Operation and Maintenance Manual

Bremner Ripon

Model: 107-20

SN: 8873

October 2007

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9511 River Street • Schiller Park, IL 60176 • 847 678-9034 • www.arpacgroup.com

WARRANTY

ARPAC warrants the equipment of its manufacture to be free from defective material or workmanship for a period of one year from date of shipment from the factory, provided that:

1. Such equipment is given normal and proper usage.
2. It is still owned by the original purchaser.
3. The equipment has been operated in accordance with generally approved practice and in accordance with ARPAC's instructions.
4. No repairs, alterations, or replacements have been made by others without ARPAC's written approval.

The purchaser shall notify ARPAC immediately of any defective parts and ARPAC shall take corrective action. If such correction requires the replacement of a defective part or parts, ARPAC will supply them F.O.B. the factory.

ARPAC shall in no event be held liable for damage or delay caused by defective parts and will not accept any charges for work performed by purchaser in making adjustments or repairs to the equipment unless such work has been authorized in writing by ARPAC.

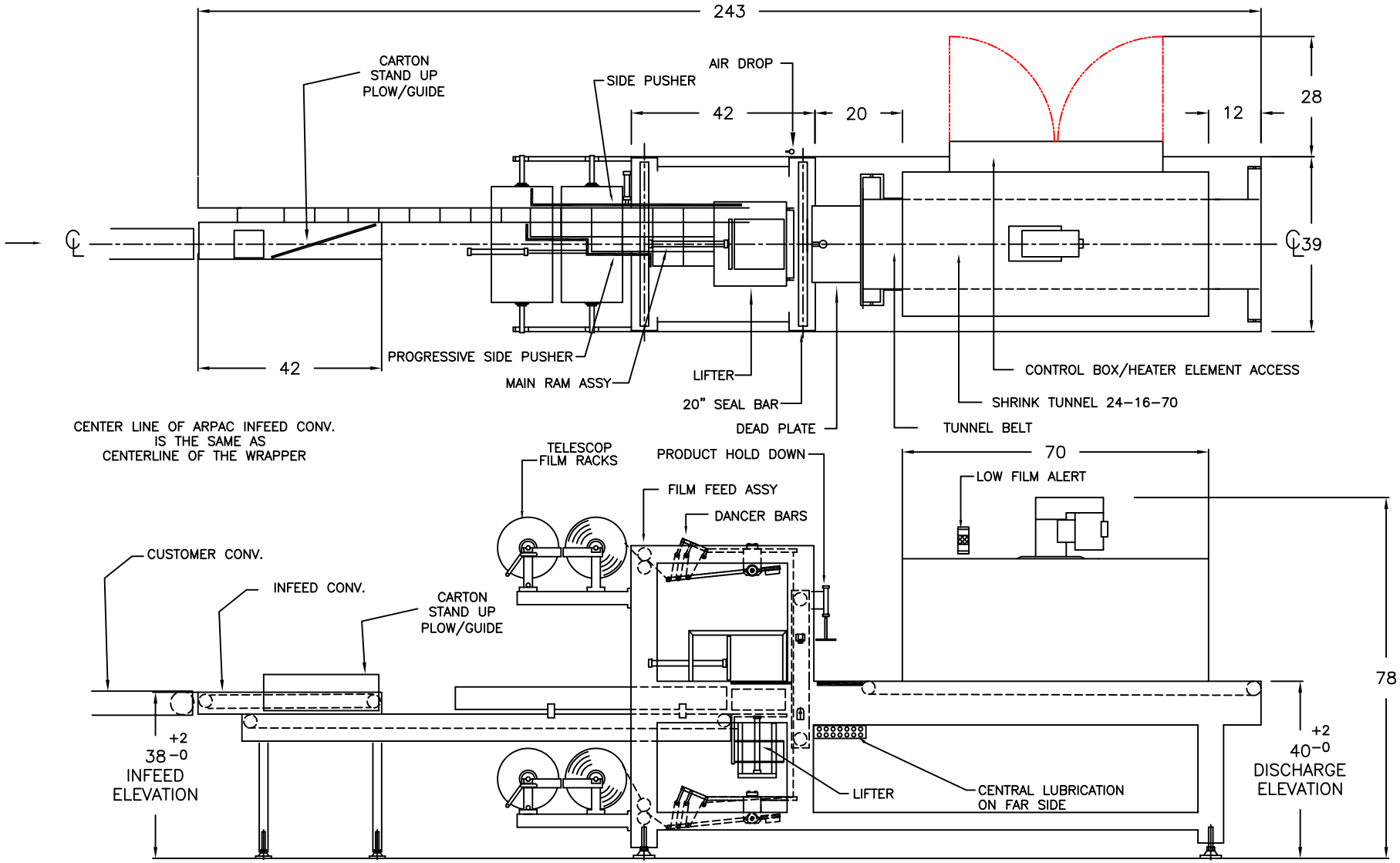
Any equipment or component not of ARPAC's own manufacture is sold under whatever warranty is provided by the maker, to the extent ARPAC is able to enforce such warranty. Such items are not warranted by ARPAC in any way.

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

ARPAC's liability (except as to title) arising out of the supplying of the equipment shall in no case exceed the purchase price of the said equipment. ARPAC makes no guarantee or warranty, expressed or implied, other than as stated above.

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

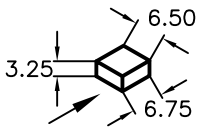
ARPAC personnel are available for ARPAC equipment training either on-site/hands on or in classroom environment, supported by visual aid and literature to be administered under a separate purchase order.



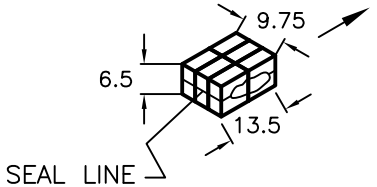
GENERAL NOTES:

INFEED AT 38 +2/-0", DISCHARGE AT 40 +2/-0"
ELEC. SPECS: 460V-3PH-60Hz
CONTROL BOX: L/H
AIR SUPPLY: 80 PSI MIN
FILM SIZE: 1.5 MIL LDPE

PRODUCT IN



BUNDLE OUT



ARPAC 9511 WEST RIVER ST. SCHILLER PARK, IL 60176

FILENAME s8873	DRAWN BY JW	SCALE: 4\Sdx3/64	SIZE:
DATE 8-21-07	REVISED	APPROVED BY: J W	

MODEL 107-20 AUTOMATIC SLEEVE WRAPPER

FOR BREMNER | DRAWING NUMBER s8873

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SECTION 3

Mechanical Sub-Assemblies

Mechanical Sub-Assemblies

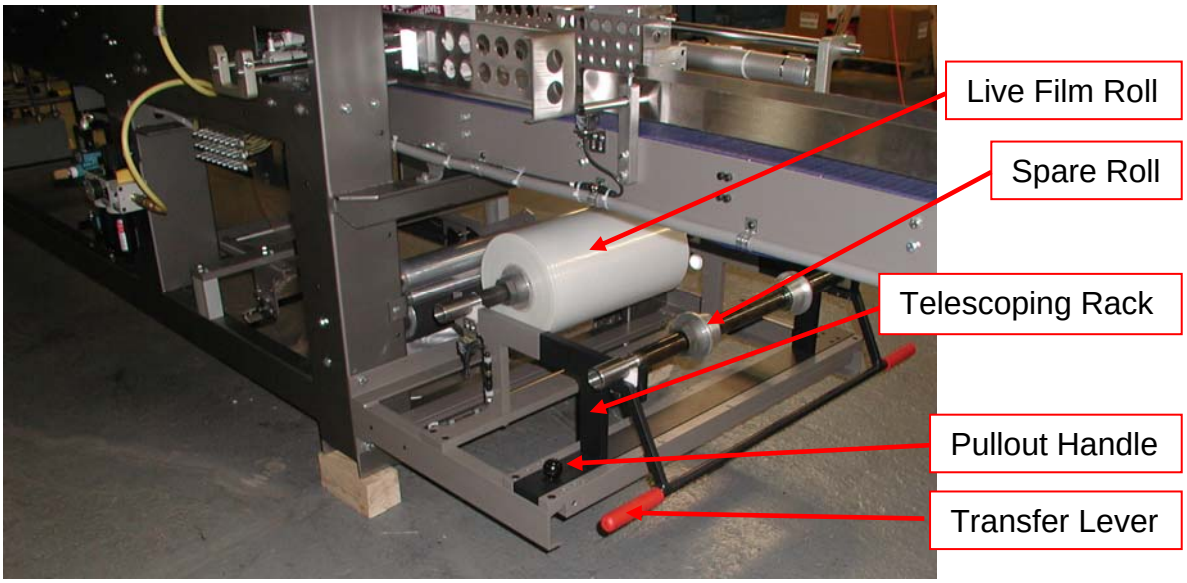
This section gives a brief overview of the equipment and its functions, under normal production conditions. See the machine layout in the front of this manual.

Film Feed System

The film feed system consists of the following major components:

Film Rack

There are two inline telescoping film racks mounted on the machine. The upper is mounted above the infeed conveyor and the lower is mounted below the infeed conveyor. The purpose of the film racks is to hold the film rolls in place without interfering with the pulling off of the film.



The film racks on this machine are capable of holding two 14” rolls of film each. Each film rack has one stationary assembly and one telescoping assembly. The stationary assembly holds the “live” or current roll of film. The telescoping assembly holds the spare roll of film.

The film shafts used for mounting the film rolls are held in place by Delrin journals. The Delrin journals are an extremely durable plastic-like material that allows the film shaft to turn freely.

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Film Feed System

Film Rack

The rolls of film are held centered on the film shaft by two film core plugs. This keeps the rolls of film in a set position for continuous tracking during the cycle mode.

The inner roll of film is the live roll. It is the roll that is currently in use. The outer roll of film is the spare roll. On machines with telescoping film racks, the section of the film rack that holds the spare film roll can be pulled out to the side of the machine for easier film roll loading. To do this, simply lift up the pullout handle that is mounted on the black mounting bracket and pull out on it. It will telescope out until it contacts the stops.

DANGER: Do not lift the bracket up when pulling out on the telescoping film rack. Lifting this bracket up out of its normal position will create a pinch point.

Never leave the machine unattended while either of the telescoping film racks is pulled out.

The end of the film rack with the pullout handle is held down by gravity only. It rides on a set of camfollower bearings. The opposite end is held down in the film rack by another set of camfollower bearings.

To move the telescoping rack back to its home position, simply push on the bracket. When it is in its home position, the pullout handle will drop down and lock the film rack in place. If at any time the pullout handle does not drop down and lock the film rack in place, notify maintenance to fix it immediately.

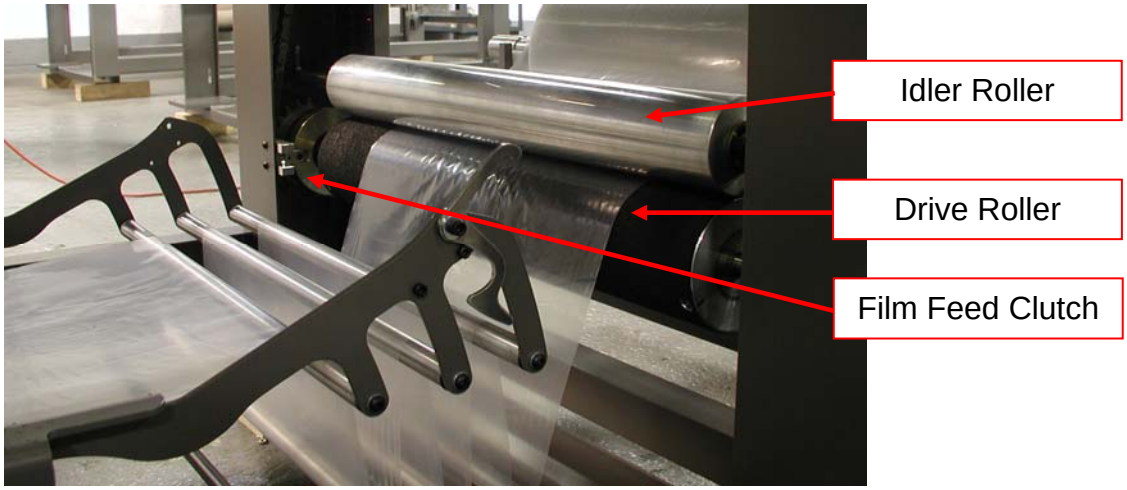
Each film rack has a film roll transfer lever. By lifting up on the red handle, the operator can easily transfer the spare roll of film from the spare rack to the live rack.

DANGER: Keep long hair dressed properly, preferably in a hair net or cap. Do not wear loose clothing around this assembly. Be aware of possible unseen or unexpected pinch points around this assembly. Stay alert when loading and unloading film rolls; pinch points will be created.

Film Feed System

Film Feed

There are two film feed assemblies on this machine. The upper is located in the top of the seal frame upright. The lower is located in the bottom of the seal frame upright. Each assembly removes the film from the corresponding film roll and then feeds it to the dancer assembly.



This is done by placing the film between the two spring loaded film feed rollers. These rollers, driven by a pneumatic clutch off the main drive, pull the film off of the film roll at a calculated rate. The film then travels to the film dancer assembly.

NOTE: Only the lower roller of each pair of film feed rollers is driven. It is provided with a replaceable rubber lagging.

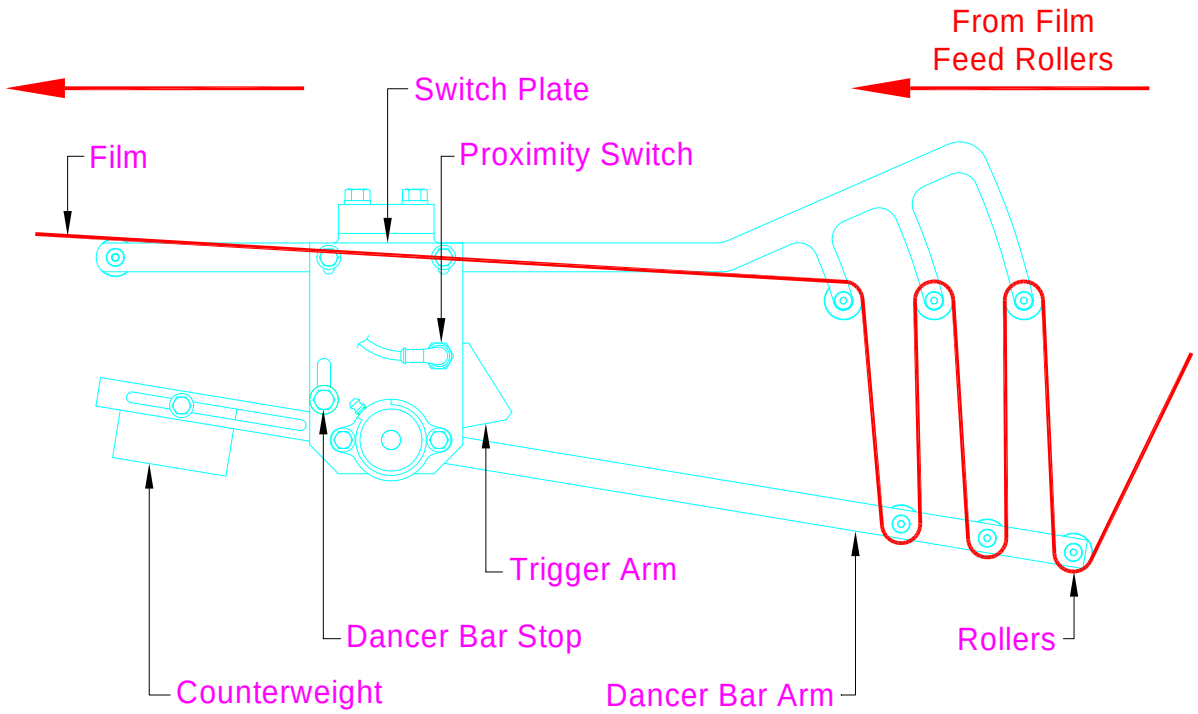
Proximity switches on the dancer mechanism send signals to the PLC to control the film feed clutches.

DANGER: Keep long hair dressed properly, preferably in a hair net or cap. Do not wear loose clothing around this assembly. These rollers are spring loaded together. They are typically wrapped with a ruff lagging, or a cork material. They are designed to effectively pull the film from the film rack. Therefore, anything that comes in contact with these rollers can and will be pulled into the machine. Do not put your body parts, clothing, rags or anything else near these rollers when the machine is in cycle.

Film Feed System

Film Dancer

There are two dancer bar assemblies on this machine. Each was designed to create a reservoir of film under constant light tension, to immediately meet the film requirements of the advancing product and closing seal bar. The upper dancer bar is located just before the upper film feed rollers. The lower dancer is located just before the lower film feed rollers.



The film is fed into the dancer bars by the film feed rollers when the dancer trigger arm moves in front of the dancer proximity switch. When enough film is fed the dancer arm will pivot down, thus moving the dancer trigger arm away from the dancer proximity switch and stopping the film feed rollers.

When another product moves through the seal frame it will use more film and cause the dancer arm to pivot up again. This will move the dancer trigger arm in front of the dancer proximity switch again, which will again begin the feeding of film.

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Film Feed System

Film Dancer

If the film breaks or either of the film rolls run out, both upper and lower dancer arms will drop to their lowest limits. This will cause the film break operating flag to move in front of the film break proximity switch, which will stop the machine from cycling. The machine will not go into cycle again until the film break flag is moved away from the film break proximity switch.

NOTE: Only the upper dancer bar assembly has a film break flag.

The dancer arm has two counter weights. These are used to adjust the amount of tension placed on the film. If they are moved toward the pivot point of the dancer arm the film tension will increase. If they are moved away from the pivot point of the dancer arm the film tension will decrease. The dancer weights were positioned during the testing process. However, due to environment, product or film changes, they may need to be readjusted by the customer.

NOTE: Increased film tension will not result in a tighter wrap on the product, but will cause weak seals and broken film webs.

Each dancer switch plate has a dancer bar stop. These are used to adjust the amount of swing the dancer arm has. They have been adjusted by the manufacturer and under normal conditions will not need to be readjusted. If however, there is a need to readjust the stops, adjust them so that the dancer arm will pivot as far as possible without interference.

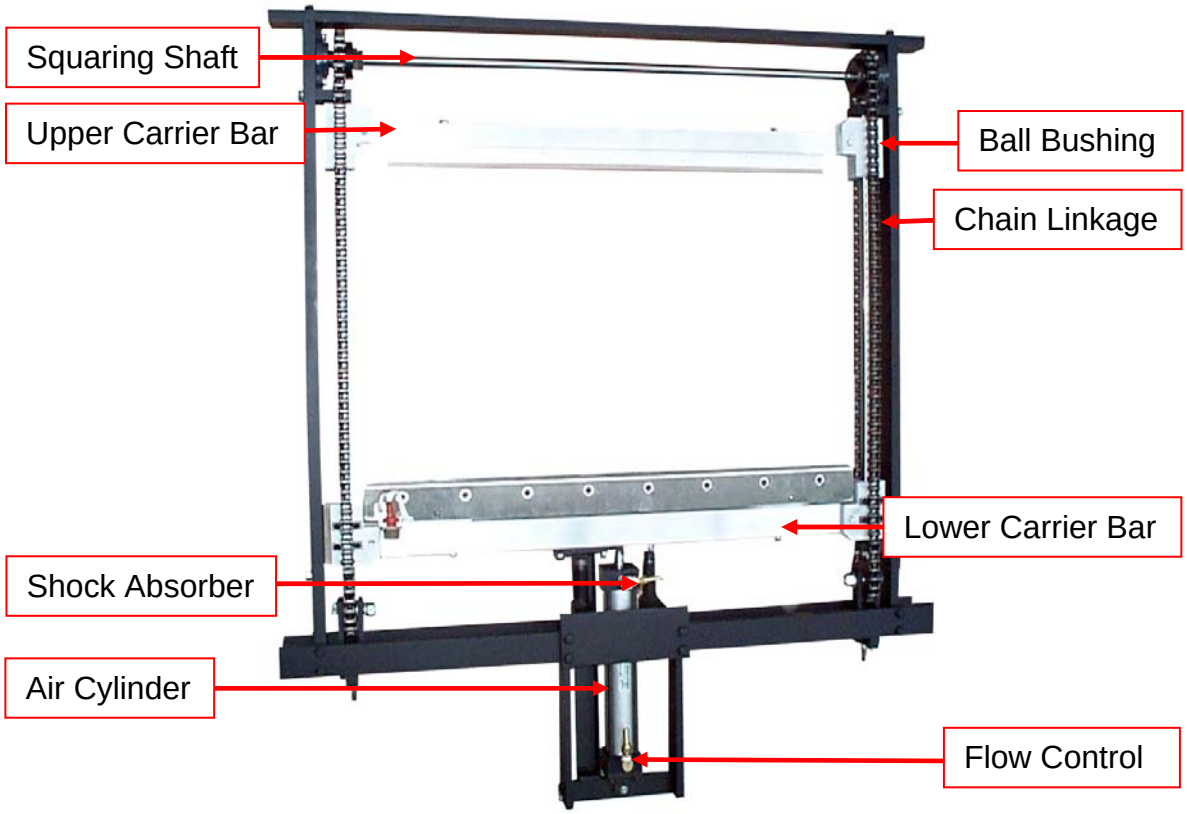
Seal Assembly

The seal assembly is one of the most important assemblies on the machine. It is in this area that the product is wrapped or sealed in the film. The seal bars cut and fuse the film before and after each product, thus creating a film sleeve around the product. The cutting of the film must be complete and accurate. If the film is not cut completely, then excessive film will be pulled into the tunnel creating a possible major problem.

The film sleeve itself must not be too large or too small. If it is too large the tunnel will not be able to shrink it properly. This will cause the film to have wrinkles and not hold the product securely. If it is too small one or both of the seals will open in the tunnel and again the product will not be held securely.

Seal Frame

The seal frame is the mechanical assembly in which the seal bars are mounted. This assembly opens and closes the seal bars, thus sealing both ends of the plastic sleeve that has been formed around the product.



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Seal Assembly

Seal Frame

After the product passes through the seal frame and clears the seal bars, the seal bars close simultaneously sealing and cutting the film. This seals one product in the film and prepares the next section of film for the next product.

An air cylinder operates the seal frame. The cylinder attaches to the lower seal carrier by a threaded connection on its rod end and to the seal frame through the clevis on the body end. This provides some adjustment of the total seal opening.

An electric solenoid valve controls this air cylinder. Flow controls are used to control the speed of opening and closing the cross seal bars. They are located at the air cylinder, between the cylinder and its manifold base.

Hydraulic shock absorbers are provided for both seal closing and opening. Both the upper and lower seal carriers are guided by double ball bearings at the ends of each carrier. The air cylinder raises the lower seal carrier, which through two chain linkages lowers the upper carrier bar until the seal bars meet. A squaring shaft interconnects the two chain linkages. This ensures positive alignment of the seal bars.

Also, there is a photo eye mounted to the seal frame at the point at which the seal bars meet. This photo eye is called the seal bar blocked photo eye. The photo eye is enabled only when the seal bars are closing in the cycle mode or for a manual seal. If at that time they detect a blockage a signal is immediately sent to the PLC. The PLC sends a signal to open the seal bars and if the machine is in cycle it disables the cycle mode. It then reports this error on the operator interface screen.

DANGER: The seal frame can be hazardous to your body parts. There are hot and moving parts above and below the machine deck when this device is activated. Do not override any of the machine safety devices while sealing film. Stay clear of this assembly when the machine is turned on.

Seal Assembly

Seal Bars

There are two seal bars in each machine. One is called the hot bar, and the other is called the cold bar. The hot bar has a thermocouple; two Teflon coated inserts, a knife, a plug, two guards and mounting brackets. The cold bar has one silicon strip, one piece of Teflon cloth and two side plates.

The purpose of this assembly is to seal and cut the film before and after each product. This is accomplished by squeezing two pieces of the film together between the hot and cold bars. The hot bar heats the film until the two pieces of film fuse together. Simultaneously, the knife, which is mounted in between the two Teflon coated plates, cuts the fused section of the film into two pieces.

The temperature of the heated surfaces is accurately controlled by a panel- mounted temperature control connected to a thermocouple located within the seal bar. The temperature controller shows the actual temperature of the seal bar.

DANGER: The seal bars can be hazardous to your body parts. They are hot and move very fast when activated. Do not override any of the machine safety devices, while sealing film. Stay clear of this assembly when the machine is turned on.

Product Accumulation Assembly

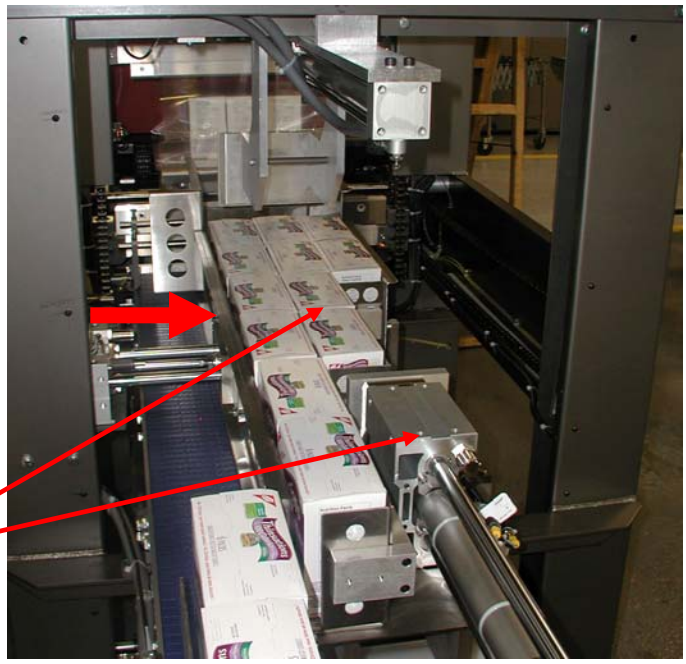
Z-Infeed Conveyor

The Z-Infeed conveyor uprights the product and feeds the product into the product accumulation area of the machine. The conveyor if fitted with photo eyes that monitor the presence of product on the conveyor and will shut the machine down if product starts running out.

Product Accumulation Assembly

Side Pusher Assembly

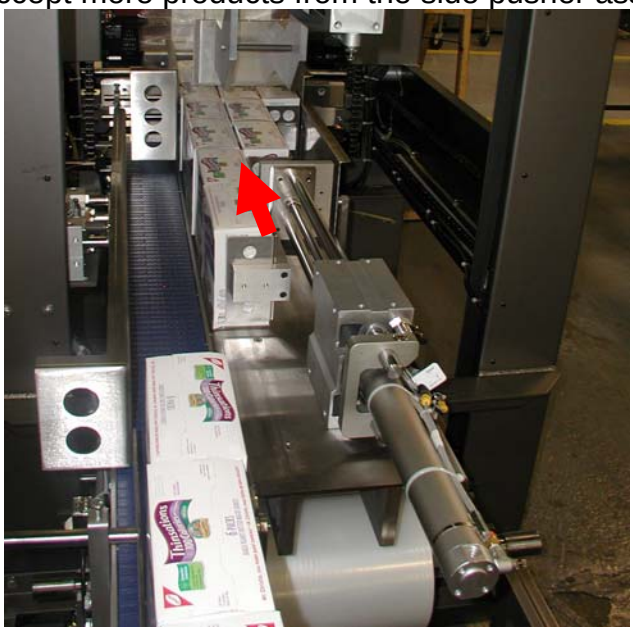
The conveyor then moves product into the side pusher assembly. When a photo eye detects that the side pusher is full, the PLC send a signal for the pusher to activate and push product into the progressive pusher assembly.



Product Accumulation Assembly

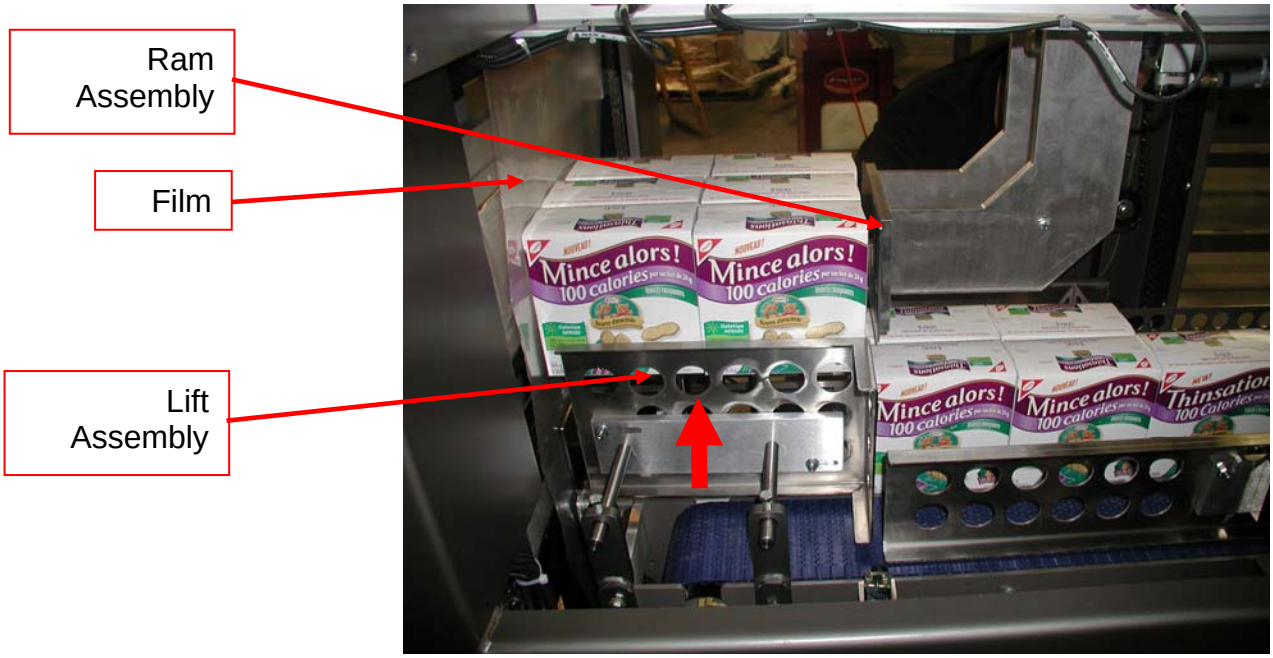
Progressive Pusher Assembly

The progressive pusher assembly then advances the products onto the lift assembly and then retracts to accept more products from the side pusher assembly.



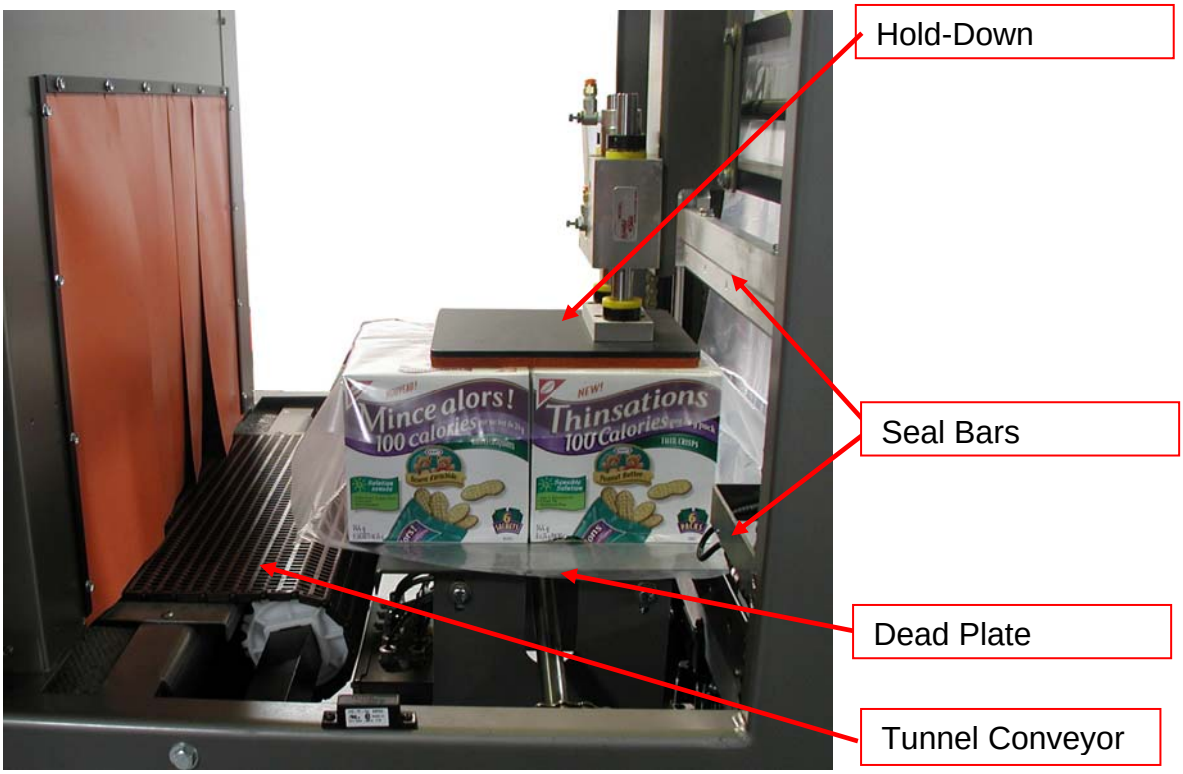
Lift & Ram Assembly

The lift assembly then rises up and the ram assembly pushes the group of products through the film and onto the dead plate assembly. The ram then retracts and the lift lowers to accept new products.



Dead Plate and Hold-Down Assembly

Once the group of products is on the dead plate, a pneumatically operated hold-down lowers to hold the products steady. The seal bars then close and seal and cut the film around the product. The seals bars then open, the hold-down raises up and the next group of products is pushed on to the dead plate. This, in turn, pushes the wrapped group of products onto the heat tunnel conveyor and into the heat tunnel.



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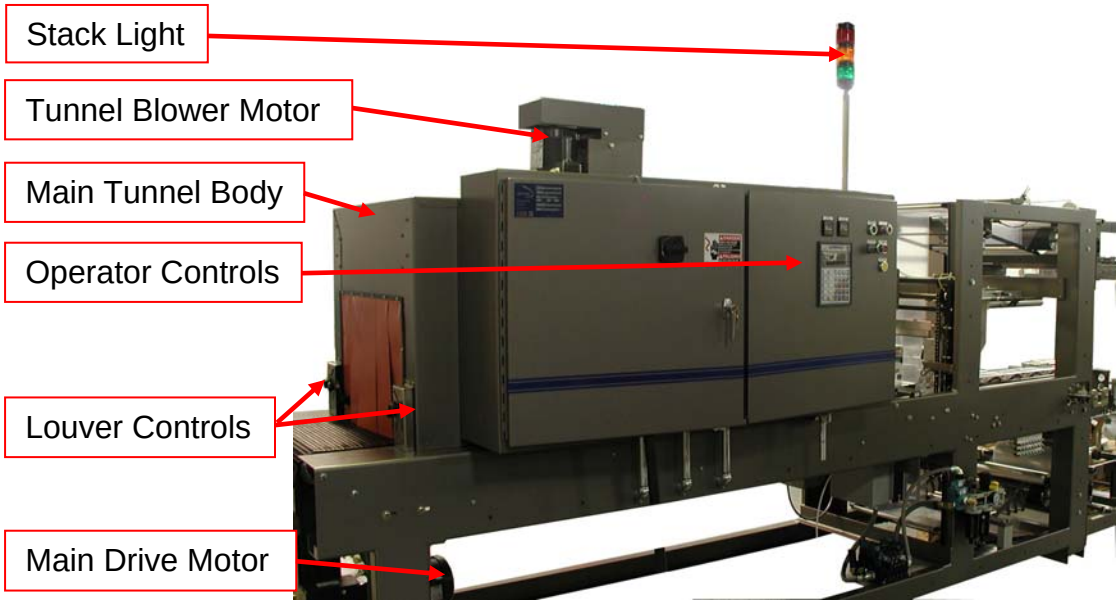
Shrink Tunnel

The tunnel has an Intralox® belted conveyor, one controlled heat zone, a drive motor and a cooling section. The tunnel shrinks the film around the product without adversely affecting the product in any way. The film must not only properly contain the product, but it must be aesthetically acceptable as well.



The tunnel drive motor, located under the tunnel, drives the main tunnel conveyor belt. Adjusting the frequency of the main tunnel drive motor controller or by changing the sprocket ratios on the main drive chain will change the speed of the conveyor belt.

The speed of this conveyor should be set slightly faster than the conveyor feeding it. This prevents shingling and/or tipping of the products as well as it keeps them spaced properly. It is important that the products are spaced properly going through the tunnel for proper airflow around the product and even shrinking of the film. 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.

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Shrink Tunnel

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.

The main tunnel conveyor belt is intralox belt. The drive shaft has a series of sprockets that drive the belt. These eliminate the need for special tracking. Another advantage to the intralox belt is that no belt take-up is necessary.

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.

The intake vents for each heat zone are located on the inside of the tunnel walls in the center of the zone next to the deck. The exhaust vents are located on the inside of the tunnel walls on the top and sides of the tunnel. There are louvers located on both sides at the exit end of the tunnel. These louvers control the velocity and direction of the airflow in the corresponding areas.

Each heater element tray consists of a series electrical thermal coils mounted in a stainless steel frame. As electrical current is applied to the coils they become hot. Air is drawn from inside the tunnel heat zone through the tunnel intake vents by the radial blower. This air 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 in the top and sides of that zone.

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.

Shrink Tunnel

At the exit end of the tunnel, a cooling section blows room temperature air onto the product. This cools the film down as it moves onto the customer's conveyor.

NOTE: It is important to clear any jams very quickly, as any product left in the tunnel could be melted or damaged. The tunnel temperature should never exceed 450º Fahrenheit.

DANGER: The tunnel and some of its parts can become extremely hot. 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 clean a hot tunnel!!!** When cleaning the machine or any components, use only non-flammable cleaning materials. Flammable and/or aerosol cleaners may ignite or explode when coming into contact with the hot tunnel. This is extremely hazardous to your health.

Shrink Tunnel

Tunnel Blower

The tunnel blower is an electrically controlled 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.

SECTION 4

Operator Controls

Operator Controls

This section explains the purpose and location of all of the controls used to operate the machine.

Main Power Disconnect

The main power disconnect supplies the main high voltage (typically 240 or 480 volts) to the machine. It is typically mounted on the main control cabinet. It is extremely important that anyone coming in contact with the machine knows where this switch is and knows how to use it.

DANGER: This device controls energy that is extremely hazardous and could cause death.

Master Air Supply Regulator

The master air supply regulator controls the air supply (typically 80 psi min.) to the machine. It is usually located on the lower control side of the wrapper. It is extremely important that anyone coming in contact with the machine knows where this valve is and how to use it.

DANGER: This device controls energy that can be hazardous and could cause injury, especially to the eye. Always wear safety glasses!!!

Emergency Stop Push-Pull Button

Each emergency stop push-pull button will shut down all electrical and pneumatic devices, with the exception of the controller. It is extremely important that anyone coming in contact with the machine knows where this valve is and how to use it.

DANGER: Always check around the machine before starting it.

Operator Controls

Power On Push Button

The power on push button supplies power to the main drive motor, the Mac valve, the seal bar heating element, the tunnel blowers and the tunnel heater elements.

DANGER: The pressing of this button may cause devices on the machine to move and/or turn on. Examples of these are the main drive, the pneumatic system and the heater elements and blowers. Be sure to keep clothing and body parts clear. Always check around the machine before pressing this button.

Cycle Stop/Reset Push Button

The cycle stop/reset push button is used to stop the cycle of the machine as well as to reset the controller after an emergency stop or jam situation.

Cycle Start Push Button

The cycle start push button starts the normal cycle of the machine.

DANGER: The pressing of this button will cause devices on the machine to move and/or turn on. Be sure to keep clothing and body parts clear. Always check around the machine before pressing this button.

Operator Controls

Manual Seal Push Button

The manual seal push button will cause the seal bars to close for one cycle. This is used to splice the film together after threading the machine. This button is disabled while the machine is in the cycle and when the guard doors are open.

DANGER: The pressing of this button will cause the seal bars to close. There will also be movement of parts under the seal area. Do not override any of the machine safety devices while using this button. Be sure to keep clothing and body parts clear. Always check around the machine before pressing this button.

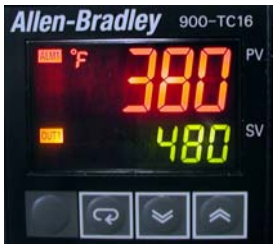
Operator Interface

The operator uses this interface to communicate with the PLC in the machine. The screen is used to indicate the machine's current mode of operation, and any problem the machine may encounter, as well as to help the operator make any necessary changes or adjustments to timers in the program.

NOTE: There is a password lockout to change certain timers and options.

Operator Controls

Temperature Controllers



The temperature controllers control and display the temperature of the heating elements of the machine. They are labeled as to which elements they control.

Stack Light

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

- **Red solid** – an emergency stop button is tripped.
- **Red flashing** – a fault or alarm situation.

- **Amber solid** (optional) – the film supply is getting low.

- **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

Tunnel Louvers

The tunnel louvers are located just above the deck at both ends of the tunnel. These adjust the direction and velocity of hot air flow to the sides of the product.

NOTE: These have been pre-set at the factory. However, because of the possible differences in the factory environments, they may need to be re-adjusted at the end user's facility.

DANGER: The tunnel and its parts get very hot. Avoid touching the tunnel and its parts while it is running and shortly thereafter. Never stick anything into a hot tunnel. Keep your body parts clear.