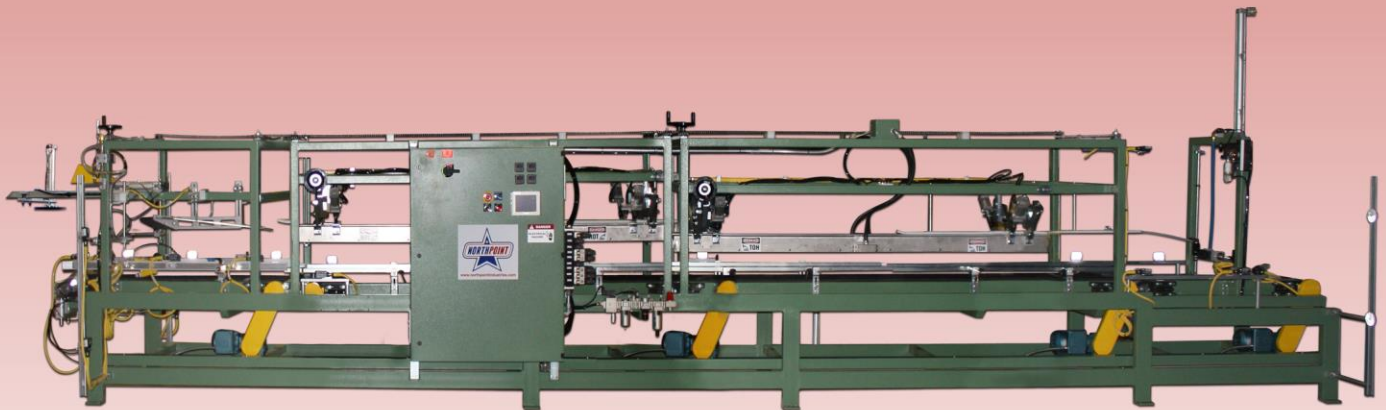




**Carton Conditioner  
Model # NP4800**

# **Operations Manual**



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### Carton Conditioner Safety

#### ***General Safety:***

- Read manual before operating or troubleshooting the machine.
- CAUTION! Heater bars may be HOT!
- Do not bypass light curtains in any way.
- Do not run machine without safety guards in place.
- Keep area around machine clear.
- Always push E-stop in before doing any work on the machine.
- Look out for pinch points.

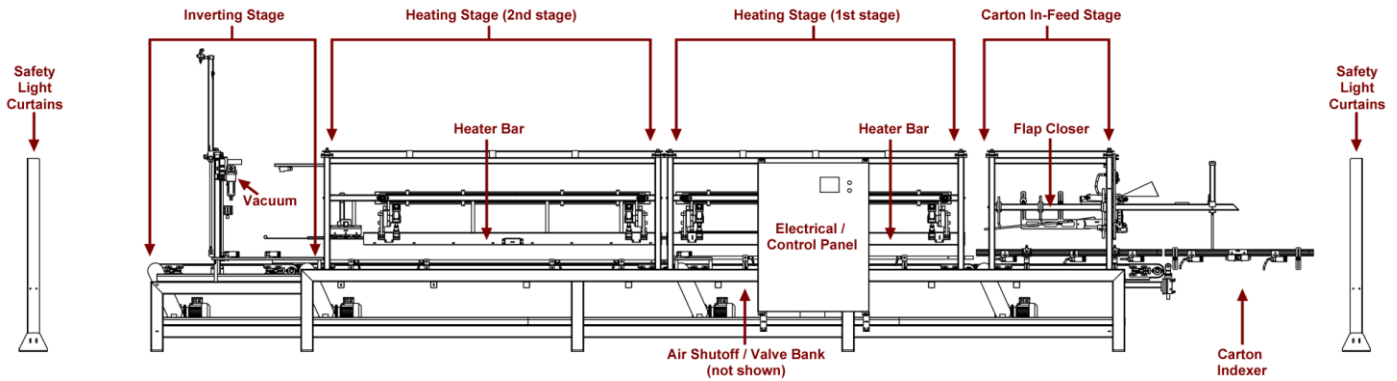
#### ***Carton Conditioner lock out procedure:***

1. Push the E-Stop in.
2. Turn off the Main Air and lock it out.
3. Turn the power off at the main panel and lock it out.



## Carton Conditioner Descriptions

### *General Overview*



### *Main Panel Operators:*

**Emergency Stop PB:** When pushed in the caps light up a red color to tell the operator that the E-stop is pushed in and the machine is stopped. To start the machine up the push button must be pulled out until it clicks and the red lights turn off on all the E-stops. The machine can only be started up by using the E-stop the remote station only. Pushing the button in de-energizes all the outputs controlled by the PLC and dumps the air out of the main valve bank but not the solenoid valve used for the vacuum.

**MAIN RESET PB:** If the light curtains have been tripped or the emergency stop button has been pushed. The blue RESET button will need to be pushed to reset the safety circuit. **Extremely important that the danger situation has been removed before this button is reset as a harm could come to anyone in the machine.**

**Main Air Dump:** Located by the valve bank, turn the red knob to the exhaust position to dump the air out of the machine. The red knob can be locked out also.



## ***Valve Descriptions and Operation***

**Vacuum:** Picks up the front of the box with a suction cup to flip the box up side down. The operation is selected with the touch screen as with the amount of boxes to be inverted is entered through the touch screen for the different pallet configurations.

**Invert:** Will pick the box up from the front using a vacuum with a switch to be made and the invert stage PE made it will invert the box when it is time for it in the cycle. It must be selected using the touch screen.

**Vacuum Rotate Away:** A 3 position exhaust to center valve used to rotate the box while keeping the flaps closed when flipping the case upside down.

**Flap Closer:** When the carton makes the photo eye the cylinder extends out to tuck the rear minor flap.

**Spray:** Applies a mist of water along the folding edge of the major flaps. This helps to keep the flaps closed.

**Partition Tamper:** This cylinder is used to push the carton insert back into the box before it enters the flap closing stage. It also checks for bottles laying on top of the case.

**Carton Brake:** Works with the carton index cylinder. While Indexer is letting a carton into the machine the carton brakes work to keep any other cartons from entering the machine.

**Carton Index:** Operates the roller at the entrance to the machine. Allows cartons to enter the machine one at a time.

**Heater Bars:** Controls the up and down motion of the first set of heater bars.

**Heater Bars 2:** Controls the up and down motion of the second set of heater bars (optional).



### ***Sensor Descriptions and Functions***

Refer to Fig. 1 at the end of this section for sensor locations.

**Carton Index PE and Carton Prime PE:** The carton index photo eye and carton prime photo eye control the actions of the carton infeed belt, carton brakes and partition tamper. Carton brakes will be in the retract position and the partition tamper in the retract position when the photo eye is blocked.

When cartons block both photo eyes the carton brakes will extend to stop the second box and all the boxes behind it. The tamper will come down to check the case and then if its ok the carton infeed conveyor will index the first box into the machine. The tamper must make the partition tamper down proximity within a set time or it will determine that something was impeding its travel such as a bottle laying on top of the case. This is an error condition that will stop the machine from allowing any cases into the machine until the carton is checked by the operator and the cycle is resumed.

If all was ok then the partition inserter will retract. If the first carton has made it into the machine and the carton index extend delay has elapsed then the carton indexer will extend and the carton brakes will retract allowing the cartons to proceed to the carton indexer.

**Flap Closer PE:** When the flap closer photo eye detects a carton it triggers the flap closer boot after the flap closer delay timer has expired. The job of the flap closer boot is to close the trailing minor flap and to hold it in the closed position until the carton has continued under the hold down rails.

**Heat Stage Enter PE:** Located at the beginning of the first heater stage. It signals that a carton is about to enter the heating stage. This signals the following cycle to happen. The heater bars retract, the heat conveyor turns on and runs for a time set by the heat conveyor run timer. Once this timer has expired the heat conveyor shuts down and the heater bars extend. The gap between boxes can be controlled by increasing or decreasing this run time.



**Heat Stage Exit PE / Flap Open Detect PE:** These two photo eyes work together. When the Heat Stage Exit PE goes from blocked to unblocked, the Flap Open Detect photo eye will check to see if the lagging minor flap has been properly tucked under the major flaps. If the check is good the carton is allowed to pass on to the invert stage. If an open flap is detected the machine cycle will shut down. An operator will need to manually fold the flap, move the carton to exit side of the carton inverter and then restart the machine.

**Invert Stage PE / Vacuum Switch:** When the present tier is being inverted, the Invert Stage PE senses when a carton has arrived at the inverter turning on the vacuum. Once the carton has seated itself on the vacuum cup it will start to draw vacuum. Once enough vacuum has been drawn it will turn on the vacuum switch. This will signal the inverter to lift up. Lifting the box as it rises. The carton will continue to be pulled by the conveyor. The effect of this is that the carton will invert up side down.

**Invert Up Prox.:** This proximity is activated when the cylinder is in the up position. When not inverting boxes it allows the heat stage conveyor to run boxes being indexed. This proximity is adjusted according to the height of the box.

**Invert Down Prox.:** This proximity is activated when the cylinder is in the down position and will allow the next box to come in for inversion.

**Carton Backup PE:** If this photo eye is blocked it will do an orderly cycle stop of the machine. If a carton is being flipped, it will finish its flip. If a carton has started to have its flaps closed it will continue to do so. If a carton has started to be released from the indexer it will be allowed to enter the machine. Once the machine detects that these last operations are complete the machine will stop and will not continue until the backup photo eye sees again. The restart is automatic.

**Partition Tamper Down Prox.:** When the proximity is made it means the box is good and the box will be indexed into the machine. If not made the machine will shut down.

**Pressure Switch:** Prevents the machine from starting below a set pressure (80 PSI).

**Vacuum Switch:** When inverting boxes the switch turns when enough vacuum is sensed to activate the invert valve to have the cylinder to lift the box up to be inverted.

**Safety Light Curtains:** If the path is broken between the light curtain on either side of the machine, the machine will shut down and go into a lock out state. In order to restart push the blue reset button on the main panel.

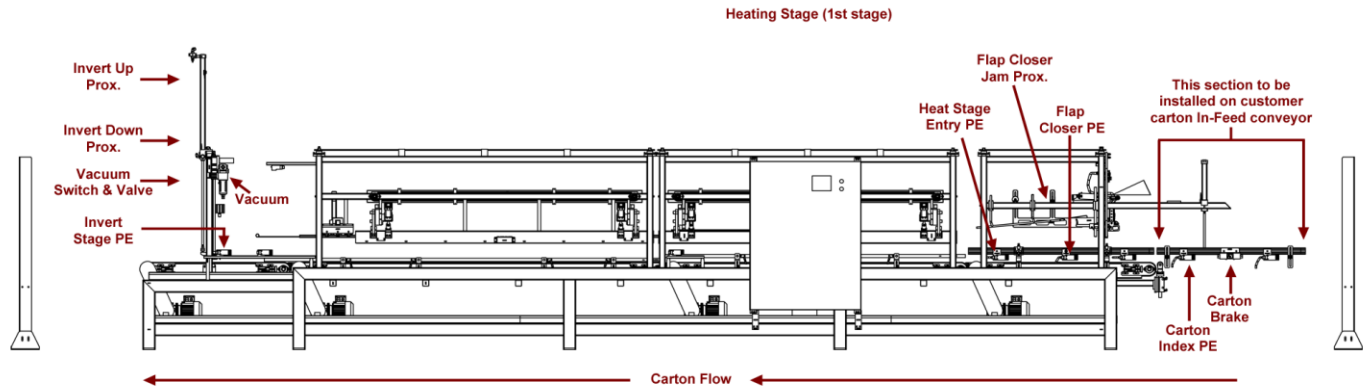


Fig. 1

## Carton Conditioner Setup Procedures

### **Main Air Set up**

The F.R.L. unit is preset at the factory with the air pressure regulated to 60 PSI. The pressure switch is set to shut the machine off if the pressure drops below 40 PSI approximately. The air lock out is used to turn the air off and to discharge it out of the system. The lubricator should be filled with airline oil only.

### **Valve Bank Set up**

The valve bank is located next to the main panel (refer to Fig. 1) and controls the air cylinders on the carton conditioner. The left side of the solenoid valve is the extend port of the cylinder and the right side is the retract port. To manually operate the valve use the white button located on the end of the valve by pushing it in (solenoid valve must not be energized). Before operating the carton conditioner, set up the valve bank to prevent damage to the equipment:

Heater bars air pressure is set to 40 PSI and this is done at the valve by pulling out the knob and turning it.





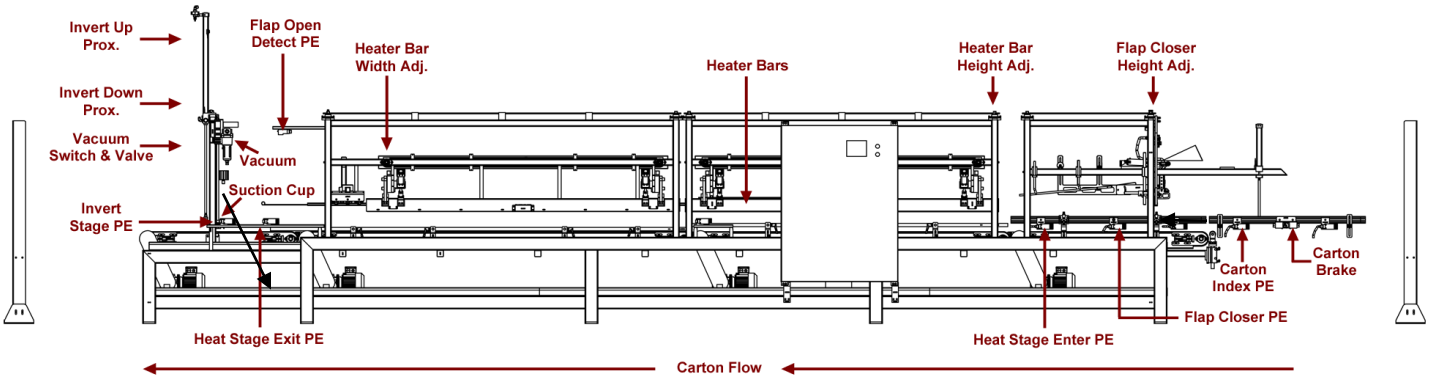
## Carton Conveyor Setup

**! WARNING !**



**Push E-stop on panel to disable the machine when working on it.  
Serious injury may result if instructions are not followed.  
Heater bars may still be HOT – wait for them to cool.**

Cartons are delivered to the carton in-feed stage area by individual indexing each carton to close the flaps. Carton Indexer assembly is installed on the customers in-feed carton conveyor. Refer to Fig. 2 below.



**Fig. 2**

1. Push E-Stop in!
2. Turn Heater Bars off and wait for the heaters bars to cool down!
3. Refer to Fig. 2 for locations described below.
4. Adjust the carton brake so it works in conjunction with the carton indexer to individually index boxes into the carton in-feed stage.
5. Center the carton on the conveyor then allow for 1/4" clearance between the rail and the carton on both sides and do this on all three stages of the machine.



6. Adjust the flap closing rails to close the major flaps by turning the hand wheel to raise or lower the unit.
7. Adjust the flap closer photo eye to trigger the flap closer to kick the rear minor flap in before the major flaps are closed. Kicker position should be adjusted so it kicks the flap near top.
8. Adjusting the heater bar height and width by loosening all 16 3/8 " bolts on the shaft clamps then use a 9/16 inch wrench to adjust the Bars In and out. bars extend out.
9. Adjust the case invert cylinder stops to limit the up stroke on the cylinder for the box to be inverted by holding the box up vertically and having it lean towards the exit end of the conveyor going to the case palletizer.
10. Pull E-Stop out to retract the invert cylinder up so the up proximity can be adjusted to (**refer to Fig. 2**) turn on when the invert cylinder is in the up position.
11. Go to the touch screen under **Carton Totals Setup** Screen and enter the number of cartons to be INVERTED and the number of cartons left UP based on what the case palletizer needs.
12. Then go to **Selector Switches** Screen and choose the operation of the carton conditioner

### Carton Conditioner Startup

#### ***Check list:***

Before starting the machine, the following must be completed:

- Guards are in place and no one is working on the machine.
- Air lock out is in the supply position.
- Photo eyes and proximities on the machine are set.
- Invert Stage is setup if being used.
- All settings have been set using the touch screen.

#### ***Starting the Machine***

1. Pull out E-stops or clear light curtain.
2. Push Blue Reset button.
3. Push Cycle Start.



### Main Screen



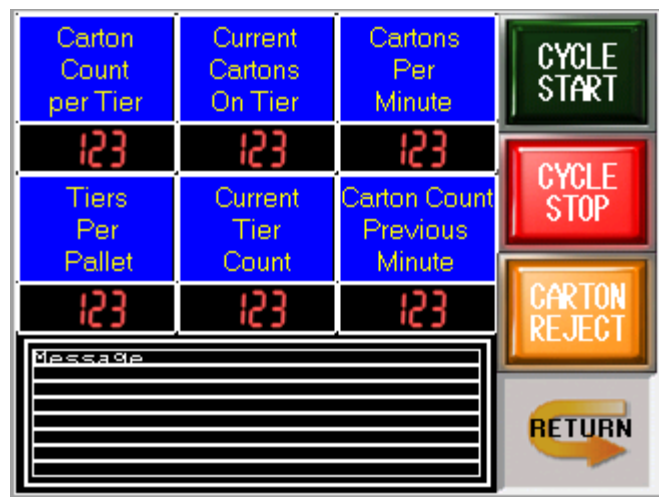
When the screen is black, touch to display the Northpoint Main screen as shown to access the GOTO PANEL buttons for the **OPERATOR SCREEN** and **DATA CHANGE** menu screens.

**Operator Screen:** Touch the button labeled **Operator Screen** to access the general operations screen and Alarms. This screen is not password protected.

**Data Change Menu:** touch the button labeled **Data Change** to access set-up screens. A keypad will be displayed and a password must be entered each time the **Data Change** button is touched. The password should only be known by maintenance and other authorized personal only.



## Operator Screen



This screen allows operation and monitoring of the machine.

**Carton Count per Tier:** Displays the preset value for the number of cartons for each tier.

**Current Carton on Tier:** Displays the current number of cartons to be conditioned for the current tier.

**Cartons Per Minute:** Displays the current speed of the machine.

**Tiers Per Pallet:** Displays the number of tiers to be conditioned per pallet.

**Current Tier Count:** Displays the current Tier number the machine is working on.

**Carton Count Previous Minute:** Displays the last minute of the cycle speed of the machine.

**Cycle Start:** Push to start the machine.

**Cycle Stop:** Push to stop machine.

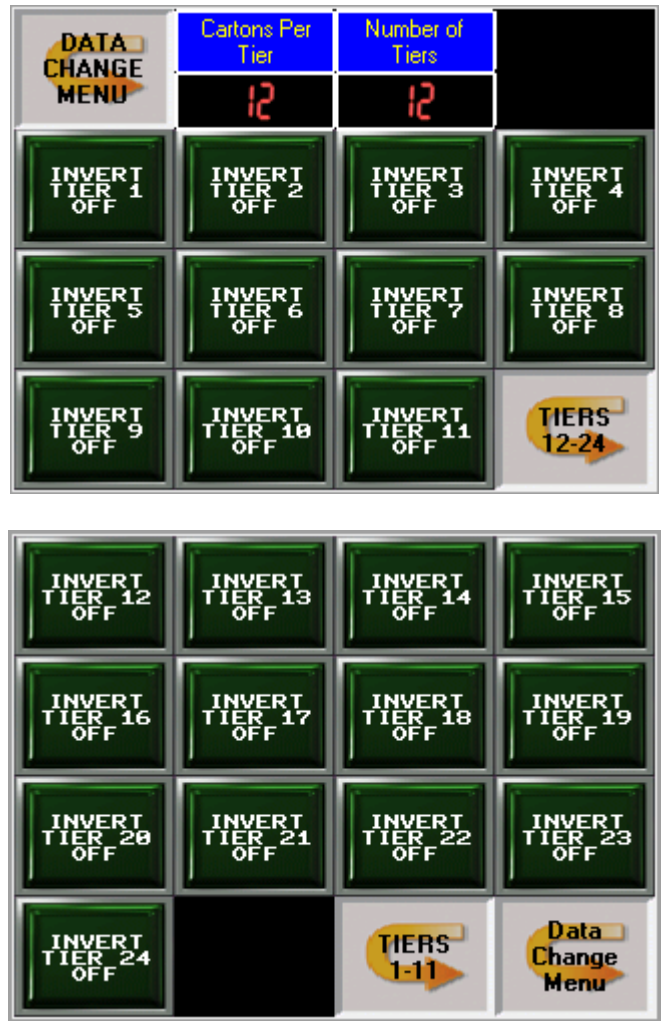
**Carton Reject:** Push to reject all the cases in the machine.

**Return:** Touch this button to go back to the main logo screen.

**Message:** Shows current alarm messages for the machine.



Tier Setup Screens



These screens are used to setup the carton counts for the carton conditioner to execute. The numbers are based on what the case palletizer needs.

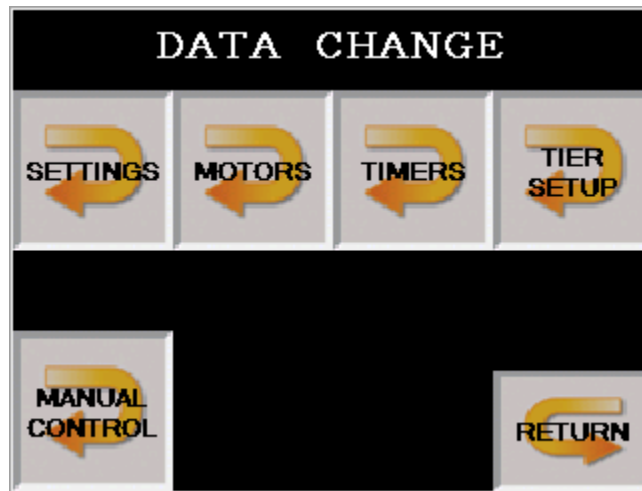
**Cartons Per Tier:** Enter the number of cartons to be used to complete one tier.

**Number Of Tiers:** Enter the number of tiers for a Full pallet.

**Invert Tier XX On/Off:** Touch these buttons (24) to select if you want to invert or leave the cases flaps up. Tier numbers greater then the **Number of Tiers** value enteres will be ignored.



**Data Change Menu Screen**



This screen is password protected and allows you to configure the carton conditioner by touching the various buttons defined below:

**SETTINGS:** Screen to access carton conditioner settings.

**MOTORS:** Screen to access conveyor motor speeds for the carton conditioner.

**TIMERS:** Screen to access Timers to change in the PLC program.

**TIER SETUP:** Go to this screen to setup each Tier to have the cases inverted or upright.

**MANUAL CONTROL:** This screen allows for manual functions of the machine.

**RETURN:** Touch this to GOTO PANEL button to go back to the Northpoint Main screen.



## Timers Screen

Password protected screen. Touch the timer you want to change and another keypad will appear to be able to change the value. Values entered will be in milli-seconds.

## Timers Screen

	Index Delay For Tamper 12345 ms	Index Cnv Start Delay 12345 ms	Index Cnv Stop Delay 12345 ms
Flap Closer Delay 12345 ms	Spray On Delay 12345 ms	Spray On Time 12345 ms	Heat Cnv Run Time 12345 ms
Vac Rotate Away Delay 12345 ms	Carton Backup Delay 12345 ms		

**RETURN:** Touch this button to go back to the **Data Change Menu** screen.

**Index Delay For Tamper:** Delays carton at indexer for the tamper to finish its cycle to check a mispack.

**Index Cnv Start Delay:** When a carton is sensed at the Indexer PE, this timer is used to delay the start of the conveyor.

**Index Cnv Stop Delay:** This timer is used to delay the stopping time of the conveyor.

**Flap Closer Delay:** This timer is used to delay the flap kicker valve when the Flap Closer PE is blocked.

**Spray On Delay:** Delays start of the misting system when the PE is blocked.

**Spray On Timer:** Timer used to control the run time of the misting system.

**Heat Cnv Run Time:** Elapsed time heat conveyor will run when a carton is sensed at the entrance to the heating bars.

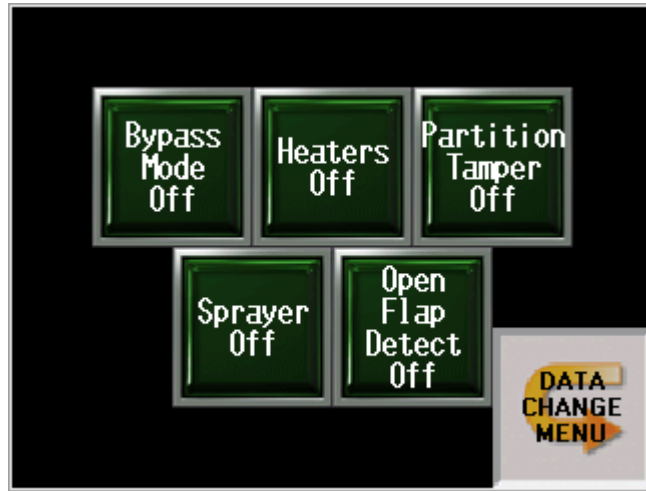
**Vac Rotate Away Delay:** Time delay used to release the case that is being rotated on case inverting stage.

**Carton Backup Delay:** Time needed to elapse when the carton backup PE is blocked to stop the machine.



Touching the button labeled **SETTINGS** on the **DATA CHANGE MENU** screen allows access to the following screen. This screen allows you to configure the carton conditioner to do the following:

### SETTINGS SCREEN



**Bypass Mode Off/On:** Touch the button to turn bypass on or off then push cycle start to start the machine. This function allows cartons to be sent through the machine by only running the conveyors and retracting all the air cylinders out of the way.

**Heater Off/On:** Touch this button to enable or disable the heater bars..

**Partition Tamper Off/On:** Pushes the partition back down the case and checks for any bottles on top of the partitions also. This button will turn this feature Off or ON.

**Spray Off/On:** Touch this button to enable or disable the water misting section.

**Open Flap Detect Off/On:** This button will enable/disable the detection of the back flap that was not tucked in by the flap closer.

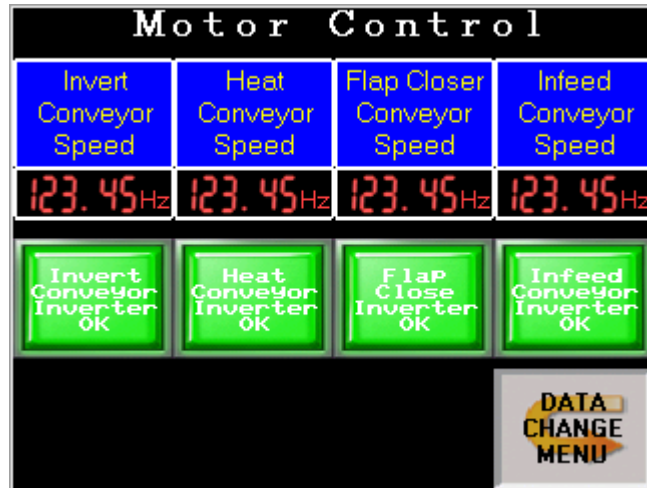
**Data Change Menu:** Touch this to go back to the previous **Data Change Menu** screen.





Touching the button labeled **MOTORS** on the **DATA CHANGE MENU** screen allows access to the screen below. The speed (in Hz) can be changed for various motors and motor faults can be reset also.

## MOTORS Screen



**Invert Conveyor Speed:** Section of conveyor where the carton gets inverted.

**Heat Conveyor Speed:** Section of conveyor with heater bars above. This conveyor turns on and off as a case gets indexed into the section after the flaps are closed.

**Flap Closer Conveyor Speed:** This section of conveyor is where the carton enters the machine and the flaps are closed before the heat stage.

**Infeed Conveyor Speed:**

**XXXX Conveyor Inverter OK:** When the inverter faults this button changes to the color red. Touch the button to reset the Inverter fault for that motor.

**DATA CHANGE MENU:** Touch this button to go back to the previous screen.



## Carton Conditioner Un-Jamming Procedures

### *Carton Jam ups*



#### **! WARNING !**

**Serious injury may result if instructions are not followed.  
Heater bars may still be HOT – wait for them to cool.**

1. Push cycle stop.
2. Push E-stop in.
3. Use caution around heater bars because of the HOT surface!
4. Remove the jammed box.
5. If the jam up occurs at the Invert stage, when removing the damaged box make sure you replace the case with an inverted or with one not inverted.
6. Pull the E-stop out and/or push the blue reset button
7. The push cycle start.

## Maintenance and Repairs

### *Inspections and maintenance for each job change:*

- Push E-stop in.
- Lock out the air and power.
- **CAUTION! Heater Bars may be HOT - wait for them to cool!**
- Check airline oil level.
- Check wear and tear on carton conveyor belts then repair or replace.
- Check for air leaks on all air cylinders, airlines, air hoses and valve banks.
- Wipe dust and dirt off photo eyes and reflectors with a clean cloth.
- Check all the sensors to make sure they are not loose.
- Check all nuts and bolts if they are loose and retighten.



**Trouble Shooting**



**! WARNING !**

**Serious injury may result if instructions are not followed.  
 Heater bars may still be HOT – wait for them to cool.**

<b>Problem</b>	<b>Reason</b>	<b>Solution</b>
Machine does not start	Light Curtains misaligned	Realign them to see again. Green LEDs means they are aligned.
	E-stop pushed in	Check E-stop
	Fuses blown	Check fuse
	Main air is off or low	Check main air supply
	Reset button broken	Check reset button
Conveyors are not running	Speed on touch screen is zero	Check the value
	Inverter faulted	Reset Inverter via the touch screen or cycle the power at the panel.
	Blown drive fuses	Check/replace fuses
	Voltage incorrect	Check incoming supply
	Mechanical issue	Check for loose bolts broken chains and sprockets.
	Electrical Issue	Check for loose/broken wires connections
Heater Bars don't work properly	Blown output fuses	Replace with equivalent fuse
	Coil shorted out or open	Replace coil
	Seized solenoid valve or cylinder	Replace valve or cylinder
	Air line leak	Replace or repair air line
	Controlling Photo eye not seeing properly	Realign photo eye to see reflector or replace
Cartons are not cycling through the machine properly	Photo eyes are not seeing the reflector	Adjust the reflector or photo eye until it turns on.
	Cartons are backed up or photo eye is blocked	Check photo eye and make sure carton is not caught on something.
	Conveyor belts are not running at a constant speed	Check tension on the belts



Carton Inverter does not work	Inverter cylinder does not go up	Check for vacuum and vacuum switch input.
		Check valve, output and fuses
	Inverter cylinder does not go down	Check valve, output and fuses
	Invert Stage photo eye not working	Check photo eye and reflector.
Heaters do not heat up	No power at heaters	Check heaters for open circuit
		Check fuses
		Check HI-limit monitor
		Check PLC output
		Check touch screen button
	Check Contactor	

