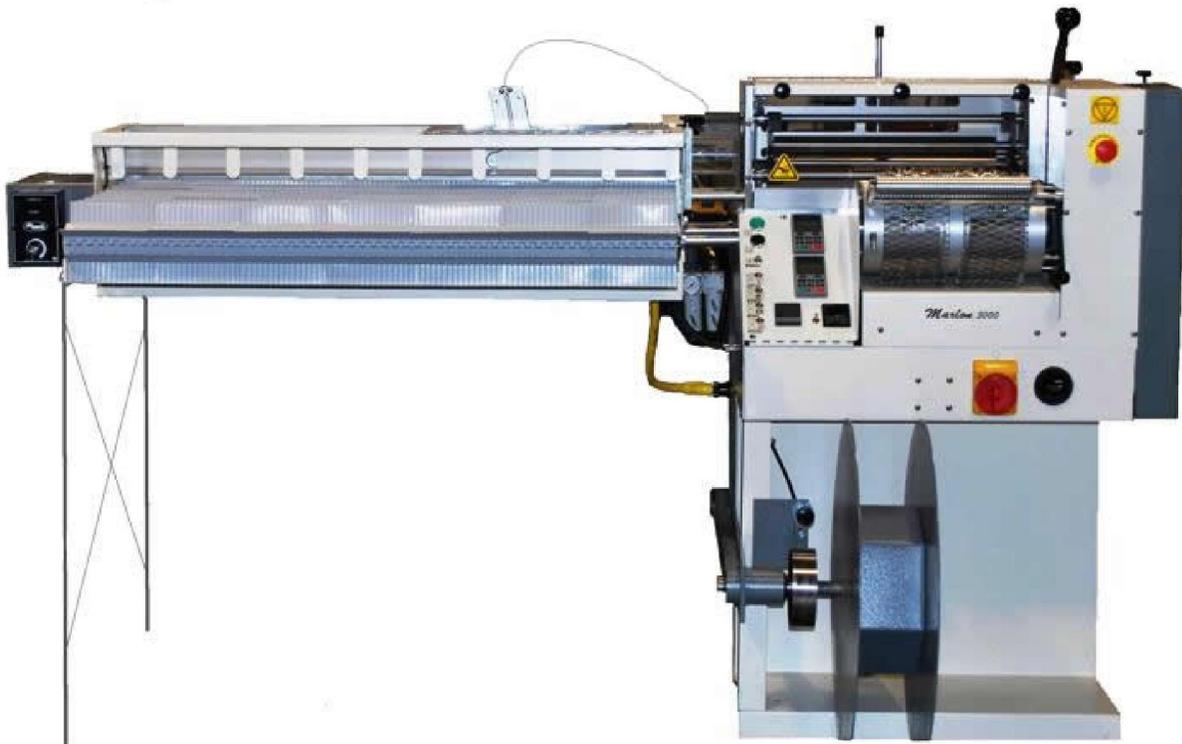


MARLON 5000 SPEED FORMER



OPERATORS MANUAL

PVC SPIRAL SUPPLY
123 EAST 45TH STREET
BOISE, IDAHO 83714
(800) 461-9301

INTRODUCTION

Your new Marlon 5000 forming machine is designed to increase your coil production without compromising the quality of your product. The Marlon 5000 was designed to accept two off feed systems for product packaging, or staging coil to one of the industries many high-speed coil inserters. The design of the Marlon 5000 allows the operator to inspect the coil for defects as the machine is operating giving you full confidence in the quality of your spiral bindings. Mandrels for the Marlon 5000 are available in a full range of diameters, and pitch. Changing mandrels in the Marlon 5000 can be accomplished in a matter of minutes reducing unwanted down time. The independent drive system of the Marlon 5000 enables the operator to fine tune operating variables to insure a quality controlled product at maximum production rates, while minimizing product waste.

The following sections of this manual will familiarize you with the controls and safety features of the Marlon 5000. It will cover operating procedures, trouble shooting, and the maintenance required to keep your Marlon 5000 performing to its full potential. We are confident that your new Marlon 5000 forming machine will fulfill your highest expectations, and prove to be a valuable asset to your growing business.

FACILITY REQUIREMENTS

Marlon 5000:
Minimum requirements for machine setup

Service branch: Max 20 Amp breaker

Facility air pressure: 100 psi / 6.9 bar – 120 psi / 8.3 bar.

Set-up and operate in a well-ventilated area.

Use only a damp cloth to clean exterior surfaces of machine.

Under no circumstance shall an operator go inside of machine, only a qualified service person.

Service people shall wear **no jewelry or metal objects** while working inside machine or under control panel.

Service people shall adhere to all applicable warning labels.

Electrical service shall be disconnected and locked out before any service or repairs are made.



SAFETY FIRST !

Your Marlon 5000 was designed with operator safety in mind. We strongly suggest that all machine operators read this manual and become familiar with the operations, functions, and safety hazards.

The Marlon 5000 is equipped with a guillotine cutter that cycles with enough force to cause serious injury. The door covering the conveyor entrance and the coil guide tube have magnetic switches that disable the cutter air valve when opened. Never place your hands into the cutter opening under any circumstances.



The Marlon 5000 is equipped with an emergency shut off switch located on the top right front of the machine. Press the switch in to shut the machine off. Turn the switch clockwise to reset the emergency shut off switch.



The drive systems are equipped with interlock switches that disable the roller drive and heater drive when the end door (covering the gear plate) is opened. Only the roller drive is disabled when the top door (covering the roller compartment) is opened. The drive pads (in the control panel) will display Hbb SafeDisable Open and the alarm light will flash red. To restart the machine you will need to close the opened door, press the FWD key or the green main start button.



The Marlon 5000 contains high voltage components. Never operate your Marlon 5000 without all shrouds fastened in place and doors closed. The control panel, doors and shrouds should only be opened or removed by a qualified technician with the power supply disconnected and locked out.



The heater drum on the Marlon 5000 operates at temperatures ranging between 0 and 275 degrees Fahrenheit. Use caution when working around the heater drum. Never operate machine without heater band shields secured in place.



The Marlon 5000 should be installed and operated in a well-ventilated area. The sound level during operation averages 75dba with peaks of 88dba. Hearing protection is not required but is advised.

Your new Marlon 5000 forming machine is only as safe as the person operating it. One careless moment is all it takes to create an unsafe situation. Stay alert and aware of safety hazards around you to avoid any unnecessary accidents.

MARLON 5000

COVER, DOOR AND EMERGENCY STOP SWITCHES

The interlock switches built into this machine are critical to insure **OPERATOR SAFETY**. Hands should not be inside the areas of **CUTTER, ROLLERS,** or **MOTOR DRIVE**, While machine is running. The doors to these areas have interlocks installed to facilitate operator safety. **This machine will not function if any of the doors are open.**

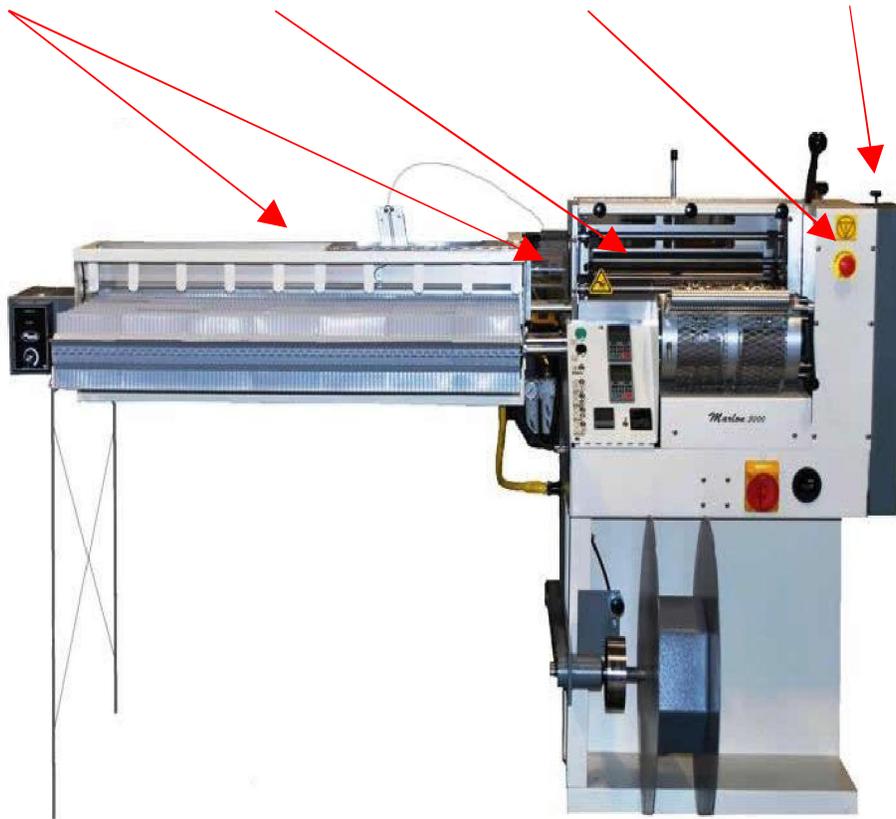


Cutter / Guide tube
Off feed system

Roller

Emergency stop

Motor drive



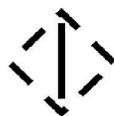
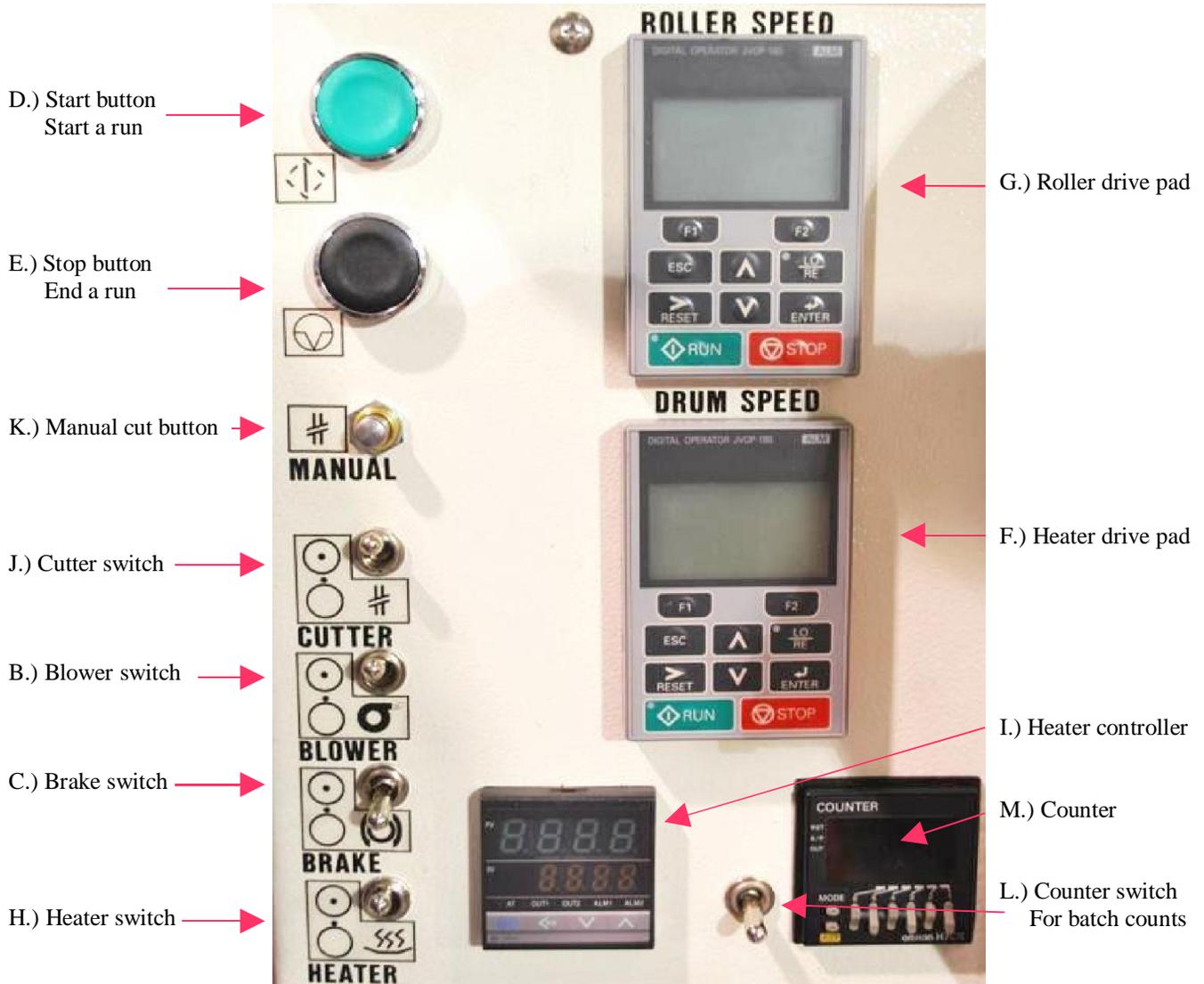
INTERLOCK SWITCH LOCATIONS
INDICATED ABOVE

CONTROL PANEL FUNCTIONS

- A.) Main Switch – Power main disconnect for Marlon 5000 located below the control panel to the right on front of machine.
- B.) Blower Switch – On/Off toggle switch for blower. When turned to the on position the blower will turn on and off with the roller drive. The blower cools the heated filament forming it to the correct inside diameter and pitch of the mandrel.
- C.) Brake Switch – On/Off toggle switch for spool brake. When turned to the on position the brake will stop and release the spool with the heater drive. Leave the brake on to avoid spool lash that can result in tangled or broken filament.
- D.) Start Button – Green push button on top of control panel. Start button simultaneously starts heater and roller drives.
- E.) Stop Button – Black push button on top of control panel. Stop button simultaneously stops heater and roller drives.
- F.) Heater Drive Pad (*) – Controls heater drum speed, adjust the heater drive speed with the arrow up or arrow down keys. Setting will be saved automatically. Press the RUN key to start the drive. Press the STOP key to stop the drive. To simultaneously start or stop both drives use the green and black push buttons.
- G.) Roller Drive Pad (*) – Controls roller drive speed, functions are the same as Heater Drive Pad (see F.).
- H.) Heater Switch – On/Off toggle switch controlling power to heater band and controller. The heater switch must be in the on position when the machine is running. Turn the switch to the off position to cool heater drum without changing heater controller settings.
- I.) Heater Controller - Controls the temperature of the heater drum. Press the set key to enter the setting mode. Press the arrow left key to shift between characters. Press the arrow up or arrow down keys to change values. When the correct value is displayed press the set key. The heater controller displays two settings; (PV) on top is the present value or current temperature of the drum, (SV) on bottom is the set value or temperature desired.
- J.) Cutter Switch – On /Off toggle switch to cutter. The cutter switch must be in the on position for the cutter to cycle.
- K.) Manual cut button – This button overrides the photoelectric sensor and cycles the cutter. This allows you to cut the coil at any time.
- L.) Counter Switch – On/Off toggle switch: in the on position the counter will automatically stop the forming machine when the counter reaches the preset batch count. The counter will now reset when the green start button is pressed and the forming machine will run until the batch count is reached again. Leave the counter switch in the off position to run the machine continuously.
- M.) Counter – Counts the number of times the cutter cycles. The counter can be preset to run a batch of a certain number, and then automatically stop the drives (counter switch must be in the on position). Preset the counter by pressing the buttons labeled one through six until the desired batch count is displayed. To run continuously set all characters to the maximum batch count (counter switch must be in the off position). Press the reset button to return the counter to zero.
- N.) Hour Meter – Keeps track of elapsed time while Marlon 5000 is running. Located below the control panel to the right on front of machine.

(*) Drive pads must be in FREF (OPR) mode to start and run drives.

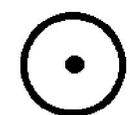
CONTROL PANEL



Start a Run



On



Off



Cutter



Blower



Brake



Heater

MACHINE SETTINGS

Operating specifications for the Marlon 5000 are not geographically constant. Operating specifications for your climate will need to be documented. Use the formula below to assist you in finding the optimum drive speeds and heater drum temperatures for your location.

Formula: You should be able to form a quality 36” piece of coil at a rate of one second per millimeter of inside coil diameter.

Example: 10mm-4:1 coil 36” long at a rate of 10 seconds per piece.

Your Marlon 5000 forming machine is capable of producing coil faster than the formula described above, but careful attention is required to avoid compromising coil quality.

The enclosed specifications are approximate for operation in Boise, Idaho. I use the word approximate because changes in weather will affect the coil process. Use our specifications as a starting point and make adjustments for optimum drive speeds and heater drum temperature. Document your final specifications for future reference.

Roller Drive speed: Set the drive speed to the approximate speed enclosed using the arrow up, and down keys on the roller drive pad. When the desired setting is displayed on the drive pad press enter to store the setting.

Heater Drum Speed: Set the drive speed to the approximate speed enclosed. Now you will need to fine-tune the heater drum speed to match the roller drive speed. To accomplish this you will need to watch the filament at the point where it first contacts the mandrel. The filament should create a loop as it wraps the first revolution around the mandrel center before riding tight on the center shaft the full distance to the mandrel end. If the heater drum speed is set to low the filament will not have a loop on the first revolution and could possibly be “pulling down” (stretching) the filament.

If the heater drum speed is set to high the loop will have too much slack and could possibly make contact with the mandrel shell causing scratches on the filament.

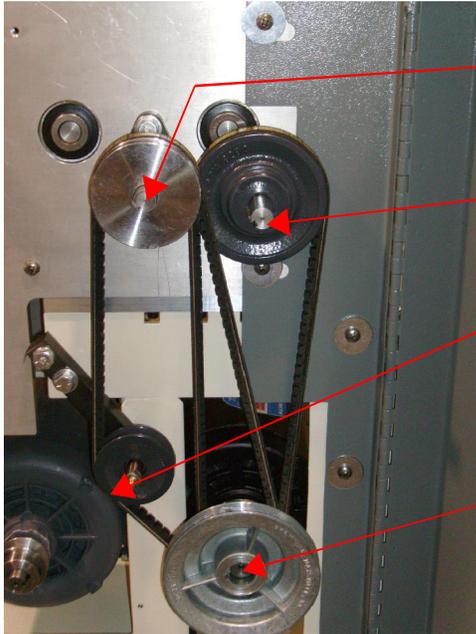
Heater Drum Temperature: Start by setting the heater drum to the approximate specifications enclosed. If temperature changes are needed make them in five-degree increments until the optimum temperature setting is found. If the heater drum is too cold the finished coil will have a lack of gloss and a rippled look instead of a uniform glossy appearance.

APPROXIMATE SPEED REFERENCE

Size	Drum Speed	Roller Speed	Drum Temperature
6MM-4:1	22 HZ	42 HZ	220 DEGREES FAHRENHEIT
6MM-5:1	22.5 HZ	43 HZ	220 DEGREES FAHRENHEIT
8MM-4:1	22.8 HZ	37.5 HZ	220 DEGREES FAHRENHEIT
8MM-5:1	23 HZ	37 HZ	220 DEGREES FAHRENHEIT
9MM-4:1	26.5 HZ	36 HZ	220 DEGREES FAHRENHEIT
10MM-4:1	23 HZ	26 HZ	225 DEGREES FAHRENHEIT
10MM-5:1	21.5 HZ	28 HZ	225 DEGREES FAHRENHEIT
12MM-4:1	24 HZ	22 HZ	225 DEGREES FAHRENHEIT
12MM-5:1	25 HZ	30 HZ	225 DEGREES FAHRENHEIT
14MM-4:1	26.5 HZ	25 HZ	230 DEGREES FAHRENHEIT
16MM-4:1	27.5	25 HZ	230 DEGREES FAHRENHEIT
18MM-4:1	25 HZ	18 HZ	235 DEGREES FAHRENHEIT
20MM-4:1	27 HZ	16 HZ	235 DEGREES FAHRENHEIT
22MM-4:1	23.5 HZ	17 HZ	240 DEGREES FAHRENHEIT
25MM-4:1	23.5 HZ	14.5 HZ	240 DEGREES FAHRENHEIT
28MM-4:1	22 HZ	12.5 HZ	245 DEGREES FAHRENHEIT
30MM-4:1	22 HZ	12 HZ	245 DEGREES FAHRENHEIT
33MM-4:1	22 HZ	11 HZ	245 DEGREES FAHRENHEIT
35MM-4:1	22 HZ	11 HZ	245 DEGREES FAHRENHEIT
38MM-4:1	20.5 HZ	12 HZ	245 DEGREES FAHRENHEIT

NOTE: SPEEDS SHOWN ARE APPROXIMATES TAKEN FROM OUR FACILITY. OPERATING VARIABLES INCLUDING FLUCTUATIONS IN HUMIDITY FROM DAY TO DAY CAN CAUSE CHANGES IN THE COIL FORMING PROCESS. SLIGHT CHANGES IN HEATER DRUM TEMPERATURE WILL BE NECESSARY TO COMPENSATE. EXAMPLE; THE HIGHER THE HUMIDITY IS THE LOWER THE CORRECT HEATER DRUM TEMPERATURE SETTING WILL BE. INPUT POWER IN OUR FACILITY COMPARED TO YOURS MAY NOT BE CONSTANT, THEREFORE A SIMILAR SPEED REFERENCE CHART WILL NEED TO BE COMPILED BY MACHINE OPERATORS TO USE AS A DAILY STARTING POINT PRIOR TO FINE TUNING YOUR MARLON 5000.

Belt and Pulley Combinations

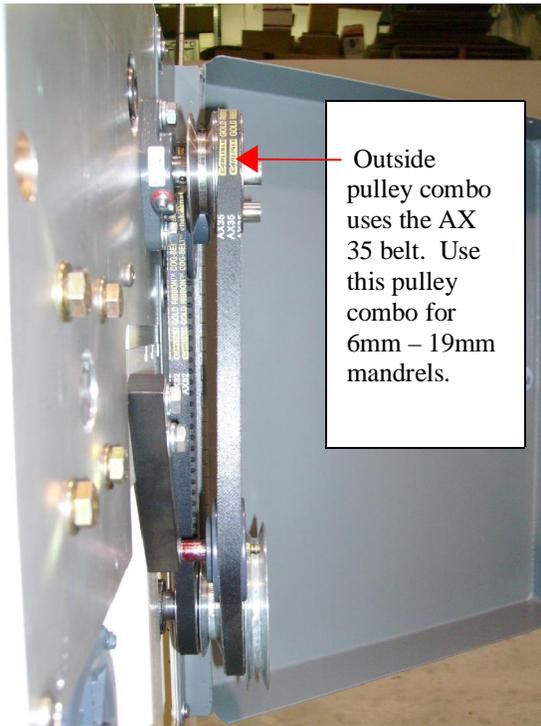


Mandrel drive shaft: two pulleys are mounted on this shaft.

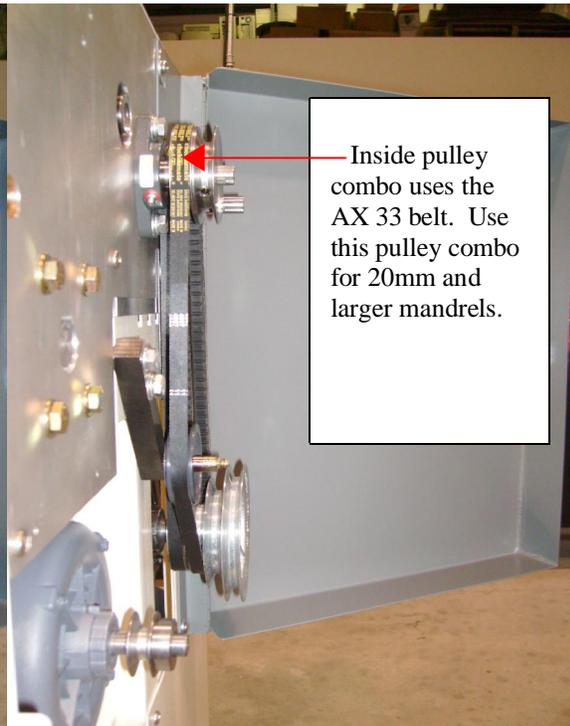
Roller drive shaft: one pulley mounted on this shaft.

Idler pulley shaft: idler pulley slides side to side and is used on both belt combinations.

Roller motor shaft: two pulleys are mounted on this motor shaft. The outside groove of the outboard pulley is never used.



Outside pulley combo uses the AX 35 belt. Use this pulley combo for 6mm – 19mm mandrels.



Inside pulley combo uses the AX 33 belt. Use this pulley combo for 20mm and larger mandrels.

OPERATING PROCEDURES

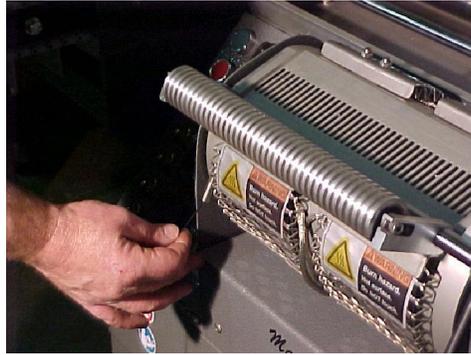
Pre Check

- A.) Make sure power supply is plugged in, and circuit breaker is on.
- B.) Make sure air supply is connected and turned on.
- C.) Make sure your work area is clear of obstacles that limit your movement or raise the risk of an accident.

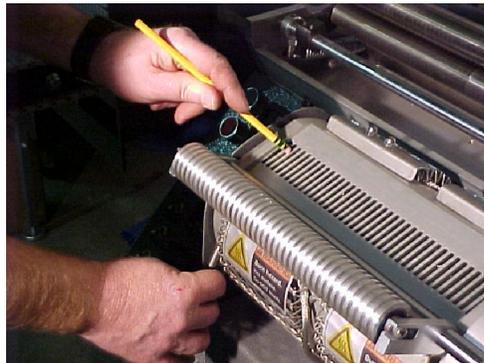
1) Set Up Procedures

- A.) Set the photoelectric sensor for the approximate coil length desired by sliding the photoelectric sensor bracket left or right. A final adjustment can be made after the machine is running.
- B.) Turn the main power switch clockwise to the on position.
- C.) Confirm that the set value (SV) displayed on the heater controller is approximately 180 degrees Fahrenheit. Press the RUN key on the drum speed controller to start the heater drum. The present value (PV) on the heater controller will rise past the set value (SV) before leveling out to the same temperature as the set value (SV).
- D.) Remove the center shaft from the required mandrel. Clean any lubricant left from previous use off the center shaft with a cleaning solvent and clean rag. Apply a light film of lubricant (3 in 1 oil works well) to the center shaft and reinsert it into the mandrel shell.
- E.) Open the rollers by pushing the roller handle forward. With the roller handle forward lock the rollers open by pressing the roller lock knob in, and simultaneously relieving the roller handle so it rests against the roller lock. To unlock the rollers simply push the roller handle forward until the roller lock springs out. Close the rollers by letting the spring tension pull the rollers closed as you gently guide the roller handle towards you. Never release the roller lock and let go of the handle! Be sure to always guide the rollers closed gently. Allowing the rollers to snap shut will damage the machine and could result in operator injury.
- F.) With the roller handle locked in the open position insert the mandrel hub through the mandrel hole in the gear plate. Thread the center shaft in by turning it clockwise until its finger tight. Carefully, to avoid bending the mandrel, tighten the center shaft using the proper Allen wrench or custom ground Vise-grip pliers. Confirm that the mandrel hub is bottomed out in the gear plate hole. Position the backbone of the mandrel shell up and slightly angled back, so the backbone will set between the top roller and the back roller when the rollers are in the closed position. Gently close the rollers while holding the mandrel in its proper position between the top and back rollers. Center the mandrel backbone between the two rollers so it can not make contact with the rollers. When the mandrel is centered hold it in place while you hand tighten the mandrel set knob.

- G.) Choose the appropriate filament diameter needed for the mandrel size your going to run. Load the selected spool of filament onto the spool holder, place the spool flange on the shaft and tighten the spool knob securing the spool on the holder. Remove the plastic wrap and find the filament end.
- H.) Cut off any kinks from the filament end and discard the damaged piece. Insert the filament end into the heater drum entrance tube.



Push the filament in using a soft object for the first couple of revolutions around the heater drum center.



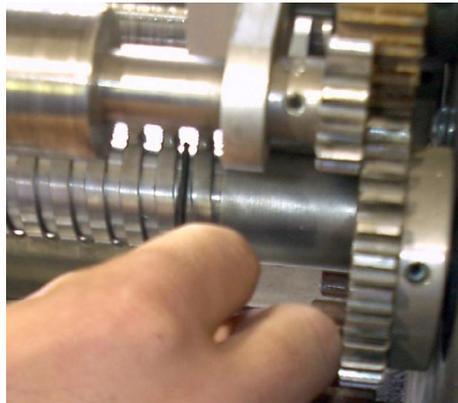
Guide the filament going into the drum with your left hand while lifting up on the heater drum insert handle.



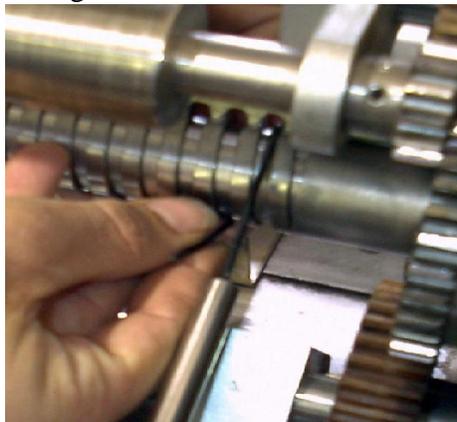
The filament will start feeding through the drum. Adjust the amount of pressure applied on the insert handle to drive the filament through the drum and out the exit tube. Leave the heater drum running so the drum center can maintain equal temperature.



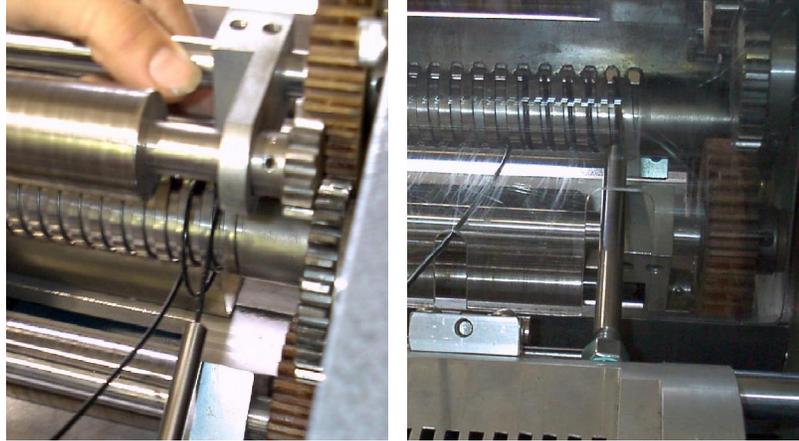
- I.) Increase the set value (SV) of the heater controller to the correct running temperature.
- J.) Set the roller and drum speeds to the correct specifications using the arrow up and down keys.
- K.) Lock the rollers in the opened position. Pull the filament out of the exit tube and insert it through the mandrel between the two ribs directly in front of the exit tube.



Reach under and behind the mandrel and pull the filament around the mandrel towards you until you have approximately twelve inches of filament through the mandrel.



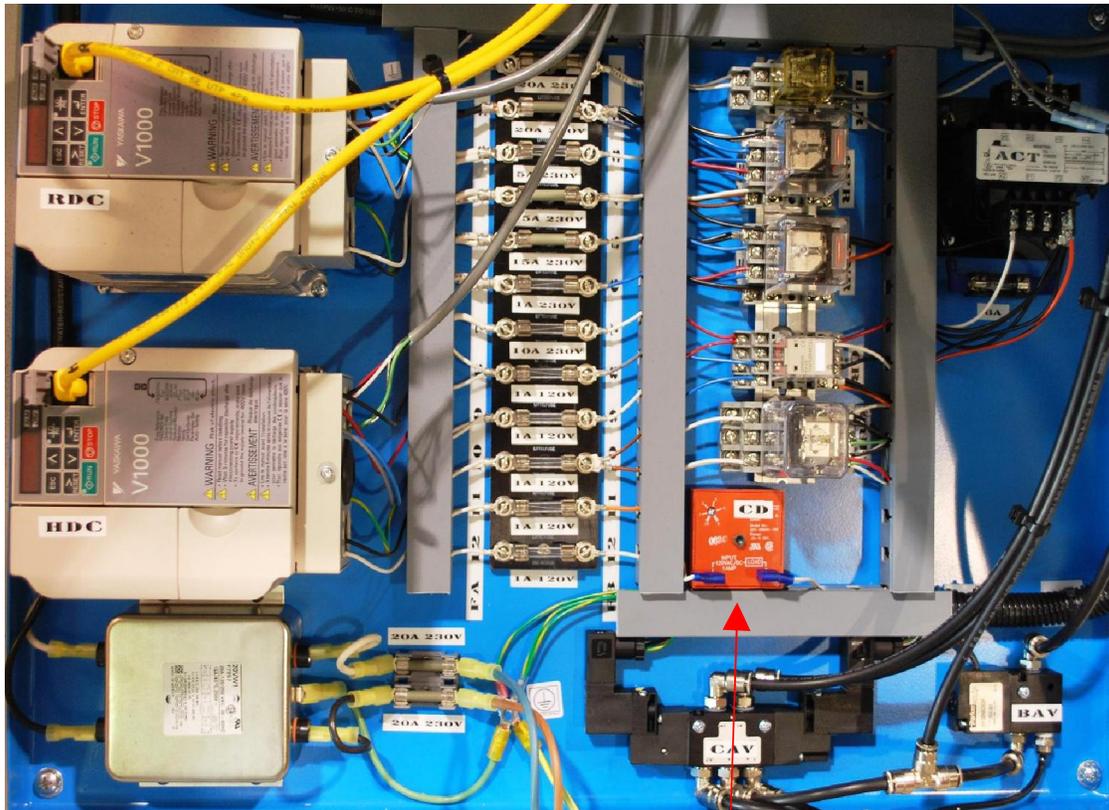
Insert the filament back through the mandrel in the next hole to the left. Pull the filament under and around the mandrel. Repeat this process until the filament is wound around the center of the mandrel far enough to the left so the filament can be pulled through the left-hand slot in the Plexiglas shield on the roller compartment door.



- L.) When the heater drum temperature reaches the set value you are ready to start the machine. Hold the filament in your left hand and close the roller compartment door, so the filament is exiting through the left hand slot in the Plexiglas door. Press the green start button while pulling the filament through the mandrel until heated filament is wound tightly around the center. While continuing to hold tension on the filament press the black stop button to stop the drives. Open the roller compartment door. Using your left hand push the filament end backwards through the mandrel creating a loop, cut the loop with side-cutters so the formed filament is now riding tight against the mandrel center shaft. Unlock and close the rollers, and the roller compartment door. Quickly before the filament between the exit tube and mandrel cools press the green start button. Verify that the blower and cutter switches are in the on position.
- M.) Measure the first few pieces of coil and adjust the photoelectric bracket right or left until the correct coil length is achieved.

CUTTER TIMING CONTROL FUNCTIONS

ELECTRICAL PANEL (ACCESS THROUGH REAR SHROUD)

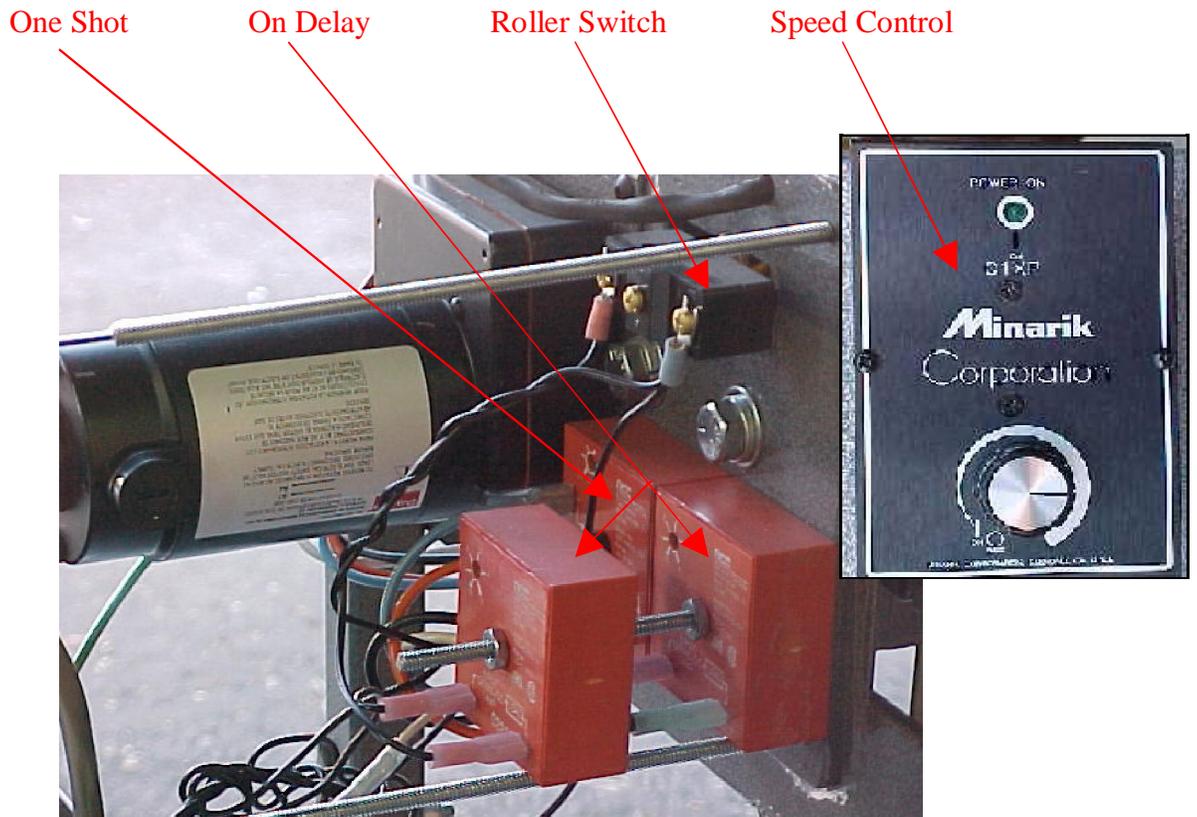


CUTTER DELAY

Function is to delay cutter after a cut cycle to allow coil to roll out of the photoelectric sensor beam eliminating the chance of a double cut.

NOTE: This control has been pre-set during machine build and test. Rarely do these settings need readjustment.

CONVEYOR ELECTRICAL CONTROL FUNCTIONS



ONE SHOT;

Function is to override roller switch and allow a conveyor position change for the next COIL.

ON DELAY;

Function is to delay movement of the conveyor until the COIL has Come to rest in tray. One delay for short coil, one delay for long coil. Long or short delay determined by toggle switch position (toggle mounted on cover top).

ROLLER SWITCH;

Positions conveyor trays for part pickup. (Switch adjusts by sliding in mounting slot).

SPEED CONTROL;

Adjust to meet cycle time of COIL cut off. Normal setting is at 80% and the minimum setting is 60%.

NOTE; These controls have been pre-set during machine build and test. Rarely do these settings need adjustment.

TRUBLE SHOOTING GUIDE

PROBLEM

SOLUTION

1.) Filament diameter is smaller in coil than it is on the spool.

Increase the drum speed to allow loop on first revolution around mandrel.

2.) Coil diameter swells.

1. Make sure blower is on.
2. Check mandrel center for roughness, polish if needed.
3. Lower drum temperature in five-degree increments.
4. Slow down the whole coil making process.

3.) Outside surface of coil is being scratched.

1. Check rollers for roughness polish, if needed.
2. Check the loop at first revolution around mandrel. Excessive drum speed can cause the filament to make contact if loop is too big.
3. Check the mandrel for a bent or broken rib.

4.) Scratches on inside of coil.

Check mandrel center for roughness, polish if needed.

5.) Cutter blade makes irregular cuts

1. Check air pressure.
Air pressure should be set between 50 psi and 100 psi depending on the filament diameter being used.
2. Check photoelectric bracket adjustment.

6.) Cutter does not cycle.

1. Verify that the air supply is plugged in and on.
2. Verify that all doors with safety switches are closed.

7.) Roller and or Heater drives will not start.

1. Verify that all doors with cover switches are closed.
2. Check fuses in electrical panel. (Access through rear shroud.)

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