AutoFinish™

DCPC250
DCPC500

AutoFinish DCPC250 & DCPC500 Centrifugal Barrel Finishing Systems
Operations Manual

Contents

Specifications

DCPC250 Specifications	
Max Capacity	0.25 Cubic Feet (7.07 Liters)
Barrel Capacity	0.0625 Cubic Feet (1.77 Liters)
Barrel Dimensions	W 4.5” (11.4cm) x H 6” (15.2cm)
Machine Dimensions	D: 30.1” x W: 28.5” x H: 51.5”
Machine Weight	~480lbs
Power Requirements	208/240 (± 10%) VAC, 50/60Hz, 1Ø, 16A
Main Drive/Motor	1HP, Inverter-Controlled, Single-Phase
Operating Volume	Under 70 Decibels
Compressed Air	Not Required

DCPC500 Specifications	
Max Capacity	0.50 Cubic Feet (14.16 Liters)
Barrel Capacity	0.125 Cubic Feet (3.54 Liters)
Barrel Dimensions	W 6” (15.25cm) x H 6.75” (17.15cm)
Machine Dimensions	D: 32” x W: 32” x H: 55”
Machine Weight	~600lbs
Power Requirements	208/240 (± 10%) VAC, 50/60Hz, 1Ø, 20A
Main Drive/Motor	2HP, Inverter-Controlled, Single-Phase
Operating Volume	Under 70 Decibels
Compressed Air	Not Required

Shipping and Placement

Shipping Information and Customer Responsibility

Shipment to the customer will be arranged as specified in the price quote. The customer is responsible for providing detailed delivery information, including, whether or not there is loading dock at the delivery site. The customer is responsible for transporting the printer to a suitable installation site.

Shipping Crates

Machine Crate: 43”D x 43”W x 64”H
DCPC250 will ship with supplies and consumables in the crate.
The DCPC500 will ship with an additional pallet not exceeding 48”D x 48”W

Placement

1. Is there adequate room to set up the machine with a pallet jack?
    a. The machine is placed on a pallet jack diagonally.
2. Is there a sink in the room?
    a. Does the sink have a plaster trap attached to it?

The equipment should be conveniently located to the “flow of parts.” The DCPC System will require the appropriate electrical power. If a sump system and water recycling unit is to be used, separate power must be provided for those units as well. Sufficient work and storage space is also required.

Installation Area

The installation area must have a level surface. Allow 6” between each edge of the machine and the wall.
The machine must be placed on included isolation pads. One under each foot.
DO NOT fasten machine to the floor or wall.

Electrical Requirements

- Is there a NEMA style receptacle rated for a minimum of 240 VAC 20 amps within the vicinity of machine location?
- What is the NEMA style #?
- If no receptacle is available, is there a 208-240 VAC distribution panel with available space and ampacity for a 2-pole 20 amp breaker in the facility?

A certified electrician should be present on-site to check distribution panel and receptacle before installing the proper cord and plug.

Loading & Unloading

Rotating the Turret

When the shutter door is open, the turret may be manually rotated by pushing it either clockwise or counterclockwise. Bring the barrel you want to work on directly in front of you for easy loading & unloading. The motor will not be operational while the door is open.

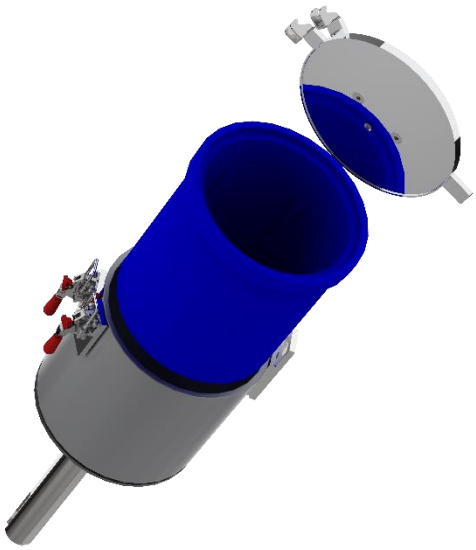
Loading Barrels

While holding the lock handle, push in the toggle lock. Pull the locks upwards and move the U-bolt out of the way. Pull out the lid and place it in the lid holder. Then, pull out the urethane barrel. Load the barrel with the contents (refer to the process report). Generally, you should first load the media, then the part, the water, then the compound. Always refer to your specific process recipe. Ensure that opposing barrels are always balanced by weight. 2 or 4 barrels should be filled at all times. If you are running an odd number of barrels, the opposing "empty" barrel should be filled with water to balance the weight.

Closing & Locking Barrels

It is important to ensure that the sealing surfaces of the barrel and the barrel lid are clean and free from media, compound, and parts that could disrupt the seal. Please follow the guidelines below for closing the barrels.

1. Clean the sealing surfaces of the barrel and lid of all media and compound. Rinse the lid.
2. Secure the locking clamps. Ensure they lock firmly into place and are not easy to unlock.
3. Pull up on locking clamps to ensure they are locked by the toggle lock. If the locks pull upwards and detach, they were not fully locked down.
4. If using only one or two barrels, use opposing barrels. This will balance the turret. Approximate barrel weights should be within ten percent of each other.
5. Operate the machine with all lids in place, even if the barrel is empty. Failure to do so may cause abnormal vibration or damage due to the machine being out of balance.
6. After locking all the barrels, a good safety practice is to rotate the turret by hand and double check all the locks one by one before closing the door.



Operating Tips

Here are a few tips for working with your CPC that should make production easier and more consistent:

- Always use a soap or detergent in every process. Otherwise the media will soon take on a glazed appearance and will no longer cut properly.
- Rinse parts after each step of the process. Do not let the compound dry on the parts.
- Do not let parts sit for an extended period after finishing. Some materials, especially aluminum and zinc alloys will develop corrosion spots if left in the machine for as little as 10 minutes after the end of the process. If the parts have sat in the barrel, operate the CPC for a few extra minutes before unloading the barrels. This may help eliminate spotting that may have developed.
- Never put compound directly on work pieces. Always load media and water on top of parts before adding compound or compound residue may be found on the parts.
- Thoroughly rinse the empty barrels between process steps.
- Never use the same scooper for more than one compound. Doing so will contaminate both products and may result in inferior finishing.
- Keep finishing media as clean and uncontaminated as possible.
- Avoid inadvertently mixing media together.

If the work pieces are subject to rust, a rustproof treatment must be used.

Touchscreen Operation

Startup Screen

Press “Select Recipe” button to begin process.

Recipe Viewing Screen

Tap the dropdown menu to view the list of saved processes.
Use the arrows to move up and down.
Tapping a process will reveal its details.

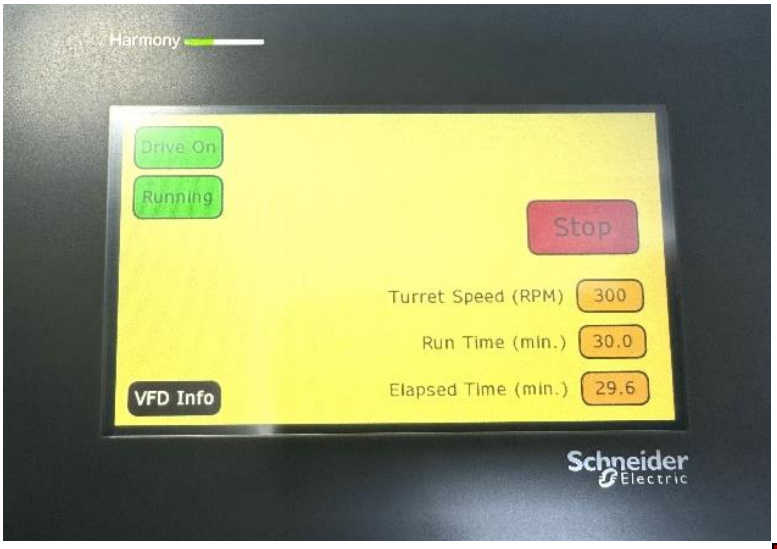
Selecting a Process Recipe

Confirm that the process details are correct.
To load the process, tap SEND/RUN

Ready Screen

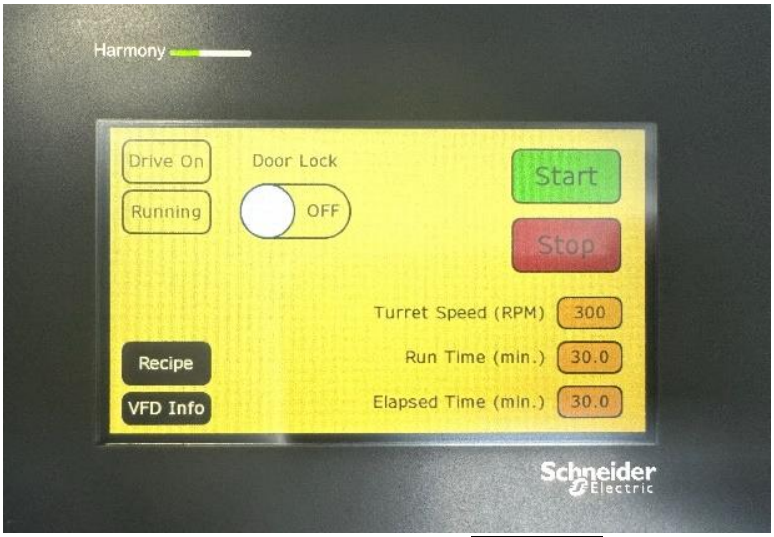
The machine is ready to start.
Before starting the machine ensure all the lids are secured to the barrels and the latches are in the locked position. Close the door then select the “lock” button on the screen. This will activate the safety lock on the door, and the Drive On button will turn green when the inverter completes its safety check. The machine will not start if the door is not locked.
Select Start to start the process.

Process in Progress



To view real time details on the speed, and power consumption select VFD Info

Real time details.

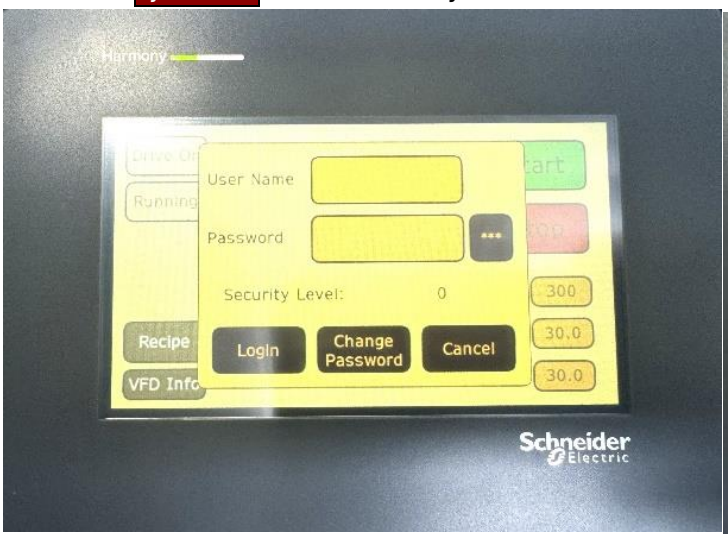


Once the machine comes to a full stop, select the Door Lock button to unlock the door.

Importing Recipes

Go to the Recipe screen by clicking Recipe, insert USB stick in the USB slot on the right side of the electrical panel.

Click IMPORT, input login and password (default login is **Tech**, password is **autofinish**), press enter, then login. (The system will log out after five minutes) Select the "Import" button to import the data from the USB stick. Note that all the data in the HMI will be overwritten with new data. We recommend backing up original data. When done, select the Eject USB button to safely remove the USB stick



To Update software, download update to the USB Stick, insert it into the slot then select "Update". *We recommend backing up original data before updating*. The unit will update itself and reboot with the updated software. Ensure all the original recipes are still installed. Then select Eject USB to remove the USB stick. Click Send/Run , then click Reset to reset the "Fault" button.

System is now ready.

Maintenance

5.1 Maintenance and Repair

5.1.1 Preventative Maintenance Schedule

Every Shift

- Inspect barrel lock bars.

First 50 Machine Hours

- Inspect barrel belts for proper tension.
- Inspect and tighten set screws on barrel shaft sprockets

First 250 Machine Hours

- Inspect barrel belts, and adjust as needed
- Inspect and tighten set screws on barrel shaft sprockets

Every 500 Machine Hours

- Grease turret bearings
- Grease barrel bearings
- Inspect barrel belts, and adjust as needed
- Inspect and tighten set screws on barrel shaft sprockets
- Inspect barrel linings

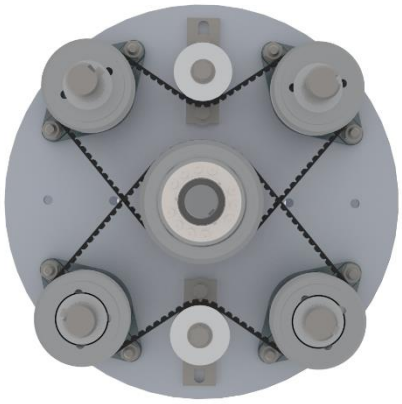
Every 1000 Machine Hours

- Inspect electrical connections and tighten as needed.

5.1.2 Drive System

The barrels are driven at a 1.5:1 ratio opposite the rotation of the turret by a sprocket and belt system. The belt type is classified as Cleated Belt and is very resistant to stretching after the brake-in period of 30-40 hours of operation. During this brake-in period some adjustment may be necessary.

5.1.3 Inspection



A butterfly configuration is used to drive the cradle assemblies that accommodate the barrels. Each butterfly configuration drives two (2) cradle assemblies and is adjusted by an idler arm assembly. Please refer to the photo *5-5 Barrel Drive Assembly* on the left for associated components. The operator can check for belt slack and determine if an adjustment is necessary simply by rocking the cradle assembly in a forward and reverse rotation while the CPC is powered OFF and the door is open. If movement is preset then adjustment is necessary.

Visually examine the belts and sprockets for signs of wear or misalignment. If indications of wear are present use the following procedure for further inspection:

5.1.5 Drive Component Removal

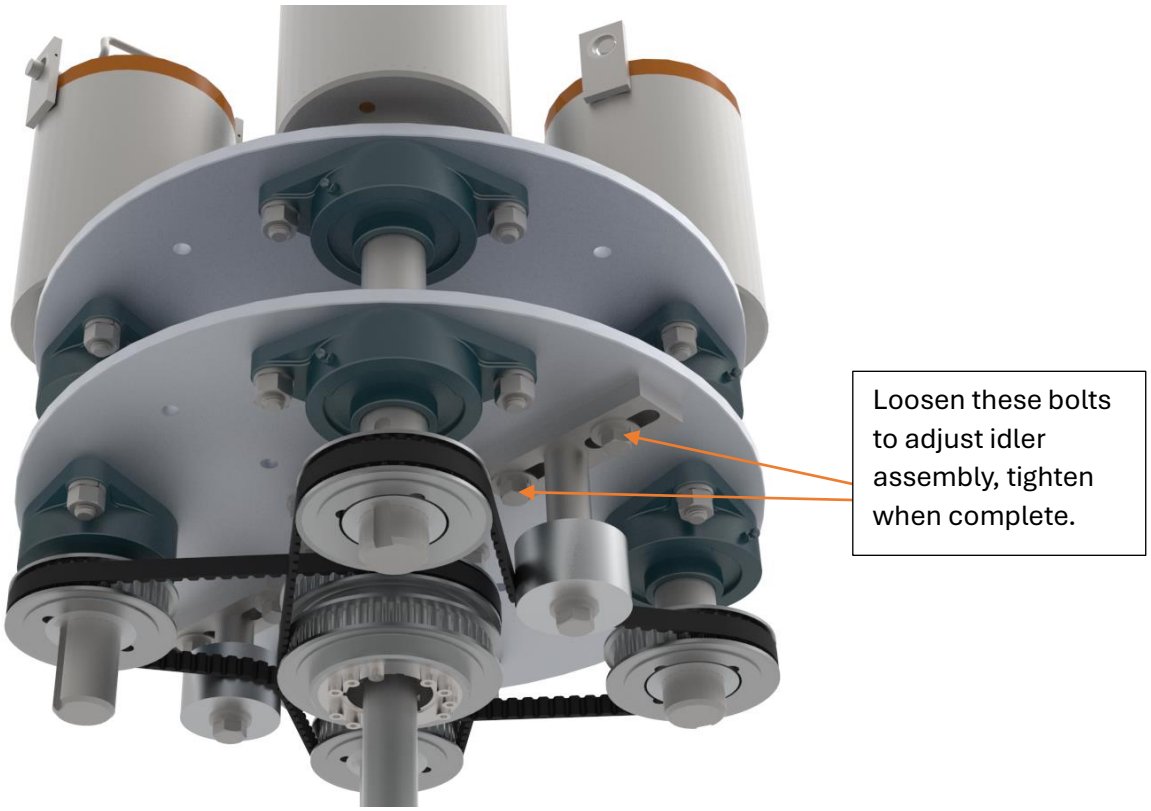
To remove and replace barrel drive components follow these procedures:

1. Empty ALL barrels.
2. Turn OFF the power at the safety disconnect and lock the handle in this position.
3. Remove the two (2) bolts holding the idler arm assembly in place and remove the Idler arm from the turret.
4. Check the Idler Sprocket Bearing for ease of movement and side play and inspect the sprocket for wear. Replace Bearing/Sprocket Assemble if necessary. Torque sprocket retainer nut to 50 ft-lbs.
5. Remove the belt. Inspect the Barrel Drive Sprockets and keyways for movement. Visually inspect for rust between the sprocket and cradle shaft and physically grasp the sprocket and check for movement on the shaft. If movement is evident remove sprocket and examine keyways for wear. Replace key, shaft or sprocket if wear is excessive.
6. Install Idler Arm Assembly and any sprockets removed and slightly tighten, do not torque.
7. Align Barrel and Turret Sprocket to Idler Sprocket using a measuring device. 2 barrel sprockets (red) must be aligned with the top sprocket. The distance between their centerlines and the turret plate must be the same. Repeat for other sprockets with the lower turret sprocket (blue).
8. Install the chain and lock the master link using the retainer.

5.1.6 Adjusting Barrel Belts

To adjust the barrel belt, please refer to the following procedure (if continuing from the previous section skip steps 1-5):

1. Empty ALL barrels.
2. Turn OFF the power at the safety disconnect and lock the handle in this position.
3. Position the turret so that the Idler Arm Assembly for the butterfly assembly that needs adjustment is conveniently located.
4. Slightly loosen the two (2) bolts holding the idler arm assembly in place and remove the Idler arm from the turret.
5. Using a pry bar gently press down (applying 10 to 15 pounds of pressure) on the Idler assembly taking up all slack in the belt.
6. Retighten the two (2) bolts holding the idler arm assembly and torque to 80 ft-lbs.



5.1.7 Bearings

Lubricating

The barrel and turret bearings must be periodically lubricated with water-resistant grease, such as Deoplex Multi-Purpose #2EP, to maintain their service life. Each of the eight (8) barrel bearings (four per side) is equipped with a zerk-fitting for this purpose

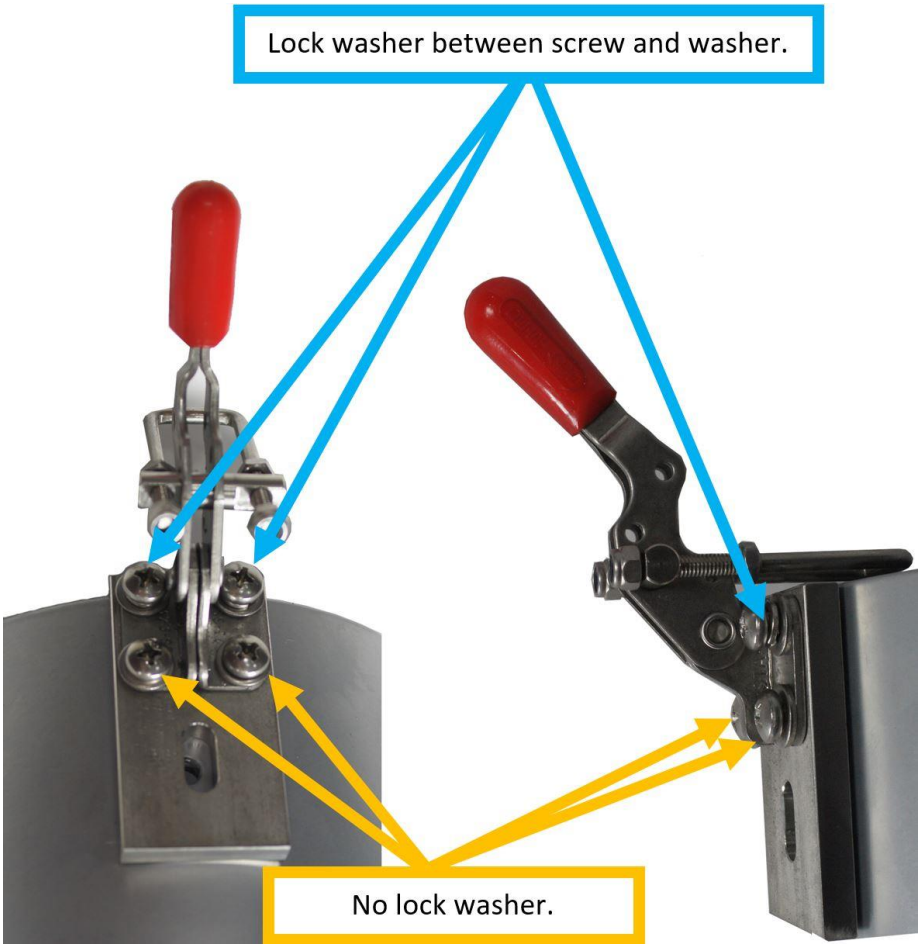
When lubricating, add only a small amount of grease at any one time, usually only one or two pumps on a grease gun. Adding too much will result in damage to the seal, which will allow water and process chemicals to enter the bearing. If this occurs, the bearing will have to be replaced within a short period of time.

5.3.8 Barrel Locks

Barrel locking clamps is used to apply pressure on the lid and create seal between the lid and barrel. If the barrel lid is not secure, the barrel will leak water during operation.

Periodically inspect the locks for wear. The locks should click into place and require effort to pull up and unlock.

If repair is needed please contact UNITED SURFACE SOLUTIONS Product Support Team, Service Department, (877) 837-4623. Displayed below is a reference for replacement procedures. Note that the bottom two screws for each locking clamp DO NOT use a lock washer.



5.3.9 Torque Specifications

PART DESCRIPTION	*TORQUE*
Turret Bearings Retaining Bolts (four per bearing)	60 ft-lbs
Barrel Bearings Retaining Bolts (two per bearing)	80 ft-lbs

Idler Assembly Retaining Bolts (two per idler)	80 ft-lbs
Idler Sprocket Retaining Nut (one per idler)	50 ft-lbs
Motor Adjustment Base to Frame Retaining Bolts (four total)	80 ft-lbs
Motor to Motor Adjustment Base Retaining Nuts (four total)	30 ft-lbs
Setscrews – Sprocket (two per sprocket)	20 ft-lbs
Setscrews – Bearings (two per bearing)	15 ft-lbs
Isolator Pad Retaining Nut (one per pad)	15 ft-lbs

6.0 Troubleshooting

6.1 Interface Not Functioning

Possible Problem	Item to Check	Remarks
Control voltage fuse blown	Check for blown breakers.	If the door interlock has shorted out, it is usually because someone attempted to open the shutter door while in Run Mode. Check the interlock before re-energizing this circuit. Replace as necessary.
No power to the machine	Carefully check the three terminal blocks on the top of the main disconnect for line power.	Consult with your plant electrician to determine the source of the power outage.
PLC Power Supply Blown	Check the lights on the PLC located inside the control box.	The Power Supply on the PLC also powers the Interface, If there is power to the Drive Inverter and not to the PLC first check fuses then replace the Power Supply if needed.
No input voltage	Check that the main disconnect located on the electrical cabinet door is turned to the “On” position	Make sure that the machine is not being serviced before re-energizing the machine.
Main fuses blown	There are three fuses located in the main disconnect. With the power off, check for continuity across each of these fuses.	If a fuse is blown, DO NOT REPLACE IT until the problem that caused the fuse to blow has been corrected.
Loose wire or defective component	Turn the main disconnect to the “Off” position and carefully check and retighten electrical connections beginning at the main disconnect.	If you are certified to work with high voltage AC, re-energize the Disconnect and follow the voltage paths until you find the problem.

6.2 Will Not Begin Cycle

Possible Problem	Item to Check	Remarks
No power to the machine	Verify that the Power Indicator is lit and the CPC screen is operational.	
Door is not closed entirely	The door must be closed in order in order to place the machine in Run Mode.	Always either completely open or completely close the Door.
Loose wire or defective component	Turn the main disconnect to the "Off" position and carefully check and retighten electrical connections beginning at the main disconnect.	If you are certified to work with high voltage AC, re-energize the Disconnect and follow the voltage paths until you find the problem.

6.3 Premature System Halt

Possible Problem	Item to Check	Remarks
No power to the machine	Verify that the Power Indicator is lit	Follow the procedures under "Interface Not Functioning"
Human error	Attempting to open the Shutter Door while the machine is running may result in the cycle being canceled. The Stop Button may have been accidentally pressed.	If the cycle timer has reset, human error is likely the problem. If the machine is stopped and the timer is still running, human error must be discounted.
Loose wire or defective component	Turn the main disconnect to the "Off" position and carefully check and retighten electrical connections beginning at the main disconnect.	If you are certified to work with high voltage AC, re-energize the Disconnect and follow the voltage paths until you find the problem.

6.4 Desired RPM Not Reached

Possible Problem	Item to Check	Remarks
Machine overloaded	If the acceleration of the machine slows before the desired RPM is reached, the machine is attempting to avoid an overload condition.	Loading the barrels with more material will not overload the machine. With the CPC, the greatest load condition occurs at approximately 60% fill height. Try running your process with more parts and media to eliminate this condition.
Exceeds Maximum RPM	If in Manual or Auto Mode Screens the "EXCEEDS MAXIMUM RPM" is displayed, check the Maximum RPM setting in the System Tools screen.	Maximum RPM and Cycle Time limits are set to protect the system from operator error. These settings can be password proteced.

6.5 Barrels Leak

Possible Problem	Item to Check	Remarks
Contamination on the sealing surface of the barrel and lid	Remove the lid and check for media, compound or other obstructions on the sealing surfaces	Review the section "Closing & Loading Barrels" for procedures to eliminate this problem.
Process too hot	Verify that the process is not building up significant heat and pressure that is causing the seal to fail.	Refer to the section "Opening the Barrels" for information and tips about building up pressure in the barrels.
Worn barrel tabs	Inspect the barrel tabs on each end of each Lock bar and adjust as necessary.	Refer to the section "Lockbar" for detailed instructions.
Worn linings	Inspect the barrel linings	Refer to the section "Inspecting Barrel Lining" instructions.