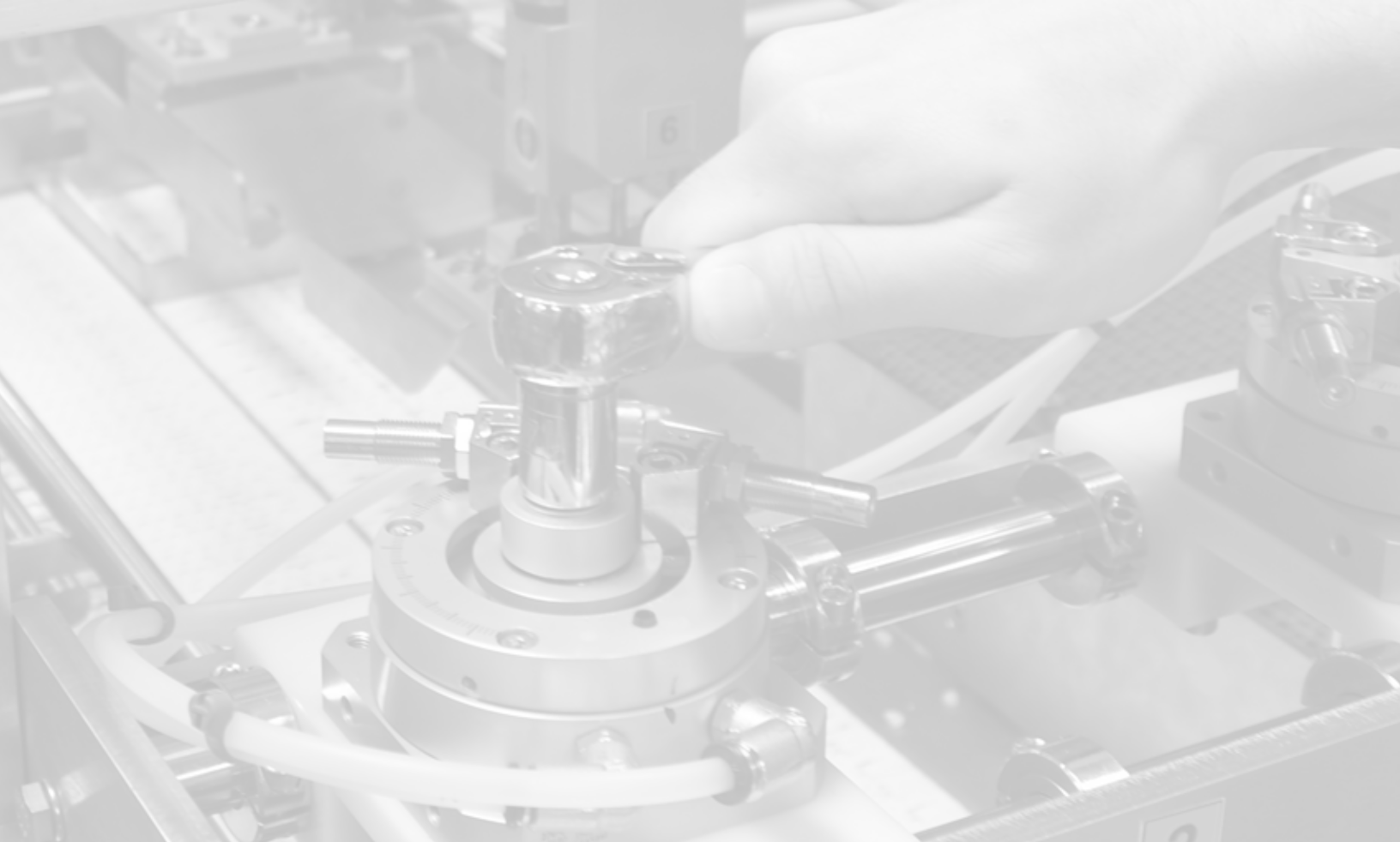




**OPERATION AND
MAINTENANCE**

MANUAL

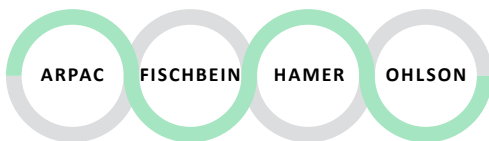
ARPAC BRAND

MODEL: BPTW-6000

SN: 210012

JOB: 220562-2-1

The nVenia
Family of
Brands



NVENIA
A DURAVANT COMPANY

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Introduction

1.1. Introduction

Congratulations on the purchase of your nVenía ARPAC Brand packaging equipment. We sincerely appreciate your business.

nVenía is a leader in secondary packaging machinery with proven experience in designing and manufacturing complex integrated packaging lines. As an experienced Original Equipment Manufacturer (OEM) integrator, nVenía has in-house capabilities to conceptualize, manufacture, install and service complete primary, secondary and end-of-line packaging solutions.

nVenía's ARPAC Brand is renowned for providing high quality end-of-line packaging machinery to consumer goods and industrial product producers. We deliver solutions to producers of food, beverage, building supplies, automotive products, printed publications, personal care products and a wide variety of packaged goods.

1.2. Contact Information

nVenía's corporate offices and production facilities are located just minutes from Chicago's O'Hare International Airport.

nVenía

750 Wood Dale Rd.
Wood Dale, IL 60191
www.nvenia.com
847.678.9034

A Duravant Company

1.3. Warranty Information

nVenia warrants the Products of its manufacture to be free from defects in material or workmanship for a period of one year from date of shipment from nVenia's factory, provided that:

1. Such equipment is given normal and proper usage.
2. It is still owned by the original buyer.
3. The Products have been operated in accordance with generally approved practice and in accordance with nVenia's specifications and instructions.
4. No repairs, alterations, or replacements have been made by others without nVenia's prior written approval.
5. Genuine nVenia repair components are used during the warranty period.

nVenia's liability under this warranty or in connection with any other claim relating to the Products shall be limited to the repair or, at nVenia's option, the replacement of any Products, parts or components thereof which are returned to nVenia freight prepaid and which are defective in material or workmanship.

The Buyer shall notify nVenia immediately of any defective parts and nVenia shall thereupon correct the defect or defects. If such correction requires the replacement of a defective part or parts, nVenia will supply same F.O.B. its factory.

If warranty parts are required, nVenia will, at its discretion, repair or replace any defective parts with a charge to a valid purchase order number. Defective parts, with a valid Return Material Authorization number obtained from nVenia's service department, must be returned to nVenia within thirty (30) days of warranty part shipment, freight prepaid, to receive a credit to this purchase order number. Failure to do so will result in zero credit being applied to the original P.O. or may void this warranty. All returned parts are subject to factory inspection. nVenia reserves the right to determine the cause of failure and the subsequent inclusion of the replacement part under this warranty. Defective parts that have been disassembled or damaged during removal or otherwise tampered with will not be covered under this warranty.

Damage caused during transport is the responsibility of the carrier and is not covered under this warranty. All damages detected upon receipt of equipment should be reported immediately to the carrier and nVenia should be notified.

nVenia shall in no event be held liable for any direct, indirect, incidental or consequential damage, losses, expenses or delay caused by defective parts and will not accept any charges for work performed by Buyer in making adjustments or repairs to the Products unless such work has been authorized in writing by nVenia. Except as stated herein, nVenia makes no other warranty, expressed or implied, nor does it assume or authorize anyone else to assume for it, any other obligation relating to our products or any products.

Any Product or component not of nVenia's own manufacture is not covered by this warranty and is sold to Buyer only with such warranty, if any, as is provided by such manufacturer, to the extent nVenia and its assigns are able or entitled to enforce such warranty. Such items are not warranted by nVenia in any way.

When components are sold to be assembled in combination of Buyer's design, the warranty shall be limited to each separate component and shall not apply to any combinations or components.

EXCEPT AS EXPRESSLY STATED ABOVE, nVenia MAKES NO WARRANTY, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR USE OR OTHERWISE, ON THE PRODUCTS, OR ANY PARTS OR LABOR FURNISHED DURING THE SALE, DELIVERY OR SERVICING OF THE PRODUCTS.

nVenia factory trained, qualified technical services personnel are available for start-up and instructional assistance. If the customer does not utilize nVenia personnel for this function, nVenia is only liable for replacement of defective parts, not for labor or expenses necessary to adjust any problems during the start-up period.

nVenia personnel are available for nVenia equipment training, either on-site/hands on or in classroom environment, supported by visual aids and literature, to be contracted for by a separate purchase order.

1.4. Using This Manual

This manual is an operations and maintenance manual for the nVenía ARPAC Brand BPTW tray wrapping system. Use this manual if you are responsible for using, operating and maintaining the equipment. It is organized in a manner that can be easily understood by personnel with reasonable experience. This manual is intended to provide clear and simple explanations on how to safely operate and maintain the equipment.

If operated and maintained correctly, this machine is designed to provide the user years of trouble-free service. It combines up-to-date, state-of-the art technology as well as nVenía's enormous experience in the area of packaging systems.

1.4.1. Graphical Notations

To help communicate hazardous and nonhazardous alerts, the following graphics are used through out this manual.

Hazard Alerts



DANGER indicates a hazardous situation which, if not avoided, will result in serious injury or death



WARNING indicates a hazardous situation which, if not avoided, could result in serious injury or death



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury



NOTICE indicates information considered important, but not directly injury related (i.e. could cause equipment or property damage)

Non-Hazard Alerts



Indicates information considered important, but not directly related to a specific hazard.



Indicates explanatory information on complex or difficult procedures.



Indicates the need for special tools that may be required to perform a procedure or task.

**Required
Tools**

1.4.2. Photo's & Illustrations

Photographs and illustrations appear through out the manual for informational purposes. Actual machine photos when possible are used, however not every photo shown in this manual will be of your specific machine(s).

NOTICE

Dimensions and specifications are approximates and drawings may not always be to scale.



Some photo's may show safety guarding and fencing removed for illustration purposes only.

Never operate equipment with safety devices damaged, removed or modified.

1.5. Safety

Every effort has been made by nVenia to provide you with a safe machine. This section describes the safety precautions that should be taken when working with, on or around the equipment. It is essential that machine operators and maintenance personnel follow the safety information. Safety everyone's responsibility and the information in this chapter is vital to maintaining a quality work environment.

1.5.1. Statement of Liability

While this machine has been designed for safer operation, improper operation or carelessness may result in serious injury or death, harm to the environment and damage to equipment. The manufacturer or its agents and representatives assume no responsibility for the following.

1. Injury or danger from improper use of the machine.
2. Problems or hazards resulting from failure to maintain the equipment as specified in this manual.
3. Equipment which has been tampered with or modified. nVenia is not liable for any damage or injury arising from failure to follow the instructions and procedures provided within the manuals or associated material, or from user failure to use caution when installing, operation, adjusting, or servicing this machine. nVenia is not liable for damage or injury arising from the use of this product for any other use than that intended by the manufacturer.

1.5.2. Conventions in this Manual

Hazardous alerts; Dangers, Warnings, Cautions and Notices listed in the manual are intended to draw your attention to a particular condition that may pose a safety concern, that if not avoided, will or could result in injury or death.



DANGER indicates a hazardous situation which, if not avoided, will result in serious injury or death



WARNING indicates a hazardous situation which, if not avoided, could result in serious injury or death



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury



NOTICE indicates information considered important, but not directly injury related (i.e. could cause equipment or property damage)

1.5.3. Safety Precautions

Interfacing Equipment

Observe all applicable codes when interfacing this equipment to other equipment. Specific attention must be paid to any pinch points that may be created and the prevention of unintended restart of the equipment when the electrical interlocks shut it down.

Dressing for Safety

- Tie or pull back long, loose hair that can get caught in the machinery.
- Remove loose, dangling jewelry and rings and watches that can get caught in the machinery.
- Ensure that radio headphone wires do not get caught in the machinery and cause personal injury.
- Dress comfortably. Tight clothing restricts the ability to move freely and safely.
- Do not wear shoes with slippery soles, such as high heels or boots. Uncomfortable shoes can cause personal fatigue and reduce the ability to work well.
- Do not wear neckties or scarves.
- Roll loose sleeves or secure them with rubber bands.
- Button or remove open sweaters or jackets.
- Tuck in shirttails.

Maintaining a Clean Work Area

Keep the work area clean to avoid injuries and damage to the equipment. Inspect your work area for possible causes of accidents:

- Water and other spills are dangerous. Clean and dry the area immediately after a spill.
- Keep a 3-foot clear walkway around the entire machine. Boxes and papers are hazards when left on the floor near the machine.
- Keep all food and drink away from the machine.
- Keep your work area well lit. Report all burned-out bulbs to your supervisor.

- Do not leave tools and other loose items on the machine.
- A cluttered work area requires unnecessary and hasty movement that causes accidents. Keep all materials orderly and easily accessible.

Personnel Instructions

Read and understand the following personnel safety information before operating the equipment.

- **PPE** - Make sure that you wear safety goggles and other personal protective equipment according to your company's safety standards when operating this machine. You may get injured if you do not.
- **Disconnect Power Before Servicing** - Make sure that all the power is disconnected from machine before servicing it. You may get severely injured if you do not.
- **Proper Cleaning Solvents** - Only use non-flammable, non-aerosol cleaning solvents to clean the equipment.
- **Keep Hands and Other Body Parts Clear** - All personnel working around or coming in contact with the equipment must be instructed to keep their hands and other body parts of their person and clothing clear of all moving parts.
- **Ensure Safety Devices are Operational** - Equipment must not be operated if safety devices, including guards and doors, removed, disconnected or damaged.
- **Never Reach Into Equipment** - Personnel shall not reach into the equipment for any reason, including maintenance, adjustment or clearing of jams, while the equipment is in the cycle mode. The cycle mode stops when the guard doors are opened or when the CYCLE STOP button is pressed. The process may take a couple of seconds. Do not reach into the machine until the machine has stopped.

Before any person reaches into the equipment for maintenance or adjustment, air and electrical power shall be turned off using lockable shutoffs provided. The clearing of jams may be done while the machine is turned on, but not while in the cycle mode.

Anyone entering the machine for maintenance, troubleshooting or any procedure entailing the removal of guards or performing work at any point of operation, shall be required to observe all applicable lockout-tagout requirements.

1.5.4. Safety Labels

Safety labels are placed at various locations around the machine to communicate potential hazards.

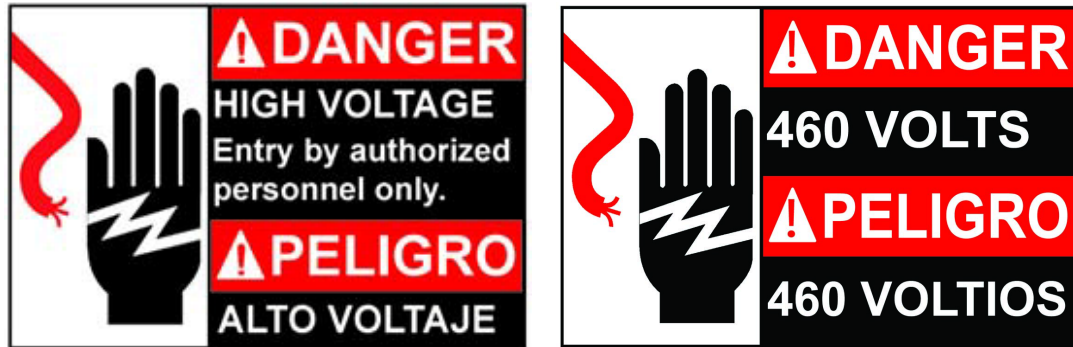


Figure 1-1 - Red & Black labels indicate DANGER hazards

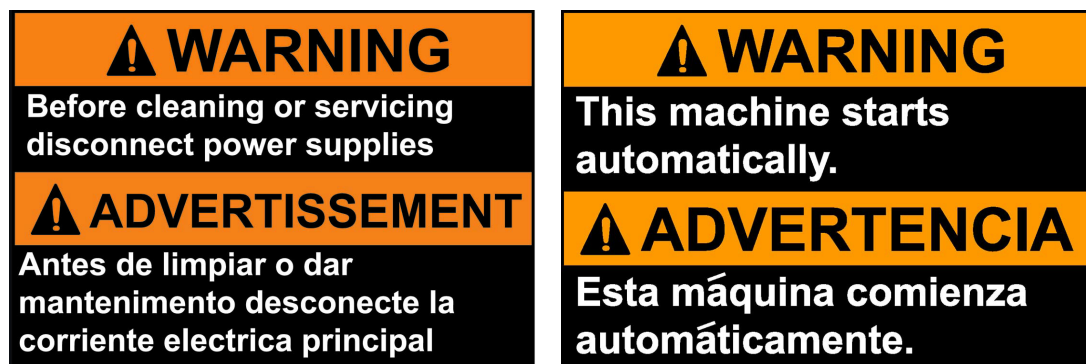


Figure 1-2 - Orange & Black labels indicate WARNING hazards

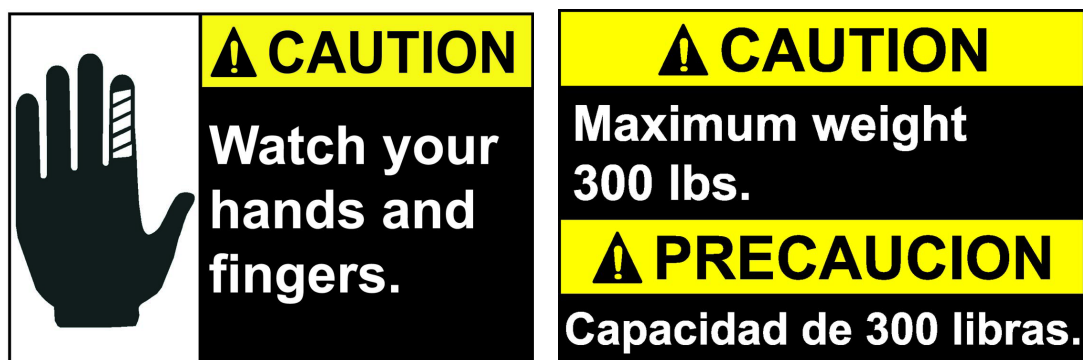


Figure 1-3 - Yellow & Black labels indicate a Caution hazardous situation

1.5.5. Energy Isolating Devices

The section discusses the various devices and proper methods for isolating energy to prevent injuries when its necessary to stop the machine to clear jams or perform maintenance, for example.

Main Disconnect Switch

The main disconnect is located on the main electrical cabinet. It is connected via a rod through the door to the main circuit breaker that supplies all power to the equipment. Different types of switches are used, depending on the type and style of the enclosure.

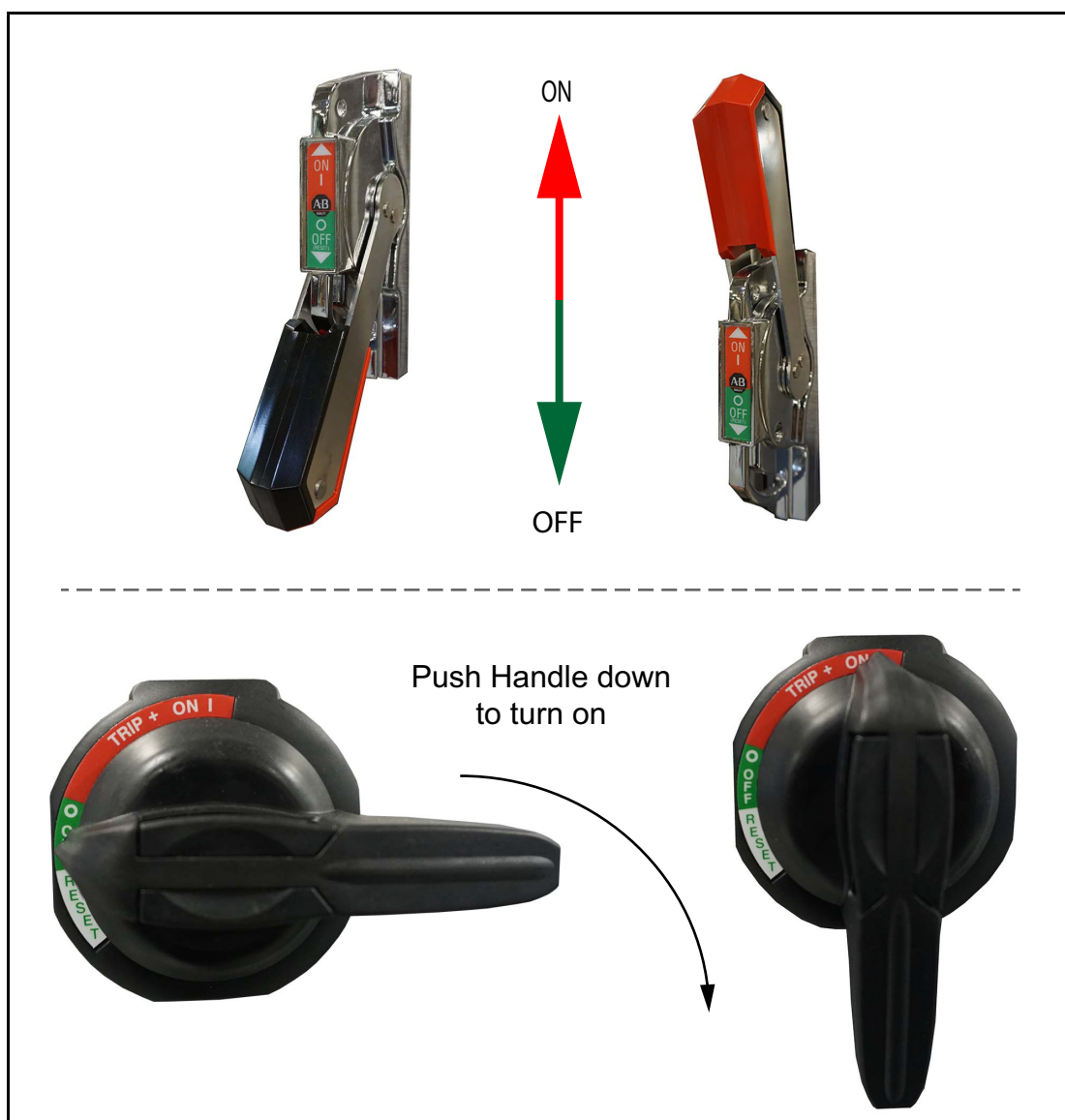


Figure 1-4 - Two Main Disconnect Switch Options

1.5.6. Emergency Stop Buttons

There are several emergency stop buttons located on the machine. Pressing any of these buttons will immediately stop the machine and drop all electrical and pneumatic power to the machine except the machine's internal controls.

NOTICE

Additional E-Stops are often added the equipment per customer's specifications. Refer to the project specific layout for exact locations for your machine.



If the Wrapper is integrated with a tunnel, activating an E-Stop will stop the tunnel conveyor belt. If machine stops with product in it, remove it as soon as it is safe to do so. Product could potentially catch fire or explode if you do not. Do not try to push product out with your hands.

There are several different types of E-stop buttons. Some are lit, some are not. Some are reset by twisting the button, while others are reset by pulling them straight out. Whatever type of E-stop happens to be on your system, the function is identical. They all stop the machine immediately in case of an emergency.



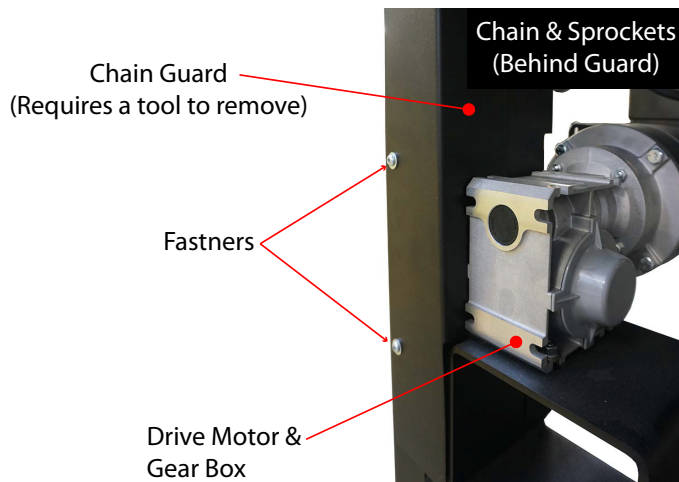
Figure 1-5 - E-Stop Button

1.5.7. Chain Guards Guard Doors



Equipment must never be operated if any safety devices, including guards and doors, are removed, disconnected or damaged.

Chain guards are bolted to the machine, requiring a tool to remove.



Guard doors are equipped with an interlocking switch. When a door is opened, the switch is interrupted, disabling power to motion control devices, regardless of where the machine is in its cycle. Personnel shall not reach into the equipment for any reason, including maintenance, adjustments or clearing of jams, while the equipment is in the cycle mode. The process of stopping the cycle may take a couple of seconds. Do not reach into the machine until the machine has stopped. Refer to the electrical schematic for specific Safety Circuit information.

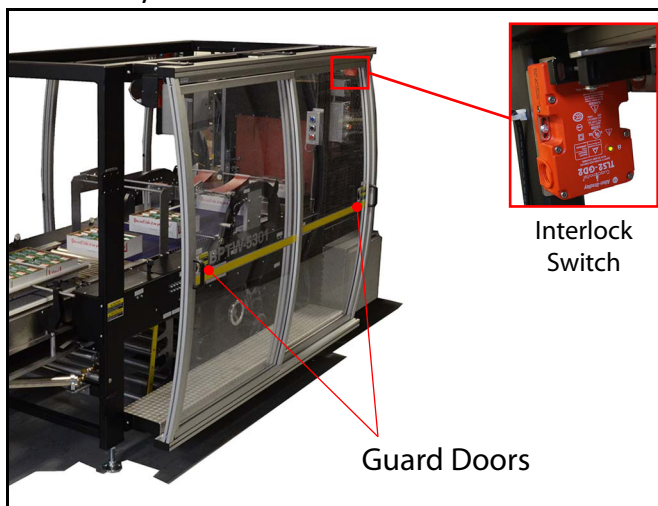


Figure 1-6 - Guard Door & Interlock Switch Example

1.5.8. Motor Disconnects (If equipped)

If equipped, individual motors can be wired to an isolation disconnect that when in the “Off” position disables power to that motor only. These devices are not connected directly to the machine’s safety circuitry, but they can be wired to an input on the PLC so that a message can be displayed on the HMI to indicate that the motor is “Off”.



Figure 1-7 - Motor Disconnect Switch

If a motor is connected to one of these disconnects, the disconnect will be within line of sight of the motor and identified as associated with that motor. If your machine has these disconnects installed, refer to the machine’s electrical schematic for more information.

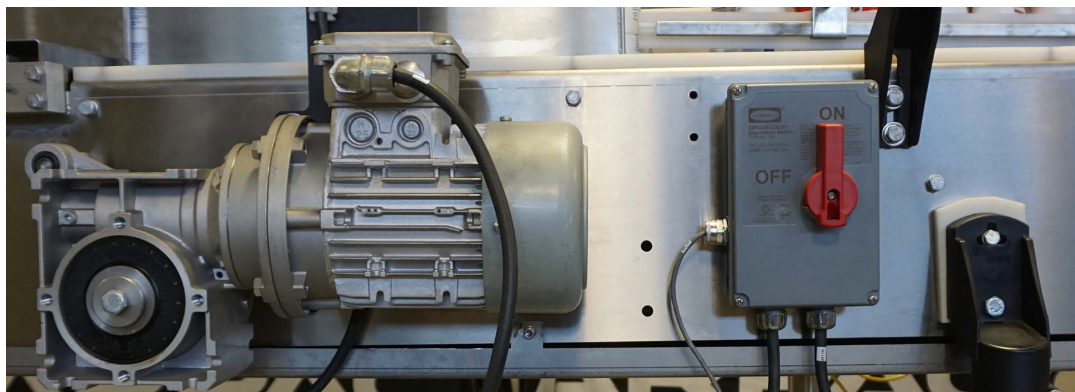


Figure 1-8 - Disconnect Location Example

1.5.9. Lock Out / Tag Out

You can lock the machine out by applying locks to the electrical main disconnect and the pneumatic regulator. Locking these two sections out will ensure safety when working on the equipment.

When you are going to work on nVenia equipment, follow the Lock Out / Tag Out (LOTO) procedure to ensure safety.



Because companies tend to tailor the LOTO protocols specific to them, we advise all users to refer to their company's procedure manual. The LOTO procedure described here are the minimum requirements

Lockout/Tagout Kit

A typical lockout/tagout kit is shown in the figure below. nVenia machines can be locked out with most standard lockout/tagout kits.



Figure 1-9 - Typical LOTO Kit

1.5.10. Electrical LOTO

It is important to safely shut down the equipment and lock it out electrically before performing any maintenance.

1. Notify affected employees that the equipment is going to be locked out.
2. Safely shut down the equipment.
3. Complete the information on the tag.
4. Apply the lock to the main disconnect. (The example illustrates one type of main disconnect switch. Other styles have the same capacity for lock application.)

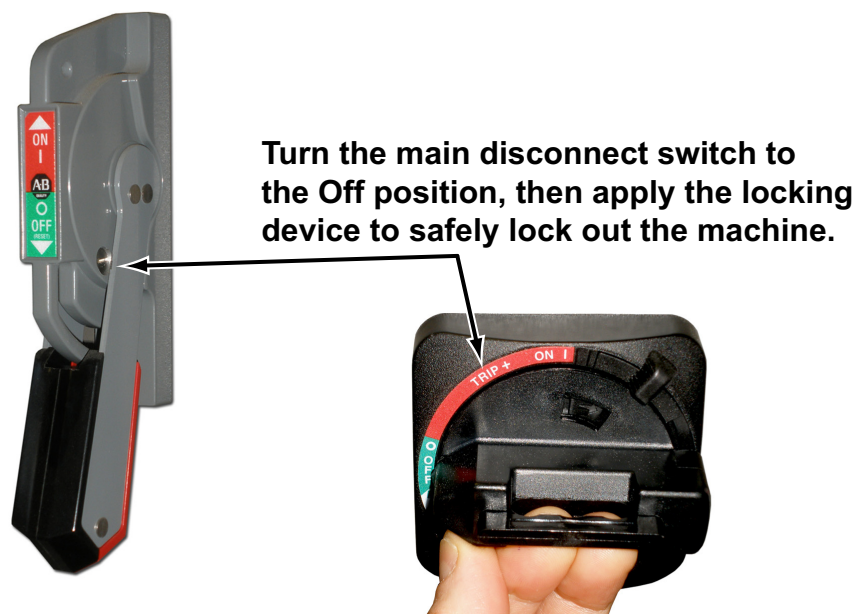


Figure 1-10 - Lockout/Tagout at Main Disconnect



Never assume power has been isolated. Always verify.

Verify power is off. The machine is now electrically locked out.

1.5.11. Pneumatic Lockout/Tagout

To lock out the air supply:

1. Notify all affected persons that the equipment is being locked out.
2. Complete the information on the tag.
3. Turn the red knob clock-wise to shut off the valve and align the knockouts for the lock and apply lock.

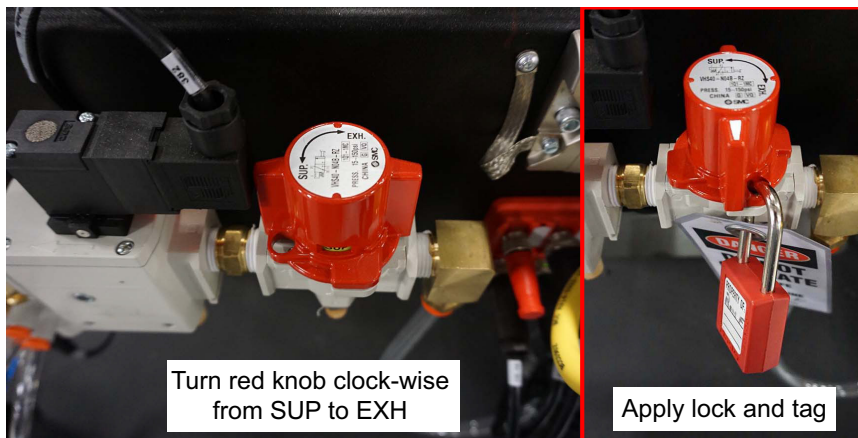


Figure 1-11 - Lockout/Tagout at Pneumatic Regulator Example

4. Verify that there is no air present. The machine is now pneumatically locked out.

1.5.12. Restoring power and air to the Machine

Restore the machine to proper working order by the following steps:

1. Ensure all personnel are clear of the machine.
2. Remove all tools and loose parts that may have been left behind from the maintenance procedure.
3. Replace all safety guarding that was removed for the maintenance procedure.
4. Remove locks and tags.
5. Notify affected employees that the lockout condition has been removed.
6. Restore power to the machine at the main disconnect.
7. Clear the machine using the human machine interface (HMI).
8. Ensure that any E-stops have been properly reset.
9. The machine is now restored to a run condition.

1.6. Introduction

Congratulations on the purchase of your nVenia Ohlson Brand packaging equipment. We sincerely appreciate your business.

nVenia is a leader in secondary packaging machinery with proven experience in designing and manufacturing complex integrated packaging lines. As an experienced Original Equipment Manufacturer (OEM) integrator, nVenia has in-house capabilities to conceptualize, manufacture, install and service complete primary, secondary and end-of-line packaging solutions.

nVenia's Ohlson Brand is renowned for providing high quality end-of-line packaging machinery to consumer goods and industrial product producers. We deliver solutions to producers of food, beverage, building supplies, automotive products, printed publications, personal care products and a wide variety of packaged goods.

1.7. Gen 4 Multi-Head Weigher

The Ohlson Brand Gen 4 Multi-Head Weigher (MHW Gen4) is a fully automatic, computerized, combination scale that is especially designed for granulated product. The MHW Gen4 is equipped with an advanced 32 bit high-speed microprocessor to ensure a high degree of efficiency and accuracy.

This manual is designed to assist operators in the proper operation and maintenance of the equipment.

Machine Overview

2.1. Introduction

This section identifies the individual assemblies and their intended function under normal production conditions. For the purpose of this manual, the BPTW assemblies are grouped together according to their function. The three groups are; product delivery, film delivery and the overwrap.

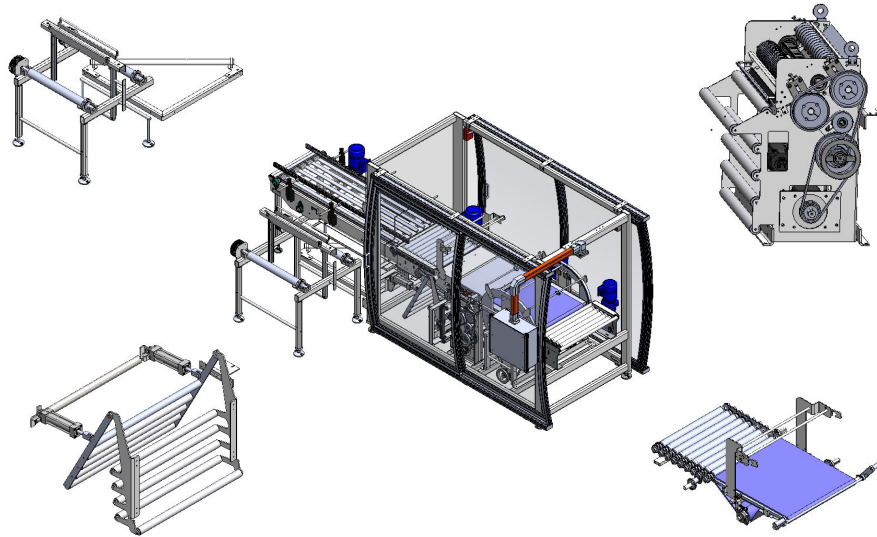


Figure 2-1 - BPTW Shrink Wrapper



Do not attempt to service or enter machine while in cycle. Always follow your company's safety procedures. Failure to do so may result in severe injury or death.

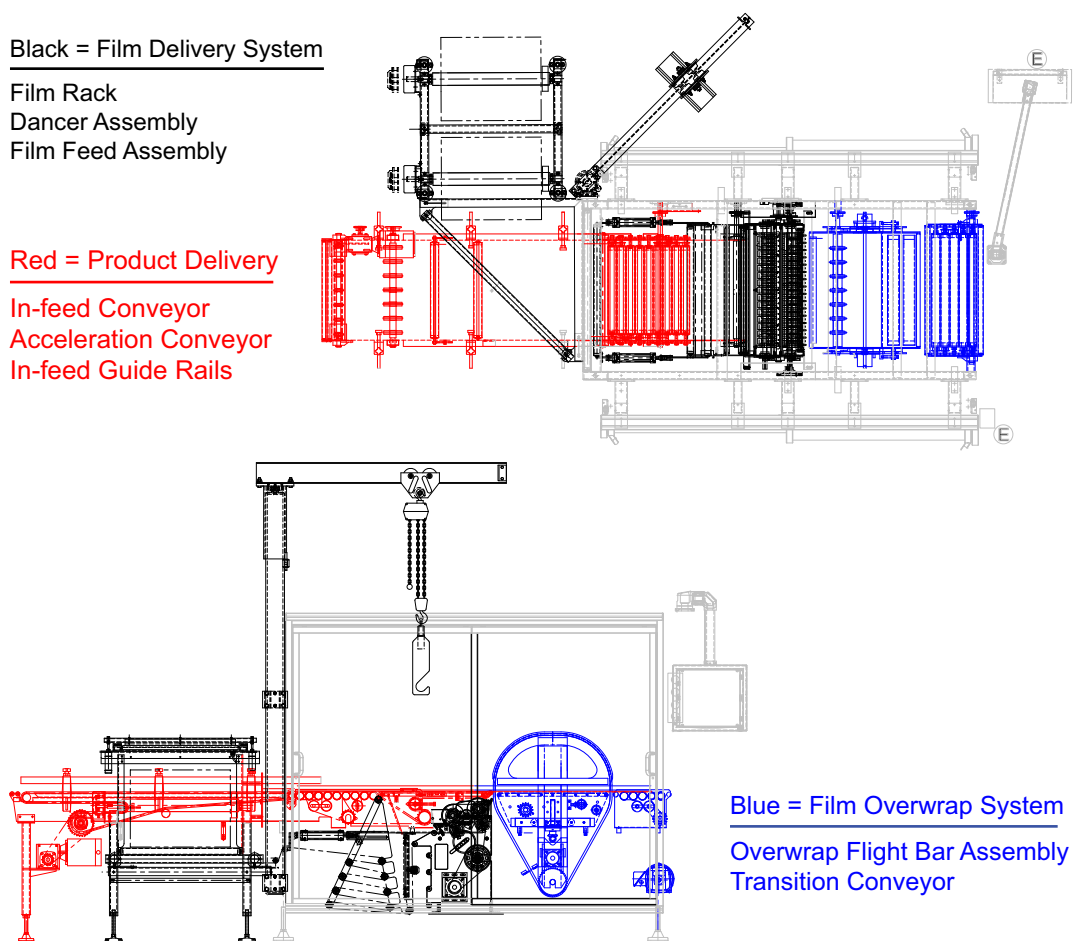
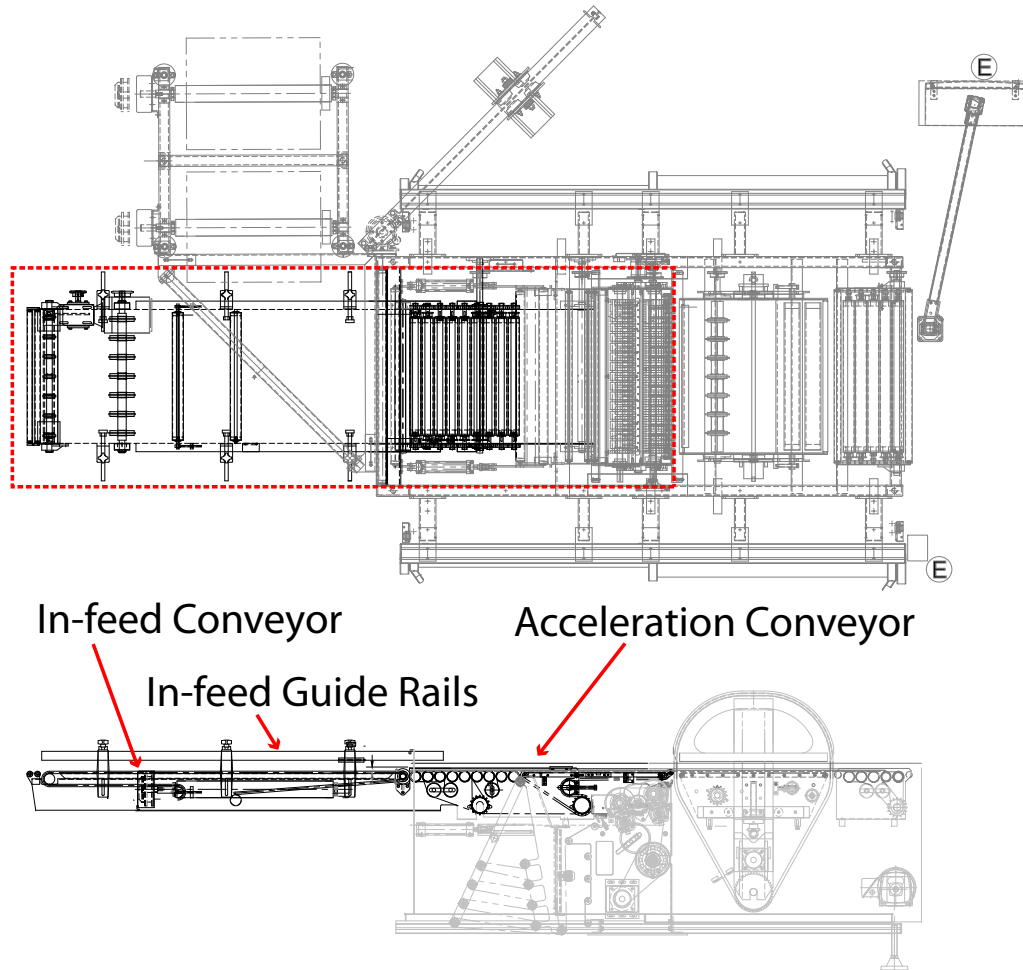


Figure 2-2 - BPTW Systems

System	Assemblies Included
Product Delivery	In-feed Conveyor
	In-feed Guide Rails
	Acceleration Conveyor
Film Delivery	Film Rack with Splice Bar
	Film Dancer Assy
	Film Feed Assy
Film Overwrap	Overwrap Flight Bar Assy
	Transition Conveyor

2.2. Product Delivery Assemblies

The mechanical assemblies of the product delivery system include the in-feed conveyor, in-feed guide rails and the acceleration conveyor.



Combined together, these assemblies accept the incoming product from the upstream equipment and then control and pace the product one at a time to the overwrap flight bar assembly (discussed in the overwrap section).

2.2.1. In-feed Conveyor & Guide Rails

The in-feed conveyor is a motor driven belted conveyor at the upstream end of the machine. When the machine is put into cycle, the PLC (Programmable Logic Controller) sends an “ON” signal to the VFD (Variable Frequency Drive) that controls the conveyor’s AC motor. The PLC also calculates what speed the belt should run based off user defined parameters that they enter into the HMI (Human Machine Interface). A set of left and right guide rails help keep the product from shifting side to side or skewing.



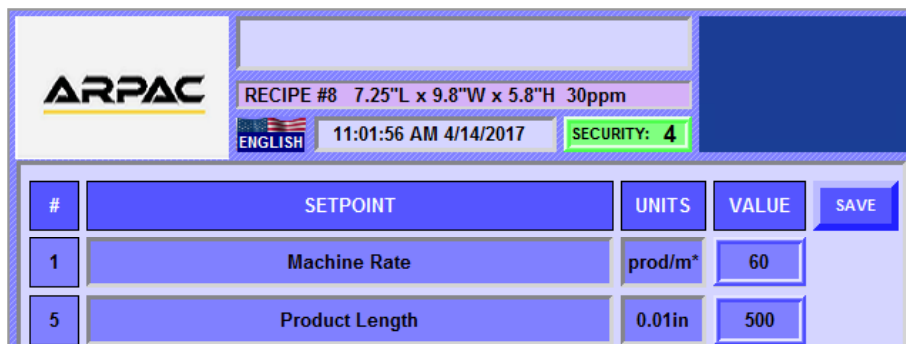
Figure 2-3 - In-feed Guide Rails

Mechanical Design Features

- Belt is constructed of modular plastic links joined with a plastic rod allowing for easy replacement of damaged links.
- High friction belt surface minimizes lateral movement. Incoming product needs to be fed centered on the conveyor.
- Belt is driven by plastic sprockets with square bores installed on a square shaft. The center sprockets on the drive shaft and the idler shaft are fixed while the remaining sprockets, spaced every two inches are allowed to “float”. This design eliminates any need for side to side tracking.
- A take-up shaft is provided with tensioning devices on both side of the conveyor to accommodate normal stretch over the life of the belt.
- Adjustable side guides, set slightly wider than the product, keep the product centered and help to minimize skewing.

Control Functions

- Motion is controlled by the in-feed conveyor motor, an AC motor connected to a VFD. The VFD controls the motor and it communicates via Ethernet connection to the PLC. The PLC sends start, stop and frequency commands to the drive.
- When the machine is put into cycle, the in-feed conveyor will start automatically after a slight delay to allow the downstream conveyors to come up to speed first.
- When the machine is taken out of cycle, the In-feed conveyor will stop first, followed by the other conveyors.
- The speed of the In-feed conveyor is determined by user defined parameters that they enter into the HMI. The PLC uses the defined product length and required rate (in products per minute) to calculate the baseline conveyor speed.



The screenshot shows the ARPAC HMI interface. At the top left is the ARPAC logo. To its right, a status bar displays 'RECIPE #8', dimensions '7.25"L x 9.8"W x 5.8"H', and '30ppm'. Below this, it shows 'ENGLISH', a timestamp '11:01:56 AM 4/14/2017', and 'SECURITY: 4'. The main area contains a table with two rows of parameters:

#	SETPOINT	UNITS	VALUE	SAVE
1	Machine Rate	prod/m*	60	
5	Product Length	0.01in	500	

Formula to determine the speed of the In-feed is:

$$S = R \times L$$

S = Speed, R = Rate, L = Length

In this example, the In-feed conveyor belt speed would be: 25'/min (60 x 5 / 12)
(Product length is given in "/min so S needs to be divided by 12 to convert to '/min)



The in-feed conveyor speed should be set equal to or slightly higher than the rate of product being fed to it from upstream equipment to prevent product from being "pushed across" the belt which could cause tracking issues with the belt and/or timing issues caused by product being out of position.

2.2.2. Acceleration Conveyor

The acceleration conveyor is a two-stage conveyor that runs faster than the in-feed conveyor in order to pull a gap between products. The space between products is necessary for the film to feed and overwrap flight bars to function properly.



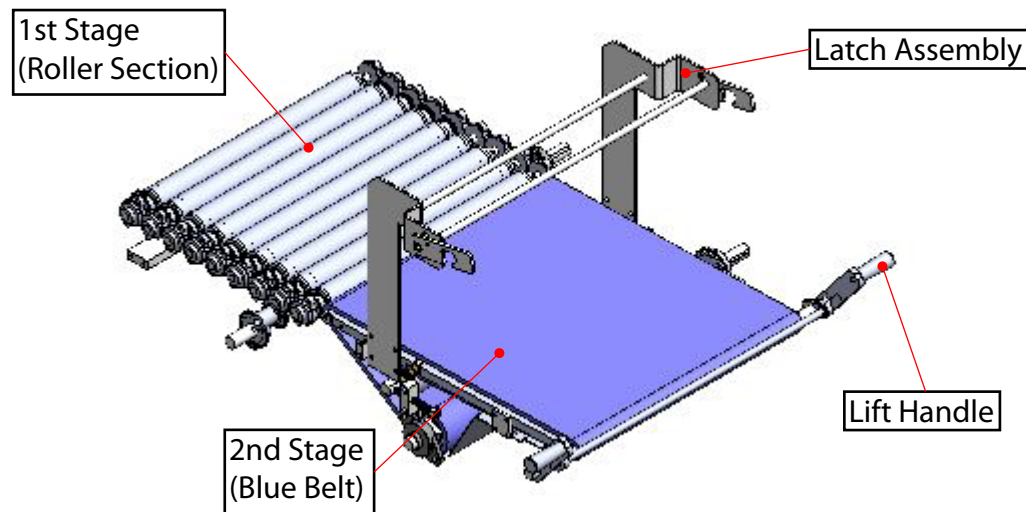
Figure 2-4 - In-feed to Acceleration Conveyor

At the downstream end of the acceleration conveyor is the *Product Before Flight Bar PE*. As a product advances on the conveyor, the leading edge of the product will block this PE. The PLC uses that signal to start the film over wrapping process that will be described later.



Figure 2-5 - Product Before Flight Bar PE

Mechanical Design Feature



- 1st stage of the conveyor consists of anodized steel rollers.
- 2nd stage of the conveyor has a modular plastic belt, similar to the In-feed conveyor belt, except this belt does not have a high friction surface.
- A take-up shaft is provided with tensioning devices on both side of the conveyor to accommodate normal stretch over the life of the belt.
- The 2nd stage conveyor lifts up to provide access to the film feed assembly. There are handles on both sides and a latching mechanism to hold the conveyor in the up position. A safety switch like the ones on the guard doors detects if the conveyor is up or down. The machine cannot cycle if the conveyor is "UP".
- The In-feed guide rails extend out over the roller section to help prevent the product from skewing.

Control Functions

- Motion is controlled by the main motor, an AC motor connected to a VFD. The VFD controls the motor and it communicates via Ethernet connection to the PLC. The PLC sends start, stop and frequency commands to the drive. The main motor controls the speed of the rollers (1st Stage), the modular plastic belt (2nd Stage) immediately following the rollers AND the overwrap flight bar conveyor belt.
- When the machine is put into cycle, the acceleration conveyor will start automatically immediately.
- When the machine is taken out of cycle, the acceleration conveyor will come to a controlled stop, depending on where the machine is at in it's cycle.
- The speed of the acceleration conveyor is determined by the speed of the in-feed conveyor (established earlier) AND another user defined parameter; *Product Interval*.

#	SETPOINT	UNITS	VALUE	SAVE
1	Machine Rate	prod/m*	60	
5	Product Length	0.01in	500	

AND

6	Product Interval	0.01in	2600	
---	------------------	--------	------	--

Formula to determine the speed of the Acceleration & Overwrap conveyors is:

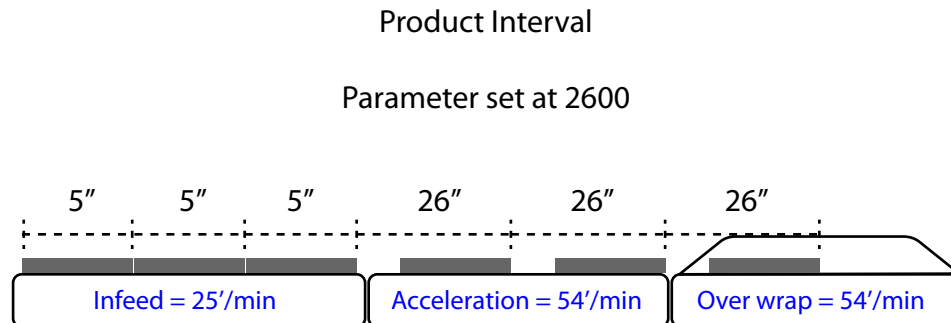
$$AS = S \times PI$$

AS = Acceleration Conveyor Speed

S = In-feed Conveyor Speed, PI = Product Interval

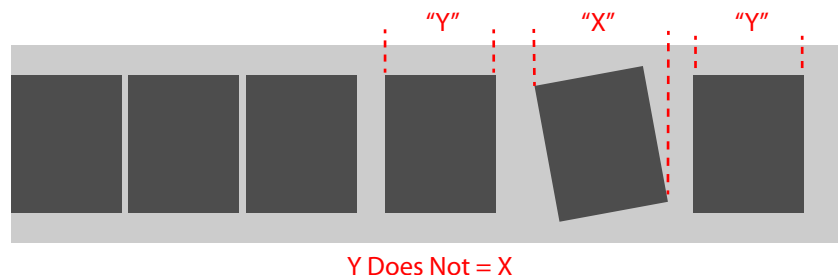
In this example, the Acceleration conveyor rollers and belt speed would be: 54.1'/min (25 x 26 / 12)
(Product Interval is given in "/min so AS needs to be divided by 12 to convert to '/min)

The illustration below shows the relationship of the *Product Interval* parameter and spacing between products.



The Affect of Skewed Product

When transitioning from one conveyor to another, it is possible for the product to skew. Skewed product can have an adverse affect on the machine's ability to properly wrap the product with film. When one corner leads while the other trails, it is nearly impossible to get the film of overlap enough to produce an aesthetically acceptable wrap.



To help prevent the product from skewing, the In-feed guide rails extend out over the roller section. If product does skew, there is a photo-eye called the *Product On Rollers PE* that will detect if the skewing is too much and fault out the machine.

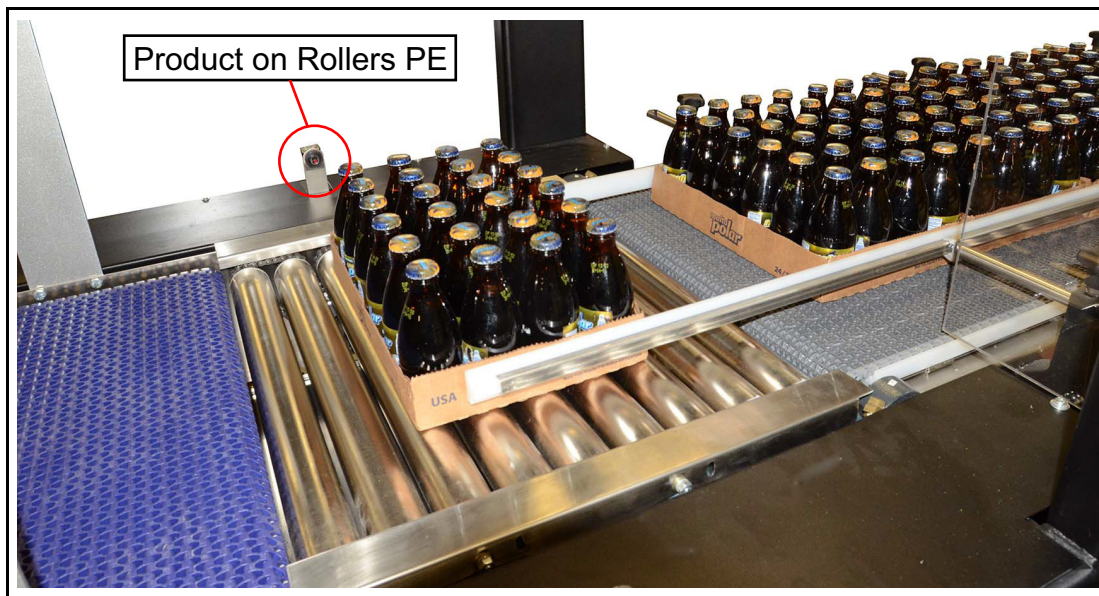


Figure 2-6 - Product On Rollers PE

The PLC calculates what the appropriate length of time is for this eye to be blocked based off the user defined product length and rate and compares that to the value entered for *Length Variance Allowed* parameter.

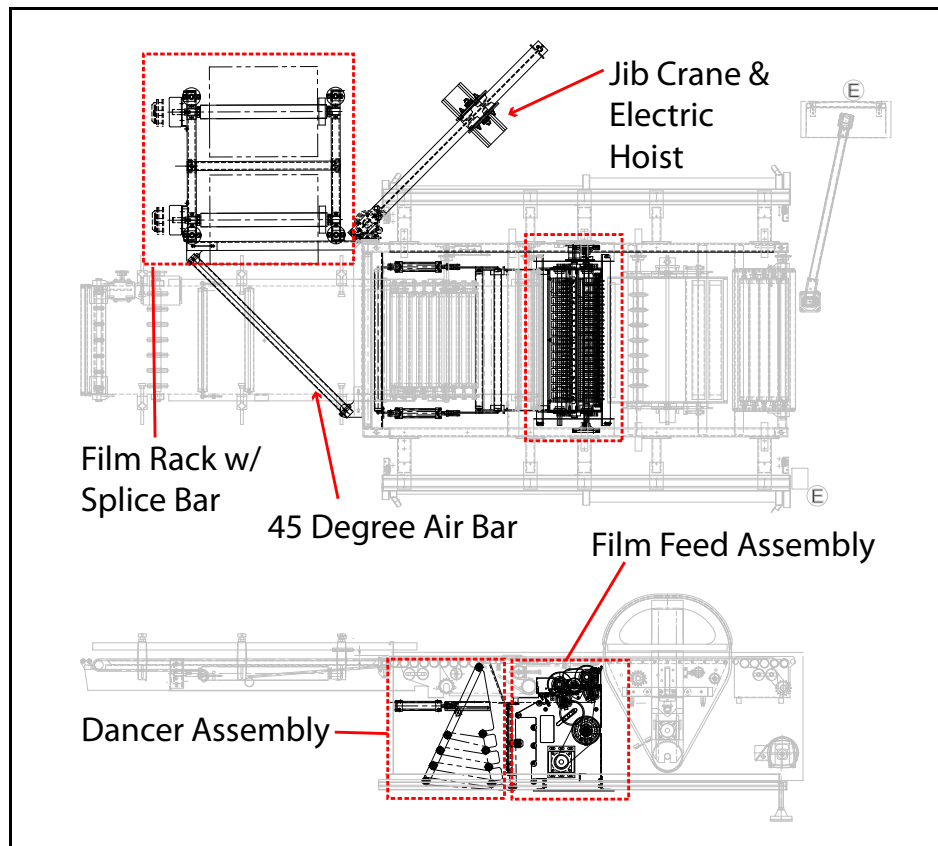
The user can define the allowable length variance.

ARPAC		RECIPE #8 7.25"L x 9.8"W x 5.8"H 30ppm	
ENGLISH		11:01:56 AM 4/14/2017	SECURITY: 4
#	SETPOINT	UNITS	VALUE
1	Machine Rate	prod/m*	60
5	Product Length	0.01in	500
18	Length Variance Allowed	0.01in	200

In this example, product that is skewed more than 2" will stop the machine and cause a fault message to appear on the HMI.

2.3. Film Delivery Assemblies

The film delivery assemblies of the BPTW are designed to store, feed, cut and position sheets of LDPE (Low Density Polypropylene) film to the overwrap assembly. The BPTW can run either clear or print registered LDPE film. The film is kept under light tension and feeds sheets of film on demand.



The mechanical assemblies that make up the film delivery system include:

- A film rack; a two position film roll rack with specially designed film roll shafts and an air operated braking system.
- A jib crane and electrical hoist to lift the rolls of film onto the film rack.
- A splice bar that joins film from a new roll to the existing roll when it runs out.
- A dancer assembly that stores film, pulled from the supply rolls, that is fed to the film feed assembly on demand.
- A film feed assembly that uses servo driven motors to control the feeding and cutting of the film on its way to the overwrap system.

2.3.1. Film Rack

The film rack is located at a right angle to the In-feed conveyor on the upstream end of the machine.

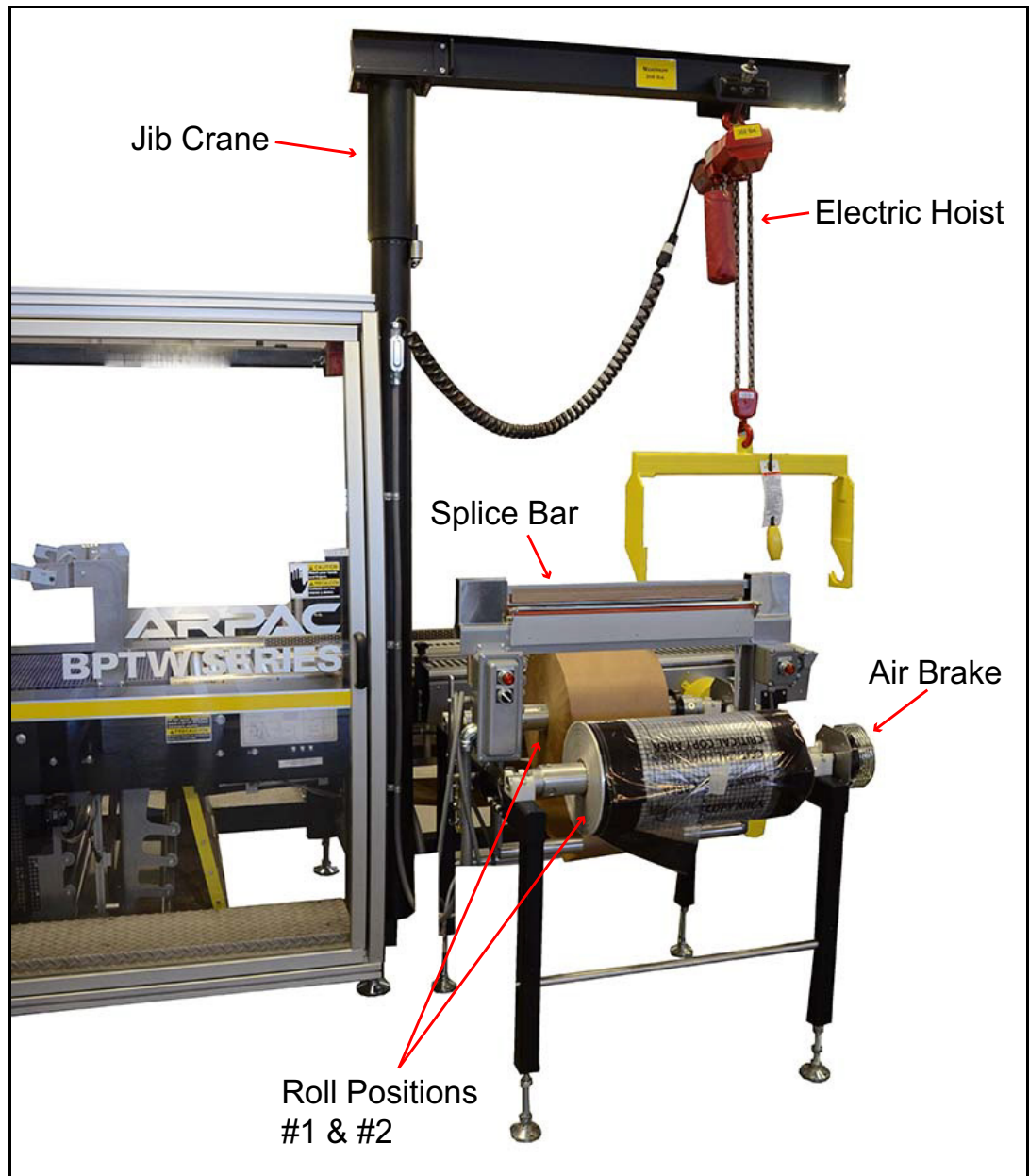


Figure 2-7 - Film Rack and Jib Crane

Mechanical Design Features

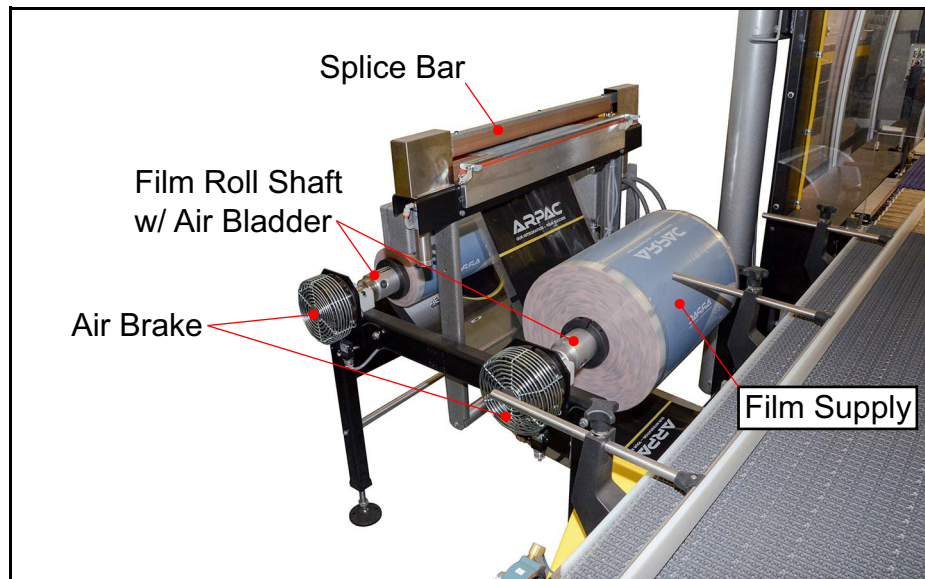


Figure 2-8 - Film Rack Subassemblies

The rack has positions for two rolls of film; rack position #1 is closest to the in-feed conveyor and #2 is the outer position. Each position has a film roll shaft with an inflatable bladder that when expanded extends cleats out that lock the roll into position. An air inflation tool is provided.

The BPTW Series is capable of running clear or print registered LDPE (Low Density Polyethylene) film. The thickness of the film, measured in "mils" (.001), has a range of 1.25 -2.5 mil thick. Film rolls must have a 3" diameter core to fit the inflatable shaft. The maximum a new roll of film can be in terms of overall diameter is 20".

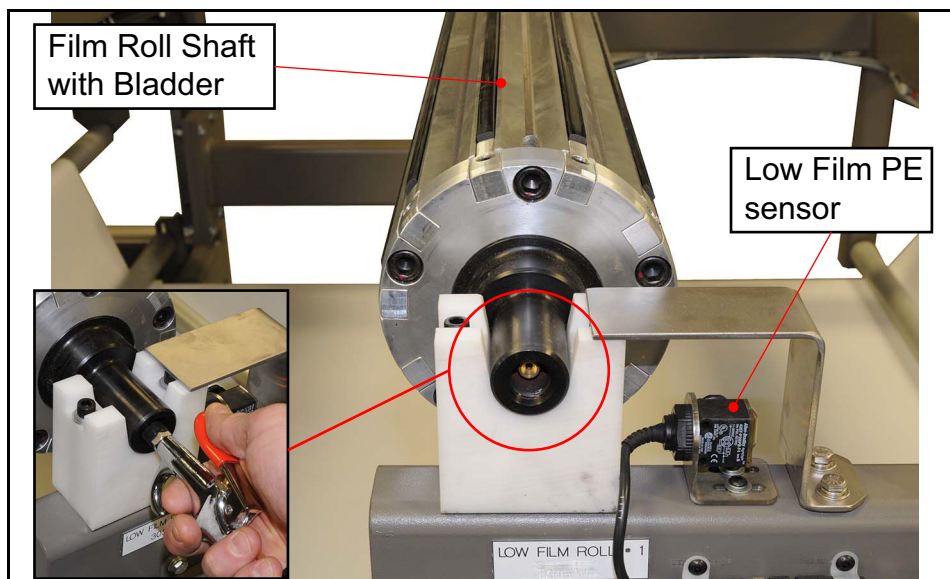


Figure 2-9 - Film Roll Shaft

In order to keep tension on the film, a necessity to running print registered film, an air operated friction brake is used. Solenoid valves via controlled air pressure regulate the amount of braking torque supplied to the brake to stop the film roll shaft from spinning in it's journal when given the proper signal from the PLC.

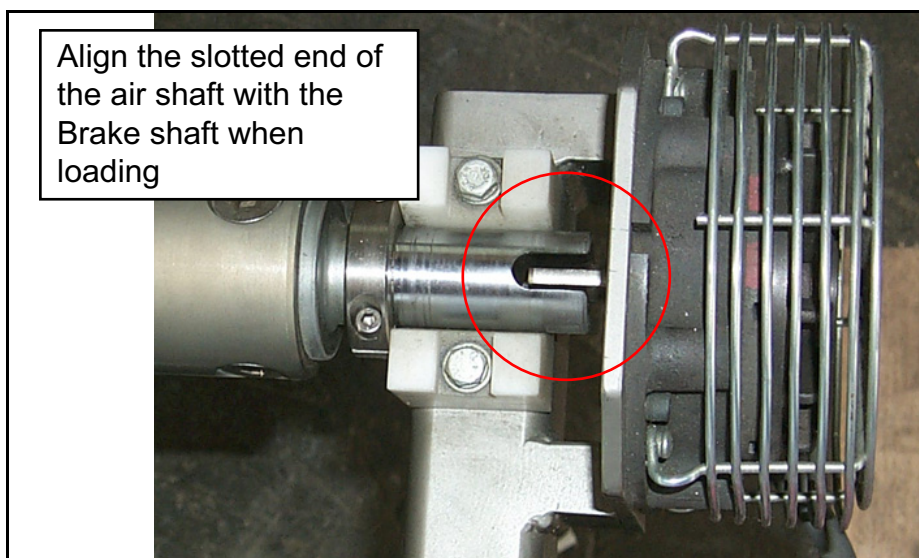


Figure 2-10 - Air Brake

A film-splicing bar consisting of a hot wire, a sealing pad and film clamps is used to splice a new roll of film to an existing roll to assist with speeding up film roll changes. The hot wire assembly is air operated. It is connected to an air cylinder that opens and closes the assembly.

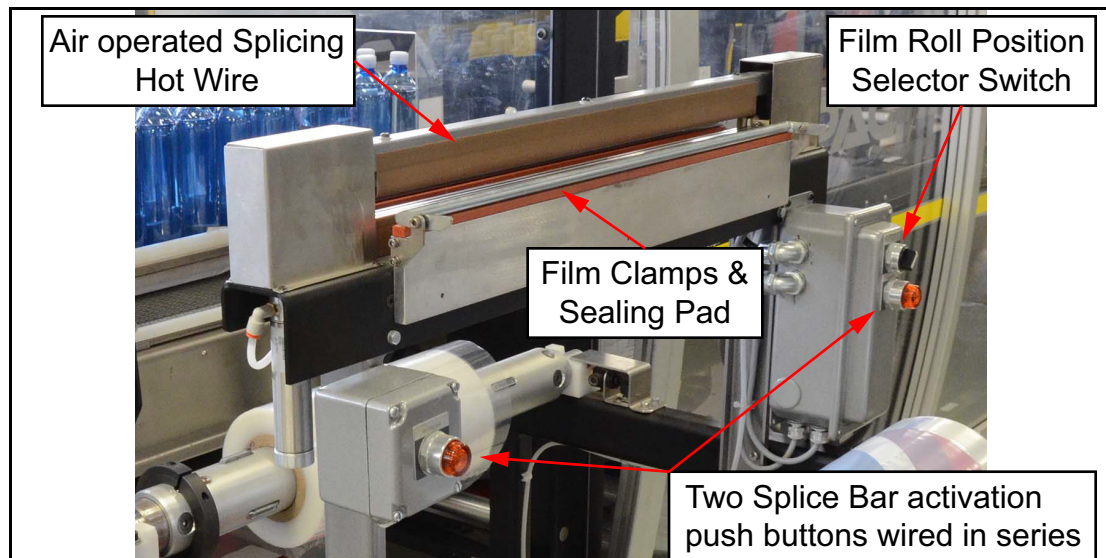


Figure 2-11 - Splice Bar

Because the film rack is at a right angle to the wrapper, the film needs to be placed in-line with the wrapper in order to wrap around the product correctly. This is accomplished with the use of 45° air bar that reroutes the film on the way to the film feed assembly.

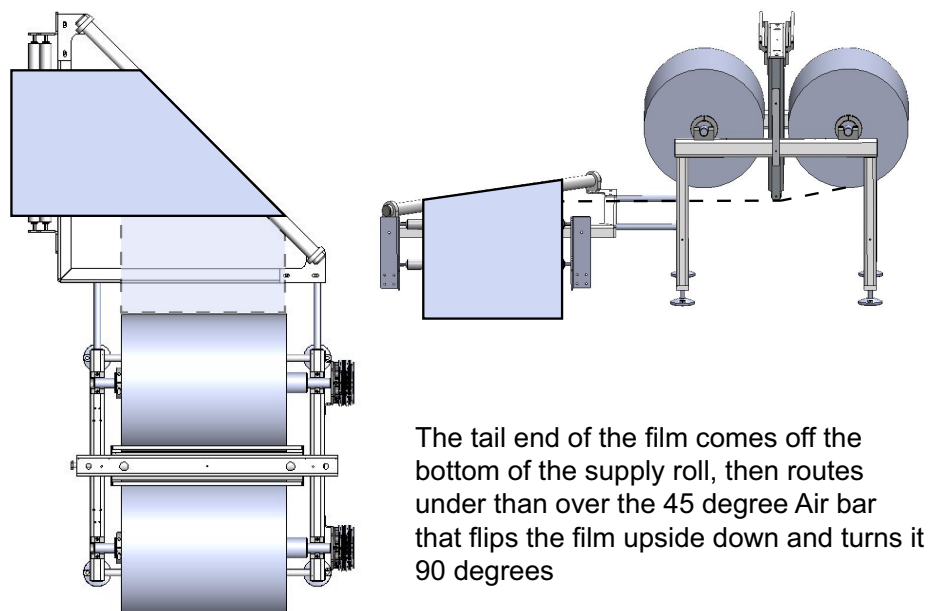


Figure 2-12 - Film Feed

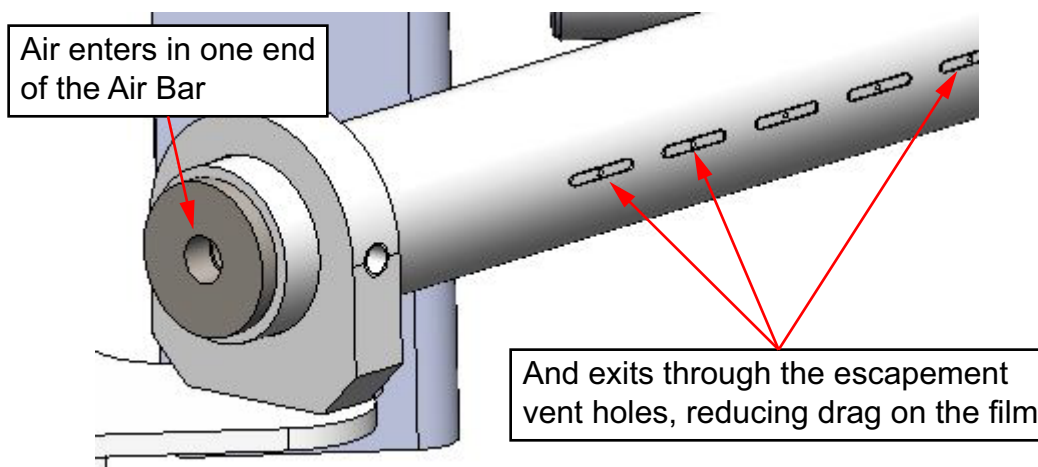


Figure 2-13 - Film Roll Shaft Airflow

- Air enters one end of the bar and exits through air escapement grooves that run the length of the bar. As the air exits the holes it contacts the film wrapped around the air bar and fills the grooves until the air pressure exceeds the film's force on the bar. The air then lifts the film off of the bar, minimizing film drag or friction.
- The wrap of the film on the air bar causes the film to flip upside down and turn 90°.
- Air flow control valves are used to adjust the amount of air sent to the air bar.



Improper adjustment of this assembly can cause film placement and tracking issues. This bar has been set and tested during setup in the factory prior to shipment and should only be adjusted by qualified personnel.

Control Functions

Film roll position selection and splicing film are controlled at the film rack auxiliary control station

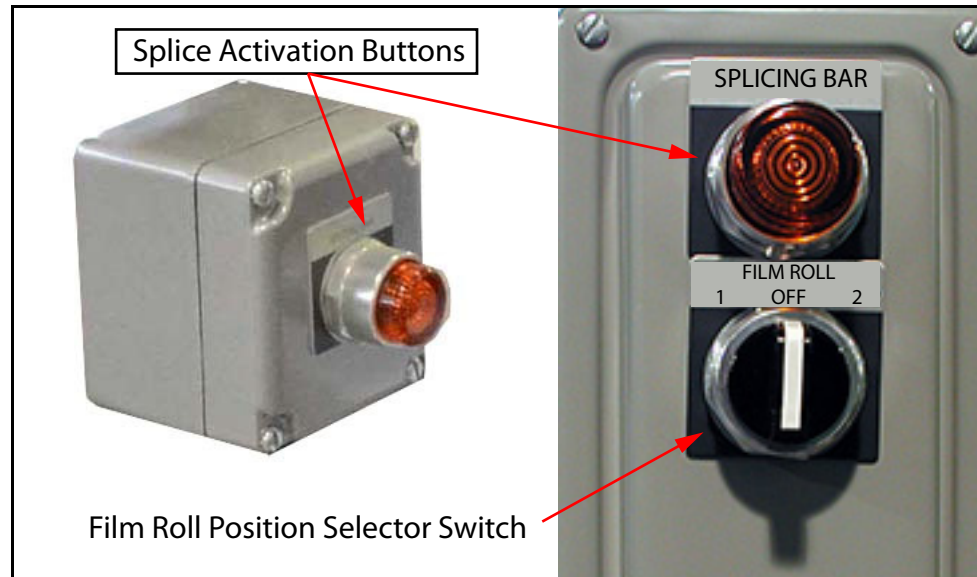
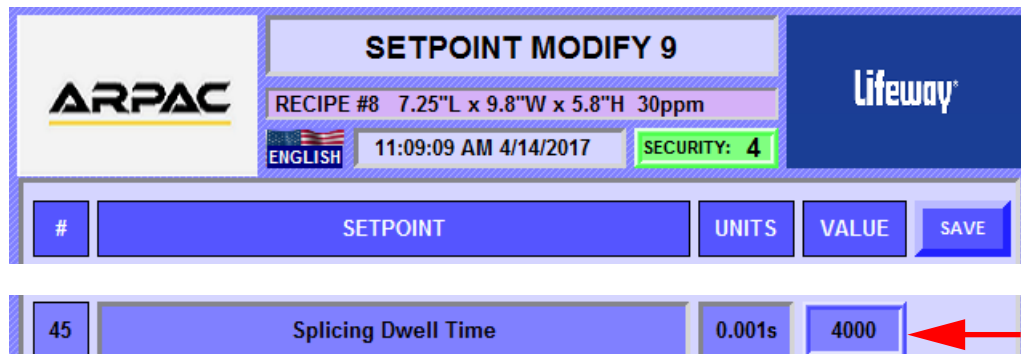


Figure 2-14 - Film Rack Control Station

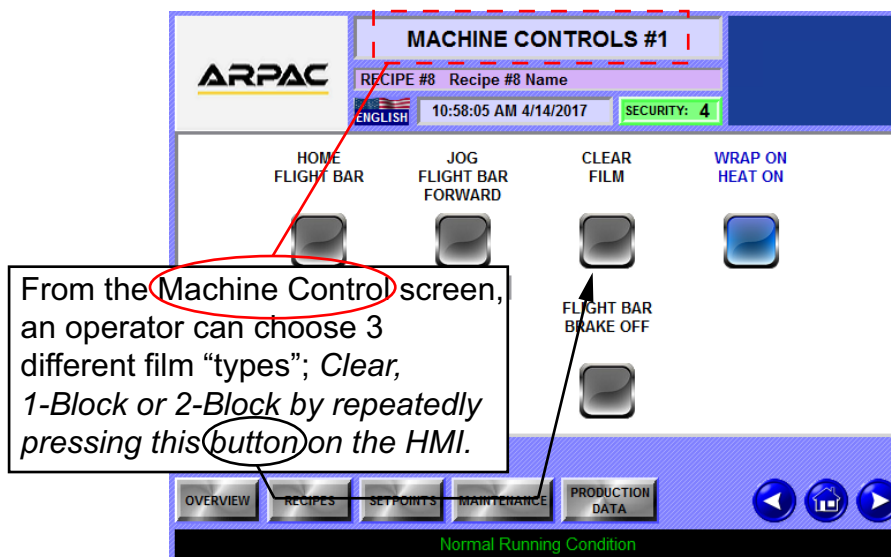
- The film roll selector switch has three positions; 1, OFF and 2. Position 1 is the position furthest from the In-feed conveyor.
- Splicing one roll to another is accomplished by overlapping the two films under the film clamps and then pushing both splice activation buttons simultaneously. With these two buttons wired in series, an operator has to use both hands to activate the hot wire.

Different film compositions and thicknesses require different splicing times. The length of time the splice bar hot wire is heated to fuse the two layers together is adjustable from the HMI.



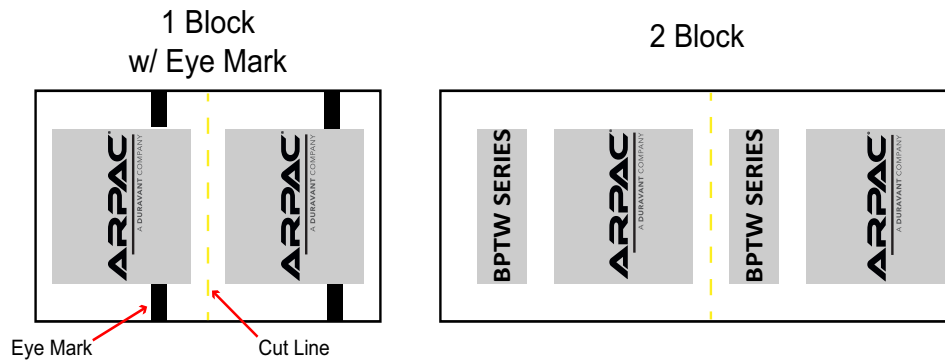
In this example, voltage will be applied to the Splice Bar hot wire for 4 seconds

The user also has to define the type of film being used; clear or printed. The first *Machine Controls* screen (shown below) is where a user would define the type of film being used.



Cycling through the different types of film is accomplished by pressing and releasing the "Film" button until the required type is shown on the screen.

Below is an example of the differences between 1-Block and 2-Block film graphics.



The above illustration is not to scale, it is for reference purposes only. For detailed specifications and requirements on film graphics, contact our Technical Service or Sales Applications departments.

Both positions have a photo-eye sensor that looks across the roll to detect when the roll is running low of film.

An operator can predetermine the number of cycles the machine will continue to run before a fault will cause the machine to stop running.

This allows for minimizing film waste left on the core and preventing the machine from completely running out of film which would require an operator to have to re-thread the film.

ARPAC **SETPOINT MODIFY 9** **Lifeway**

RECIPE #8 7.25"L x 9.8"W x 5.8"H 30ppm

ENGLISH 11:09:09 AM 4/14/2017 SECURITY: 4

#	SETPOINT	UNITS	VALUE	SAVE
43	Film Cycles After Low Film Alarm:Roll #1	-	50	
44	Film Cycles After Low Film Alarm:Roll #2	-	50	

In this example, the machine will run for 50 cycles once a *Low Film* condition is detected before stopping the machine.

- From the *Set Point Modify* screen, enter the desired value for each film roll position independently.
- The number cycles is dependent on the repeat length of the film.

2.3.2. Film Dancer Assembly

The film dancer assembly is located beneath the acceleration conveyor between the 45° air bar and the film feed assembly. The film is threaded from the 45° air bar to the dancer assembly via guide rollers.

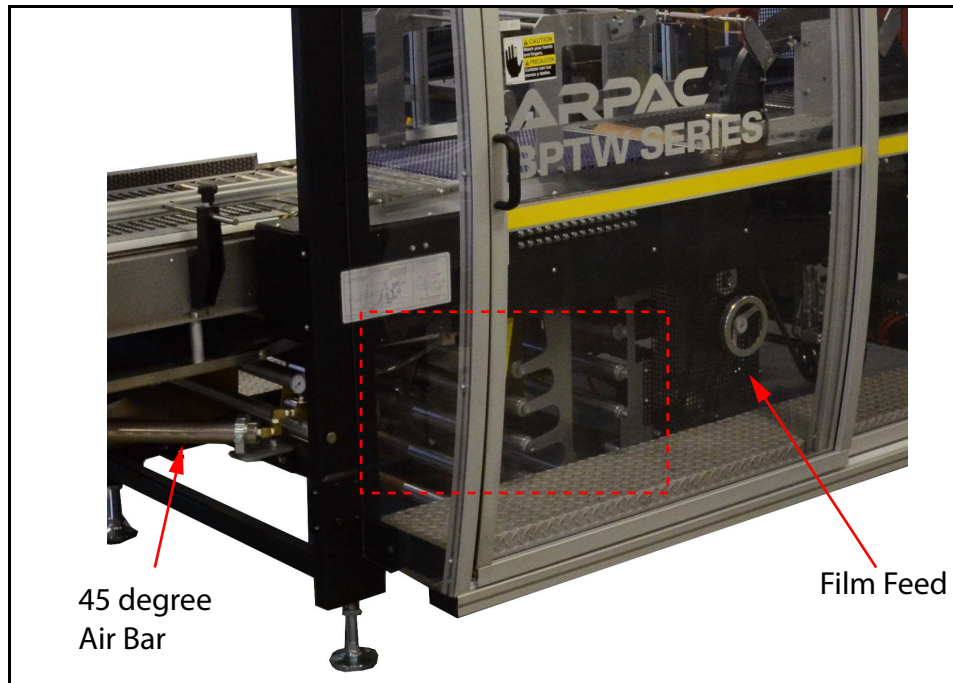
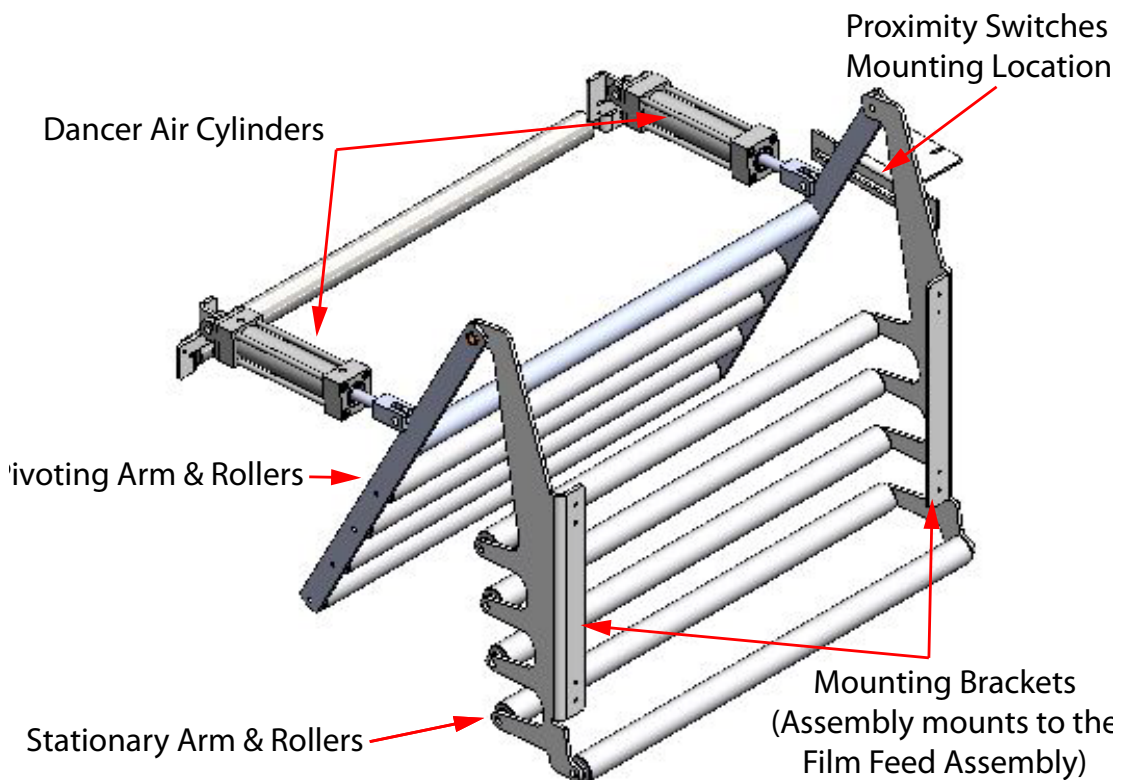


Figure 2-15 - Film Dancer Assembly

The dancer bar assembly is made up of a series of film guide rollers, a stationary arm and a pivoting arm with pneumatic cylinders and proximity sensors.

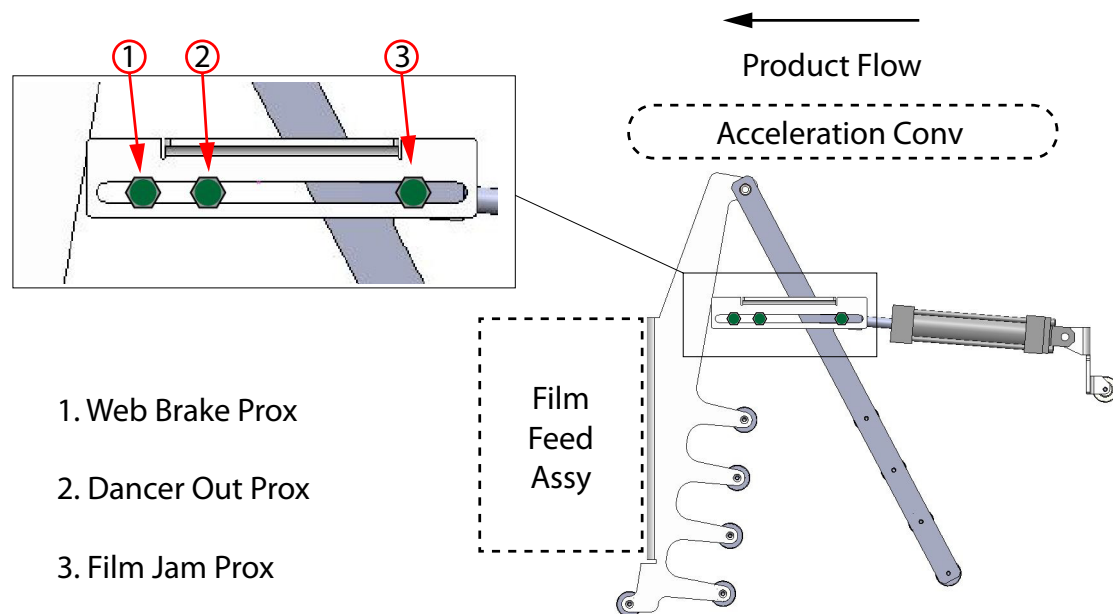
Mechanical Design Features

The dancer bar assembly is designed to create a reservoir of film under constant light tension to immediately meet the film requirements of the advancing product.



- Dual air-cylinders pull on the moving dancer arm to supply tension to the film.
- A reservoir tank supplies air to an air pressure regulator, which controls the rate the air cylinders move the dancer arm, similar to air springs.
- All tension is removed from the film when the air supply is isolated.

Control Functions



- As the film is pulled by the film feed drive, the pivoting dancer arm is pulled against the air spring until it pivots in front of the dancer out proximity sensor. This releases the brake on the active film roll allowing the film to unwind and the dancer arm to pivot away from the proximity sensor re-applying the brake on the film air shaft.
- If the pivoting dancer arm pivots past the dancer out proximity sensor toward the stationary dancer arm it will be detected by the film jammed proximity sensor. This sensor will immediately stop the cycle of the machine and an error message will be displayed on the operator interface.
- If the pivoting dancer arm pivots too far away from the stationary arm it will be detected by the web break proximity sensor. This sensor will immediately stop the cycle of the machine and an error message will be displayed on the operator interface.

2.3.3. Film Feed Assembly

The film feed assembly is located between the dancer bar and overwrap assembly, just below the conveyor line of the acceleration conveyor.

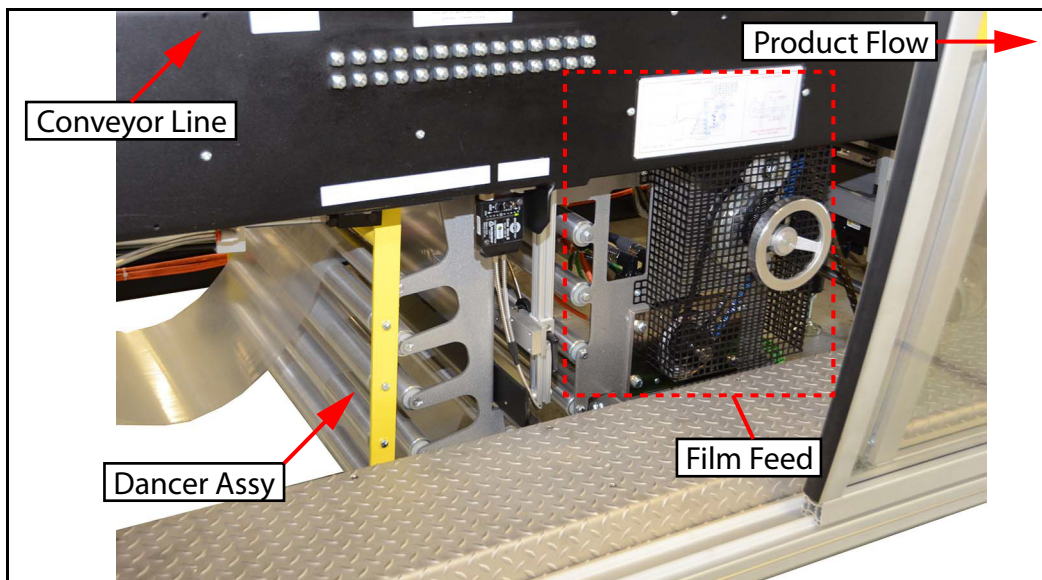


Figure 2-16 - Film Feed Assembly

- Two series of pinch rollers, driven by a servo motor connected to a series of pulleys, pulls film from the dancer assembly. These pinch rollers pull the film tight so a knife can cut the film.
- Knife blades mounted to a shaft and controlled by another servo motor rotate to cut the film at the precise time.
- The film registration photo-eye assembly mounts to this assembly.

Mechanical Design Features

Film feed is accomplished by pulling the film through a pair of servo-driven pinch rollers and onto another set of pinch rollers. A speed differential between the sets of pinch rollers keeps the film taut so that the knife-bladed shaft can easily cut the film.

The sequence of operation for the film feed assembly is as follows:

- A film detect photo-eye on the acceleration conveyor detects incoming product.
- After a time delay to allow the product to advance to the proper position, the PLC signals the film feed servomotor to start and the film is fed.
- When operating with **clear** film, the servo makes the required number of revolutions and then, the PLC signals the knife servo motor to cut the film. The servo continues to run a set number of revolutions, then stops.

When running **print-registered** film, the servo runs until the registration photo-eye detects the registration mark. Upon detection, the PLC signals the knife servo motor to cut the film. The servo continues to run a set number of revolutions, then stops.

The film registration photo-eye is located between the dancer bar and film feed assemblies. This photo-eye detects the registration mark on printed film. Proper alignment of the photo-eye to the film registration mark is critical to allow the rotary knife shaft to cut the film at the correct location and allow the flight bar to overwrap the film around the product

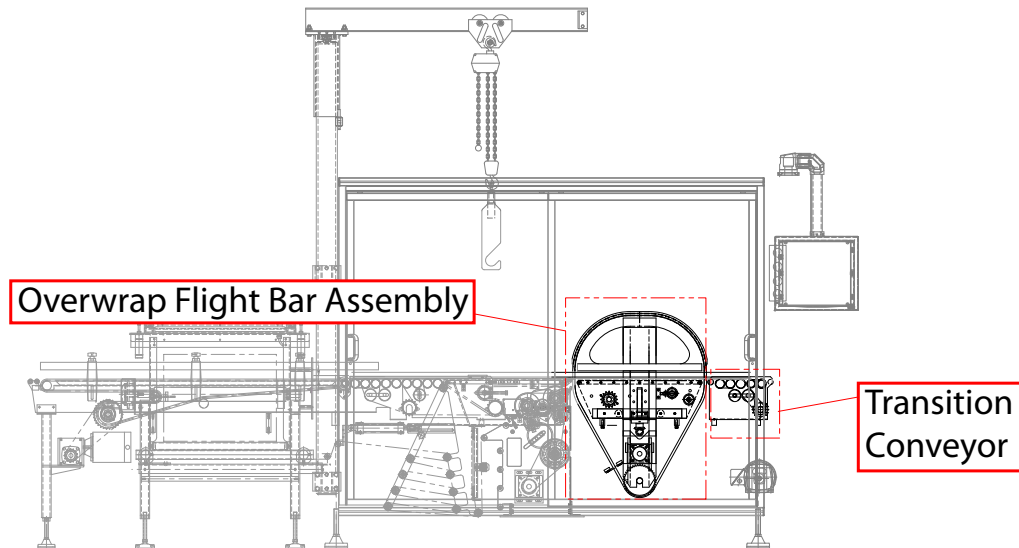
The assembly consists of a photo-eye mounted on a dual-axis adjustable platform. The horizontal adjustment of the film registration photo-eye is needed, so the photo-eye can detect the location of different registration marks due to film type and how the film is centered in relation to the machine.

A vertical adjustment to the position of the photo-photo-eyeye will alter how the film is wrapped around the product, since the photo-eye signals the PLC to stop the servo motor and allow the rotating knife blade to cut the film

The conveyor consists of a set of acceleration rollers followed by an high-friction rubber belt. The speed of the acceleration conveyor must be faster than the in-feed conveyor to provide the necessary spacing between incoming products. The static eliminator brush contacts the incoming product to ground built-up static electricity.

2.4. Film Overwrap System

The mechanical assemblies that make up the film overwrap system include the overwrap flight bar assembly and the transition conveyor.



2.4.1. Overwrap Flight Bar

The overwrap flight bar assembly follows the acceleration conveyor. This servo controlled assembly is designed to wrap the film around the bundle creating an overlapping seal on the bottom of the bundle.



Figure 2-17 - Overwrap Flight Bar

Overwrap Process

The flight bar orbits around the overwrap conveyor, wrapping the film around the product. As the product enters the overwrap conveyor, the leading edge of film is fed up through the film feed pinch rollers in between the product and the belt. The flight bar comes up and behind the product through a gap between the overwrap and acceleration conveyors, holding the trailing edge of film.



Figure 2-18 - Overwrap Process 1

Due to the speed of the flight bar and the product spacing, the flight bar overtakes the product and drops down in front of the product in a gap between the overwrap and transition conveyors, pulling the trailing edge of the film into the gap. As the product passes the end gap, the trailing edge of the film laps under the product, overlapping the leading edge of the film – wrapping the product completely in film.

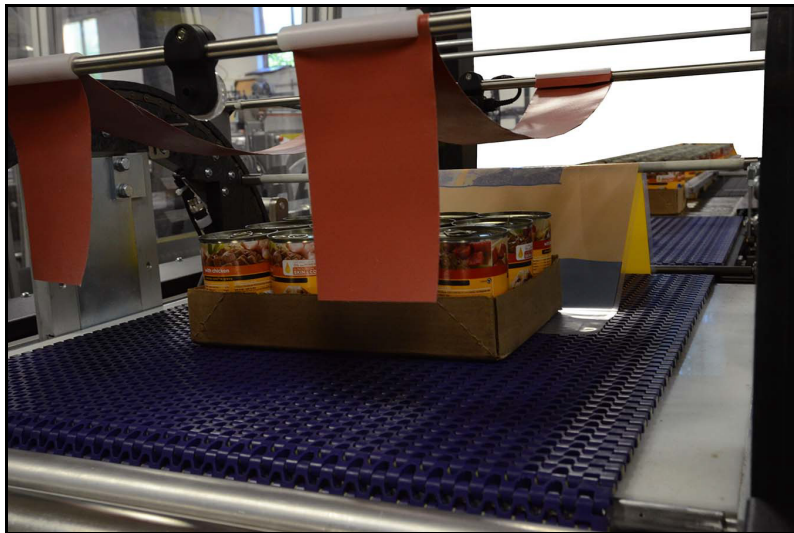


Figure 2-19 - Overwrap Process 2

The film detect on flight bar photo-eye is mounted on the flight bar track. The photo-eye signals the PLC when a film is missing to stop the machine. An air bar mounted on the inside of the conveyor belt at the exit-end of the flight bar conveyor blows the film free of conveyor belt and up against the underside of the product. This prevents the film under the product from sticking to or following conveyor belt as it returns on the underside of the conveyor. A second air bar located under the gap following this bar also assists in film control.

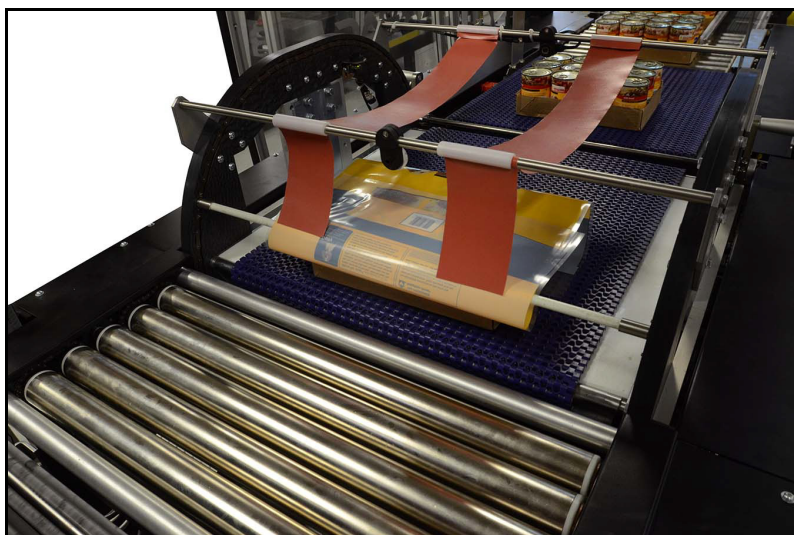


Figure 2-20 - Overwrap Process 3

The strips of silicone belt material are positioned above the overwrap flight bars. They put tension on the film to keep it from prematurely falling off of the flight bars as it wraps around the product. As the product exits the overwrap conveyor it pulls the trailing edge of the film from between the gap, creating an overlap on the bottom of the product pack.

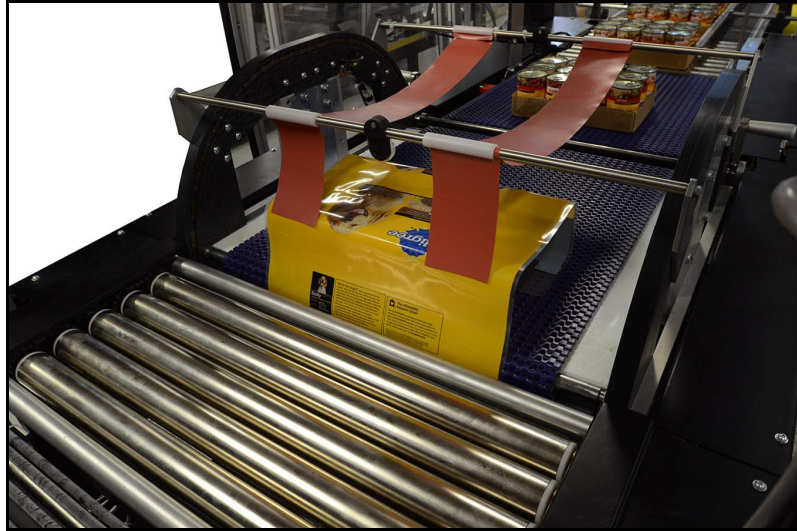


Figure 2-21 - Overwrap Process 4

Control Functions

A film detect photo-eye is mounted on the flight bar track. The photo-eye signals the PLC when a film is missing to stop the machine.

An air bar mounted on the inside of the conveyor belt at the exit-end of the flight bar conveyor blows the film free of conveyor belt and up against the underside of the product. This prevents the film under the product from sticking to or following conveyor belt as it returns on the underside of the conveyor. A second air bar located under the gap following this bar also assists in film control.

2.4.2. Transition Conveyor

The transition is a roller conveyor located between the overwrap conveyor and the tunnel conveyor. Its purpose is to reduce the speed of the wrapped product before entering the tunnel conveyor and to provide a smooth transition to the tunnel conveyor without disturbing the film-wrapped around the product. The transition conveyor consists of a series of driven and idle rollers.

This conveyor starts running when the machine is placed into the cycle mode. It is critical to keep the conveyor rollers clean to allow the conveyor to properly transfer the wrapped product.

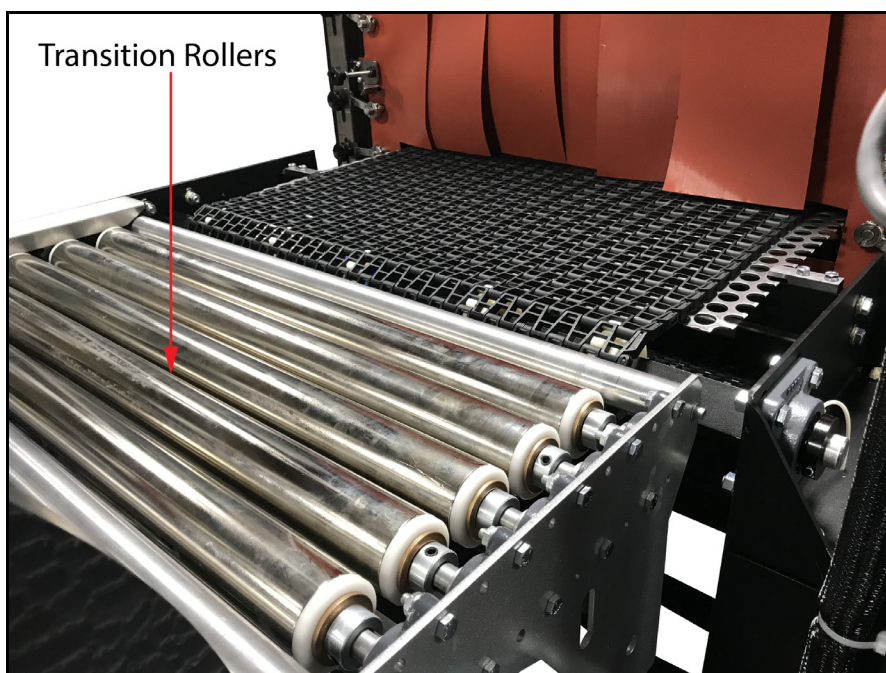


Figure 2-22 - Transition Conveyor

2.5. Shrink Tunnel

The shrink tunnel provides the heat capacity to shrink the film wrapped around the product. Dual forced-air recirculating heaters with single speed blowers and manually operated air louvers control the velocity and volume with which the airflow is directed against all wrapped product surfaces.

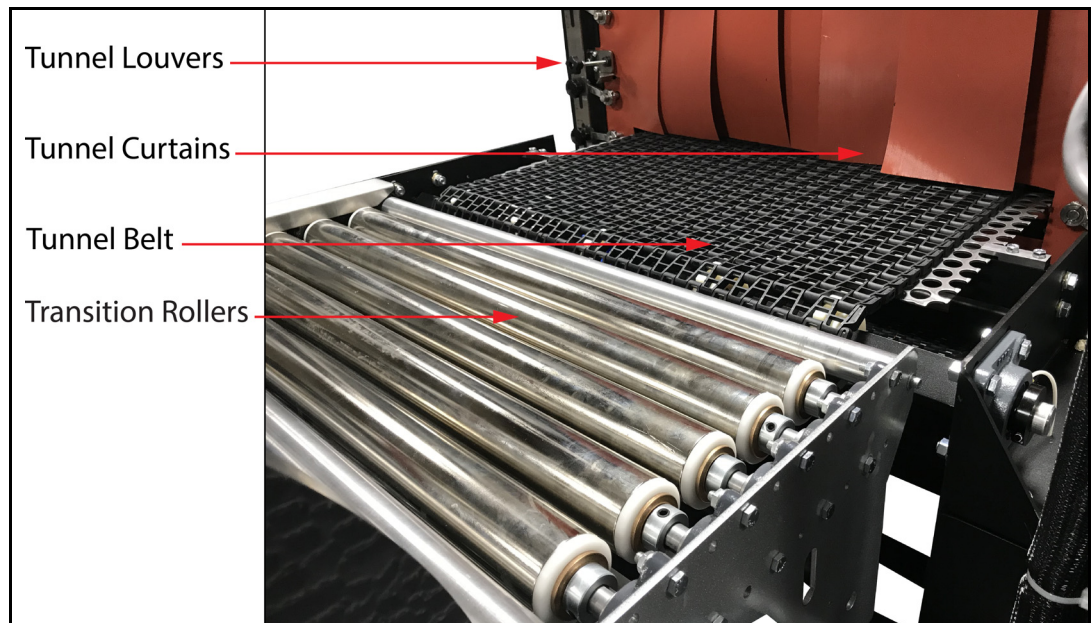


Figure 2-23 - Shrink Tunnel

The shrink tunnel consists of a common air chamber with multiple temperature zones.

The number of zones depends on the application, the product size, the type of product and the wrapper rate.

Tunnels are heated in sections called heat zones. Depending on the application some tunnels are equipped with more than one heat zone. Each heat zone in the tunnel has its own heater element tray, radial blower and thermocouple mounted inside for temperature feedback to the tunnel temperature controller. The radial blower that moves the heated air is mounted directly above the heater element tray.

As electrical current is applied to the coils the heater element tray becomes hot. Air drawn from the inside of the tunnel heat zone through the tunnel intake vents by the radial blower passes through the heater element tray, thus becoming hot. The hot air then returns to the inside of the tunnel heat zone through the exhaust vents on the top, bottom and sides of the inside tunnel walls.

There is a thermocouple located in each heat zone near the heater element tray. This thermocouple connected to the corresponding temperature controller allows for accurate temperature control of that zone.

The intake vents for each heat zone are located on the top of the tunnel. The exhaust vents are located on the inside of the tunnel walls and under the tunnel belt. Tunnel louvers direct the air to the sides or bottom of the tunnel.

The tunnel belt is made of individual fiberglass rods attached to a chain and sprocket arrangement. The tunnel drive motor, located under the tunnel, drives the main tunnel conveyor belt. Adjusting the frequency of the main tunnel drive motor controller. The speed of this conveyor should be set slightly slower than the conveyor feeding it. This prevents the bottom overlap seal from pulling apart.

It is also important that the products are spaced after the tunnel, as the film will be somewhat tacky and if the products are allowed to touch each other the film wrapped around them may become damaged.

When adjusting the speed of this conveyor the operator must also adjust the temperature of the tunnel. It is important to operate this conveyor at the slowest acceptable speed to get the job done, as the faster the conveyor runs the higher the tunnel temperature must be kept.

At the exit end of the tunnel, a cooling section blow ambient air onto the product. This cools the film down as it moves onto the downstream conveyor. It is important that the products are spaced after the tunnel, as the film will be somewhat tacky and if the products are allowed to touch each other the film wrapped around them may become damaged.



It is important to clear any jams very quickly, as any product left in the tunnel could be damaged or melted. All products must be removed immediately from the tunnel in the event of a tunnel shut down. Products not removed will be damaged. The tunnel temperature should never exceed 450°F.



Shrink tunnel is EXTREMELY hot. Always use proper protective equipment when clearing tunnel jams. Use an adequate length device (such as a long pole) to clear product from tunnel. NEVER place hands or arms directly into tunnel while it is hot. Always follow your company's safety procedures. Failure to do so may result in severe injury.

2.5.1. Shrink Tunnel Conveyor

The tunnel conveyor simply allows the product to travel through the shrink chamber and onto the turbo-cooling section. During normal operation, the wire mesh conveyor belt is independently driven by its own drive motor through a chain arrangement at the discharge end.



Figure 2-24 - Shrink Tunnel Conveyor Drive

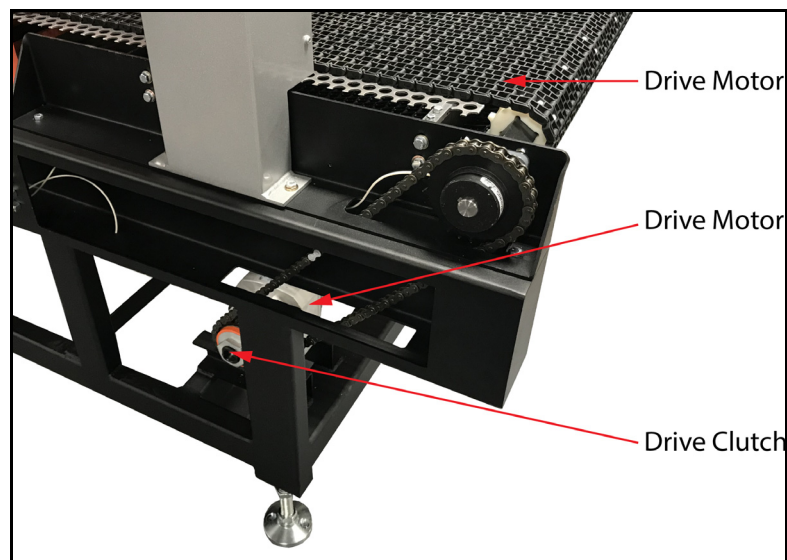


Figure 2-25 -

2.5.2. Tunnel Blowers

The tunnel blower is an electrically controlled radial blower located at the top of the tunnel. The purpose of the blower is to circulate heated air around the film wrapped bundles as they travel through the tunnel.

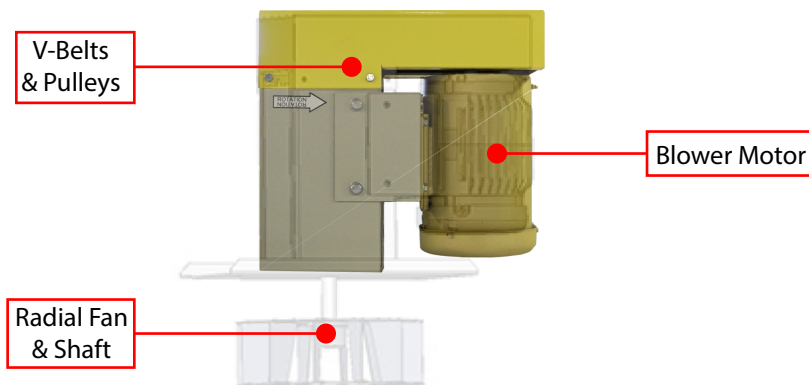


Figure 2-26 - Tunnel Blower (Typical)

Each zone's dual blowers are mounted directly above the electric heater element tray. Each blower draws air from the center of its heat zone through the electric heater element. The heated air is returned to the tunnel heat zone through holes in the sides and bottom of the tunnel.

Some applications require a tunnel with more than one heat zone. Each heat zone has its own blower. The blowers draw air from the center of the tunnel through an electric heater element tray. The heated air is then returned to the tunnel through holes in the top, bottom and sides of the inside tunnel walls.

2.5.3. Turbo Cooling Section

The turbo-cooling section mounted at the exit end of the shrink tunnel is designed to cool off the film immediately after the product exits the tunnel shrink chamber.

Each cooling blower draws in ambient temperature air through its screened intake and discharges air toward the traveling product as it exits the tunnel's shrink chamber.

The turbo cooling section directs ambient temperature air onto the top, sides and ends of the product as it exits the tunnel. This cooling is adequate to ensure that the film shrinks uniformly around the product. However, even after the product passes the cooling section, the film around the product may still be somewhat soft or tacky.

Therefore, it is recommended that the products not be allowed to touch each other immediately after they exit the cooling section.

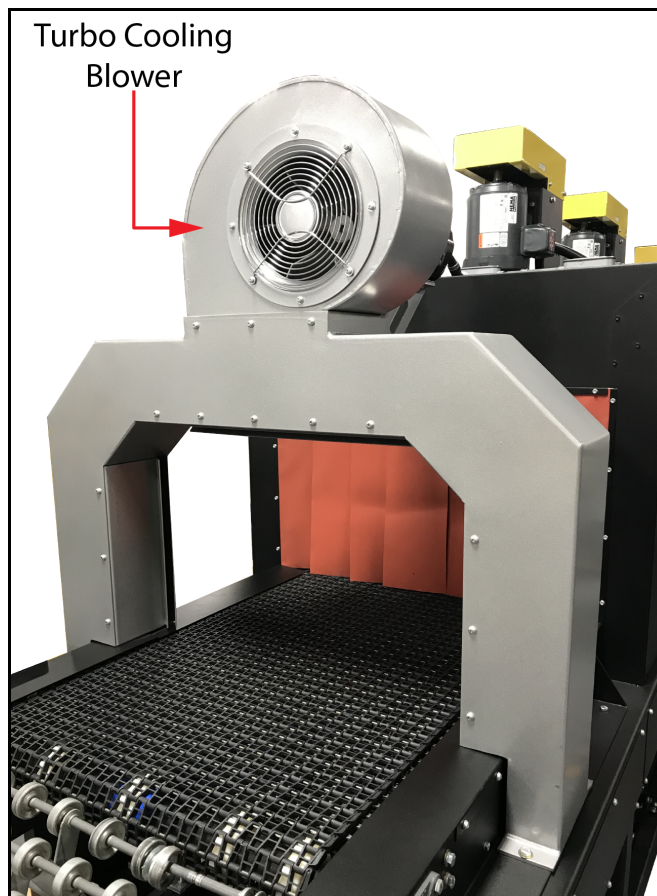


Figure 2-27 - Turbo Cooling Section

2.5.4. Tunnel Belt Cooling Fans

The tunnel belt cooling fans consist of two fan assemblies pointed toward the shrink tunnel conveyor. The fans are located below the tunnel conveyor. The purpose of these fans is to cool the tunnel conveyor belt before the products enter the tunnel.

The products are wrapped in such a way that they must have air blowing on them in all directions when they are moving through the tunnel. The cooling fan helps to keep the tunnel belt temperature at a level so that there will be minimal opportunity for the film to stick to it. The proper air circulation also promotes the even shrinking of film on the products.

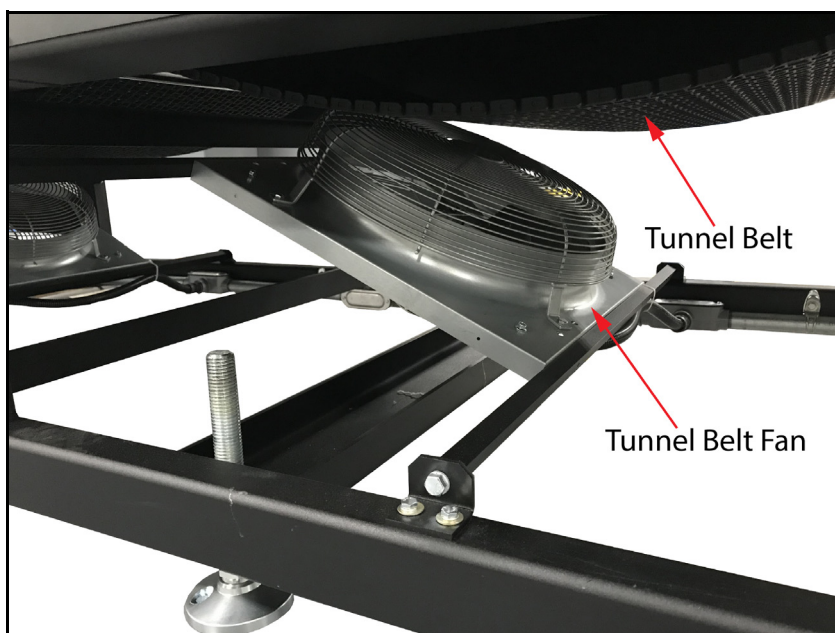
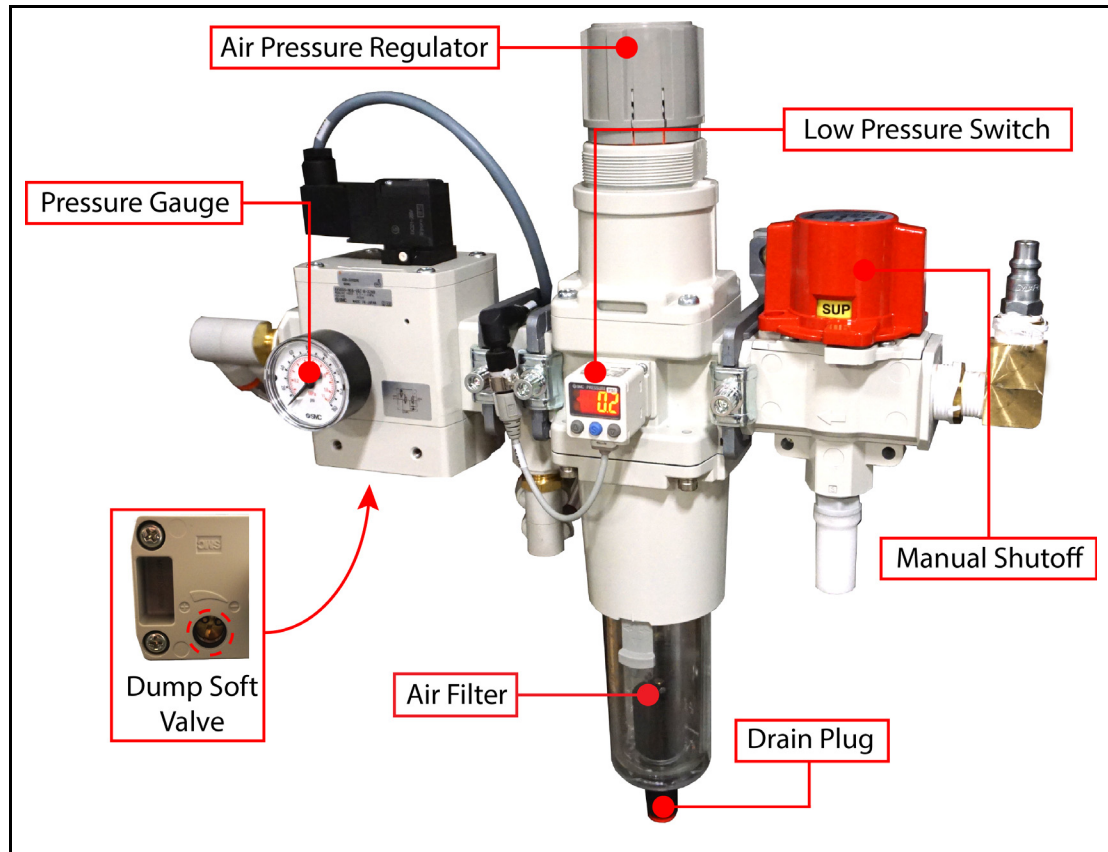


Figure 2-28 - Tunnel Belt Cooling Fan

2.6. Pneumatic Supply & Control System

The pneumatic regulator assembly allows the operator to set and control the air flow and pressure in the machine.



- **Air Pressure Regulator** - This manually adjusts the air pressure in the machine.
- **Pressure Gauge** - This gives a real-time reading of the air pressure in the machine.
- **Low Pressure Switch** - This sets the minimum and maximum air pressure values for machine operation and send a signal to the PLC when limits have been reached.
- **Dump Soft Valve** - This allows for depressurization of the machine for shut-down or service.
- **Air Filter** - This filters the air supply to the machine.
- **Drain Plug** - This allows for drainage of water that has been collected from the machine's air supply.
- **Manual Shutoff Switch** - This allows for manual shutoff of the machine's air supply. This is also where lockout/tagout is applied when necessary.

2.7. Temperature Controllers

The BPTW is equipped with Omron E5CC temperature controllers that allow the operator to control the temperature levels and functions of the shrink tunnel. To set up the temperature controllers, follow the steps below.



Figure 2-29 Temperature Controller

Step 1:

DISPLAY	PARAMETER DESCRIPTIONS	SETTING
CN-t	INPUT TYPE	7
d-U	C/F SELECTION	F
SL-H	SET POINT UPPER LIMIT	500
SL-L	SET POINT LOWER LIMIT	0
ALt1	ALARM 1 TYPE	3
ALt2	ALARM 2 TYPE	0
ALt3	ALARM 3 TYPE	0

STEP #1: HOLD  FOR AT LEAST 3 SECONDS AND INPUT THE PARAMETERS ABOVE. CYCLE THROUGH THE PARAMETERS USING THE  BUTTON.



Step 2:

DISPLAY	PARAMETER DESCRIPTIONS	SETTING
	TEMPERATURE SETTING	*
AL-1	ALARM VALUE	40**

* VARIES FOR TUNNEL, SEAL BAR, ETC.

** 40 FOR TUNNEL, 25 FOR SEAL BAR

STEP #2: GO BACK TO THE MAIN OPERATOR SCREEN. SET THE TEMPERATURE USING THE ARROWS. USE THE  BUTTON TO FIND THE PARAMETER(S) ABOVE.



Step 3:

DISPLAY	PARAMETER DESCRIPTIONS	SETTING
oAPt	OPERATION/ADJUSTMENT	1
Cpt	INITIAL/COMMUNICATION	2

STEP #3: HOLD  AND  FOR 3 SECONDS. SET THE PARAMTERS ABOVE.



3

Installation Considerations

3.1. Overview

Due to the size and type of the equipment, disassembly of major components is typically required for shipping. Precise installation instructions are not available, but the following should be considered.



Rigging and installation of this equipment should only be performed by personnel qualified to perform heavy equipment rigging and with the equipment necessary to perform these types of tasks

NOTICE

Contact SupportPro, ARPAC's after-market support group, if you require additional installation assistance.

3.1.1. Site Preparation & Other Considerations

The following has to be considered when planning for the rigging and installation of this equipment:

- Have and review the equipment layout drawings and electrical schematics prior to beginning this process.
- Firm, level work areas with suitable ground bearing capacity for the loads imposed by the equipment and the machinery used to position the equipment is required. Be sure to consider and plan for adequate space to maneuver.
- Ensure unrestricted/uninterrupted pathways from the equipment storage area (if not being installed upon arrival) or receiving area. Minimum clearance of pathways to be 11' wide by 12' high.
- Check with local authorities regarding any zoning and/or permit requirements. Obtaining any required permits and all taxes are the responsibility of the end user.

3.1.2. Material Handling Equipment Required

The following heavy rigging equipment is necessary, at a minimum, to install this equipment:

- Forklift (Minimum 6500 lbs Load Capacity) with extended forks and/or lifting straps (if ceiling heights will allow) and side shift capabilities



Required Tools

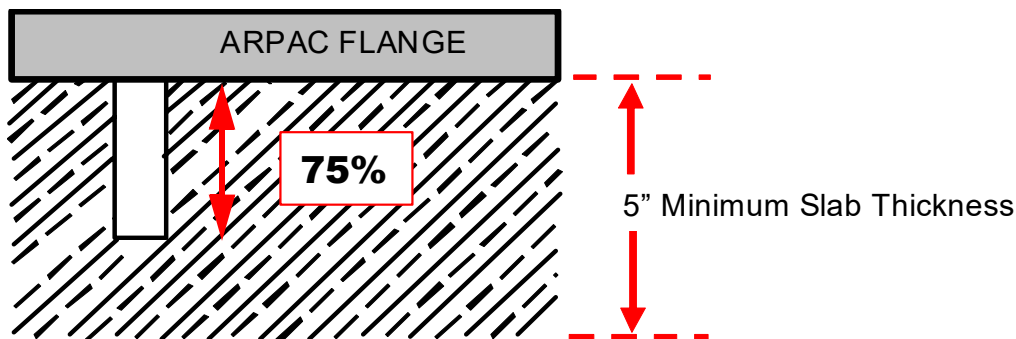
In addition to the rigging equipment, you need the following tools for this procedure:

- Pry Bar, Utility Knife, Diagonal Cutters and other tools to remove equipment from shipping crates
- 6' & 8' Ladders
- Machine Levels, Chalk-Lines and other marking tools
- Power and Hand Tools to include: Hammer Drills for anchoring, Sockets, Wrenches, Screwdrivers, etc.
- Plenty of fasteners of various sizes, wire ties, etc.

3.1.3. Anchoring the Equipment

The equipment is required to be anchored or secured to the floor by generally accepted rigging practices.

Local rules, laws, requirements and generally accepted rigging principles supersede these guidelines, but at a minimum, the following should be followed when anchoring the equipment to the floor:



Use 1/2-13 concrete anchor bolts and lagging shields. The length of the bolt is determined by the thickness of the concrete floor. Only drill down 75% of the concrete floor thickness as not to break through the bottom of the concrete slab. Also, when drilling stay away a minimum of 12" from the edge of the slab and avoid drilling through any surface cracks.



Failure to properly secure the equipment to the floor can result in severe injury to personnel and possible damage to the equipment.



The process of rigging and installing this equipment may require the temporary removal of safety design elements. Failure to properly reinstall and to confirm the functionality of all safety devices prior to and during the power up, start up and commissioning could result in severe injury.

4

Operation

4.1. Introduction

This chapter describes the following:

- What the controls of the machine do.
- How to set the controls and operate the machine.
- How to change film rolls.
- How to thread film.



Read the Safety section found in the Introduction Chapter in this manual before attempting to operate machine. Do not attempt to service or enter machine while in cycle. Always follow your company's safety procedures. Failure to do so may result in severe injury or death.

4.2. Wrapper Main Disconnect Switch

The wrapper main disconnect switch, shown below, turns off all power to the machine.

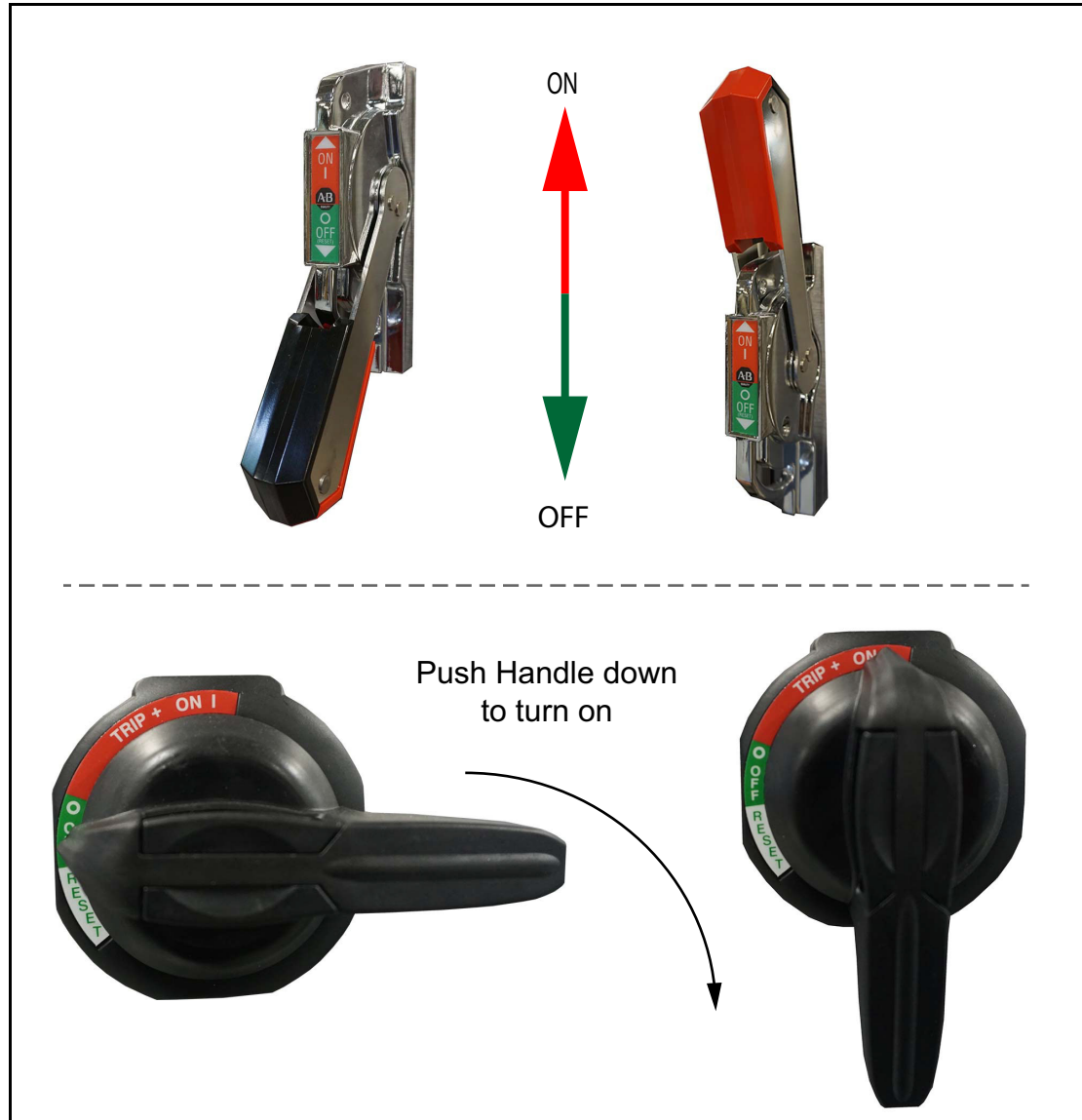


Figure 4-1 - Main Disconnect Switch

4.3. Wrapper Controls

This section describes the various control panels found on the wrapper assemblies.

4.3.1. HMI Main Control Panel

Figure 4-2 below shows the HMI main control panel of the machine. The list that follows describes each control.



Figure 4-2 - Wrapper Main Control Panel

1. **EMERGENCY STOP Push/Pull Button:** Pressing this button will immediately shut down the machine. The button must be pulled out before restarting the machine. This button is also located at various points around the machine.
2. **POWER ON:** Pressing this button turns the machine on.
3. **CYCLE START Button:** Pressing this button will start the normal production cycling of the machine.
4. **CYCLE STO/RESET Button:** Pressing this button stops the machine after it has completed a full cycle. Pressing this button will also clear error messages on the machine's interface after the problem that caused the message has been resolved.
5. **PRODUCT HALT/RUN Switch:** This lighted switch is used to manually halt or start the in-feed conveyor. The **HALT** position disables the in-feed conveyor from running. The **RUN** position enables the in-feed conveyor to run in the normal cycle mode.
6. **JOG Button:** Pressing and holding this button will jog the machine's conveyors without advancing any film. The machine will stop when the button is released. This button can only be used when the machine is not in cycle.
7. **Operator Interface:** This touch screen panel is used to change various settings of the machine. It also displays error messages when the machine experiences a fault or jam. Its use is covered more thoroughly later in this chapter.

4.3.2. Auxiliary Control Panel 1 & 2

Auxiliary control panel 1 is shown and described below. Auxiliary control panel two is identical and located on the opposite side of the conveyor form panel 1.

1. **FILM FEED ONE CYCLE Button:** Pressing this button will make the machine cycle once.
2. **FILM FEED JOG Button:** Pressing and holding this button will jog the machine's film feed without advancing product through the machine. The machine will stop when the button is released. This button can only be used when the machine is not in cycle.
3. **CYCLE STOP/RESET Button:** Pressing this button stops the machine after it has completed a full cycle. Pressing this button will also clear error messages on the machine's interface after the problem that caused the message has been resolved.

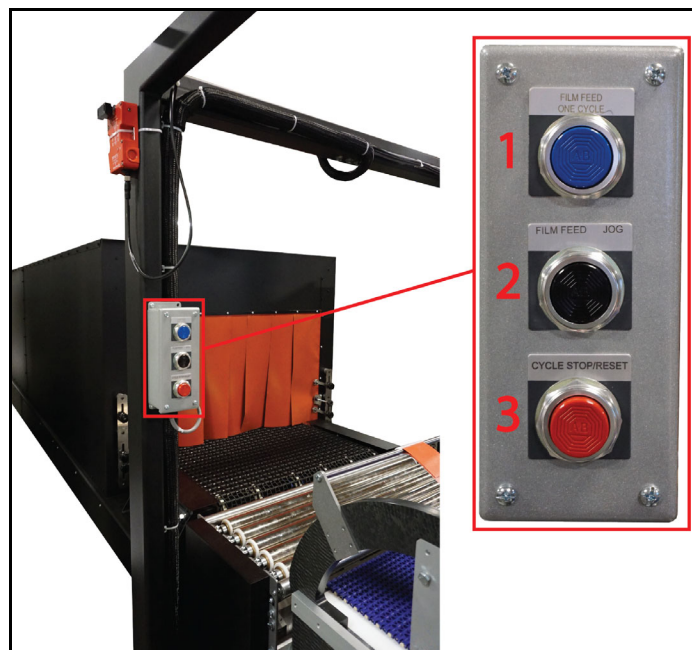


Figure 4-3 - Auxiliary Control Panel 1

4.3.3. Auxiliary Control Panel 3

Auxiliary control panel 3 is shown and described below.

1. **EMERGENCY STOP Push/PULL Button:** Pressing this button will immediately shut down the machine. The button must be pulled out before restarting the machine. This button is also located at various points around the machine.
2. **CYCLE STOP/RESET Button:** Pressing this button stops the machine after it has completed a full cycle. Pressing this button will also clear error messages on the machine's interface after the problem that caused the message has been resolved.
3. **CYCLE START Button:** Pressing this button will start the normal production cycling of the machine.
4. **PRODUCT HALT/RUN Switch:** This lighted switch is used to manually halt or start the infeed conveyor. The **HALT** position disables the infeed conveyor from running. The **RUN** position enables the infeed conveyor to run in the normal cycle mode.
5. **JOG Button:** Pressing and holding this button will jog the machine's conveyors without advancing any film. The machine will stop when the button is released. This button can only be used when the machine is not in cycle.



Figure 4-4 - Auxiliary Control Panel 3

4.3.4. Splice Bar Control Panel

The splice bar control panel is shown and described below.

1. **FILM ROLL Switch:** This switch selects which film roll is currently feeding the machine. "1" is the outside roll; "2" is the inside roll; And None is neither roll.
2. **SPLICING BAR Push/Pull Button:** The splicing bar push button allows the operator to splice a new roll of film to the existing film in the machine. The button remains lit while the seal is made and goes out automatically when the seal is complete. Splicing the film is covered in Splicing Film Section of this chapter.

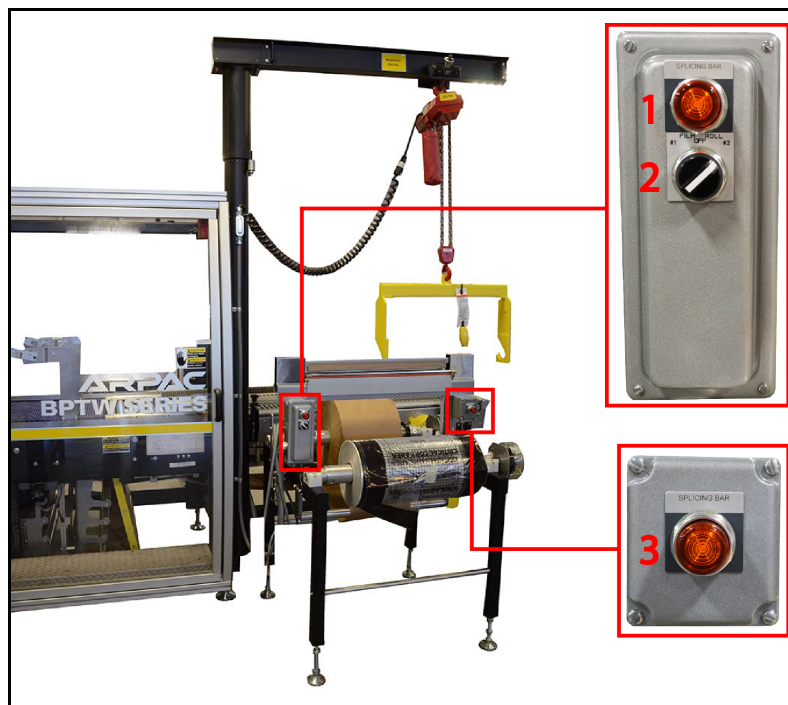


Figure 4-5 - Auxiliary Control Panel 4

4.3.5. Shrink Tunnel Fan Controls

The shrink tunnel fans are controlled through the HMI on the main control panel.

4.3.6. Stack Light Description

The stack light shows the status of the machine and warns the operator of problems.

- **Solid Red** indicates an emergency stop push-pull button is tripped.
- **Flashing Red** indicates a fault or alarm situation.
- **Solid Amber** indicates the film is getting low.
- **Flashing Amber** indicates the machine is in the override or interlock mode.
- **Solid Green** indicates the machine is in the cycle mode.
- **Flashing Green** indicates the machine is going into or coming out of the cycle mode. Also indicates that machine is in standby mode because it received an outside signal from an upstream or downstream sensor to stop.



Figure 4-6 - Light Stack

4.4. Machine Setup



Make sure you have read and understand the Safety section in the Introduction chapter of this manual before attempting to power up or operate the machine. Make sure all personnel are clear of the machine before powering on. Failure to do so may result in severe injury.



Press the EMERGENCY STOP button immediately if any hazard to personnel or the machine is present. See section 4.4.1 for steps to recover from an E-Stop.

1. Make sure the machine is connected to its power source.
2. Make sure machine is loaded with film.
3. Make sure that proper recipe for product has been selected.
4. Turn on the main disconnect switch.
5. Pull out all **EMERGENCY STOP** buttons.
6. Press the **POWER ON** button.
7. Turn the **PRODUCT HALT/RUN** switch to **RUN**.
8. Turn the **COOLING FAN** switches on the shrink tunnel control panel **ON**.
9. Set the **REGISTRATION MODE** through the HMI (see section 4.6.4):
 - “0” for unregistered film
 - “1” for single mark registration
 - “2” for dual mark registration

10. Wait for the shrink tunnel to heat up - it will take 10-20 minutes. When the tunnel within operating range of the set temperature, the ALARM 1 indicator in the temperature controllers will turn off (for more on information on temperature control operation, please see the Omron E5CC manual on the vendor CD found at the end of this manual). Normal cycling of the machine can then be started.
11. Press the **CYCLE STOP/RESET** button.
12. Press the **CYCLE START** button.

4.4.1. Recovering from an Emergency Stop

After pressing the **EMERGENCY STOP** button, do the following to reset the machine:

1. Remove all product from machine.
2. Remove or resolve the cause of the emergency stop action.
3. Pull all the **EMERGENCY STOP** buttons up.
4. Press the **CYCLE STOP/RESET** button.
5. Press the **POWER ON** button on both the wrapper and the tunnel.
6. Press the **CYCLE START** button.

4.5. Operator Interface Introduction

The Human Machine Interface (HMI) is a color touch screen that allows the operator to monitor and change the operation of the machine. An operator can change the operation of the machine by modifying its setpoint values. These values are numerical settings used by the machine's controller/processor to execute its control program. Setpoint values can be saved as a recipe. A recipe contains all of the setting required to properly control the machine for a specific product(s). Using recipes permits a single machine to be used for multiple products.

When opened most displays completely replace the current screen. However, some displays are of the pop-up type. The displays appear overlaid on the current screen. Usually a circular, red button with a white X is located in the corner of the pop-up display. Press this button to close the pop-up display. Otherwise, touch anywhere on the pop-up screen itself to close it. In general, Security, Warning, and Menu displays are pop-up.



Do not use anything but your fingers to operate the HMI touchscreen. Using pens or pencils on the touchscreen can cause damage to the screen and necessitate costly replacement.

4.5.1. General Procedures

The following information applies to all operator interface programs. Model and/or machine specific information is not included in this section.

4.5.2. Data Entry

The interface is equipped with two objects for data entry. Numeric and string (i.e. text) data are inputted using the (numeric) pop-up keypad and the pop-up keyboard, respectively. If the interface is at a sufficient security level for a particular function, the keypad or keyboard opens when an operator touches an object calling for data entry. In addition to buttons for entering characters, both have the following.

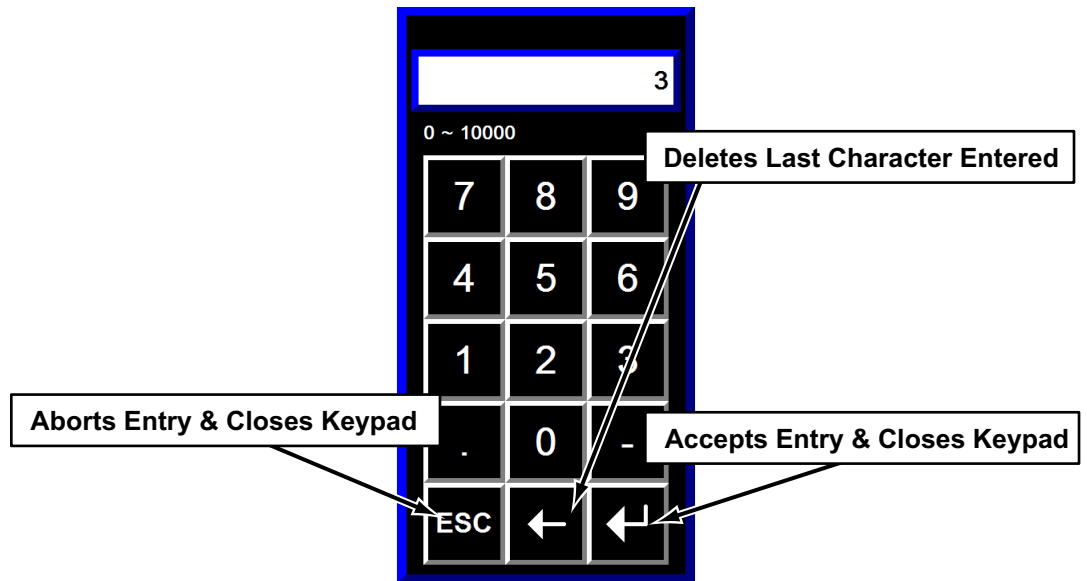


Figure 4-7 - Numeric Keypad

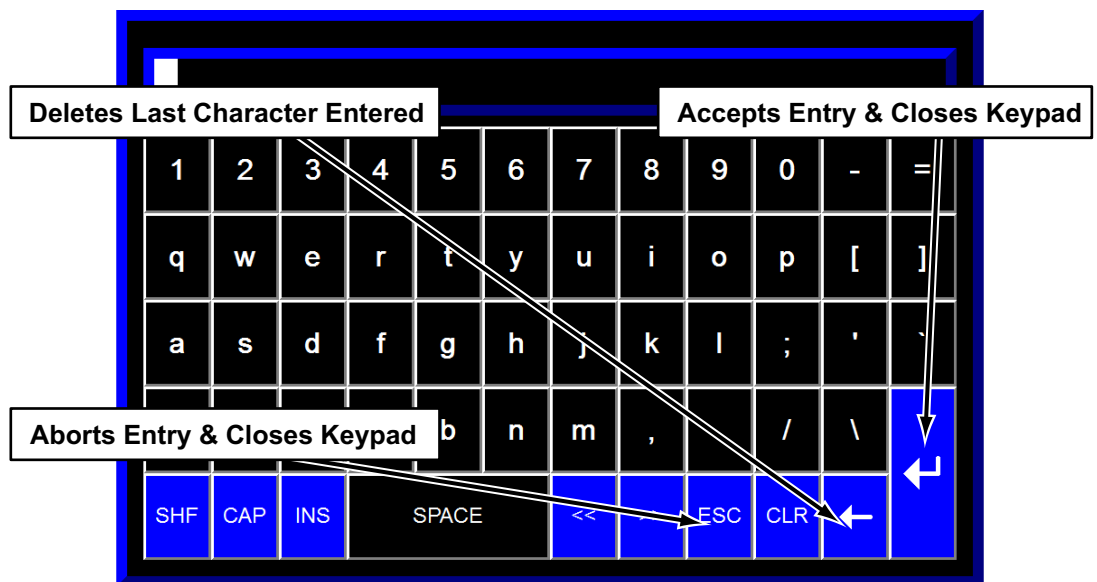


Figure 4-8 - Alpha-Numeric Keypad

4.6. Using the Operator Interface

The Operator Interface allows the operator to monitor and change the operation of the machine.

4.6.1. Security Levels

There are four different security levels associated with the interface. Each progressive level offers a deeper level of access to controlling and monitoring the machine. The levels are as follows:

1. **Basic:** This level is available to all users and is active when the machine is first turned on. This level does not allow anyone to change anything. But it does allow the operator to view basic machine messages.
2. **Operator:** This level is available to trained operators of the machine. It allows the operator to load different recipes for different products into the machine and to change setpoints in the machine's operation. The operator must login to the machine and enter a password to gain access to this level.
3. **Maintenance:** This level is available to trained maintenance technicians. It allows access to all functions of the machine. The technician must login to the machine and enter a password to gain access to this level.
4. **Setup:** This level is only available to OEM trained technicians. It is used during initial machine setup. The technician must login to the machine and enter a password to gain access to this level.

4.6.2. Logging Into Machine

In order to login into the machine, you must first have a four digit numerical password to access the operator maintenance levels. Each level has a different password. If you do not know the password, you can get it from your supervisor or by calling ARPAC. The password was set when the machine was built and it cannot be changed.

1. Turn the machine on. A boot up screen will appear for a moment and then the Main Screen Overview menu shown below will appear. If the machine was already on but the screen is blank, touch it to activate it.

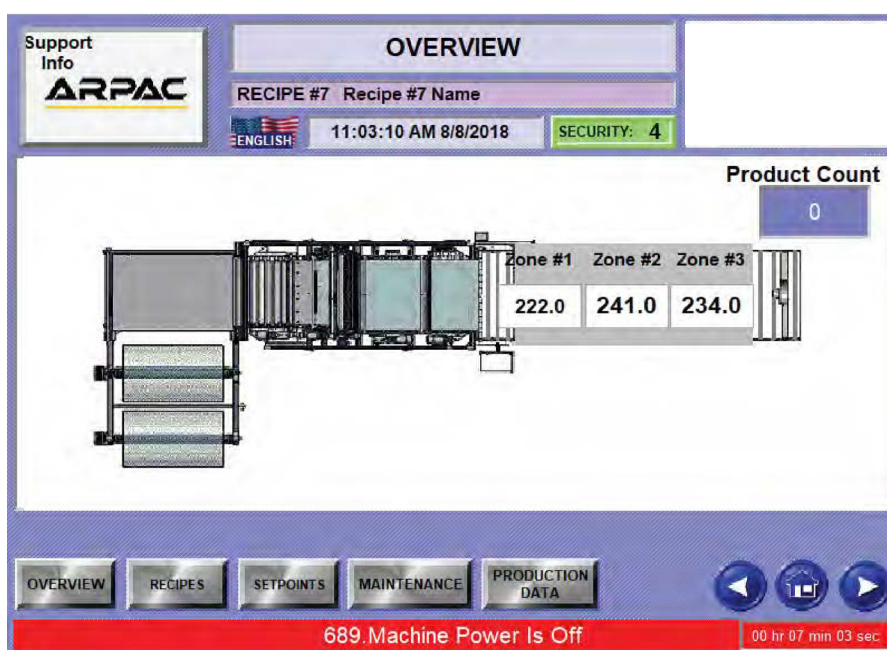


Figure 4-9 - Main Screen Overview Menu

2. Press the **LEVEL** button next to the date and time at the top of the Overview Menu. The login menu shown below will pop-up.

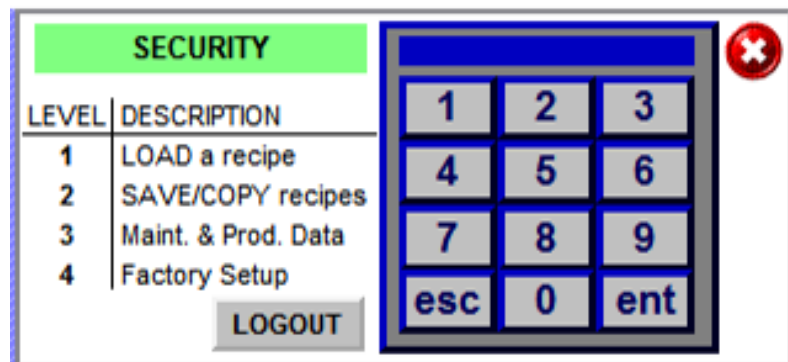


Figure 4-10 - Login In Pop-Up

3. Enter the four digit code and press **ENT**.
4. You are now logged in.

4.6.3. Operator Interface Menu Group Descriptions

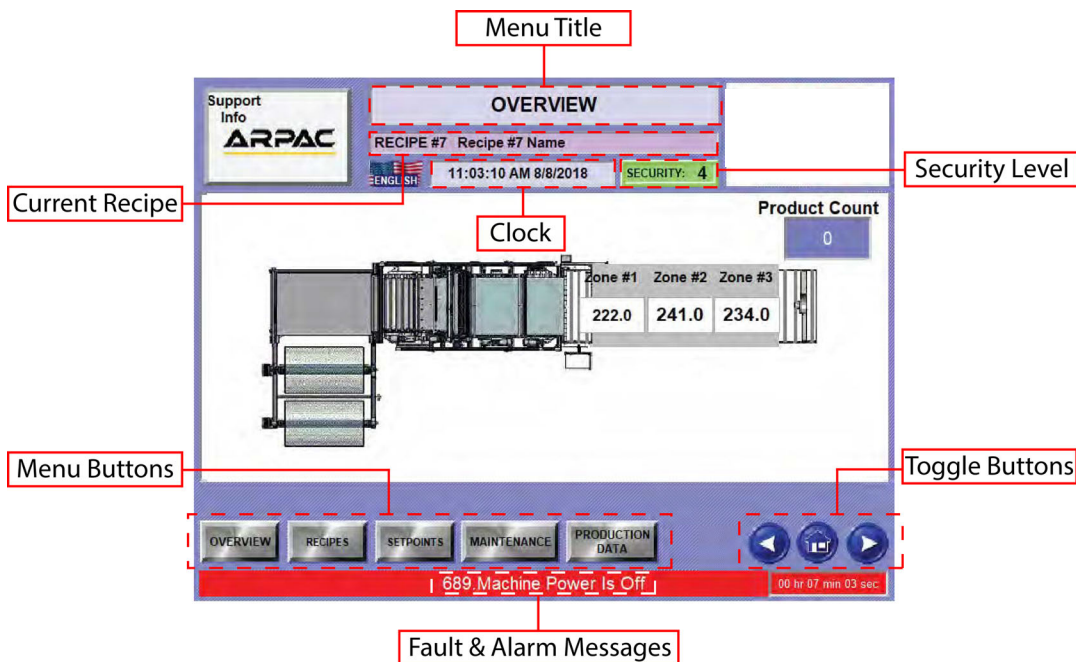
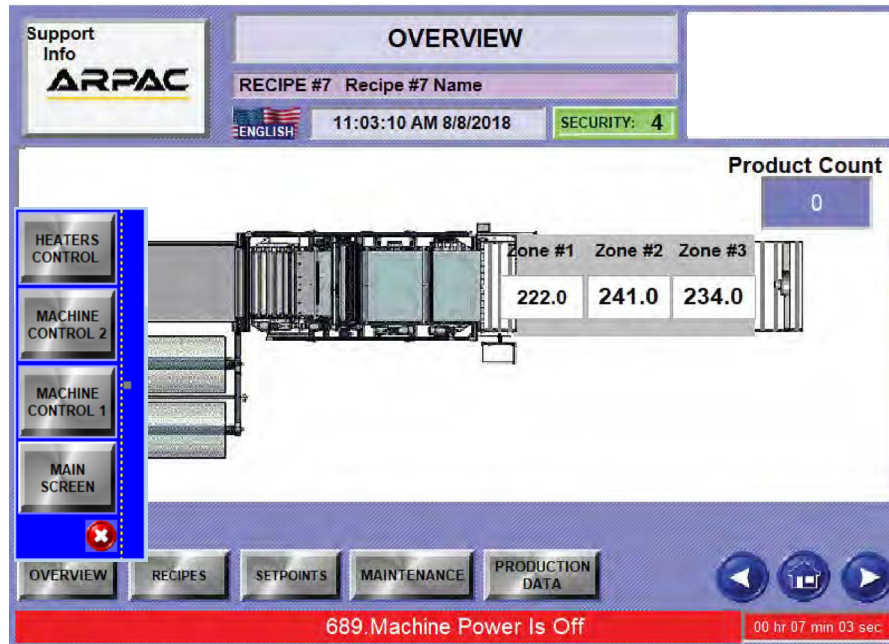


Figure 4-11 - Overview Menu Call Outs

- **Menu Title:** Is the title of the menu currently displayed.
- **Clock:** Shows the current time and date.
- **Login Button:** Pressing the button makes the login menu appear and allows you to login to the machine.
- **Toggle Buttons:** When a menu group has more than one menu, the toggle buttons allow you to toggle between menus in the group.
- **Menu Group Buttons:** Pressing these buttons makes various menu groups appear. Each of these menus will be described in sections that follow.
- **Fault & Alarm Messages:** Displays fault and alarm messages such as “Low Film” or “Emergency Stop”.
- **Current Recipe:** Shows the current recipe being used by the machine. A recipe is a set of parameters (height, length, width, time, etc.) that is specific to the type of product being run.

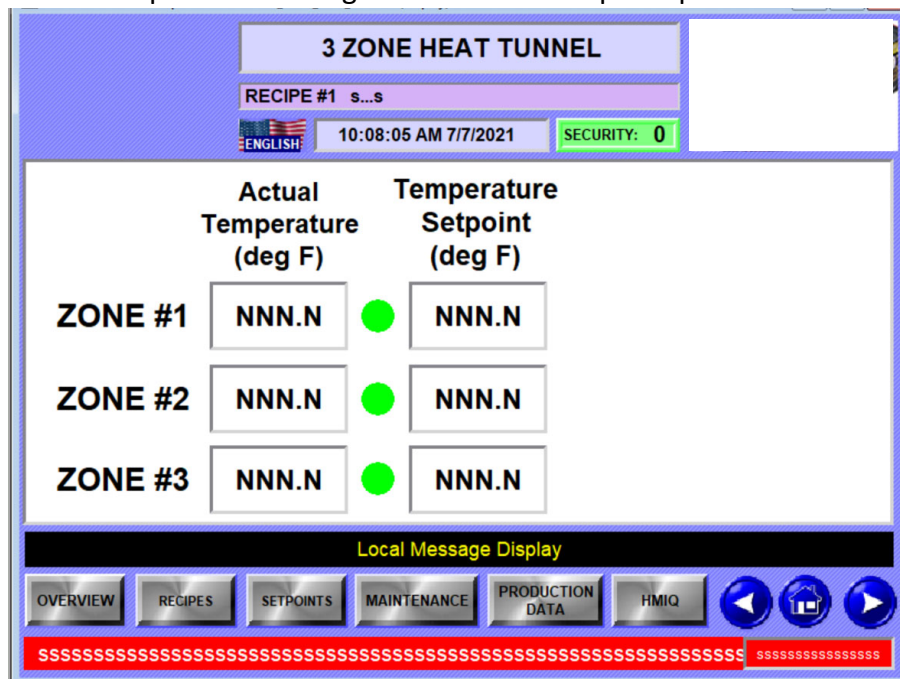
4.6.4. Overview Menu Group

Pressing the Overview button will bring up a pop-up menu for the main control screens (shown below). Pressing each of these buttons will take the user to the corresponding menu screen. The Main Screen (shown below) is an overall view of the machine and keeps track of production count.



Heater Controls Menu

The BPTW allows the operator to control the temperature levels and functions of the shrink tunnel. Temperature settings are based on recipe setpoint values.



Machine Controls Menus

This menu is made up of seven buttons. Depending on machine options, there may be more than one machine controls menu. The name and function of each button is described below. Pressing them will activate the function of that button.

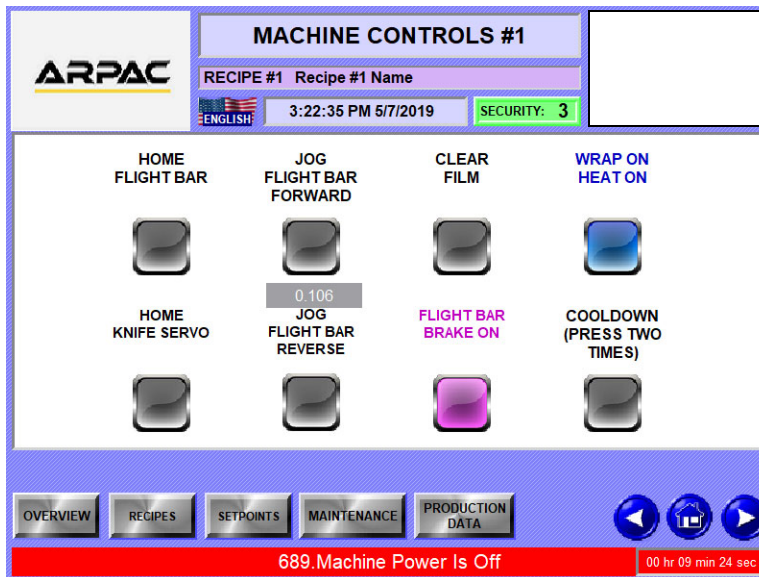


Figure 4-12 - Machine Controls #1 Menu

- **Home Flight Bar:** Pressing this will bring the flight bar to its home position.
- **Home Knife Servo:** Pressing this will bring the knife servo to its home position.
- **Job Flight Bar:** Pressing this button will jog the flight bar forward for .008 seconds.
- **Cool Down (Press Twice):** This button will shut the machine down on a timer. It will turn the heat off but continue to run the belt and fans. This is done in an effort to preserve the tunnel belt longevity.
- **Clear Film:** This button changes the film cutting position. It can be changed from Registration Mark 1; which only reads 1 block on the film. Registration Mark 2; which reads two blocks on the film. Or Clear Film which reads no blocks and film is cut by parameters entered.
- **Flight Bar Break On/Off:** The button will engage/disengage the brake on the flight bar.
- **Jog Machine:** This button is used to jog all the machines mechanism.

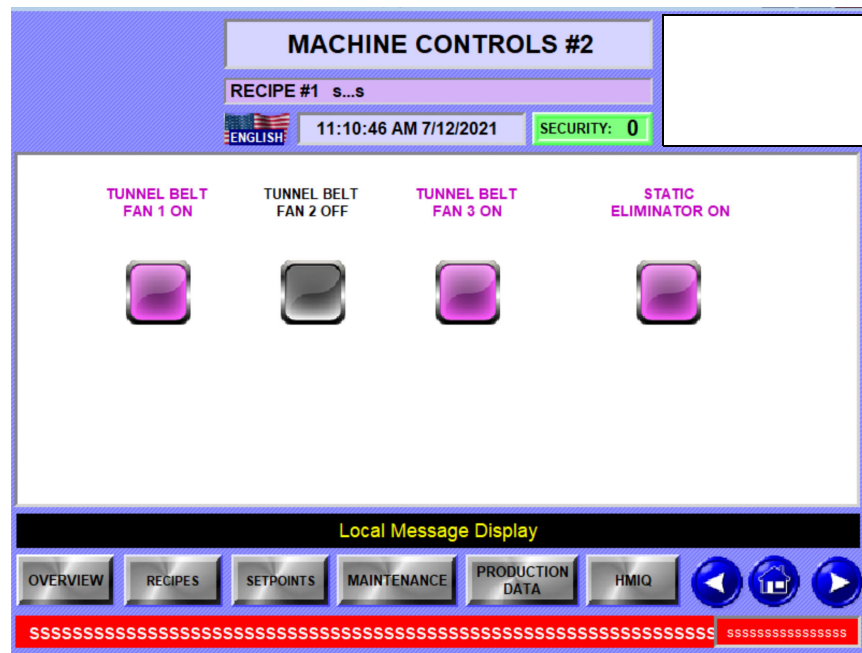


Figure 4-13 - Machine Controls #2 Menu

- **Tunnel Belt Fan 1:** This button is used to turn tunnel belt fan 1 ON/OFF.
- **Tunnel Belt Fan 2:** This button is used to turn tunnel belt fan 2 ON/OFF.
- **Tunnel Belt Fan 3:** This button is used to turn tunnel belt fan 3 ON/OFF.
- **Static Eliminator:** This button is used to turn the static eliminator function ON/OFF.

4.6.5. Recipes Menu Group

The Recipes Menu is where you can load and copy recipes.

Recipes contain the setpoint values for various machine functions. Each recipe is identified by a number and name. Recipe numbers are unique and are used to select recipes with the numeric keypad.

Factory-default setting requires login to security level 1 to load recipes and level 2 or higher to activate all other functions in this group.

Pushing the **RECIPES** button will bring up the **LOAD & COPY** menus.

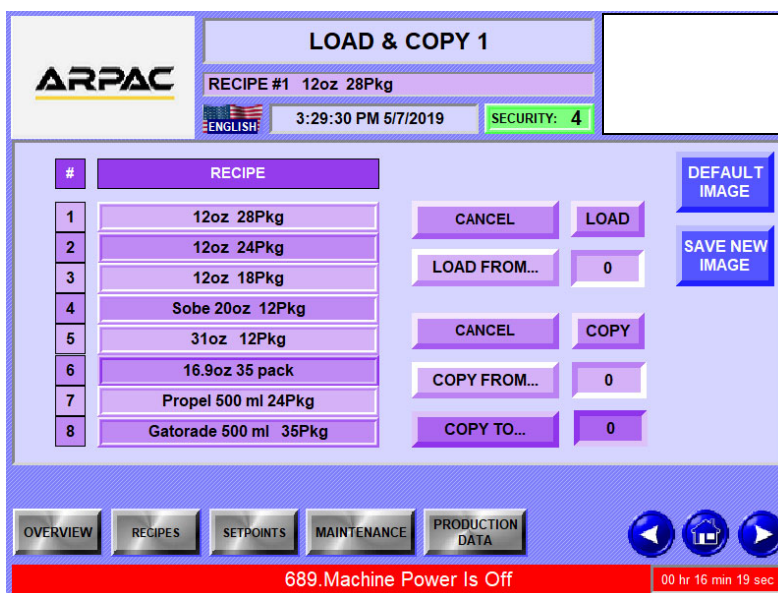


Figure 4-14 - Recipe Load & Copy Menu 1

Loading a Recipe

When you wish to load a recipe, you must make sure the machine is out of cycle.

1. Press **LOAD FROM** to open the numeric keypad. Enter the recipe number you wish to use. Press **CANCEL** to clear any entry.
2. A warning pop-up will appear letting you know you are about to overwrite the current recipe settings.
3. Click **YES** to load the recipe or **NO** to abort the operation.

Copying a Recipe

Copying a recipe overwrites the data stored in one recipe and replaces it with the data from another recipe.

1. Press **COPY FROM** to open the numeric keypad and enter the recipe number from which you wish to copy setpoints.



The recipe you are copying information from remains unaffected by this operation.

2. Press **COPY TO** to enter recipe number that you wish to copy the setpoints to for use.
Press **CANCEL** to abort the operation without copying any data.
3. Press **COPY** to copy the recipe.
4. A warning pop-up will appear letting you know you are about to overwrite the contents.
5. Press **YES** to copy the recipe data or **NO** to abort the operation.

4.6.6. Setpoint Menu Group

A number of numeric values are used to control the machine. Of these, the setpoints are those values which are directly accessed with the operator interface. Most setpoints are accessed through the screens in this menu group. However, some high-level Setpoint Modify displays are accessed via the Maintenance Menu group.

Below each setpoint menu and description of each setpoint is outlined.

#	SETPOINT	UNITS	VALUE	SAVE
1	Machine Rate	prod/min	50	
2	Delay to Start Film Feed	0.01in	740	
3	Delay to Start Flight Bar	0.01in	1350	
4	Reserved	---	0	
5	Product Length	0.01in	1060	

Figure 4-15 - Setpoint Modify Menu 1

1. **Machine Rate:** This sets the production rate of the machine in bundles per minute.
2. **Delay to Start Film Feed:** This sets the time delay between when the product is detected by the product detection beam on the accumulation conveyor and when the film feed starts feeding film. This is used to set the position of the leading edge of the film under the bundle.
3. **Delay to Start Flight Bar:** This sets the distance delay between when the product is detected by the product detection beam on the accumulation conveyor and when the film flight bar starts to rise engaging the film after the bundle has moved completely onto the overwrap conveyor.
4. **Reserved:** These are preset programmed options that activate when additional equipment is added.
5. **Product Length:** This sets the length of the product.

#	SETPOINT	UNITS	VALUE	SAVE
6	Product Interval	0.01in	2400	
7	Reserved	---	0	
8	Film Length	0.01in	3675	
9	Film Feed Low Speed Distance	0.01in	525	
10	Film Feed Low Speed	%	100	

689. Machine Power Is Off 00 hr 20 min 11 sec

Figure 4-16 - Setpoint Modify Menu 2

6. **Product Interval:** This sets the distance between the leading edge of one product on the acceleration conveyor and the leading edge of the following product.
7. **Reserved:** These are preset programmed options that activate when additional equipment is added.
8. **Film Length:** This sets the amount of film that will be fed out for each bundle. The length should equal the sum of the sides, top, bottom, and film overlap on the bottom of the bundle. This setting only applies to clear film or film without registration marks. Film length for registered film is automatically monitored and set by a photo eye.
9. **Film Feed Low Speed Distance:** This sets the length of film that will be fed out before the high speed portion of the wrap cycle starts up.
10. **Film Feed Low Speed:** This sets the film feeds low speed relative to the speed of the overwrap conveyor.

#	SETPOINT	UNITS	VALUE	SAVE
11	Film Feed High Speed	%	315	
12	Film Stopping Position	0.01in	1400	
13	Flight Bar Height Position	in	1	
14	Flight Bar Low Speed Distance	0.01in	1050	
15	Flight Bar Low Speed	%	245	

689.Machine Power Is Off 00 hr 20 min 56 sec

Figure 4-17 - Setpoint Modify Menu 3

11. **Film Feed High Speed:** This sets the film feeds high speed relative to the speed of the overwrap conveyor. The speed is a percentage of the speed of the overwrap conveyor.
12. **Film Stopping Position:** This sets how far the film that remains in the film feeder will advance past the knife after a cut has been made. This should be set so that the leading edge of the new film has emerged from the feeder and is protruding about 1-2" onto the overwrap conveyor.
13. **Flight Bar Height Position:** This give the height at which the flight bar should adjusted.
14. **Flight Bar Low Speed Distance:** This sets how far the flight bar will advance before the high speed portion of the wrap cycle starts up. This distance is typically half the length of the bundle plus the distance of the film overlap on the bottom of the bundle.
15. **Flight Bar Low Speed:** This sets the speed of the flight bar as it travels through the low speed portion of the wrap cycle. The speed is a percentage of the speed of the overwrap conveyor.

#	SETPOINT	UNITS	VALUE	SAVE
16	Flight Bar High Speed	%	340	
17	Infeed Conveyor Speed Adjustment	%	100	
18	Acceleration Conveyor Speed Adjustment	%	100	
19	Tunnel Belt Speed Adjustment	%	70	
20	Transition Conveyor Speed Adjustment	%	100	

689. Machine Power Is Off 00 hr 21 min 28 sec

Figure 4-18 - Setpoint Modify Menu 4

16. **Flight Bar High Speed:** This sets the speed of the flight bar as it travels through the high speed portion of the wrap cycle. The speed is a percentage of the speed of the overwrap conveyor.
17. **Infeed Conveyor Speed Adjustment:** This sets the speed of the infeed conveyor relative to the acceleration conveyor to control product spacing.
18. **Acceleration Conveyor Speed Adjustment:** This sets the speed of the acceleration conveyor relative to the overwrap conveyor to control product stability.
19. **Tunnel Belt Speed Adjustment:** This sets the speed of the tunnel relative to the transitional conveyor speed. It should always be set to around 85%. Although the tunnel speed is set lower than the overwrap conveyor, the product will not back up because the gap between the incoming bundles compensates for the slower conveyor.
20. **Transition Conveyor Speed Adjustment:** This sets the speed of the transition conveyor relative to the speed of the tunnel conveyor to control spacing between products.

#	SETPOINT	UNITS	VALUE	SAVE
21	Knife Speed Adjustment	%	95	
22	Cooling Conveyor Speed Adjustment	%	120	
23	Tray Turner Left Speed Adjustment	%	225	
24	Tray Turner Right Speed Adjustment	%	105	
25	Print Conveyor Speed Adjustment	%	100	

689. Machine Power Is Off 00 hr 22 min 03 sec

Figure 4-19 - Setpoint Modify Menu 5

21. **Knife Speed Adjustment:** This sets the speed of the knife relative to its base speed. Adjusting this speed helps eliminate bunching of the film behind the knife (if too slow) or tearing of the film (if too fast). This is an inverse adjustment - a higher setting results in a lower knife speed and vice versa.
22. **Cooling Conveyor Speed Adjustment:** This sets the speed of the cooling conveyor relative to the tray turner. This allows for increased spacing within product as needed.
23. **Tray Turner Left Speed Adjustment:** This sets the speed of the tray turner to allow for proper conveyance of different size products.
24. **Tray Turner Left Right Adjustment:** This sets the speed of the tray turner to allow for proper conveyance of different size products.
25. **Print Conveyor Speed Adjustment:** This sets the speed of the print conveyor to accommodate various printer speeds.

#	SETPOINT	UNITS	VALUE	SAVE
26	Wrap Off Mode Speed	ft/min	45	
27	Product Length Variance Allowed	0.01"	200	
28	Registration Minimum Position	0.01in	150	
29	Spare	---	0	
30	Spare	---	0	

689. Machine Power Is Off 00 hr 22 min 47 sec

Figure 4-20 - Setpoint Modify Menu 6

26. **Wrapper OFF Mode Speed:** This sets the speed of all conveyors when the machine is in bypass mode.
27. **Product Length Variance Allowed:** This sets the amount of time product is detected by the product detect skewed photo-eye to accommodate different size products.
28. **Registration Minimum Position:** Sets the amount of film that is ignored by the film registration photo-eye before it begins looking for the next cut point.
29. **Spare:** Not Used
30. **Spare:** Not Used



Parameter numbers 31 - 40 have been disabled as they are not required for operation on this machine.

31. **Disabled:** Not required

32. **Disabled:** Not required

33. **Disabled:** Not required

34. **Disabled:** Not required

35. **Disabled:** Not required

36. **Disabled:** Not required

37. **Disabled:** Not required

38. **Disabled:** Not required

39. **Disabled:** Not required

40. **Disabled:** Not required

4.6.7. Maintenance Menu Group

The Maintenance Menu group consists of nine menus. They are used to control various maintenance functions of the machine and are only accessible by using the maintenance password. Each menu is described below.

Main Screen

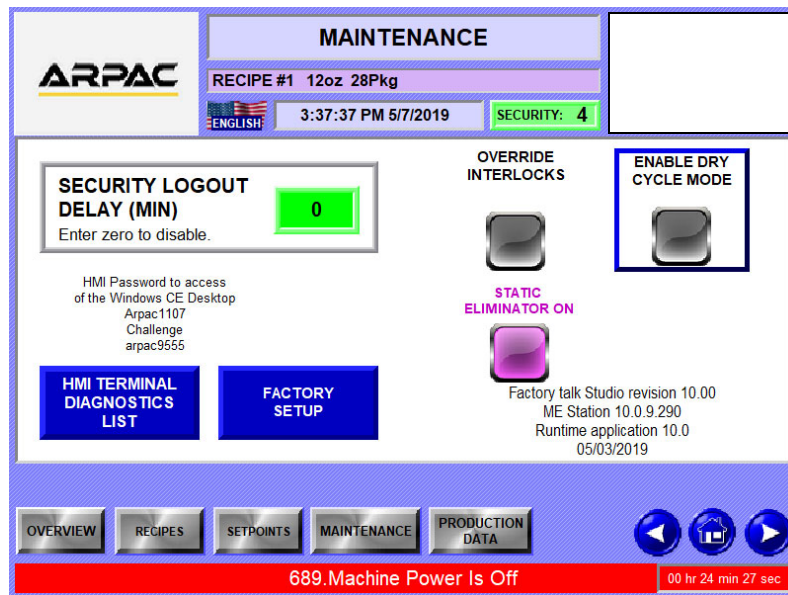


Figure 4-21 - Maintenance Main Menu

- **Security Logout Delay:**
Is the preset for the automatic logout timer. This timer starts when a valid security code is entered. Once the timer is complete, the logout function is executed automatically: security access is returned to level 0 (Default).
- **Override Interlocks:**
This maintained push button toggles the machine between Interlocks Override Enable and Disable modes. When override interlocks is enabled, conditions that usually prevent machine operation (e.g. downstream unavailable) are suppressed.
- **Dry Cycle:**
This maintained push button toggles the machine between Dry Cycle Enable and Disable modes. When dry cycle is enabled, the machine performs its packaging cycle in an automatic, repeating manner regardless of the presence of product or consumable (e.g. film or corrugate). Also any faults resulting from the absence of product or consumable are suppressed.

- **HMI Terminal Diagnostics List:**
Pressing the goto-display button opens the screen containing the terminal diagnostic log. Information in this list is only required for advanced troubleshooting.
- **Wrap/Heat On/Off:** This button cycles through three options. Wrap On/Heat On should be activated when running machine for product. Wrap On/Heat Off will wrap the product with film but the heat in the tunnel is off so it will not shrink. Lastly, Wrap Off/Heat Off will run the conveyor belts only.
- **Factory Setup:** This button give the operator access to change setpoint/recipe names.
- **Static Eliminator ON/OFF:** Bar that extends along the width of the film that has an electrical change in it in order to dismiss the static created by the film role.

Alarm Status

This menu contains a quantitative log of the machine faults. The number of times that the alarm has been activated (since the last reset), the net time that the alarm has been active (since the last reset), and the alarm messages are shown in the first, second, and third columns, respectively.

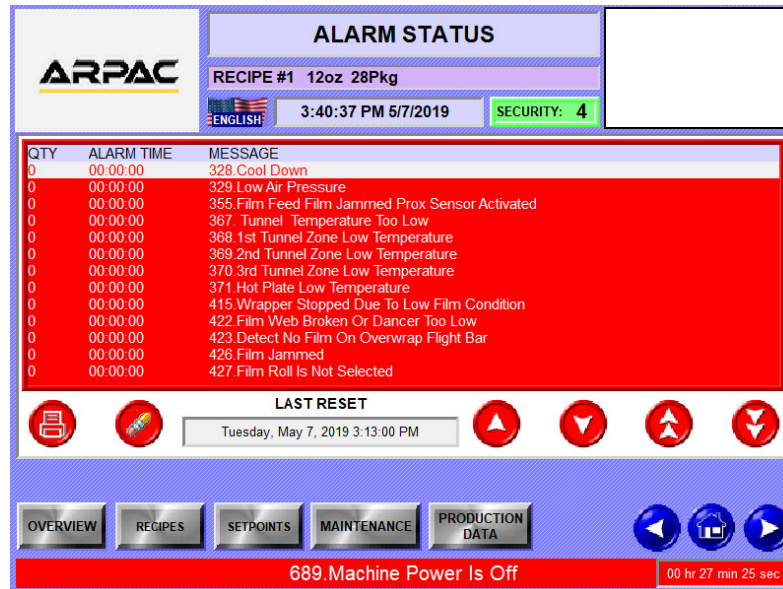


Figure 4-22 - Alarm Status Menu

- **Print:** The printer icon is used to print the outputs of the log.



NOTE

The operator interface program requires configuration at the factory for printing.

- **Erase/Reset:** Resets the quantity and alarm time for all entries in the log.
- **Last Reset:** Shows the timestamp from the last erase/reset of the log.
- **Scroll Up, Scroll Down, Page Up, and Page Down:** Buttons that are used to navigate through the log entries.

Alarm History

This menu contains a historical log of the machine's faults. The time that the alarm was activated, the time the alarm was acknowledged, and the alarm messages are shown in the first, second, and third columns, respectively.

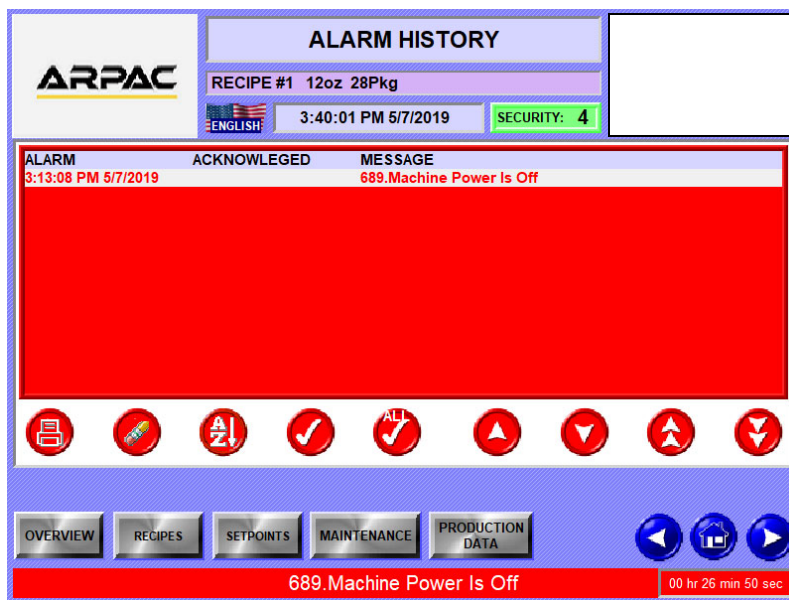


Figure 4-23 - Alarm History Menu

- **Print:** The printer icon is used to print the outputs of the log.



The operator interface program requires configuration at the factory for printing.

- **Erase:** Deletes all entries in the log.
- **Sort:** Toggles between organizing the log by alarm time or by message.
- **Acknowledge:** Push the currently high-lighted alarm. Alarm acknowledgment is a method for an operator to indicate that an active alarm condition is being addressed. Resetting a fault acknowledges the associated alarm.
- **Acknowledge All:** To acknowledge all alarms at once.
- **Scroll Up, Scroll Down, Page Up, and Page Down:** Buttons that are used to navigate through the log entries.

Timers & Counters

This screen allows an operator to access the control program timers and counters.

To change which timer or counter is displayed, press TIMER NUMBER or COUNTER NUMBER in the left-hand column. This opens a keypad.

Press PRESET to open the keypad for changing this value.

The accumulated value of the selected timer and counter are shown in the right-hand column.

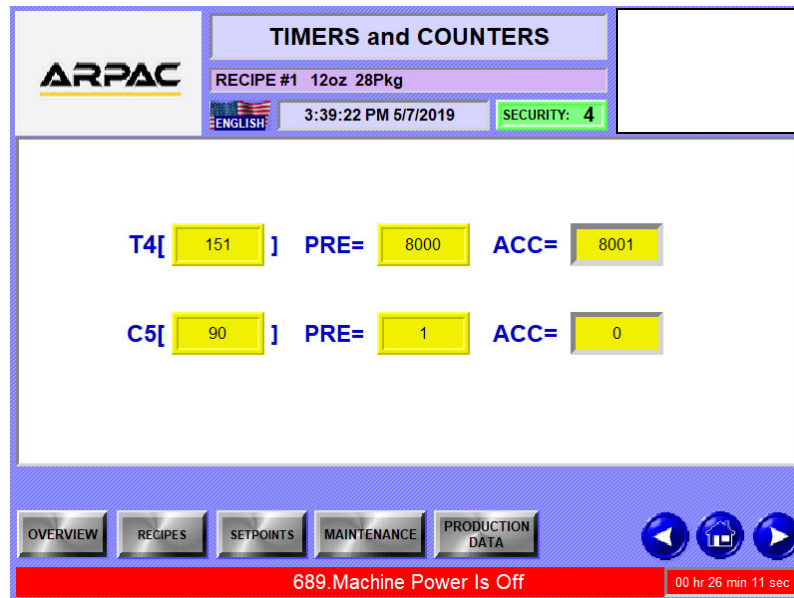


Figure 4-24 - Timers & Counters Menu

Setpoint Modify (Maintenance Level)

These setpoint modify parameters require a maintenance level password to adjust them.

#	SETPOINT	UNITS	VALUE	SAVE
41	Spare	-	0	
42	Flight Bar Home Offset	0.01in	3700	
43	Film Cycles After Low Film Alarm:Roll #1	-	50	
44	Film Cycles After Low Film Alarm:Roll #2	-	50	
45	Splicing Dwell Time	0.001s	6000	

Overview Recipes Setpoints Maintenance Production Data

689. Machine Power Is Off 00 hr 39 min 49 sec

Figure 4-25 - Setpoint Modify Menu 9

- 41. **Spare:** Not used.
- 42. **Flight Bar Home Offset:** This sets the flight bar's starting position.
- 43. **Film Cycles After Low Film Alarm Roll #1:** This sets the number of times the machine will cycle after detecting low film on roll #1.
- 44. **Film Cycles After Low Film Alarm Roll #2:** This sets the number of times the machine will cycle after detecting low film on roll #2.
- 45. **Splicing Dwell Time:** This set s the duration that the splice bar carries a current.

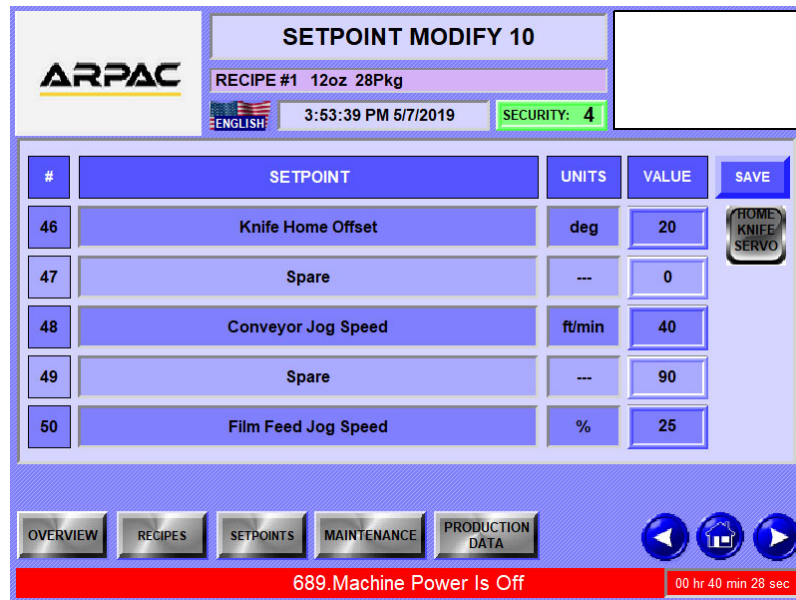


Figure 4-26 - Setpoint Modify Menu 10

- 46. **Knife Home Offset:** This is the defined position of the knife after homing it.
- 47. **Spare:** Not used.
- 48. **Conveyor Jog Speed:** This sets the speed at which the conveyor jogs when manually engaged.
- 49. **Spare:** Not used.
- 50. **Film Feed Jog Speed:** This sets the speed at which the film feed jogs when manually engaged.

#	SETPOINT	UNITS	VALUE	SAVE
51	Tunnel Maximum Backup Delay	0.001s	5000	
52	Temp Setpoint Error	deg	50	
53	Spare	---	0	
54	Spare	---	0	
55	Spare	---	0	

689.Machine Power Is Off 00 hr 41 min 08 sec

Figure 4-27 - Setpoint Modify Menu 11

51. **Tunnel Maximum Backup Delay:** Used to detect a jam after the tunnel.

52. **Disabled:** Not required.

53. **Spare:** Not used.

54. **Spare:** Not used.

55. **Spare:** Not used.

ARPAC

SETPOINT MODIFY 12

RECIPE #1 12oz 28Pkg

ENGLISH 3:55:09 PM 5/7/2019 SECURITY: 4

#	SETPOINT	UNITS	VALUE	SAVE
56	Spare	---	0	
57	Spare	---	0	
58	Spare	---	0	
59	Spare	---	0	
60	Spare	---	0	

OVERVIEW RECIPES SETPOINTS MAINTENANCE PRODUCTION DATA

689. Machine Power Is Off 00 hr 41 min 58 sec

Figure 4-28 - Setpoint Modify Menu 12

56. **Spare:** Not used.

57. **Spare:** Not used.

58. **Spare:** Not used.

59. **Spare:** Not used.

PLC Chassis

The PLC chassis is used to check what electrical components are functioning or not functioning without having to open the main electrical cabinet. Click on the chassis numbers to access that PLC's menu.

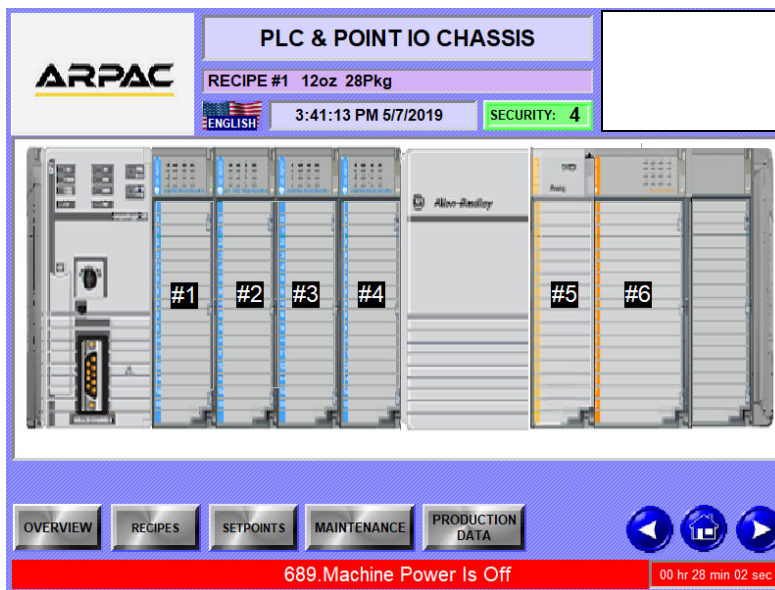


Figure 4-29 - PLC Chassis Main Menu

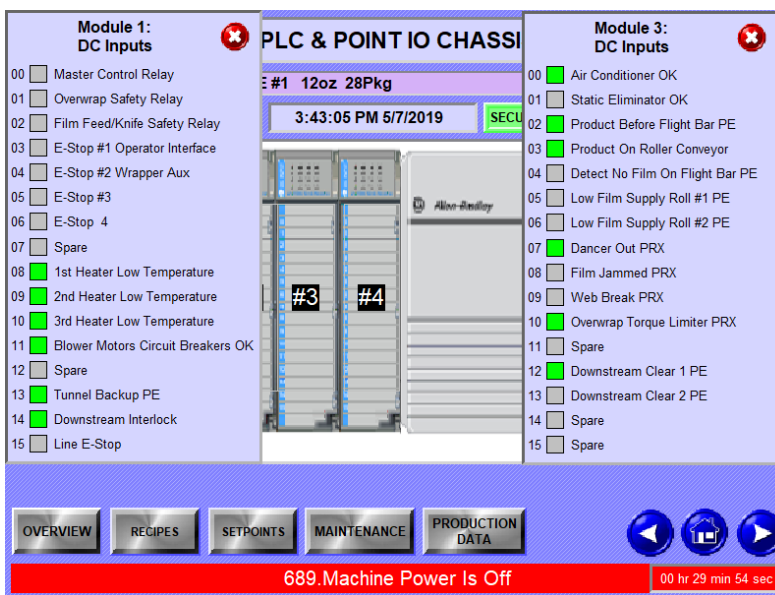


Figure 4-30 - PLC Chassis Menu 1

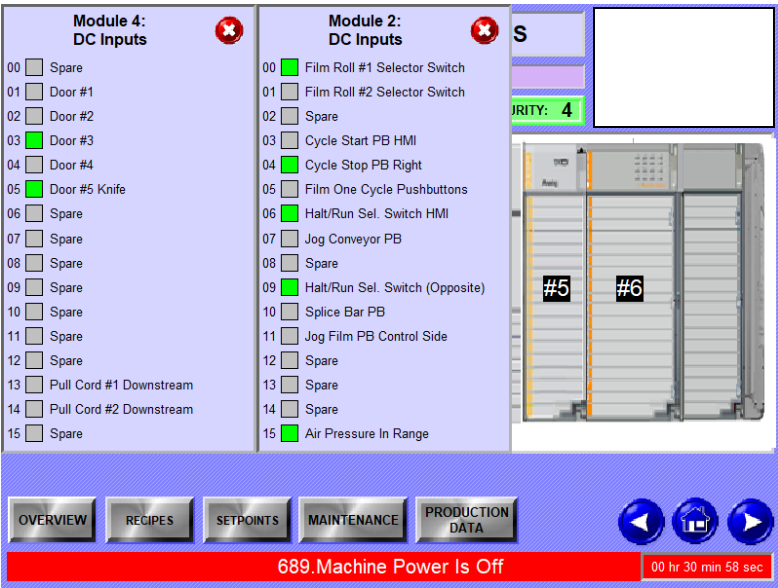


Figure 4-31 - PLC Chassis Menu 2

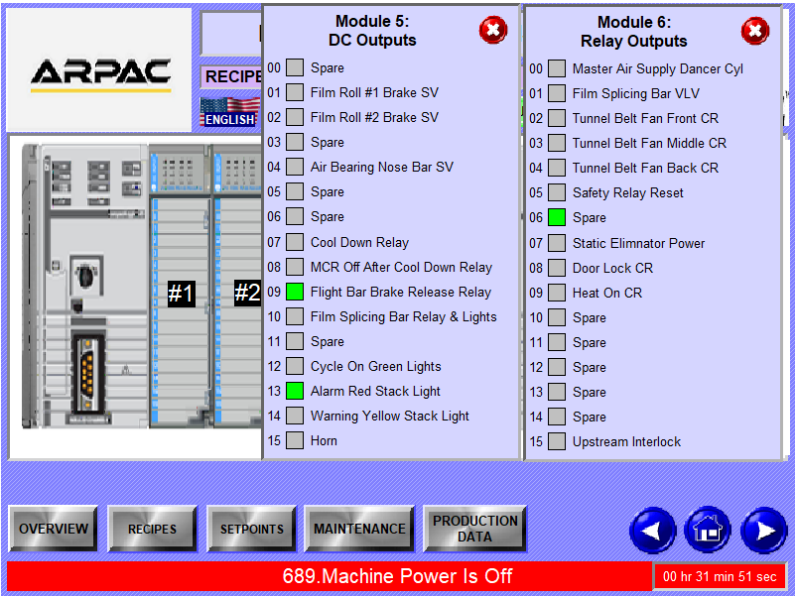


Figure 4-32 - PLC Chassis Menu 3

4.6.8. Production Data Menu Group

The Production Data Menu group consists of two menus. They are used to monitor production data. Each menu is described below.

Production Data Menu

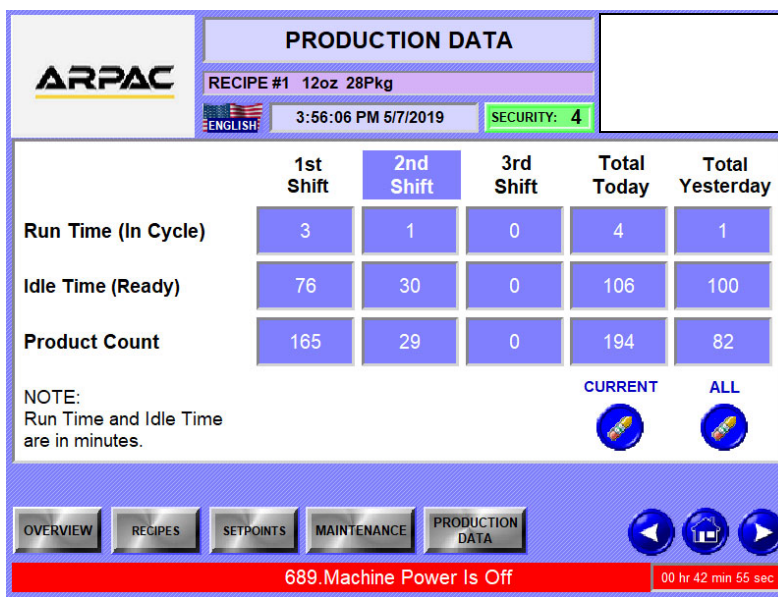


Figure 4-33 - Production Data Menu Screen

- **Run Time (In Cycle):** This shows the number of minutes the machine has been in cycle (producing product) on a per shift and per day basis. The total tally from the previous day is also shown.
- **Idle Time (Ready):** This shows the number of minutes the machine has been idle (not producing product) on a per shift and per day basis. The total tally from the previous day is also shown.
- **Production Count:** This shows the number of products the machine has produced on a per shift and per day basis. The total tally from the previous day is also shown.

Production Data Settings

This shows the start and stop times of the three daily shifts. The times are shown in 24-hour format. The start and stop times can be changed by pressing the number values and reentering a new time in the pop-up menu that appears.

The screenshot displays the ARPAC SETTINGS interface. At the top left is the ARPAC logo. The main title is 'SETTINGS'. Below it, 'RECIPE #1 12oz 28Pkg' is shown. A status bar includes 'ENGLISH', '3:59:06 PM 5/7/2019', and 'SECURITY: 4'. The central area is a table for shift settings:

	Start	Finish
Shift #1	6:00 am	2:00 pm
Shift #2	2:00 pm	10:00 pm
Shift #3	10:00 pm	6:00 am

Below the table is a note: 'NOTE: Set Start and Finish to zero to disable Shift.' At the bottom, a navigation bar contains buttons for OVERVIEW, RECIPES, SETPOINTS, MAINTENANCE, and PRODUCTION DATA. To the right are three circular icons. A red status bar at the very bottom displays '689.Machine Power Is Off' and a timer '00 hr 45 min 56 sec'.

Figure 4-34 - Production Data Settings Menu Screen

4.7. Film

4.7.1. Loading Film Roll

Install new film roll as follows:



Before attempting to perform the following procedure, make sure EMERGENCY STOP button is engaged and machine is not in cycle. Always follow your company's safety procedures. Failure to do so may result in serious injury.

1. Press **EMERGENCY STOP** button on machine to disable machine.
2. Turn **FILM ROLL** switch to OFF (*Figure 4-35*).



Figure 4-35 - Film Rack Switch

3. Insert air nozzle into film shaft to release air from shaft. Don't press the nozzle's lever to add air – just press the nozzle tip against the shaft valve to release the air in the shaft. This air pressure in the shaft activates a clamp that clamps the shaft to the roll. The purpose of this step is to release this pressure so that the roll can be slid off of the shaft (*Figure 4-36*).

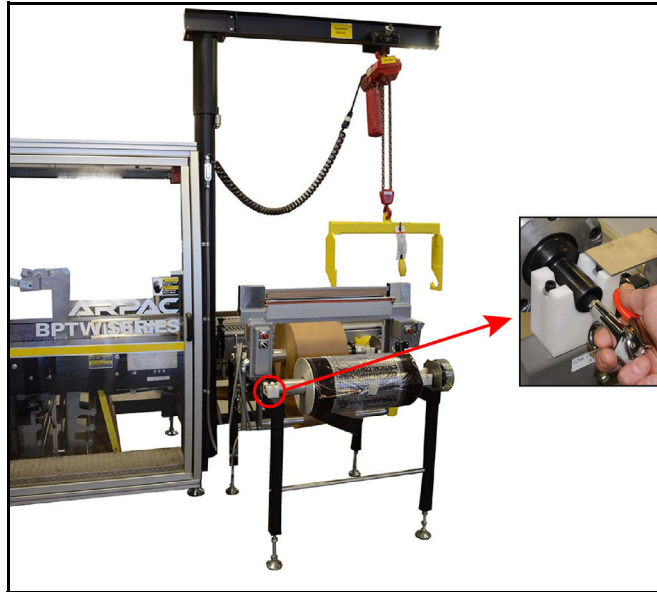


Figure 4-36 - Releasing Shaft Air Pressure

4. Remove the empty film roll and air film shaft from the film rack.
5. Insert shaft into new film roll. Make sure that shaft is oriented so that its slotted end is on the side shown and the film unrolls in the direction shown. As the diagram shows, the direction in which the film unrolls depends on whether the print image on the film is on the inside or outside of the film. For clear films, it does not matter which direction the film unrolls (*Figure 4-37*).

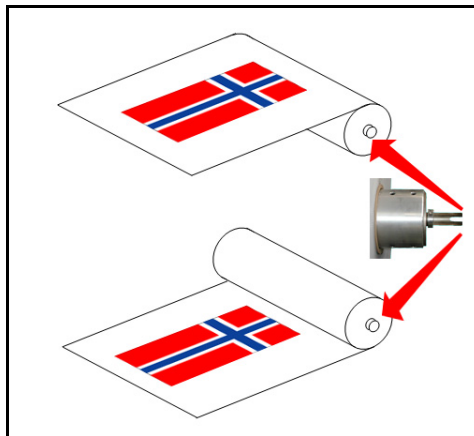


Figure 4-37 - Film Orientation

6. Check that the film roll is centered on the film roll air shaft by measuring the distance from the film roll core to the edge of the film shaft. This distance should be the same on each end. Adjust as required.



It is much easier to center the film on the film roll air shaft before placing it on the film rack.

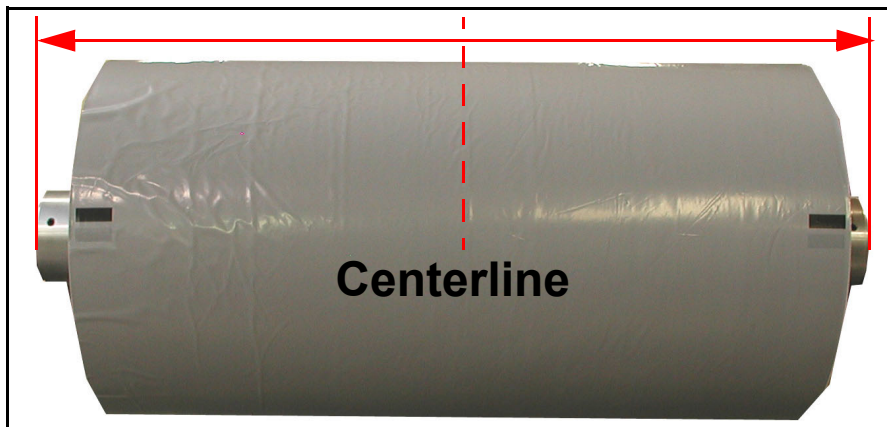


Figure 4-38 - Centering film Roll

7. Turn the air motor shaft (1) so that it is in vertical position.

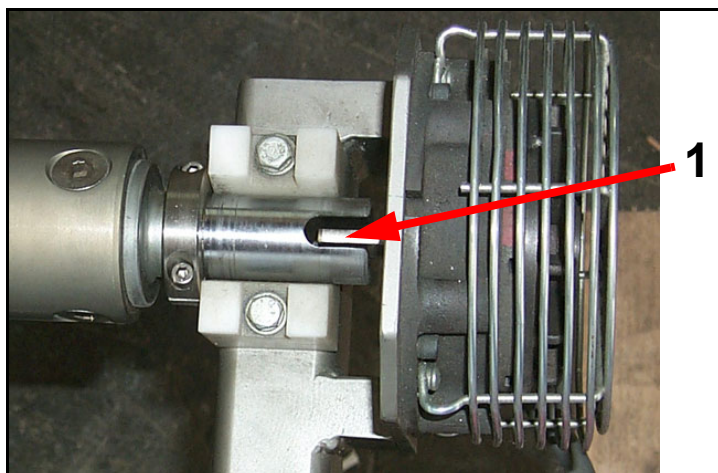


Figure 4-39 - Air Motor Shaft Positioning

8. Place new film roll and shaft on empty portion of rack as shown below. Make sure the slotted end of the shaft mates with the air motor shaft as shown in *Figure 4-39*. The roll can go into either front or rear positions – whichever is empty.

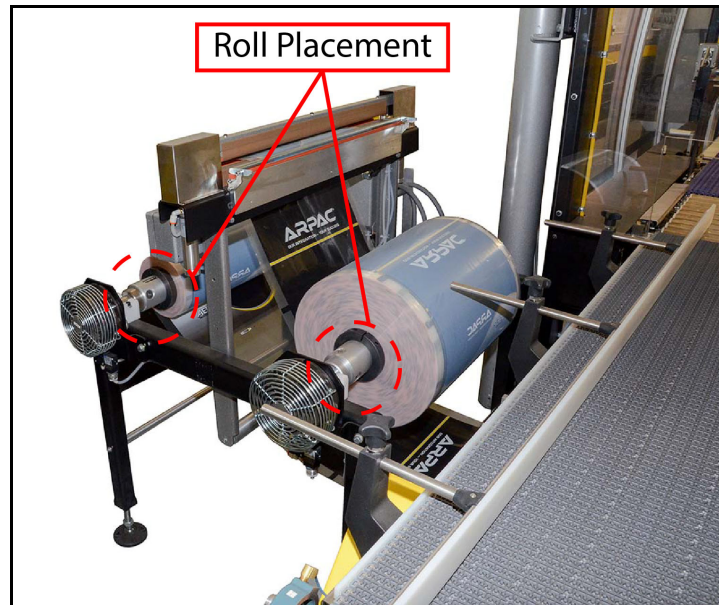


Figure 4-40 - Loading Roll

9. Insert air nozzle into shaft and inflate shaft so that shaft clamps lock onto roll.

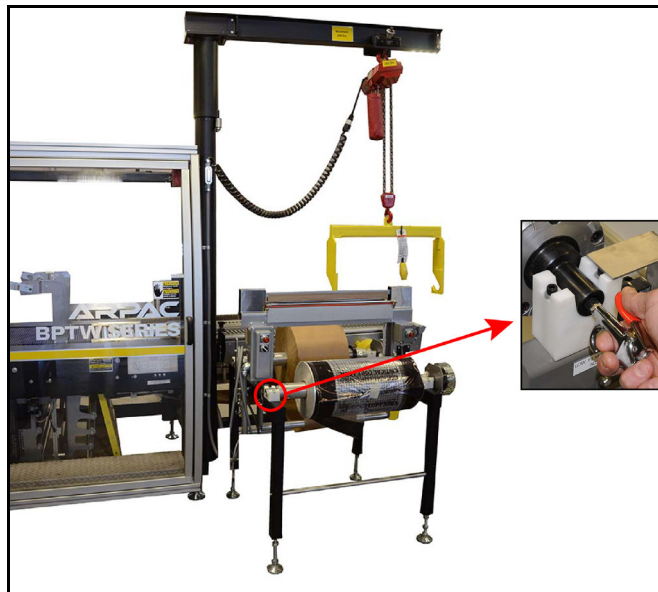


Figure 4-41 - Inflating Shaft

4.7.2. Splicing Film

This section describes how to splice the film from a full film roll to the trailing edge of film already threaded in the machine. This procedure allows the film to be quickly replaced when it runs out. This is because the film does not have to be completely rethreaded into the machine.



Required Tools

- Utility Knife



WARNING

The cutting wire on this assembly is electrically connected and becomes hot when enabled. DO not touch this wire at any time you may get seriously burned.

1. Turn **FILM ROLL** switch on the film rack control panel to **OFF** (Figure 4-42).



Figure 4-42 - Film Rack Switch

2. Make sure that spare roll position has a roll loaded into it. If not, load a roll according to Section 4.7.1 **Loading Film Roll**.
3. Squarely cut the old film away from the old roll.

4. Move the weight rods on the splice bar to the up position.

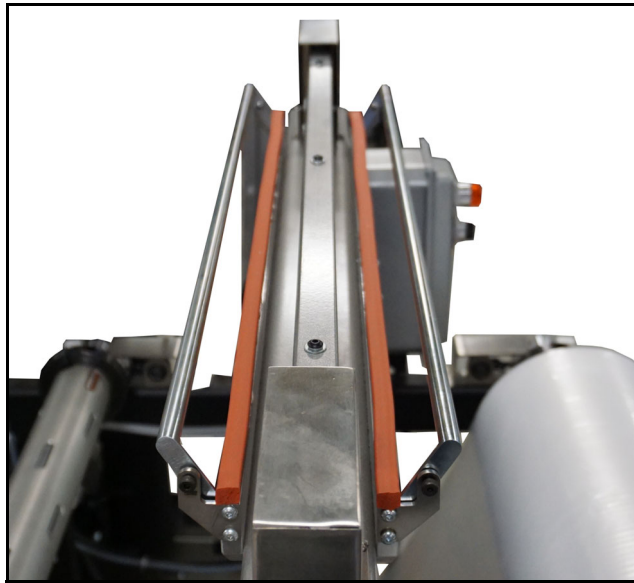


Figure 4-43 - Weight Rods

5. Thread the leading edge of the new film roll under the weight rods and through the splice bar seal area.



Figure 4-44 - Feeding New Film

6. Lower the weight rod on the same side as the new film roll.



Figure 4-45 - Lowering Weight Rod

7. Feed the trailing edge of the old film roll under the weight bar and through the splice seal area.



Figure 4-46 - Feeding Old Film Roll

8. Lower the weight bar on the same side as the old film roll.



WARNING

The splice wire remains very hot for a few seconds after splicing.

9. The splice bar requires a two-handed control to operate. Push both splice bar buttons on the film rack at the same time to engage the splice bar and initiate the splicing process.

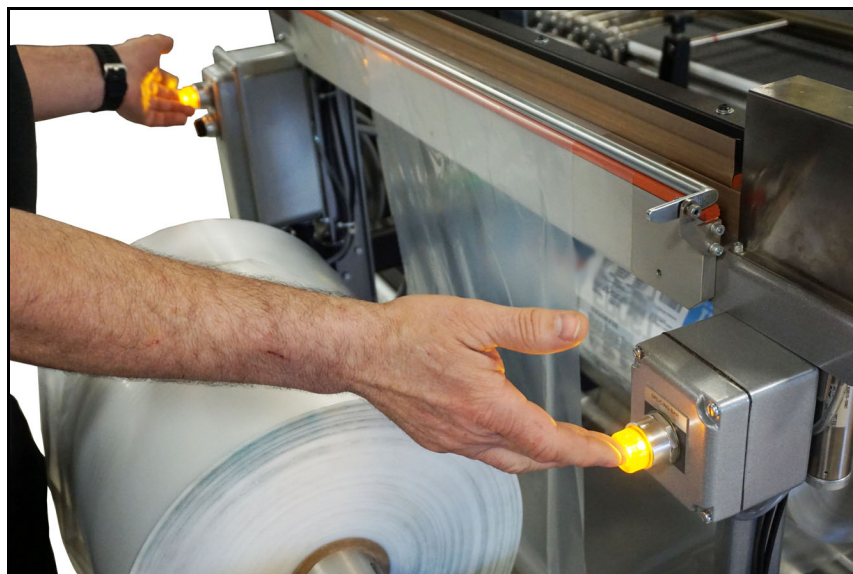


Figure 4-47 - Splicing Film

10. After the seal bar has raised and the splice bar lights are off, remove scrap film.
11. Manually roll any slack film back onto roll.

12. Set the **FILM ROLL** selector switch to position 1 or 2 - depending on the film roll that will be supplying the machine with film.



Figure 4-48 - Select New Roll



If the film roll selector switch is not set to the correct position, the active film roll will not turn.

13. Restart production.
14. Add new roll to spare position on film rack.

4.7.3. Film Threading

This procedure is for installing film for the first time or when changing the type of film to be run. If your machine is running low on film and you simply need to add more of the same type film, refer to **Film Splicing Section 4.7.2** of this chapter. It is a much easier and quicker way to add film to the machine.



Make sure machine's main power disconnect switch is turned OFF before performing the following procedures. Failure to do so may result in severe injury.

1. Place the **main power disconnect** switch to the **OFF** position.
2. Manually remove any film currently in the system.
3. Load the film roll required for the new job onto the film rack according to **Film Loading Section 4.7.1** of this chapter.
4. Open and latch the acceleration conveyor to expose the film feed system.

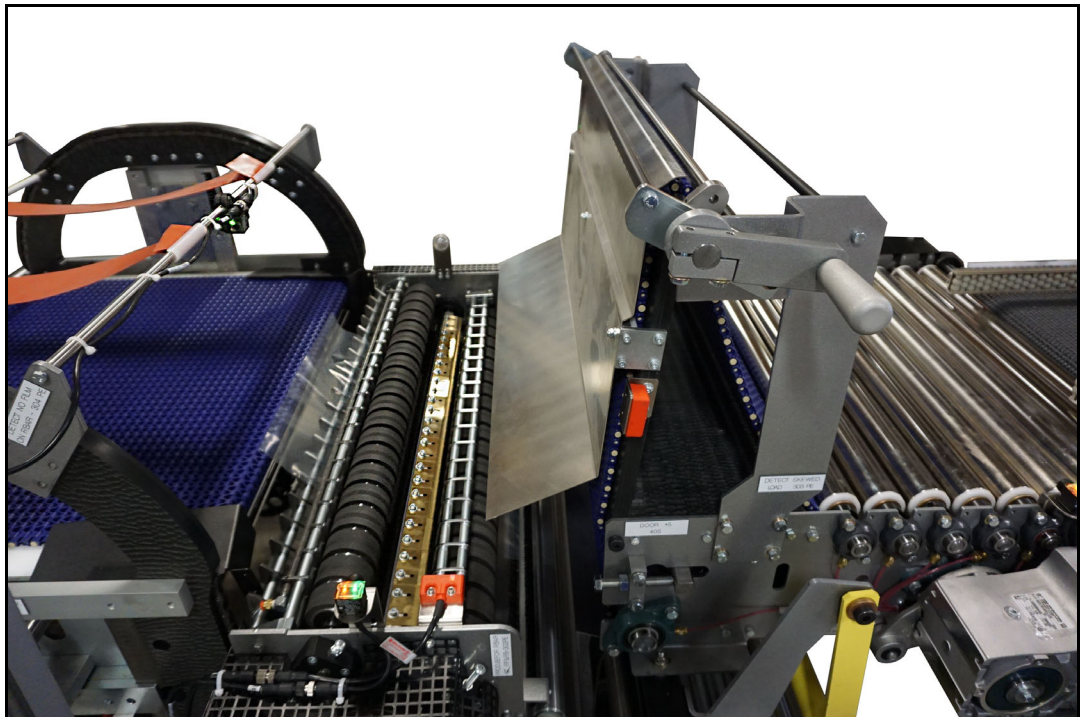


Figure 4-49 - Film Feed System

5. Thread the film past the first roller and the 45° bar.

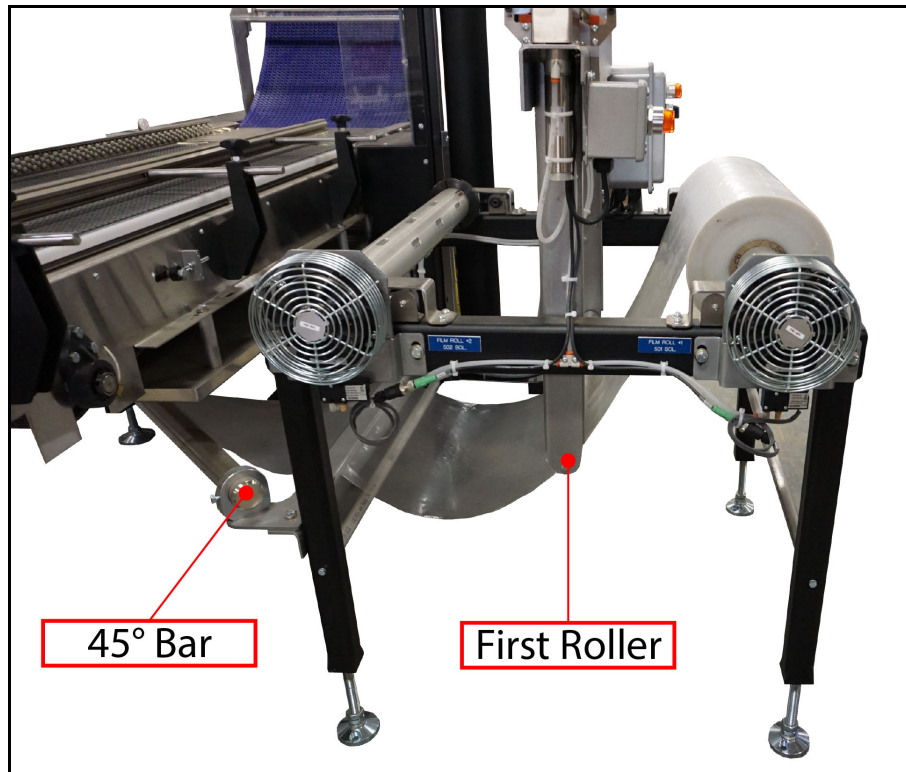


Figure 4-50 - First Roller & 45° Bar

6. Thread the film through the rollers as shown below.

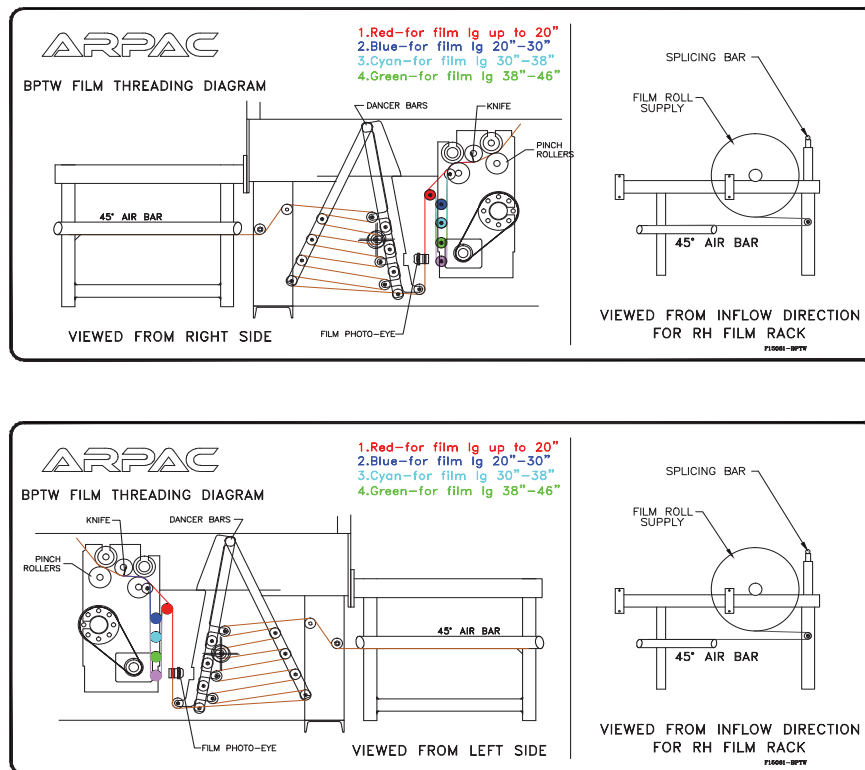


Figure 4-51 - Film Threading Diagram

7. Feed the film into the first set of film feed rollers by rotating the film feed hand wheel **COUNTERCLOCKWISE**.

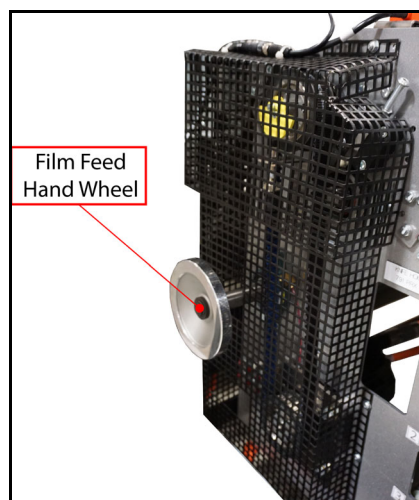


Figure 4-52 - Film Feed Hand Wheel

8. Carefully feed the leading edge of the film across the knife mechanism and between the second set of film feed rollers.

NOTICE

Check that the film lies flat, with no fold-overs, in the system and that about two inches of film extends past the center of the second set of film rollers (towards the knife).

9. Use the HMI to set the film registration mode depending on the type of film used (clear, one registration mark, or two registration marks).
10. If loading registered film, adjust the position of the film registration photo eye so that it is aligned to correctly to see the film registration mark.

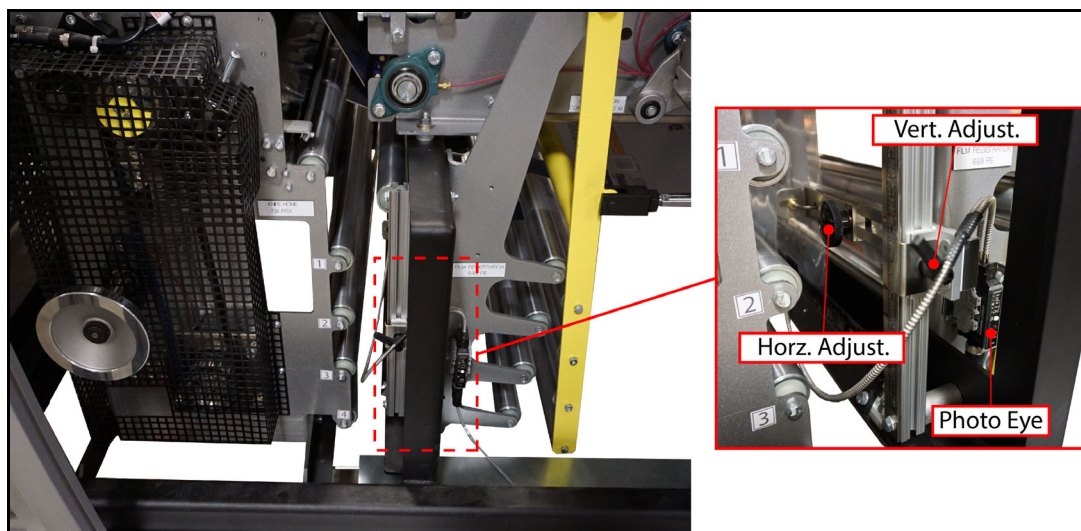


Figure 4-53 - Registration Photo Eye Adjustment

11. Close the acceleration conveyor to cover the film feed assembly.
12. Close the dancer bar doors.
13. Place the **MAIN POWER DISCONNECT** to the **ON** position.
14. Press the **POWER ON** push button.

15. Press the **FILM FEED ONE CYCLE** push button to feed one length of film.

NOTICE
Do not allow the film to enter the tunnel.

NOTICE
The distance from the knife blade to the film registration photo eye should be equal to the distance from the film registration photo eye to the actual cut. All printed film must have at least a 3"-long un-printed zone where the ends will be overlapped under the product. If the rotating knife is cutting too early, adjust the vertical position of the film registration photo eye by moving it up. If the rotating knife is cutting too late, adjust the vertical position of the film registration photo eye by moving it down.

16. Press the **FILM FEED JOG** push button until the film feeds flat and unwrinkled from the gap preceding the overwrap conveyor.
17. Press the **FILM FEED ONE CYCLE** push button to feed one length of the film. Observe the film length for quality and print registration.
18. When the film is feeding satisfactorily, perform the quick start up procedure.

5

Maintenance

5.1. Chapter Overview

This chapter contains various procedures necessary to maintain the proper function and longevity of the BPTW Series. This chapter is divided into a preventative maintenance section and a corrective maintenance section.



This equipment requires connection to hazardous line voltages. Disconnect all power supplies before opening the electrical enclosure or servicing.

The tunnel and some of its parts can become extremely hot. Be sure to allow tunnel to cool completely before performing maintenance or service. Do not allow anything with the exception of the product, to enter the tunnel while it is turned on. This includes your body parts. Do not use flammable solvents when cleaning a tunnel. Never clean a hot tunnel.

Always wear proper safety equipment. Follow your company's lockout/tagout and all other safety procedures at all times. Failure to do so may result in serious injury or death.



**Required
Tools**

To complete the maintenance procedures described in the following sections, you will need a variety of tools. Since certain parts may be customized on certain machines, it is recommended that you have all the tools listed below on hand before beginning any of the maintenance procedures:

- | | |
|---|--------------------------|
| - Standard open-end wrench set | - Standard Allen key set |
| - Phillips screw driver set | - Needle-nose pliers |
| - Diagonal cutting pliers | - Utility knife |
| - Glass cleaning spray & warm soapy water | - Soft dry cloth |

5.2. Preventative Maintenance Schedule



Due to varying operating conditions, the procedures listed in this section may have to be performed more or less frequently. You may be required to adjust intervals according to your production environment and machine's performance.

What To Do:	When To Do It:			
	Daily	Weekly	Monthly	Every 6 Months*
Perform Walk Around Safety Inspection	X			
Clean External Surfaces	X			
Check EMERGENCY STOP Button For Proper Operation	X			
Drain Air Filter Bowl	X			
Inspect Shrink Tunnel	X			
Inspect Film Feed Drive Rollers		X		
Clean Photo-Eyes		X		
Inspect Conveyor belts		X		
Grease Zerk Fittings			X	
Lubricate Overwrap Chain			X	
Inspect Tunnel Curtains for Damage			X	
Replace Air Filter Element				X
Inspect Heater Coils				X

Table 5-1 - Preventative Maintenance Schedule

5.3. Lubrication

5.3.1. Chain Lubrication & Care

Proper lubrication is critical in achieving the maximum wear life of any roller chain. As the chain articulates around the sprockets, the pin and bushing wear. This wearing causes the elongation, or “stretch”, in the chain. Lubrication of these surfaces through proper lube application can greatly increase the wear life of the chain.

Recommended Lubricants

Ambient temperature: 20-40 F - SUS Viscosity 100 F of 200-400, SAE Engine oil of 20 Weight, SAE Gear Oil 80 W, ISO 46 or 68, and AGMA lubrication 1 or 2.

Ambient temperature: 40-100 F - SUS Viscosity 400-650, SAE Engine oil of 30 Weight, SAE Gear Oil 85 W, ISO 100, and AGMA lubrication 3.

Ambient Temperature 100-120 F - SUS Viscosity 650-950, SAE Engine oil of 40 Weight, SAE Gear Oil 90, ISO 150, and AGMA lubrication 4.

Ambient Temperature 120-140 F - SUS Viscosity 950-1450, SAE Engine oil of 50 Weight, SAE Gear Oil 90, ISO 220, and AGMA lubrication 5.

5.3.2. Bearing Lubrication & Care

Food Grade

LUBRIPLATE SFL-2 is a **synthetic multi-purpose food-grade grease**, which can be used throughout most modern food processing plants for most all grease lubrication requirements. This product has an approximate operating temperature range of -25 to 400°F. (white in color).

Non-Food Grade

MULTIPLEX RED #2 **lithium complex grease** developed for the lubrication of automotive and industrial equipment operating under heavy loads and at moderate to high temperatures. It is particularly recommended for use in applications that are too severe or require higher performance than provided by conventional extreme-pressure lithium greases.

These are just brands, there are many other comparable brands which can be used on industrial equipment use in secondary packaging.

They only need to be comparable in temperature range, viscosity, and application (food grade or not).

5.3.3. Daily Maintenance

The following tasks should be performed on a daily basis to ensure optimal operation, safety and machine life.



The following procedures should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

- **Daily Safety Inspection:** Make sure all areas in and around the machine are clear of any debris or obstacles. Check underneath and around the machine for any hardware that may have come loose. Have a qualified technician replace any missing parts. Check all of the basic settings of the machine including: the seal jaw opening, seal jaw pressure, seal bar temperature setting, etc. Run the machine and listen carefully for any unusual noises. Watch for any unusual motion. Stop the machine immediately and have a qualified technician diagnose and repair any problems with the machine.
- **Clean External Surfaces:** Clean in and around the machine with a soft rag and warm soapy water. Wipe down and dry machine. Do not use any abrasive or flammable solvents.
- **Check E-Stop Buttons:** Check the operation of all safety features including cover safeties, E-Stops, etc.
- **Inspect Shrink Tunnel:** Check tunnel for film buildup and function of tunnel light. Remove melted film and replace tunnel light as needed.
- **Drain Air Filter Bowl:** Empty any water that has accumulated in the air filter drainage bowl. Make sure air is connected and machine is on but not running. Turn the drain plug at the bottom of the air cylinder 1/4 turn and let water drain out. Turn plug back 1/4 turn to stop flow and wipe up expelled water.

5.3.4. Weekly Maintenance

The following tasks should be performed on a weekly basis to ensure optimal operation, safety and machine life.

- **Inspect Film Feed System and Drive Rollers:** Remove covers and check chain tension and alignment. Inspect sprockets for wear and make sure they are secure with keys in place. Make sure all fasteners are tight and that all mechanical linkage components are secure. Inspect all rollers. Make sure they are properly located and secure. Check roller bearings and perform maintenance as needed.
- **Inspect Conveyor Belts:** Check the traveling belt for proper tracking. There are two adjustment bolts underneath the exit assembly. Inspect inverter, belts, and transfer plates. Make sure they are level to each other. Check the tension of the side seal belt as well as the traveling belt. Check belts for excessive wear. Adjust as necessary.
- **Clean Photo-Eyes:** To clean the photo eye spray a small amount of window cleaner on it and wipe it clean with a cleaning wipe.

5.3.5. Monthly Maintenance

The following tasks should be performed on a monthly basis to ensure optimal operation, safety and machine life.

- **Lubricate Zerk Fittings and Drive Chains:** Inspect and lubricate all sprockets, bearings, lubrication ports and chains.
- **Clean:** Excessive grease and debris in and around any moving parts of the machine (See Lubrication Schedule for recommended lubricants).
- **Inspect Tunnel Curtains for Damage:** The tunnel curtains should be checked for signs of excessive wear or damage.

5.3.6. Every 6 Months

The following tasks should be performed on a monthly basis to ensure optimal operation, safety and machine life.

- **Inspect Heater Coils:** Inspect the heater coils for damage or broken coils, insulators and connecting straps.
- **Replace Air Filter Element:** Replace the machine's air filter element.

5.4. Preventative Maintenance Procedures



The following procedures should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

5.4.1. Daily Maintenance Procedures

Walk Around Safety Inspection

At the beginning of each day, do a daily safety inspection of the machine and its surrounding area. Pick up any trash or obstacles around the machine. Wipe up any grease or spills.

Clean External Surfaces

Use cleaning wipes and warm soapy water to clean external surfaces of the machine.

Check Emergency Stop Button

1. With the machine cycling, press the **EMERGENCY STOP** button.
2. The machine should stop immediately.
3. Pull button back up and press **CYCLE STOP/RESET** button to reset.

Draining Air Filter Bowl

1. Make sure that air is connected to machine and machine is turned on but not running.
2. Turn drain plug 1/4 turn and let water drain out.
3. Turn drain plug back 1/4 turn to stop air flow.
4. Wipe up expelled water.

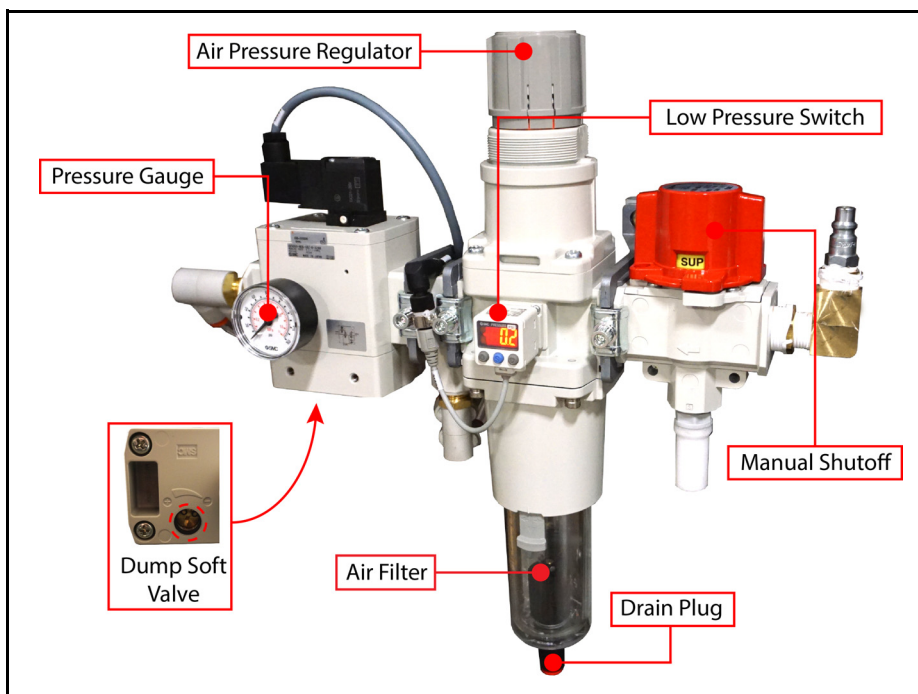


Figure 5-1 - Pneumatic Controls

Inspecting Shrink Tunnel

1. Turn off machine's main disconnect switch and apply LOTO. Let shrink tunnel cool to room temperature.
2. Inspect inside of shrink tunnel as shown below. Remove any foreign objects or melted film.
3. Turn main disconnect switch back on.

5.4.2. Weekly Maintenance



The following procedures should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

Inspecting Film Feed Drive Rollers

1. Turn off machine's main disconnect switch and apply LOTO.
2. Lift acceleration conveyor up and latch into place with hooks.
3. Inspect drive rollers. Remove any dirt, objects or melted film.
4. Lower conveyor.
5. Turn main disconnect switch back on.

Cleaning Photo Eyes

1. Turn off machine's main disconnect switch and apply LOTO.
2. Spray a small amount of window cleaning solution to the face of each photo-eye (See Illustrated Parts List chapter for a map of photo-eyes) and dry photo-eye with a soft cloth.
3. Turn main disconnect switch back on.

5.4.3. Monthly Maintenance



The following procedures should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

Inspecting Conveyor Belts

1. Turn off machine's main disconnect switch and apply LOTO.
2. Inspect conveyor belts. Remove any dirt, objects or melted film.
3. Turn main disconnect switch back on.

Greasing Zerk Fittings

1. Turn off machine's main disconnect switch and apply LOTO.
2. Apply one pump of grease to each fitting on grease manifolds. Read label next to manifold for special instructions
3. Wipe up excess grease.

Lubricating Overwrap Chain

1. Turn off machine's main disconnect switch and apply LOTO.
2. Lightly but thoroughly apply oil to chains (1 in Figure 4) with brush.
3. Wipe up excess or spilled oil.
4. Reattach cover and turn main disconnect switch back on.

Inspecting Tunnel Curtains

1. Turn main disconnect switch off and apply LOTO.
2. Check tunnel curtains for any damage or tearing. Replace as required.
3. Turn main disconnect switch back on.

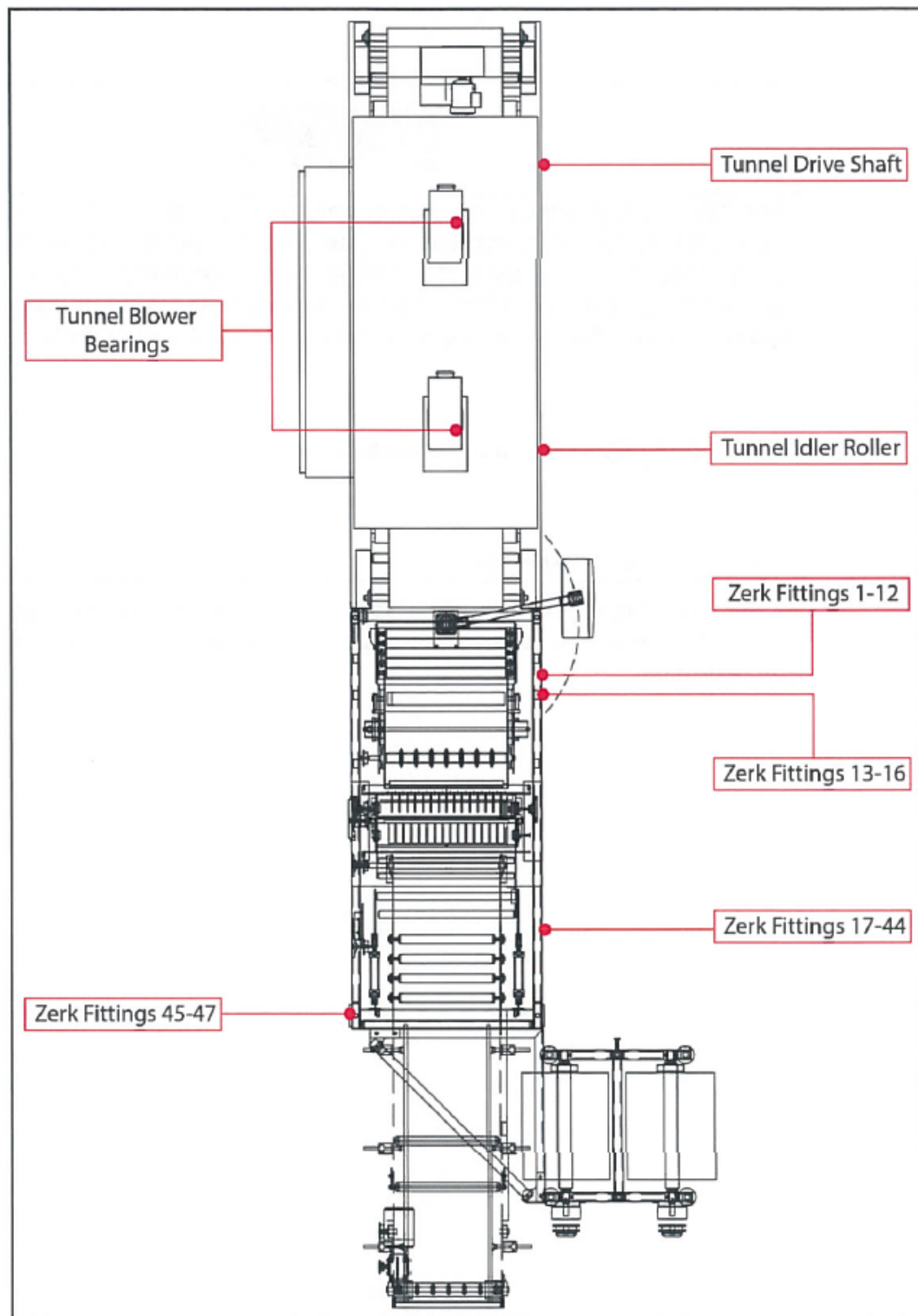


Figure 5-2 - Lubrication Points

5.4.4. Every 6 Months



The following procedures should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

Replace Air Filter Element

Part Required:

- Numatics EKF32B 5 Micron Filter Element

1. Turn off main shutoff valve by turning it counterclockwise.
2. Press down on tab.



Figure 5-3 - Tab

3. Still pressing on tab, turn bowl so that tab aligns with mark.

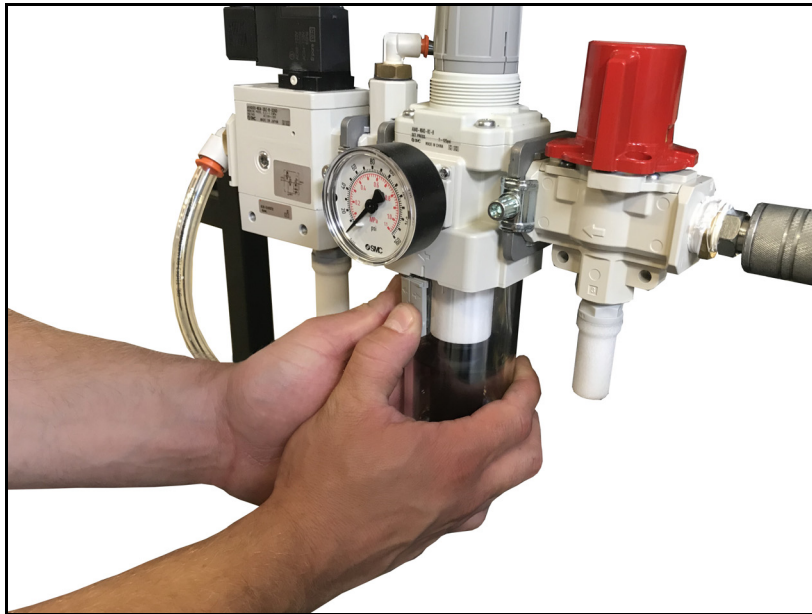


Figure 5-4 - Turning Bowl

4. Pull bowl off of filter body.



Figure 5-5 - Removing Bowl

5. Unscrew baffle and pull filter element off of filter body.

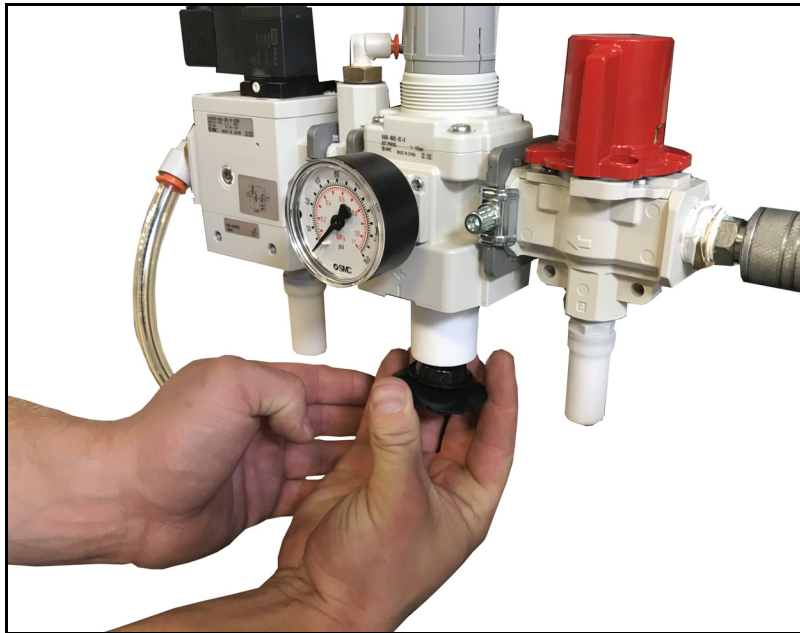


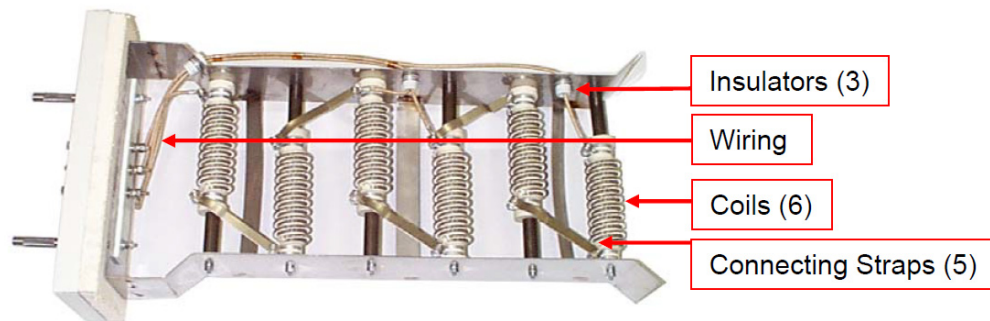
Figure 5-6 - Removing Filter Element

6. Reverse step to reassemble.

Inspecting Heater Coils



The following procedures should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.



1. Turn off machine's main disconnect switch.
2. Unscrew nut and remove bracket.
3. Unscrew electrical nuts.
4. Slide element assembly out.
5. Inspect the heater element tray. Inspect for damaged or broken coils, insulators and connecting straps. Be sure that the heater coils do not touch any other part of the heater element tray.
6. Examine the wiring to ensure that no wires are loose or damaged. Damaged parts of the heater element tray must be replaced to maximize shrink tunnel efficiency.



The heater element coils may appear to have expanded from their normal size. This is normal. Expanded coils are adequate for use if there is not damage to the coil.

7. Reverse steps to reassemble.

5.5. Corrective Maintenance



Corrective maintenance should only be performed by qualified maintenance technicians and should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

Qualified maintenance personnel should always perform corrective maintenance.

5.5.1. *Film Rack Assembly*

Inspect film roller bearings. Alignment of film shaft with the brake shaft is important. The brake housing can be adjusted to compensate for most wear. If needed, replace friction facings and/or bearing and o-ring seals.

5.5.2. *Air Cylinders*

Air cylinders are pre lubricated/sealed at the manufacturer's factory for extensive maintenance free life. However, if an air cylinder appears sluggish or oil is migrating past its seals, the air cylinder should be replaced. Contact SupportPro for repair kits; see chapter 10 for contact information.

5.5.3. *Roller Chain*

When connecting or disconnecting chain:

- Always disconnect and lockout electrical power.
- Wear eye and face protection when grinding pin ends or driving pins out of links with a punch and hammer. Chain pins, which are case hardened, may chip when struck with tools.
- Support the chain to prevent uncontrolled movement of chain and parts.
- If chain length is to be altered, use of a chain vise or detaching tool is recommended. Tools should be in good condition and properly used.

5.5.4. Drive and Blower Motors

The drive motors selected for your machine are virtually maintenance free. If failure occurs, verify replacement motor rotates in the same direction (blower motor rotation is shown on pulley housing).

5.5.5. Knife Blades

Notched Knife Blades

By removing teeth from the knife in a few strategic locations, small sections of the film are not cut. These small sections then serve to pull the leading edge of the cut film into the second set of pinch rollers with no slack and no wrinkling of the film.

The small uncut sections between sheets of film are easily broken by the overwrap flight bar as it wraps the film around the product. In the even that the trays of product are too light to hold the leading end of the film in place under the product, experiment with smaller notches in the knife. Film that is thicker than 2 mil does not normally need a notch in the knife.

Standard or notched knife blades may be purchased from SupportPro. For notched blades, please specify right/left/or center notched blades.

Grinding Knife Blades

The notches are typically located about 1" to 2" in from the edge of the film. When film widths varying by more than 2" are to be used on the same machine, the knife notches will need to be relocated when changing product.

Grind the teeth using a standard bench grinder with a wheel of 60 grit or greater, trued to sharp square edges. Remove precisely three full teeth plus the half tooth on one end of the blade. Grind down at least 1/8" past the root of the tooth and grind a radius at the new root to eliminate all sharp edges at the root.

This will result in right and left handed notched blades. Perform this process in small steps, cooling the blade in water between steps to prevent losing temper of ungrounded portions of the blade. If you damage the point of the adjacent tooth, discard that blade and get a new one.

To test the effectiveness of the notched knife blades, cycle the film feed with the film feed one cycle push button. The dispensed sheet of film should still be attached to the following sheet at points corresponding to the notches.

Replacing Knife Blades



Corrective maintenance should only be performed by qualified maintenance technicians and should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

To avoid possible injury to hands, use extreme care when working around the acceleration conveyor while it is in its lifted position. Make certain the conveyor is fully latched in its raised position before starting work. Do NOT touch the knife blades, they are extremely sharp and hazardous.

1. Disconnect and perform the lockout/tagout procedure. Follow company guidelines.
2. Lift and secure or latch the cover to expose the film feed assembly.
3. Using a 1/8" hex key, remove the old knives
4. Install new blade portions with their back edge against the stop. Secure bladed portions with hex nuts.
5. Replace the cover to its home position; remove lockout and supply electrical power to machine.
6. With guard doors closed, use *film feed one cycle* push button to rotate the knife shaft once to ensure proper clearance.
7. Check blades for any burrs; replace blades as needed.

5.5.6. Pinch Roller Adjustment



Corrective maintenance should only be performed by qualified maintenance technicians and should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

To avoid possible injury to hands, use extreme care when working around the acceleration conveyor while it is in its lifted position. Make certain the conveyor is fully latched in its raised position before starting work. Do NOT touch the knife blades, they are extremely sharp and hazardous.

Refer to the film feed assembly drawing when performing this procedure.

1. Disconnect and perform the lockout/tagout procedure. Follow company guidelines.
2. Lift and latch that acceleration conveyor.
3. Turn the set screw clockwise until the compression spring is fully compressed.
4. Turn the set screw counterclockwise one half turn.
5. Repeat the adjustment on the opposite side of the pinch roller.
6. Lower the acceleration conveyor.
7. Start the machine and check the tension. Repeat procedure if required.

5.5.7. Tunnel Belt



Corrective maintenance should only be performed by qualified maintenance technicians and should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

To replace the tunnel belt, feed the belt through the unit noting the proper direction of travel indicated by the tag attached to the belt. Bring the right and left hand spirals together, and connect with a crimp rod supplied with the belt. Right hand spirals are wound clockwise. Left hand spirals are wound counterclockwise.

Trim the connector rod back to the edge of the belt. Weld or silver solder the rod to the end of the spiral in a fashion similar to the finish on the rest of the belt.

Do not bend connector rods into belt unless the belt pitch can be maintained. Spirals are required to bottom out on the crimped connector rods in order to match the sprockets.

Be sure the wrap of the belt around the sprockets is less than 180 degrees angle but more than 120 degrees angle. This action allows maximum drive with smooth engagement and release characteristics from the sprockets.

This is a low tension system. Counter tension is not normally required.

However, these require careful installation. The clamping collar must be held tight to the bearing inner arc and not be allowed to twist while its clamp screw is tightened. If the collar is not square to the shaft when it is installed, it will come loose in service.

5.6. Tunnel Blower Maintenance



Corrective maintenance should only be performed by qualified maintenance technicians and should only be performed after the machine has been turned off, allowed to cool down, and the air pressure has been released. Be sure to follow your company's lockout/tagout procedures and all other safety procedures. Always wear safety glasses and other required protective equipment at all times. Failure to do so may result in severe injury or death.

5.6.1. Overview

The purpose of this document is to provide and explain the procedures necessary for performing various preventative maintenance procedures on the standard tunnel blower assembly.

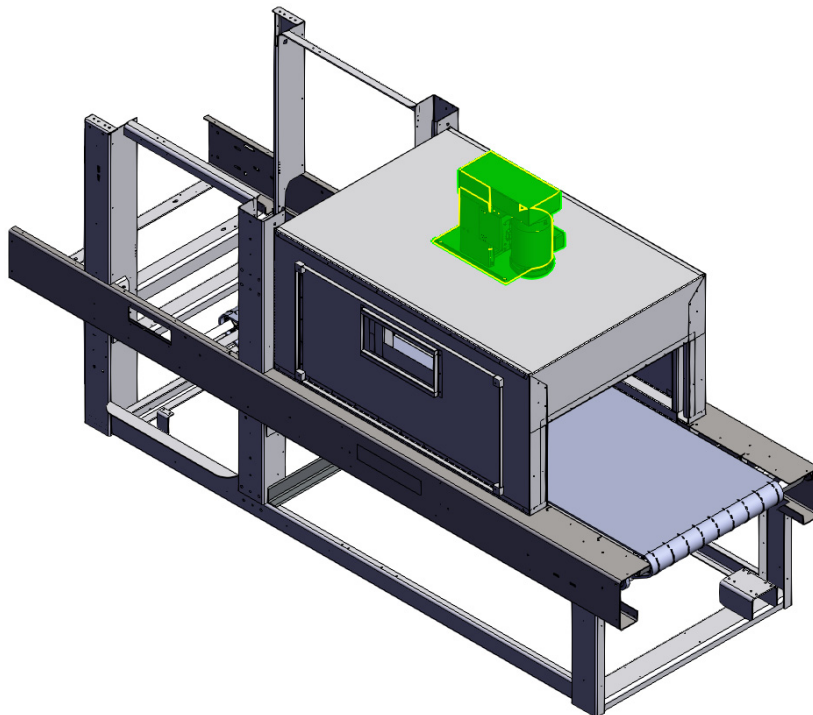


Figure 5-7 - Tunnel Blower Location (Example)

5.6.2. Corrective Maintenance Procedures

Tunnel Blower Bearing Replacement

The following procedures explain the process for replacing the four bolt flange bearings on the tunnel plower shaft. For a complete parts list, please see the corresponding assembly drawing in the “Illustrated Parts List” chapter of your Operation and Maintenance Manual.



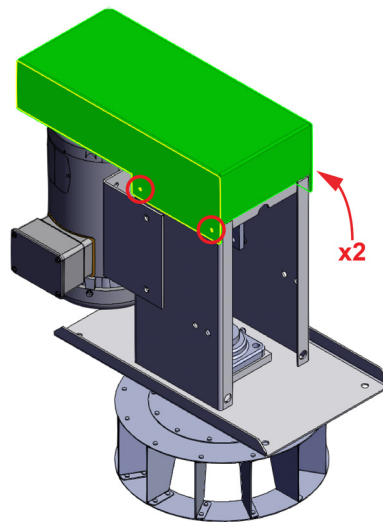
THE FOLLOWING PROCEDURES SHOULD ONLY BE PERFORMED AFTER THE MACHINE HAS BEEN TURNED OFF, ALLOWED TO COOL DOWN, THE AIR PRESSURE HAS BEEN RELEASED AND YOUR COMPANY’S LOCKOUT/TAGOUT PROCEDURES HAVE BEEN APPLIED. ALWAYS WEAR SAFETY GLASSES AND OTHER REQUIRED PROTECTIVE EQUIPMENT AT ALL TIMES. BE SURE TO FOLLOW ALL OTHER COMPANY SAFETY POLICIES. FAILURE TO DO SO MAY RESULT IN SEVERE INJURY OR DEATH.

Parts Required

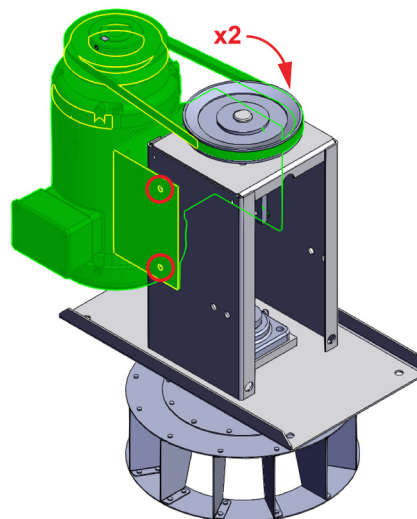
- Open-end or socket wrenches (5/16, 3/8, 1/2, 9/16)
- Hex Key (5/32)
- Torx Wrench (T25)
- Hammer
- 1/2” to 3/4” brass rod

Procedure

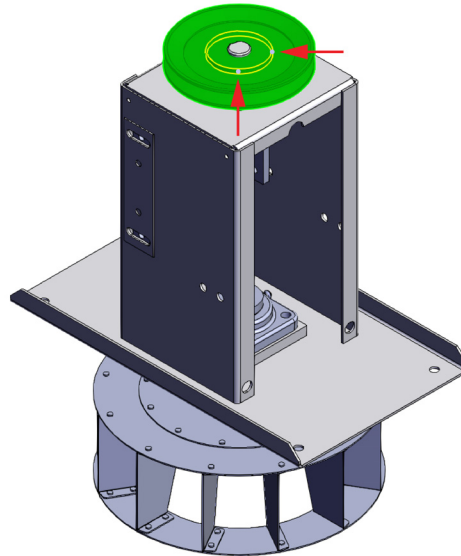
1. Disconnect and lockout electrical power to the tunnel. Be sure to follow all of your company's required safety procedures.
2. Allow the shrink tunnel components to cool down to room temperature. This can take 30 minutes or more.
3. Using a 7/16" wrench, remove the four bolts securing the v-belt guard to the tower weldment and remove the guard.



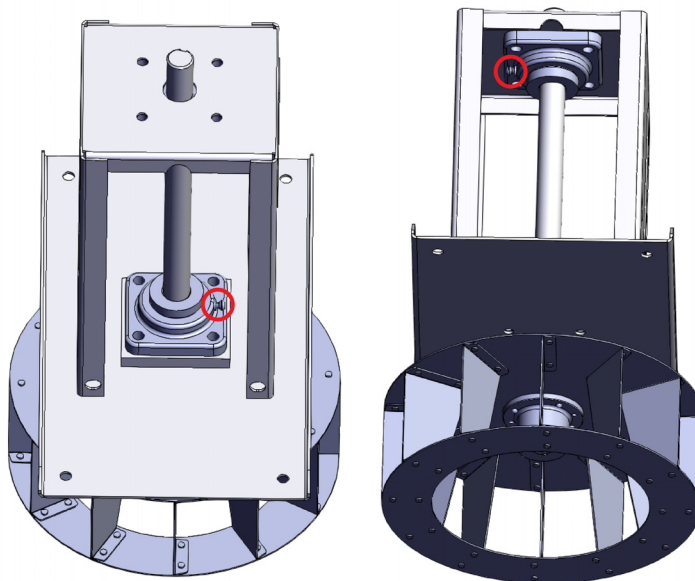
4. Using a 1/2" wrench, remove the four bolts securing the motor-mounting bracket to the tower weldment and remove the bracket, the v-belt and the motor.



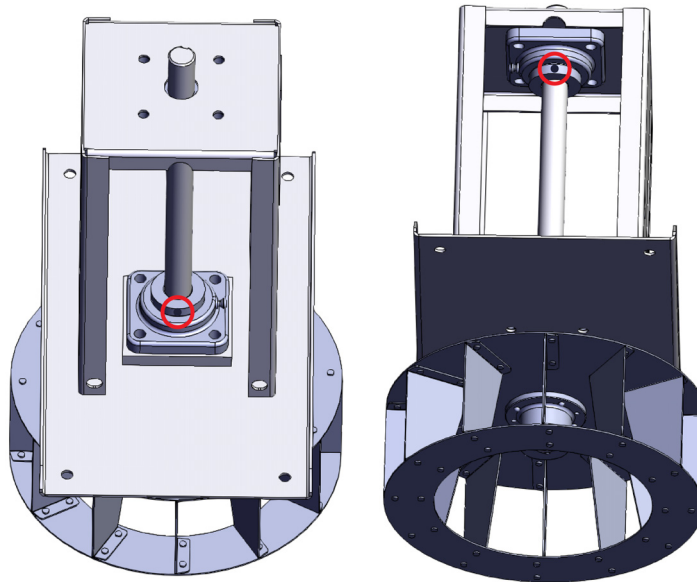
5. Using a 5/32" hex key, loosen the setscrews securing the blower impeller shaft pulley and remove the pulley and key stock from the impeller shaft.



6. Using 5/16" and 3/8" wrenches, remove the central lubrication lines from the bearing grease fittings.

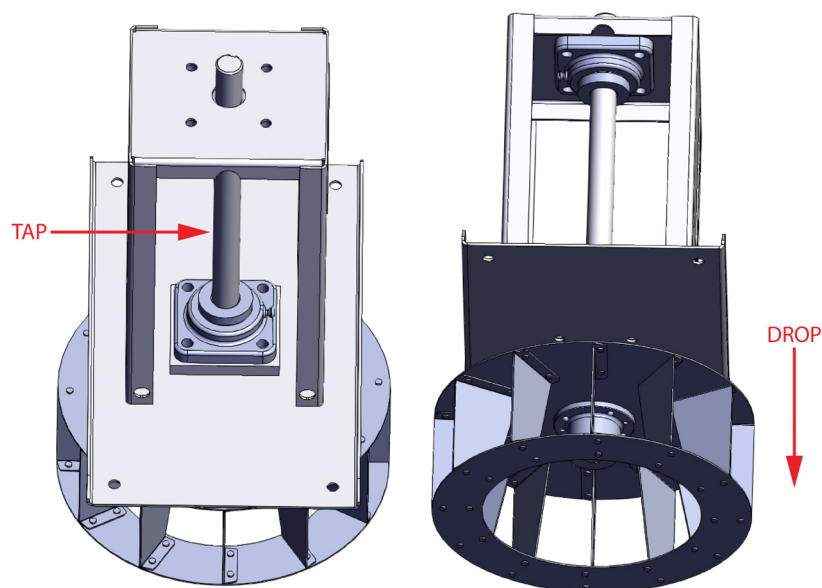


7. Using a T25 torx wrench, loosen the bolts in the Skwezloc fittings on each of the 4-hole flanged bearings and loosen the fitting from the impeller shaft.

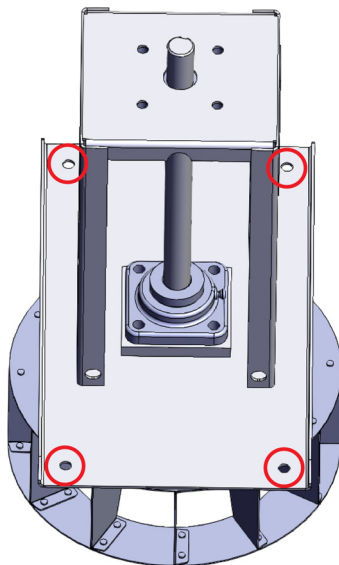


Do not use excessive force when separating bearings from shaft. This could cause the shaft to drop with excessive force and cause damage.

8. If the impeller shaft does not freely move up and down after loosening the Skwezloc fittings, use the hammer and the brass rod (as a punch) and tap with moderate force on the top of the shaft until it drops all the way down.



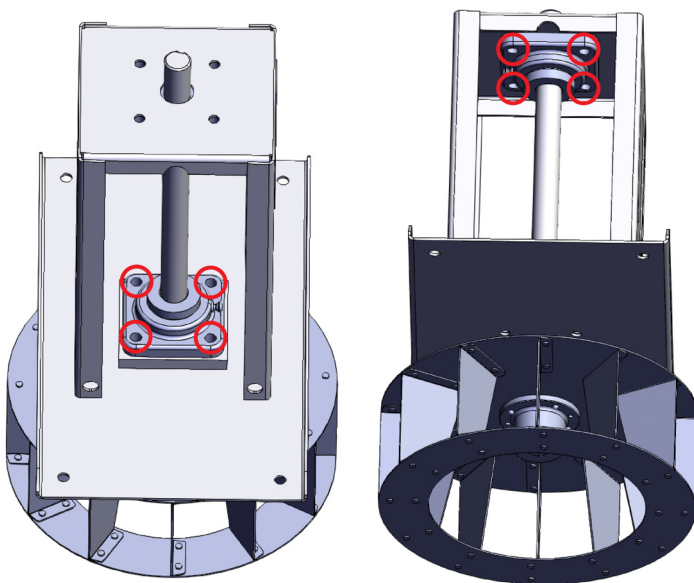
9. Using a 9/16" wrench, remove the four nuts securing the tower weldment to the tunnel.



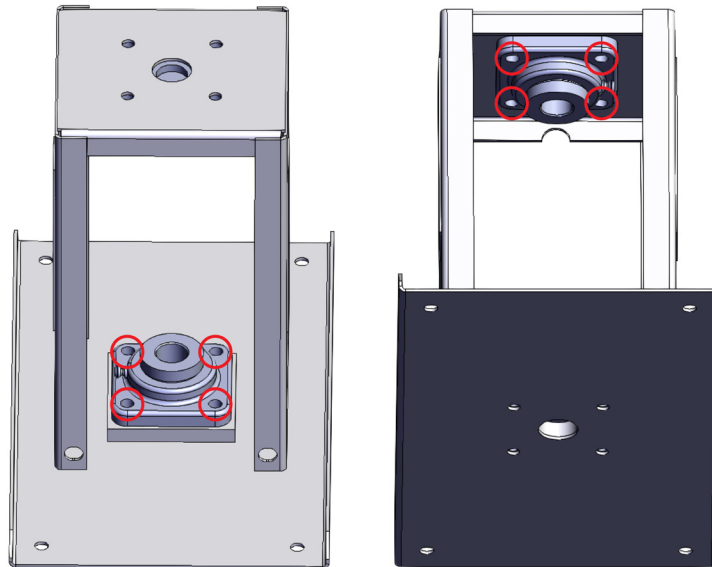
NOTICE

Note the orientation of the tower weldment for reinstallation later.

10. Using a 9/16" wrench, loosen (but not remove) the four bolts securing each of the 4-hole flange bearing to the tower weldment and then lift the tower weldment and slide the weldment with the bearings off the impeller shaft.



11. Remove the four bolts securing the 4-hole flange bearings to the tower weldment and discard the worn bearings.



12. Inspect and clean the impeller shaft. Be especially aware of areas where the pulley setscrew and bearings contact the shaft. If the impeller shaft is severely scored or damaged, it should be replaced. See "Tunnel Blower Impeller and Shaft Replacement" section for procedure.
13. Loosely install new 4-hole flange bearings to the tower weldment.
14. Reinstall the tower weldment with bearings by sliding the bearings onto the impeller shaft and fitting the weldment over the studs on top of the tunnel. Be sure to install the Skwezloc fittings on the impeller shaft between the bearings.
15. Reinstall and tighten the tower weldment nuts to the tunnel studs.
16. Tighten the bearings to the tower weldment. Make sure the impeller shaft moves freely up and down through the bearings. There should be 3/4" to 1" of play.
17. Slide the impeller shaft up and down through the bearings and mark the highest and lowest points of travel on the shaft.
18. Position the impeller shaft so it is centered between the marks and tighten the bolt on each of the two Skwezloc fittings.
19. Reinstall the lubrication fittings.

20. Loosely reinstall the motor mounting bracket with motor.
21. Reinstall the pulley with the key stock on the impeller shaft, making sure it lines up with the motor pulley, and tighten the setscrews.
22. Reinstall the v-belt. When installing the v-belt, place a moderate amount of tension on the belt while tightening the motor mounting brackets to the tower weldment.
23. Reinstall the v-belt guard and tighten the bolts.

Tunnel Blower Impeller Fan and Shaft Replacement

The following procedures explain the process for replacing impeller fan and impeller shaft on the tunnel blower. For a complete parts list, please see the corresponding assembly drawing in the “Illustrated Parts List” chapter of your Operation and Maintenance Manual.



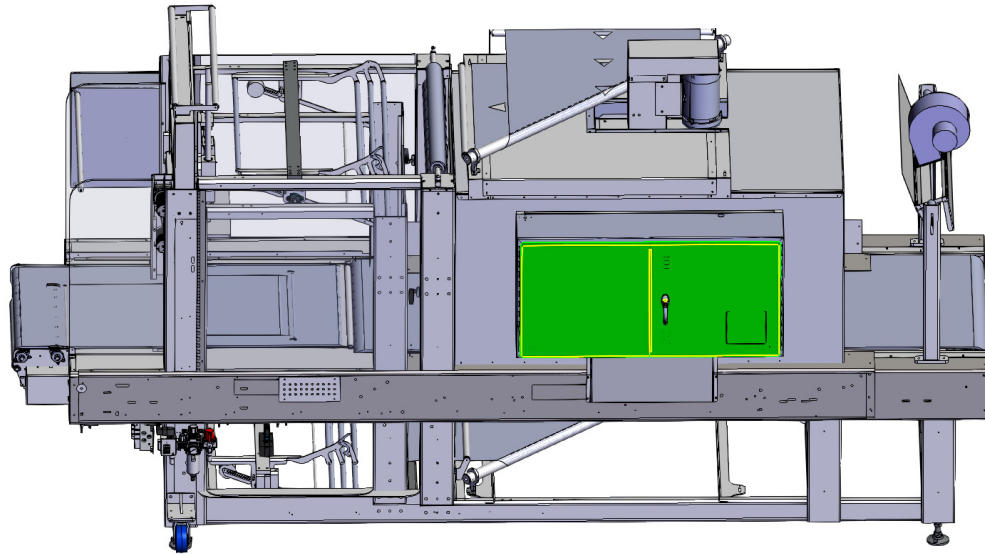
THE FOLLOWING PROCEDURES SHOULD ONLY BE PERFORMED AFTER THE MACHINE HAS BEEN TURNED OFF, ALLOWED TO COOL DOWN, THE AIR PRESSURE HAS BEEN RELEASED AND YOUR COMPANY’S LOCKOUT/TAGOUT PROCEDURES HAVE BEEN APPLIED. ALWAYS WEAR SAFETY GLASSES AND OTHER REQUIRED PROTECTIVE EQUIPMENT AT ALL TIMES. BE SURE TO FOLLOW ALL OTHER COMPANY SAFETY POLICIES. FAILURE TO DO SO MAY RESULT IN SEVERE INJURY OR DEATH.

Parts Required

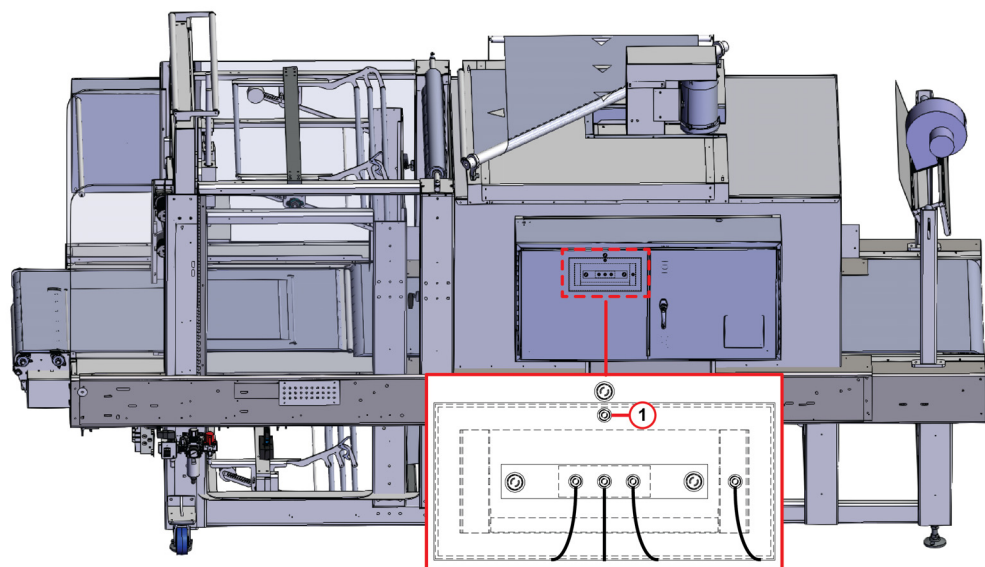
- Open-end or socket wrenches (5/16”, 3/8”, 1/2”, 9/16”)
- Hex Key (1/8”, 5/32”)
- Torx Wrench (T25)
- Hammer
- 1/2” to 3/4” brass rod

Procedure

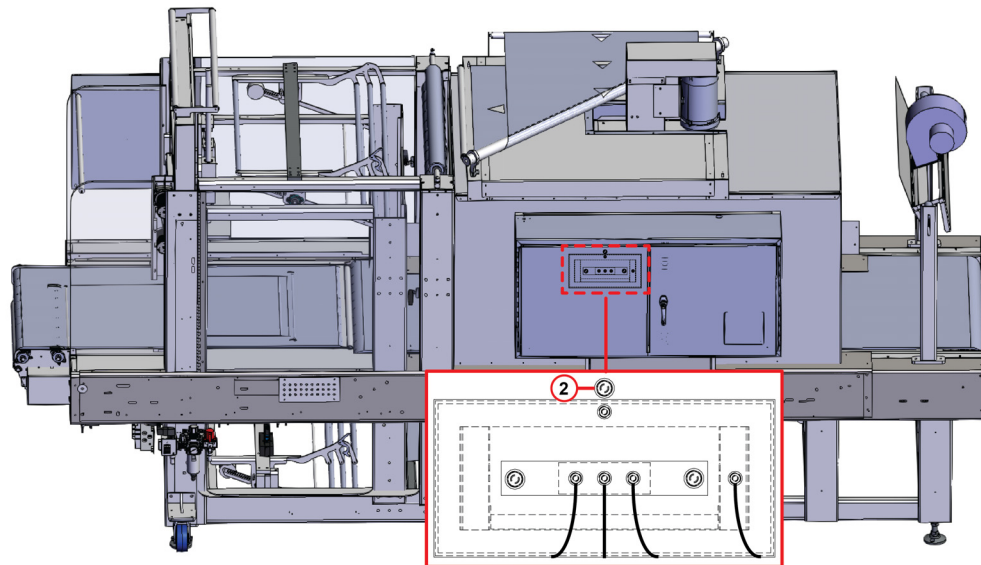
1. Disconnect and lockout electrical power to the tunnel. Be sure to follow all of your company's required safety procedures.
2. Allow the shrink tunnel components to cool down to room temperature. This can take 30 minutes or more.
3. Open the electrical cabinet doors to access interior panel and heater element.



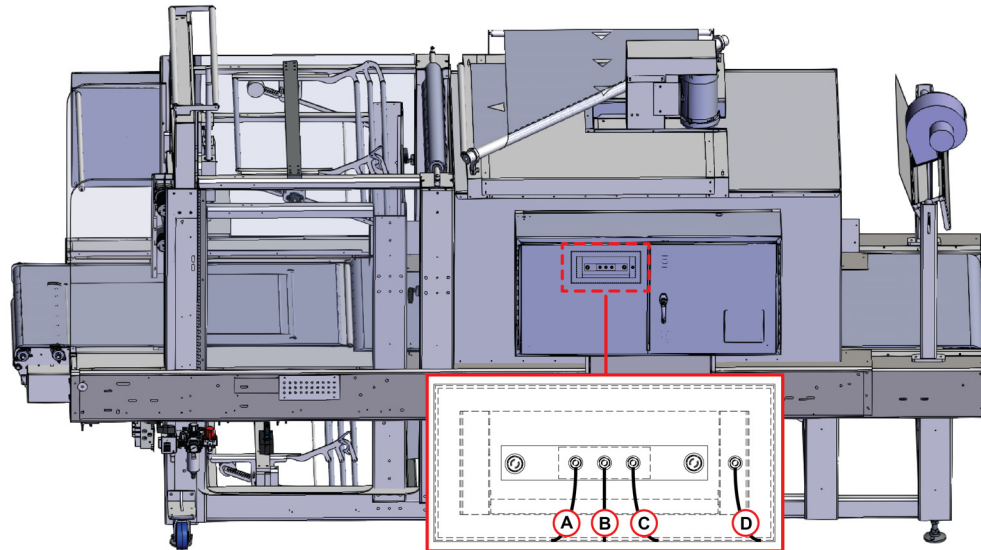
4. Using a 1/8" hex key remove the bolt (1) that secures the associated heater element cover in place.



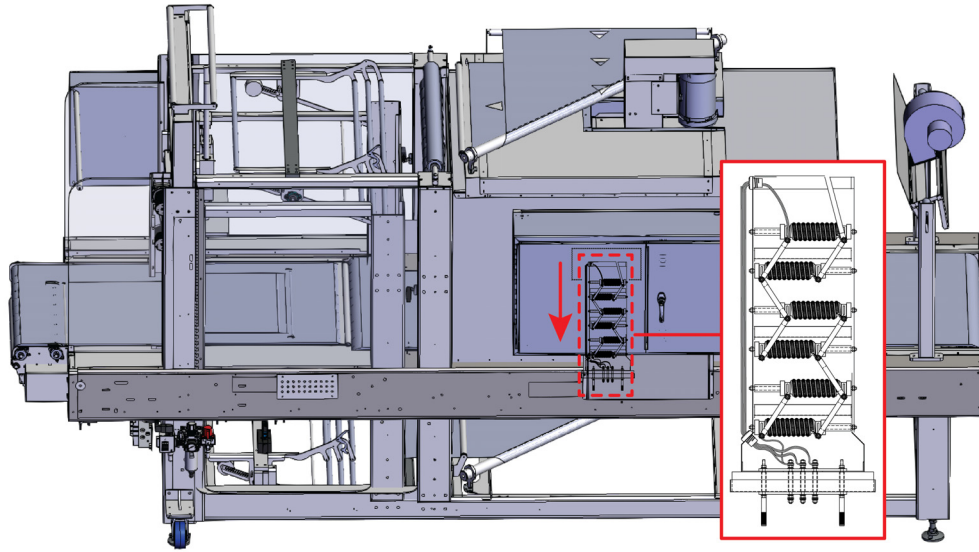
5. Using a 1/2 wrench, remove the nut that securing the associated heater element retaining bracket in place.



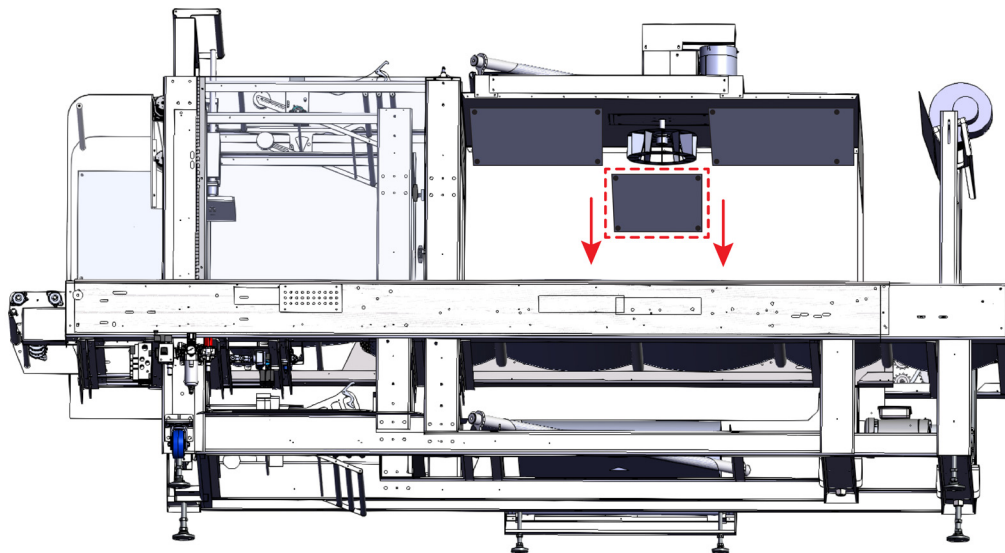
6. Using a 7/16 wrench, disconnect the machine wires (A,B,C) and the ground wire (D).



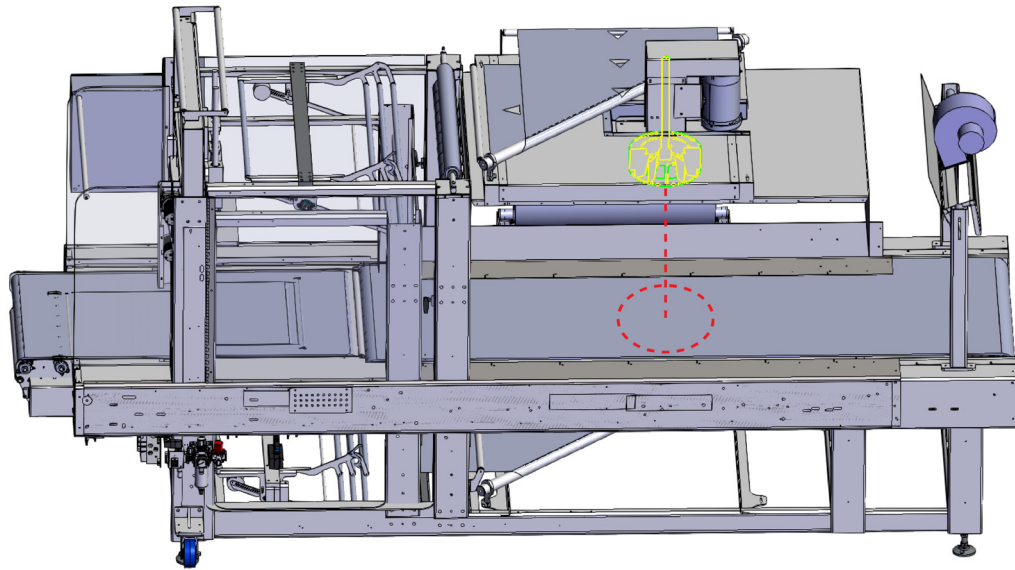
7. Slide the heater element tray out of the machine.



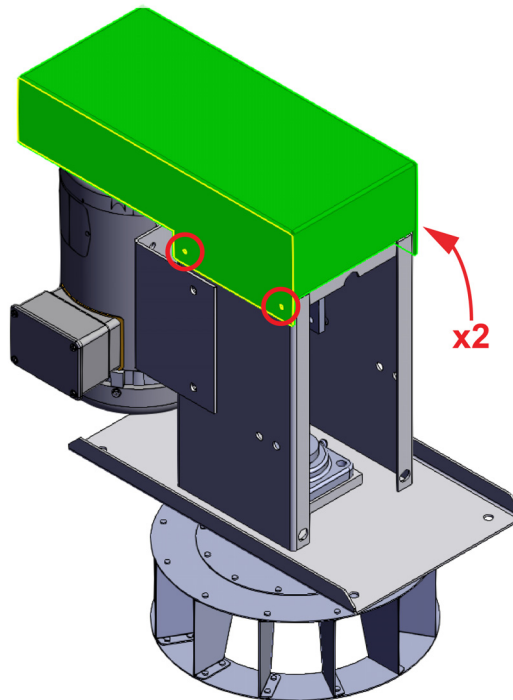
8. Inside the tunnel, remove the sheet metal plate located directly below the impeller shaft.



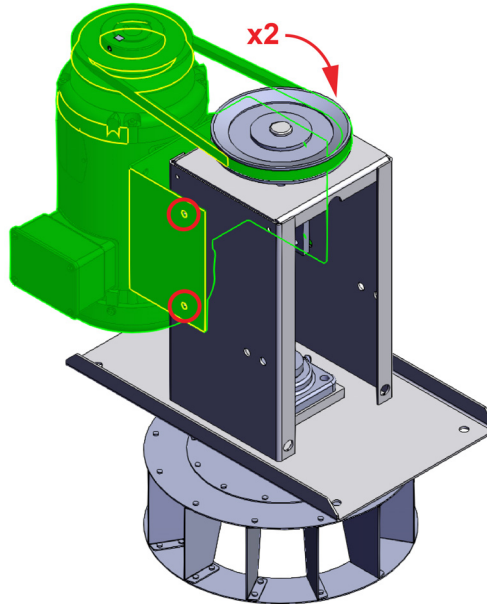
9. Exit the tunnel and place cushioning material on the tunnel belt immediately below the impeller to protect the belt when the impeller shaft is dropped onto it.



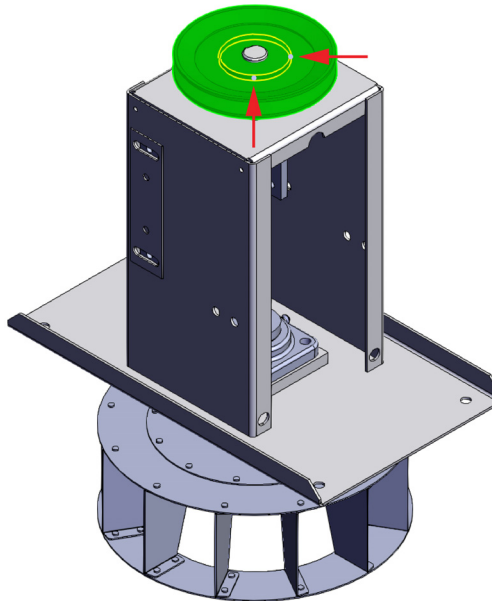
10. Using a 7/16" wrench, remove the four bolts securing the v-belt guard to the tower weldment and remove the guard.



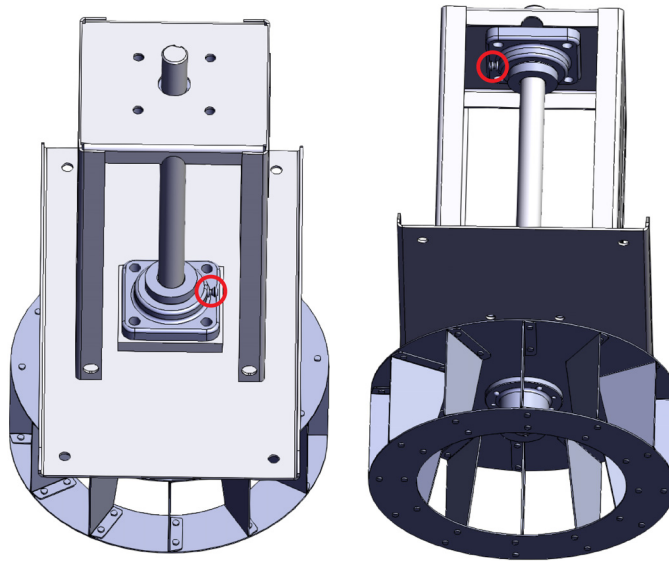
11. Using a 1/2" wrench, remove the four bolts securing the motor mounting bracket to the tower weldment and remove the bracket, the v-belt and the motor.



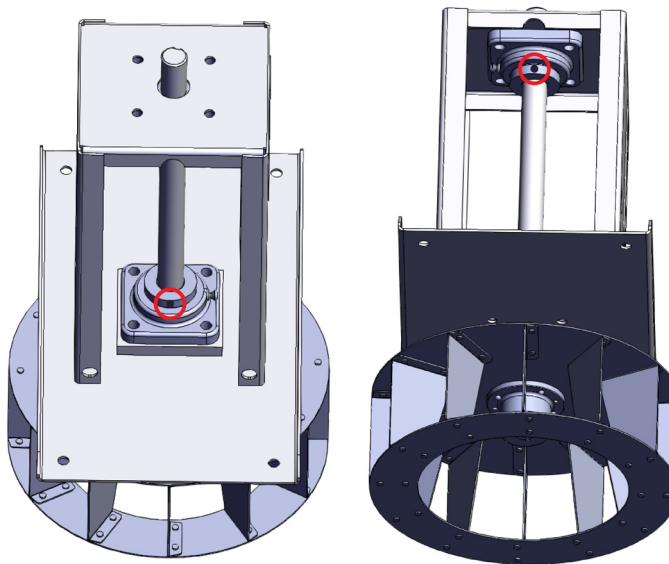
12. Using a 5/32" hex key, loosen the setscrews securing the plower impeller shaft pulley and remove the pulley and key stock from the impeller shaft.



13. Using 5/16 and 3/8" wrenches, remove the central lubrication lines from the bearing grease fittings.



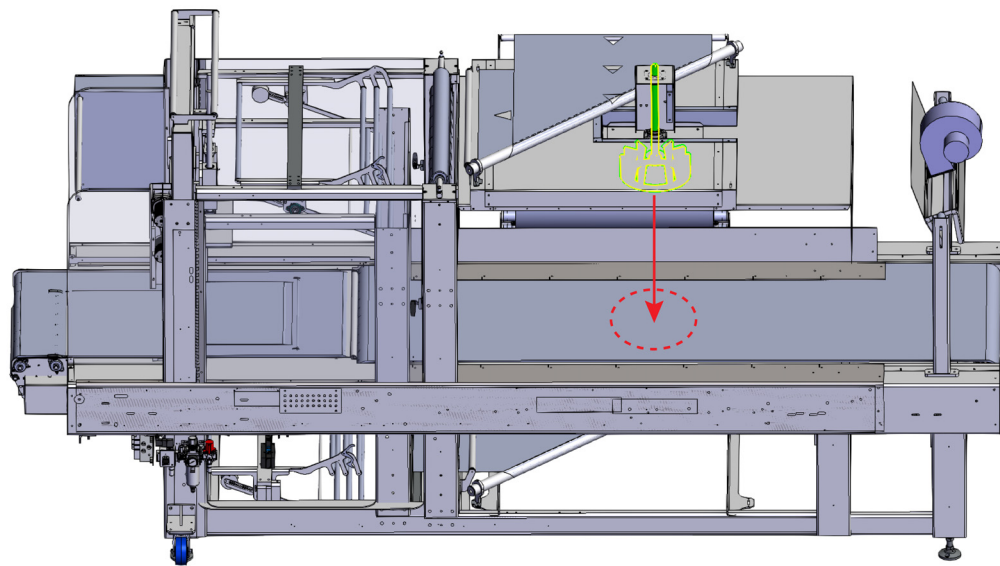
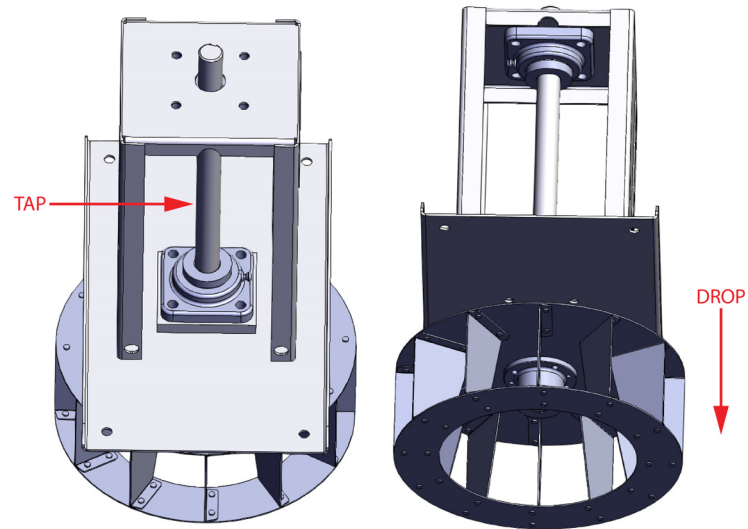
14. Using a T25 torx wrench, loosen the bolts in the Skwezloc fittings on each of the 4-hole flanged bearings and loosen the fitting from the impeller shaft.



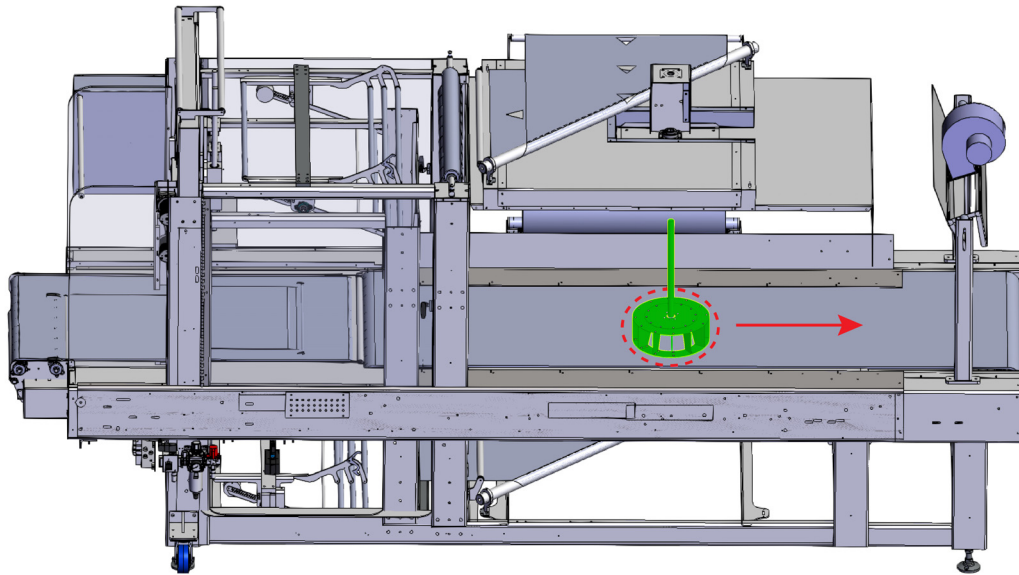
WARNING

Do not use excessive force when separating bearings from shaft. This could cause the shaft to drop with excessive force and cause damage.

15. If the impeller shaft does not freely move up and down after loosening the Skwezloc fittings, use the hammer and brass rod (as a punch) and tap with moderate force until the shaft drops all the way down onto the cushioning on the tunnel belt.



16. Carefully remove the impeller shaft from the tunnel.



17. Inspect the impeller shaft and bearings for wear and diagnose the cause of the shaft damage.
18. Install the new impeller and shaft up through the tunnel and through the 4-hole flange bearings and Skwezloc fittings.
19. Slide the impeller shaft up until it stops and temporarily tighten one of the Skwexloc fitting bolts to prevent the impeller and shaft from dropping down into the tunnel again. Inside the tunnel, reinstall the sheet metal previously removed below the impeller.
20. Reinstall the heater element tray.
21. Loosen the bolt on the Skwezloc fitting and allow the impeller shaft to drop down onto the sheet metal inside tunnel.
22. Slide the impeller shaft up and down through the bearings, marking the highest and lowest points of travel on the shaft.
23. Position the impeller shaft so it is centered between the marks and tighten the bolt in each of the Skwezloc fittings.
24. Reinstall the lubrications lines to the fittings.
25. Loosely reinstall the motor mounting bracket and motor.

26. Reinstall the pulley with the key stock on the impeller shaft, making sure it lines up with the motor pulleys, and tighten the setscrews.
27. Reinstall the v-belt. when installing the v-belt, place a moderate amount of tension on the belt while tightening the motor mounting brackets to the tower weldment.
28. Reinstall the v-belt guard and tighten the bolts.

6

Troubleshooting

6.1. Introduction

This chapter is divided into two sections.

The first section is an index of fault messages that appear on the machine's display. This index is cross referenced to a group of troubleshooting charts that will guide you through how to resolve fault message issues.

The second section is an index of generic machine problems not indicated by fault messages. This index is cross referenced to a second group of troubleshooting charts that will guide you through how to resolve the problem.

6.2. Fault Message Troubleshooting Index & Charts

Use the following troubleshooting index and troubleshooting charts as an aid in solving your problems associated with fault messages that appear on the machine's display.

Fault Message	Possible Cause	Remedy
ACCELERATION CONVEYOR DRIVE FAULTED	The VFD controlling the Acceleration conveyor motor is in a faulted state.	Press the CYCLE STOP/RESET button to see if that will clear the fault and reset the drive. Determine the exact fault and take corrective action to remedy the fault. Consult OEM manual for additional information
CHECK FLIGHT BAR FILM DETECTION PHOTO SENSOR	The internal code of the PLC did not detect the film detection sensor on the Overwrap conveyor's flight bar within the proper window/time frame.	Check the alignment/set-up of the sensor.
CYCLE HALTED BY HALT/RUN SELECTOR SWITCH AUX. STATION CONTROL SIDE	One or more halt/run selector switches in the "halt" position.	Put the corresponding halt/run selector switch into the "run" position.
CYCLE HALTED BY HALT/RUN SELECTOR SWITCH AUX. STATION OPPOSITE SIDE	One or more halt/run selector switches in the "halt" position.	Put the corresponding halt/run selector switch into the "run" position.
DANCER DOOR OPENED	Indicates that dancer door is opened.	Make sure that guard door is closed. If door is closed but message still occurs, checking mounting and operation of door switch.

Fault Message	Possible Cause	Remedy
DETECT FILM IS TOO LONG (DID NOT CUT)	Manual reset required. Loose or damaged connection between servo drive and controller. Drive controller fault.	Restart the machine. Reset the servo drives from the operator interface. Inspect the servo drive, controller and cables for loose connections or damage. Correct or replace, as necessary. Shut down the machine for a minimum of 1 minute and restart the machine.
DETECT FILM IS TOO LONG (DID NOT STOP)	Manual reset required. Loose or damaged connection between servo drive and controller. Drive controller fault.	Restart the machine. Reset the servo drives from the operator interface. Inspect the servo drive, controller and cables for loose connections or damage. Correct or replace, as necessary. Shut down the machine for a minimum of 1 minute and restart the machine.

Fault Message	Possible Cause	Remedy
DETECT FILM REGISTRATION ERROR (PRINTED FILM)	Print/clear film selector switch is in the incorrect position. Registration mark is out of position. Registration mark is too light or small. Dirty, defective or misaligned registration photo-eye. Light/dark switch improperly set.	Inspect the selector switch; adjust to the proper position. Inspect the film roll and adjust accordingly. Compare film to new, high-quality film. Contact your film distributor. Inspect the film registration photo-eye and wiring. Clean, replace or correct as necessary. Inspect the switch and adjust as necessary.
DETECT FLIGHT BAR RAN TOO LONG	A physical obstruction prevented the overwrap flight bar from completing its cycle within the time frame allowed by the PLC Set speed of the flight bar is too slow or the window to complete the flight bar cycle is too short.	Clear obstruction. Reset / restart the machine Make appropriate set-up adjustment.
DETECT FLIGHT BAR DID NOT START	Internal code of the PLC detected that the flight bar did not start when it was supposed to.	Check physical condition of the flight bar. Clear any possible obstructions.
DETECT LOW AIR PRESSURE	Air disconnected from machine.	Make sure that air supply hose is connected.

Fault Message	Possible Cause	Remedy
DETECT NO FILM ON OVERWRAP FLIGHT BAR	Film is jammed in the film feed. Dirty, defective or misaligned photo-eye.	Inspect the film feed assembly for jammed film. Remove any film that is jammed. Inspect the photo-eye and wiring. Clean, replace or correct as necessary.
2SR DOOR SAFETY RELAY NOT RESET	The safety circuit was interrupted and not reset	Close all guard doors within that circuit. Press the CYCLE STOP / RESET button.
3SR DOOR SAFETY RELAY NOT RESET	The safety circuit was interrupted and not reset	Close all guard doors within that circuit. Press the CYCLE STOP / RESET button.
DOOR #1 OPEN	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #2 OPEN	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #3 OPEN	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #4 OPEN	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #5 OPEN (KNIFE)	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.

Fault Message	Possible Cause	Remedy
DOOR #6 OPEN (WRAPPER-RIGHT SIDE BOTTOM)	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #7 OPEN (WRAPPER-LEFT SIDE BOTTOM)	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #8 OPEN (WRAPPER-LEFT SIDE BOTTOM)	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOOR #9 OPEN (WRAPPER-KNIFE)	Guard door is open or sensor is not functioning properly	Close the door or correct issue with sensor. Press the CYCLE STOP / RESET button.
DOWNSTREAM CONVEYORS OUT OF CYCLE	Internal PLC code did not receive the signal that the downstream conveyors are running when they should be.	Press the conveyors CYCLE START button.
DOWNSTREAM COOLING CONVEYOR OUT OF CYCLE	Internal PLC code did not receive the signal that the downstream conveyors are running when they should be.	Press the conveyors CYCLE START button.
E-STOP #1 ENGAGED (WRAPPER-OPERATOR INTERFACE)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP #2 ENGAGED (WRAPPER AUX. CONTROLS)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.

Fault Message	Possible Cause	Remedy
E-STOP #3 ENGAGED (TUNNEL)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP #4 ENGAGED (TUNNEL-OPOSITE SIDE)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP #5 ENGAGED (DOWNSTREAM PULL CORD 1)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP #6 ENGAGED (DOWNSTREAM PULL CORD 2)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP #6 ENGAGED (DOWNSTREAM CONVEYORS)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP ENGAGED OPERATOR STATION (CONTROL SIDE)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
E-STOP ENGAGED OPERATOR STATION (OPPOSITE SIDE)	The E-Stop was pressed.	When safe to do so, reset the E-Stop, press the POWER ON button then the CYCLE STOP / RESET button.
FILM BAR SERVO DRIVE NOT READY	Servo drive is not in a ready state	Press CYCLE STOP / RESET.
FILM FEED FAILED TO START	Film feed fault.	Shut down the machine for a minimum of 1 minute and restart the machine. If the problem persists, contact ARPAC's technical service department.

Fault Message	Possible Cause	Remedy
FILM FEED SERVO DRIVE NOT READY	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/RESET button and restart machine.
FILM FEED SERVO POSITION ERROR EXCEED LIMITS	The actual position of the film feed servo differs by too much of a margin compared to what the PLC has set as the command position.	Variance is most likely due to a physical obstruction or mechanical condition. Correct the condition and/or remove obstruction.
FILM FEED FILM JAMMED PROX SENSOR ACTIVATED	Torque Limitor for the assembly is tripped and made the prox switch	Reset the torque limitor. Adjust position of prox switch
FILM JAMMED	Incorrect air pressure. Film roll obstruction. Dirty dancer bar rollers. Defective film brake solenoid valve. Defective or misaligned proximity switch.	Check and adjust the air pressure if necessary. Air pressure should be 80 psi minimum. Check airflow adjustment (solenoid/cylinder). Check for air leakage. Inspect film roll and Delrin bearings for obstruction. Clean or correct, as necessary. Inspect the dancer bar rollers for contamination. Clean or replace as necessary. Inspect solenoid valve for proper operation. Correct or replace as necessary. Inspect the proximity switch and wiring. Correct or replace as necessary.
FILM REGISTRATION MARK MISSED	Film registration sensor did not see the eye mark.	Adjust position or set-up of sensor

Fault Message	Possible Cause	Remedy
FILM ROLL IS NOT SELECTED	Film roll switch on film rack is set to "0".	Make sure switch is set to "1" or "2".
FILM WEB BROKEN OR DANCER TOO LOW	Film web has broken.	Splice film roll according to Section "5.12 Splicing Film" on page 5-41.
FLIGHT BAR CONVEYOR DRIVE FAULT	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/ RESET button and restart machine.
FLIGHT BAR DID NOT START	Jammed product. Dirty or damaged flight bar chain. Loose connection or damaged connection between servo drive and controller. Manual reset required. Drive controller fault.	Clear the product from the flight bar area and reset the machine. Inspect the flight bar chain. Clean, lubricate or replace as necessary. Inspect the servo drive, controller and cables for loose connections or damage. Correct or replace, as necessary. Restart the machine. Reset the servo drives from the operator interface. Shut down the machine for a minimum of 1 minute and restart the machine.
FLIGHT BAR EXCESSIVE HOMING TIME	Flight bar did not complete it's homing sequence in the allowed amount of time.	Check for physical obstruction/condition.

Fault Message	Possible Cause	Remedy
FLIGHT BAR JAMMED	Jammed flight bar. Damaged or defective proximity switch. Dirty or damaged flight bar chain. Torque limiter out of adjustment.	Inspect the flight bar area for jammed products or any other obstructions. Correct as necessary. Inspect the proximity switch and wiring. Correct or replace, as necessary. Inspect the flight bar chain. Clean, lubricate or replace as necessary. Inspect the torque limiter and adjust if necessary.
FLIGHT BAR RAN TOO LONG	Jammed flight bar. Dirty or damaged flight bar chain. Manual reset required. Drive controller fault.	Inspect the flight bar area for jammed products or any other obstructions. Correct as necessary, then reset the machine. Inspect the flight bar chain. Clean, lubricate or replace as necessary. Reset the servo drives from the operator interface, then restart the machine. Shut down the machine for a minimum of 1 minute and restart the machine.

Fault Message	Possible Cause	Remedy
FLIGHT BAR SERVO AXIS FAULT	Drive controller fault (motor short circuit, control board overtemp, undervoltage, motor overtemp, etc).	Inspect conditions for possible excess load due to jam or belt tracking problem. Shut down the machine for a minimum of 1 minute and restart the machine. Also, refer to drive controller specification.
FLIGHT BAR SERVO DRIVE NOT READY	Servo drive is just starting up	Waits 30 seconds. Then press CYCLE STOP/RESET button and restart machine.
FLIGHT BAR SERVO POSITION ERROR EXCEED LIMITS	The actual position of the servo differs by too much of a margin compared to what the PLC has set as the command position.	Variance is most likely due to a physical obstruction or mechanical condition. Correct the condition and/or remove obstruction.
FLIGHT BAR TORQUE LIMITER TRIPPED	Torque Limitor for the assembly is tripped and made the prox switch	Reset the torque limiter. Adjust position of prox switch

Fault Message	Possible Cause	Remedy
GAP BETWEEN PRODUCTS TOO SMALL	Damaged product. Improper backpressure. Infeed belt is slipping. Improper product settings. Dirty, damaged or defective photo-eye.	Inspect machine for damaged or skewed products. Remove damaged products and restart the machine. Inspect upstream equipment for excessive backpressure. Adjust as necessary. Inspect infeed conveyor belt. Adjust tension as necessary. Adjust the product interval and the product length through the operator interface. Inspect the photo-eye and wiring. Clean, replace or correct as necessary.
GAP TOO SMALL FOR FLIGHT BAR OPERATION	Product set-up incorrect. The gap or space created between two consecutive trays is too small for the flight bar to operate properly.	Increase the Product Interval set point
HOT PLATE LOW TEMPERATURE	Temp controller for the tunnel hot plate has not reached the proper temperature yet	Allow more time for the hot plate to come up to temp. Correct / repair / replace hot plate heater element or thermocouple.
INCORRECT PRODUCT SETTING FOR FILM FEED	A combination of different set points related to the film feed has caused the allowable variance of the PLC to be exceeded. Most likely the film length, the product interval and the machine rate	Verify that all the film feed set point parameters are set correctly.

Fault Message	Possible Cause	Remedy
INFEED CONVEYOR DRIVE NOT READY	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/RESET button and restart machine.
INFEED DRIVE FAULT	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/RESET button and restart machine.
KNIFE DOOR OPENED	Indicates that dancer door is opened.	Make sure that guard door is closed. If door is closed but message still occurs, checking mounting and operation of door switch.
KNIFE EXCESSIVE HOMING TIME	Knife servo did not complete it's homing sequence in the allowed amount of time.	Check for physical obstruction/condition.
KNIFE EXCESSIVE RUNNING TIME	Knife servo did not complete its cycle in the allowable time frame	Check for physical obstruction/condition.
KNIFE SERVO POSITION ERROR EXCEEDS LIMITS	The actual position of the servo differs by too much of a margin compared to what the PLC has set as the command position.	Variance is most likely due to a physical obstruction or mechanical condition. Correct the condition and/or remove obstruction.
KNIFE SERVO NEEDS TO BE HOMED	Servo drive lost track of its position	Go to the Control screen and re-home the servo
KNIFE SERVO DRIVE NOT READY	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/RESET button and restart machine.
LINE E-STOP ENGAGED	Emergency Stop button on manufacturing line is pressed in.	Pull button out, press Cycle/Stop Reset button on main control panel and restart machine.
LOW AIR PRESSURE	Amount of air pressure detected at the regulator is too far below the set point	Turn on air supply and/or check for incoming air

Fault Message	Possible Cause	Remedy
LOW FILM SUPPLY	Indicates film supply is running low and machine will automatically stop soon if film is not replaced.	Add new film roll according to Section “5.12 Splicing Film” on page 5-41.
MACHINE IN OVERRIDE AFTER TUNNEL INTERLOCK MODE	Machine’s heat tunnel function is in override (bypass) mode.	Go to Wrap On Heat On button on OverView 2 screen to change back to normal operational mode.
MACHINE IN OVERRIDE AFTER WRAPPER INTERLOCK MODE	Machine’s wrapper function is in override (bypass) mode.	Go to Wrap On Heat On button on OverView 2 screen to change back to normal operational mode.
MACHINE IN OVERRIDE ALL INTERLOCKS MODE	Machine’s wrapper and heat tunnel function is in override (bypass) mode.	Go to Wrap On Heat On button on OverView 2 screen to change back to normal operational mode.
MACHINE POWER IS OFF	Power is applied to the machine, but the POWER ON button has not been pressed.	Press the POWER ON button
MAIN DRIVE NOT READY	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/ RESET button and restart machine.
OVERWRAP CONVEYOR DRIVE FAULTED	The VFD controlling the Acceleration conveyor motor is in a faulted state.	Press the CYCLE STOP/RESET button to see if that will clear the fault and reset the drive. Determine the exact fault and take corrective action to remedy the fault. Consult OEM manual for additional information

Fault Message	Possible Cause	Remedy
PHOTO EYE DETECT NO FILM ON FLIGHT BAR DISCONNECT, MISALIGNMENT BROKEN	Film ripped or dropped while on flight bar. Dirty, defective or misaligned photoeye.	Inspect flight bar and film feed assembly for cause. Remove any film that is jammed. Press Reset button prior to restart. Inspect the photoeye and wiring. Clean, replace or correct as necessary.
PRODUCT JAMMED ON UPSTREAM FLEX CONVEYOR	Sensor on the conveyor blocked longer than the internal PLC code allows	Remove / correct the issue causing the sensor to be blocked for so long
PRODUCT JAMMED ON DOWNSTREAM CONVEYOR	Sensor on the conveyor blocked longer than the internal PLC code allows	Remove / correct the issue causing the sensor to be blocked for so long
PRODUCT NEEDS TO BE REMOVED FROM INFEED CONVEYOR	Product on infeed conveyor.	Remove the product from the infeed and continue startup.
PRODUCT SETUP IS INCORRECT TOO SMALL FOR PROPER FILM FEED OPERATION	Incorrect product selection. Operation rate increased. Settings on maintenance menu have changed. Incorrect registered film.	Check product settings on the operator interface. Correct or adjust as necessary. Check machine speeds on the operator interface. Correct or adjust as necessary. Inspect settings using the operator interface. Correct or adjust as necessary. Inspect the film. Adjust machine settings as necessary.

Fault Message	Possible Cause	Remedy
PRODUCT SETUP IS INCORRECT TOO SMALL FOR PROPER FLIGHT OPERATION	Improper product settings. Improper operator interface adjustments.	Adjust the product interval and the product length through the operator interface. Lower delay to start flight bar setting. Increase flight bar low and high speeds. Lower the low speed distance. Monitor the film and flight bar relationship. Adjust as needed.
PRODUCT TOO LONG, SKEWED, BROKEN OR BACK TO BACK	Damaged or skewed products. Improper product spacing. Improper product settings. Dirty, damaged or defective photoeye.	Inspect machine for damaged or skewed products. Remove damaged products and restart the machine. Adjust conveyor speeds. Adjust the allowed length variance. Inspect the photoeye and wiring. Clean, replace or correct as necessary.
RESET SERVO DRIVES	Servo drive is just starting up.	Waits 30 seconds. Then press CYCLE STOP/RESET button and restart machine.

Fault Message	Possible Cause	Remedy
TUNNEL BELT DRIVE NOT RUNNING	Tunnel belt is jammed. Drive controller fault (motor short circuit, control board overtemp, undervoltage, motor overtemp, etc).	Inspect tunnel belt. Check clearance and movement of the tunnel belt. Correct as necessary. Shut down the machine for a minimum of 1 minute and restart the machine. Also, refer to the controller specification.
TUNNEL BLOWER MOTOR CIRCUIT BREAKER TRIPPED	Excessive load on the motor caused the CB to trip	Correct issue / clear obstruction. Reset CB
TUNNEL BLOWER MOTOR #1 CIRCUIT BREAKER TRIPPED (1ST ZONE)	Excessive load on the motor caused the CB to trip	Correct issue / clear obstruction. Reset CB
TUNNEL BLOWER MOTOR #2 CIRCUIT BREAKER TRIPPED (2ND ZONE)	Excessive load on the motor caused the CB to trip	Correct issue / clear obstruction. Reset CB
TUNNEL BLOWER MOTOR #3 CIRCUIT BREAKER TRIPPED (3RD ZONE)	Excessive load on the motor caused the CB to trip	Correct issue / clear obstruction. Reset CB
TUNNEL TEMPERATURE TOO LOW	Open circuit in heater element tray. Defective thermocouple. Defective temperature controller.	Inspect heater element tray. Check for open circuit or loose wires. Tighten wires or replace coils as necessary. Inspect thermocouple. Replace as necessary. Also, refer to controller specification.

Fault Message	Possible Cause	Remedy
1ST TUNNEL ZONE LOW TEMPERATURE	Temp controller has not reached the proper temperature yet	Allow more time to come up to temp. Correct / repair / replace heater element or thermocouple.
2ND TUNNEL ZONE LOW TEMPERATURE	Temp controller has not reached the proper temperature yet	Allow more time to come up to temp. Correct / repair / replace heater element or thermocouple.
3RD TUNNEL ZONE LOW TEMPERATURE	Temp controller has not reached the proper temperature yet	Allow more time to come up to temp. Correct / repair / replace heater element or thermocouple.
UPSTREAM EQUIPMENT HALTED BY DOWNSTREAM INTERLOCK	Downstream equipment halted. Faulty connection to downstream equipment	Correct the problem and equipment will resume cycle mode automatically. Inspect connection to downstream equipment. Adjust or replace as necessary.
WRAPPER DOOR OPEN	Indicates that one or more of guard doors on wrapper are open.	Make sure that all guard doors are closed. If doors are closed but message still occurs, checking mounting and operation of door switches.
WRAPPER STOPPED DUE TO LOW FILM CONDITION	Indicates film supply is running low and machine has stopped because of it.	Add new film roll according to Section "5.12 Splicing Film" on page 5-41.

6.3. General Troubleshooting Index & Charts

Use the following troubleshooting index and troubleshooting charts as an aid in solving general problems with the machine not indicated by fault messages.

Problem	Possible Cause	Remedy
Film Jams in the Film Feed	Incorrect air pressure.	Check and adjust the air pressure if necessary. Air pressure should be 80 psi minimum at main regulator.
	Incorrect air flow to 45° air bars.	Check airflow adjustment (solenoid/cylinder). Check for air leakage. Open the control valve approximately 1 full turn.
	Dancer bar proximity switches set incorrectly.	Inspect the dancer bar proximity switches. Adjust as necessary.
	Improper knife placement.	The knife is not notched wide enough or too far from the edges.
	Dirty rollers or plates.	Inspect rollers and plates. Clean with mild soap and water as necessary. Ensure residue, soap/water, etc. is removed.
	Fingers interrupting roller motion.	Inspect pinch rollers for obstruction by the fingers. Manually rotate the roller and tighten the outer bearings in necessary.

Problem	Possible Cause	Remedy
Film Curling Problems	Defective film.	Inspect film for unusual wrinkles or sags. Contact your film supplier.
	Dirty rollers or plates.	Inspect rollers and film plates. Clean as necessary.
	Dirty or defective static bars.	Inspect the static bars. Clean with a nylon brush or replace as necessary.
	Wrong product selected.	Check product settings.
Knife Does Not Cut	The knife is dull. Loose clutch.	Inspect the knife. Replace as necessary.
	Improper tension on upper film feed rollers.	Inspect the film feed rollers for proper tension. Adjust as necessary.
Knife Stops Inconsistently	Improper connection.	Inspect knife servo drive connections. Adjust as necessary.
	Defective return spring.	Inspect the knife return spring. Replace as necessary.
	Defective knife clutch.	Inspect knife clutch. Replace as necessary.

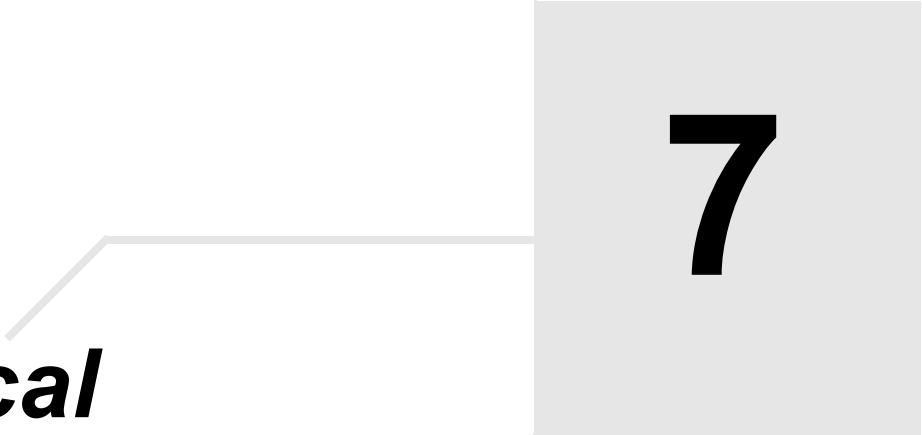
Problem	Possible Cause	Remedy
Unsynchronized Flight Bars	Wrong product selected.	Check product settings.
	Torque limiter out of adjustment.	Inspect the torque limiter and adjust if necessary.
	Manual reset required.	Shut down the machine for a minimum of 1 minute and restart the machine. Home the flight bars and monitor their position. Verify that the torque limiter is engaged.
	Defective or misaligned flight bar detect proximity sensor.	Inspect the proximity switch and wiring. Correct or replace as necessary.
Poor Overwrap	Improper air jet adjustment.	Inspect air jets at exit of film feed and flight bar conveyor. Adjust using the flow controls, if necessary. Close, then re-open one-half to one full turn, dependent on film type.
	Flight bar unsynchronized.	See “unsynchronized flight bars” running condition, above.
	Drag strip too long.	Inspect the drag strip. If the flight bar drag strip pulls the film back during overwrap, the drag strip should be replaced with a shorter strip.

Problem	Possible Cause	Remedy
Weak Seal Line	Film not relaxed. Defective temperature controller. Incorrect tunnel temperature setting (too high or low). Incorrect data (auto preset option). Improper film threading.	Adjust product spacing and/or speed of conveyors. Inspect temperature controller. Replace as necessary. Adjust temperature on temperature control. Check presets: film thickness and speed/minute. Inspect the film threading. Rethread as necessary.
Film Sticks to Tunnel Belt	Belt too hot. Improper film.	Use belt cooling fans when the tunnel temperature exceeds 360°F. Inspect film for unusual wrinkles or sags. Contact your film supplier. Avoid opaque film if possible. When using registered film, the inside of the film can be printed to appear opaque, while providing a clean surface to the belt. If opaque film must be used, contact ARPAC for information on a special varnish coating for opaque film applications.

Problem	Possible Cause	Remedy
Poor Shrink or No Shrink	Temperature too low.	Increase temperature preset on temperature controller.
	Incorrect air flow in tunnel.	Adjust the tunnel louvers.
	Air intakes on side of tunnel blocked by film.	Clean air intake openings in the tunnel.
	Wrong rotation tunnel blower(s).	Inspect tunnel blower(s) motor rotation. Correct as necessary.
	Tunnel blower(s) not running; belts loose or worn out.	Check for overload. Correct problem or reset as necessary. Check for loose connections. Adjust as necessary.
	Tunnel blower fan belt slipping.	Inspect tunnel blower motor(s). Replace as necessary.
	Cooling blower or other fan in plant blowing cooled air into tunnel.	Check blower bearings. Replace as necessary. Inspect blower fan belt. Adjust or replace as necessary. Reposition plant blowers or fans.

Problem	Possible Cause	Remedy
Tunnel Slow to Reach Temperature	Blown circuit breaker.	Inspect circuit breaker. Correct as necessary.
	Loose connection.	Check connection between thermocouple and temperature controller. Correct as necessary.
	Loose or open circuit on heater element tray.	Inspect heater element tray. Check for open circuit or loose wires. Tighten wires or replace coils as necessary.
	Tunnel blower fan belt slipping.	Inspect blower fan belt. Adjust or replace as necessary.
	Tunnel blower not running.	Inspect circuit breakers and connections. Correct or replace as necessary. Inspect motor. Replace as necessary.
	Cooling blower or other fan in plant blowing cooled air into tunnel.	Reposition plant blowers or fans.

Problem	Possible Cause	Remedy
Poor Temperature Uniformity (Tunnel)	Incorrect temperature settings in multi-zone tunnels.	Adjust temperature on temperature control.
	Loose connection.	Check connection between thermocouple and temperature controller. Correct as necessary.
	Loose or open circuit on heater element tray.	Inspect heater element tray. Check for open circuit or loose wires. Tighten wires or replace coils as necessary.
	Tunnel blower fan belt slipping.	Inspect blower fan belt. Adjust or replace as necessary.
	Incorrect air flow in tunnel.	Adjust the tunnel louvers.
	Air intakes on side of tunnel blocked by film.	Clean air intake openings in the tunnel.

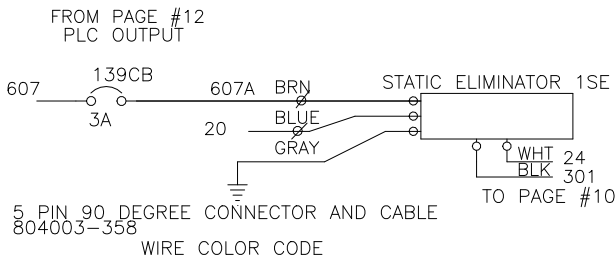
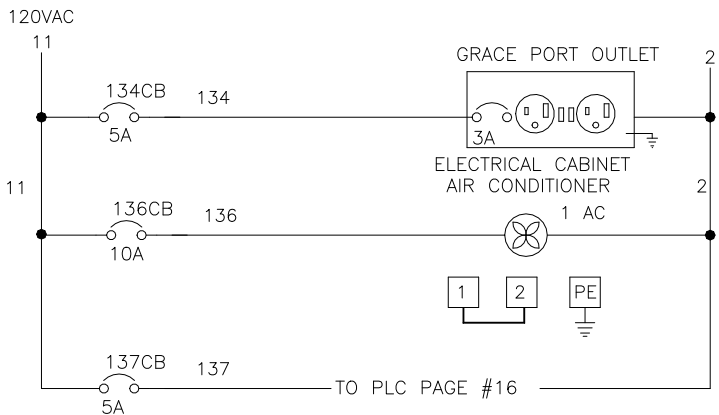
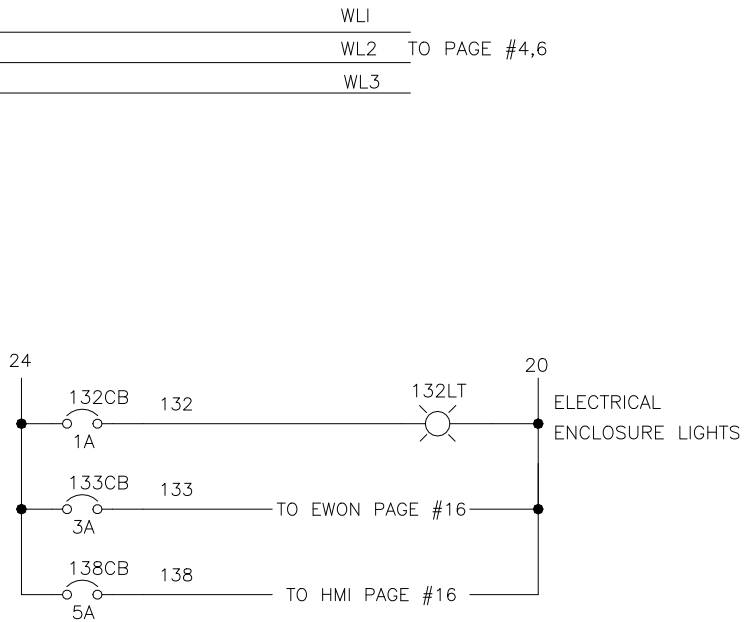
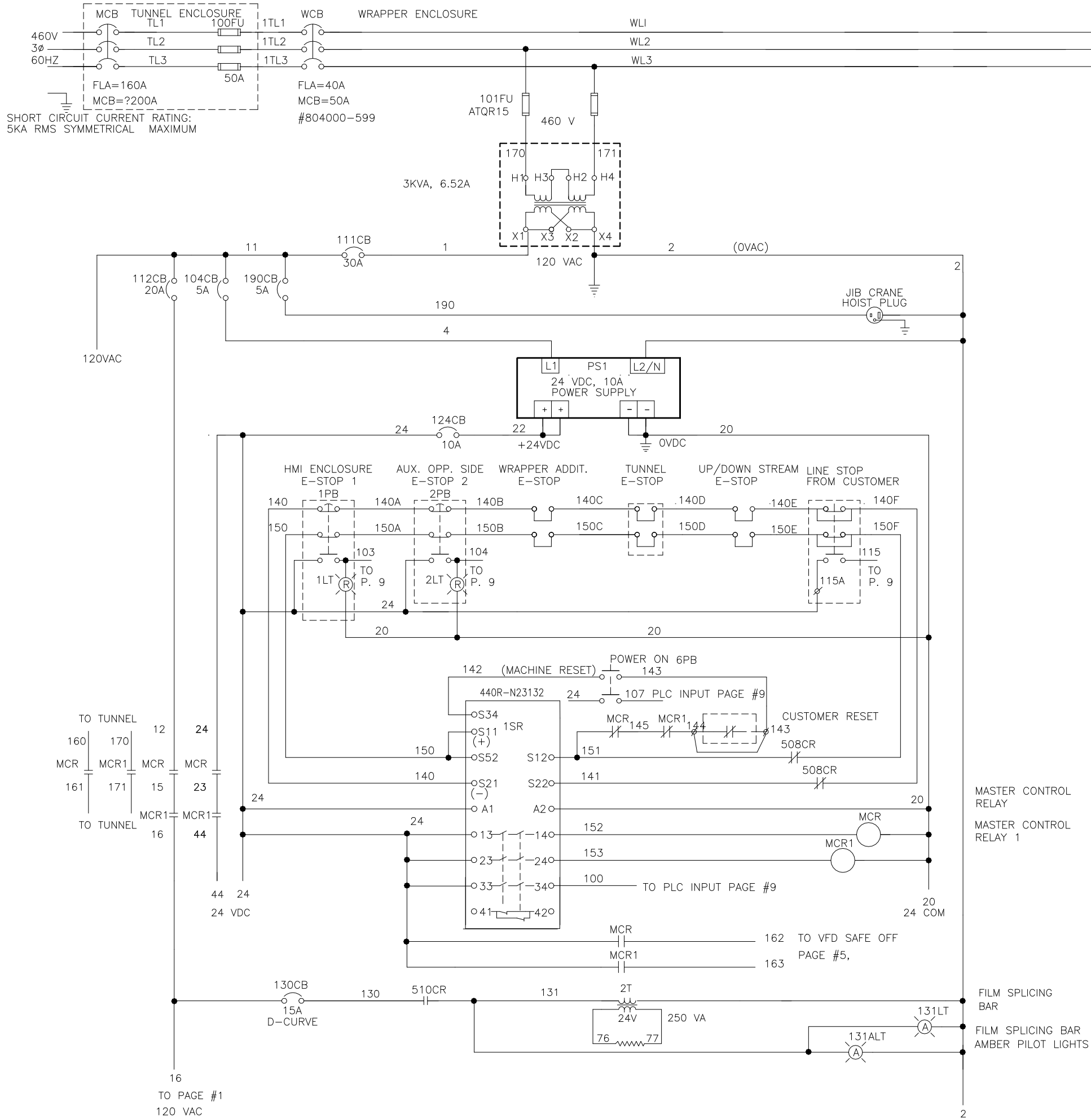


7

Electrical Schematics

7.1. Electrical Schematics

This chapter contains the electrical schematics for the BPTW tray wrapper.



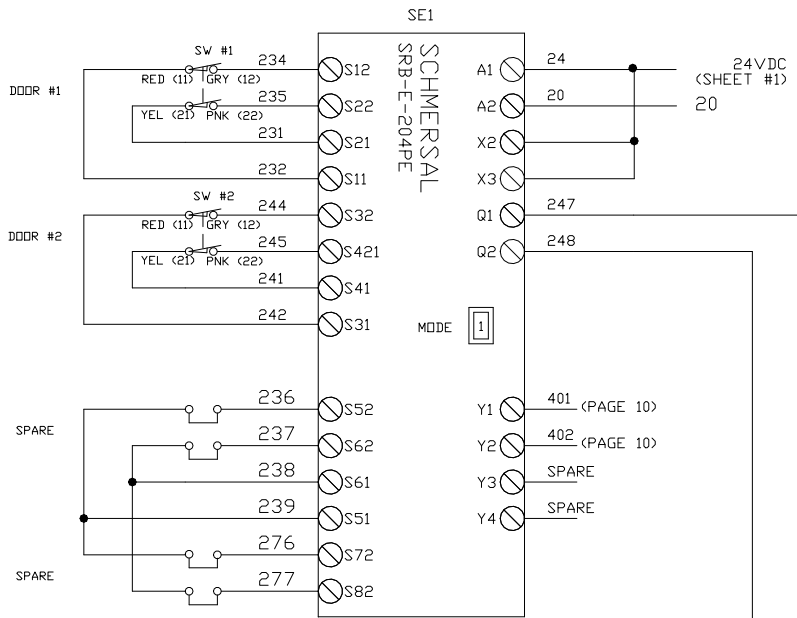
DESCRIPTION	WIRE COLOR
460 V POWER (L1, L2,L3)	BLACK
GROUND	GREEN
120 VAC	RED
120 VAC (COM)	WHITE
24 VDC	BLUE
24 VDC (COM)	WHITE WITH BLUE STRIPE

NVENIA

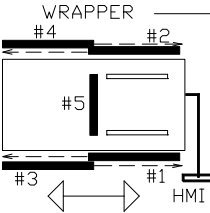
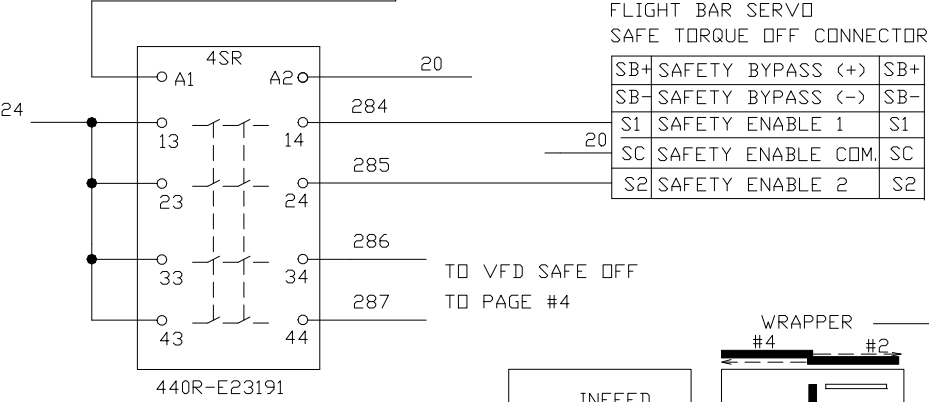
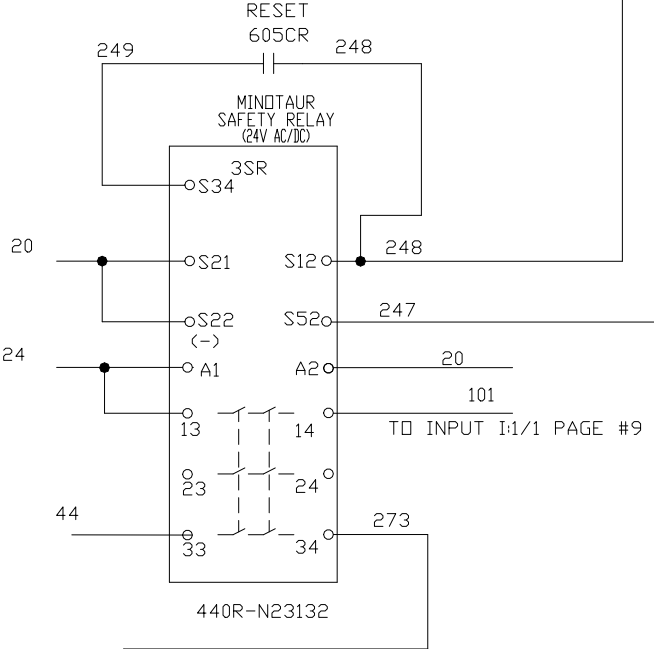
A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 1 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-01

SAFETY ZONE #2 FLIGHT BAR DOORS

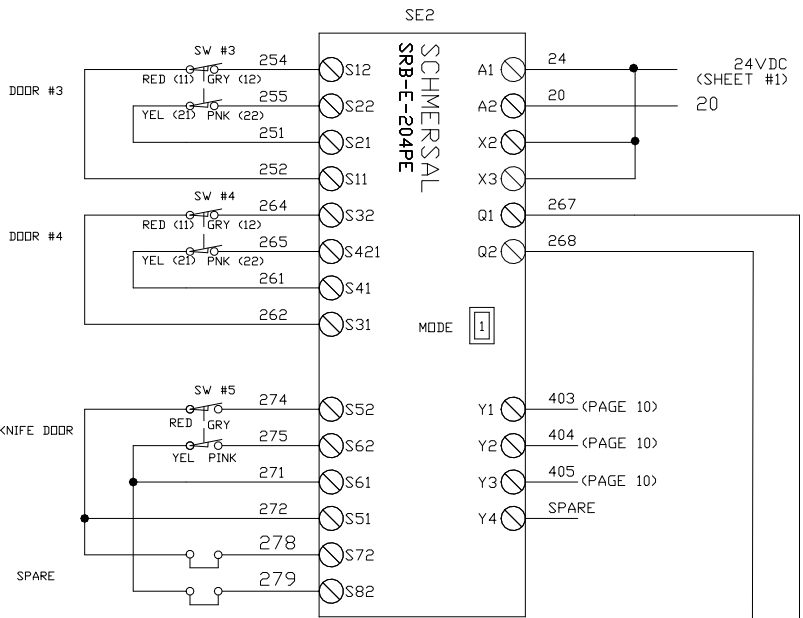


DOOR SWITCH CORDSETS
A-B 889D-F8AB

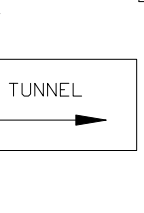
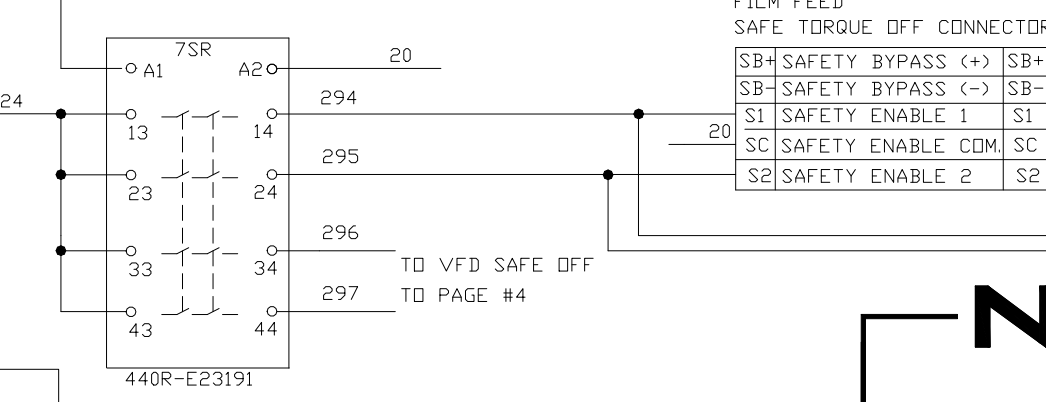
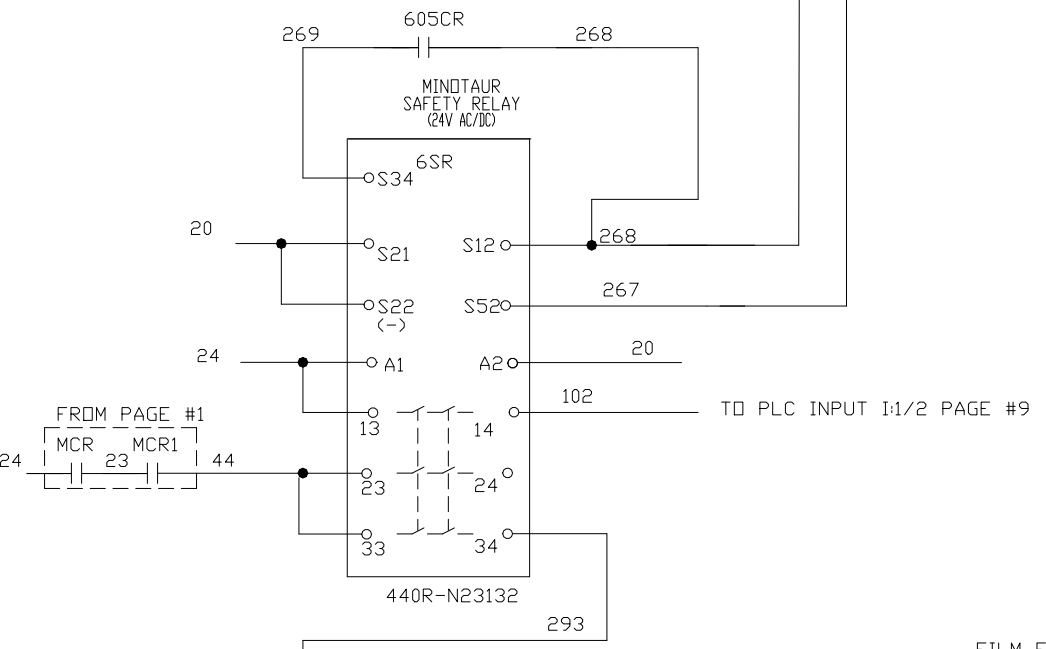


SLIDING DOORS
#1, #2 FLIGHT BAR
#3, #4 FILM FEED #5 KNIFE LIFT DOOR

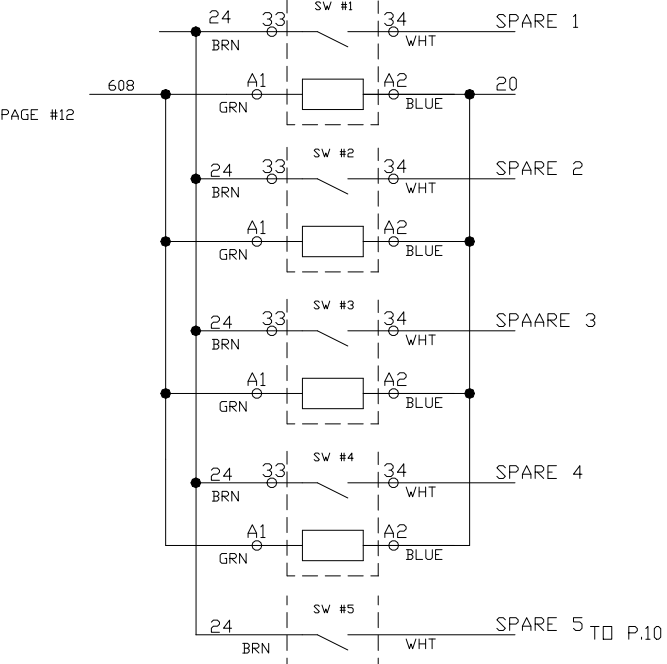
SAFETY ZONE #3 FILM FEED DOORS



DOOR SWITCH CORDSETS
A-B 889D-F8AB



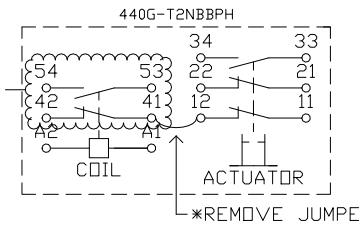
REVISION 03-30-2020
SAFETY-MONITORING 4 INPUT EXPANDER MODULE
SRB-E-204PE



440G-T2NBBPH
LOCKABLE DOOR SWITCH
TERMINAL WIRING

SWITCH CORDSET TERMINAL	COLOR	DESCRIPTION
A1	BRN	SOLENOID POWER
A2	BLUE	0VDC
11	RED	SAFETY A
12	GRAY	SAFETY A
21	YELLOW	SAFETY B
22	PINK	SAFETY B
33	BRN	+24 VDC
34	WHT	AUX. CONTACT (TO PLC)
41	N/A	*NOT CONNECTED
42	N/A	*NOT CONNECTED
53	N/A	*NOT CONNECTED
54	N/A	*NOT CONNECTED

**REMOVE JUMPER BETWEEN 12 AND 41



SWITCH CORDSET TERMINAL	COLOR	DESCRIPTION
A1	BRN	SOLENOID POWER
A2	BLUE	0VDC
11	RED	SAFETY A
12	GRAY	SAFETY A
21	YELLOW	SAFETY B
22	PINK	SAFETY B
33	BRN	+24 VDC
34	WHT	AUX. CONTACT (TO PLC)
41	N/A	*NOT CONNECTED
42	N/A	*NOT CONNECTED
53	N/A	*NOT CONNECTED
54	N/A	*NOT CONNECTED

REV. A

DESIGNER: JR/PT

MODEL: BPTW-6000

ELECTRICAL SCHEMATIC

SIZE: B

DATE: 12/02/2021

SHEET: 2 OF 16

DRAWING NUMBER: 210012-02

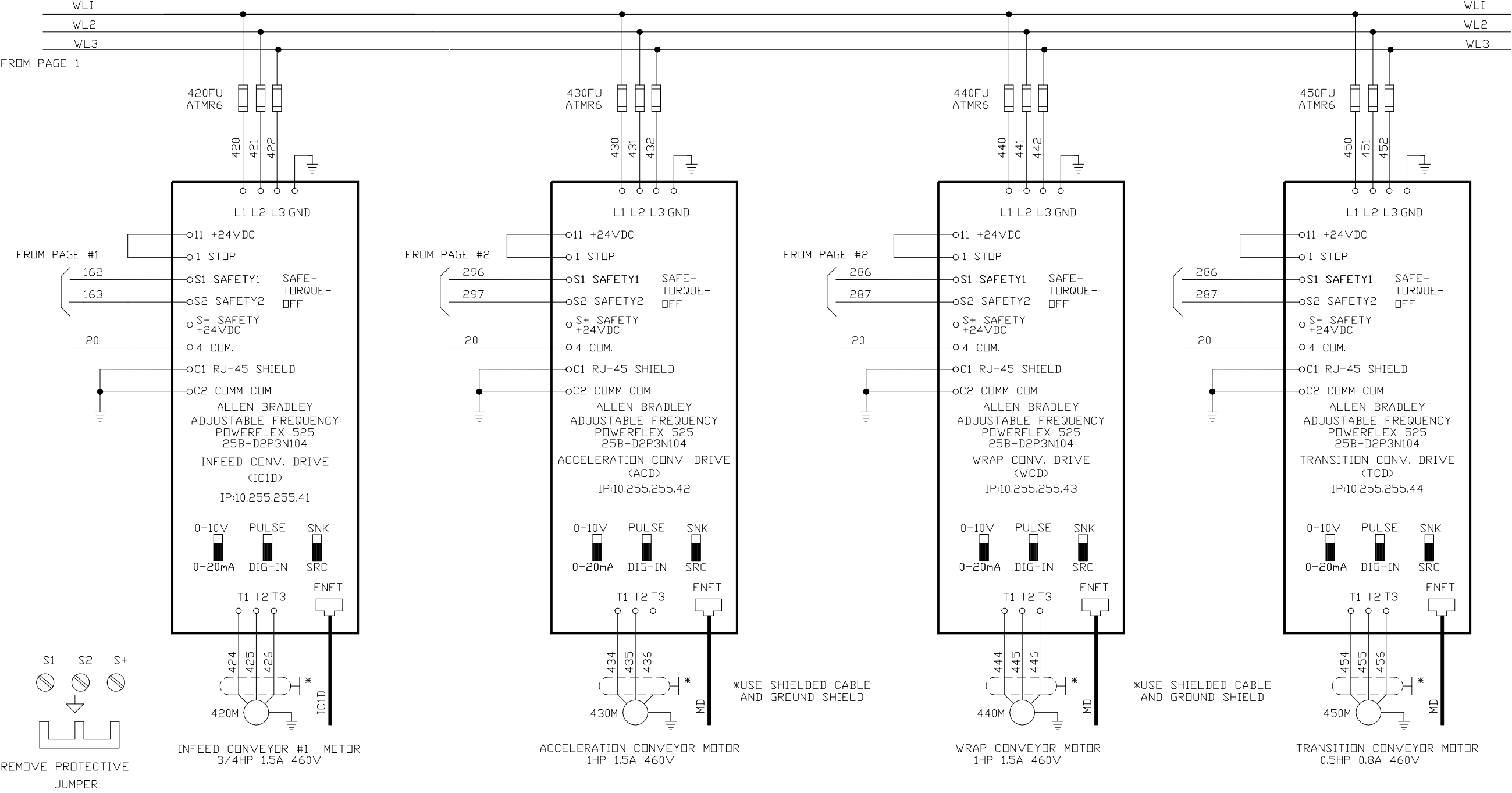
BLUE MARBLE

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NVENIA

A DURAVANT COMPANY

REV.	A	ELECTRICAL SCHEMATIC	SIZE:	B
DESIGNER:	JR/PT		DATE:	12/02/2021
MODEL:	BPTW-6000		SHEET:	3 OF 16
BLUE MARBLE			DRAWING NUMBER: 210012-03	

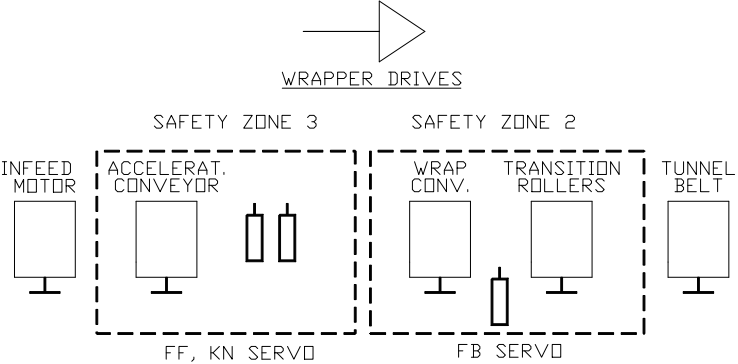


TO PAGE #6

POWER FLEX 525 DRIVE SET UP
(DIFFERENT THAN DEFAULT)

DISPLAY	PARAMETER DESCRIPTIONS	SETTING
P031	RATED VOLTAGE	460
P033	MOTOR OL CURRENT	1.2 *
P046	START SOURCE 1	5 (ETH)
P047	SPEED REFERENCE 1	15 (ETH)
P041	ACCELERATION TIME	1 SEC
P042	DECELERATION TIME	1 SEC
P044	MAX FREQUENCY	60 HZ
A541	AUTO RESTART TRIES	0.0
A543	START AT POWER UP	1.0

* SET TO THE MAXIMUM ALLOWABLE MOTOR CURRENT
AUTO RESTART TRIES SET TO DEFAULT 0



*INSTALL DRIVES WITH 2" CLEARANCE
TOP AND BOTTOM AND WITH 1" CLEARANCE
LEFT TO RIGHT

NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 4 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-04

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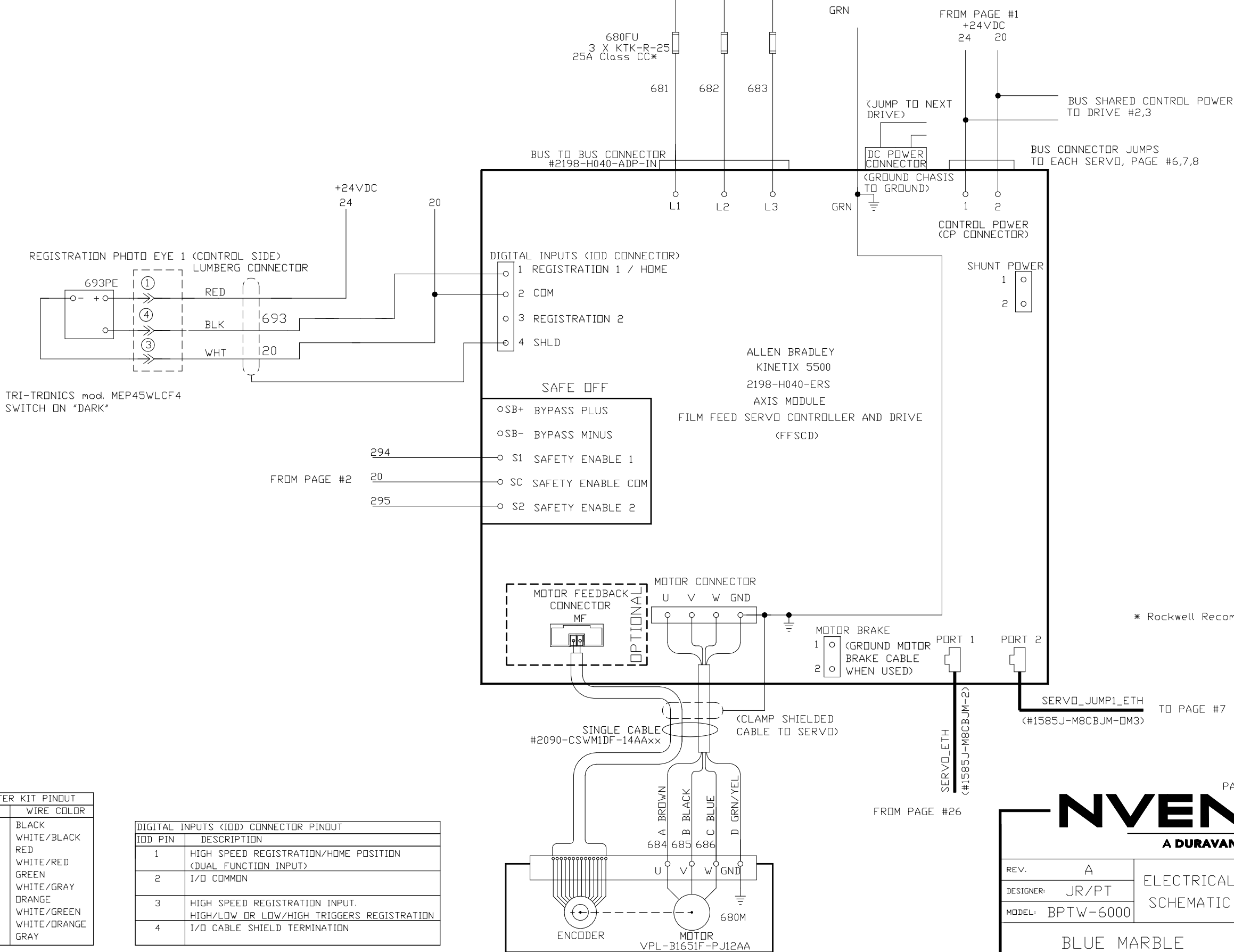
- NVENIA -

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 5 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-05

FROM PAGE #1
460 VAC

WLI
WL2
WL3



2198-H2DCK CONVERTER KIT PINOUT		
TERMINAL	SIGNAL	WIRE COLOR
1	SIN+	BLACK
2	SIN-	WHITE/BLACK
3	CDS+	RED
4	CDS-	WHITE/RED
5	DATA+	GREEN
6	ECOM	WHITE/GRAY
7	EPWR_9V	ORANGE
10	DATA-	WHITE/GREEN
11	TS+	WHITE/ORANGE
14	EPWR_5V	GRAY

DIGITAL INPUTS (IOD) CONNECTOR PINOUT	
IOD PIN	DESCRIPTION
1	HIGH SPEED REGISTRATION/HOME POSITION (DUAL FUNCTION INPUT)
2	I/O COMMON
3	HIGH SPEED REGISTRATION INPUT. HIGH/LOW OR LOW/HIGH TRIGGERS REGISTRATION
4	I/O CABLE SHIELD TERMINATION

103XX

DEVICE NAME

103XX

DEVICE NUMBER

PAGE NUMBER

NVENIA

A DURAVANT COMPANY

REV. A

DESIGNER: JR/PT

MODEL: BPTW-6000

SIZE: B

DATE: 12/02/2021

SHEET: 6 OF 16

BLUE MARBLE

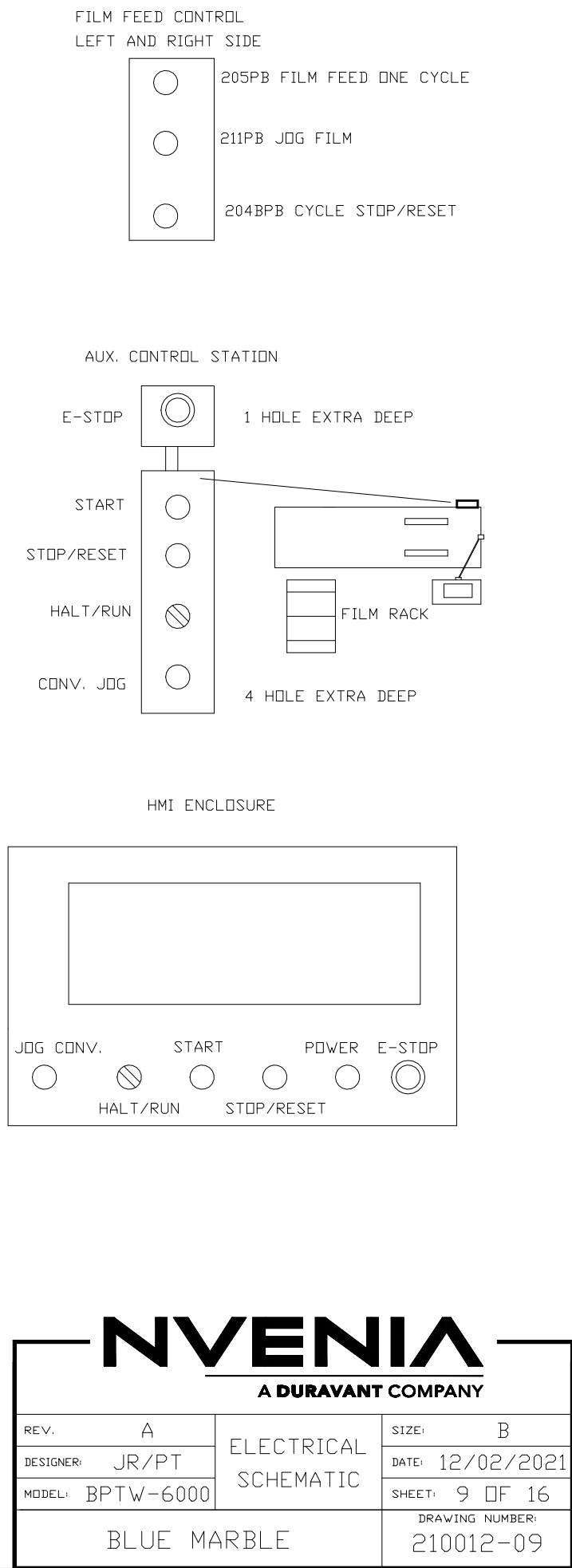
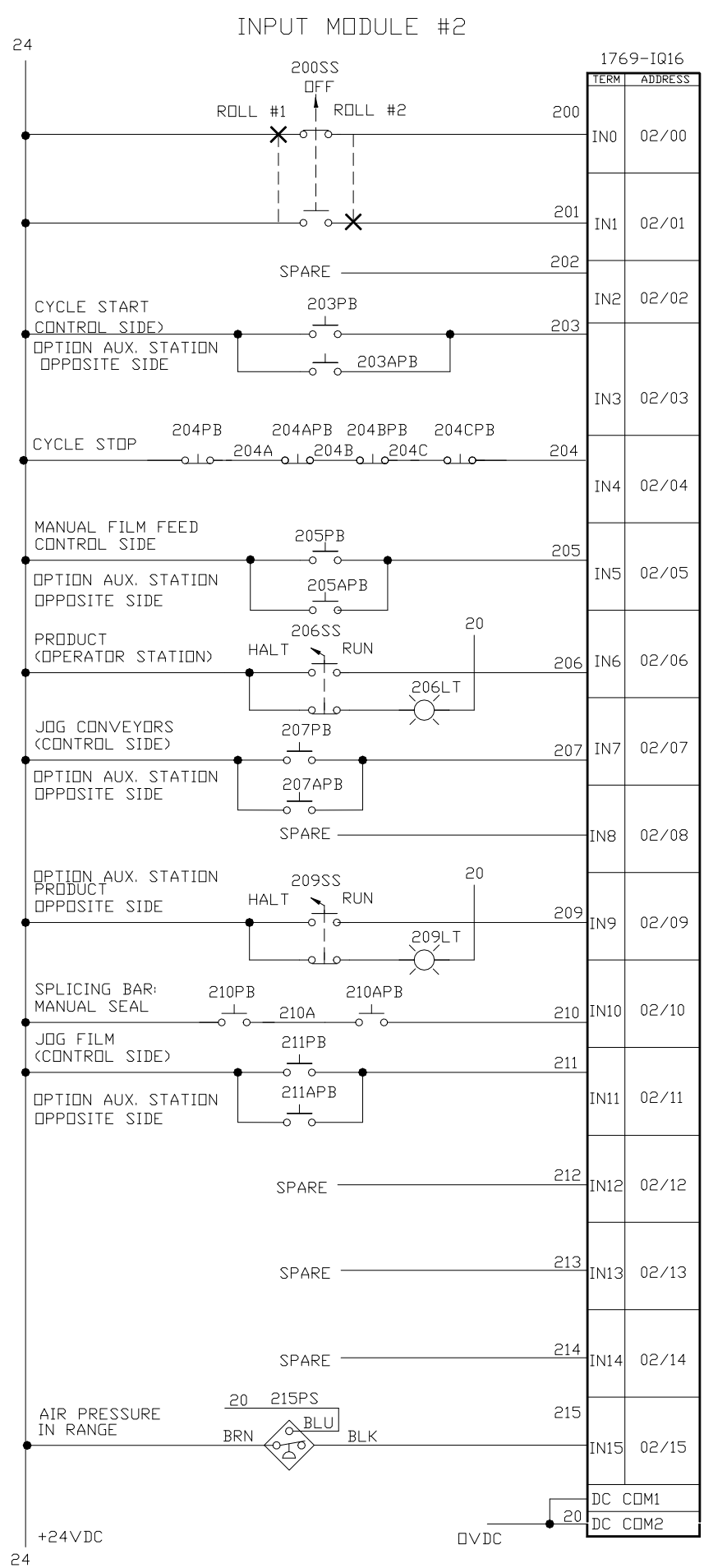
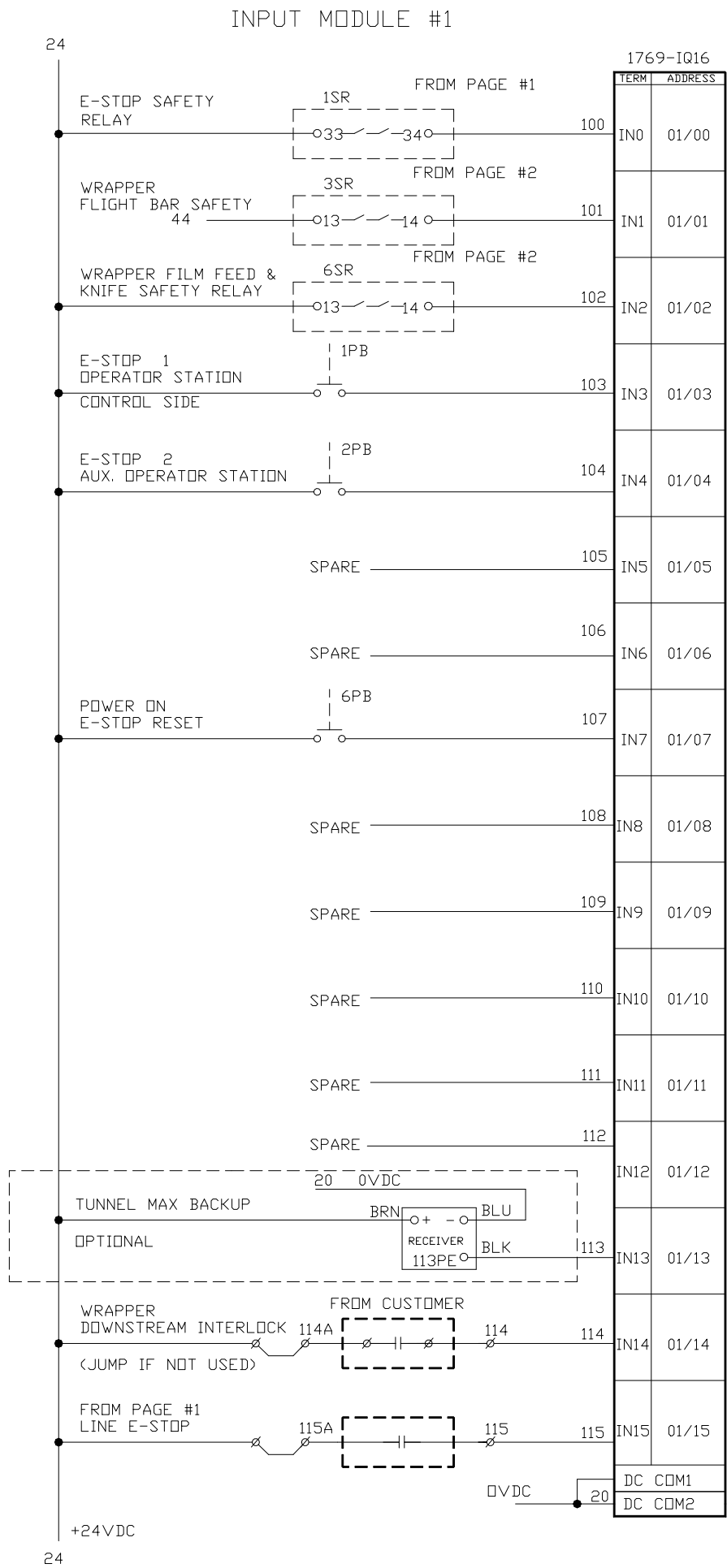
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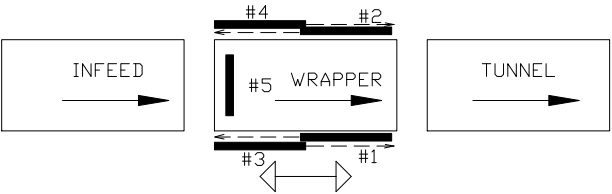
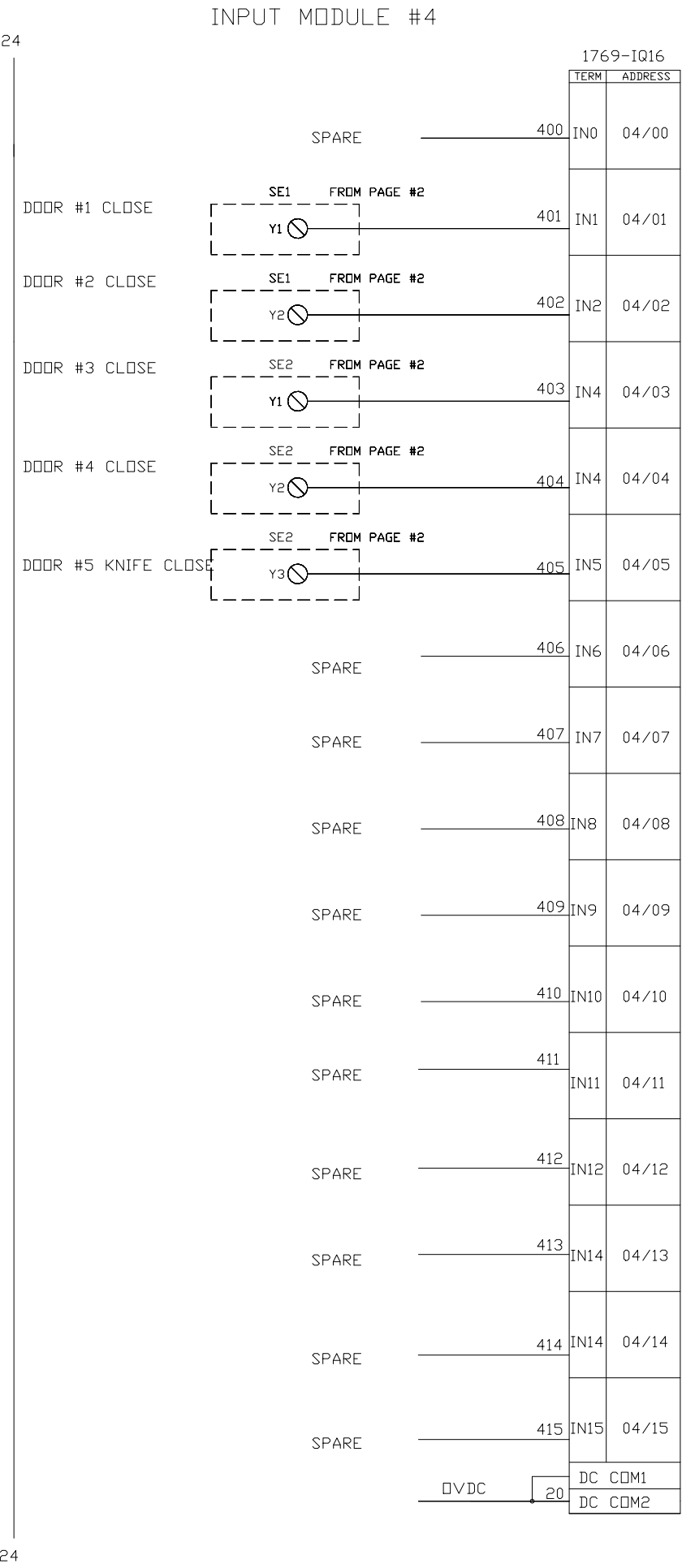
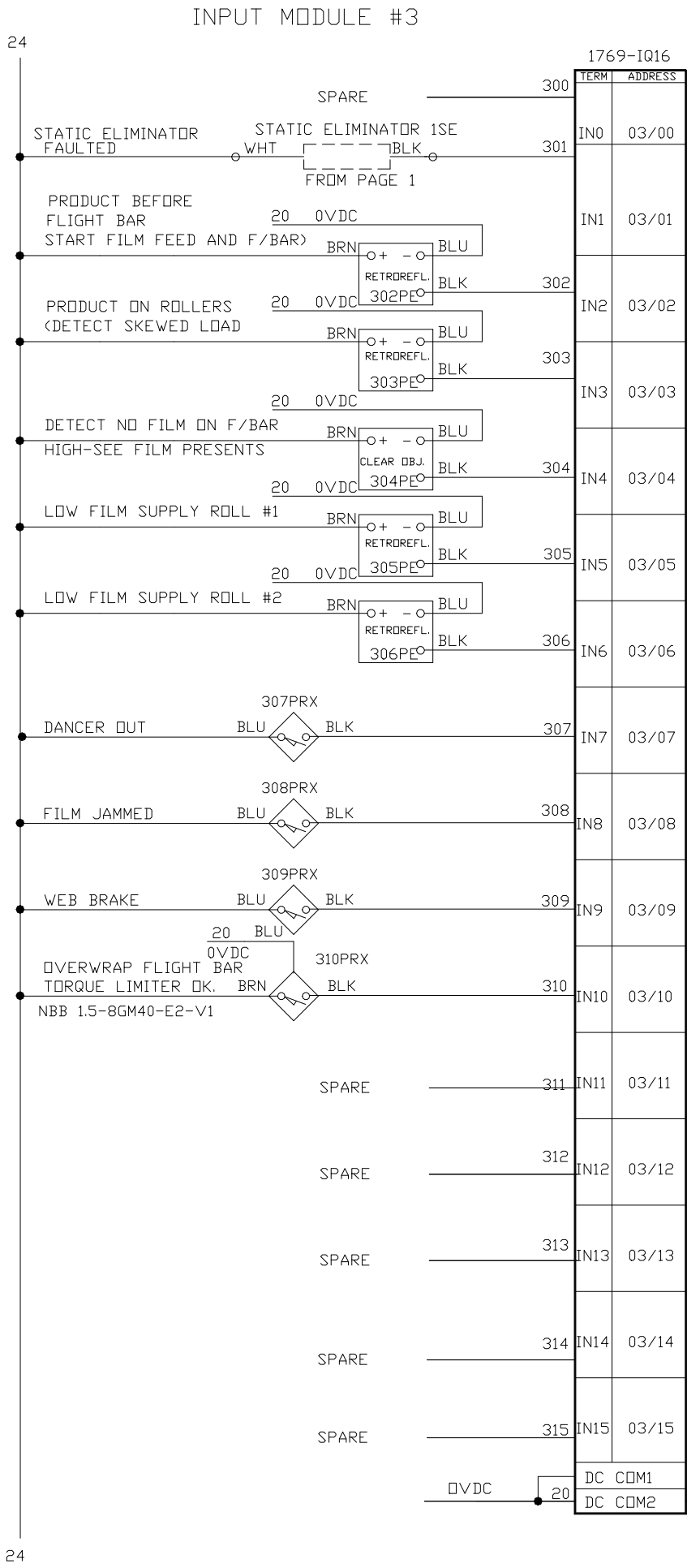
ELECTRICAL SCHEMATIC

FROM PAGE #26

TO PAGE #7

* Rockwell Recommendation





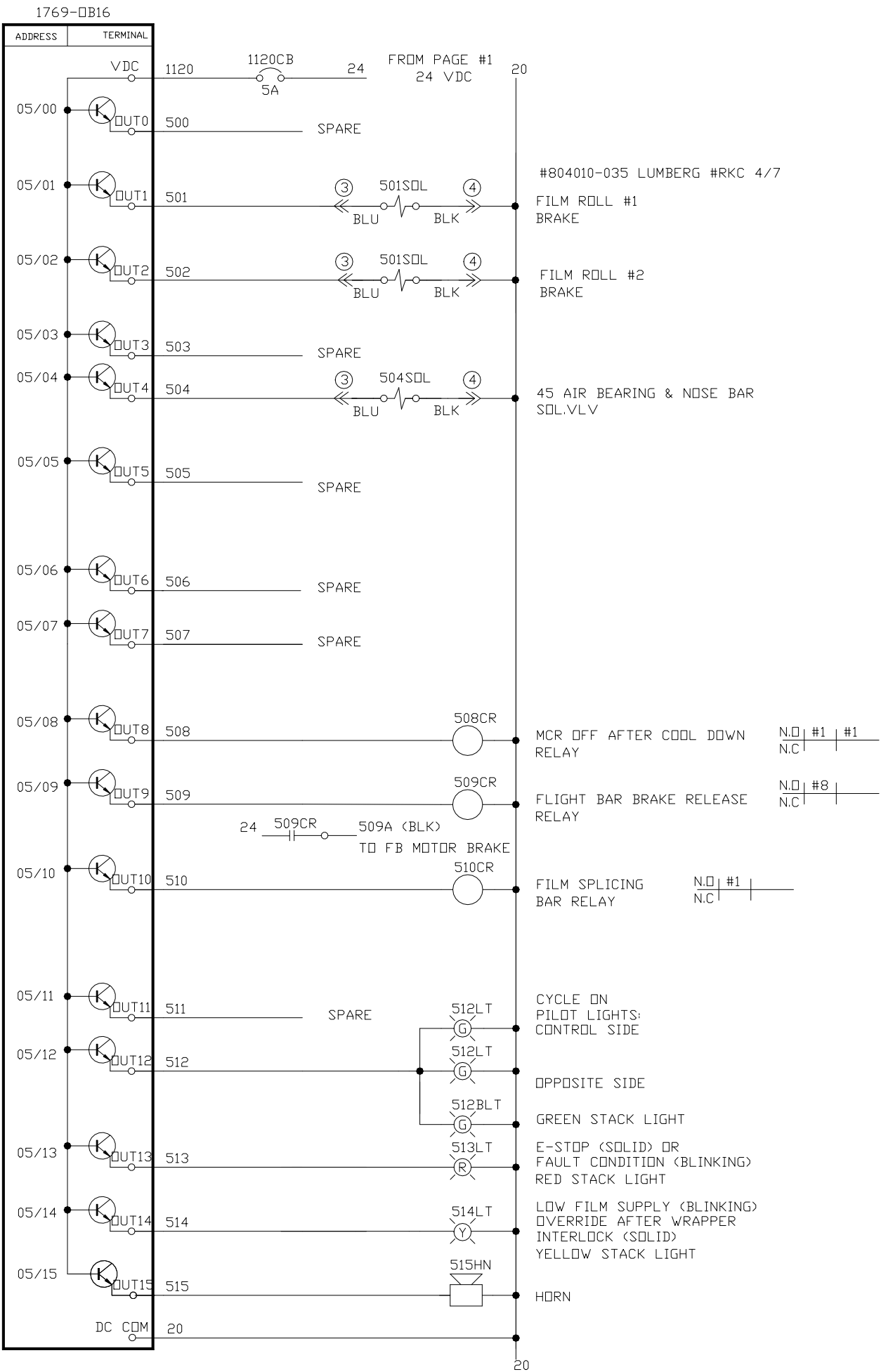
0103CB
CIRCUIT BREAKER NUMBER
PAGE NUMBER

NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 10 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-10

OUTPUT MODULE #5

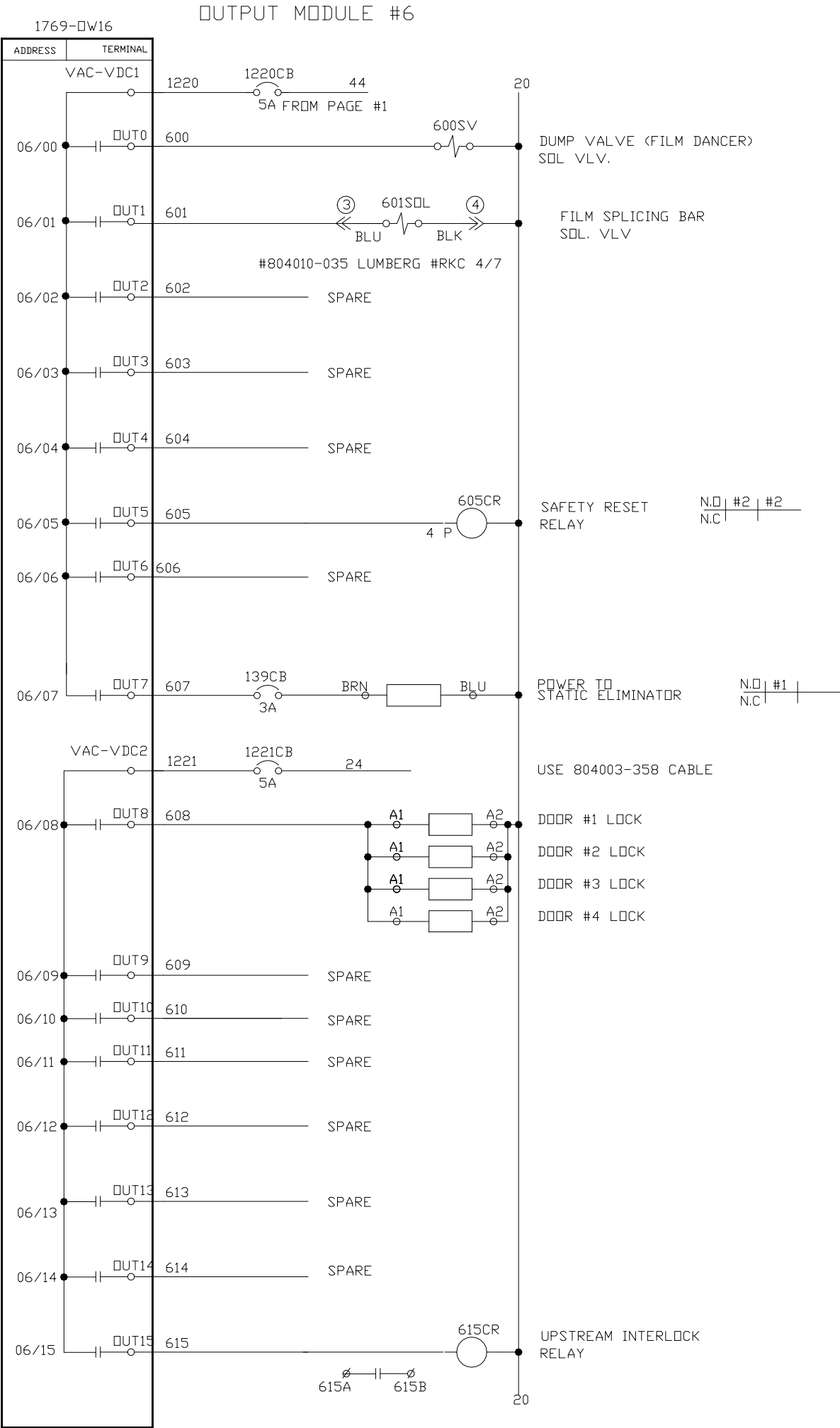


0103CB
CIRCUIT BREAKER NUMBER
PAGE NUMBER

NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 11 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-11



NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 12 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-12

PAGES 13-15 LEFT INTENTIONALLY BLANK

REV.

A

DESIGNER:

JR/PT

MODEL:

BPTW-6000

ELECTRICAL
SCHEMATIC

SIZE:

B

DATE:

12/02/2021

SHEET:

13-15 OF 16

DRAWING NUMBER:

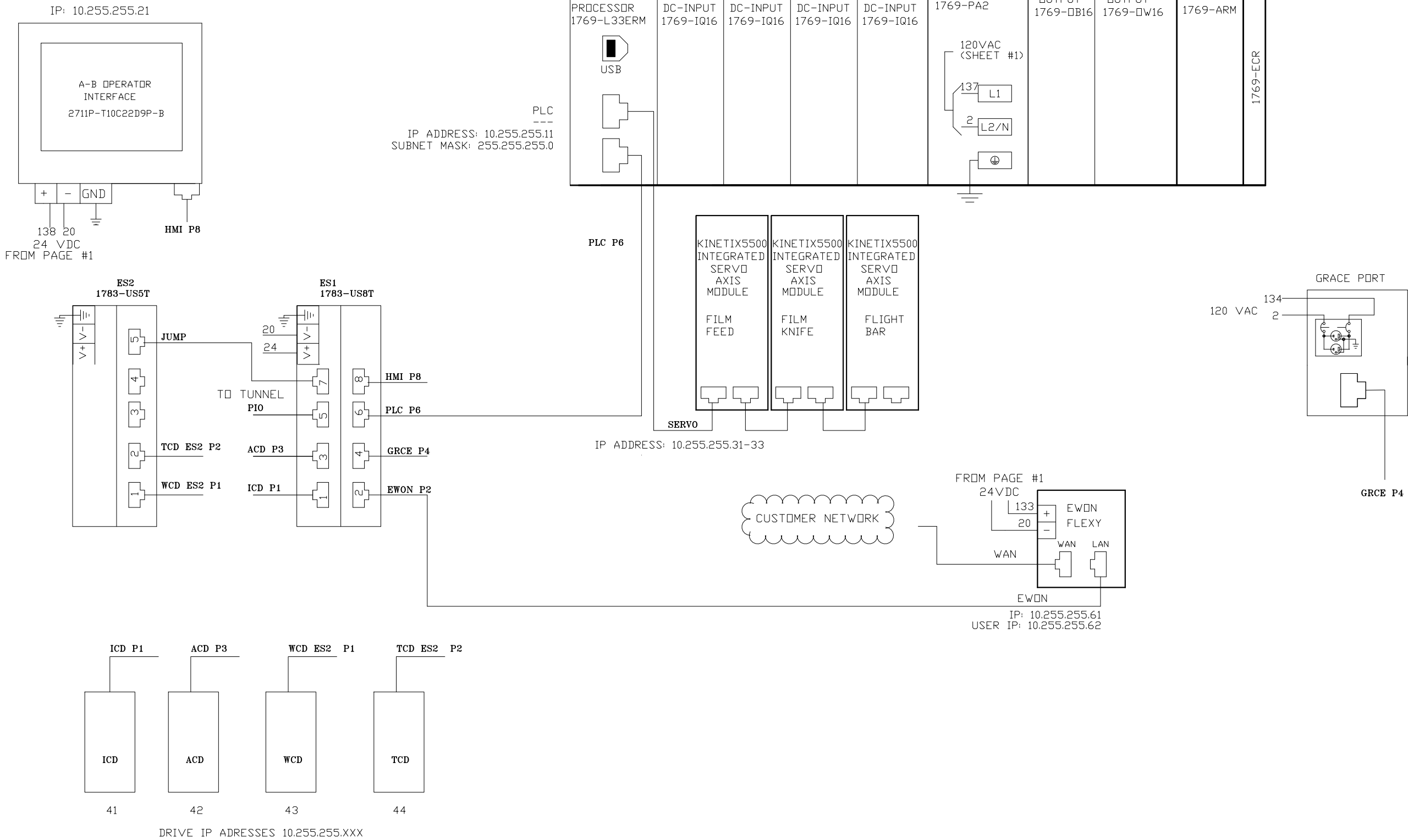
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BLUE MARBLE

NVENIA

A DURAVANT COMPANY

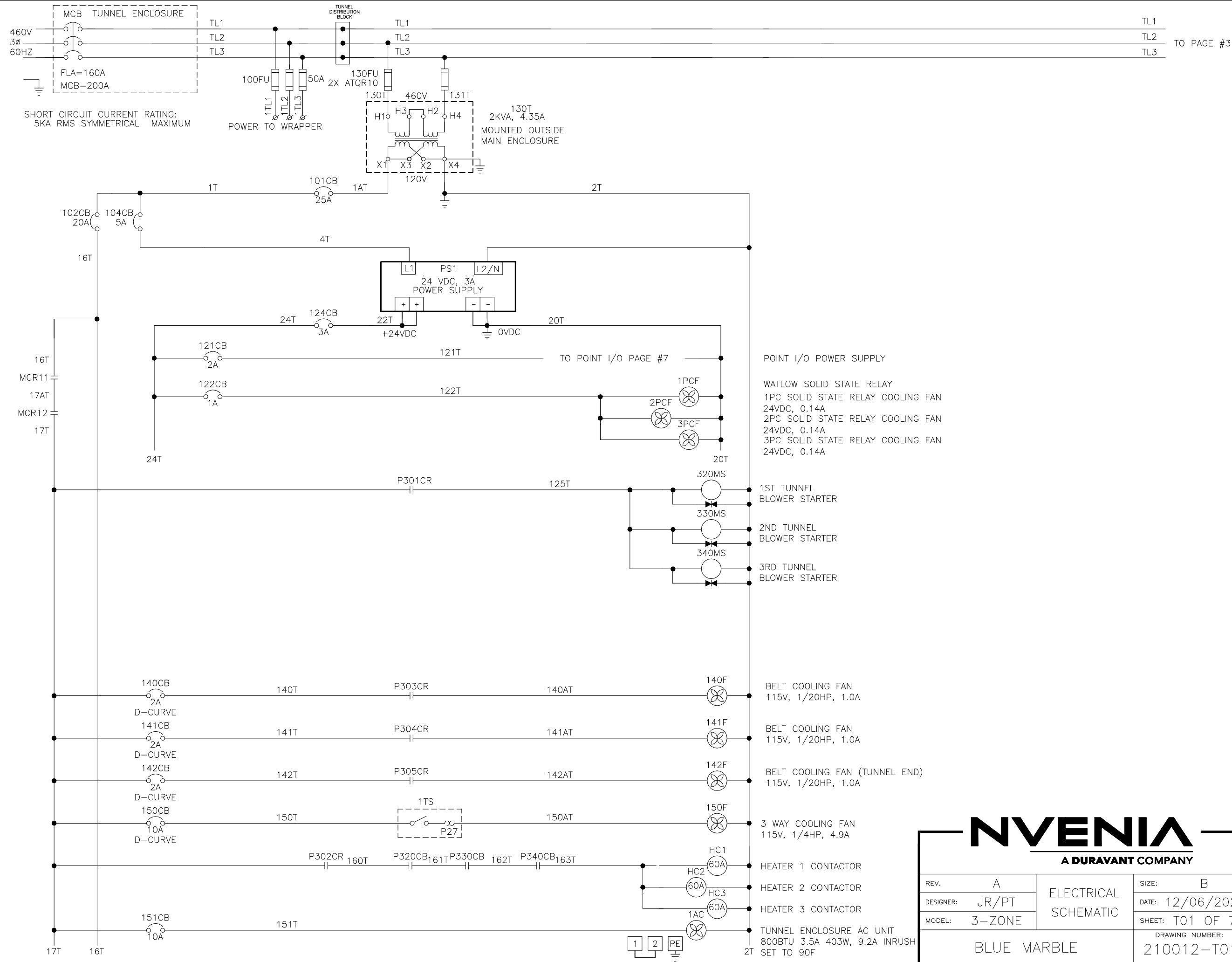
ALLEN BRADLEY COMPACTLOGIX



NVENIA

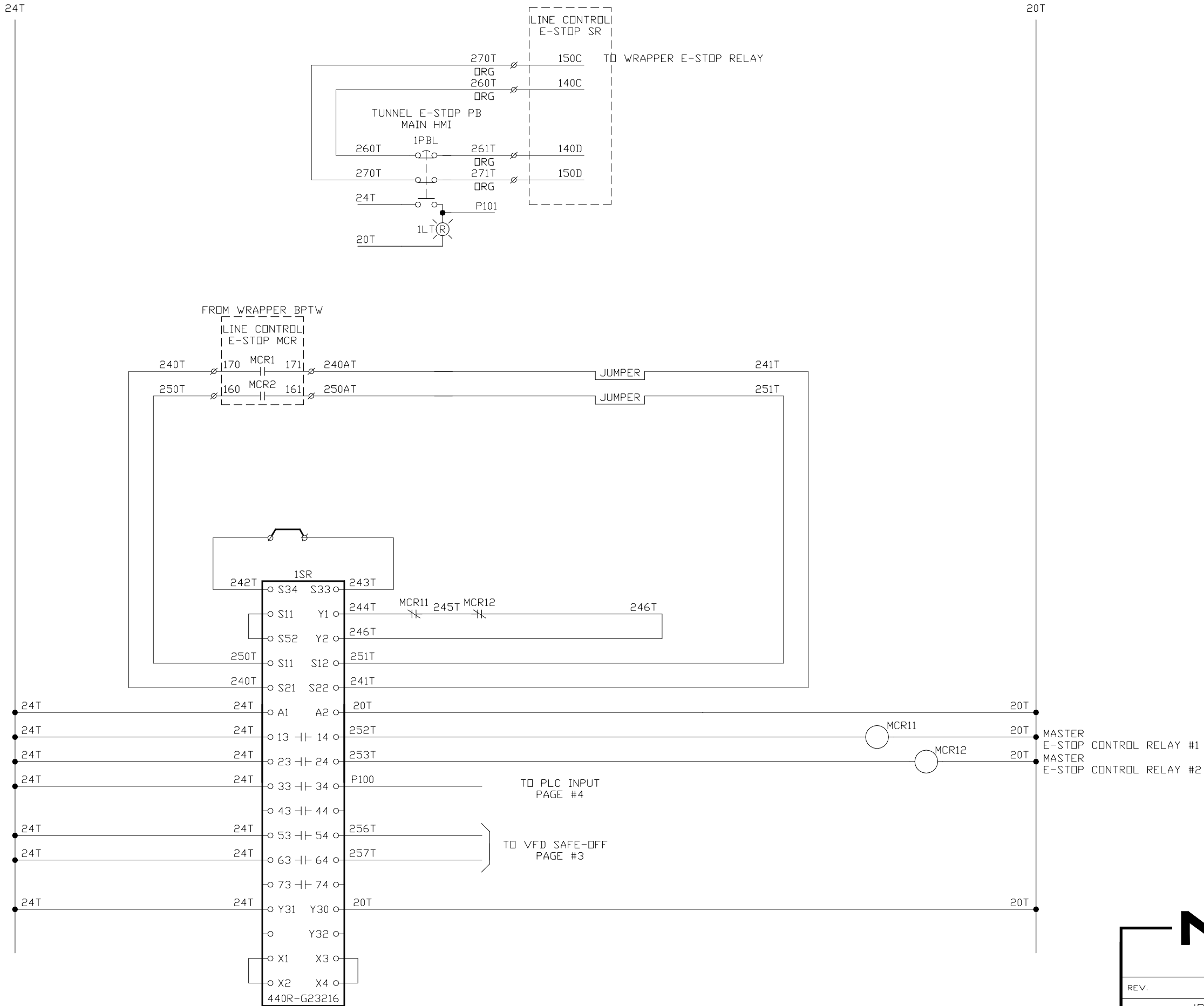
A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/02/2021
MODEL: BPTW-6000		SHEET: 16 OF 16
BLUE MARBLE		DRAWING NUMBER: 210012-16



24T

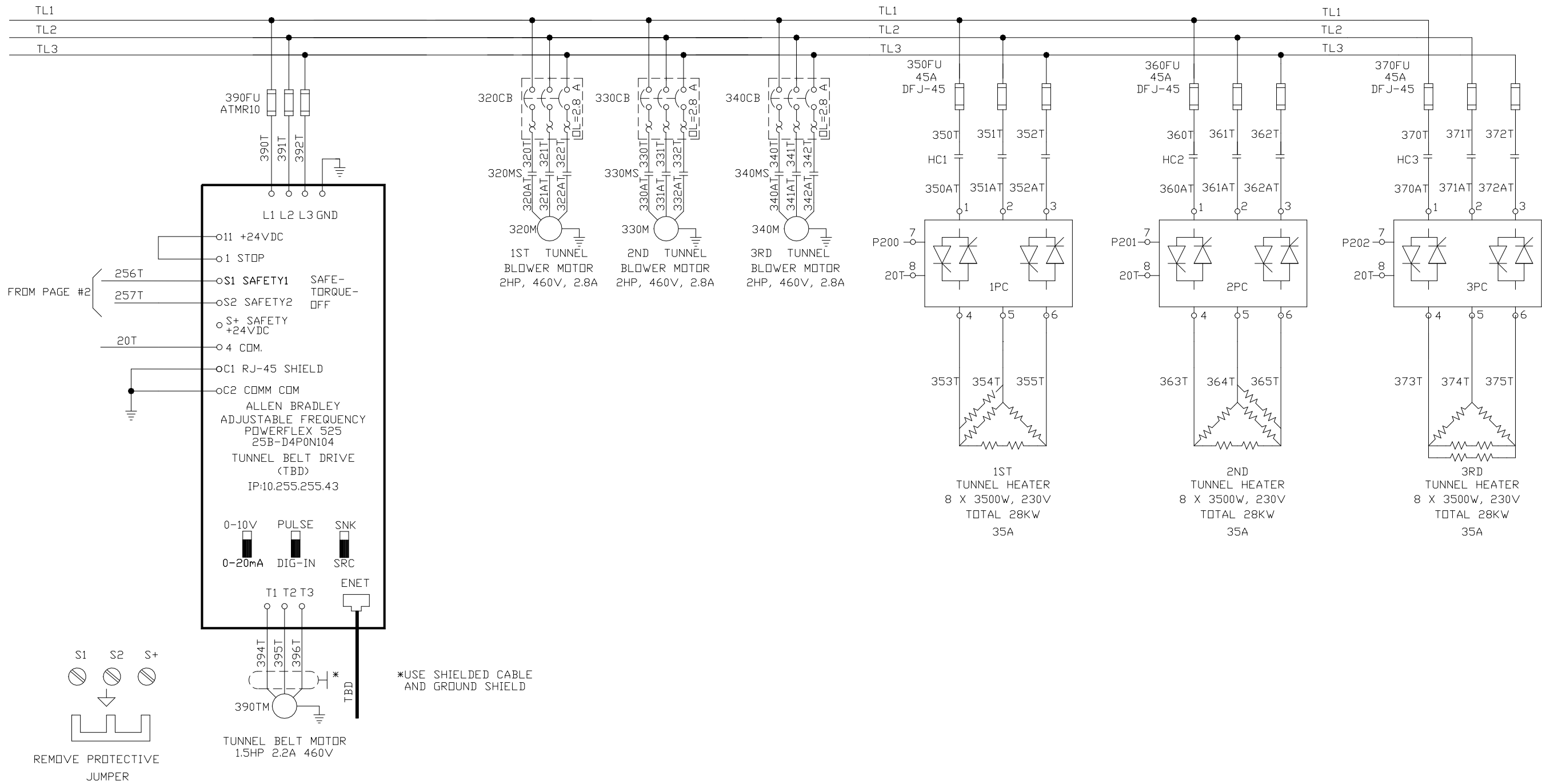
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NVENIA

A DURAVANT COMPANY

REV.	A	ELECTRICAL SCHEMATIC	SIZE	B
DESIGNER	JR/PT		DATE	12/06/2021
MODEL	3-ZONE		SHEET	T02 OF 7
BLUE MARBLE			DRAWING NUMBER: 210012-T02	



*INSTALL DRIVES WITH 2" CLEARANCE
TOP AND BOTTOM AND WITH 1" CLEARANCE
LEFT TO RIGHT

0103CB
PAGE NUMBER

POWER FLEX 525 DRIVE SET UP
(DIFFERENT THAN DEFAULT)

DISPLAY	PARAMETER DESCRIPTIONS	SETTING
P031	RATED VOLTAGE	460
P033	MOTOR OL CURRENT	1.2 *
P046	START SOURCE 1	5 (ETH)
P047	SPEED REFERENCE 1	15 (ETH)
P041	ACCELERATION TIME	1 SEC
P042	DECELERATION TIME	1 SEC
P044	MAX FREQUENCY	60 HZ
A541	AUTO RESTART TRIES	0.0
A543	START AT POWER UP	1.0

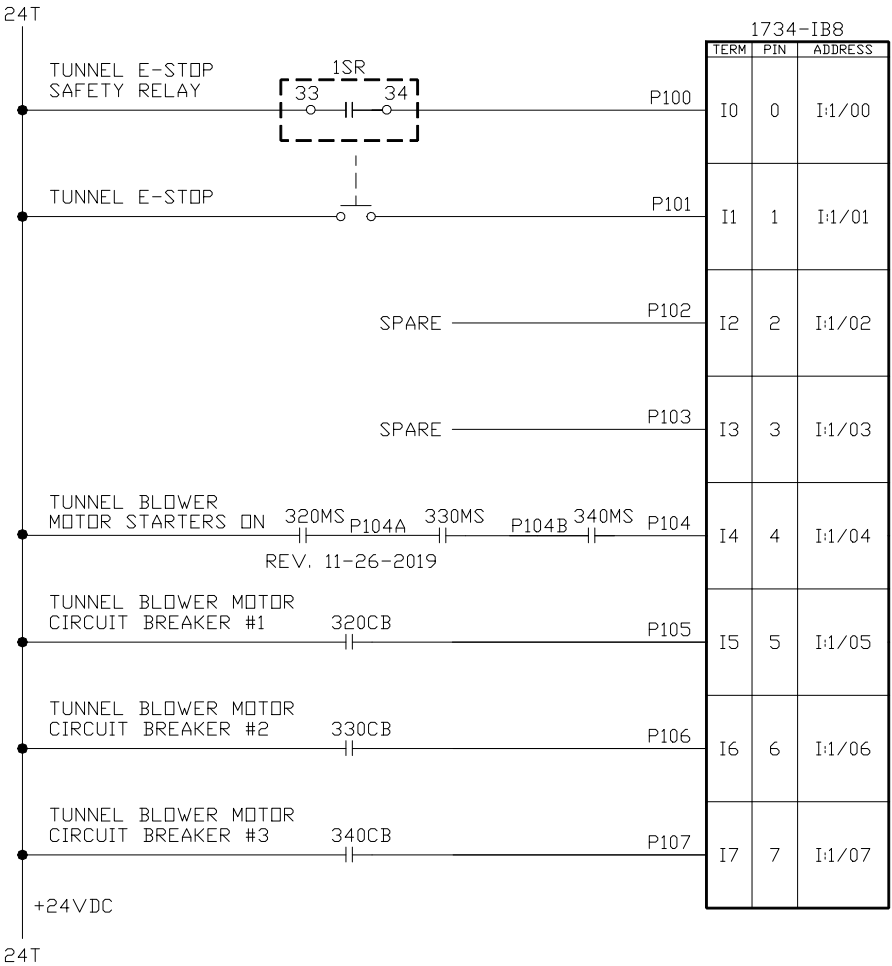
* SET TO THE MAXIMUM ALLOWABLE MOTOR CURRENT
AUTO RESTART TRIES SET TO DEFAULT 0

NVENIA

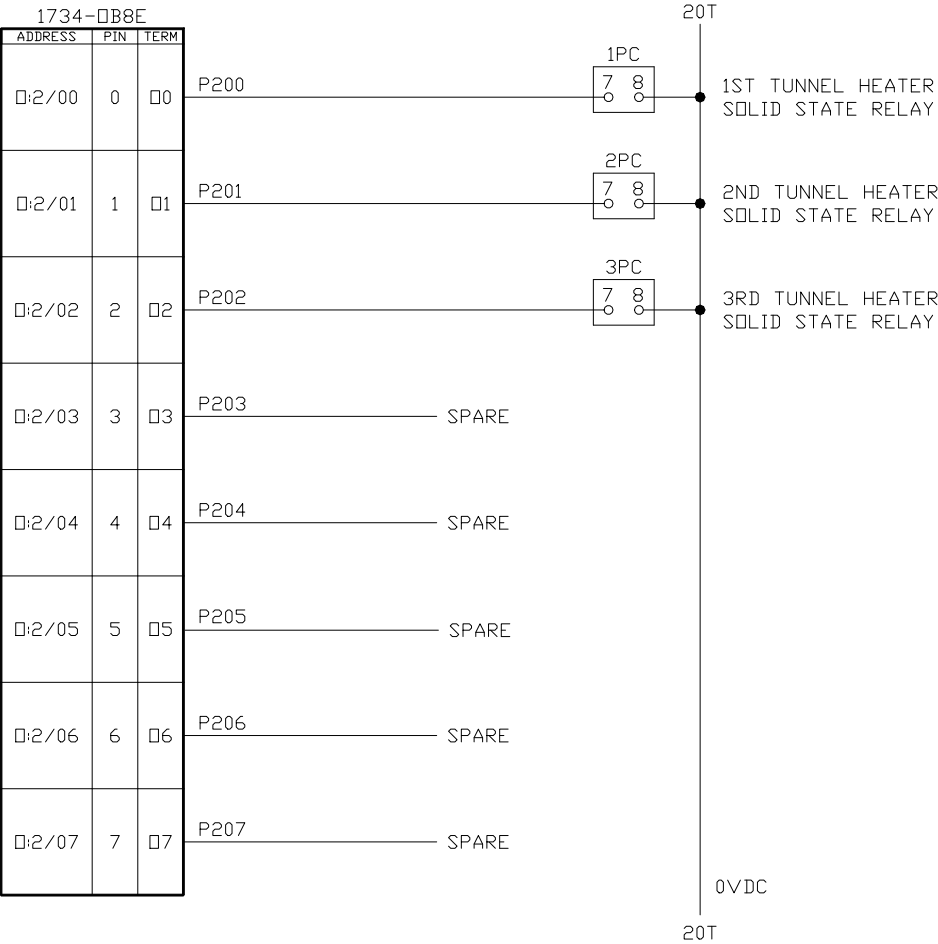
A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/06/2021
MODEL: 3-ZONE		SHEET: T03 OF 7
BLUE MARBLE		DRAWING NUMBER: 210012-T03

POINT I/O RACK #1 - INPUT MODULE #1



POINT I/O DC OUTPUT MODULE #2



TERMINAL LAYOUT FOR 1734-IB8

I0	I1
0	1
I2	I3
2	3
I4	I5
4	5
I6	I7
6	7

1734-TB

TERMINAL LAYOUT FOR 1734-OB8E

00	01
0	1
02	03
2	3
04	05
4	5
06	07
6	7

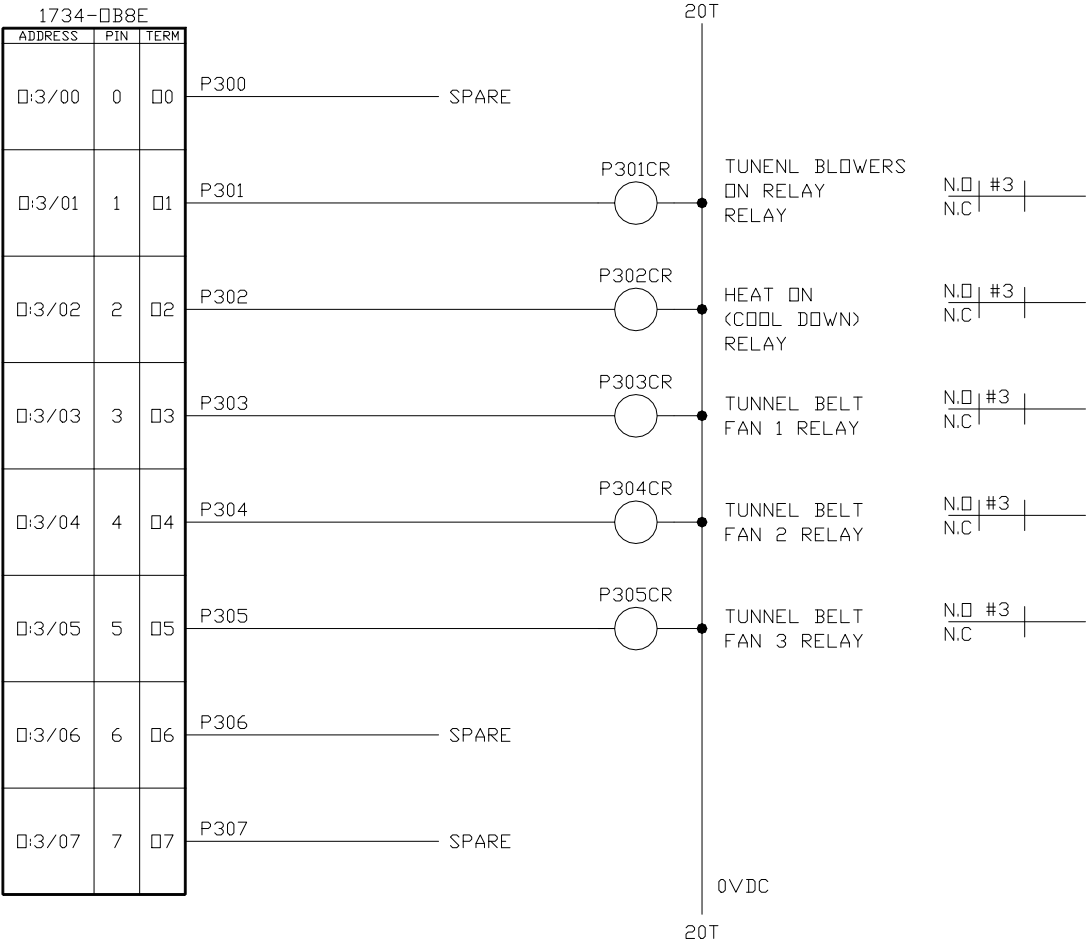
1734-TB

NVENIA

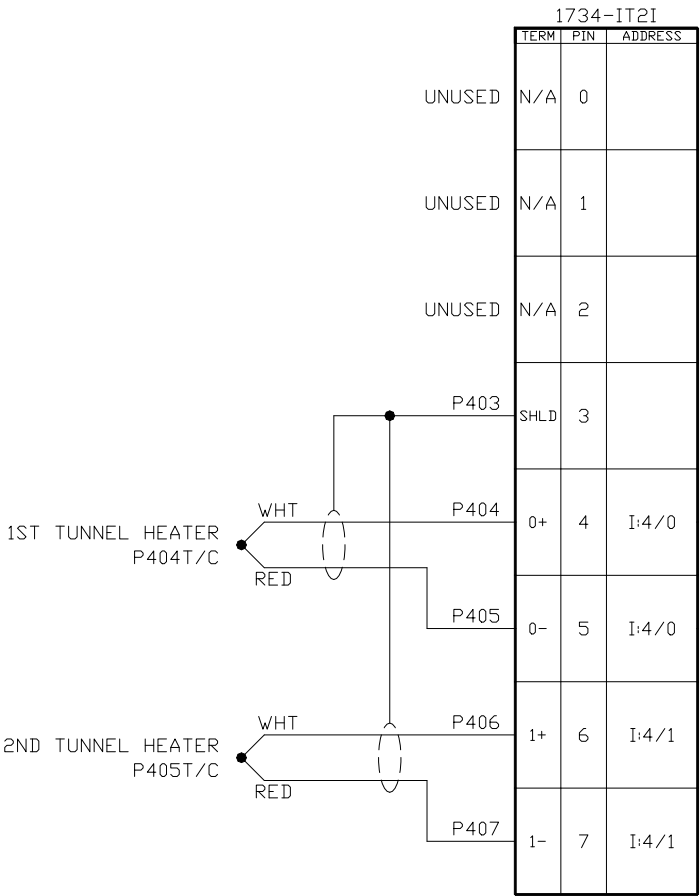
A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/06/2021
MODEL: 3-ZONE		SHEET: T04 OF 7
BLUE MARBLE		DRAWING NUMBER: 210012-T04

POINT I/O DC OUTPUT MODULE #3



POINT I/O J-TYPE THERMOCOUPLE INPUT MODULE #4



TERMINAL LAYOUT FOR 1734-IT2I

N/A	N/A
0	1
N/A	SHLD
2	3
0+	0-
4	5
1+	1-
6	7

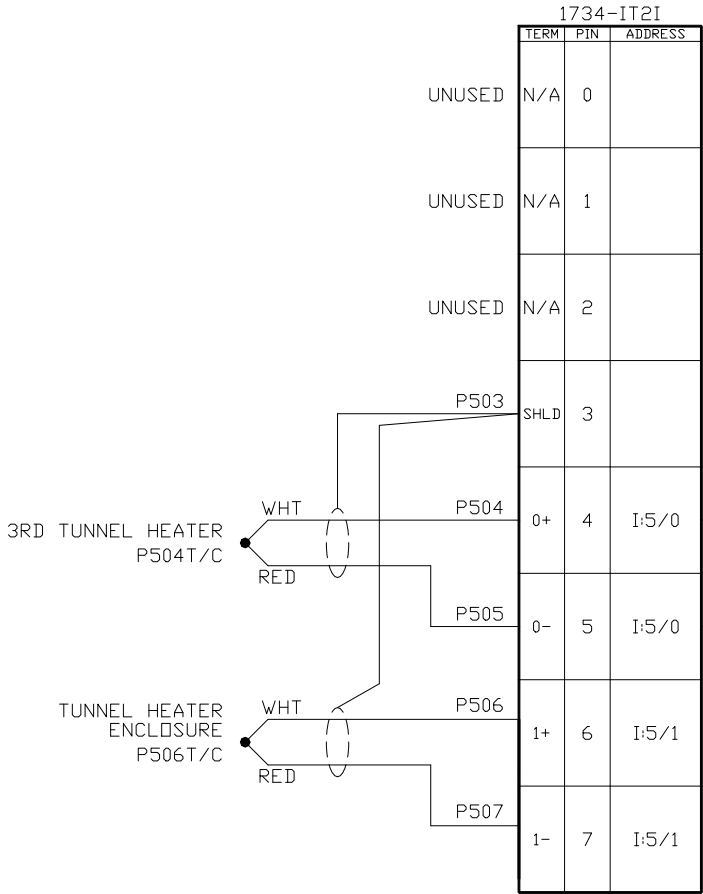
1734-TB

NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/06/2021
MODEL: 3-ZONE		SHEET: T05 OF 7
BLUE MARBLE		DRAWING NUMBER: 210012-T05

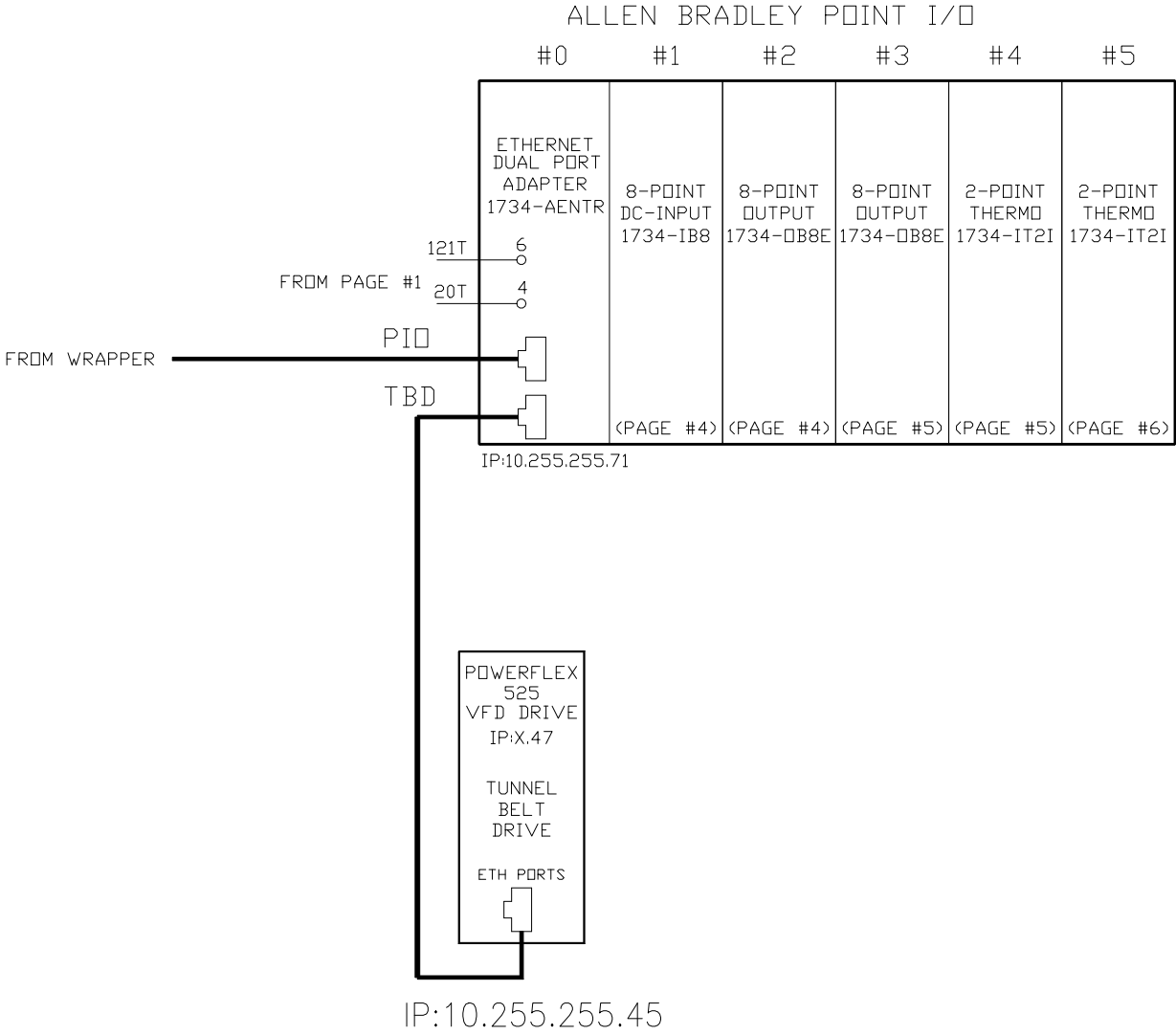
POINT I/O J-TYPE THERMOCOUPLE INPUT MODULE #5



NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/06/2021
MODEL: 3-ZONE		SHEET: T06 OF 7
BLUE MARBLE		DRAWING NUMBER: 210012-T06



NVENIA

A DURAVANT COMPANY

REV. A	ELECTRICAL SCHEMATIC	SIZE: B
DESIGNER: JR/PT		DATE: 12/06/2021
MODEL: 3-ZONE		SHEET: T07 OF 7
BLUE MARBLE		DRAWING NUMBER: 210012-T07

8.1. Service Information Introduction

This section contains an overview of nVenia's field service policies. nVenia aims to deliver the highest level of service with the assistance of the aftermarket department, SupportPro™.

8.2. Objective

To furnish our customer with prompt, competent, and complete service so they can operate at optimum efficiency.

SupportPro is a one-stop, national aftermarket solution, representing strategic secondary packaging equipment partners. Our facilities in Chicago and Syracuse, combined with a nationwide field service network, allow us to provide a complete range of aftermarket services. We offer these in a convenient, cost-effective, and value-added manner for our equipment partners and end-customers across the US.

8.3. Service Personnel

Our technical services work to optimize your equipment investment. With their experience in servicing APRPAC equipment, instructing customer's personnel in correct operation and maintenance is a simple task. All field service technicians receive support from the factory and engineering departments.

8.4. Training

An nVenia advantage is free lifetime training for customers purchasing packaging machines from nVenia or its distributors. Knowledge of machines leads to power, performance, and profitability. SupportPro teaches theory of operation, machine setup and operation, preventive maintenance and long-term care. For further information please contact SupportPro at 844.777.8776.

8.5. nVenia & SupportPro Commitment

Consistently accessible to communicate with customer(s). Service Technician availability for supervision and instruction of personnel. The goal of the tech is to minimize downtime of your production facilities and commence training of your personnel.

8.6. Tech Scheduling

Please allow 10-days advance notice to schedule a SupportPro technician. Emergency situation are handled as quickly as possible. If assistance is required please contact SupportPro to schedule a technician at 844.777.8776.

8.7. Instillation Policy

All equipment is unloaded, unpacked and inspected for any damage. If there is any damage, the Bill of Landing will need to be signed describing the damage.

Prepare area to install your nVenia equipment. Assemble your equipment.

Provide qualified technicians, operators, and maintenance personnel to start up system.

8.8. The SupportPro Advantage

Leverage our aftermarket services. Our secure web portal gives you access to all documentation of your machines. Therefore, no need to reorder any lost manuals, schematics, or bill of materials. In addition, the portal user can access pictures and videos of their machine to visually understand the machine. Finally, the portal gives the machine operator secure way to contact SupportPro with any questions or concerns. Details about the web portal will be sent via email after the machine is shipped.

SupportPro

3500 Lacey Road, Suite 290

Downers Grove, IL 60515

844.777.8776

Illustrated Parts List

9.1. Ordering Parts

For your convenience, replacement parts and accessories can be ordered from nVenia by contacting SupportPro.

SupportPro

3500 Lacey Road, Suite 290

Downers Grove, IL 60515

844.777.8776

service@supportpro.com

Open for service Monday through Friday
7:00 AM to 6:00 PM (Central Time)

Please have the following information available to ensure quick, easy, and accurate service.

- Your name and telephone number
- Your P.O. (Purchase Order) number
- Your preferred method of delivery

9.1.1. Replacement Parts Policy

Should a replacement part be needed, nVenia's return material authorization policy must be adhered to. nVenia will not distribute equipment or parts without a purchase order from an authorized nVenia distributor. This procedure includes warranty and non-warranty replacement parts. A return authorization will be issued at that time, and credit will not be issued until the suspect part has been received and inspected.

9.2. How to Use This Parts List

9.2.1. General Part Numbers

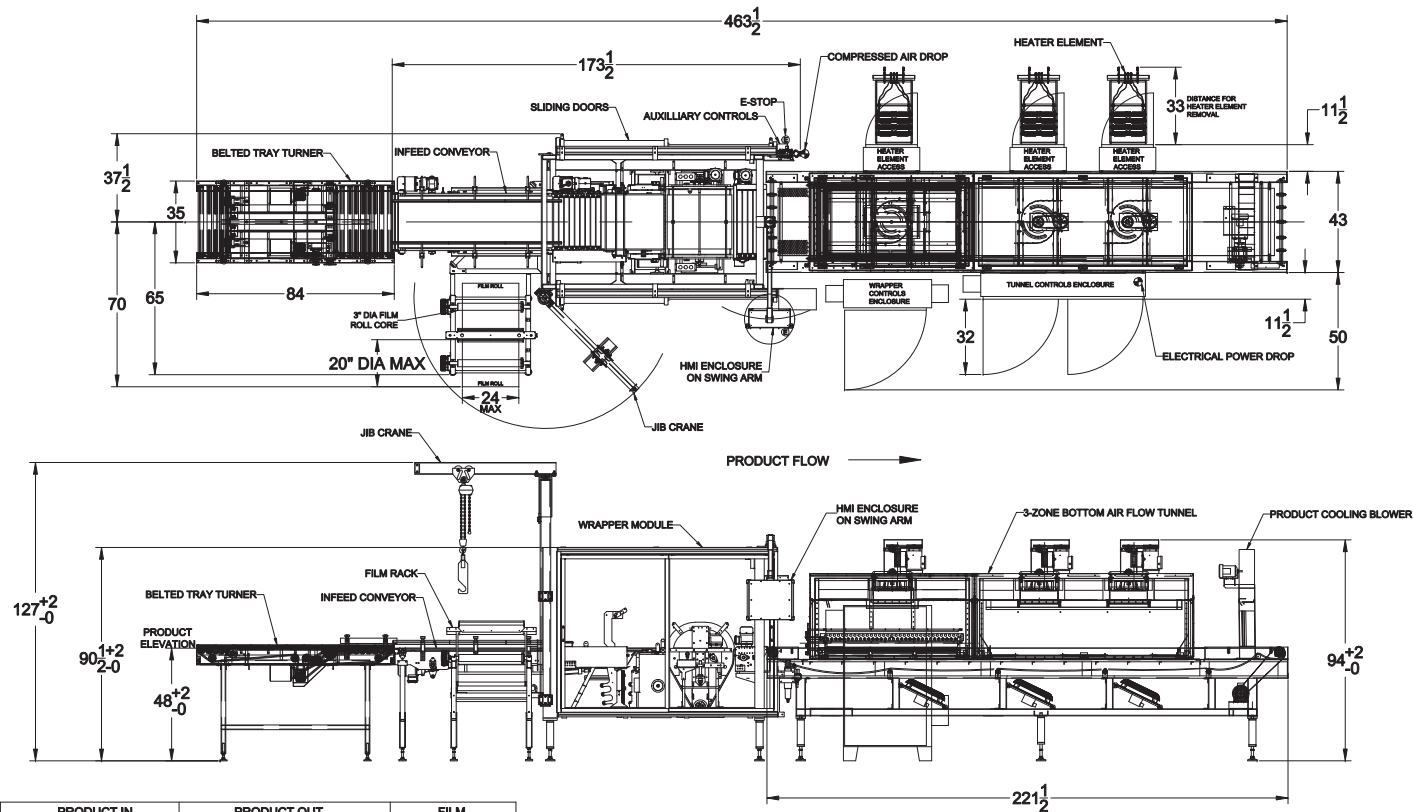
This chapter contains all part numbers necessary to order BPTW Series tray wrapper replacement parts and assemblies.

This illustrated parts breakdown is presented in disassembled order. Detail parts are shown below their respective upper level assemblies whenever possible.

The parts lists follow the illustration for a particular assembly and represent components of that assembly. The number listed in the quantity column is the number of the specific part required to complete the assembly and may not reflect the quantity needed for the entire system.

The lists are divided into four columns. The item/index numbers refer to the identification number located on the drawing. The part number is the nVenia part number, used to identify the part for ordering. The part description column lists each part name, and the quantity column lists the quantity of that part used in that particular assembly.

Illustrations are shown before the parts list for each assembly when available.



PRODUCT INFORMATION		PRODUCT IN				PRODUCT OUT				FILM	
PROD #	PRODUCT DESCRIPTION	WIDTH	LENGTH	HT	RATE	PATTERN	WIDTH	LENGTH	RATE	TYPE	CLR/PRNT
1	355 ML 12 COUNT LOOSE	9.04	6.78	6.13	62	1 X 1 X 1	9.04	6.78	62	LDPE	BOTH
2	355 ML 4-PACK CARTON, 6 PER TRAY	13.56	9.04	6.13	34	1 X 1 X 1	13.56	9.04	34	LDPE	BOTH
3	355 ML 6-PACK CARTON, 4 PER TRAY	13.56	9.04	6.13	34	1 X 1 X 1	13.56	9.04	34	LDPE	BOTH
4	355 ML 12-PACK CARTON, 2 PER TRAY	13.56	9.04	6.13	34	1 X 1 X 1	13.56	9.04	34	LDPE	BOTH
5	355 ML 24-PACK CARTON, 1 PER TRAY	13.56	9.04	6.13	62	1 X 1 X 1	13.56	9.04	62	LDPE	BOTH
6	12 OZ 12 COUNT LOOSE	10.40	7.80	4.81	62	1 X 1 X 1	10.40	7.80	62	LDPE	BOTH
7	12 OZ 24 COUNT LOOSE	10.40	15.60	4.81	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
8	12 OZ 4-PACK CARTON, 6 PER TRAY	15.60	10.40	4.81	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
9	12 OZ 6-PACK CARTON, 4 PER TRAY	15.60	10.40	4.81	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
10	12 OZ 12-PACK CARTON, 2 PER TRAY	15.60	10.40	4.81	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
11	12 OZ 24-PACK CARTON, 1 PER TRAY	15.60	10.40	4.81	62	1 X 1 X 1	15.60	10.40	62	LDPE	BOTH
12	16 OZ 12 COUNT LOOSE	10.40	7.80	6.13	62	1 X 1 X 1	10.40	7.80	62	LDPE	BOTH
13	16 OZ 24 COUNT LOOSE	10.40	15.60	6.13	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
14	16 OZ 4-PACK CARTON, 6 PER TRAY	15.60	10.40	6.13	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
15	16 OZ 6-PACK CARTON, 4 PER TRAY	15.60	10.40	6.13	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
16	16 OZ 12-PACK CARTON, 2 PER TRAY	15.60	10.40	6.13	34	1 X 1 X 1	15.60	10.40	34	LDPE	BOTH
17	16 OZ 24-PACK CARTON, 1 PER TRAY	15.60	10.40	6.13	62	1 X 1 X 1	15.60	10.40	62	LDPE	BOTH

ANY PRODUCTS SPECIFIED ABOVE THAT ARE NOT PROVIDED FOR MACHINE SETUP/TESTING AT ARPAC, INCLUDING CONSUMABLES (FILM), WILL REQUIRE ADDITIONAL SETUP/TESTING IN THE FIELD AT THE STANDARD SERVICE AND ENGINEERING RATE.

TECHNICAL INFORMATION:

PRODUCT ELEVATION: 36" +2/-0
 ELECTRICAL POWER: 460V 60HZ 3PH, 160 FULL LOAD AMPS
 MAIN CIRCUIT BREAKER AMPERAGE: 200A, 5KA SCCR
 COMPRESSED AIR: 80 PSI (OPERATING PRESSURE) 30 SCFM
 AMBIENT TEMPERATURE LESS THAN 95 DEG F
 ARPAC PAINT COLORS: BLACK & SILVER
 IP ADDRESS SCHEME: 10.255.255.XXX
 PLC FIRMWARE VERSION: STUDIO 5000 V32
 HMI FIRMWARE VERSION: FACTORY TALK STUDIO V10

FILM REQUIREMENTS:

- TYPICAL FILM RANGE 1-1/2 TO 2 MIL.
- SEAL INITIATION TEMP RANGE OF 230 TO 240 DEG.F.
- DYNE LEVEL ON PRINTED FILM TO BE 37-39 UTILIZING SOLVENT BASED INKS.
- SHRINK PROPERTIES:
 - TD SHRINK 0-20% (TO BE TUNED PER APPLICATION)
 - MD SHRINK 50-70 %P- ROLL WIDTH OF 12" TO 24"
 - ROLL DIAMETER 9-20"
 - 3" DIAMETER CORE

Approved By: _____

Signature: _____

Date: _____

RETURN TO:

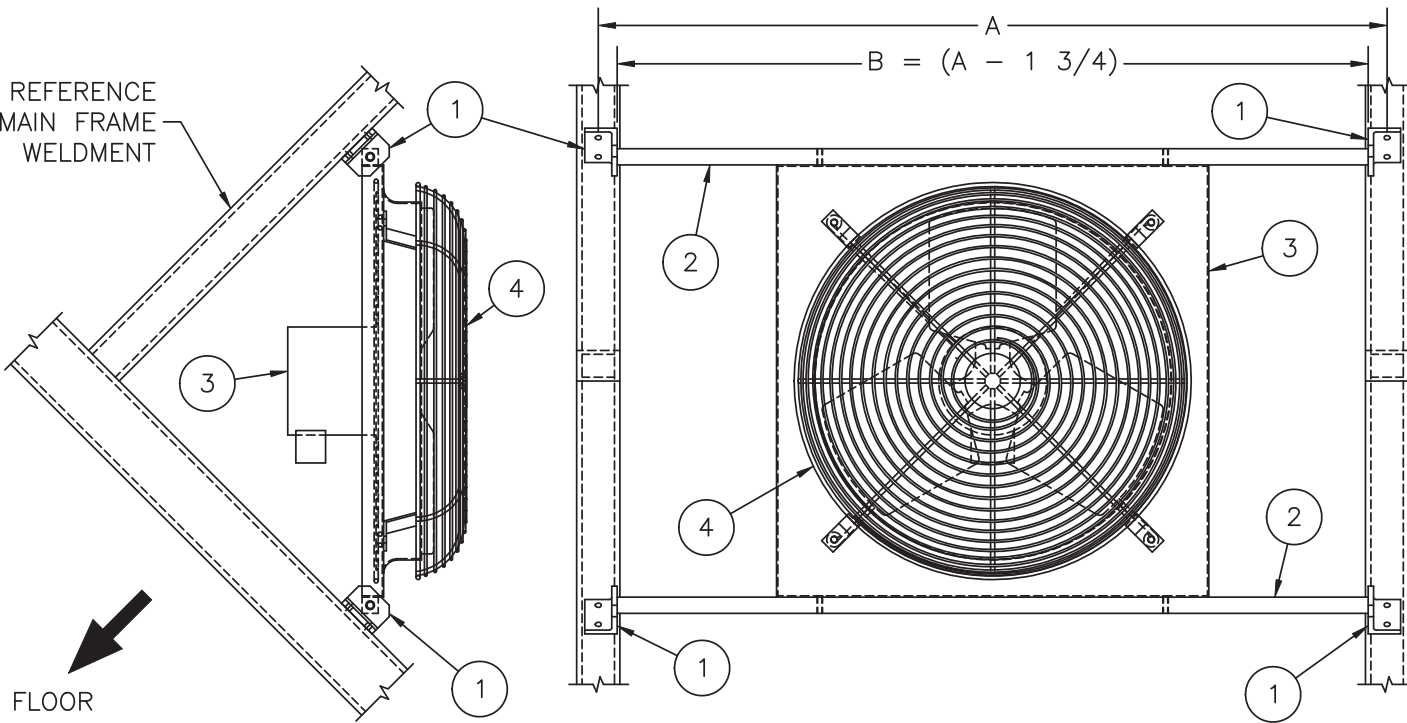
ARPAC

ARPAC
 A DUREAVANT COMPANY

9555 WEST IRVING PARK RD.
 SCHILLER PARK, IL 60176

DRAWN: 4/22/2021	BY: SRA	SCALE: N/A	SIZE: B
RELEASED:	FILENAME: S220562-2-1	APPROVED BY:	
DESCRIPTION: LAYOUT, TRAY WRAPPER, BPTW-6000			
BLUE MARBLE PRODUCTIONS			DRAWING NUMBER: S220562-2-1

REFERENCE
TUNNEL/MAIN FRAME
WELDMENT



54 3/8	52 5/8	112380-015
57 1/4	55 1/2	112380-014
41	39 1/4	112380-013
27 1/4	25 1/2	112380-012
45	43 1/4	112380-011
-	-	112380-010
-	-	112380-009
57	55 1/2	112380-008
40 1/4	38 1/2	112380-007
48 3/4	47	112380-006
36 1/2	34 3/4	112380-005
68 1/4	67 1/2	112380-004
42 1/4	40 1/2	112380-003
46 1/4	44 1/2	112380-002
39 1/4	37 1/2	112380-001
A	B	ASSY NUMBER

4	1	121309	WLDMT, GUARD, FAN, SAFETY, 16 DIA
3	1	121296	FAN, EXHAUST, 16" DIA BLADE, 20" SQ, MOD
2	2	112382-XXX	BAR, MTG, FAN, COOLING, BELT
1	4	112381	BKT, MTG, FAN, COOLING, BELT
ITM	QTY	PART NUM	DESCRIPTION

BILL OF MATERIAL

ARPAC 9511 WEST RIVER ST.
SCHILLER PARK, IL 60176

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONAL TOLERANCES:

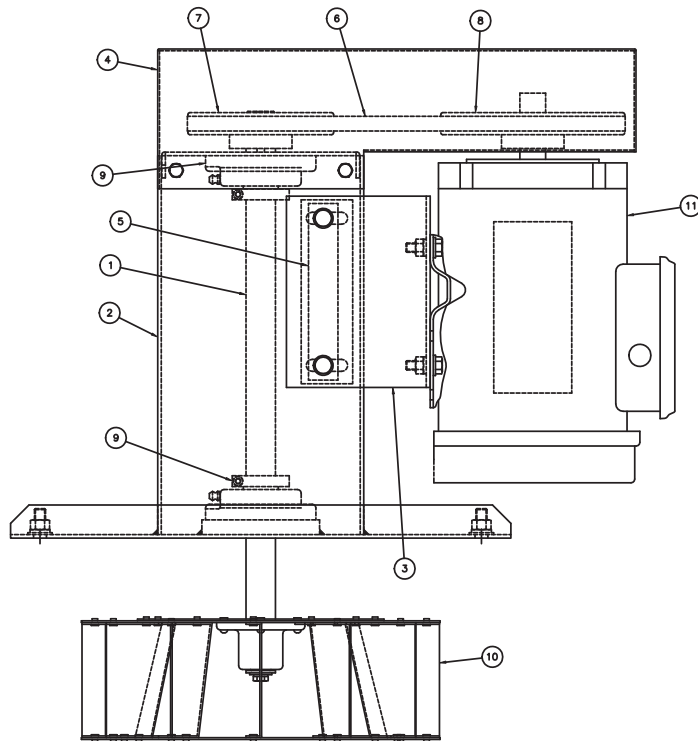
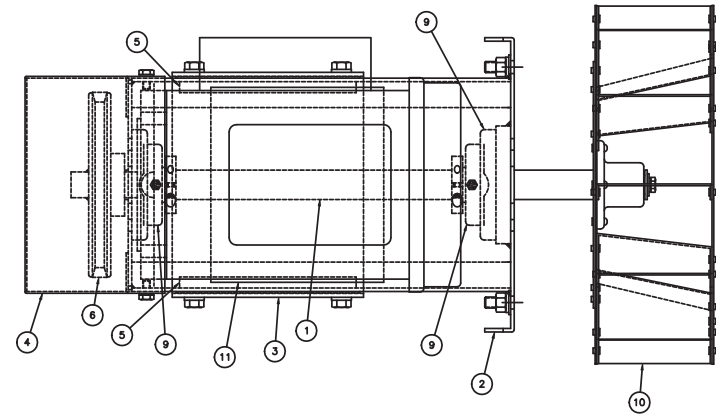
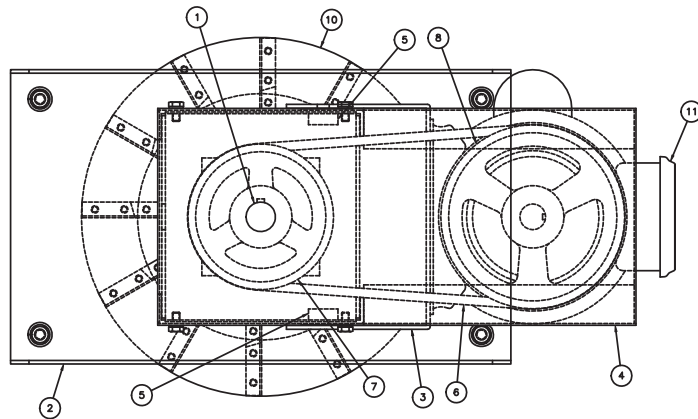
FRACTIONS ± 1/64
TWO (2) DECIMALS ± 0.010
THREE (3) DECIMALS ± 0.005
ANGLES ± 0.5°

DRAWN: 8-2-99 BY: JPC SCALE: 1/8"=1" SIZE: A

RELEASED: 8-2-99 FILENAME: 112380 APPROVED BY: JPC

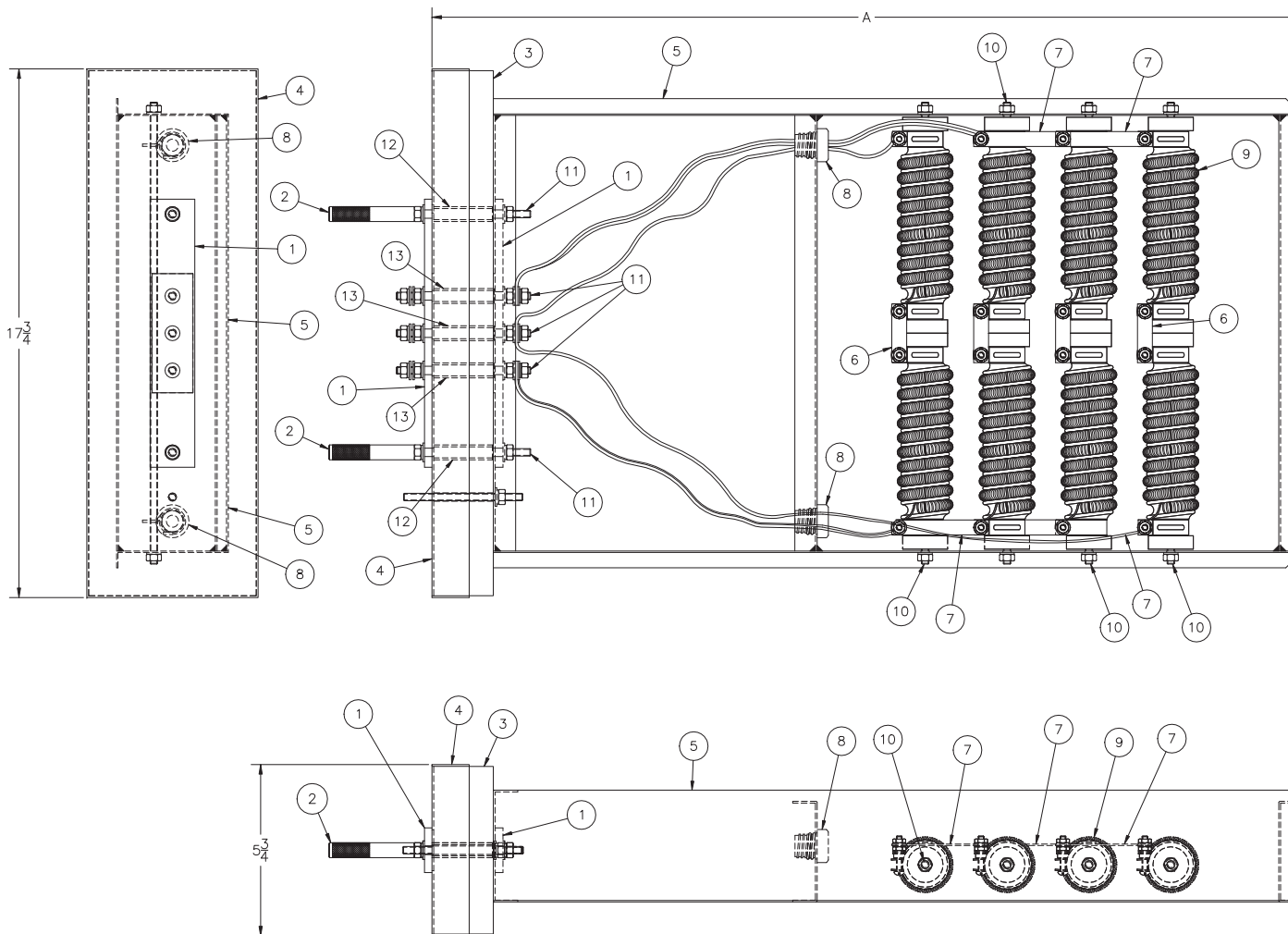
DESCRIPTION: ASSY, FAN, COOLING, BELT

DRAWING NUMBER:
112380



NOTE: USE WITH INLET CONE #803039

ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO (2) DECIMALS THREE (3) DECIMALS ANGLES	± 1/64 ± 0.010 ± 0.005 ± 0.5°
DRAWN: 6-8-99	BY: KGL	SCALE: 3/8"=1"	SIZE: C
RELEASED: 6-8-99	FILENAME: 114196L	APPROVED BY: KGL	
DESCRIPTION: ASSY, BLOWER, TUNNEL, 1 1/2HP, 230/460V, STD			
			DRAWING NUMBER: 114196L



PART NUMBER 121097-3Y SHOWN ABOVE

REVISIONS

RV	DATE	BY	DESCRIPTION
A	11-26-18	JW	UPDATED PER DCR #18591

PART NUMBER = 121097-XY

WT = INSIDE TUNNEL WIDTH

48	36	7/16	120885-007	7
44	34	7/16	120885-006	6
40	32	7/16	120885-005	5
36	30	7/16	120885-004	4
32	28	7/16	120885-003	3
28	26	7/16	120885-002	2
24	24	7/16	120885-001	1
WT	A		ITEM #5	X

VOLTS = VOLTAGE FOR ENTIRE TRAY
VE = VOLTAGE FOR SINGLE ELEMENT

575	300	3000	804016-019	13
460	230	3000	804016-014	03
VOLTS	VE	WATTS	ITEM #8	Y

13	3	141722-002	SS RND TBG 1/2 OD x 16 Go WALL x 2 3/32 LG
12	2	141722-001	SS RND TBG 1/2 OD x 16 Go WALL x 1 31/32 LG
11	5	141723-004	SS THRD ROD, 1/4-20, 4 1/2 LG
10	4	141723-003	SS THRD ROD, 1/4-20, 15 1/2 LG
9	8	804016-XXX	HEATER
8	2	803878	BUSH, CERAMIC, #20, W/ CLAMP
7	4	108680-003	STRAP, CONNECTOR, ELEMENT, 3 1/4 LG
6	4	108680-001	STRAP, CONNECTOR, ELEMENT, 1 31/32 LG
5	1	120885-XXX	WLDMT, FRAME, TRAY, ELEMENT, EIGHT, ...
4	1	108678	COVER, TRAY, ELEMENT
3	1	108677	INSULATION, COVER, TRAY, ELEMENT, INTAKE, UPPER
2	2	101977	HANDLE, TRAY, ELEMENT
1	2	101976	INSULATOR, TRAY, ELEMENT
ITM	QTY	PART NUM	DESCRIPTION

BILL OF MATERIAL

ARPAC 9511 WEST RIVER ST.
SCHILLER PARK, IL 60176

UNLESS OTHERWISE SPECIFIED FRACTIONS ± 1/64
TWO (2) DECIMALS ± 0.010
ALL DIMENSIONAL TOLERANCES: THREE (3) DECIMALS ± 0.005
ANGLES ± 0.5°

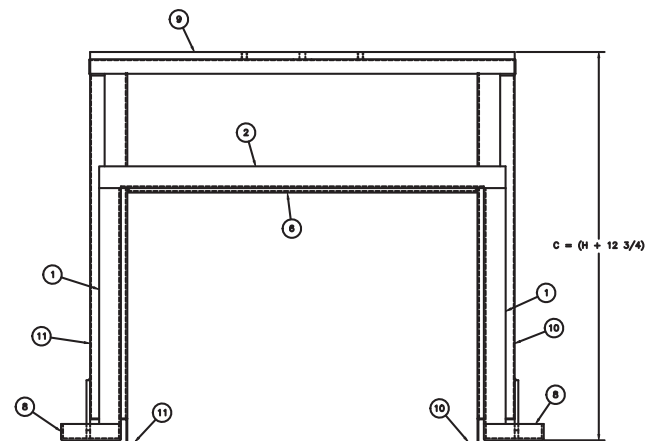
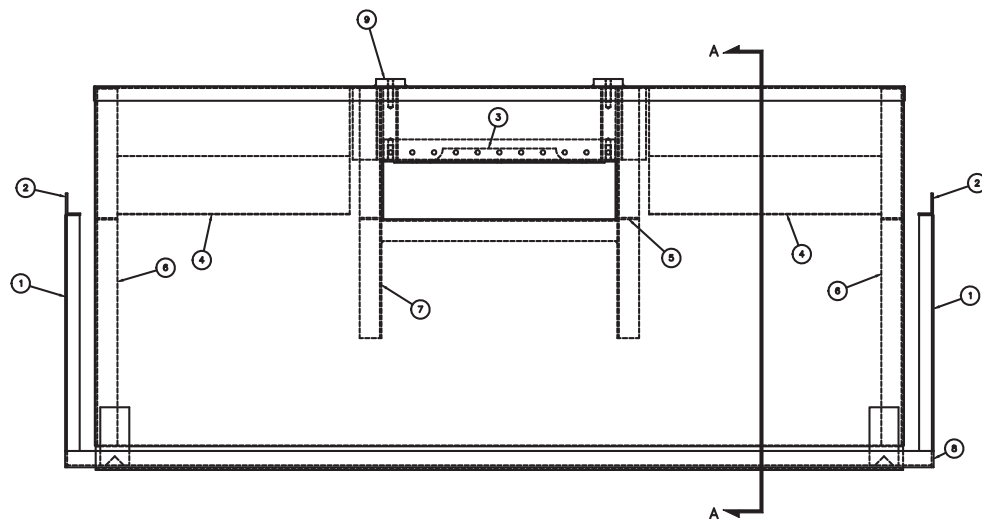
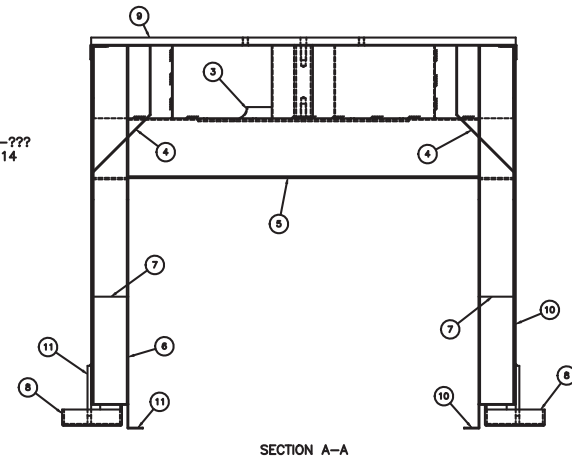
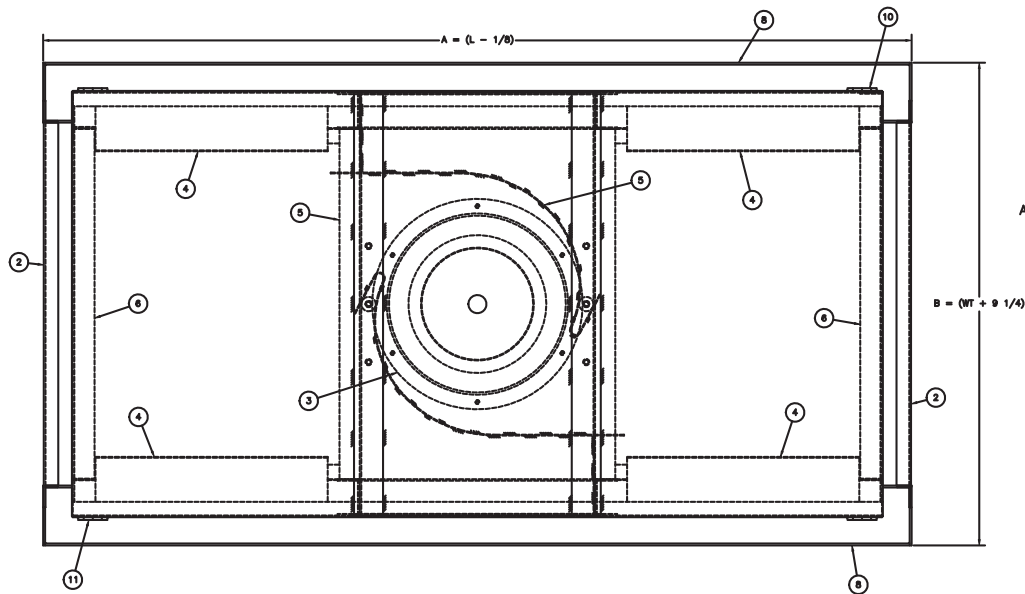
DRAWN: 10-26-98 BY: JPC SCALE: 1/4"=1" SIZE: B

RELEASED: 10-26-98 FILENAME: 121097 APPROVED BY: JPC

DESCRIPTION:
ASSY, TRAY, ELEMENT, 8, TUNNEL, INTAKE, UPPER,

SERIES WIRING

DRAWING NUMBER:
121097



L = TUNNEL LENGTH

60	79 7/8
70	89 7/8
80	99 7/8
L	A

WT = INSIDE TUNNEL WIDTH

48	57 1/4
44	53 1/4
40	49 1/4
36	45 1/4
32	41 1/4
28	37 1/4
24	33 1/4
WT	B

H = INSIDE TUNNEL HEIGHT

40	52 3/4
36	48 3/4
32	44 3/4
28	40 3/4
24	36 3/4
20	32 3/4
16	28 3/4
14	24 3/4
H	C

ITEM	QTY	PART NUM	DESCRIPTION
11	1	128312-XXX	WLDMT, PLT, SIDE, HOUSING, INR, ACCESS, ELEMENT
10	1	128311-XXX	WLDMT, PLT, SIDE, HOUSING, INNER, ZONE, SINGLE
9	1	121782-XXX	WLDMT, PLT, TOP, HOUSING, INNER, TUNNEL

BILL OF MATERIAL

8	2	121103-XXX	WLDMT, RUNNER, BASE
7	2	120957-XXX	WLDMT, FRAME, END, HOUSING, ELEMENT, & BLOWER
6	2	120956-XXX	WLDMT, FRAME, END, HOUSING, INNER, TUNNEL
5	1	120954-XXX	WLDMT, HOUSING, ELEMENT, AND, BLOWER
4	4	108702-XXX	BAFFLE, CORNER, TUNNEL, INTAKE, UPPER
3	1	108698	WLDMT, PLT, ACCESS, BLOWER, & CONE, INLET
2	2	101981-XXX	MEMBER, HOR, FRAME, END, TUNNEL
1	4	101980-XXX	MEMBER, VER, FRAME, END, TUNNEL

ITEM	QTY	PART NUM	DESCRIPTION
11	1	128312-XXX	WLDMT, PLT, SIDE, HOUSING, INR, ACCESS, ELEMENT
10	1	128311-XXX	WLDMT, PLT, SIDE, HOUSING, INNER, ZONE, SINGLE
9	1	121782-XXX	WLDMT, PLT, TOP, HOUSING, INNER, TUNNEL

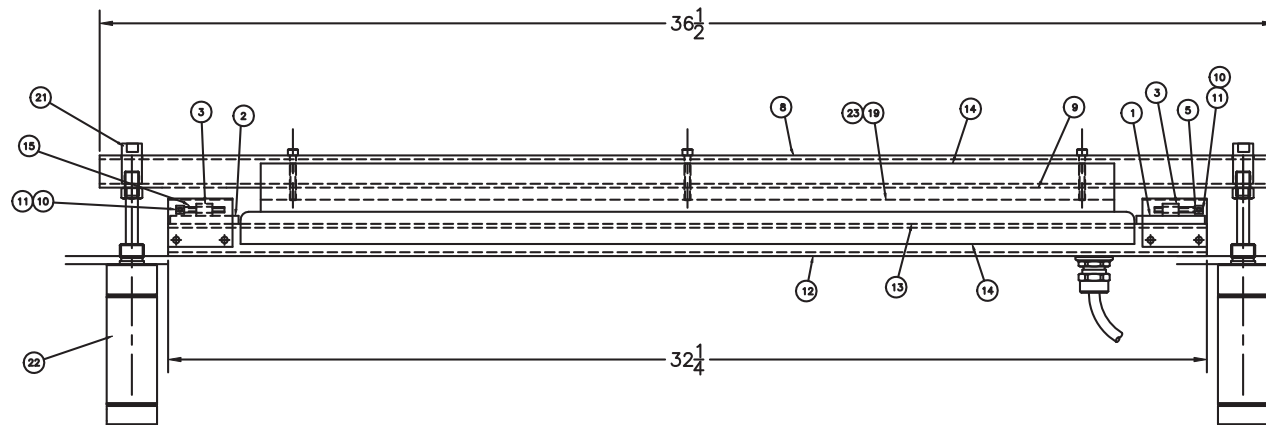
BILL OF MATERIAL

ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FINISHING NO. PLT. HOLES NO. HOLES NO. HOLES	± 1/64 ± .005 ± .010 ± .015
DRAWN 1-6-99	BY KGL	SCALE 1/4"=1"	MIN. D
REVISION 1-6-99	REVISION 128339L	APPROVED BY KGL	
ASSY, HOUSING, INNER, TUNNEL, INTAKE, UPPER,			
ZONE, SINGLE, FLOW, AIR, BOTTOM			
DRAWING NUMBER			128339L

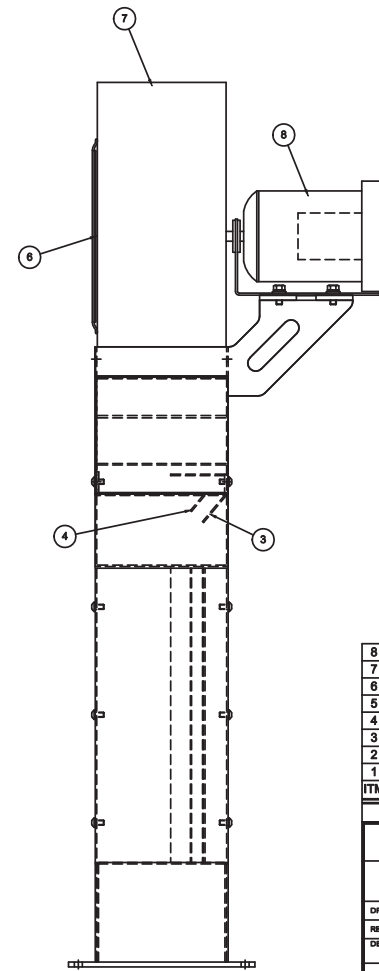
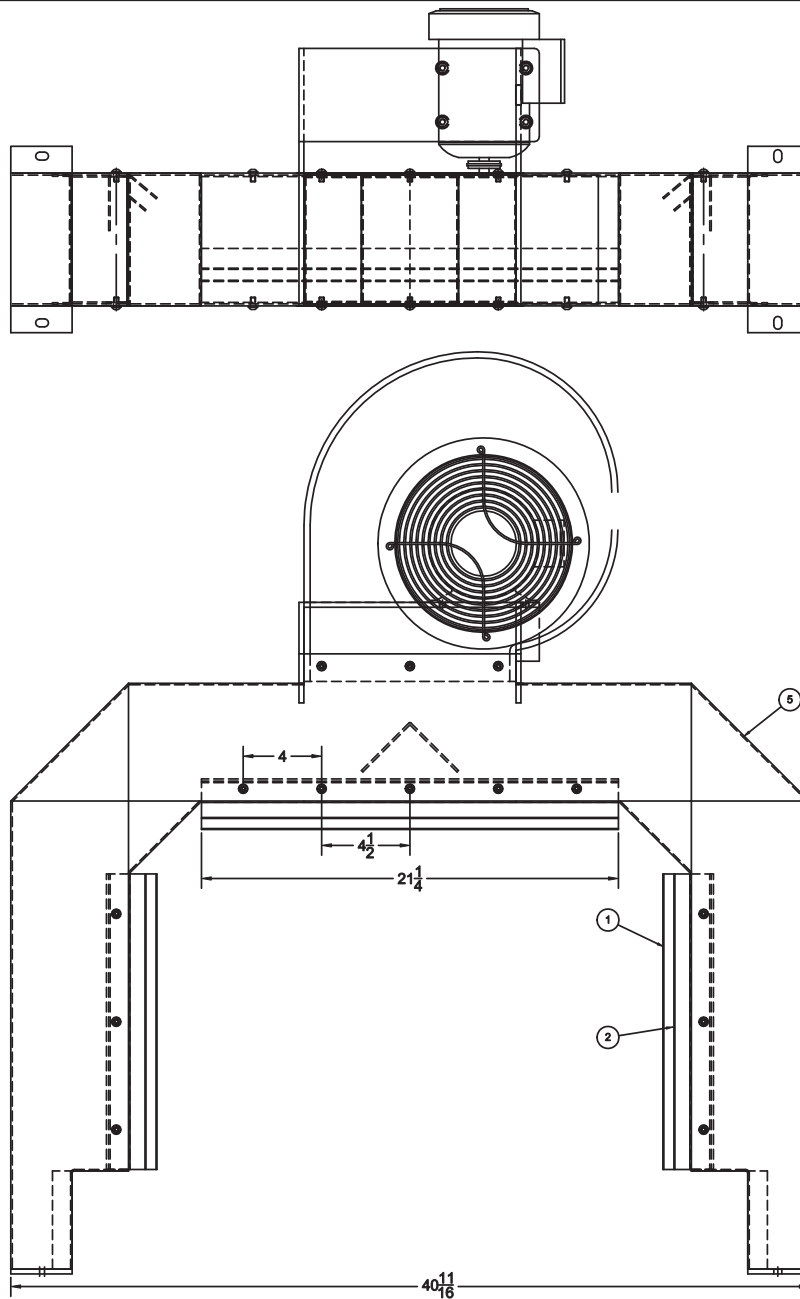


PRESS FIT TIMKEN CUP (ITEM 9)
INTO JIB CRANE BEARING CUP
(ITEM 5). PRESS FIT TIMKEN CONE
(ITEM 8) ONTO JIB COLUMN (ITEM 2).

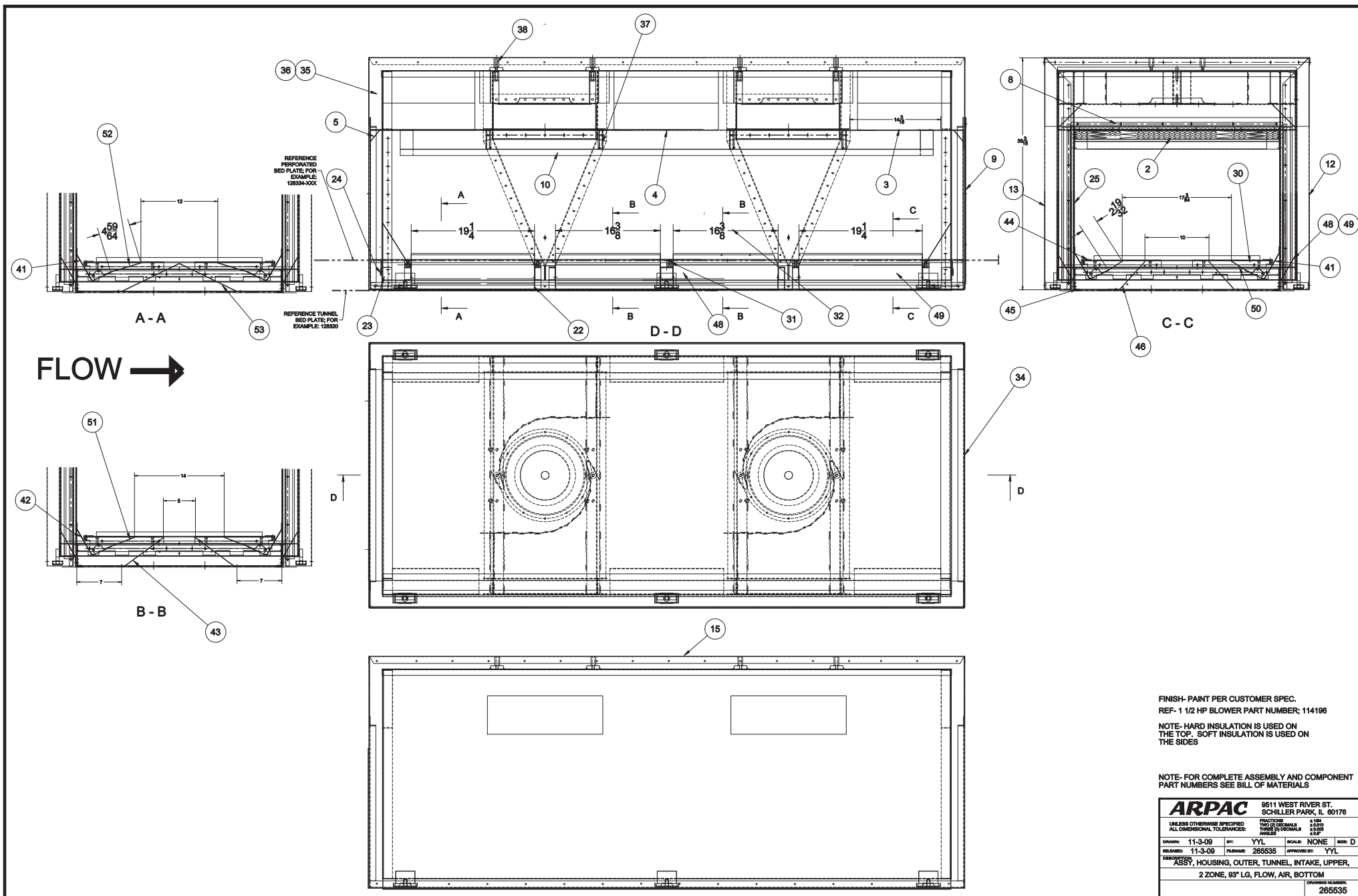
DRAWING NUMBER:	
215251	



ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO (2) DECIMALS THREE (3) DECIMALS ANGLES	± 1/64 ± 0.010 ± 0.005 ± 0.5°
DRAWN: 5-17-04	BY: YL	SCALE: 1/4" = 1"	SIZE: B
RELEASED: 5-17-04	FILENAME: 226659	APPROVED BY: YL	
DESCRIPTION: ASSY, BAR, SPLICE, PNEUMATIC			
			DRAWING NUMBER: 226659



8	1	803229	MOTOR, 120VAC, 1/4 HP
7	1	803035	FAN, COOLING
6	1	803027	GUARD, FAN, 7 1/2
5	1	251073	WLDMT, COOLING, 3-WAY
4	1	114128-012	DEFLECTOR, AIR, HOR, DNSTRM, COOLING, 3-WAY
3	1	114128-012	DEFLECTOR, AIR, HOR, UPSTRM, COOLING, 3-WAY
2	2	119681	DEFLECTOR, AIR, VER, DNSTRM, COOLING, 3-WAY
1	2	119680	DEFLECTOR, AIR, VER, UPTSRM, COOLING, 3-WAY
ITEM	QTY	PART NUM	DESCRIPTION
BILL OF MATERIAL			
ARPAC 9511 WEST RIVER ST. SCHILLER PARK, IL 60176			
UNLESS OTHERWISE SPECIFIED		FRACTIONS	± 1/64"
ALL DIMENSIONAL TOLERANCES:		TWO (2) DECIMALS	± 0.010"
		THREE (3) DECIMALS	± 0.005"
		ANGLES	± 0.5°
DRAWN:	11-12-07	BY:	YYL
RELEASED:	11-12-07	FILENAME:	251074
DESCRIPTION:		APPROVED BY:	YYL
ASSY, PRODUCT, COOLING, 3-WAY			
43" W			
DRAWING NUMBER:			251074

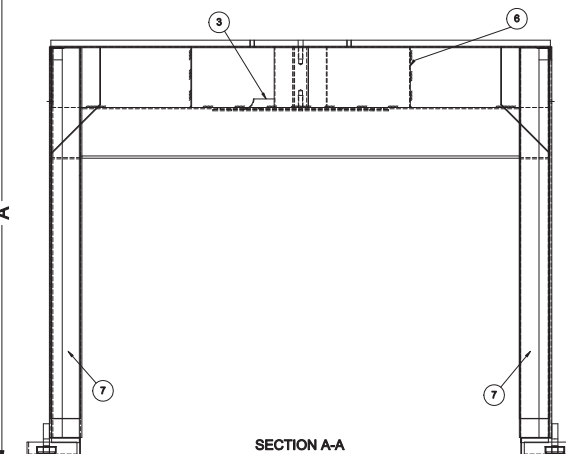
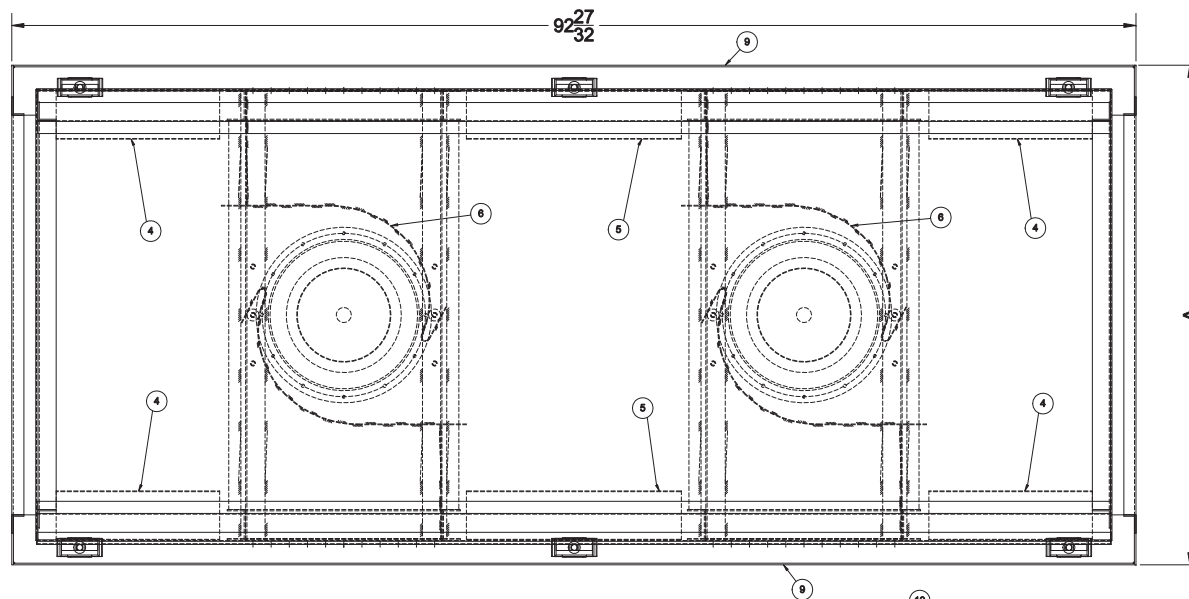


FINISH- PAINT PER CUSTOMER SPEC.
REF- 1 1/2 HP BLOWER PART NUMBER: 114196

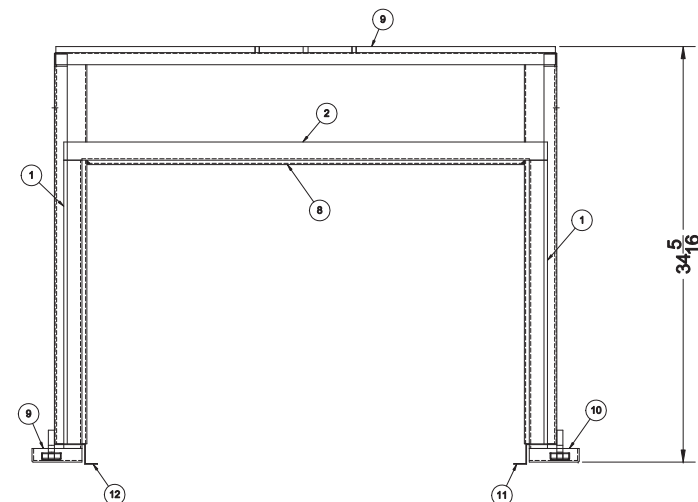
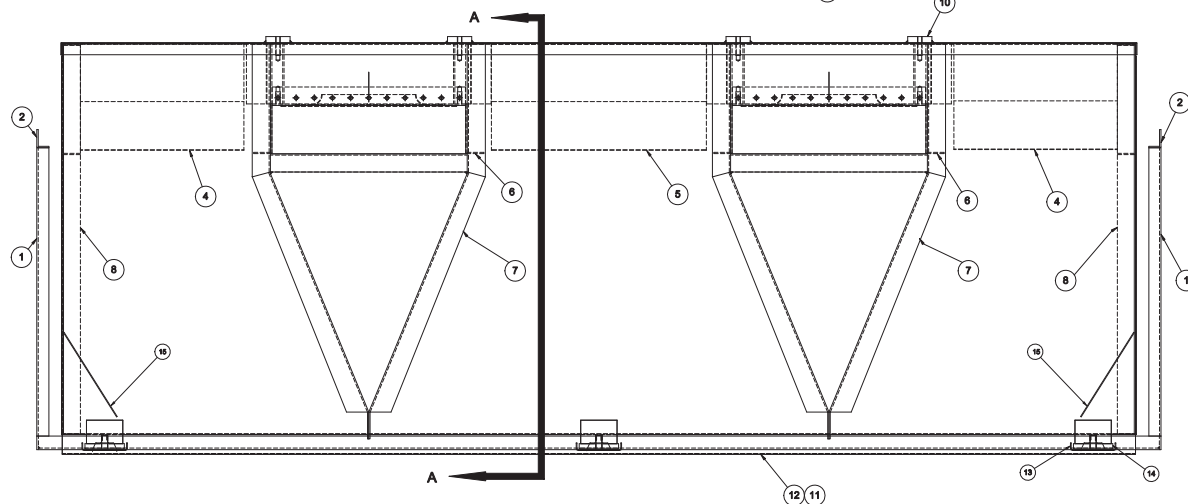
NOTE- HARD INSULATION IS USED ON
THE TOP. SOFT INSULATION IS USED ON
THE SIDES

NOTE- FOR COMPLETE ASSEMBLY AND COMPONENT
PART NUMBERS SEE BILL OF MATERIALS

ARPAC				9511 WEST RIVER ST. SCHILLER PARK, IL 60178
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONAL TOLERANCES:				FRACTIONS THRU 16 DECIMALS THRU 32 DECIMALS THRU 64 DECIMALS THRU 128 DECIMALS THRU 256 DECIMALS THRU 512 DECIMALS THRU 1024 DECIMALS THRU 2048 DECIMALS THRU 4096 DECIMALS THRU 8192 DECIMALS THRU 16384 DECIMALS THRU 32768 DECIMALS THRU 65536 DECIMALS THRU 131072 DECIMALS THRU 262144 DECIMALS THRU 524288 DECIMALS THRU 1048576 DECIMALS THRU 2097152 DECIMALS THRU 4194304 DECIMALS THRU 8388608 DECIMALS THRU 16777216 DECIMALS THRU 33554432 DECIMALS THRU 67108864 DECIMALS THRU 134217728 DECIMALS THRU 268435456 DECIMALS THRU 536870912 DECIMALS THRU 1073741824 DECIMALS THRU 2147483648 DECIMALS THRU 4294967296 DECIMALS THRU 8589934592 DECIMALS THRU 17179869184 DECIMALS THRU 34359738368 DECIMALS THRU 68719476736 DECIMALS THRU 137438953472 DECIMALS THRU 274877906944 DECIMALS THRU 549755813888 DECIMALS THRU 1099511627776 DECIMALS THRU 2199023255552 DECIMALS THRU 4398046511104 DECIMALS THRU 8796093022208 DECIMALS THRU 17592186044416 DECIMALS THRU 35184372088832 DECIMALS THRU 70368744177664 DECIMALS THRU 140737488355328 DECIMALS THRU 281474976710656 DECIMALS THRU 562949953421312 DECIMALS THRU 1125899906842624 DECIMALS THRU 2251799813685248 DECIMALS THRU 4503599627370496 DECIMALS THRU 9007199254740992 DECIMALS THRU 18014398509481984 DECIMALS THRU 36028797018963968 DECIMALS THRU 72057594037927936 DECIMALS THRU 144115188075855872 DECIMALS THRU 288230376151711744 DECIMALS THRU 576460752303423488 DECIMALS THRU 1152921504606846976 DECIMALS THRU 2305843009213693952 DECIMALS THRU 4611686018427387904 DECIMALS THRU 9223372036854775808 DECIMALS THRU 18446744073709551616 DECIMALS THRU 36893488147419103232 DECIMALS THRU 73786976294838206464 DECIMALS THRU 147573952589676412928 DECIMALS THRU 295147905179352825856 DECIMALS THRU 590295810358705651712 DECIMALS THRU 1180591620717411303424 DECIMALS THRU 2361183241434822606848 DECIMALS THRU 4722366482869645213696 DECIMALS THRU 9444732965739290427392 DECIMALS THRU 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3369993333793829974333376885877453834204643052817571553427064881152 DECIMALS THRU 6739986667587659948666753771754907668409286105635143106854129762304 DECIMALS THRU 13479973335175319897333507543509815336818572211270286213708259524608 DECIMALS THRU 26959946670350639794667015087019630673637144422540572427416519049216 DECIMALS THRU 53919893340701279589334030174039261347274288845081144854833038098432 DECIMALS THRU 107839786681402559178668060348078522694548577690162289709666076196864 DECIMALS THRU 215679573362805118357336120696157045389097155380324579419332152393728 DECIMALS THRU 431359146725610236714672241392314090778194310760649158838664304787456 DECIMALS THRU 862718293451220473429344482784628181556388621521298317677328609574912 DECIMALS THRU 1725436586902440946858688965569256363112777243042596635354657219149824 DECIMALS THRU 3450873173804881893717377931138512726225544486085193270709314438299648 DECIMALS THRU 6901746347609763787434755862277025452451088972170386541418628876599296 DECIMALS 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SECTION A-A



PART #	A
265602	41 1/4
265602-001	45 1/4

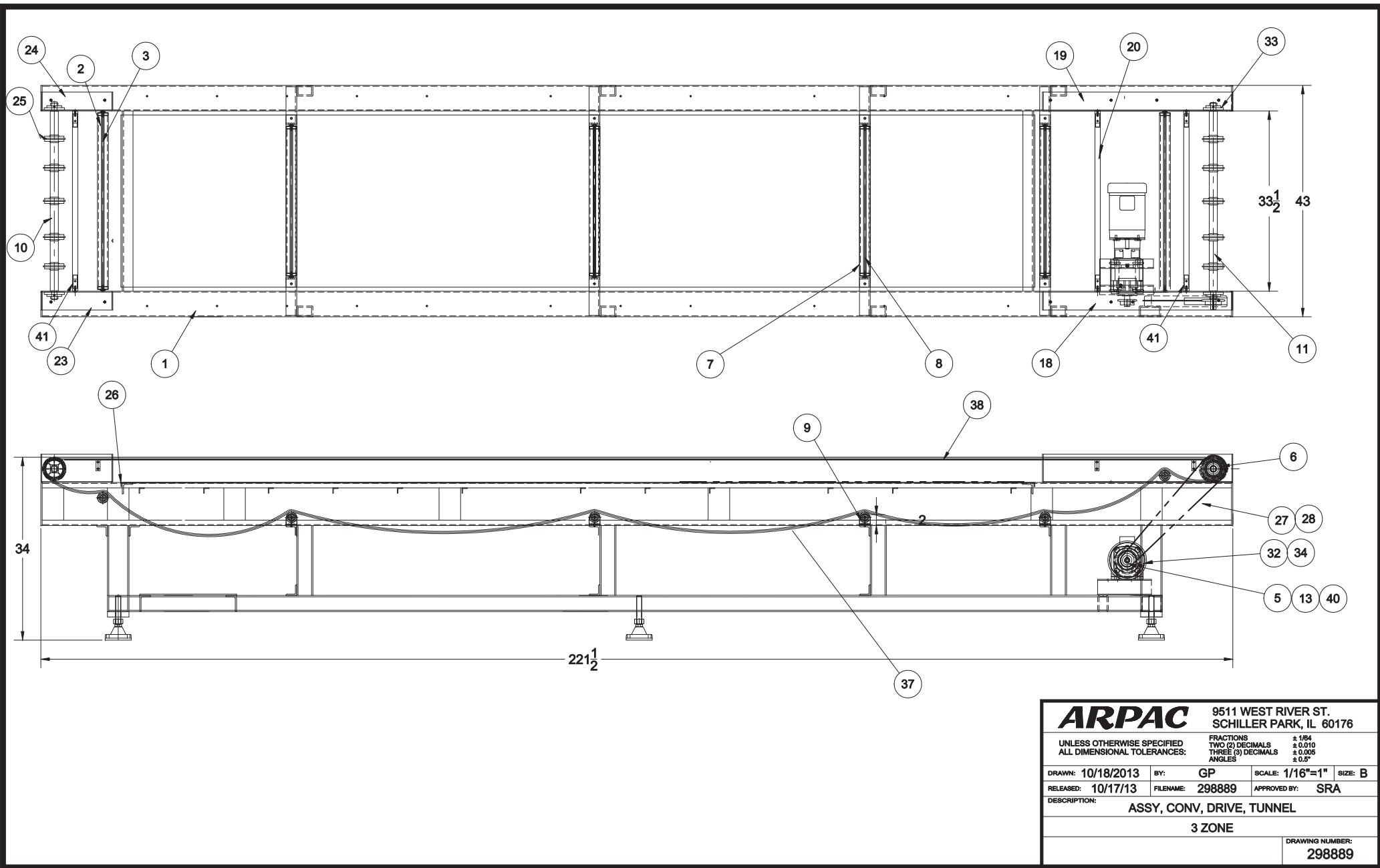
FINISH- NONE

9	1	106668-303	WLDMT, PLY TOP, HOUSING, INNER, TUNNEL, ZONE, DUAL
6	2	120656-305	WLDMT, FRAME, END, HOUSING, INNER, TUNNEL
7	4	282306	WLDMT, FRAME, END, HOUSING, ELEMENT, & BLOWER
6	2	120654-003	WLDMT, HOUSING, ELEMENT, AND, BLOWER
5	2	106702-002	BAFFLE, CORNER, TUNNEL, INTAKE, UPPER, CENTER
4	4	106702-001	BAFFLE, CORNER, TUNNEL, INTAKE, UPPER, END
3	2	106686	WLDMT, PLY, ACCESS, BLOWER, & CONE, INLET
2	2	101961-013	MBR, HOR, FRAME, END, TUNNEL
1	4	101960-018	MBR, VER, FRAME, END, TUNNEL
10	2	199204-008	WLDMT, RUNNER, BASE
11	1	199846-205	WLDMT, PLY, SIDE, HOUSING, INNER, ZONE, DUAL
12	1	199201	POCKET, FOOT, TUNNEL
13	6	199201	POCKET, FOOT, TUNNEL
14	6	199202	BLOCK, INSULATION, FOOT, TUNNEL
15	4	247340	BAFFLE, PLY, BOT FLOW

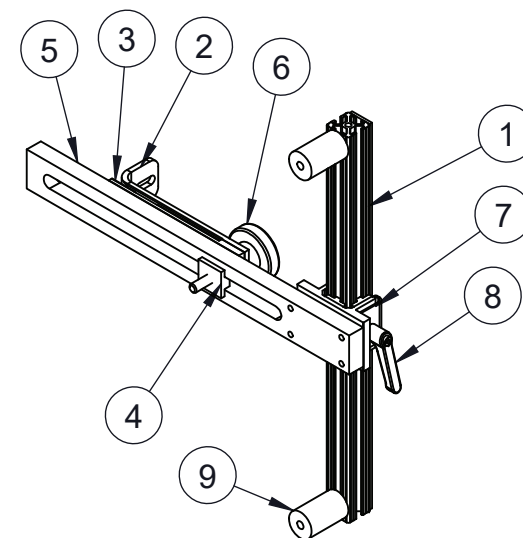
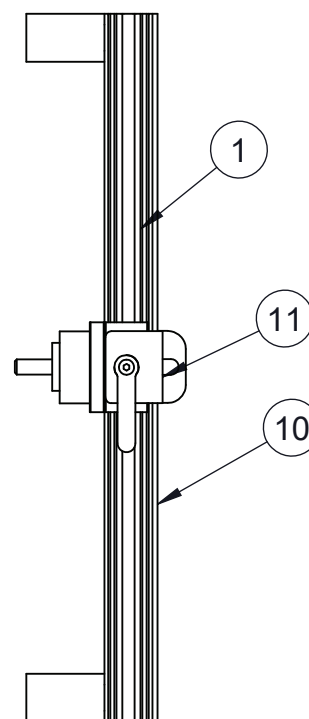
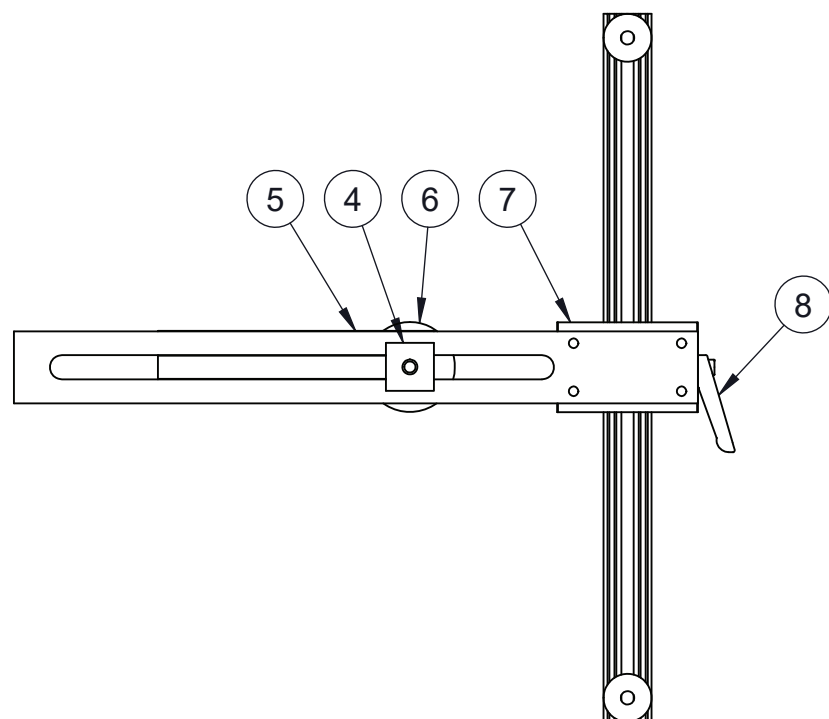
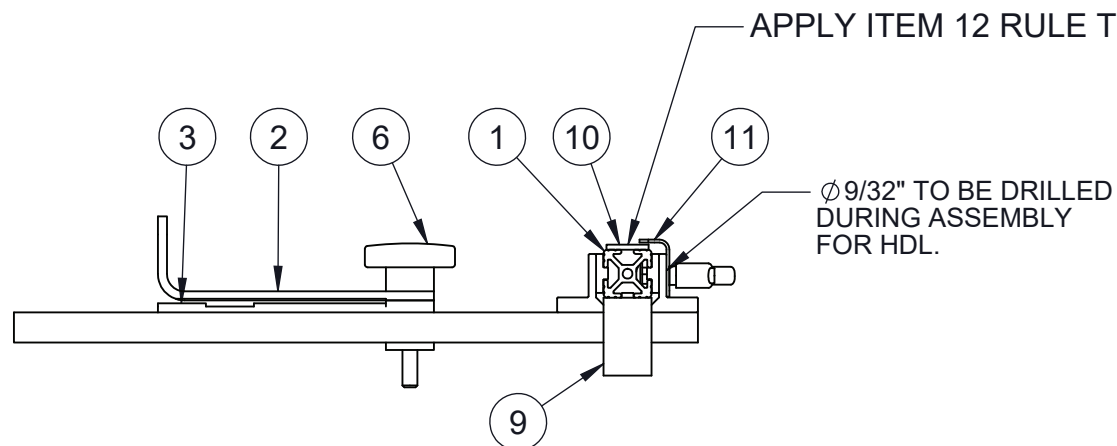
ITEM QTY	PART NUM	DESCRIPTION
BILL OF MATERIAL		

ITEM QTY	PART NUM	DESCRIPTION
BILL OF MATERIAL		

ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FRACTIONS AND DECIMALS THRU 99 DECIMALS AND 1/16 AND 1/32	
DRAWN: 11-5-09	BY: YYL	SCALE: 1/4"=1'	REV: D
DESIGNED: 11-5-09	FILENAME: 265602	APPROVED BY: YYL	
ASSY, HOUSING, INNER, TUNNEL, INTAKE, UPPER, ZONE, DUAL, FLOW, AIR, BOTTOM			
DRAWING NUMBER: 265602			



ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO (2) DECIMALS THREE (3) DECIMALS ANGLES	± 1/64 ± 0.010 ± 0.005 ± 0.5°
DRAWN: 10/18/2013	BY: GP	SCALE: 1/16"=1"	SIZE: B
RELEASED: 10/17/13	FILENAME: 298889	APPROVED BY: SRA	
DESCRIPTION: ASSY, CONV, DRIVE, TUNNEL			
3 ZONE			
			DRAWING NUMBER: 298889



12	1	850152	RULE, ADHESIVE BACKED, 1/2 WIDE, VERTICAL, BTM TO TOP
11	1	322623	POINTER, SCALE
10	1	322622	PLT, MTG, SCALE
9	2	220369-002	SPACER, 9/32 ID X 1 OD X 1 1/2 LG
8	1	816551	HDL, L, RATCHETING, 10 SERIES
7	1	816544	BRG, LINEAR, FLANGE, DOUBLE, SERIES 10
6	1	802658	KNOB, BLACK, PLASTIC, 5/16-18 X 2
5	1	241020	ARM, SUPPORT, PHOTO-EYE REG
4	1	225597	NUT, TEE, BKT, PE REG
3	1	224003	PLT, BASE, PE REG
2	1	224004	BKT, MTG, PE REG
1	1	241022	EXTRUSION, 1010 SERIES 14.75" LONG

ITM	QTY	PART NUM	DESCRIPTION
-----	-----	----------	-------------

BILL OF MATERIALS

ARPAC 9511 WEST RIVER ST.
SCHILLER PARK, IL 60176

UNLESS OTHERWISE SPECIFIED FRACTIONS ± 1/64
ALL DIMENSIONAL TOLERANCES: TWO (2) DECIMALS ± 0.010
THREE (3) DECIMALS ± 0.005
ANGLES ± 0.5°

DRAWN: 12/8/2015 BY: SRA SCALE: 1:4 SIZE: A

FILENAME: 322675

DESCRIPTION: ASSY, REGISTRATION, PRINT, FILM

 DRAWING NUMBER:

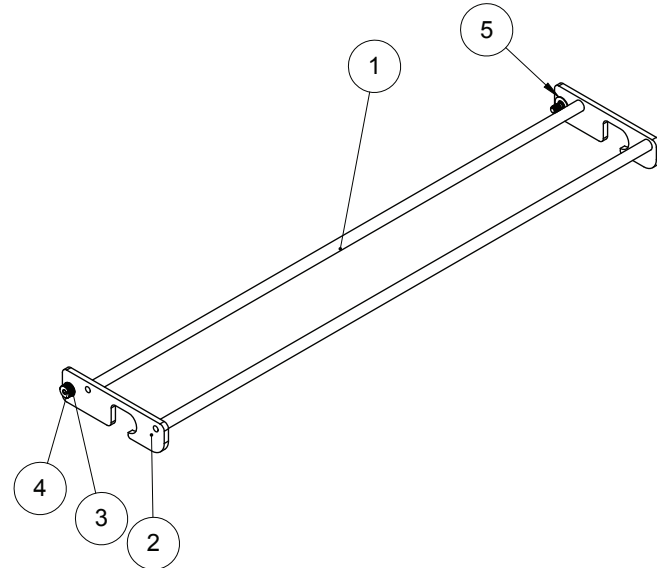
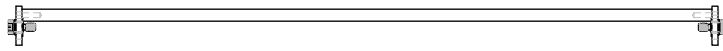
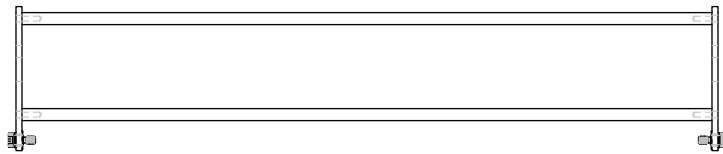
322675

B

A

ARPAC A SIZE FORMAT R4

2



BILL OF MATERIALS

ITEM	QTY	NUMBER	DESCRIPTION
1	2	324876	ROD, CONNECT
2	2	324877	PLT, LATCH
3	2	800407	BUSH, OILITE, FLG, 0.3765 X 0.502 X 1/4, 5/8 OD X 1/16 LG FLG
4	2	800323-001	FSNR, BOLT, SHLDR, 3/8 DIA X 3/8 LG, 5/16-18 THD
5	2	800444	WSHR, OILITE, 0.390 X .750 X 1/32 THK

2

1

1

REV	DATE	BY	NOTE
REVISIONS			

NOTES

- INTERPRET PER ASME Y14.5M-1994.
- DIMENSIONS ARE IN INCHES [mm].
- DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY.
- BREAK SHARP EDGES AND CORNERS.
- PROPRIETARY NOTICE: THIS INFORMATION IS THE PROPERTY OF ARPAC LLC AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS OBTAINED.
- CREATED IN SOLIDWORKS 2013.

ARPAC

 9555 W. Irving Park Rd
 Schiller Park, IL 60176
 www.arpac.com

MODEL

 FILE \ CONFIG
 SIMILAR TO
 DATE CREATED
 DATE UPDATED
 UPDATED BY

324878\324878

 --
 Monday, March 19, 2012 8:56:03 AM
 Friday, March 1, 2019 11:08:29 AM
 hhg

DRAFT

 DATE CREATED
 DATE UPDATED
 UPDATED BY

 Wednesday, May 11, 2016 12:35:35 PM
 Tuesday, December 17, 2019 2:00:07 PM
 MFitc

SIZE

A

SCALE

1:8

MATERIAL

SEE BILL OF MATERIALS

DESCRIPTION

ASSY, LATCH

 3RD ANGLE

 UNITS
 INCH

TOLERANCES

 X/X: ±1/32
 X.XX: ±.015
 X.XXX: ±.005
 ANGLES: ±1°

FINISH

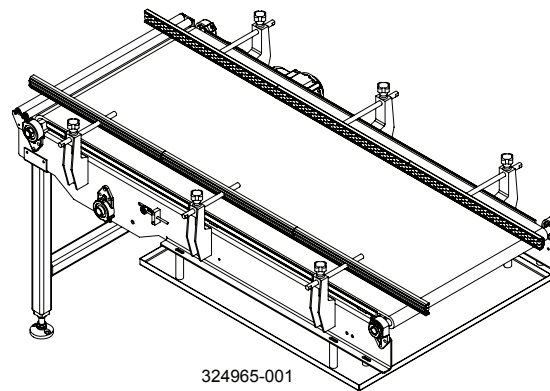
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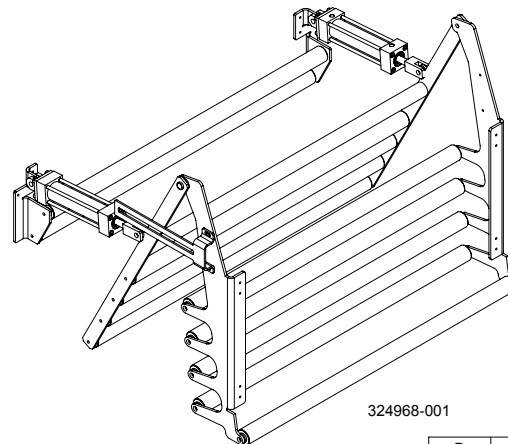
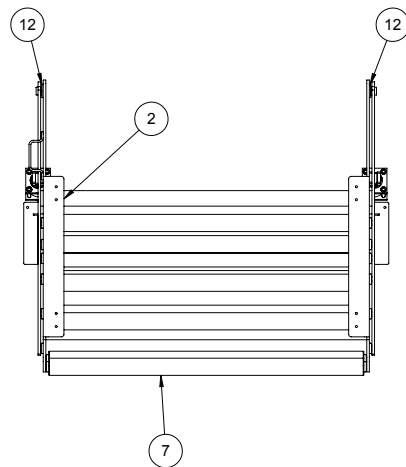
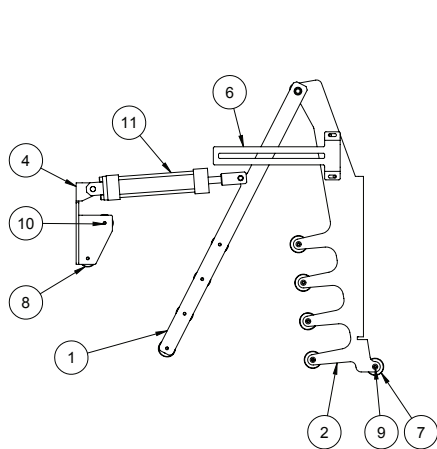
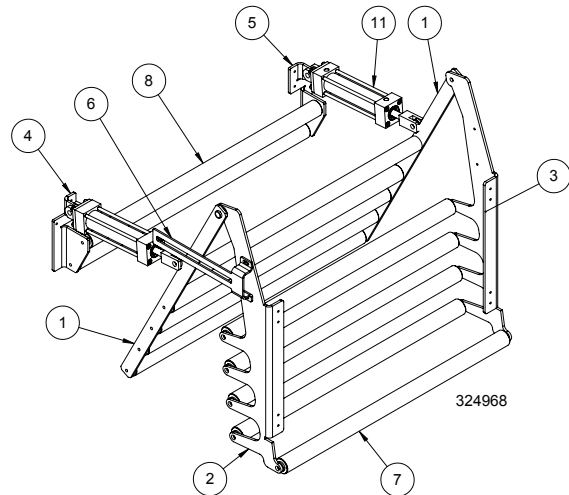
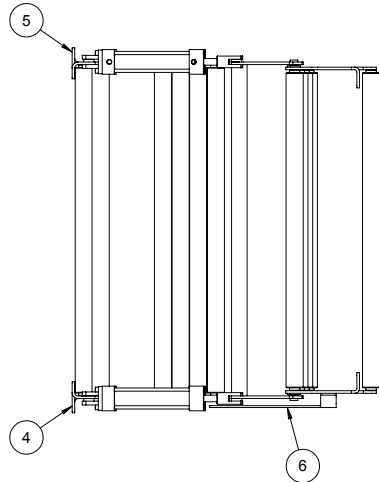
324878

B

A

[illegible][illegible]

NOTES



324968 BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	1	319236	WLDMT, ARM, DANCER
2	1	228365-001	BAR, DANCER, STATIONARY, RH
3	1	228365-002	BAR, DANCER, STATIONARY, LH
4	1	324967	BKT, CYL, RH
5	1	324967-001	BKT, CYL, LH
6	1	383408	BKT, SENSOR, PROX, DANCER
7	5	111467-004	RLR, IDL, AL, 1.660, 30 5/16 LG
8	6	111467-003	RLR, IDL, AL, 1.660, 31 5/16 LG
9	5	101811-103	SHAFT, RLR, HEX, 7/16, TAPPED 1/4-20,31 L, FRAME WIDTH, SEAL WIDTH
10	6	101811-132	SHAFT, RLR, HEX, 7/16, TAPPED 1/4-20,32 L, FRAME WIDTH, SEAL WIDTH
11	2	801962	CYL, AIR, 1-3/4 BORE, 6 STROKE, AL SQUAREHEAD, CLEVIS MNT
12	2	800439	WSHR, OILITE, 0.628 X 1.250 X 1/8 THK

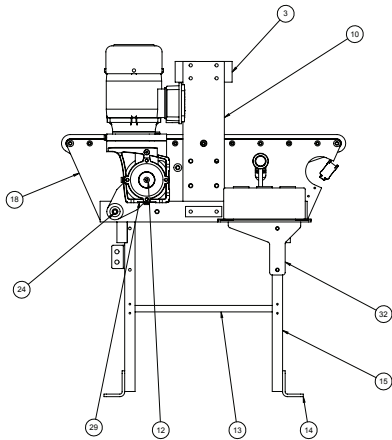
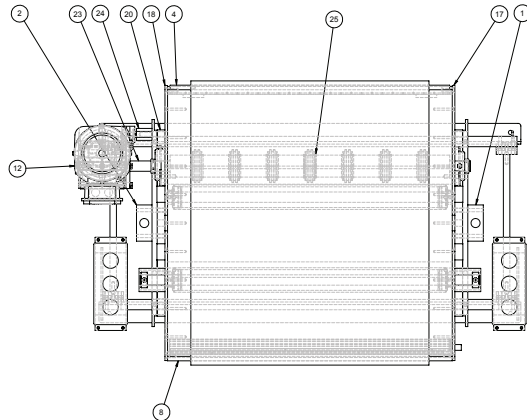
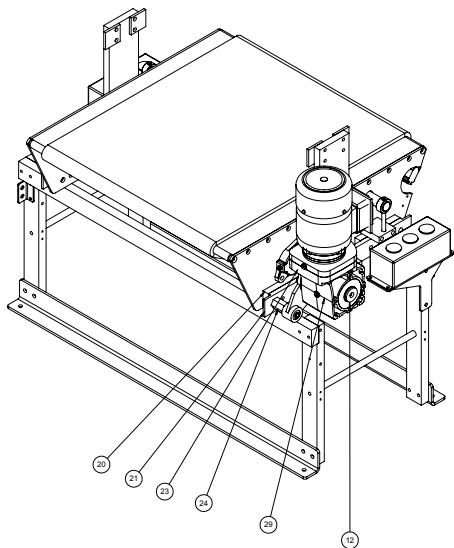
12	2	800439	WSHR, OILITE, 0.628 X 1.250 X 1/8 THK
11	2	801962	CYL, AIR, 1-3/4 BORE, 6 STROKE, AL SQUAREHEAD, CLEVIS MNT
10	6	101811-024	SHAFT, RLR, HEX, 7/16, TAPPED 1/4-20,38 L, FRAME WIDTH, SEAL WIDTH
9	5	101811-262	SHAFT, RLR, HEX, 7/16, TAPPED 1/4-20,37 L, FRAME WIDTH, SEAL WIDTH
8	6	111467-001	RLR, IDL, AL, 1.660, 38 3/8 LG
7	5	111467-006	RLR, IDL, AL, 1.660, 38 3/8 LG
6	1	383408	BKT, SENSOR, PROX, DANCER
5	1	324967-001	BKT, CYL, LH
4	1	324967	BKT, CYL, RH
3	1	228365-002	BAR, DANCER, STATIONARY, LH
2	1	228365-001	BAR, DANCER, STATIONARY, RH
1	1	319236-001	WLDMT, ARM, DANCER
ITM	QTY.	PART NUM	DESCRIPTION
324968-001 BILL OF MATERIALS			

B	3/23/2021	SRA	383408 WAS 324855
A	1/22/2020	SRA	324855 WAS 324855-001
REV	DATE	BY	NOTE

REVISIONS

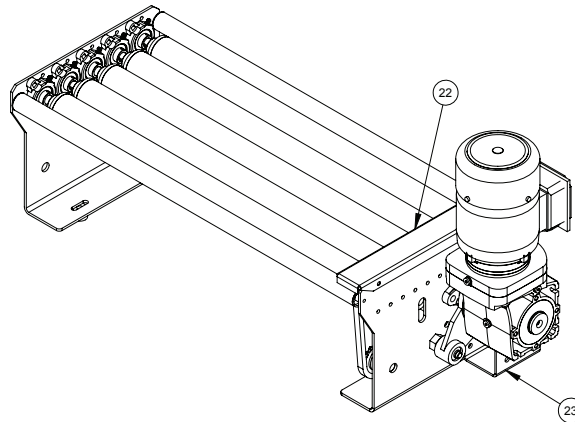
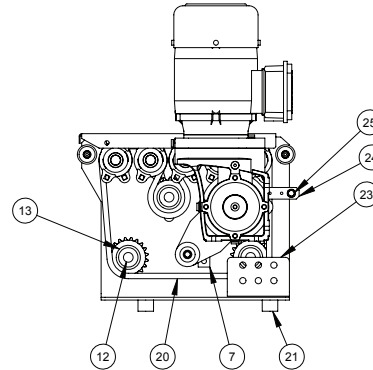
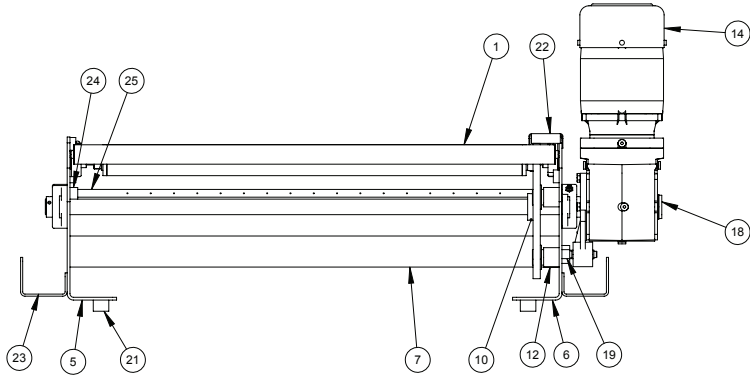
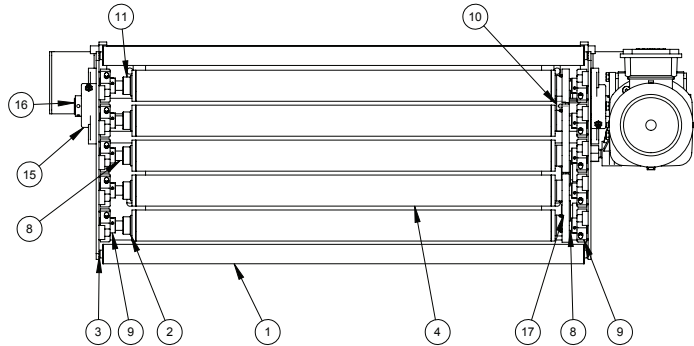
NOTES				SIZE	SCALE	MATERIAL	DESCRIPTION
• INTERPRET PER ASME Y14.5M-1994. • DIMENSIONS ARE IN INCHES [mm]. • DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY. • BREAK SHARP EDGES AND CORNERS. • PROPRIETARY NOTICE: THIS INFORMATION IS THE PROPERTY OF ARPAC LLC AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS OBTAINED. • CREATED IN SOLIDWORKS 2013.				ARPAC	1:12	SEE BILL OF MATERIALS	ASSY, DANCER, BPTW
MODEL	FILE \CONFIG SIMILAR TO	324968\324968	DATE CREATED	Wednesday, March 7, 2012 10:12:41 AM	3RD ANGLE	UNITS	NUMBER
	DATE UPDATED	Tuesday, March 23, 2021 2:32:26 PM	UPDATED BY	sarcher			
DRAFT	DATE CREATED	Friday, April 22, 2016 9:16:20 AM	DATE UPDATED	Tuesday, March 23, 2021 2:31:22 PM	TOLERANCES	FINISH	
	UPDATED BY	sarcher			X.X: ±.1/32 X.XX: ±.015 X.XXX: ±.005 ANGLES: ±1°	NONE	324968

PROVIDE 1/8" DIA. PIN



ARPA C B SIZE FORMAT 102.2

NOTES

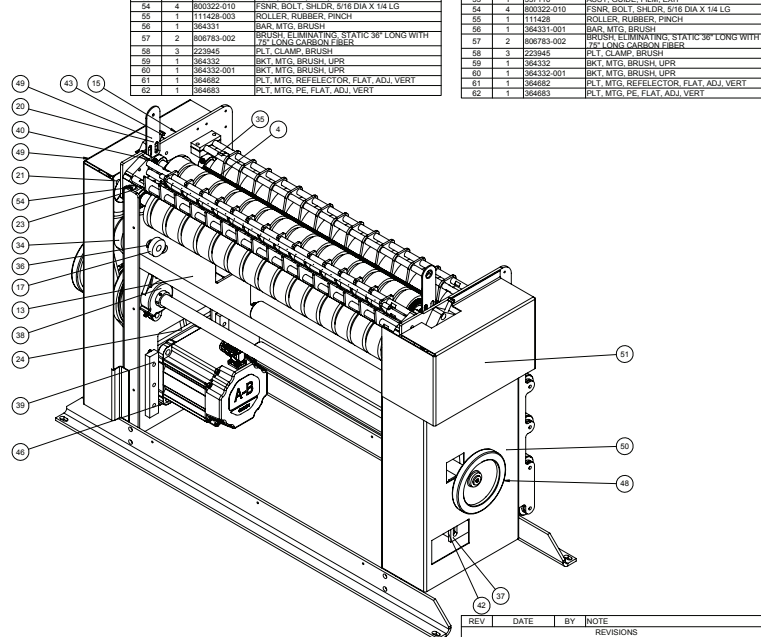


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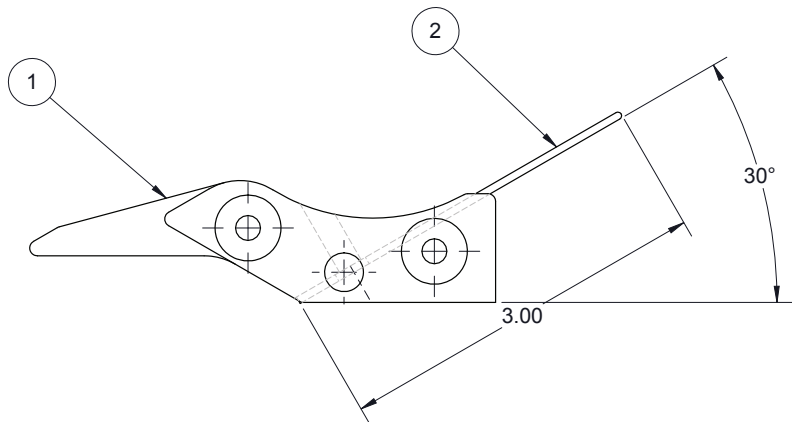
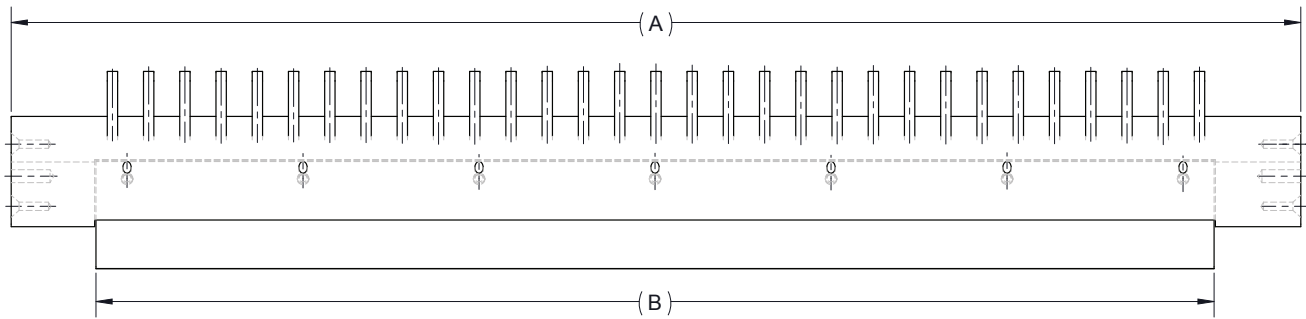
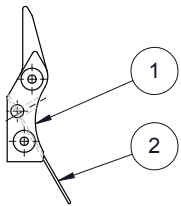
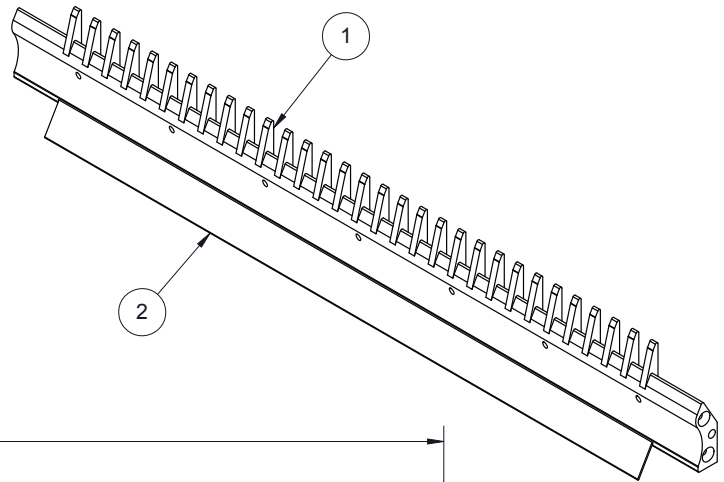
BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	2	101806-059	RLR, IDL, AL, 1.25
2	10	800275-030	FSNR, WASHER, FLAT, 5/8, SAE HARDENED
3	2	101883-007	SHAFT, RLR, HEX, 5/16, TAPPED, 10-32, 31.500 LG 31.5 31.5
4	5	123689-006	ROLLER, SLIP
5	1	324969	PLT, SIDE, CONV
6	1	324969-001	PLT, SIDE, CONV
7	1	106743	XMBR, CONV, TRANSITION
8	5	218717	SHAFT, RLR, IDLER
9	10	827119	BRG, FLG, 5/8 ID, 2 BOLT
10	1	828561	SPKT, 35B18, MOD, 1.000 BORE
11	5	800560	COLLAR, SHAFT, SET SCREW, 5/8
12	3	324961	SPACER, SPKT, IDLER
13	3	800912	SPKT, 35BB20H, IDLER, 5/8 ID
14	1	870545	MOTOR-GEARBOX, 1/2 HP, 230/460V 60HZ, 175 RPM, HELICAL BEVEL, 3/4" DIA HOLLOW SHAFT, M4 MTG, TB4, CEII, W/TORQUE ARM
15	2	827116	BRG, FLG, 1 ID, 2-BOLT, 3.89 BOLT CNTRS
16	1	324954	DRIVE SHAFT
17	5	828560	SPKT, 35BS15-5/8, 5/8" BORE, 3/16" KW & 2 SS
18	1	311656	SPECIAL WASHER
19	1	324956	ROD, HEX STANDOFF, GEARBOX ANTI-ROTATION TORQUE ARM MTG, 1" HT SHOULDER
20	1	800459	CHAIN, RLR, #35, RLR RVT, (HANAGATA-G9000408)
21	4	140369-138	SPACER, 1" OD, 13/32 ID
22	1	324862	GUARD, CHAIN
23	2	324856	BKT, LUBRICATION, 6 POINTS
24	2	364668	BKT, MTG, AIR TUBE
25	1	364669	TUBE, AIR

A	4/2/2020	SRA	ROLLER 123689-006 WAS 106740
REV	DATE	BY	NOTE

REVISIONS			
SIZE	SCALE	ARPA C 9555 W. Irving Park Rd. Skokie, Park, IL 60176 www.arpac.com	FINISH
B	1:8		
PRO-ANGLE	UNITS	NOTES	
	INCH	• INTERPRET PER ASME Y14.5M-1994.	
TOLERANCES UNLESS OTHERWISE SPECIFIED		• DIMENSIONS ARE IN INCHES (mm)	
XX: ±1/32		• DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY.	
XXX: ±0.015		• BREAK SHARP EDGES AND CORNERS.	
X.XXX: ±0.005		• PROPRIETARY NOTICE: THIS INFORMATION IS THE PROPERTY OF ARPA C LLC AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS OBTAINED.	
ANGLES: ±1°		• CREATED IN SOLIDWORKS 2013.	
FILE DETAILS			
MODEL	FILE CONFIG	324983324983	
	SIMILAR TO		
	DATE CREATED	Tuesday, April 9, 2013 5:06:00 AM	
DRAWN	DATE UPDATED	Thursday, April 2, 2020 3:06:43 PM	
	UPDATED BY	sarcher	
DATE	DATE CREATED	Thursday, April 7, 2016 1:16:29 PM	
	DATE UPDATED	Thursday, April 2, 2020 3:06:44 PM	
			NUMBER
			324983

[illegible]

PART #	A	B
325898	31.141	27.00
325898-001	37.141	33.00



2	1	129925	SS SHEET 16GA EMBOSSED, 5WL
1	1	325897	PATTERN, 304, 2B FINISH
ITEM	QTY	PART NUM	DESCRIPTION
BILL OF MATERIALS			
ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO (2) DECIMALS THREE (3) DECIMALS ANGLES	± 1/64 ± 0.010 ± 0.005 ± 0.5°
DRAWN: 4/21/2004	BY: SRA	SCALE: 1:3	SIZE: B
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		ASSY, TABLE, KNIFE, BPTW	
		DRAWING NUMBER: 325898	

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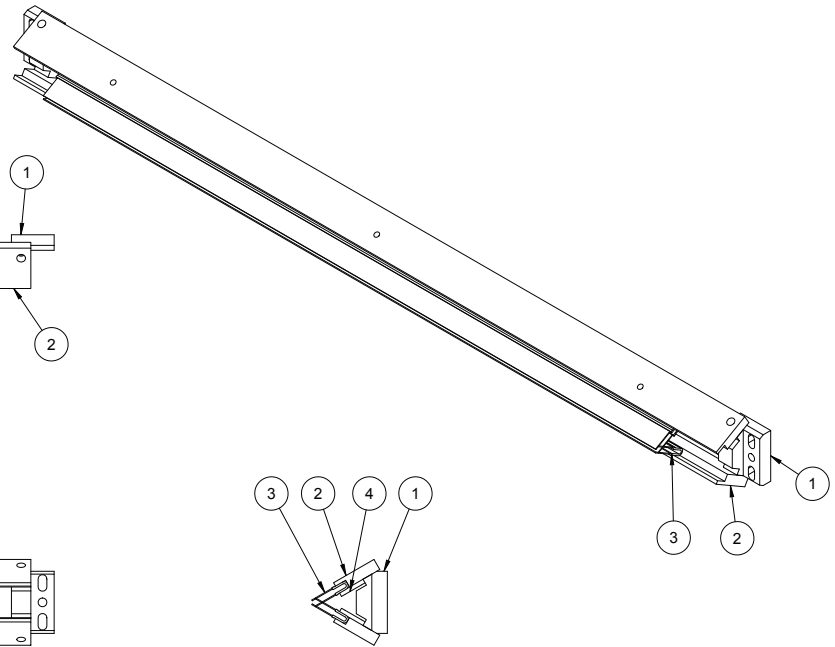
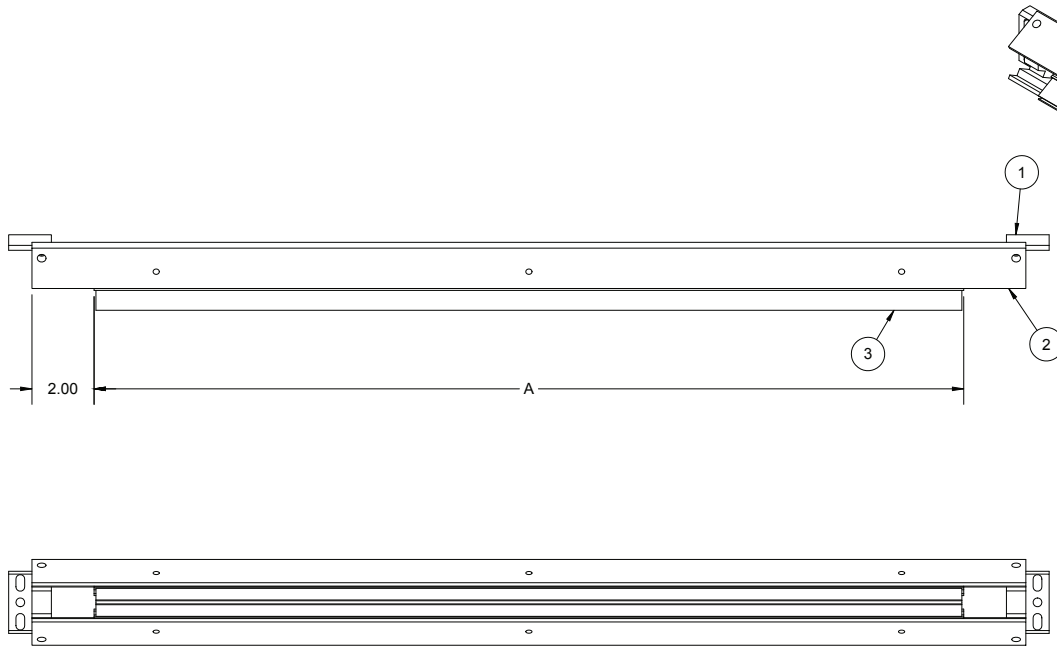
C

B

A



BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	2	370026	BLK, MTG, BRUSH
2	2	370599	BAR, MTG, BRUSH, STATIC
3	2	806783-002	BRUSH, ELIMINATING, STATIC 36" LONG WITH .75" LONG CARBON FIBER
4	6	223945	PLT, CLAMP, BRUSH



PART NUMBER	A
325958	28
325958-001	34

B	2/17/2020	SRA	370599 WAS 325957, ADDED 223945
A	1/22/2020	SRA	370026 WAS 294171
REV	DATE	BY	NOTE
REVISIONS			

NOTES			9555 W. Irving Park Rd Schiller Park, IL 60176 www.arpac.com		SIZE	SCALE	MATERIAL	DESCRIPTION
			B	1:4	SEE BILL OF MATERIALS	ASSY, BRUSH, ELIMINATION, STATIC		
	MODEL	FILE \ CONFIG	325958\325958	3RD ANGLE 	UNITS	INCH	FINISH	NUMBER
		SIMILAR TO	–					
	DATE CREATED	Monday, April 22, 2016 12:03:15 PM						
	DATE UPDATED	Monday, February 17, 2020 2:25:51 PM						
	UPDATED BY	sarcher	TOLERANCES					
			XX: ±1/32					
			X.XX: ±.015					
			X.XXX: ±.005					
			ANGLES: ±1°					
DRAFT	DATE CREATED	Monday, July 25, 2016 3:14:22 PM						
	DATE UPDATED	Monday, February 17, 2020 2:25:38 PM						
	UPDATED BY	sarcher						

D

C

B

A

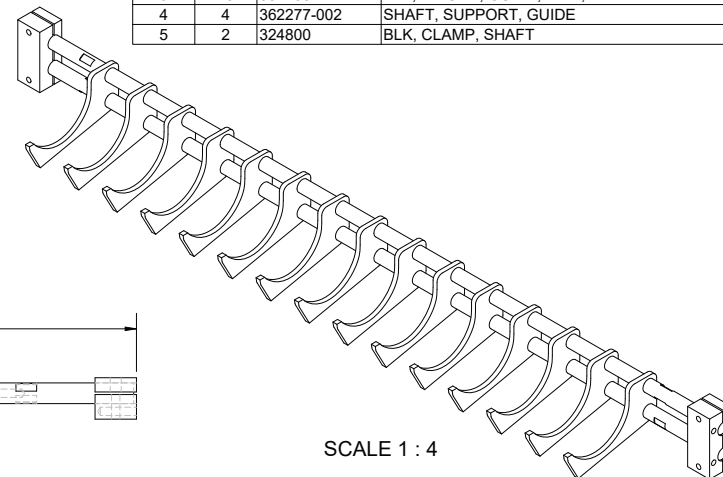
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C

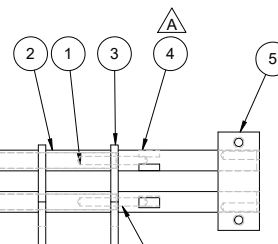
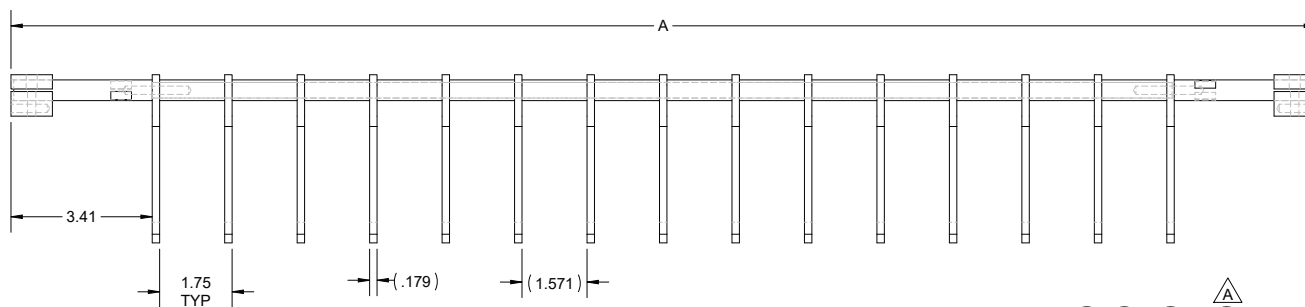
B

A

BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	2	326316-002	SHAFT, MTG, FINGER, GUIDE
2	28	357111	SPACER, FINGER, GUIDE, FILM
3	15	357108	PLT, FINGER, GUIDE, FILM, ENTRY
4	4	362277-002	SHAFT, SUPPORT, GUIDE
5	2	324800	BLK, CLAMP, SHAFT



SCALE 1 : 4



USE 1/4-20 SET SCREW TO CONNECT ITEMS 1 AND 4

PART #	A	ITEM 4
357112	31.50	362277-002
357112-001	37.50	362277-005

NOTES

- INTERPRET PER ASME Y14.5M-1994.
- DIMENSIONS ARE IN INCHES [mm].
- DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY.
- BREAK SHARP EDGES AND CORNERS.
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MODEL	FILE 1 CONFIG SIMILAR TO DATE CREATED DATE UPDATED UPDATED BY	357112/357112 - Thursday, May 12, 2016 3:09:02 PM Tuesday, March 5, 2019 1:32:51 PM hhg
DRAFT	DATE CREATED DATE UPDATED UPDATED BY	Tuesday, May 17, 2016 5:23:10 PM Tuesday, March 5, 2019 1:32:52 PM hhg

A	11/9/2018	SRA	ITEM 4 WAS PART # 326317-002	
REV	DATE	BY	NOTE	
REVISIONS				
SIZE B	SCALE 1:3	MATERIAL SEE BILL OF MATERIALS	DESCRIPTION ASSY, FINGER, GUIDE, FILM, ENTRY	
3RD ANGLE 	UNITS INCH	FINISH NONE	NUMBER 357112	
TOLERANCES X/X: ±1/32 X.XX: ±.015 X.XXX: ±.005 ANGLES: ±1°				

D

C

B

A

D

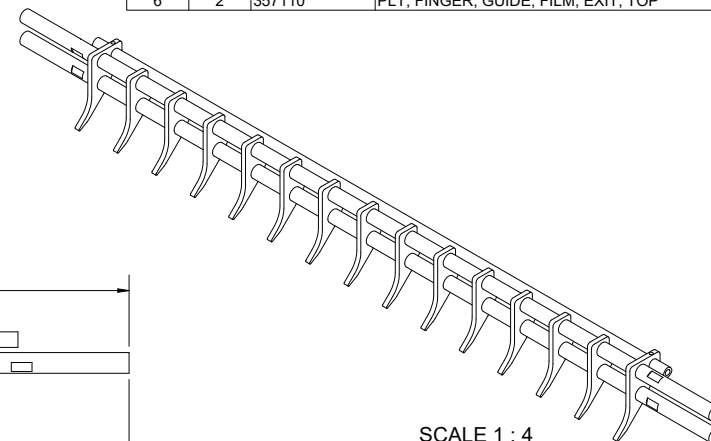
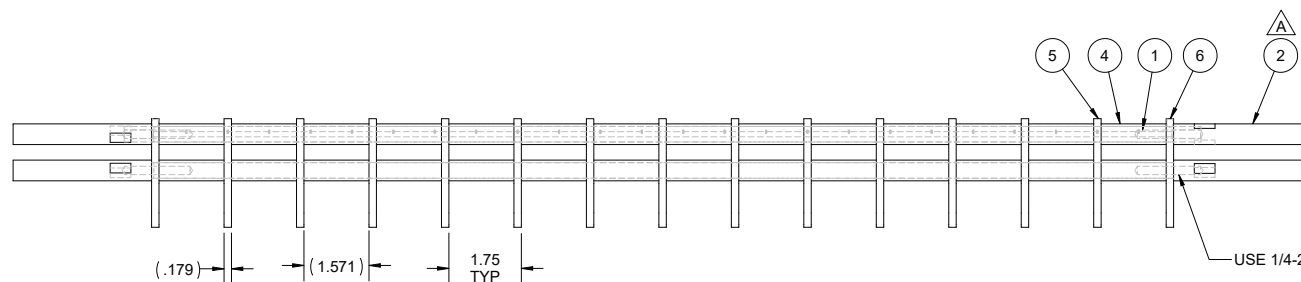
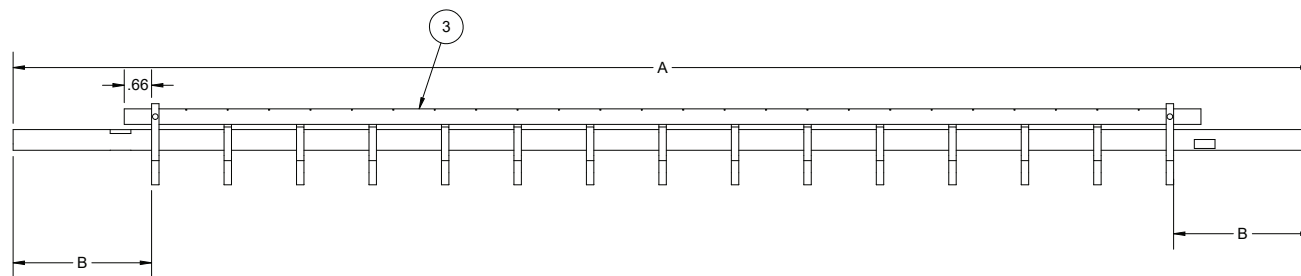
C

B

A

PART#	A	B	ITEM 1	ITEM 2	ITEM 3
357114	31.37	3.34	326316-002	362277-002	213275
357114-001	37.37	2.84	326316-007	362277-005	213275-001

BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	2	326316-002	SHAFT, MTG, FINGER, GUIDE
2	4	362277-002	SHAFT, SUPPORT, GUIDE
3	1	213275	TBG, GUIDE, FILM
4	28	357111	SPACER, FINGER, GUIDE, FILM
5	13	357113	PLATE, FINGER, GUIDE, FILM, UPPER
6	2	357110	PLT, FINGER, GUIDE, FILM, EXIT, TOP



SCALE 1 : 4

USE 1/4-20 SET SCREW TO CONNECT ITEMS 1 AND 2

A	11/9/2018	SRA	ITEM 2 PART # WAS 326317-002	
REV	DATE	BY	NOTE	
REVISIONS				
SIZE	SCALE	MATERIAL	DESCRIPTION	
B	1:3	SEE BILL OF MATERIALS	ASSY, GUIDE, FILM, EXIT, UPPER	
3RD ANGLE	UNITS			
	INCH			
TOLERANCES			NUMBER	
X/X: ±1/32			357114	
X.XX: ±.015				
X.XXX: ±.005				
ANGLES: ±1°				
		FINISH		
		NONE		

NOTES

- INTERPRET PER ASME Y14.5M-1994.
- DIMENSIONS ARE IN INCHES [mm].
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FILE \CONFIG	357114\357114
SIMILAR TO	-
DATE CREATED	Thursday, May 12, 2016 1:47:25 PM
DATE UPDATED	Monday, March 4, 2019 6:42:45 PM
UPDATED BY	hhg
DATE CREATED	Tuesday, May 17, 2016 4:20:00 PM
DATE UPDATED	Tuesday, March 5, 2019 3:27:55 PM
UPDATED BY	hhg

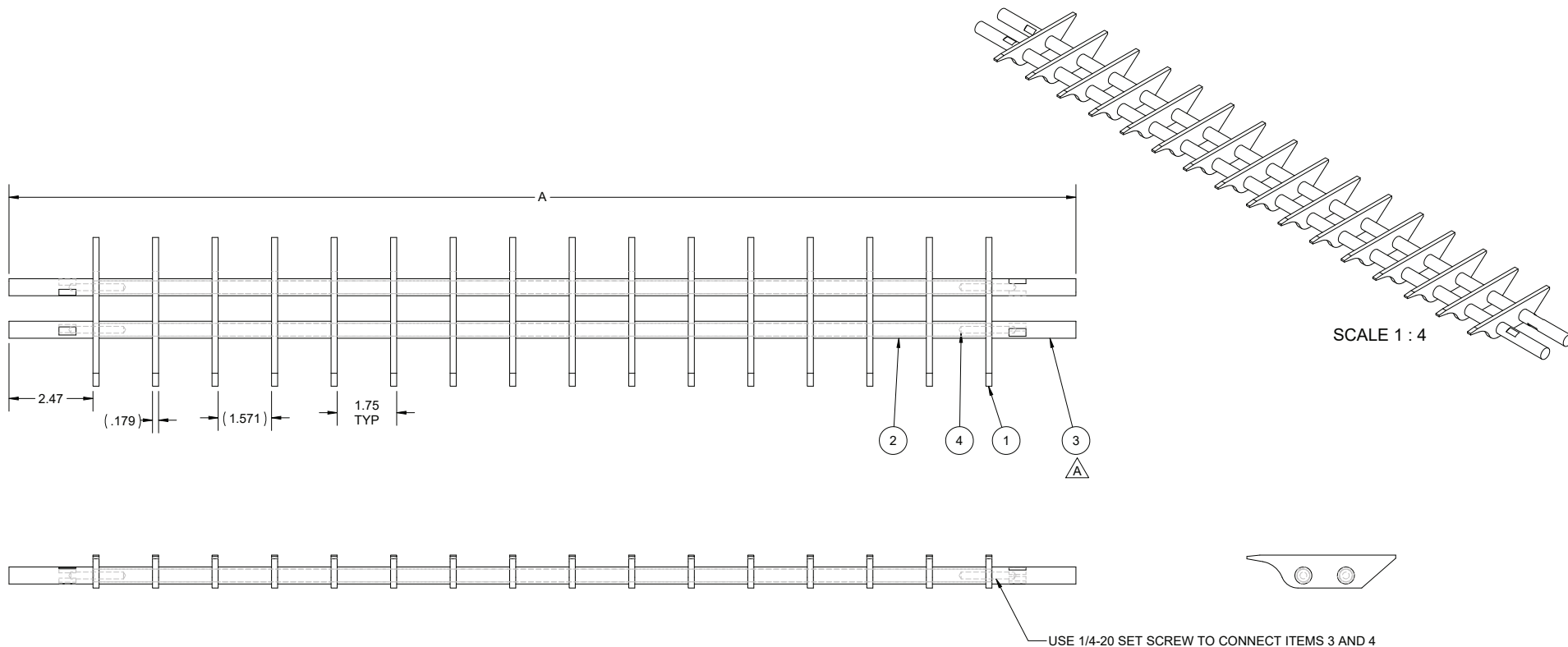
D

C

B

A

BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	16	357109	PLT, FINGER, GUIDE, FILM, EXIT, LWR
2	30	357111	SPACER, FINGER, GUIDE, FILM
3	4	362277	SHAFT, SUPPORT, GUIDE
4	2	326316	SHAFT, MTG, FINGER, GUIDE



PART #	A	ITEM 3	ITEM 4
357115	31.37	362277	326316
357115-001	37.37	362277-004	326316-006

NOTES

- INTERPRET PER ASME Y14.5M-1994.
- DIMENSIONS ARE IN INCHES [mm].
- DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY.
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MODEL	FILE 1 CONFIG SIMILAR TO	357115/Default
DRAFT	DATE CREATED DATE UPDATED UPDATED BY	Tuesday, May 10, 2016 10:58:17 AM Tuesday, March 5, 2019 3:08:49 PM hhg
DRAFT	DATE CREATED DATE UPDATED UPDATED BY	Tuesday, May 17, 2016 4:29:36 PM Tuesday, March 5, 2019 3:08:50 PM hhg

A	11/9/2018	SRA	ITEM 3 PART # WAS 326117	
REV	DATE	BY	NOTE	
REVISIONS				
SIZE B	SCALE 1:3	MATERIAL SEE BILL OF MATERIALS		DESCRIPTION ASSY, GUIDE, FILM, EXIT, LOWER
3RD ANGLE 	UNITS INCH	FINISH NONE		NUMBER 357115
TOLERANCES X/X: ±1/32 X.XX: ±.015 X.XXX: ±.005 ANGLES:				

D

C

B

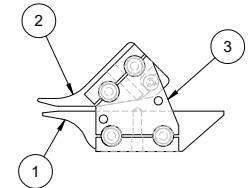
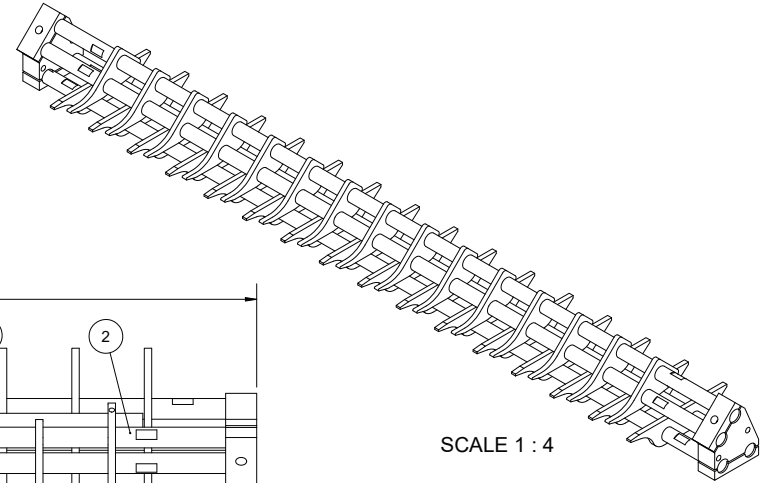
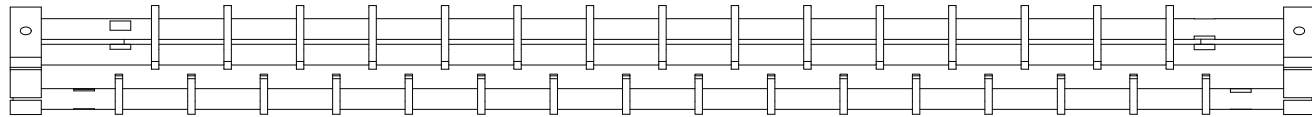
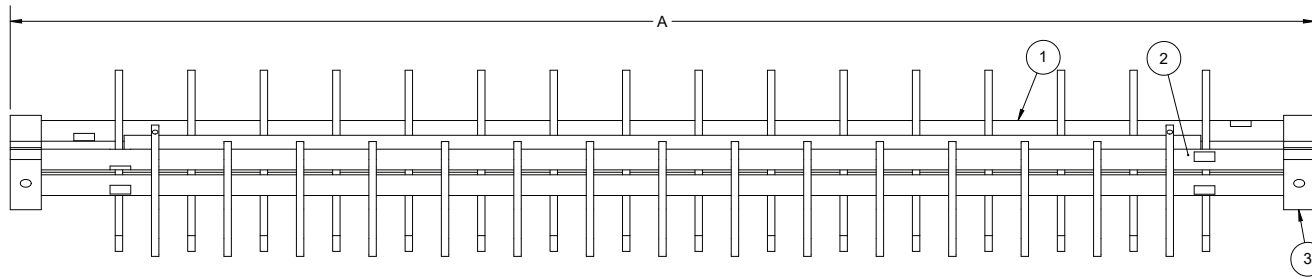
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ARPAC B SIZE FORMAT R4

2

2

BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	1	357115	ASSY, GUIDE, FILM, EXIT, LOWER
2	1	357114	ASSY, GUIDE, FILM, EXIT, UPPER
3	2	326357	BLK, CLAMP, SHAFT



1

1

PART #	A
357116	31.50
357116-001	37.50

NOTES

- INTERPRET PER ASME Y14.5M-1994.
- DIMENSIONS ARE IN INCHES [mm].
- DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY.
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www.arpac.com

MODEL	FILE \CONFIG SIMILAR TO DATE CREATED DATE UPDATED UPDATED BY	357116\357116 Tuesday, May 17, 2016 4:40:49 PM Tuesday, March 5, 2019 3:33:08 PM hhg
DRAFT	DATE CREATED DATE UPDATED UPDATED BY	Tuesday, May 17, 2016 5:03:09 PM Tuesday, March 5, 2019 3:33:18 PM hhg

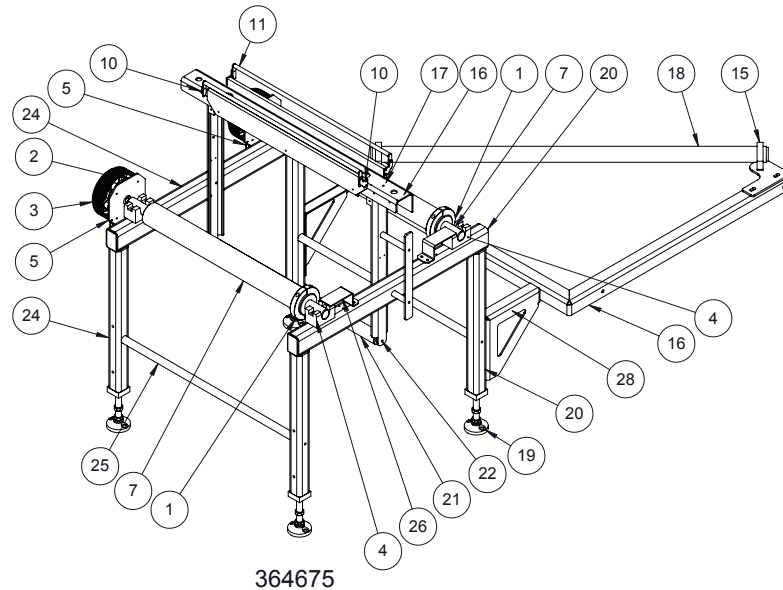
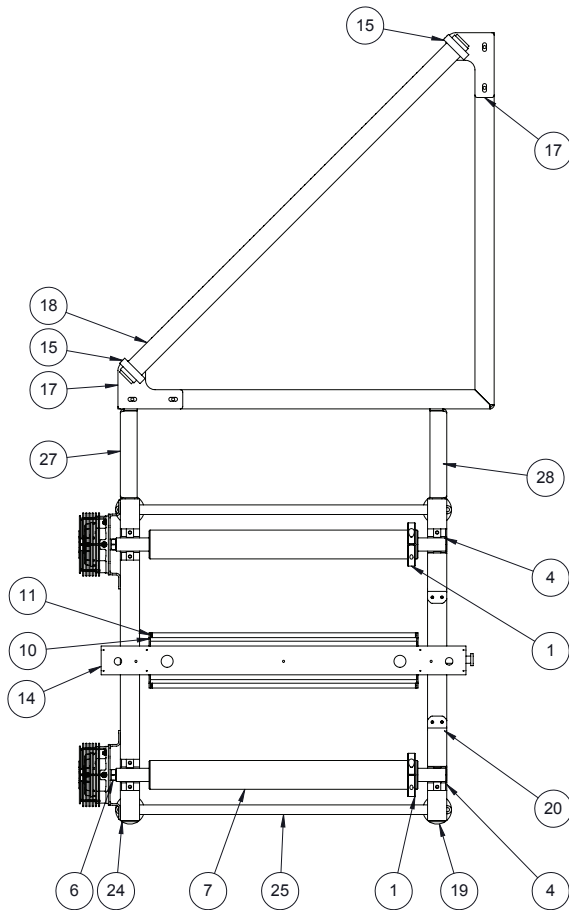
REV	DATE	BY	NOTE
REVISIONS			
SIZE B	SCALE 1:3	MATERIAL SEE BILL OF MATERIALS	DESCRIPTION ASSY, GUIDE, FILM, EXIT
3RD ANGLE 	UNITS INCH	FINISH NONE	NUMBER 357116
TOLERANCES X.X: ±1/32 X.XX: ±.015 X.XXX: ±.005 ANGLES: ±1°			

D

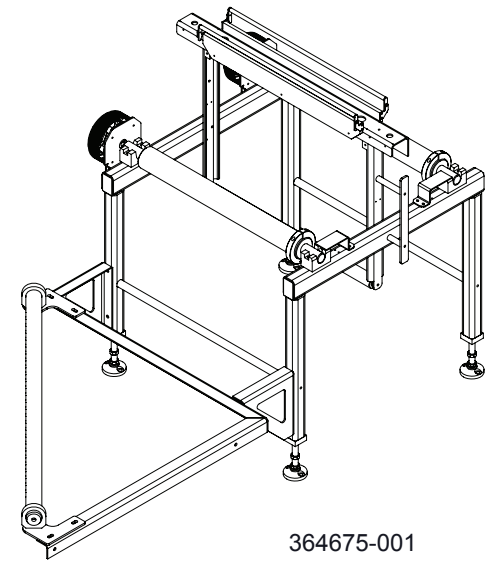
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B

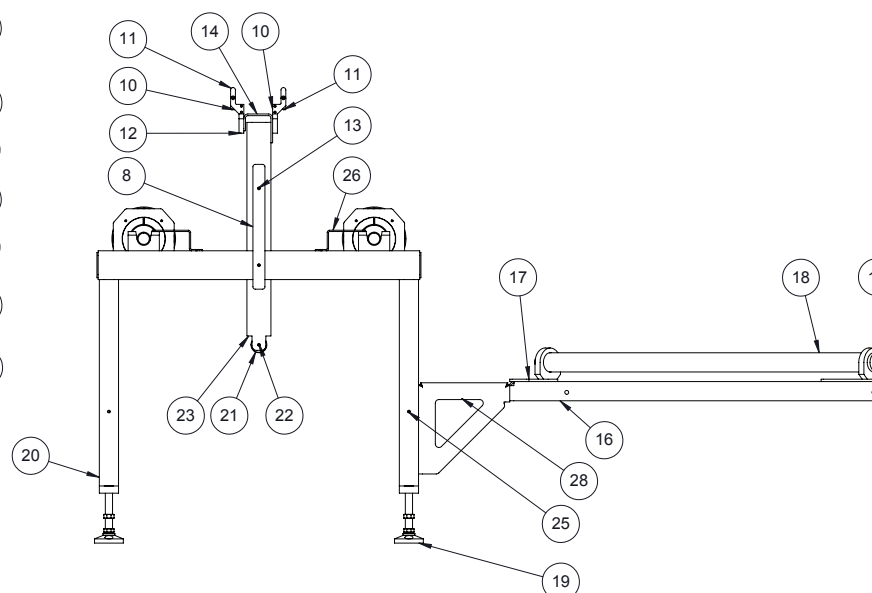
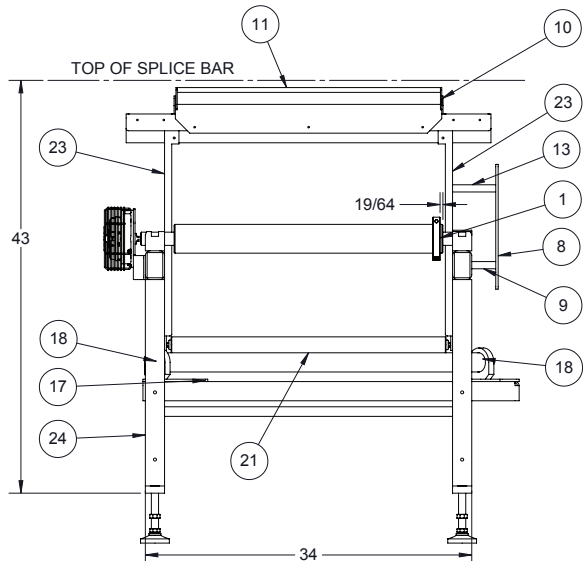
A



364675



364675-001



NOTE: ITEMS 29 AND 30 NOT SHOWN

28	1	364705	WLDMNT, ANGLE, MTG, 45 DEG BAR
27	1	364705-001	Default
26	2	230769	GUARD, PHOTO-EYE, RACK, FILM
25	2	118861-003	ROD, AL, 1.000, TAPPED, 1/4-20
24	1	364677	WLDMT, FRAME, SIDE, LH
23	2	203688-001	CHANNEL, MNT
22	1	101811-117	SHAFT, RLR, HEX, 7/16, TAPPED 1/4-20, 29.5 L, FRAME WIDTH, SEAL WIDTH
21	1	111467-005	RLR, IDL, AL, 1.660, 28 1/2 LG
20	1	364678	WLDMT, FRAME, SIDE, RH
19	4	841410	LEVELER, ARTICULATING, 7400 # CAP, 3/4-10 STEM, 9.5 HIGH, CRS 3" BASE, 2 C'SUNK LAG HOLES, HEAVY LIP ON BASE
18	1	111487	BAR, AIR TURNING
17	2	224014	BKT, MTG, BAR, AIR
16	1	357266	ANGLE, MTG, BAR, AIR, 45 DEG
15	2	111488	COLLAR, BAR, TURNING
14	1	230538	ANGLE, MTG, BAR, SPLICE
13	1	203700	ROD, TAPPED 1/4-20
12	2	227577	PAD, CLAMP, SPLICE BAR
11	2	106883	BAR, CLAMP
10	4	106880	PIVOT, CLAMP
9	1	129243	SPACER, SUPPORT, HOSE, AIR
8	1	129242	PLT, SUPPORT, HOSE, AIR
7	2	825453	SHAFT, AIR, 3" DIA X 28" BODY X 35" LG LUG STYLE, W/AIR VALVE & AIR TOOL
6	2	111486	SHAFT, BRAKE
5	2	203690	BKT, MTG, AIR BRAKE
4	4	111483	BLK, BRG, FILM SHAFT
3	2	805989	GUARD, FINGER, CLUTCH #5450 HORTON CLUTCH
2	2	805988	BRAKE, FRICTION, AIR 1-1/8 BORE NO S450
1	2	800573	COLLAR, SHAFT, HINGED, 2-15/16 ID 4-1/2 OD X 3/4 W

ITEM QTY PART NUM DESCRIPTION

BILL OF MATERIALS

ARPAC 9511 WEST RIVER ST.
SCHILLER PARK, IL 60176

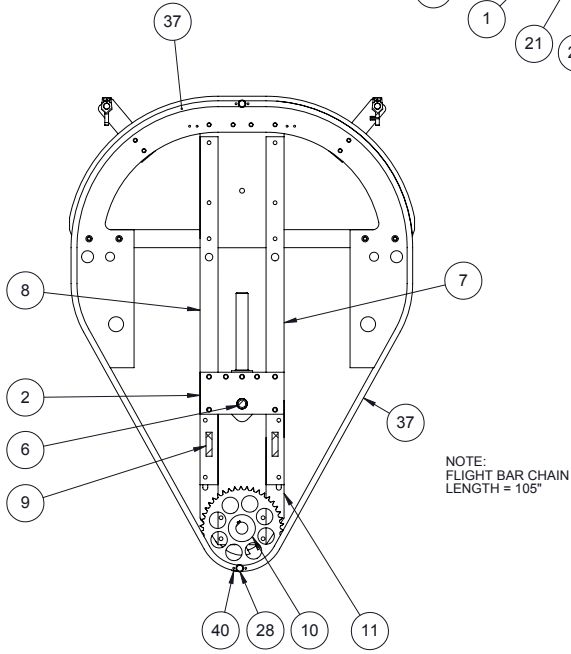
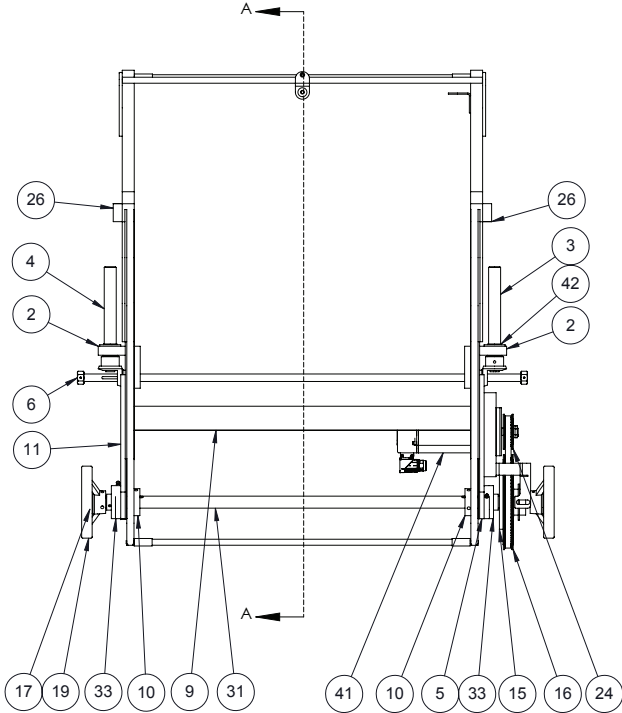
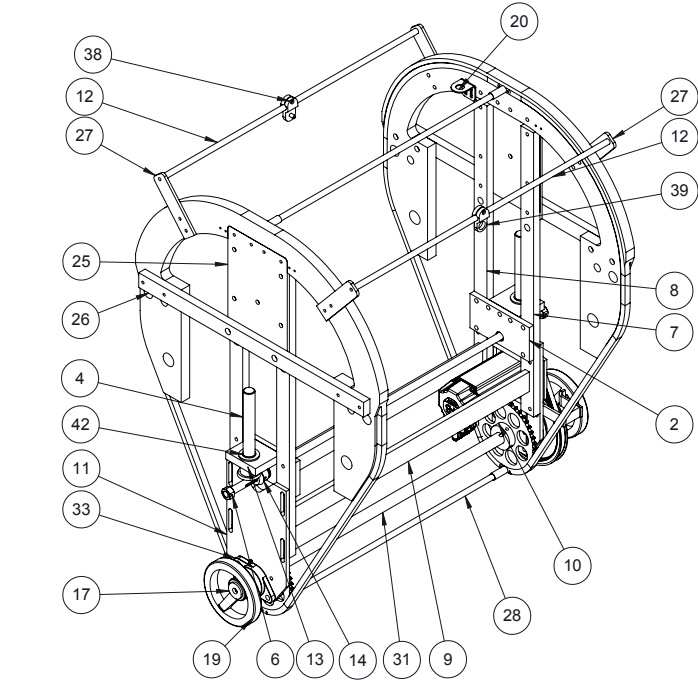
UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONAL TOLERANCES:
FRACTIONS ± 1/64
TWO (2) DECIMALS ± 0.010
THREE (3) DECIMALS ± 0.005
ANGLES ± 0.5°

DRAWN: 11/18/2019 BY: HG SCALE: 1:10 SIZE: C

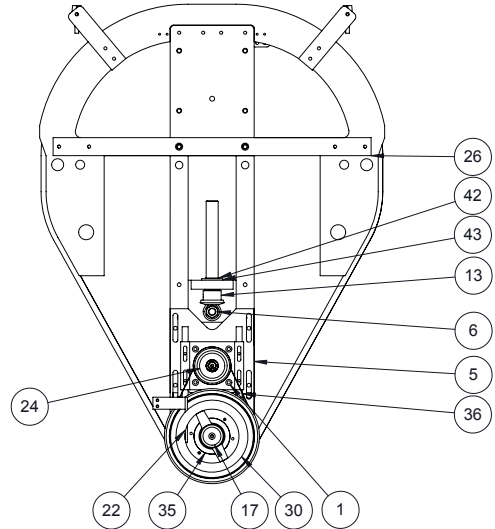
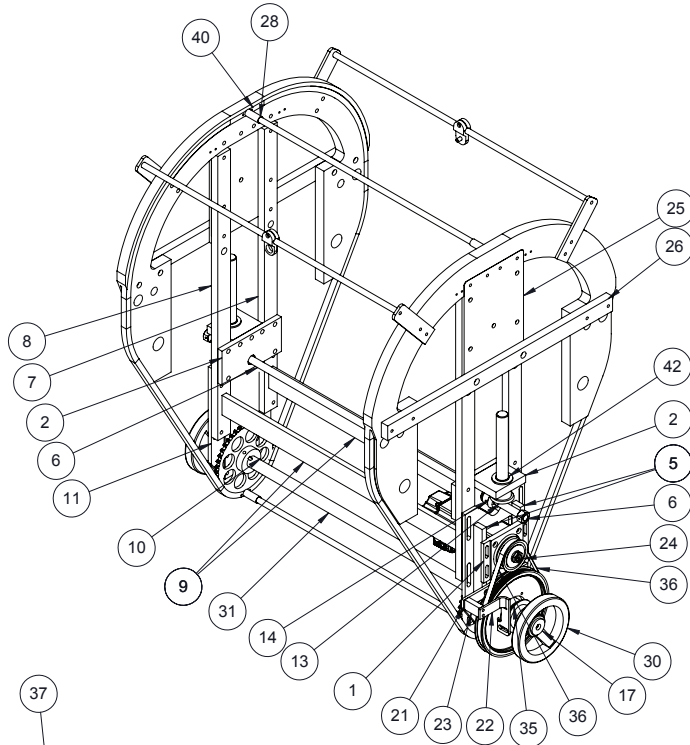
FILENAME: 364675

DESCRIPTION: ASSY, RACK, FILM, BPTW

DRAWING NUMBER: 364675



SECTION A-A



BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	1	319221	PLT, MTG, SERVOMOTOR, OVERWRAP
2	2	106751	MITER GEAR BRACKET
3	1	364685	SCREW, 1-8 RH
4	1	364686	SCREW, 1-8 LH
5	1	106754	DRIVE SHAFT MTG PLATE WELDMENT, BPTW-70
6	1	106757	SHAFT, ADJUSTABLE, A = 37.50"
7	2	106759	FLIGHT BAR FRAME R.H.
8	2	106760	FLIGHT BAR FRAME L.H.
9	2	106782	BAR, FLIGHT, CROSS MEMBER
10	2	111544	FLIGHT BAR DRIVE SPROCKET
11	1	111758	PLT, MTG, SHAFT, DRIVE
12	2	117051	DRAG STRIP MTG BAR
13	2	117310	BEVEL, GEAR, 27T, MOD
14	2	117311	GEAR, BEVEL, 18T, MOD, 5/8 BORE & KEYWAY
15	1	119483	ADAPTOR, TORQUE LIMITER
16	1	120071	SPROCKET, TORQUE LIMITER, OVERWRAP
17	2	125668-003	SPACER
18	2	126312	MTL, CURTAIN, RED, 6" X 36"
19	1	138129	HANDWHEEL, MOD, AL, 2-SPOKE, 1 BORE
20	1	102675	BKT, MTG, PHOTOEYE, ADJ, VER, LG,
21	1	203746-001	PLT, MNT, PROX
22	1	203747-001	BRKT, PROX, MNT
23	1	203748-001	SPACER, PROX
24	1	231362	SPKT, DRIVE, SERVO
25	2	231384	PLT, TRACK CONN
26	2	231385	BAR, CONNECTOR, TRACK, FLIGHT BAR
27	4	364684	PLT, MTG, ROD
28	2	364687	FLIGHT BAR, OVERWRAP
29	2	364670	PROFILE, CHAIN, FLIGHT BAR TOP
30	1	364064	HANDWHEEL, MOD, AL, 2 SPOKE, 0.813 BORE
31	1	364067	SHAFT, DRIVE, A = 37.625"
32	4	800523	CHN, LINK, CONN, #40, OFFSET
33	2	802760	BRG, FLG, 1.0 ID, 2-BOLT
34	1	802981	SPACER, FULL ROUND, (PURCH IN 8 FT SECT)
35	1	803970	LIMITER, TORQUE, 200-400, 13/16" BORE
36	1	806316-002	BELT, TIMING, 8MM P, 12MM W, 720MM LG,
37	1	806853	CHAIN, RLR, DBL, PITCH
38	1	836993	REFLECTOR MOUNT
39	1	836994	SENSOR HOLDER, 1/2" ROD, 3/4" BORE
40	4	840749	LINK, CONN, C2040DL, D-5, 25" DIA THRU HARD, 3/4" LG EXT
41	1	849460	MOTOR, SERVO, 37 IN-LB, 4750 RPM, 460VAC, W/BRAKE, KINETIX 5000 CONTROLLER
42	2	846213	WASHER, SHIM, .75 ID X 1.125 OD X .0625 THK, SS
43	2	809046	WSHR, OILITE, 0.752 X 1.755 X 1/8 THK

NOTE: ITEMS 18, 32, 34 NOT SHOWN

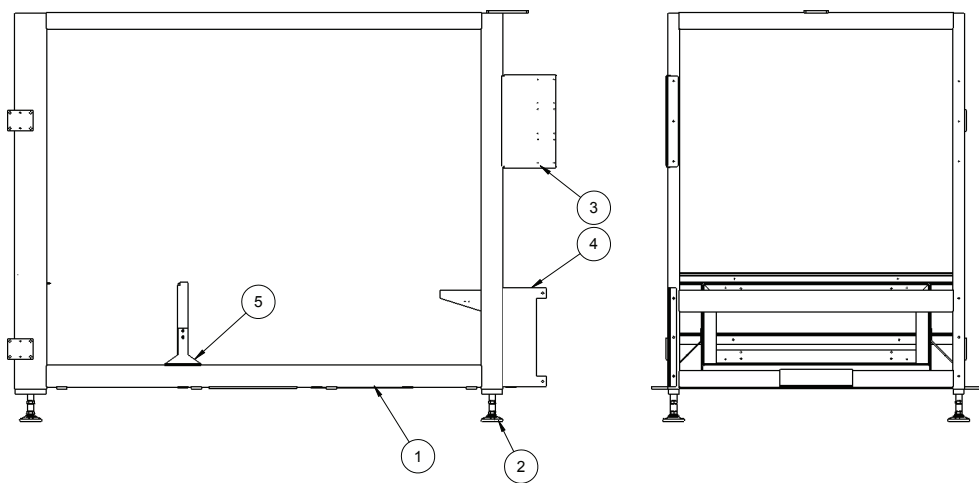
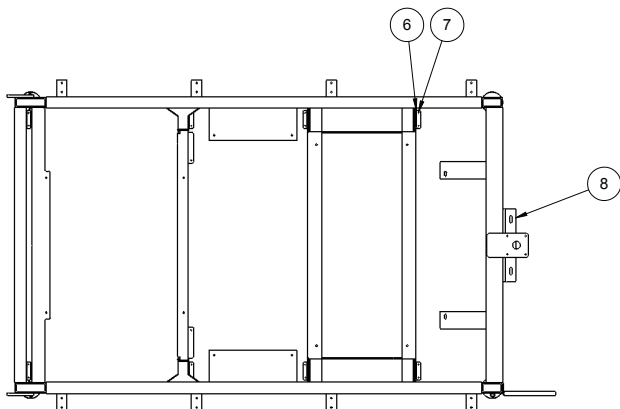
REVISIONS			
REV	DATE	BY	NOTE
A	3/2/2020	SRA	WASHER 846213 WAS COLLAR 807096
REV	DATE	BY	NOTE
REVISIONS			
SIZE	SCALE	MATERIAL	DESCRIPTION
C	1:8	SEE BILL OF MATERIALS	ASSY, FLIGHT BAR, OVERWRAP ADJUSTABLE, A-B MOTOR W/BRAKE, FLIGHT BAR = 28.00"
TOLERANCES		FINISH	NUMBER
3RD ANGLE			
X.X: ±1/32			
X.XX: ±0.015			
X.XXX: ±0.005			
ANGLES: ±1°			
			364680

D

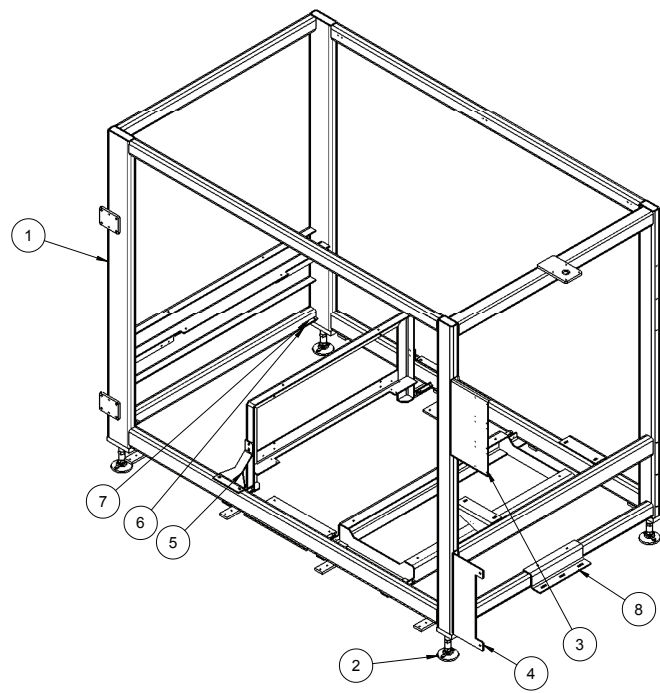
C

B

A



BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	1	364689	WELDED, FRAME, BPTW
2	4	841409	LEVELER, ARTICULATING, 20000 # CAP, 1-8 STEM, 9.88 HIGH, CRS 4" BASE, 2 C'SUNK LAG HOLES, HEAVY LIP ON BASE
3	1	364326	BKT, MTG, BOX, PUSHBUTTON
4	1	368844	BKT, MTG, BOX, JUNCTION
5	2	364901	ANGLE, REINFORCEMENT
6	10	364902	ANGLE, MTG, WIREWAY
7	10	364903	PLT, CLAMP
8	1	370503	BKT, MTG, CONDUIT



REVISIONS			
REV	DATE	BY	NOTE
A	1/30/2020	SRA	ADDED BRACKET 370503
REVISIONS			
SIZE		SCALE	MATERIAL
B		1:24	SEE BILL OF MATERIALS
3RD ANGLE		UNITS	DESCRIPTION
		INCH	ASSY, FRAME, BPTW
TOLERANCES		FINISH	NUMBER
X.X: ±1/32 X.XX: ±.015 X.XXX: ±.005 ANGLES: ±1°		NONE	364690

NOTES		ARPAC	
- INTERPRET PER ASME Y14.5M-1994. - DIMENSIONS ARE IN INCHES [mm]. - DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY. - BREAK SHARP EDGES AND CORNERS. - PROPRIETARY NOTICE: THIS INFORMATION IS THE PROPERTY OF ARPAC LLC AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS OBTAINED. - CREATED IN SOLIDWORKS 2013.		9555 W. Irving Park Rd Schiller Park, IL 60176 www.arpac.com	
MODEL	FILE \ CONFIG	DATE CREATED	DATE UPDATED
	SIMILAR TO	Tuesday, November 5, 2013 1:34:47 PM	Thursday, January 30, 2020 5:33:39 PM
DRAFT	DATE CREATED	DATE UPDATED	UPDATED BY
	Friday, July 22, 2016 2:33:55 PM	Thursday, January 30, 2020 5:36:07 PM	sarcher

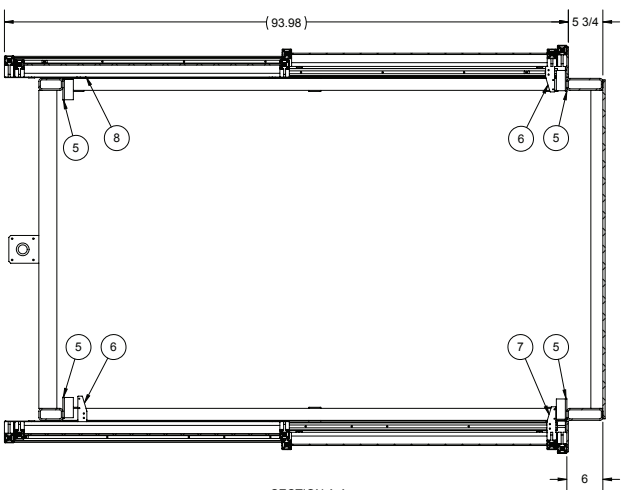
ARPAC SIZE FORMAT R4

D

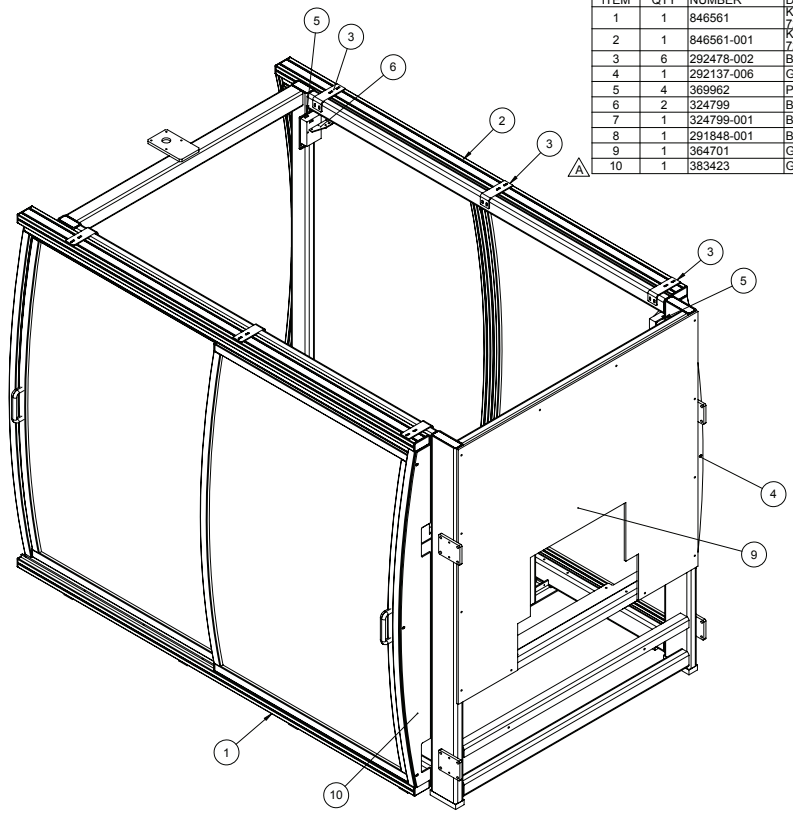
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B

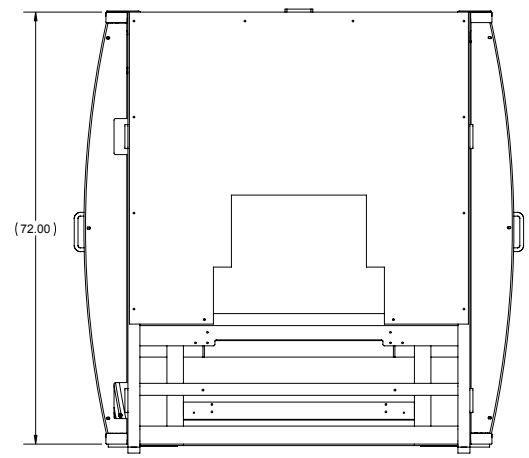
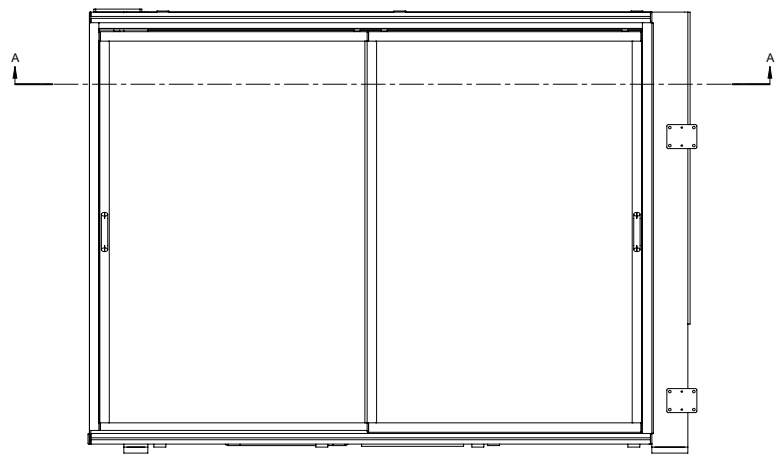
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SECTION A-A



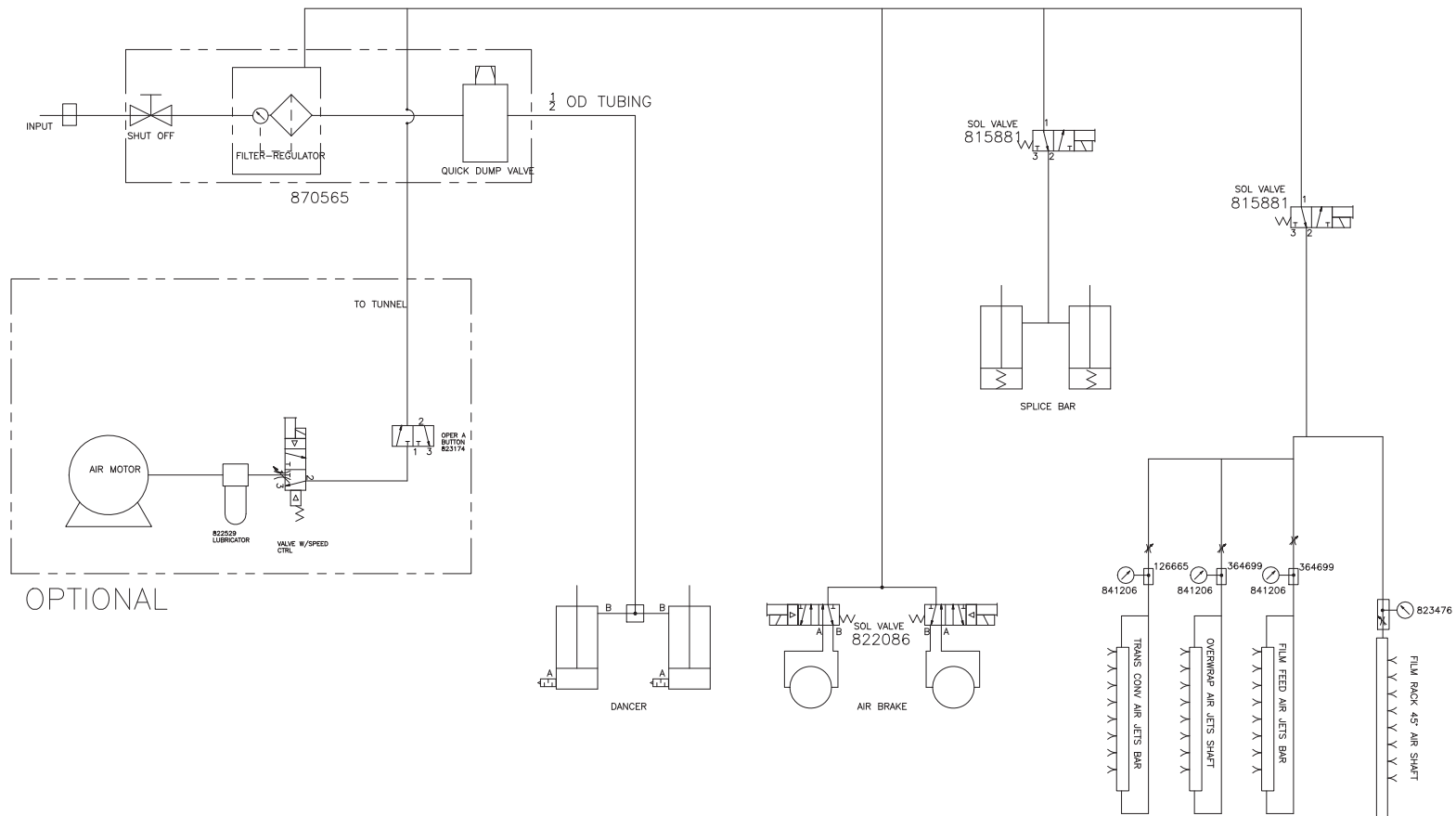
BILL OF MATERIALS			
ITEM	QTY	NUMBER	DESCRIPTION
1	1	846561	KIT, DOOR, GUARD, W/LEXAN, AL EXTRUSION, 72 H X 93-47/64 LG, LH
2	1	846561-001	KIT, DOOR, GUARD, W/LEXAN, AL EXTRUSION, 72 H X 93-47/64 LG, RH
3	6	292478-002	BKT, MTG, ASSY, DOOR, TOP
4	1	292137-006	GUARD, END, DOORS
5	4	369962	PLT, MTG, SWITCH, DOOR
6	2	324799	BKT, MTG, PIN, SWITCH, DOOR, 4.25IN
7	1	324799-001	BKT, MTG, PIN, SWITCH, DOOR, 4.25IN
8	1	291848-001	BKT, MTG, PIN, SWITCH, DOOR, 2.5IN, LH
9	1	364701	GUARD, LEXAN, ENTRANCE, BPTW
10	1	383423	GUARD, END, DOORS, NOTCHED



A	4/1/2021	SRA	ADDED 383423
REV	DATE	BY	NOTE

REVISIONS			
SIZE	SCALE	MATERIAL	DESCRIPTION
C	1:16	SEE BILL OF MATERIALS	ASSY, GUARD, SLIDING DOOR, BPTW-6000
3RD ANGLE	UNITS	FINISH	NUMBER
	INCH	NONE	364700
TOLERANCES		ANGLES	
XX: ±1/32		XX: ±0.05	
X.XX: ±0.015		X.XX: ±0.005	
ANGLES: ±1°			

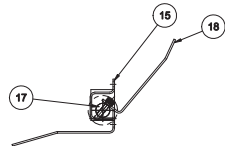
NOTES		ARPAC	
• INTERPRET PER ASME Y14.5M-1994.		364700/364700	
• DIMENSIONS ARE IN INCHES (mm).		Monday, July 25, 2016 5:15:23 PM	
• DIMENSIONS IN PARENTHESES FOR REFERENCE ONLY.		Thursday, April 1, 2021 5:39:10 PM	
• BREAK SHARP EDGES AND CORNERS.		sarcher	
• PROPRIETARY NOTICE: THIS INFORMATION IS THE PROPERTY OF ARPAC LLC AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS OBTAINED.		Friday, July 29, 2016 3:40:09 PM	
• CREATED IN SOLIDWORKS 2013.		Thursday, April 1, 2021 4:58:21 PM	
		sarcher	



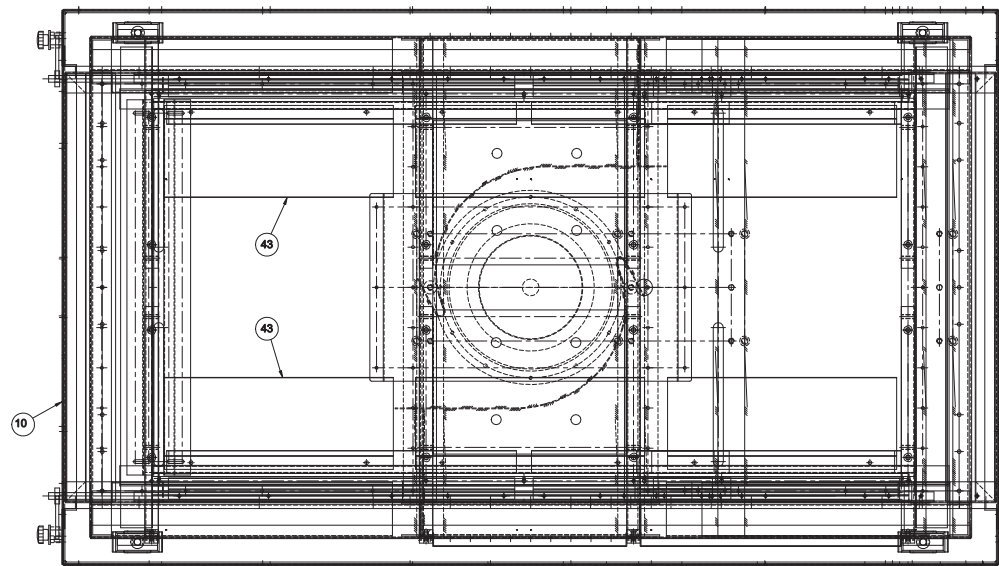
ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO (2) DECIMALS THREE (3) DECIMALS ANGLES	± 1/64 ± 0.010 ± 0.005 ± 0.5°
DRAWN: 11/18/2019	BY: HG	SCALE: NONE	SIZE: B
RELEASED:	FILENAME: 364706	APPROVED BY:	
DESCRIPTION: ASSY, PNEUMATIC, 24 VDC			
BPTW-6000			
			DRAWING NUMBER: 364706



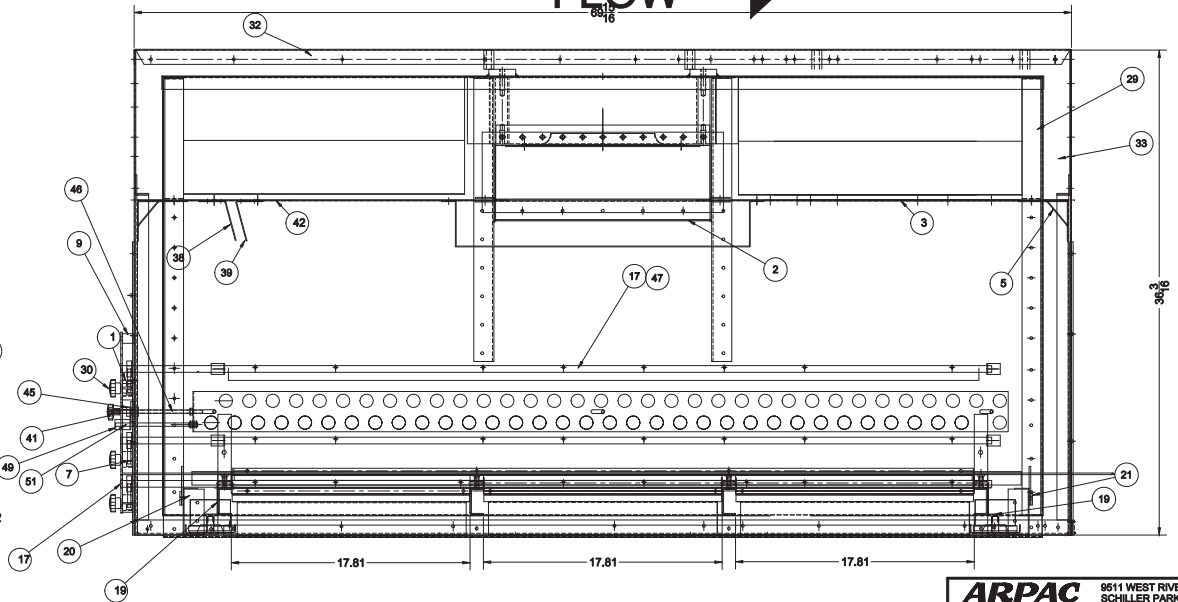
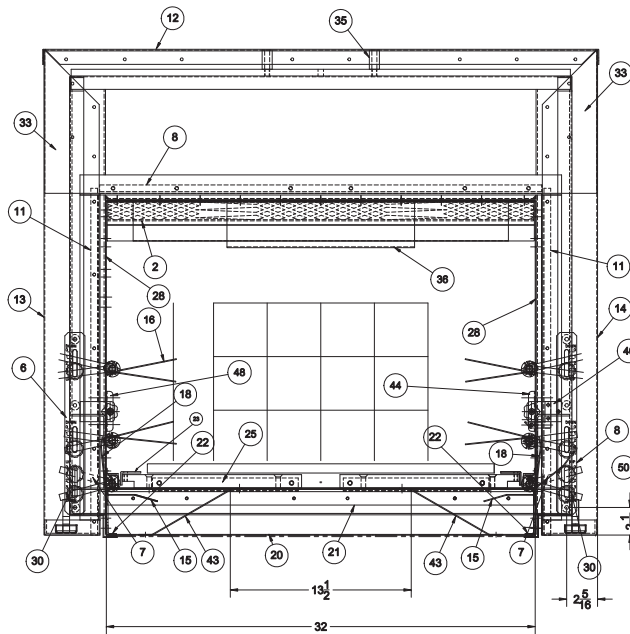
SECTION B-B



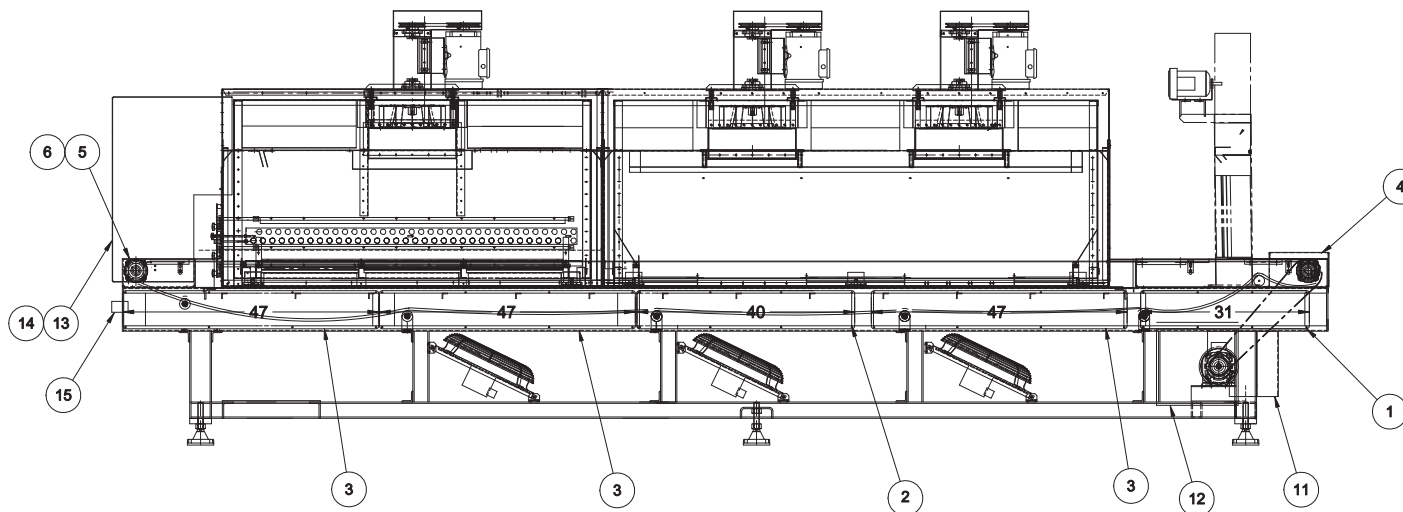
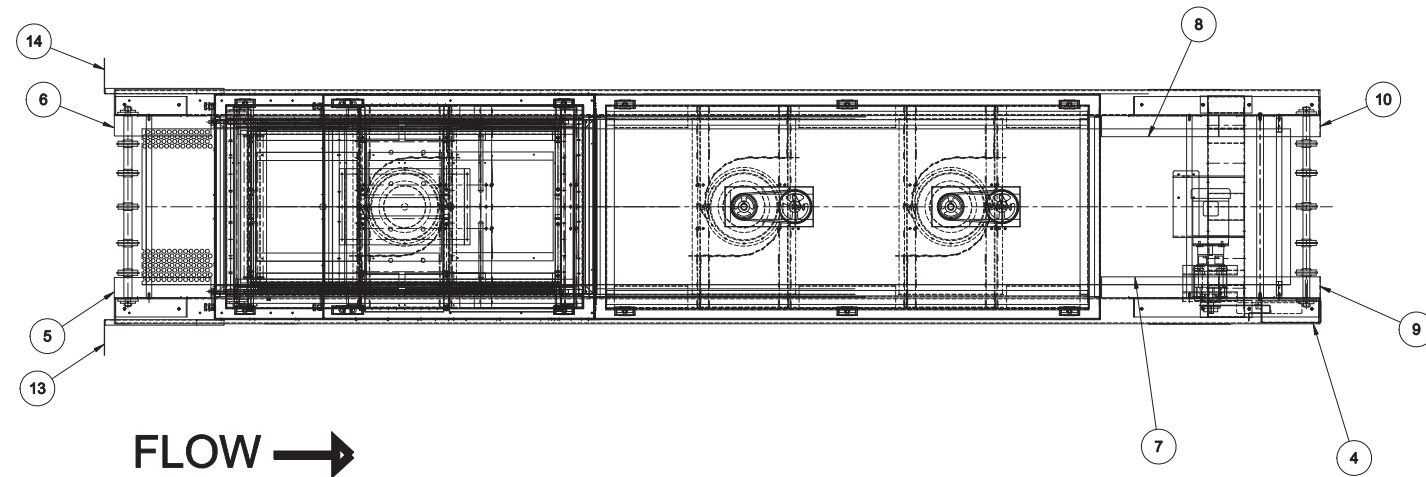
PREASSEMBLY IT.15
WITH SHAFT IT.17 AND
AIR CONTROL PLT IT.18
PRIOR TO GENERAL ASSEMBLY



FLOW →

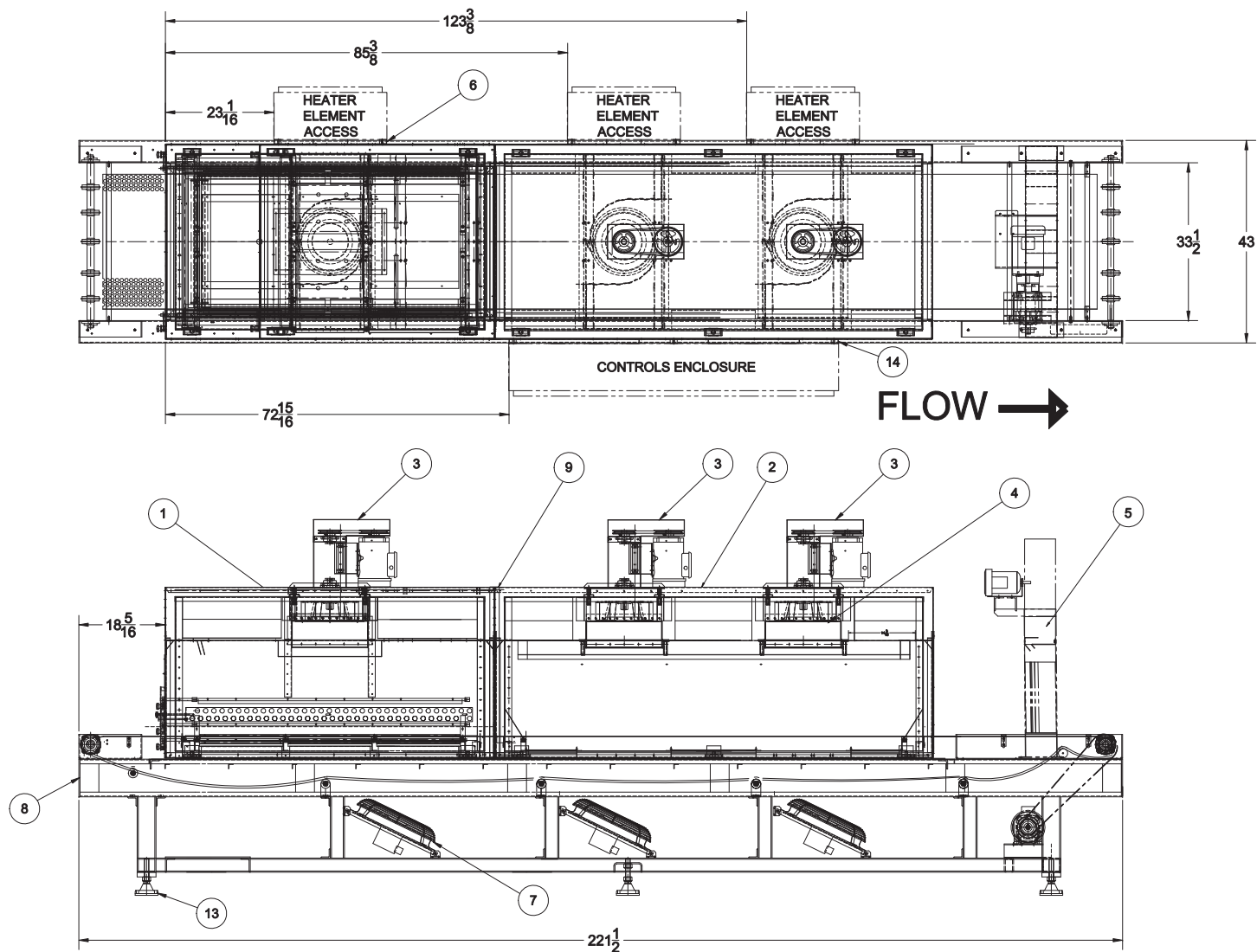


ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO DECIMALS THREE DECIMALS THREE DECIMALS THREE DECIMALS	AS SHOWN AS SHOWN AS SHOWN AS SHOWN
DRAWN: 11/28/2019	BY: SRA	SCALE: 3/16"=1"	REV: D
RELEASED:	FILENAME: 369684	APPROVED BY:	
DESCRIPTION: ASSY, HOUSING, OUTER, TUNNEL, 1 ZONE			
SIDE/ BOTTOM FLOW			
80 X 32 X 22			DRAWING NUMBER: 369684



NOTE: ITEM 16 NOT SHOWN

ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60178	
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONAL TOLERANCES:		FRACTIONS TWO (2) DECIMALS THREE (3) DECIMALS ANGLES	AS SHOWN AS SHOWN AS SHOWN AS SHOWN
DRAWN: 1/22/2021	BY: SRA	SCALE: 3/32"=1"	REV: D
RELEASED:	FILENAME: 382286	APPROVED BY:	
DESCRIPTION: ASSY, GUARDS, TUNNEL, 3-ZONE			
DRAWING NUMBER:			382286



REFER TO THE SALES LAYOUT FOR HEATER
ACCESS AND ELECTRICAL ENCLOSURE SIDES

NOTE: ITEMS 10, 11, 12 NOT SHOWN

ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONAL TOLERANCES:		FRACTIONS AND DECIMALS THREE (3) DECIMALS AND UP	A 1/16 B 1/32 C 1/64 D 1/128
DRAWN: 1/22/2021	BY: SRA	SCALE: 3/32"=1"	REV: D
RELEASED:	FILENAME: 382287	APPROVED BY:	
ASSY, TUNNEL, BOT AIR FLOW, 3 ZONE, UNI BELT			
32" WIDE, BPTW			
CONTROLS ENCLOSURE ATTACHED			DRAWING NUMBER: 382287

Notes

[illegible]

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal black lines across its entire width, typical of notebook or legal stationery. The background is a solid off-white color, and there are no margins, text, or other markings present.

Notes

[illegible]

Distributor Information

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