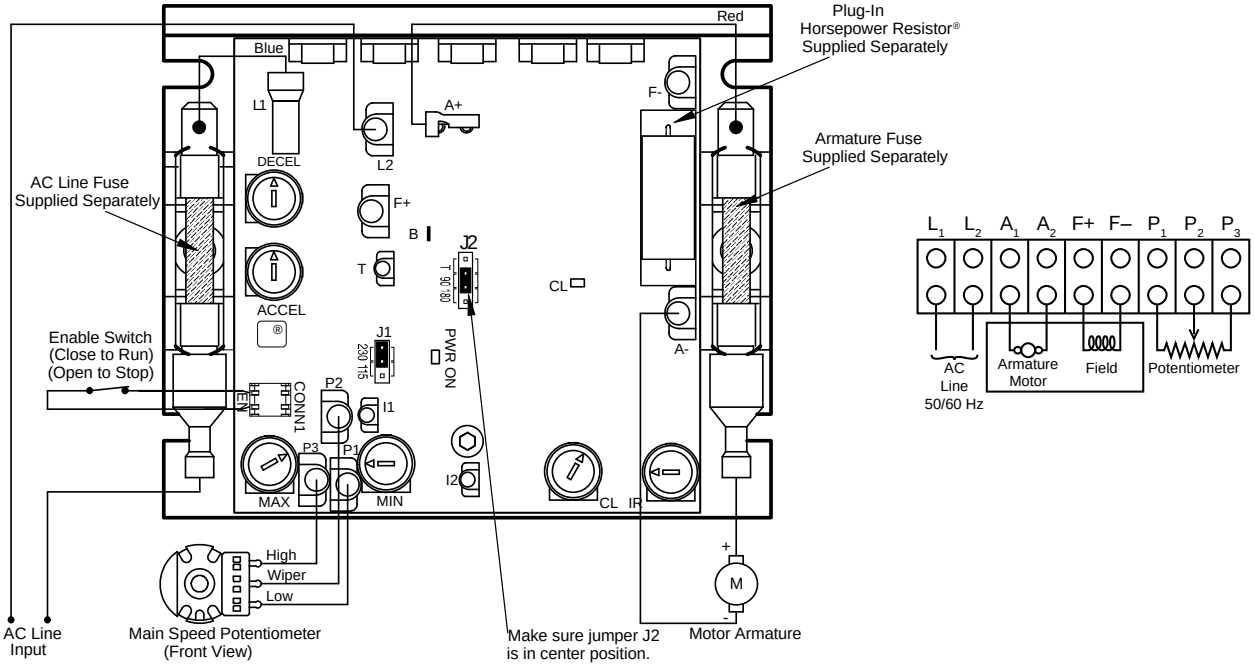
Panel layout for larger model tunnels: ETB4816, ETB4820, ETB5616, ETB5620, ETB7016 & ETB7020



Motor Controller Board (KBMM™) Basic Connections for Controller Board and Barrier Terminal Kit

Basic KBMM™ Connection Diagram **KBMM™ with Barrier Terminal Kit**

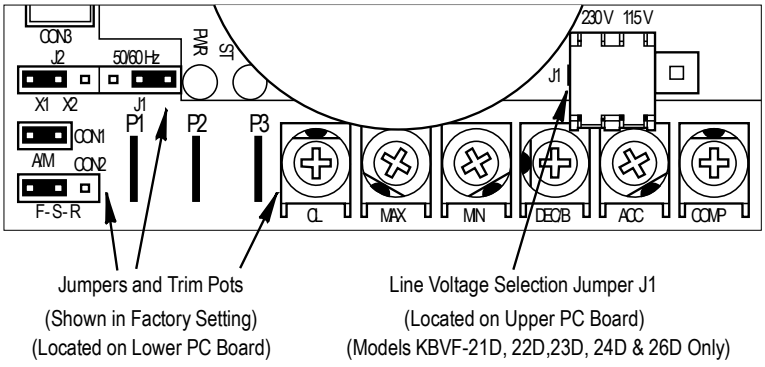
CONTROL LAYOUT & GENERAL CONNECTION DIAGRAM (Model KBMM-225D Shown)
(Note: Control is set for 208/230 VAC line input, 0-180 VDC output with armature feedback)



For more information refer to the *KBMM™ Installation and Operation Manual* (provided by the controller board manufacturer).

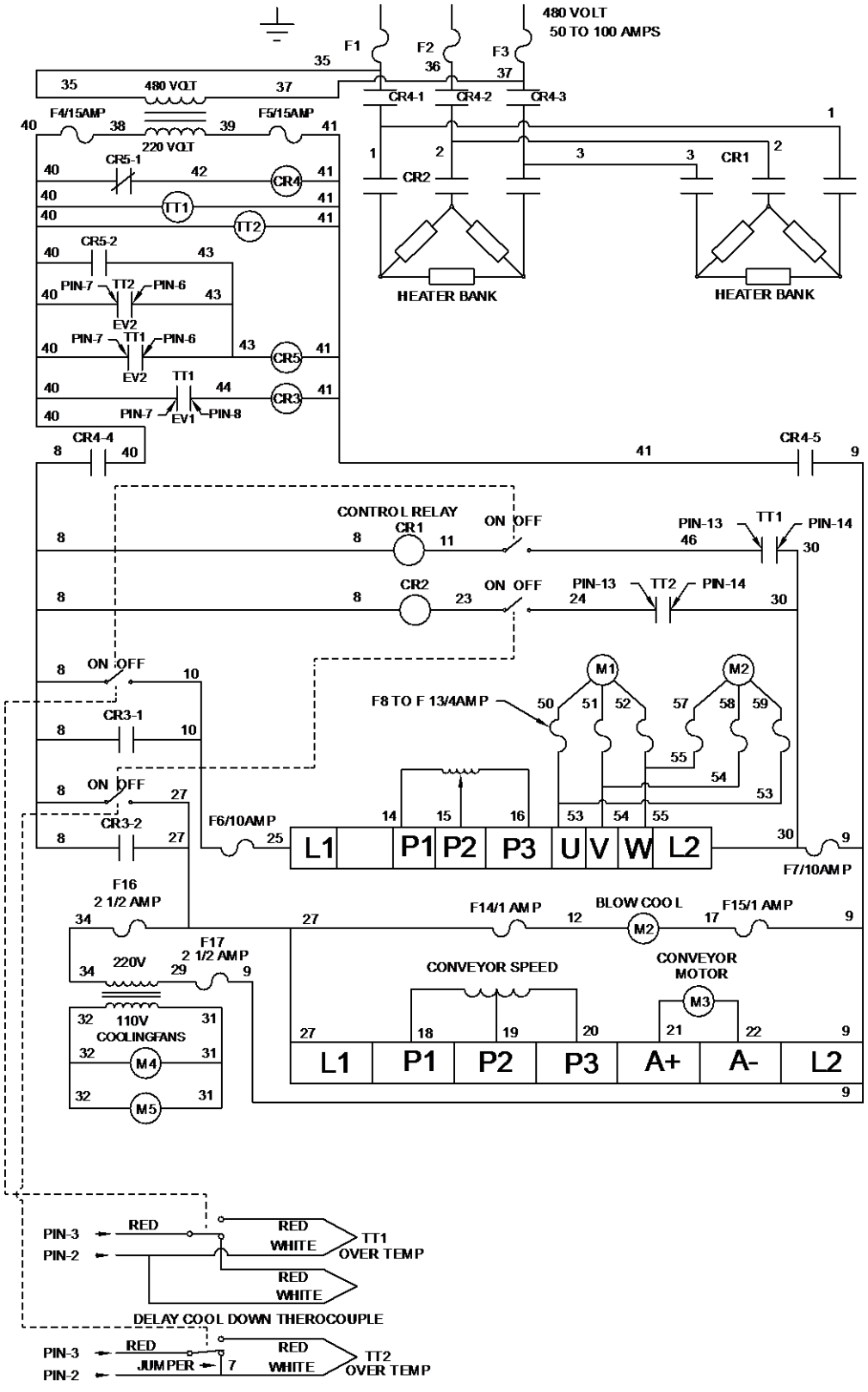
Motor Controller Board (KBVF) Expanded View of Jumpers and Trim Pots, Controller Board for Blower Fans

Basic KBVF Diagram



Electrical Schematic for All Standard Tunnel Models:

Complete Schematic for smaller tunnels ETB2416, ETB2420, ETB3616 & ETB3620; Part One of Two for larger tunnels ETB4816, ETB4820, ETB5616, ETB5620 ETB7016 & ETB7020.



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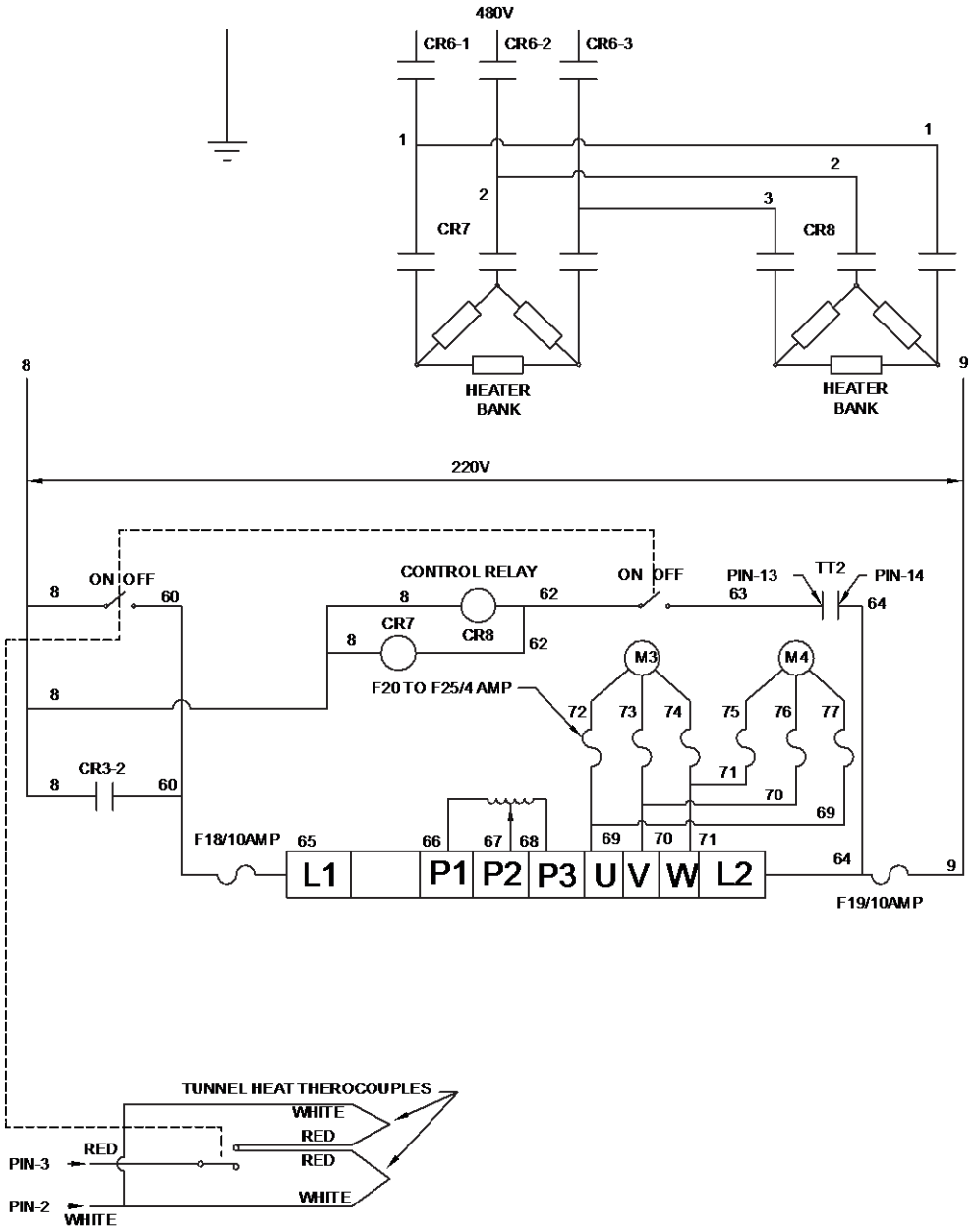
Electrical Schematic for Larger Standard Model Tunnels only

Not Applicable for smaller tunnels: ETB2416, ETB2420, ETB3616 & ETB3620;
Part Two of Two for larger tunnels: ETB4816, ETB4820, ETB5616, ETB5620, ETB7016 & ETB7020.

Larger tunnels (48-inch wide and wider) require heaters and circuitry in addition to what is required for smaller tunnels and shown in the previous schematic. Combined with the previous schematic (Part 1 of 2), the schematic on this page (Part 2 of 2) represents the complete schematic for the larger tunnel models listed above.



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Warranty Statement

ETB Professional Series Bundling Tunnels

Warranty Statement
Eastey Enterprises warrants that all of the products it ships will be in good working order and free from defects in material and workmanship for a period of two (2) years from the date of shipment by Eastey and will conform to the published specifications for that product.

Warranty Period

Silicone Tubing (Roller Covering):	30 days
End Curtains:	30 days

Fuses are considered to be consumable items and not under warranty.

Shrinking Quality
Shrinking quality achieved in a given application is dependent on the installation, the material handling, and the maintenance provided. Eastey makes no warranty that the shrinking quality achieved in an application will be the same as that achieved on a test piece in our demo facility.

Shipping Policy
Customer pays all incoming shipping. If the item is defective and under warranty, Eastey pays return shipping charges for least costly method. If expedited shipping is desired, customer must furnish his shipping account and shipping fees will be charged to that account.

Warranty Verification
If you conclude that a product may be defective and may be covered by warranty, obtain a Return Material Authorization number by calling our technical support number (toll free at 1-800-835-9344, or 763-428-4846 or Fax: 763-795-8867) or e-mail: info@eastey.com, and return the defective item to Eastey. Eastey will analyze the product and, if found to be defective, we will, at our option, replace or repair the item. If the item is found to not be eligible for warranty, you will be notified and may decide on disposition. Defective products will be replaced or repaired as promptly as possible.

Warranty Eligibility
The warranty provided by Eastey Enterprises, Inc. is only to the original buyer.

Limited Warranty
THE ABOVE WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT.

Disclaimer of Damages

REGARDLESS OF WHETHER ANY REMEDY SET FORTH HEREIN FAILS OF ITS ESSENTIAL PURPOSE, IN NO EVENT WILL EASTEY ENTERPRISES, INC. BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT OR SIMILAR DAMAGES, INCLUDING LOST PROFIT OR LOST OPPORTUNITIES OF ANY TYPE ARISING OUT OF THE USE OR INABILITY TO USE THESE PRODUCTS EVEN IF EASTEY ENTERPRISES, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Customer Support

Eastey Technical Service

For help setting up or operating the ETB Professional Series Bundling Tunnels, please contact Eastey Technical Service at one of the numbers listed below.

Toll-Free Phone	800-835-9344
Phone	763-428-4846
Fax	763-795-8867
E-mail	info@eastey.com
Web	www.eastey.com

Thank you again for your purchase of Eastey products. We are pleased to be a part of your packaging needs.


EASTEY®