CONTECH

ΣPA1000

Οωνερэσ / Οπερατορэσ Μανυαλ

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Table of Contents

1. Safety

Safety must be a primary concern. When operating or performing maintenance procedures follow all standard safety guidelines. Do not wear loose fitting clothing or any articles that may be pulled into the mechanisms.

Be sure that when operating the equipment that all safety devices operate properly. Never under any circumstances disable, remove, or alter the original configuration of the safety system.

Should any component of the safety system become inoperable, immediately discontinue operation, and notify a supervisor.

Avoid placing fingers, hands or, any other body part in or, near the platen or other moving mechanisms.

Read and understand this manual prior to operating the equipment.

Proper eye protection should be worn at all times when operating the equipment.

The area around the SRA1000 should be well lighted, dry, and free of obstacles.

When servicing the unit always practice standard lockout/tag-out procedures to avoid personal injury.

Qualified maintenance personnel only should perform service operations on the SRA1000.

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2. System Installation

2.1. Placement

The system requires placement on a hard and level surface allowing access to all sides of the machine for operator and maintenance personnel. Leveling of the SRA1000 should be referenced to the material drive roller.

2.2. Electrical

The electrical hookup of the system differs depending on the operating voltages selected. Electrical connection of systems operating at main 220-VAC /1-↓ requires a plug to be installed on the power cable extending from right side of the machine.

Electrical hookup of the 220 to 480-VAC /3-↓ systems requires proper phasing. When connecting the power cord to a three-phase power source, the rotational direction of the electric motor must be observed. When looking into the fan end of the motor, the motor fan must be turning clockwise.

All electrical connections should be performed by a locally licensed electrician.

2.3. Pneumatic

The SRA1000 requires less than 5-cfm clean dry air at 80 to 120-psi. An air inlet is located near the Electrical Control Panel. To avoid damage to other components in the system it is important that the compressed air is free of moisture and other debris. Please note that an air compressor is not supplied with the SRA1000 system.

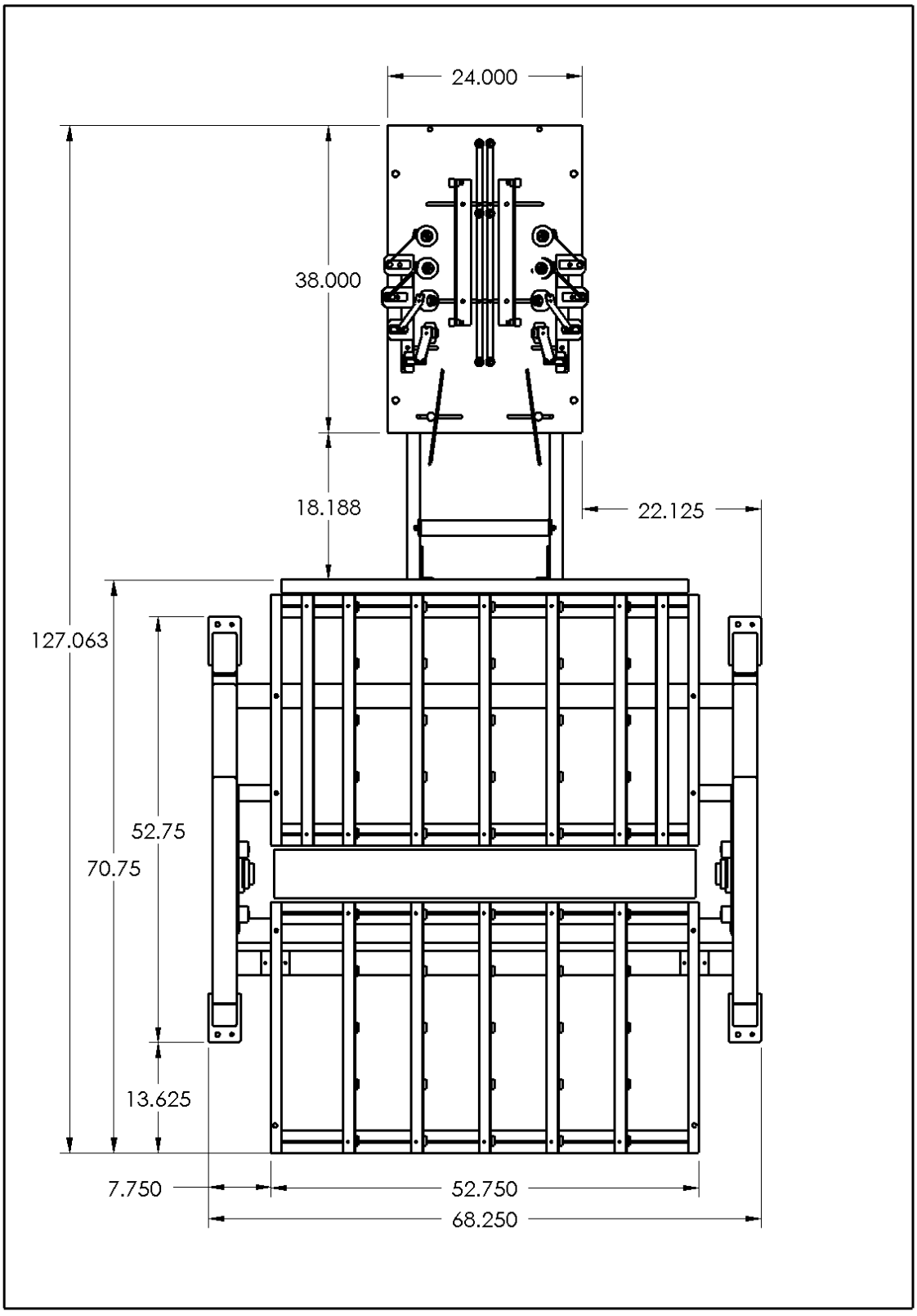


Figure 1: SRA1000 Footprint

3. Theory of Operation

The Primary function of the SRA1000 is the application of vinyl films, application tape (pre-mask) or other adhesives from a roll form. The standard SRA1000 is equipped with Liner Rewinding and Slip Sheet Unwinding Stations, enabling it to apply materials that require the removal of a liner. While the Slip-Sheet Unwind / Rewind Mandrels prevent the application if adhesives to the lower drive roller. Options are available for the SRA1000 enabling it to process a variety of materials used in the converting industry.

3.1. Unwind Brake

The Unwind Brake controls the web tension of the film between the Unwind and the Drive Roller. Turning the black knob labeled Brake clockwise will increase the web tension, while turning the black knob counterclockwise will decrease the web tension. The film web tension will greatly effect the flatness the finished sheets. Excessive web tension will stretch the film as it is applied to the material and when the web tension is no longer applied to the film it will relax and "shrink", causing a curl of the finished sheet. Optimum Unwind Brake tension is achieved when the film and liner separation point remain at the lowest point on the Idler Roller.

Note:
Unwind Brake pressure must be decreased as the roll diameter decreases.
Excessive unwind web tension may cause curling of the material toward the film.

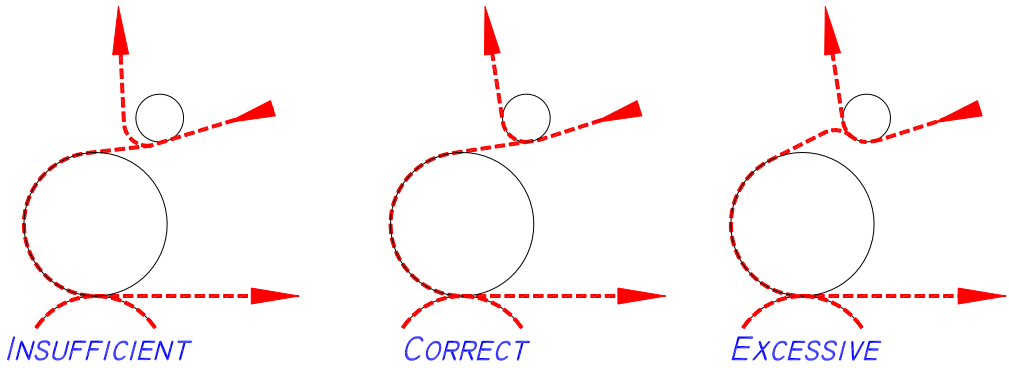


Figure 2: Web Tension

3.2. Application / Drive Rollers

The Drive Roller is the base roller from which other rollers are positioned. It is fitted with 6" dia. aluminum collars. The Collars are designed to allow lateral adjustment and are engineered to contact the bottom surface of the extruded blank fitting between the extrusion ribs. It must be aligned parallel to the film unwind and film liner rewind mandrels.

The Application / Drive Rollers supply the nip point as well as the advancement of the processed material. The nip pressure of the Application / Drive Roller is controlled from the pressure regulator labeled Nip Pressure on the Operator Control Panel. Turning the black knob clockwise will increase the nip pressure, while turning it counterclockwise will decrease the nip pressure.

Three controls are involved with the advancement of the processed material, the first is the Forward / Reverse switch located on the Operator Control Panel. The Second is the Foot switch control, which when pressed applies power to the drive motor and removes power when the switch is released. Third is the Speed dial located on the Operator Control Panel, turning the dial clockwise will increase the Drive Roller speed, while turning the knob counterclockwise will decrease the speed.

3.3. Rewind Clutch

The Rewind Clutch controls the web tension of the liner paper between the Rewind and the Drive Roller, turning the black knob labeled Clutch clockwise will increase the liner web tension. While turning the black knob counterclockwise will decrease the liner web tension.

Proper clutch adjustment can only be determined once applications are underway. The clutch controls the liner wind-up tension. Prepare for operation by setting the clutch as follows: Firmly grasp the liner mandrel with one hand. The mandrel should rotate with slight resistence.

Note:
Rewind Clutch pressure must be increased as roll diameter increases.

3.4. Slip Sheet Unwind

The Slip Sheet Unwind allows a roll of rewound liner paper to be fed under the processed material to protect the rubber Drive Roller from excess adhesive. The liner paper is threaded through the SRA1000 as shown in Figure 4. Web tension for the Slip-Sheet Unwind is controlled by the knurled knob located on the operator end of the Slip-Sheet Unwind Mandrel Support Arm. Turning the knob clockwise will increase the Slip-Sheet web tension, while turning the knob counterclockwise will decrease the tension.

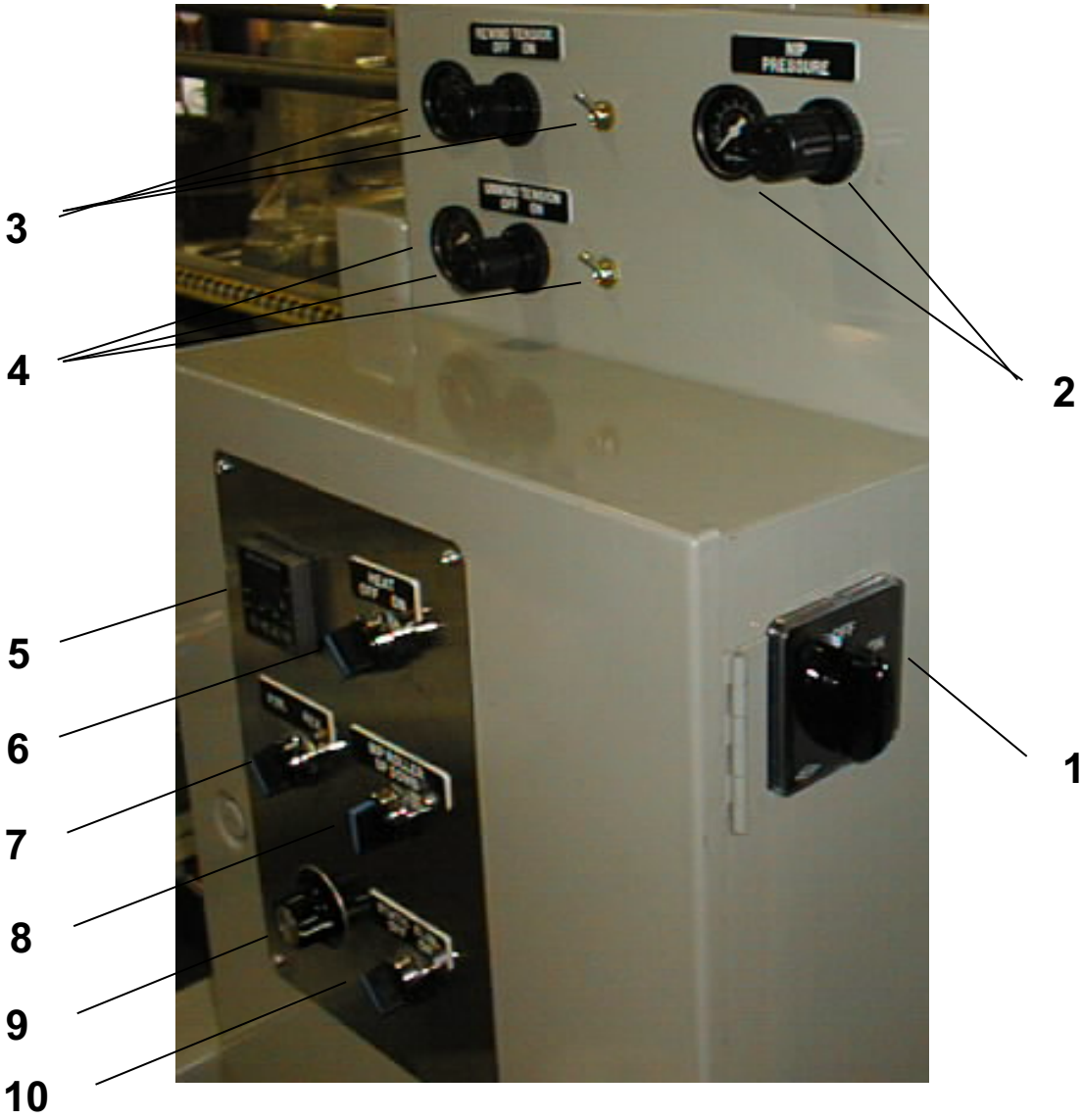
Note:
Slip Sheet Unwind Mandrel Brake pressure must decreased as unwind roll diameter decreases.

3.5. Slitter

The SRA1000 is equipped with the Slitter Station, allowing the application of a partial width from a roll of film. The Slitter is a non-driven razor slitter mounted near the Film Unwind station. The depth of the slit is controlled by the amount of blade protruding from the slitter body.

4. Main Operator Control

The Operator Control Panel provides the operator control of basic machine functions. Located on the Operator Control Panel are the Main Power Switch, which also serves as an Emergency Stop, the Directional control switch and, the Nip Roller Up/Down switch.



3: Main Operator Control Panel

Item	Description
1	Power Switch
2	Nip /Lamination Roller, Pressure Regulator & Gauge Set & Switch
3	Liner Rewind Clutch Pressure Regulator & Gauge Set & Switch
4	Film Unwind Clutch Pressure Regulator & Gauge Set & Switch
5	Temperature Controller
6	Heater Power Switch
7	Forward / Reverse Switch
8	Nip Load / Run
9	Nip /Lamination Roller Speed Control
10	Static Bar Power Switch

Table 1: Main Operator Control Descriptions

4.1. Power

Pulling the Power switch will apply power to the SRA1000. Pushing the Power switch will remove power from the SRA1000. The Power switch also acts as an Emergency Stop button when pressed power is removed from the system and all movement will stop.

Note:

When performing maintenance functions do not rely on the Power Switch to remove power as certain mechanical or electrical component failure may leave the circuit energized.

4.2. Direction

Nip Roller direction is controlled by the switch labeled “Fwd. /Rev.). Moving the switch will cause the Nip Roller to move in the respective direction.

Note:

To avoid severe damage to the SRA1000,

Do not change the direction of operation before the Drive Roller has came to a complete stop!

4.3. Speed

The Speed of Drive Roller is controlled by the black knob labeled “Speed”. Turning the knob clockwise will increase the speed of the Drive Roller, while turning the knob counterclockwise will decrease the speed. The Speed Knob controls both forward and reverse directions and may be adjusted while moving or stopped.

4.4. Liner Rewind Control

The Rewind Web tension is controlled by the regulator labeled “Liner Rewind Clutch Pressure”. Turning the black knob clockwise will increase rewind web tension, while turning the knob counterclockwise will decrease tension.

4.5. Film Unwind Control

The Unwind Web tension is controlled by the regulator labeled “Unwind Brake Pressure”. Turning the black knob clockwise will increase unwind web tension, while turning the knob counterclockwise will decrease tension.

4.6. Nip /Lamination Roller Control

The Nip Roller pressure is controlled by the regulator labeled “Nip Roller Load /Run”. Turning the black knob clockwise will increase Nip Roller pressure, while turning it counterclockwise will decrease the pressure. The gauge displays the current Nip Roller pressure. Moving the Nip Up Down switch will move the Nip Roller to its respective position.

4.6.1. Optimum Temperature

The variable speed drive must be set to provide application speed of 12 feet per minute. The combination of controlled voltage, proper heater aim, and 12 feet per minute applicator speed results in a sheeting temperature between 130°-140°F (55°-60°C) as the sheeting is laminated.

4.6.2. Heater On /Off

The Heat On/Off switch will enable the Temperature Controller and maintain the temperature determined by the Temp Controller, when in the On position. When the switch is the Off position, power is removed from the Temperature Controller and the Heater is disabled.

4.6.3. Temperature Controller

The temperature of the Upper Heated Platen is controlled by the Barber Coleman temperature controller. There are two temperatures displayed on the controller; the upper, in orange is the actual temperature of the Roller Heater. The lower temperature displayed in

green indicates the desired temperature. Located in the lower right corner of the temperature controller are up and down arrow keys. Pressing the up arrow will increase the set point while; pressing the down arrow will decrease the set point.

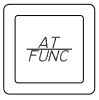
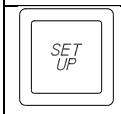
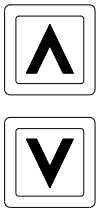
Keys	Operating mode	Setup mode	Configuration mode
	For Startup autotuning, cancels "startup" tuning constants (press again to re-initiate tuning). For Bump autotuning, initiates autotuning (press again to cancel tuning; press again to re-initiate tuning).	Steps the display through a particular setup function. Once in Setup, press the Setup key repeatedly to reach the proper setup function (e.g.,"tun1"). Use this key to step through the function.	Steps the display through a particular configuration function. Once in Config, press the Setup key repeatedly to reach the proper config function (e.g., "SEc"). Use this key to step through the function.
	***Controller.*** Toggles the controller between Automatic and Manual (percent out) control.	Not Used.	In Calibration, initiates calibration.
	***Programmer I Timer:*** If the Programmer I Timer is selected, toggles between run and hold. Press (and hold 4 seconds) to reset. Press again to run.		
	Steps through a loop of displays: Active Setpoint, Timer or Programmer, Amps (with HBO), Actuator Position, Remote Setpoint, % Out (heating and/or cooling), 2nd Setpoint, Setpoint Ramp and Deviation from Setpoint.	Returns the controller to the operating mode.	Returns the controller to the operating mode.
	Steps the controller through two different modes. Press (and release), controller goes to Setup ('SEtU') mode. Press (and hold 4 seconds), controller goes to Configuration ('conF") mode. Outputs are ON in Setup, OFF in Configuration.	Steps the controller forward one Setup functional group.	Steps the controller forward one Configuration functional group.
	During Automatic control, pressing an arrow key increases or decreases the control setpoint. During Manual control, pressing an arrow key Increases or decreases the percent output. With a numeric display, the longer an arrow key is pressed the faster the rate of change.	Increases/decreases the Setup parameter on display or selects a mode of operation for a Setup parameter. With a numeric display, the longer an arrow key is pressed the faster the rate of change.	Increases/decreases the Configuration parameter on display or selects a mode of operation for a configuration parameter. With a numeric display, the longer an arrow key is pressed the faster the rate of change.

Table 2: Temperature Controller Key Functions

5. Preparation

Before operating, the SRA100 must be prepared for the type of function to be performed.

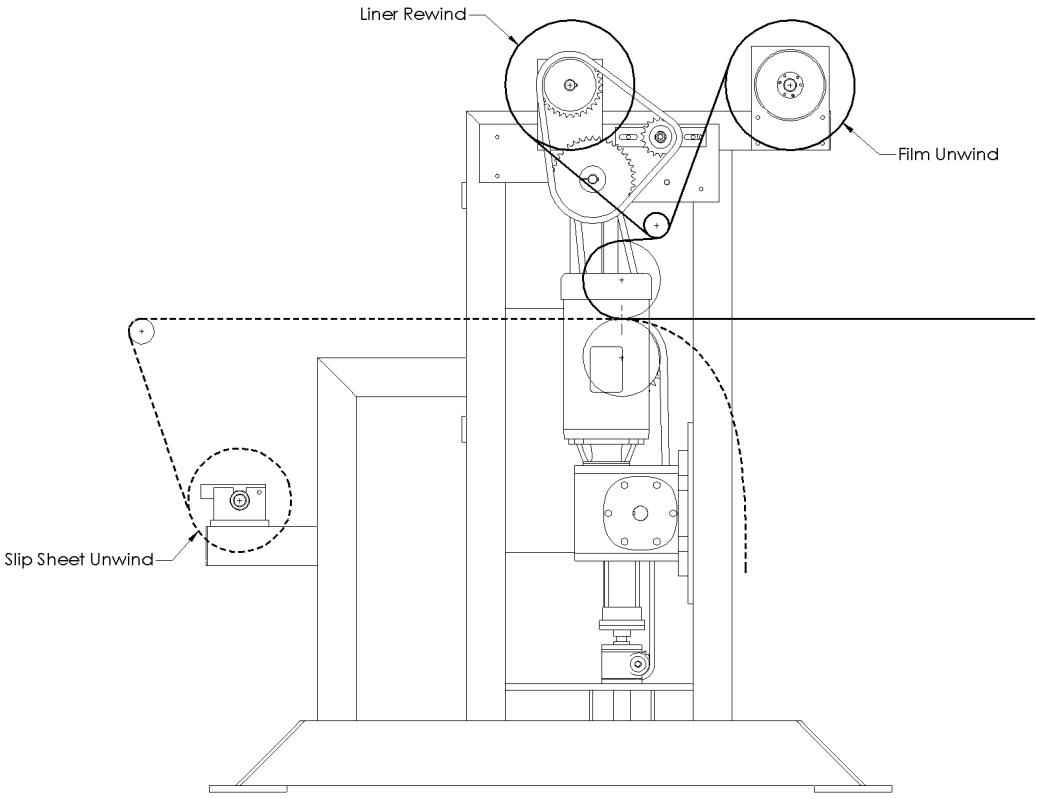


Figure 4: SRA1000 Material Thread Diagram

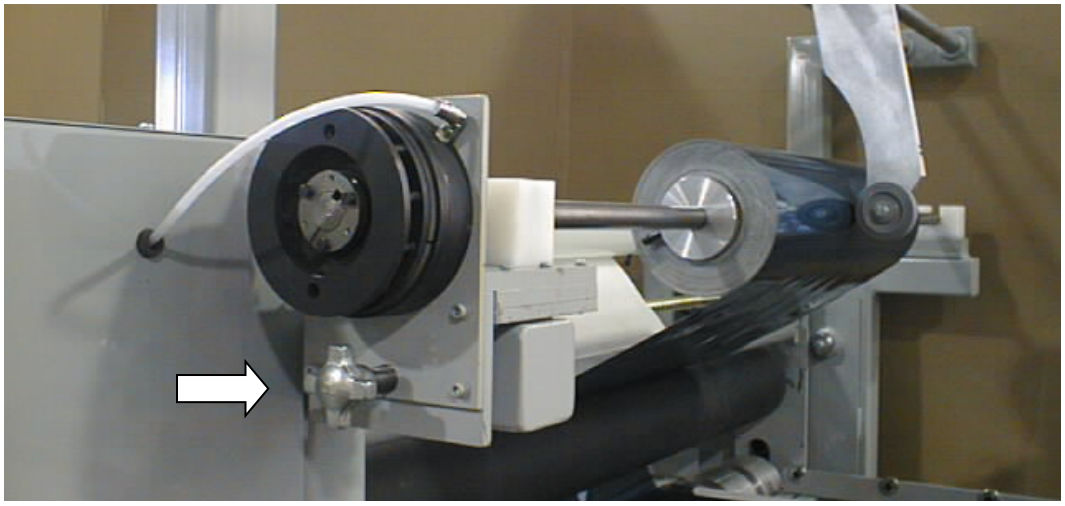


Figure 5: Film Unwind Lateral Adjustment knob

5.1. Lateral Film Adjustment

The control knob shown positions the film laterally as necessary.

Figure 6: Nip Opening Adjustment Wheel & Register

5.2. Nip Set Opening

The opening of the Nip Roller set may be adjusted by turning the Nip Opening Adjustment Wheel. This height setting will require adjustment when changing sign face (material) thickness. The correct opening should be no more than 3/32" less than the thickness of the sign face (material).

5.3. Collar Roll

The Material Collars are the aluminum rings mounted on the Lower Drive Roller. These collars may be placed anywhere along the Drive Roller Shaft (preferably at the center) as required to support as much of the extrusion as possible. Position any extra collars at the extreme ends of the drive shaft so as to provide a support for the ends of the nip roller to bear against.

To change the position of the collars;

1. Loosen but do not remove, both of the Collar Clamping Bolts.
2. Slide the Collar to the desired position.
3. Tighten both of the Collar Clamping Bolts so that the gaps between the collar halves are approximately equal and the screws are in a straight line along the shaft.

5.4. Edge Roll Assembly

Figure 7: Edge Roll Asembly

5.4.1. Adjustment

To adjust the edge roller assembly, pass an extruded panel through the machine and over the edge roller table. Adjust the roller assemblies to the edges of the extruded panel as necessary to support the panel and firmly roll sheeting over the panel edges.

5.4.2. Heat Guns

Commercial heat guns are mounted so as to assist in forming the sheeting around the edges of the extrusion. The guns should be aimed as necessaryto eliminate folding resistance at the first edge roller and provide heat along the line of edge rollers. Avoid extreme temperatures which might damage the sheeting. Shut off the heat guns any time applications are stopped.

5.4.3. Inspect Edges

Inspect the panel grove for contamination. Edges of the panels must be clean in order for the material to adhere.

5.5. Removing and Replacing Mandrels

The Unwind and Rewind Mandrel must be removed to load and unload material at the beginning and end of each run. The following steps represent the typical Mandrel removal and replacement.

1. Disable the Clutch or Brake depending upon the Mandrel to be removed.
2. Rotate the Mandrel by hand until the slot in the operator end of the Mandrel support block is vertical, permitting removal of the Mandrel.
3. Lift the Mandrel from the Mandrel Support Blocks.

For replacement of the Mandrel;

1. Insure that the slot in the operator end of the Mandrel support block is vertical, permitting installation of the Mandrel.
2. Place the Mandrel into the Mandrel Support Blocks.
3. Enable the Clutch or Brake depending upon the Mandrel replaced.

5.6. Liner Rewind

To prepare the Liner Rewind Mandrel for operation an empty material core must be placed on the Rewind Mandrel;

1. Remove the Rewind.
2. Remove the Material Core Inserts by loosening the 5/16-18 set bolts and sliding off of the Rewind Mandrel.
3. Slide the Rewind Mandrel through the empty core.
4. Slide the tapered end of one of the Core Inserts onto the Rewind Mandrel and into the empty core. Align the bolt with the flat strip on the Rewind Mandrel and tighten the bolt.
5. Slide the remaining Core Insert onto the Mandrel and into the empty core.
6. Rotate the Core Insert so that the bolt is aligned with the flat strip in the Rewind Mandrel. Firmly press the Core insert into the empty core and tighten the bolt.

5.7. Film Unwind

The following steps represent a typical unwind roll installation;

1. Remove the Unwind.
2. Remove the Material Core Inserts by loosening the 5/16-18 set bolts and sliding off of the Unwind Mandrel.
3. Place the material roll flat on its side on the floor.
4. Slide the Unwind Mandrel through the material roll.
5. Slide the tapered end of one of the Core Inserts onto the Unwind Mandrel and into the material roll. Align the bolt with the flat strip on the Unwind Mandrel and tighten the bolt.
6. Slide the remaining Core Insert onto the Mandrel and into the material roll.
7. Rotate the Core Insert so that the bolt is aligned with the flat strip in the Unwind Mandrel. Firmly press the Core insert into the material roll and tighten the bolt.

5.8. Thread Up

After the Material Roll has been loaded and the Nip Roller opening has been set, the material must be threaded through the machine. The following steps represent the typical thread up procedure, for more information about each step see the above subsections.

1. Adjust the Nip Set Opening to accommodate the thickness of the parts to be processed.
2. Load the Film Material Roll onto the Unwind Mandrel.
3. Place an empty rewind core on the Rewind Mandrel.
4. Open the path for material loading (open nip rollers, slitters or, any other options that require opening to feed the material through).
5. Disable Material Unwind Brake.
6. Thread the material through theSRA1000 as shown in Figure 4. Do Not close the Nip Roller set at this time.
7. Align the Material Collars.
8. Peel the liner paper from the material and attach it with tapeit to the empty Rewind Core.
9. Align one (1) or both of the material guides on the Input Table.
10. Insert a scrap sign face (material) into the Nip Roller set and close the rollers.
11. Step on the Foot switch to advance the rollers. Prepare the next blank before the sign face exits the Nip Set.

5.9. Bottom Roller Protection

When a large number of small or irregularly shaped blanks are to be run, liner or slipsheet may be used as a conveyor to prevent sheeting adhesion to the bottom roller.

5.9.1. Slipsheet Unwind

To load the roll, thread the slipsheet from the bottom unwind mandrel up and over the idler roller that is mounted on the end of the exit roller table, and through the space between the nip and drive rollers. Slipsheet must unwind under tension in order to operate properly. The knurled knob located on the operator end of the Slip-Sheet Unwind Mandrel Support Arm controls web tension for the Slip-Sheet Unwind. Turning the knob clockwise will increase the Slip-Sheet web tension, while turning the knob counterclockwise will decrease the

tension. Slip Sheet Unwind Mandrel Brake pressure must decreased as unwind roll diameter decreases.

5.9.2. Slipsheet Applied to Roller

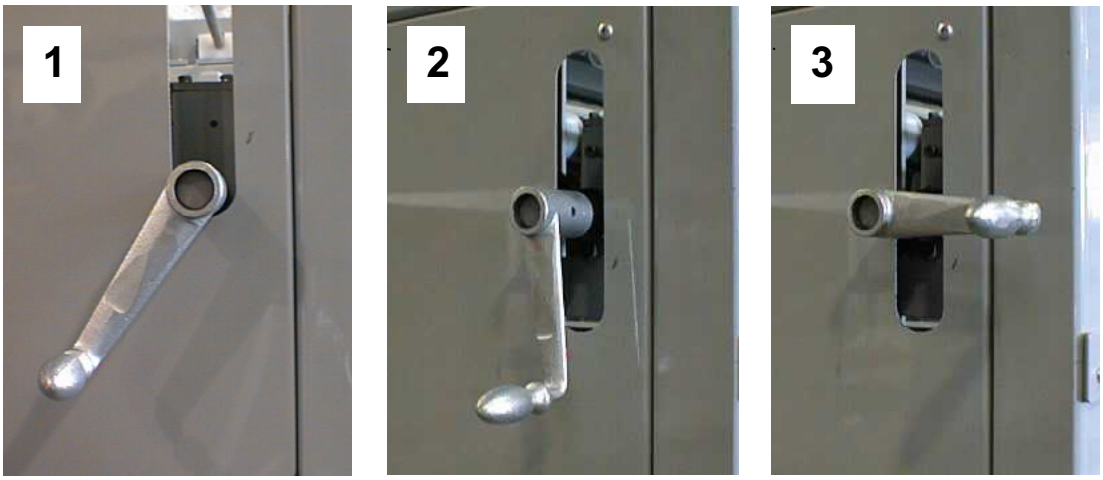
Alternatively, paper liner from Engineer Grade Sheeting slipsheet may be wrapped around the roller, glossy side out. Wrap in the opposite direction from normal bottom roller rotation and tape in place.

The material should form a smooth, wrinkle-free cover. Reversal of roller direction may wrinkle or tear the protective sheet form the roller. Do not use silicone spray or Release agents to protect the roller.

5.10. Roller Heater

The rubber (upper) nip roller must be pre-warmed to provide proper temperature conditions for application. The roller must also be re-warmed any time application is halted for more than 3 minutes.

6. Operation



Item	Description
1	Run Position
2	Preheat Position
3	Safety Position

Table 3: Heater Arm Position

6.1. Heater Arm Control

The Heater Arm is the primary control. It has 3 positions as shown in Figure 1. The heater system provides heat to the Nip and Drive (Lamination) Roller set. It is capable of applying heat to the roller (preheat), to the film (run) and, to open air (stand-by). In order to change the position of the heater, turn the handle to the desired position. In order to prevent severe increment roller damage, the machine is set to automatically rotate the increment rollers whenever the heater switch is in the on position and the Heater Position handle is in the Run or, Preheat position.

1) *Run Position* The heater is directed toward the drive roller. The drive roller is activated when the arm is moved into the #1 position.
2) *Preheat Position* The heater is directed straight down. Move the heater into this position to preheat blanks (when no material is being applied.)
3) *Safe Position* The heater is directed horizontally into the safety shroud. This is the safe position. When in this position the heater can cause no harm to the sheeting material or rubber roller but do not touch the shroud — IT WILL BE HOT. DO NOT LEAVE THE HEATER ON IN THIS POSITION FOR EXTENDED PERIODS.

6.2. Foot Switch Control

When the power is turned on, the unit can be activated at any time by depressing the foot switch. The drive remains on as long as the foot switch remains depressed.

6.3. Normal Proceedure

After the SRA1000 has been properly set up it is ready for operation. The following steps represent the typical operating procedure.

1. Pull the Power switch.
2. Insert a scrap part (material to be processed) into the Nip Set.
3. Close the Nip Rollers.
4. Step on Foot switch to advance the Drive Rollers.

5. Prepare to insert the next part before the trailing edge of the current part exits the Nip Set.
6. Insert the following part close enough to the trailing edge of the current part as to not allow the adhesive to make contact with the Lower Drive Roller.
7. Use a suitable tool to separate the parts as they exit the Nip Roller Set.

6.4. Application Speed

Application speed *must* be set at 12 feet (3.66 m) per minute for High Intensity Grade applications. At this speed, a 4-foot (1.22 m) panel will pass through the rollers in 20 seconds.

IMPORTANT: The drive motor must be in operation when speed changes are made. Numbers on the variable speed dial do not correspond to application speeds. Application speed may not be repeatable and must be checked when returned to 12 feet per minute from other settings.

If an adjustment is needed, start the drive motor and adjust the variable speed dial. Clockwise rotation increases speed. To verify 12 feet per minute application speed, time panels as they pass through the machine.

6.5. Edge Guide Placement

Nominal sheeting widths allow for approximately 1/8" (0.32 cm) sheeting overlap which is trimmed after application. Edge Guides are positioned as follows for proper panel alignment:

6.5.1. Start Sheet

Drape sheeting evenly over the Nip Roller. Center a square panel against the sheeting. Position the edge guides close to the pane with an allowance for possible variation in panel width. Lock guides in place. Replace the sheeting on the liner.

6.5.2. Align Panels

Check edge quide alignment by passing panels through the machine. The brake must be set to prevent stock-roll rotation and the sheeting must not be allowed to contact the panels.

Hold panels against one edge guide as they are fed into the nip. If panels do not travel in a straight line, or panels put pressure against guides, reposition edge guide ends that are farthermost from the rollers. This will keep the panels centered under the sheeting.

6.6. Feeding Panels

Consecutive panels should be fed approximately 1.2 inch (1.3 cm) apart. Avoid large gaps between panels or sheeting may stick to the bottom roller.

6.7. Lateral Liner Adjustment

To maintain proper sheeting overlap on panels, stock roll position may be slowly adjusted at the liner unwind lateral adjustment assembly.

If the adjustment is not performed slowly, hard wrinkles in the sheeting may be formed on the panels.

6.8. Heater Caution

Do not allow sheeting or liner to touch the heater while it is hot. When the application is finished, turn the heater off at the machine.

6.9. Nip Roller Protection

Always lower the bottom roller so as to prevent contact between the nip roller and drive roller when not in use for extended periods. This will prevent flat spots from forming in the rubber. The liner stripper roller should remain in the UP position.

Maintenance

This section outlines the operational theory, and maintenance requirements of the SRA1000.

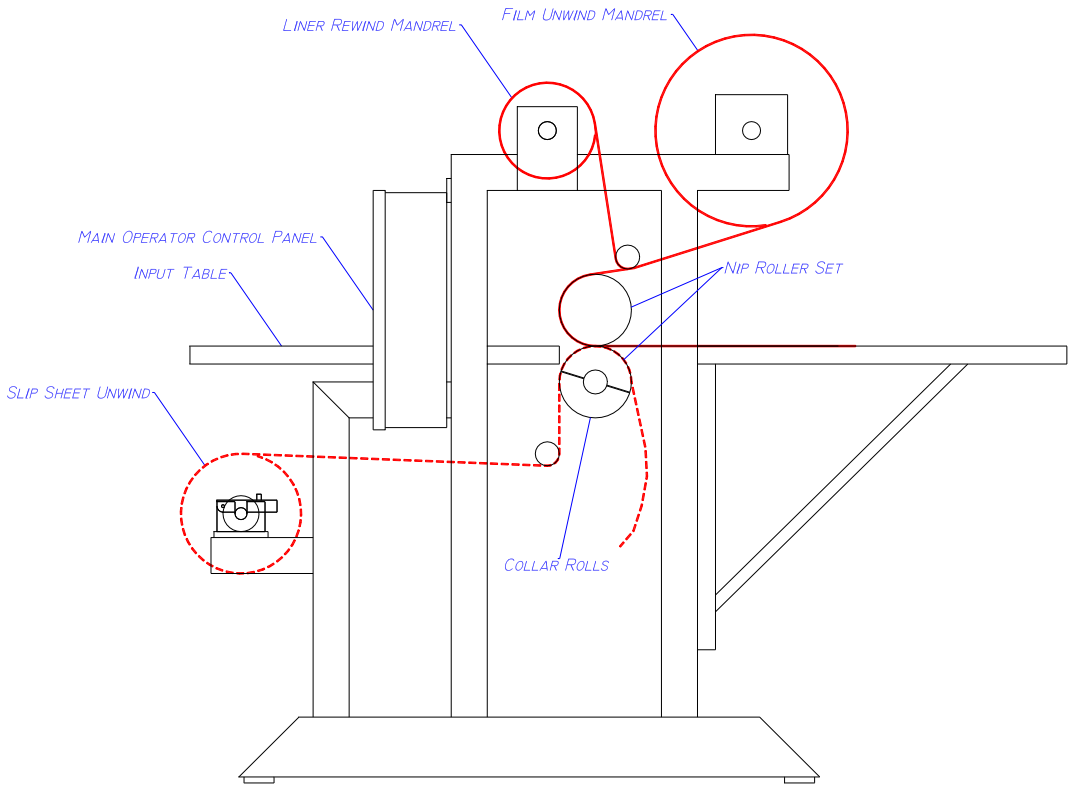


Figure 9: Main Component Location

The SRA1000 utilizes electronic, mechanical and, pneumatic technology to perform the increment and application operations. The Nip Roller pressure is supplied by two (2) pneumatic cylinders, air flow to these cylinders is directed by an electro-pneumatic valve. The Drive Roller is chain coupled to a DC motor driven gearbox, control signals for this motor are generated from a DC drive card. The Unwind Brake is a pneumatic disc brake coupled to the Unwind Mandrel, pneumatic pressure is supplied from a precision regulator, and flow to the Unwind Brake is directed through a manually shifted operator control switch. The Rewind Clutch is a pneumatic single disc clutch coupled to the Rewind Mandrel, pneumatic pressure is supplied from a precision regulator, flow to the Rewind Clutch is directed through a manually shifted operator control switch. The SRA1000 utilizes sealed self-lubricating bearings in certain locations, all other bearings that require lubrication in the system are indicated in Figure 10.

Occasionally the drive chains will require lubrication and possibly tension adjustment, Figure 19 indicates the location of the Drive Roller, Unwind, and Rewind drive chains. Located opposite the operator side of the SRA1000 is a fourth chain linking the Nip Opening Adjustment Wheel to the machine screw actuators that raise and lower the Nip Roller Air Cylinders.

6.10. General

The following Subsections contain useful information pertaining to maintenance procedures for various drive system components. Though not all of the items discussed apply to every machine, the information is general and applies to the basic principles of the various items.

6.10.1. Synchronous Belt Drives (timing belt drives)

Service all belt drives only when it is safe to do so. Remove the incoming electrical and pneumatic power from the equipment and install the appropriate lockout /tagout devices.

Timing belts should be installed with a snug fit, neither too loose nor too tight. High initial tension is not necessary but when shaft torque is too high a loose belt may "jump grooves." In such cases, the tension should be gradually increased until satisfactory operation is attained. Excessive tension wears out the belt quickly and decreases bearing life.

Be sure that the shafts are parallel and pulleys are in alignment. When the distance between shaft centers is long, because of the tendency for the belt to run against one of the pulley flanges, it is sometimes advisable to offset the driven pulley to compensate.

Belt tension requires little attention after initial installation. When changing belts, do not force the belt over the flange of the pulley. This could damage the cords within the belt.

An increase in noise level could indicate either belt or pulley wear. Visually inspect the teeth on both. Worn pulley teeth greatly decrease belt life. Also, check the belt for cord exposure.

Make sure that the driver and driven units are tightly mounted. Loose bolts in either can cause timing belt tension variation resulting in premature wear or loss of increment accuracy.

Never apply any chemicals (belt dressing) on any belt drive. This will only damage the belt and cause slipping and early failure. Keep belts free from foreign material.

6.10.2. V-Belt Drives

Service all belt drives only when it is safe to do so. Remove the incoming electrical and pneumatic power from the equipment and install the appropriate lockout /tagout devices.

Be sure that the shafts are parallel and pulleys are in alignment. The ideal tension is the lowest tension at which the belt will not slip under peak load conditions. A short "chirp" noise at machine startup is normal, but continuous belt squealing indicates either too loose of tension or worn belts and pulleys.

It is a good idea to check the tension frequently during the first 24-48 hours of operation. Make a periodic v-drive inspection afterwards (every 30 days).

Over tensioning shortens belt, pulley, and bearing life.

Keep belts free from foreign material, which may cause slippage. Never apply any chemicals (belt dressing) on any belt drive. This will only damage the belt and cause slipping and early failure.

Visually inspect belts for cracking, splitting, and cord damage. Replace them if they have any damage.

Inspect the pulleys for wear. Use a straightedge to check to see if the sides of the pulley v-groove are flat. The pulley must be replaced if they are not.

Make sure that the driver and driven units are tightly mounted. Tighten any loose bolts.

When installing new belts, never force the belt over the sheave. More belts are broken from this cause than from actual service. Always loosen the belt tensioner or other drive component to allow the belt to be easily slipped into place by hand.

When installing new pulleys (sheaves) never drive them on or off the shafts with a hammer. Be sure that the shaft and keyway are smooth and free from burrs or setscrew marks. Remove these burrs by dressing lightly with a finishing file. Tighten screws carefully and recheck tightness after eight hours of operation. Installation and tightening instructions are nearly always included in the pulley package; sometimes they are printed on the inside surface of the box.

On drives that have more than one belt, replace all the belts with a matched set of new belts. Failure to do this will probably result in the premature breakage of new (and probably shorter) belts mixed with old ones.

Store extra belts in a cool, dry, dark place.

6.10.3. Lubricating Mounted Bearings With Grease Zerks

Lubricate bearings only when it is safe to do so. Remove the incoming electrical and pneumatic power from the equipment and install the appropriate lockout /tagout devices. In some cases, the bearings may be lubricated with all guards and safeties installed and operating.

The proper amount of lubricant in a bearing is important. Both excessive and inadequate lubrication may cause bearing failure. The bearings should be lubricated while they are rotating if it is safe to do so. The grease should be pumped in slowly until a slight bead forms around the seals. This bead in addition to acting as an indicator of adequate lubrication, provides additional protection against the entry of foreign matter and helps flush out contaminates in the bearing. Excess grease can be removed by removing the grease fitting and allowing the grease to escape.

By the time the slight grease bead is formed, it will be noted that the bearing temperature will rise. Occasionally the temperature may rise as much as 30° F after re-lubrication. If it is necessary to re-lubricate while the bearing is idle, use the following table for approximate grease charges.

Shaft Size (inches)	Grease Charge (ounces)
1/2 to 3/4	0.03
7/8 to 1-3/16	0.10
1-1/4 to 1-1/2	0.15
1-11/16 to 1-15/16	0.20
2 to 2-7/16	0.30
2-1/2 to 2-15/16	0.50
3 to 3-7/16	0.85
3-1/2 to 4	1.5

Table 4: Mounted (Cast Iron Housing) Ball Bearings Lube Quantity

All bearing units are normally pre-lubricated at the factory. The lubricant is usually a highly refined mineral oil with a lithium soap thickener to conform to NLGI Grade-2 consistency. Additives that protect against corrosion of the metal parts and oxidation of the lubricant are also included. Local bearing suppliers can provide good multi purpose grease that is compatible with these specifications. The following table provides a frequency of lubrication depending on operating conditions. Remember that bearing operating temperature is the best index for determining a lubrication schedule.

Speed (rpm)	Temperature (°F)	Cleanliness	Interval
100	Up to 125	Clean	6 mos. to 1 year
500	Up to 150	Clean	2 months
1000	Up to 210	Clean	2 weeks
1500	Over 150	Clean	Weekly
Any	Up to 150	Dirty	1 to 4 weeks
Any	Over 150	Dirty	1 to 7 days
Any	Any	Very dirty	1 to 7 days
Any	Any	Extreme dirty	Daily

Table 5: Bearing Lubrication Schedule

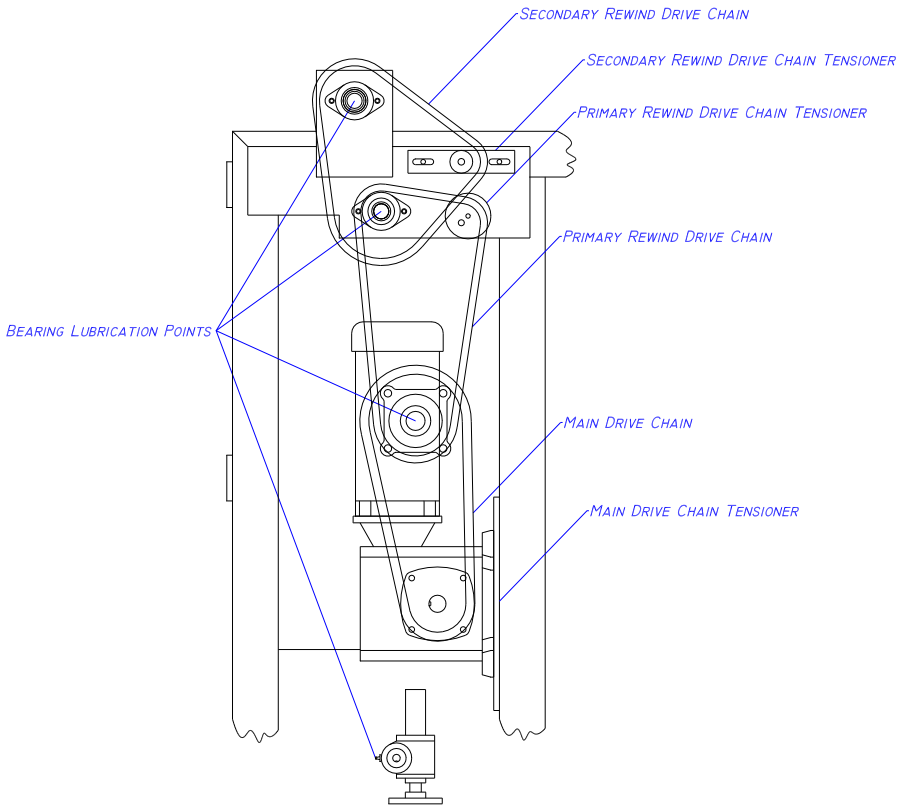


Figure 10: Bearing Lube Diagram

6.10.4. Roller Chain Drives

Service and inspect chain drives only when it is safe to do so. Remove the incoming electrical and pneumatic power from the equipment and install the appropriate lockout /tagout devices. In some cases, the drive may be serviced with all guards and safeties installed and operating.

Visually inspect periodically and make sure that shafts are parallel and sprockets are in line with each other. Insure that the sprocket teeth are not deformed, and check the chain for looseness.

Replace a worn out chain with a complete new chain and new sprockets. A new chain should be installed with light tension, as it will elongate a small amount due to the seating of the pins and bushings during the first few days of operation. A smooth operating chain drive should have a slight sag in the chain. Sprockets should be replaced with identical units as Contech uses sprockets with hardened teeth extensively.

Most roller chain drives used in Contech equipment require manual lubrication. The roller chain should be kept in good condition by proper lubrication and occasional cleaning. Clean the chain and sprockets by wiping off the contaminants. Lubricate the chain using oil specifically designed for roller chain. A local bearing supplier can provide the proper chain oil and other chain cleaning products.

6.10.5. Shaft Couplings

Service and inspect shaft couplings only when it is safe to do so. Remove the incoming electrical and pneumatic power from the equipment and install the appropriate lockout /tagout devices.

Shaft couplings are used primarily to connect two rotating shafts together. Various styles are employed depending on the physical requirements. Jaw, flex disc, bellows, beam, and rigid type couplings are used by Contech, and they usually need

only occasional visual inspection for looseness and insert integrity. Once properly installed, couplings generally give good service for the life of the equipment with very little maintenance required. Inspect couplings once every 6 months to a year.

Gear reducers usually have a bellows, or jaw style coupling attached to the input shaft and a rigid, or flex disc coupling attached to the output shaft. In order to inspect the input shaft coupling, the attached motor may need to be removed thereby exposing the coupling. An inspection opening is sometimes present in the reducer's motor adapter housing. This opening allows the coupling to be inspected and tightened. Remember that a loose coupling or damaged insert will adversely affect the increment accuracy.

Electrical encoders use beam style couplings. These couplings rarely need maintaining.

6.10.6. Gear Drives (gear reducers / boxes)

Service all gear reducers only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect.

Gear reducers are filled at the factory with lubricant and generally need no maintenance other than checking the lubricant level and checking the looseness of the gear set. Gear reducers have either a level plug or a "bulls-eye" sight glass to indicate oil level. Replacing the shaft seals can sometimes repair leaking gear reducers. Excessive looseness or "backlash" in the gear set adversely affects increment accuracy.

Individual gear reducers have their own lubrication requirements. Contech uses Mobil SHC synthetic gear oil in Boston, Cone, and Winsmith gear reducers. Other gear reducers have individual specifications and requirements. Consult the gear reducer manual for specific recommendations. Never mix brands of gear oils together. If unsure of the exact kind of gear oil that is in a gear reducer, drain the old oil completely and refill with the proper oil.

Some gear reducer manufacturers recommend that the oil be changed at the end of 2 weeks operation and then again after every 2500 hours of operation. This frequency of lubrication change will ensure long life. Again, check the individual manufacturer documentation for specific instructions.

Gear reducers in normal operation can generate temperatures up to 200°F depending on the type of reducer and the severity of the application (loading, duration of service, ambient temperature). At these high temperatures, the service life is reduced. Excessive reducer temperatures can be the result of overload, inadequate cooling, or overfilling or under filling with oil. Air must be allowed to circulate freely around the equipment.

During normal operation, the heat generated by the gearbox will cause air and lubricant to expand. A vent plug is used on some units to equalize the resulting pressure. Check the vent plug, if present, for blockage and proper operation.

6.10.7. Electric Motors

Service all electric motors only when it is safe to do so. In all cases, turn off the electrical and pneumatic power to the equipment and install an electrical lockout on the power disconnect.

Nearly all electric motors are permanently lubricated at the factory. Exceptions to this rule are large electric motors with specific lubrication instructions.

Permanent magnet DC motors are usually equipped with brushes. These need to be inspected after every 1000 hours of operation. When they shorten to a specific length, replace them with new ones. The individual motor manual will indicate minimum brush length dimensions. DC servomotors are brushless, and are normally maintenance free.

Elevated motor temperatures beyond the motor's nameplate value may indicate overload caused by a worn drive system, or inadequate cooling. Keep all motors clean, free from debris, and dry. Periodically monitoring the amp draw of each motor is a good indicator of overall machine condition.

6.10.8. Pneumatic Systems

Service pneumatic components only when it is safe to do so. Always remove the incoming electrical and pneumatic power to the equipment and install the appropriate lockout /tagout devices. Be aware that residual air pressure may still exist somewhere in the machine, even after the air-lines have been disconnected. This residual air pressure may cause part of the machine to operate resulting in a dangerous condition.

One of the most important pneumatic components used with Contech equipment is the filter regulator. The filter regulator provides two basic functions. It reduces the air-line pressure to that which is required by the machine. It also filters water and particulate matter from the compressed air. Water and dirt are the leading cause of air component malfunction. It is very important to visually check weekly the sight bowl at the bottom of this unit. A drain (possibly self-draining) will allow the water to escape the system. The filter element is also visible in the sight bowl. Auxiliary water traps may need to be installed if conditions (high humidity or large air requirements) warrant.

This filter regulator may be combined with a lubricator, which will need periodic refilling of air-line oil. The lubricator is only used when specific devices require it. Instructions on how to maintain the lubricator, if installed, will be included in the manual addendum.

Electric solenoid valves use an internal spool that shifts back and forth electrically thereby directing pressurized air to the proper air device. These spools can become stuck in place due to foreign matter or moisture in the air-lines. A long period of inactivity can also cause partial or complete sticking. If cycling the valve a few times does not clear the blockage, it will be necessary to disassemble the valve and clean it. Contech uses illuminated electrical connectors frequently to provide a visual indication of electrical power to the valve. A burned out solenoid coil can also cause the spool to not move. Valves do not need lubrication (or a lubricator) in order to function properly.

Mufflers are used on both air cylinder ports and valves. They are used to quiet machine operation, control the flow of air, and keep foreign particles out of the system. It is possible for these to become clogged on the inside surface. This is caused by contamination from deteriorating air-lines, failing components, or dirt in general. A clogged muffler can cause a valve to not shift or a cylinder to move slowly or not at all. This is not visible from the outside, and the muffler will appear to be perfectly normal. Remove the muffler and either clean or replace it.

Air cylinders are used to provide linear motion power. Rotary actuators are used to provide rotary motion power. Both of these types of devices require clean dry air and will provide long service with little or no maintenance. Sometimes they are equipped with adjustable cushions and/or flow controls (adjustable mufflers). These controls provide smooth operation and long life if adjusted properly. Eventually the piston and rod seals will wear and the machine will suffer performance degradation or cease to function. At this time it is sometimes more economical to replace the actuator rather than repair it.

Vacuum systems rely on a vacuum source (pump) for power. Pumps are usually of the piston type, requiring periodic oiling, or of a venturi type, those require clean dry compressed air. The operator’s manual for the piston pump, if installed, is included in the addendum. Venturi vacuum generators are very sensitive to dirt and have no moving parts. They can be easily disassembled and cleaned.

6.10.9. Clutches and Brakes

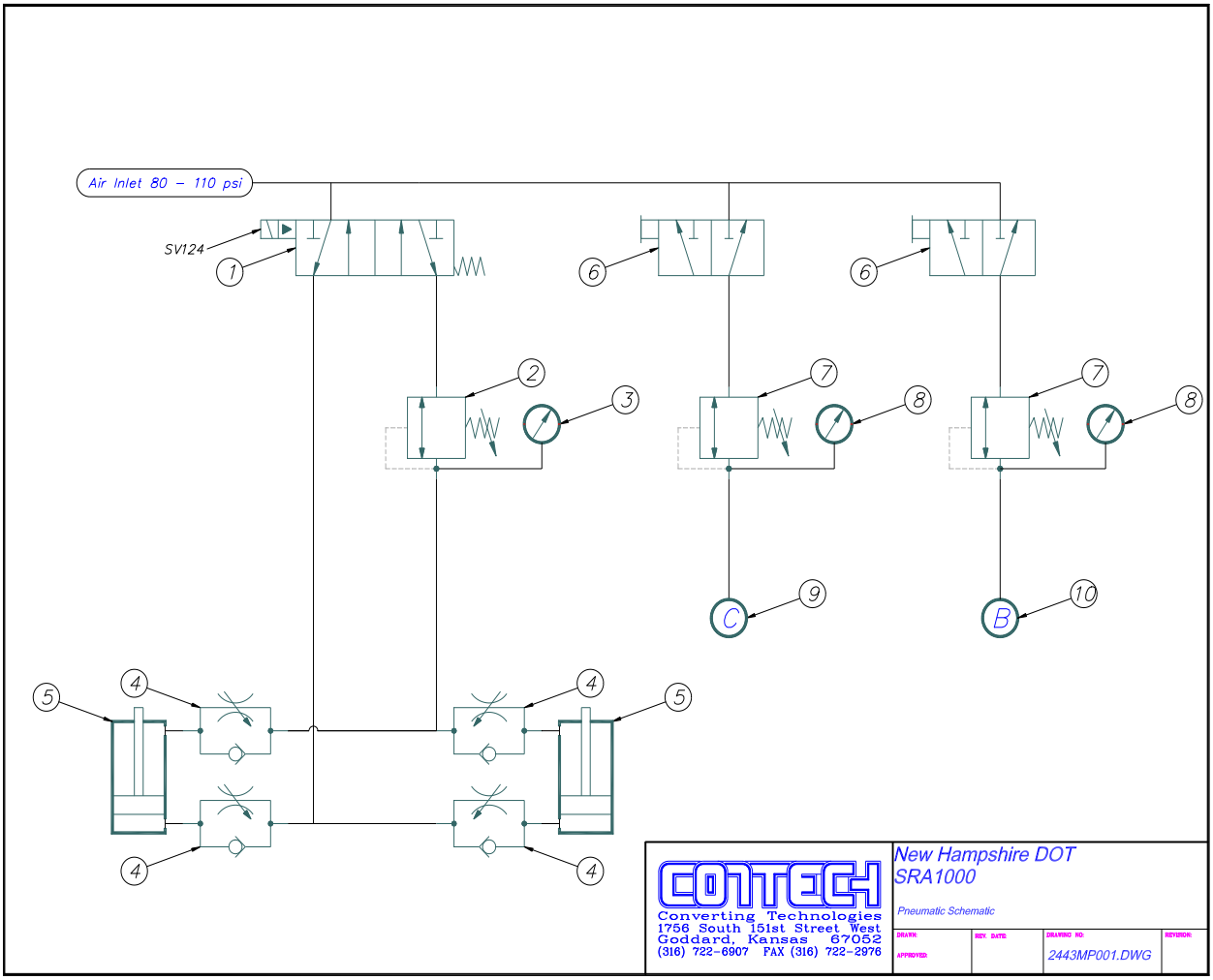
Service all clutches and brakes only when it is safe to do so. Always remove the incoming electrical and pneumatic power from the equipment and install the appropriate lockout /tagout device.

Brakes are used stop rotary motion or to drag rotary motion (provide web tension for instance) in Contech equipment. They may be either electric or air powered or even simply a leather strap placed over a drum. Electric brakes come in two styles, friction disc, or magnetic particle. Air brakes also come in two styles, disc caliper or friction disc. Maintenance is simple; replace the friction discs, linings, or pads when they are worn out. The linings or pads are sometimes visible without having to disassemble the unit. It is possible for the rotors to wear also. Replacement of the entire brake assembly should be considered when both the rotors and the friction media are worn. Magnetic particle brakes should have the particle media replaced yearly.

Clutches are similar to brakes in principle. They are employed to temporarily disconnect or apply rotary power. They are also used to provide a constant slipping transmission of rotary torque to a shaft. Construction and maintenance is the same as for brakes.

Clutch/brake mechanisms are used to provide a cyclic power pulse to rotating machinery. Contech uses an oil shear device manufactured by Force Control. This device uses liquid as the friction media and is very hardy. When the air controls are properly adjusted, they require little or no maintenance.

6.11. Pneumatic Schematic



Ref.	Qty.	Description	Part No.
1	1	Automatic L2003AAWR-AA 2 Position 5 Way Spring Return Valve	CP-N/A
2	1	1/4" Pneumatic Regulator (0 to 100-psi)	CP-40021
3	1	1.5" Pneumatic Pressure Gauge (0 to 100-psi)	CP-40026
4	4	Bimba FQP44 Pneumatic Flow Control	CP-N/A
5	2	Grainger 6X388 Air Cylinder	CP-N/A
6	2	Humphrey 31V 2 Position 3 Way Manually Operated Valve	40046
7	2	¼" Regulator (0 to 60-psi)	40032
8	2	1.5" Pneumatic Pressure Gauge (0 to 60-psi)	40027
9	1	Carlson TSC 150-PM-2L Pneumatic Clutch	CP-N/A
10	1	Carlson TSB 450 Pneumatic Disc Brake	CP-N/A

Table 6: Pneumatic Diagram Part Reference List

7. Glossary

AC	*Acronym. Alternating Current, an electrical current that reverses polarity at regular intervals.*
AC Motor	*An electric motor designed to operate using AC power.*
Actuator	*A device that converts force into movement, some examples of different actuator types are: air or hydraulic cylinder, lead or ball screw.*
Air Manifold	*A pressurized, tubular chamber with several outlets for conveniently supplying air to several pneumatic devices.*
Air Regulator	*An adjustable device used to maintain a preset air pressure.*
Air Shaft	*A unwind or rewind mandrel that expands when inflated.*
Ambient Condition	*The surrounding atmosphere and environment.*
Backlash	*Mechanical play, (slop/looseness) that exists or may develop through wear between a driven component and a drive source.*
Ball Bushing/Linear Bearing	*A tubular shaped ball bearing assembly designed for linear movement on a shaft.*
Ball Screw	*A mechanical assembly consisting of a threaded shaft and a ball bearing-type nut which, when the shaft is rotated, causes the nut to move linearly.*
Beverage Board	*A flat, dense card stock also called poster board.*
Bias (Blade)	*Typically, a cutter that uses a reciprocating blade positioned at a slight angle to the stationary blade.*
Cantilever	*A structure supported from only one end.*
Center Guiding	*The process of guiding a varying width web from an imaginary center line.*
CFM	*Acronym. Volume expressed in Cubic Feet Per Minute.*
Circuit Breaker	*A device used with electrical equipment to provide overload protection.*
Closed Loop	*A control concept in which feedback is used to modify the characteristics of the output.*

Clutch	*Typically, a pneumatically actuated mechanical coupling used to connect and disconnect a driving and driven part of a machine.*
Coalescing Filter	*Devices that collect and remove water and oil from air lines.*
Coefficient of Friction	*The relationship between the weight of a mass, and the force required to move it.*
Coil	*A number of turns of wire in spiral form, when energized creating an electromagnet. Typically used to magnetically change the position of an electrical, mechanical, pneumatic or, hydraulic device.*
Contacts	*The element of a relay or contactor which performs a junction of two electrical conductors.*
Converting	*The process of changing a web material into another material or product (e.g., plastic film into plastic bags).*
Coupling (Shaft)	*A mechanical device used to join a motor output shaft to a machine part, typically a roller.*
Cutting Plate	*A replaceable thin metal plate positioned on top of the lower platen.*
Cycle	*A series of events or operations that recur regularly and usually lead back to the start.*
Cylinder	*A piston-type actuator.*
Dancer	*A roller or arm positioned by the web that provides feedback to control web speed and /or tension.*
Dancer Linked Brake	*A braking system that uses dancer position feedback to adjust braking action.*
DC	*Acronym. Direct Current, an electrical current that flows in one direction only.*
DC Motor	*An electric motor designed to operate using DC power.*
DC Power Supply	*An electrical device used to convert incoming AC power to regulated DC power.*
Diaphragm	*A component made from a thin, flexible, durable material used in many automatic control devices to transfer force.*
Die (Tool)	*The cutting or shaping component used in a machine.*

Electrical Spike	*An unpredictable and infrequent momentary high electrical voltage which can harm electrical/electronic devices.*
Electromagnet	*A core of magnetic material surrounded by a coil of wire through which an electric current is passed to magnetize the core.*
Emergency Stop (E-Stop)	*An operator triggered device that will stop all motion in a system, typically requiring acknowledgment of the violation.*
Encoder	*A device typically electromechanical, that translates motion into electrical pulses. See also Resolver, Tachometer, or Transducer.*
Fan /Blower	*A device used for producing a current of air.*
Feedback	*The return to an input of a part of the output of a machine or control system, or process.*
FeedTable	*A reciprocating plate that can be extended from the press cavity to accept material sheets for processing.*
FPM	*Web speed expressed in feet per minute.*
Fuse	*Electrical overload protection device.*
Fuse Block	*A holder for a fuse or fuses including wire termination.*
Gain Control	*A controllable means to increase or decrease the frequency response.*
Gauge	*An instrument with a graduated scale or dial for measuring and indicating.*
Gear Reducer	*A mechanism used in power drive trains to modify the available torque or horsepower.*
Heated Platen	*A heated flat metal plate that exerts or receives pressure.*
HP	*Acronym. Available force expressed as horsepower.*
Hydraulics	*The branch of mechanics, which uses controlled hydraulic oil flow, and pressure to provide force to an actuator.*
Idler Roller	*A roller that is not driven, that relies on the material web for rotational force.*

Inertia	*A property of matter by which it stays at rest or in uniform motion in the same straight line unless acted on by an external force.*
Infrared Sensor	*An electronic sensor that uses infrared wavelengths to detect the position or presence of an object.*
Jog	*1 To align the edges of cut sheets of material.*
	2 To manually move at a controlled slow rate.
Jogger	*A machine that uses a vibrating table to align the edges of cut sheets of material.*
Laminate	*To bond layers of material using adhesive or other means.*
Lead Screw	*A mechanical assembly consisting of a threaded shaft and a nut which, when the shaft is rotated, causes the nut to move linearly.*
Limit Switch	*Typically, an electrical device that provides position information to a control system.*
Linear Actuator	*A mechanical actuator that uses an electric, pneumatic or hydraulic power to provide linear force. See Ball Screw.*
Low Voltage	*A voltage reading that is lower than the required or expected voltage.*
Make-ready	*The act of compensating for inconsistent cutting surfaces.*
Motor Drive	*An electrical device that provides voltage to drive an electrical motor (AC or DC).*
Motor Starter	*A relay capable of withstanding inductive load generated when starting an electric motor (AC or DC).*
Nip Roller Set	*A pair of parallel rollers, typically one driven and one idler with an adjustable opening.*
Open Loop	*A control concept in which feedback is not used to modify the characteristics of the output.*
Operator Interface	*Typically, a control or control panel provided for an operator to modify or monitor system variables.*
Oscillate	*To move back and forth between two points.*

Photo Sensor	*An electronic sensor that uses light wavelengths to detect the position or presence of an object.*
PID (Proportional, Integral, Derivative) Closed Loop	*A control concept in which error correction is calculated using the margin, and duration of the error.*
Platen	*A flat metal plate that exerts or receives pressure.*
PLC (Programmable Logic Controller)	*Acronym. A control computer that is designed specifically for machine control.*
PLI	*Acronym. Web tension expressed in **P**ounds per **L**inear **I**nch of web.*
Pneumatics	*The branch of mechanics which, uses controlled air-flow and pressure to provide force to an actuator.*
Point	*A unit of measure 1/72" (.072")*
Power Connector	*An electrical connection comprised of a plug and receptacle, capable of withstanding high current draw (AC or DC).*
Pressure Reducer	*Typically, a hydraulic component that senses secondary pressure to maintain that output pressure regardless of the incoming pressure.*
Pressure Relief	*Typically, a hydraulic component that uses a spring to hold an orifice closed until system pressure overcomes the spring and allows flow to the reservoir.*
Proportional Control	*An output that is directly related to an input.*
Proximity Sensor	*An electrical device capable of detecting the presence of an object.*
PSI	*Acronym. Available Force expressed in Pounds per Square Inch*
Pushbutton	*A small button or knob actuated by pushing, provided for operator control, electrical, pneumatic, or mechanical.*
Regulator	*Devices, which control or determine pressure, rate or time.*
Relay	*An electromechanical device for remote or automatic control that is actuated in variation of conditions of an electrical circuit and that operates other devices in an electrical circuit.*
Reset	*To restart or arm a control or safety system.*

Resolver	*A device typically electromechanical, that translates motion into electrical pulses. See also Encoder, Tachometer, or Transducer.*
Retrofit	*Replacing a portion of a system while, typically re-using part or all of the original components.*
Rod End	*An attachment device for the end of an actuator rod that can compensate for slight misalignment between the Actuator Base Mount and the reciprocating component mount.*
Roller Chain	*A series of metal links fitted together for the purpose of power transmission or support.*
Rotary Actuator	*A mechanical actuator that uses pneumatic or hydraulic pressure to drive pistons moving a rack gear linearly over a ring gear, delivering rotational force to single or dual output shaft (S).*
RF	*Acronym. Radio Frequency*
RPM	*Acronym. Rotational speed expressed as Revolutions pre Minute.*
RS232	*A serial communications protocol.*
Safety Chuck	*A mechanical device used to support an unwind mandrel, which when rotated automatically secures the mandrel.*
Selector Switch	*A small button or knob actuated by turning, provided for operator control, electrical, pneumatic, or mechanical.*
Serial Interface	*The act of sending information from one computer device to another one bit at a time.*
Service (Safety) Disconnect	*Typically, a large mechanical switch that is provided to completely remove incoming power for the purpose of storage or service of a machine.*
Sheave	*A pulley used with a V-Belt power transmission system.*
Shield (foil or braided)	*Typically, a metallic encasement surrounding wiring or components to avoid interference from RF signals.*
Slitter	*A cutting device that is positioned perpendicularly over or under the material web, while incremented through the system, the cutting device slices the web.*

Solenoid Valve	*Typically, a pneumatic or hydraulic valve actuated by an electromagnetic coil.*
Static Eliminator	*An electrical or mechanical device that is used to dissipate static electric charges from a web.*
Steel Rule Die	*Typically, a die made from extremely sharp metal rule bent into a shape and supported with wood.*
Stop Block (Screw Jack)	*The operator controlled mechanism used in conjunction with a spacer and position indicator, which limits the lower stopping position of the upper press platen.*
Stop Block (Spacer)	*An interchangeable round spacer used in conjunction with the stop block screw jack, which allows a press to accommodate different tooling heights.*
Tachometer	*A device used to measure RPM.*
Tool (Die)	*The cutting or shaping component used in a machine.*
Transducer	*A device typically electromechanical, that translates motion into electrical pulses. See also Encoder, Resolver, or Tachometer.*
Transformer	*An electrical device that employs the principle of mutual induction to convert variations of current in a primary circuit into variations of voltage and current in a secondary circuit.*
Trantorque	*An expandable insert typically, used to couple a roller to a shaft.*
Valve	*Any of numerous mechanical devices by which the flow of liquid, gas, or loose material in bulk may be started, stopped, or regulated by a moveable part that opens, shuts, or partially obstructs one or more ports or passageways.*
Variable Frequency Drive	*An AC motor drive device that is capable of varying the output frequency to alter the rate and torque of a drive motor.*
V-Belt	*A continuous “v” shaped tough flexible material for transmitting motion and power.*
Web	*The portion of a material roll that is threaded through a processing machine. The type of material, elasticity, maximum width, and processing speed are all factors from a processing stand point.*

Web Guide	*A control system that is dedicated to maintaining a lateral web position during processing of continuos or web fed materials.*
Web Processing	*The converting of material in continuos web /roll form.*
Web Tension	*The linear force that is measured in PLI, between two points on a material web.*

8. Warranty

Contech warrants to the original purchaser of this equipment, to replace or repair at the manufacturers choice. Any part, which in normal use proves to be defective in material or workmanship within a period of one (1) year or 2,080 hours of operation whichever comes first, when shipped prepaid to our factory in Goddard, Kansas. Contech does not warrant the paint or the stainless steel, scratching or discoloration after installation due to normal usage. Labor will be provided at no additional expense if. The machinery is shipped freight prepaid to our factory, with the proper return authorization, or if the customer agrees to pay traveling and living expenses for a technician to work at their facility. Contech reserves the right to decide on the method of dealing with a claim under this warranty.

THIS WARRANTY WILL NOT BE IN EFFECT:

1. If any part has been altered or subject to misuse.
2. If the equipment has been improperly maintained as per instructions.
3. Unless part or parts were defective in material and workmanship under normal use and operated in accordance with factory operation instructions and servicing.

THIS WARRANTY IS LIMITED TO THE ORIGINAL PURCHASER

The above warranty is in lieu of all other warranties expressed or implied. Contech does not authorize any other person or representative to make or assume for it any other obligation or liability that is not in accordance with this warranty.

Warranty information is available by contacting Contech. No part or parts will be accepted for Contech replacement or repair unless a Customer Service Return Number (CS-#) has been issued. Contact Contech Customer Service Dept. with model and serial number and nature of problem or defect at 1-316-722-6907.

This warranty gives you specific legal rights and you may have other rights which, vary from state to state.

Note:

Contech does not consider small hydraulic line leaks covered by warranty. The equipment was tested for 10 to 12 hours under full load for operation and leaks. After shipment, start up and high-pressure operation for 30 days re-tighten all hydraulic connections. If you have any questions, call our customer service department.

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