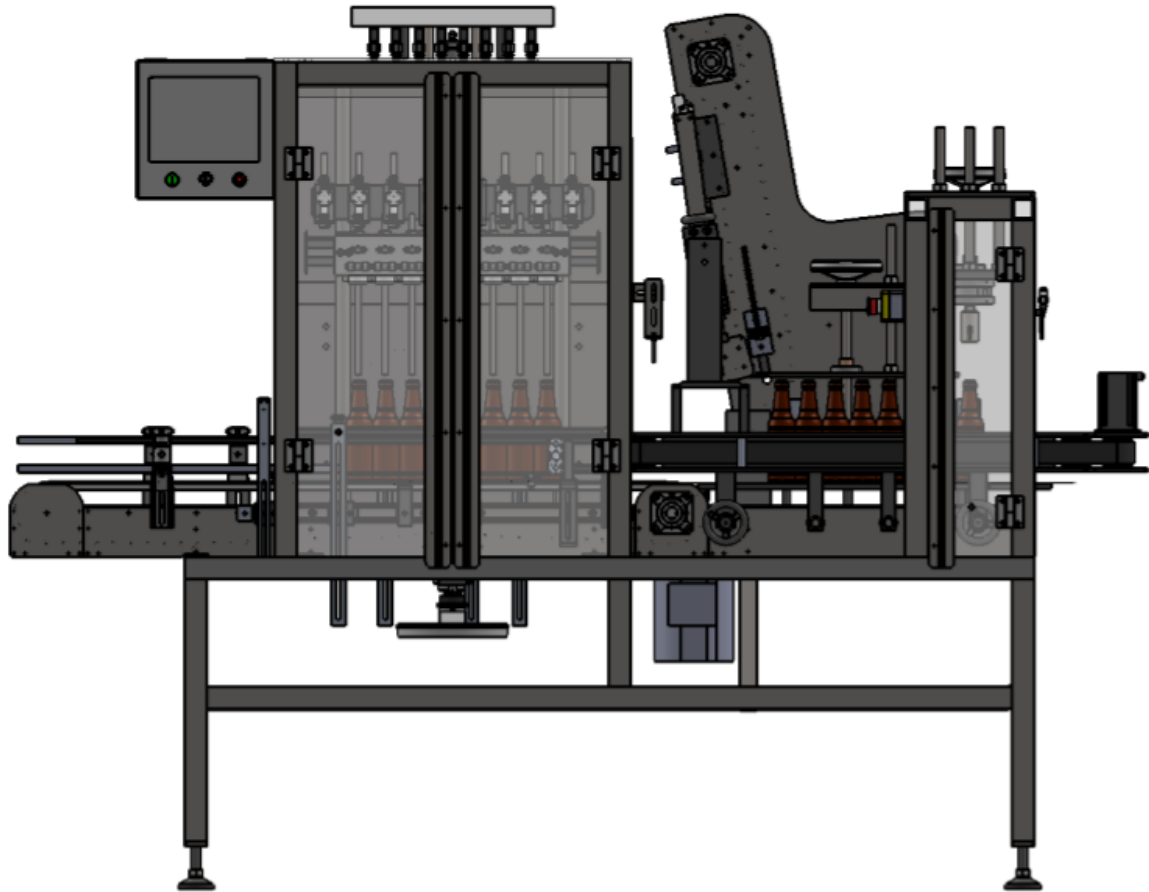




Micro Filler - Operation Manual



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CAUTION!

Persons operating this machinery are reminded to observe their own company safety policies. In addition, the following safety rules should be observed:

- DO NOT REACH INTO THE MACHINE WHILE IT IS IN OPERATION.
- USE ONLY THE CORRECT TOOL FOR THE JOB BEING DONE.
- STAY ALERT, REMEMBER LOCATION OF CONTROL SWITCHES.

MAINTENANCE

The main electric switch supplying power to the machinery should be locked out or disconnected when repairs are performed on this equipment.

Machine should be cleaned and inspected regularly. All safety switches must be operable, attachments secure and machine free of broken glass and paper.

Do not hand lubricate when the machine is in operation.
Work area should be kept clean and as dry as is practical.

The repair or adjustment of this equipment should be performed only by persons qualified through technical training and ability, as assigned by your company.

OPERATION

All guards should be securely in place before operating the machine. Close all doors when operating machine.

Company rules on eye protection should be followed.

Loose clothing or jewelry such as neckties, rolled sleeves, over blouses, bracelets, watches and rings should not be worn when operating the machine.

Report all malfunctions, unusual operation, and defects immediately.

Please exercise caution with any moving parts, including the conveyor and any pinch or drive rolls.

Stop the machine before placing hand or arms near or into any area where moving parts are located.

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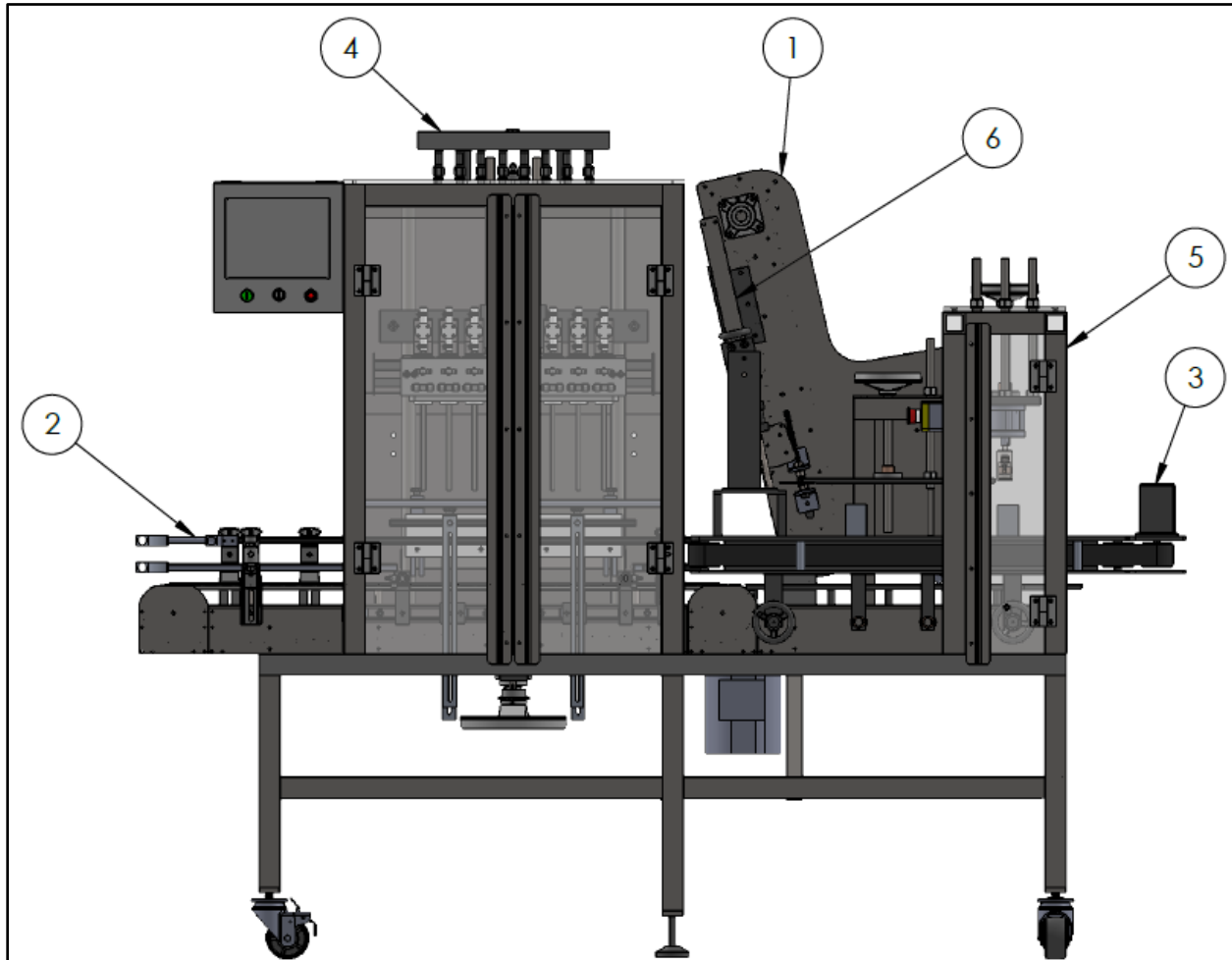
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REFERENCES

WIRING BLOCK DIAGRAMS

SECTION ONE - GENERAL INFORMATION

1.1 TERMINOLOGY OF MACHINE



Micro Filler

Item No.	Assembly Name	Description
1	<u>Micro Elevator</u>	Crown Sorter
2	<u>Filler Conveyor</u>	Moves bottles in position to fill
3	<u>Crowner Conveyor</u>	Moves bottles in position to crown
4	<u>Filler</u>	Fills bottles
5	<u>Crowner</u>	Forms the crown on top of the bottle
6	<u>Crown Chute</u>	Places crowns to the top of the bottle

1.2 SPECIFICATIONS - STANDARD MACHINE

ITEM	SPECIFICATION
CONVEYOR WIDTH	4.5 INCHES STANDARD
MACHINE SPEED	VARIABLE UP TO 32 Bottles per Minute (BPM)
OVERALL DIMENSIONS	h: 77 9/16"; L: 98 5/16"; w: 34 5/8"
ELECTRIC REQUIREMENTS	110VAC 6 AMPS
AIR REQUIREMENTS	90 PSI @ 10 CFM



1.3 **FUNCTIONAL DESCRIPTION OF MACHINE**

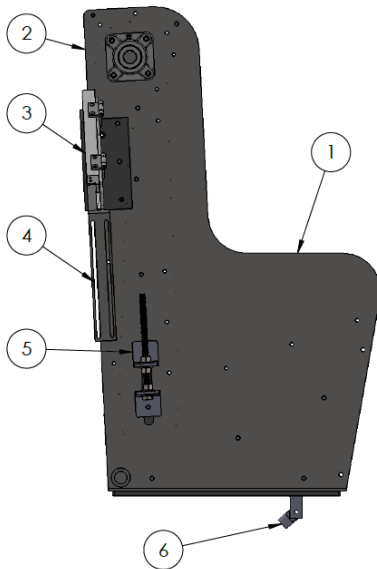
The In-line *Micro Filler* is a fully automatic in-line carbonated filling machine that can fill various bottle sizes with minimal amounts of waste. This means less product down the drain and more bottles filled.

The machine can be configured as a 4-, 6-, or 8-head machine.

The machine indexes the set target of bottles into position under the fill tubes. The straightener closes on the bottles, further aligning them to the fill tubes, and the filling manifold lowers down onto the bottles. The fill cycle consists of the following: pulling vacuum, charging bottles with CO₂, filling bottles to a consistent fill level, removing pressure from the bottle, and releasing the bottles to move down the line. The next group then indexes in and the cycle is repeated.

After filling, the bottles move into the *Crowner* section of the machine. A crown is placed onto the top of the bottle and then formed over the bottle to provide a sufficient seal. The bottles index one at a time to have the crowns formed.

1.3.1 Micro Elevator



The *Micro Elevator* is an automatic crown sorter. Simply load the elevator with unbent crowns and it will sort them and place them in the correct orientation for use.

Always make sure that the elevator is full so that it will keep up with production.

1. Hopper – load crowns here
2. Door – allows access to the back
3. Extension – connects sorter to Chute (pg. 14)
4. Bracket – connects sorter to Chute
5. Tensioner – tightens/loosens the chain
6. Turnbuckle – controls angle of sorter



If a jam ever occurs, simply go to the back of the elevator, rotate the small door lock, and pivot the door to release any jammed crowns.

Close the door back and rotate the door lock back into place. If you forget to do this every crown will end up on the floor.

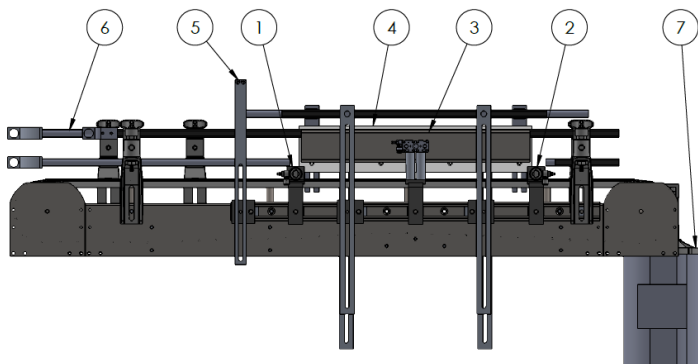
Adjustments

The only adjustment for the Micro Elevator is the angle. The angle should be set to not allow backwards crowns or multiples to go all the way up the chain. This angle is adjusted at the Turnbuckle (6) underneath the sorter. Disconnect the Bracket (4) prior to changing the angle of the sorter. Then loosen the nuts on either end of the Turnbuckle and simply rotate the turnbuckle noting the direction of rotation on the sorter.

Jog (pg. 33) the sorter to check the new angle. Once good, tighten both nuts back down.

DO NOT ADJUST THE ANGLE OF THE ELEVATOR WHILE THE BRACKET IS STILL CONNECTED TO THE CROWN CHUTE!!!!

1.3.2 Filler Conveyor



The *Conveyor* for the *Filler* controls the indexing of bottles for filling and the positioning of the bottles under the fill tubes.

1. Entry Gate – creates spacing between cycles
2. Exit Gate – positions bottles under fill tubes
3. Straightener – positions bottles under fill tubes (**CHANGE PART per bottle**)
4. Back Plate - positions bottles under fill tubes
5. Photo-eye – counts bottles to start cycle
6. Railing – keeps bottles on conveyor
7. Motor – wash down rated

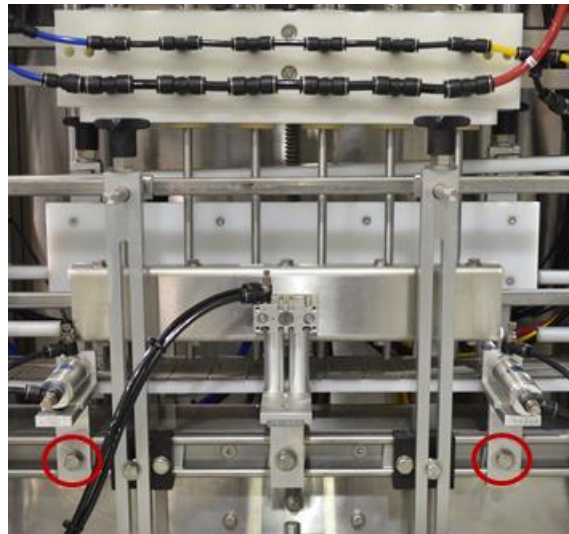
Adjustments

Place multiple bottles on the conveyor in different locations and adjust all railing accordingly.

Entry/Exit Gates (1/2):

Adjust the location of the Exit Gate (2) to align the bottles under the fill tubes. Loosen the bolts circled and slide left/right. Push a bottle all the way over to the exit gate (cylinder fully extended) and ensure it is aligned under the far right fill tube.

Put full number of bottles in place (4, 6, or 8) and move the Entry Gate (1) into position right in-between bottle in position 1 and the first bottle in the next group. It should not hit the bottles and push them back but just sit in-between the two and not allow the bottles to move into position until the cylinder retracts.

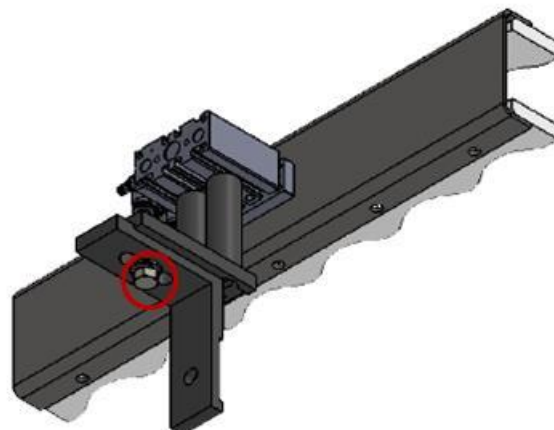


Straightener (3):

Jog (pg. 33) the Straightener and check that the bottles are aligned properly under the fill tubes. Move Straightener in/out as needed to align bottles.

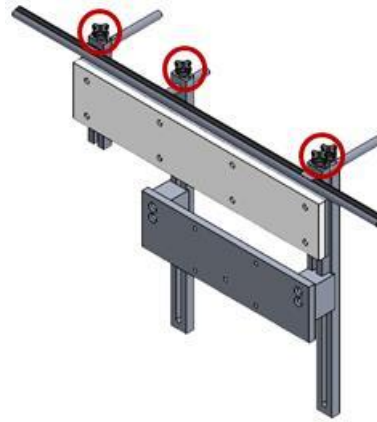
- Loosen bolt circled and slide assembly in/out as needed.

With the Straightener engaged, jog the fill head down to make sure none of the fill tubes hit the bottles.



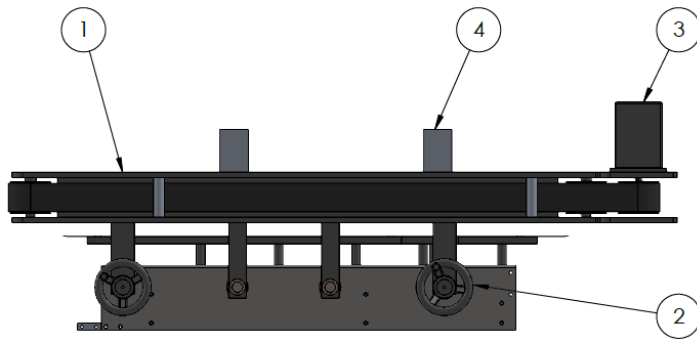
Back Plate (4):

Adjust the Back Plate to have the bottles centered under the fill tubes. Front to back adjustment is allowed from loosening star-knobs.

***Change-Over***

The only part that changes for different bottles is the Straightener (3). When doing a change-over, just remove the bolt circled above, remove the Straightener assembly, and replace with the new assembly.

1.3.3 Crowner Conveyor



The *Conveyor* for the *Crowner* controls the indexing of bottles for placing crowns on top of bottles and for crowning.

1. Side Belts - moves bottles into position
2. Hand Wheel - allows for easy changeovers between different bottle diameters
3. Motor - wash down stepper
4. Retro-reflector - controls positioning of bottles under crowner

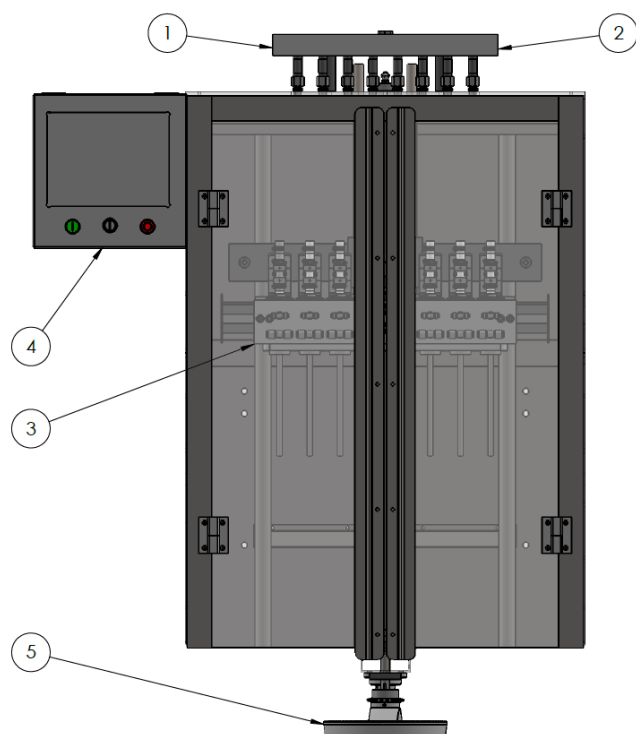
Adjustments

The only adjustment for this conveyor is the in and out adjustment when changing bottle diameter sizes. This is done by adjusting both Hand Wheels (2) in the same direction. Open the gap between the Side Belts (1) until you can fit the new bottle in-between. Then tighten down onto the bottle until it is snug.

DO NOT OVER TIGHTEN OR THE MOTOR WON'T BE ABLE TO MOVE THE BOTTLES.

BEFORE ADJUSTING IN AND OUT MAKE SURE TO LOOSEN THE HORIZONTAL PLATE ON THE CROWN CHUTE!!!!

1.3.4 Filler



The *Filler* is what fills the bottles with product.

Cycle:

- Bottles index into position
- Straightener positions bottles
- Fill head comes down onto bottles
 - Vacuum
 - Fill
 - Snift
- Everything releases and bottles released to *Crowner*

1. Inlet – customer connection point
2. Manifold – distributes product to different heads
3. Filling Manifold – fills bottles (**CHANGE PART per bottle**)
4. Control Box – See *Section 6*
5. Hand Wheel – Adjusts Filling Manifold height for changeover

Temperature and Pressure are critical components to ensure acceptable and repeatable fill levels, reference Zahn & Nagel Chart for Equilibrium, Temperature, and Pressure ([Zahn & Nagel](#)).

Temp Goal: 1-2 below Equilibrium Temperature

Pressure Goal: 1-2 psi above Equilibrium Pressure

Adjustments

The only adjustment is the vertical height of the Filling Manifold (3). This height is adjusted by the Hand Wheel (5).

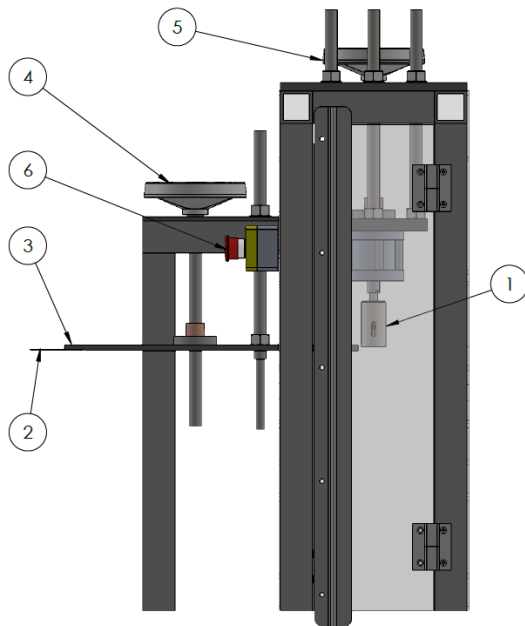
Place bottles into position, then [jog](#) (pg. 33) the fill head down. Adjust the height until the seals are on the bottles. Then [jog](#) the [CO₂ Charge](#) (pg. 33) and go to the [Bottler Settings](#) (pg. 24) and make sure that Beer Pressure is being maintained. Adjust until no leaks.

Change-Over

DISCONNECT THE AIR & CO₂ PRIOR TO PERFORMING A CHANGEVER!!!

The only change part is the Filling Manifold (3). Unhook all 4 air lines from the manifold. Loosen the shaft collar on the pinch valves and move them out of the way. Then, remove the outside bolts first and then, with a hand holding the manifold up, remove the 2 center bolts. Remove the manifold assembly and replace with the next one.

1.3.5 Crowner



This part of the machine guides the crown and bottle to the Crowning Head (1) where the crown is then formed over the bottle.

1. Crowning Head – forms the crown over the bottle
2. Extension Plate – helps put the crown on the bottle
3. Crown Guide – keeps crown on top of bottle
4. Hand Wheel – adjusts for changes in bottle heights
5. Hand Wheel – adjusts for changes in bottle heights
6. E-Stop – stops the entire machine

Adjustments

PRIOR TO ANY VERTICAL ADJUSTMENTS, LOOSEN THE NUTS ON THE ACME AND THREADED RODS TO ALLOW FOR VERTICAL MOVEMENT!!!

THERE ARE NUTS UNDER EACH TOP PLATE AS WELL

Crowning Head (1):

Lowering:

Loosen the nuts and use the Hand Wheel (5) to move the plate down.

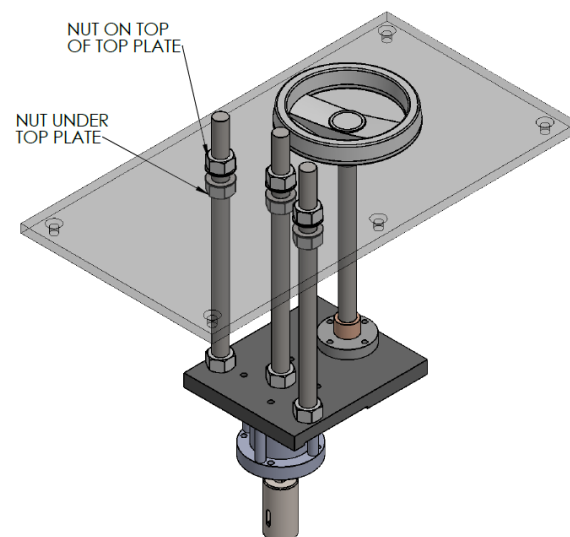
Raising:

Loosen the nuts and use the Hand Wheel (5) to move the plate up.

Hand-tighten the nuts and place a bottle (with crown on top) under the shell and jog it down. Check crimp with gauge.

Start with Crowning Head high and lower until the gauge slides on freely. Use different crowns each cycle.

Re-tighten nuts when at appropriate height. Check and make sure the plate is level.



Crown Guide (3):

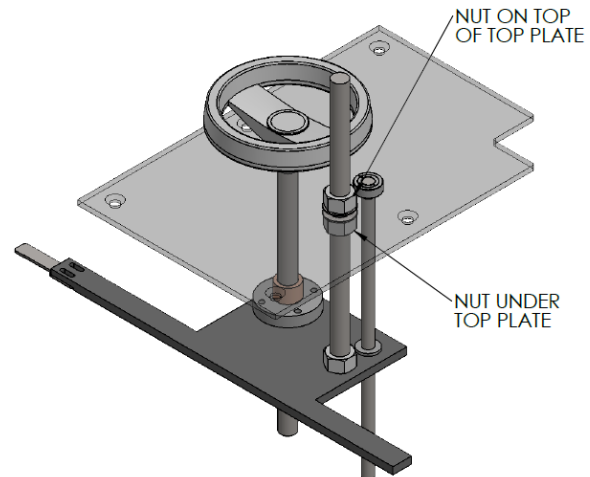
Lowering:

Loosen the nuts and use the Hand Wheel (4) to move the plate down. Do this prior to adjusting the **Crown Chute** (pg. 14) down.

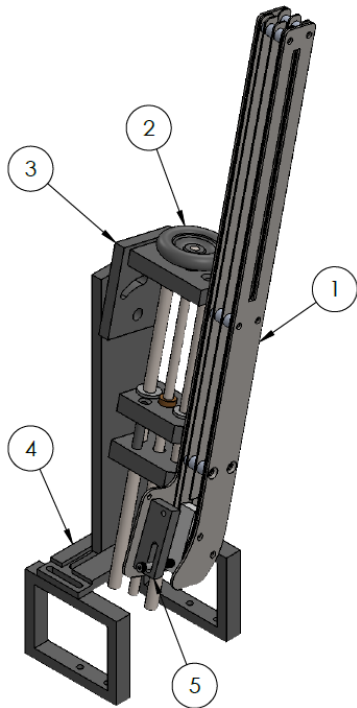
Raising:

Adjust the Crown Chute FIRST! Then loosen the nuts and use the Hand Wheel (4) to move the plate up.

Place a bottle (with crown on top) at the beginning and end of the plate to ensure height. Re-tighten nuts when at appropriate height.



1.3.6 Crown Chute



This part of the machine is what places the crown in place to then be put on top of the bottle.

1. Chute – places crowns in place to be put on bottles
2. Hand Wheel – adjusts height of chute to right height for crown transfer
3. Angle Plate – allows for chute angle adjustment to match Micro Elevator (pg. 7)
4. Horizontal Plate – allows for side to side adjustment to match Micro Elevator
5. Set Screw – Adjusts placement of crown for transfer

Adjustments

PRIOR TO ANY ADJUSTMENTS, MAKE SURE EVERYTHING IS LOOSE.

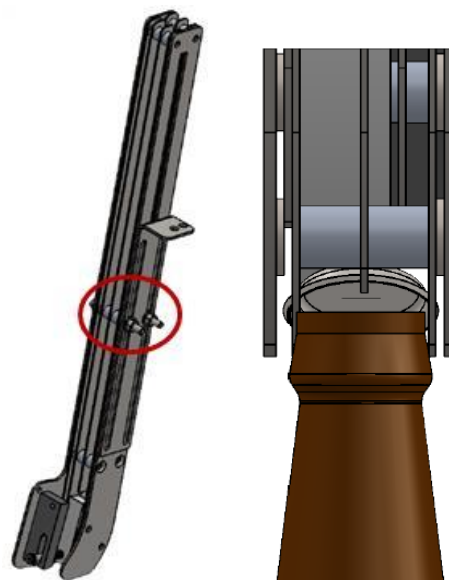
- The 2 bolts that attached the Chute (1) to the Bracket (pg. 7) on the Micro Elevator
- The 2 bolts that keep the Horizontal Plate (4) in place

Chute (1):

Loosen both bolts shown prior to beginning any adjustments.

Once loosened, place a bottle right in front of chute and adjust the height of the chute using the Hand Wheel (2).

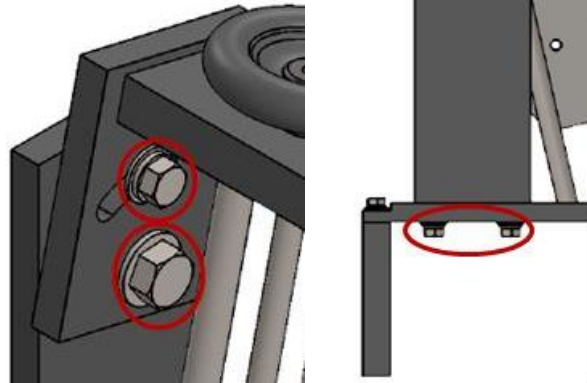
The bottle should be aligned to go right in the middle of the chute (between 2 of the 16-gauge plates) and the height should be so that it picks the crown off.



Angle Plate (2):

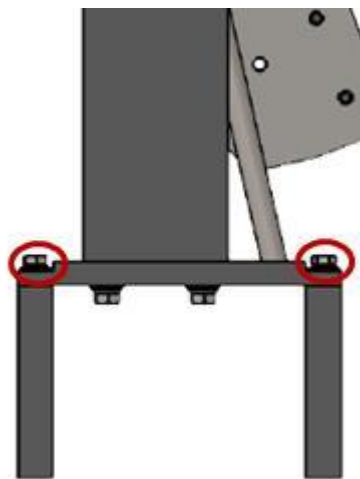
If the Elevator (pg. 7) angle is ever going to be changed, **LOOSEN THESE FOUR BOLTS FIRST!!!**

Once the new angle for the Elevator is determined, rotate the chute to match, move it to align with the Extension, and then lock these bolts back down.

**Horizontal Plate (4):**

Loosen the two bolts shown whenever adjusting Crowner Conveyor Side Belts (pg. 10).

Once Side Belts are in place, push on the Horizontal Plate to ensure the chute is flush with the Elevator Extension (pg. 7) and then tighten the bolts.

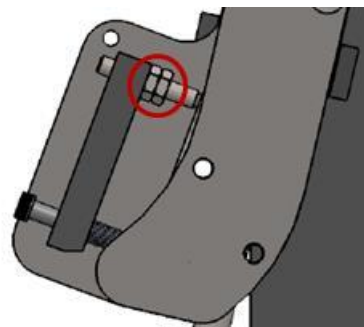
**Set Screw (5):**

Prior to adjusting the Set Screw, loosen the two jam nuts circled.

To move the crown down the Chute, turn Set Screw to the right.

To move the crown up the Chute, turn Set Screw to the left.

Re-tighten the jam nuts.



Once all adjustments are made, cycle multiple sets of bottles through and adjust accordingly.

Re-tighten the all bolts and nuts.

SECTION TWO - UNCRATING AND INSTALLATION

2.1 ELECTRICAL

A grounded electrical male plug is provided with the machine, and is connected to the main electrical enclosure on the rear side of the machine. Plug this into any grounded receptacle. The main power switch can be found on the right side of the Electrical Enclosure.

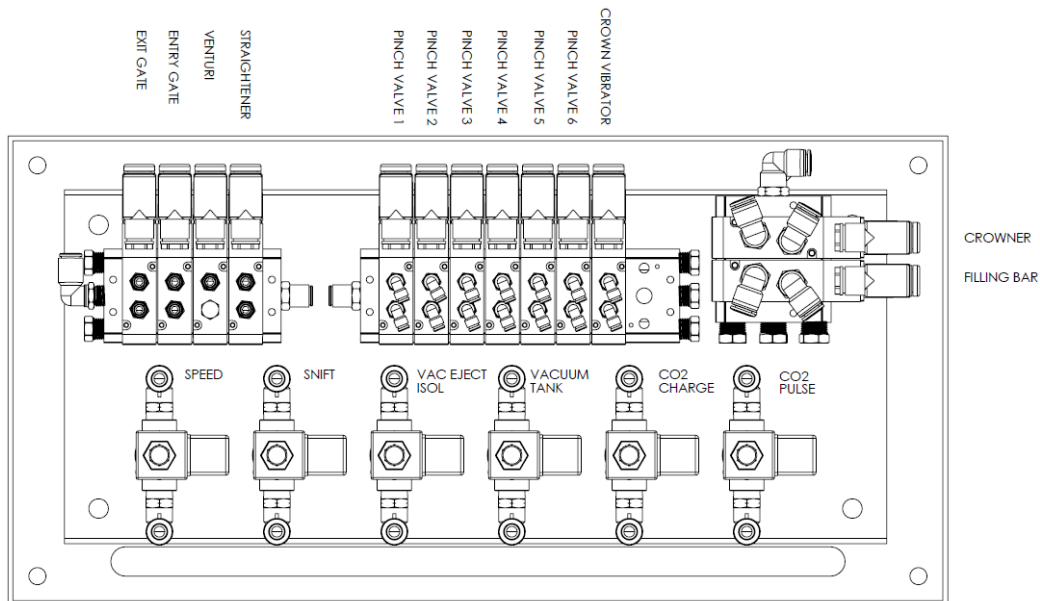


2.2 COMMUNICATION CABLES

If installed with Rinser and Labeler, connect M12 communication cables between the machines.

2.3 PNEUMATIC

The only components that receive unregulated air are the Crouner and the Filling Bar, everything else gets regulated air.



For compressed air, to the right of the Pneumatic Enclosure is an air filter/regulator with a 1/4" male quick disconnect attached. You can supply compressed air to the machine by either a mating quick disconnect on the end of an air hose, or you can permanently pipe air to the machine using standard pipe and connecting directly into the air filter using threaded pipe connections. If you permanently pipe into the system we recommend a cut-off valve be mounted at the machine. Some changeover adjustments are easier if the operator is able to temporarily turn off the air pressure.



The regulator on the left is for air and the one on the right is for CO₂.

Tubing Color Guide:

- Blue Top: Vacuum / CO₂ Charge
- Blue Bot: CO₂ Pulse
- Yellow: Sniff
- Red: Speed



2.4 INSTALLING IN PRODUCTION LINE

Move the machine into its permanent location. Adjust the conveyor height of the machine to match the heights of the adjoining machines as required. Leveling casters are provided with the Micro Filler that allow you some vertical adjustment. Position the conveyor ends as close to each other as possible and then use conveyor rails to guide the containers across narrow dead plates onto the conveyor.

2.5 LEVELING THE BASE MACHINE

Once the machine is installed, level the main conveyor through the machine by using a bubble level. Place the bubble level along the length of the machine. Leveling the machine is important to the flow of the line as it allows for more seamless transitions between machines. The squaring and straightness of the base machine will ensure the machine operates correctly.



SECTION THREE - OPERATIONAL ADJUSTMENTS

3.1 ADJUSTING FILL LEVELS

Filling on the Micro Filler is controlled by flow meters on each line. This gives the ability to adjust the fill levels of each head individually. This is controlled in the PLC and can be adjusted on the Filling Set Points page of the Touchscreen (pg. 23).

Each pinch valve closes when the product dispensed reaches the target value set on the Filling Set Points screen.

SECTION FOUR - PERIODIC MAINTENANCE, CLEANING, AND LUBRICATION

4.1 MAINTENANCE

Ensure that you perform a monthly visual inspection for wear on the Filling Manifold seals, conveyor chain, Side Belts, and Crowning Head.

4.2 CLEANING THE MACHINE

The Micro Filler comes in stainless and aluminum construction. Cleaning the machine regularly is recommended.

Hook up at the Customer Connection point and run the Cleaning cycle on the Systems Settings page.

1. Load bottles under the filling head, jog straightener in, lower filling heads onto bottle.
2. Prepare cleaning solutions, (HOT CAUSTIC RECOMMEND 160 DEGREES 170 MAX.)
3. From the system menu select the cleaning time per stage (speed, snift, vacuum paths).
4. Connect cleaning solution product supply manifold.
5. Select Cleaning ON. Switch to the monitoring menu to observe progress.
6. When the vacuum valve opens remove the tube from the vacuum pump to the tank to fill the tanks with cleaning solution, then drain the tank.

7. Repeat hot water through the machine, same process with sanitizer prior to fill
 - a. Pressure not to exceed 25psi

Wash down conveyors and components with hot water.

4.3 LUBRICATION

The only lubrication points on the machine are:

1. The conveyor idler sprockets inside the frame of the machine need grease quarterly. The conveyor idler sprockets are located under the conveyor chain.
2. Any threaded rod for linear motion should have light oil (food safe) applied to it periodically to prevent rust and to keep the mechanism moving freely.
3. Flange mount bearings; these have grease fittings and should be lubricated quarterly

SECTION FIVE - TROUBLESHOOTING

The list below represents a few scenarios in which troubleshooting may need to occur.

5.1 NOTHING WORKS AT ALL/POWER IS ON BUT NOTHING WORKS

- a) Check main power. Is machine plugged in? Is main power switch turned on?
- b) Check fuses inside control panel.
- c) Are conveyor speed controls turned up above zero (in the Touchscreen)?

5.2 OPERATIONAL INCONSISTENCIES (NOTHING IS BEING FILLED)

- a) Confirm that filling is on and that the counting eye is changing states between bottles.
- b) Confirm that air supply is on.
- c) Confirm bottles per cycle is not set to zero.
- d) Confirm CO₂ pressure is set 5-10psi above tank head pressure.

SECTION SIX - SCREENS

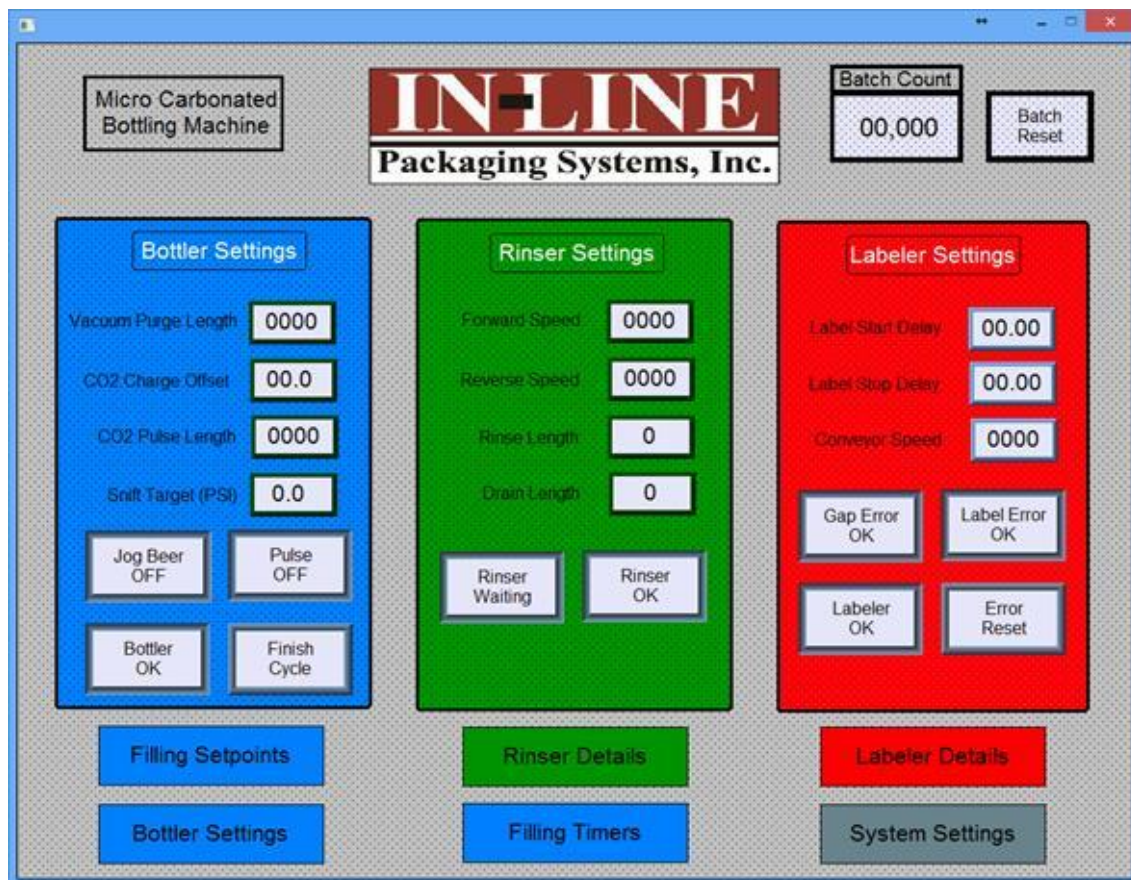
6.1 Main Screen

The Main Screen has three subsections: Bottler Settings, Rinser Settings, and Labeler Settings. The commonly edited items for each machine are listed on this screen. Below each subsection are screen buttons that take you to specific screens. Bottler screens are blue, Rinser screens are green, and Labeler screens are red.

A batch count is carried in the top right corner and a reset button is there to reset the count back to zero.

There are multiple jog buttons throughout each screen. Each one will have a stated status. The stated status is what the status of each function is. If a certain function is desired to run, then stated status must say on.

Example: The button that says Filling On indicates that the filling function is on. If it said Filling Off then the filling function would be turned off.



6.2 Bottler Screens

6.2.1 Filling Set Points

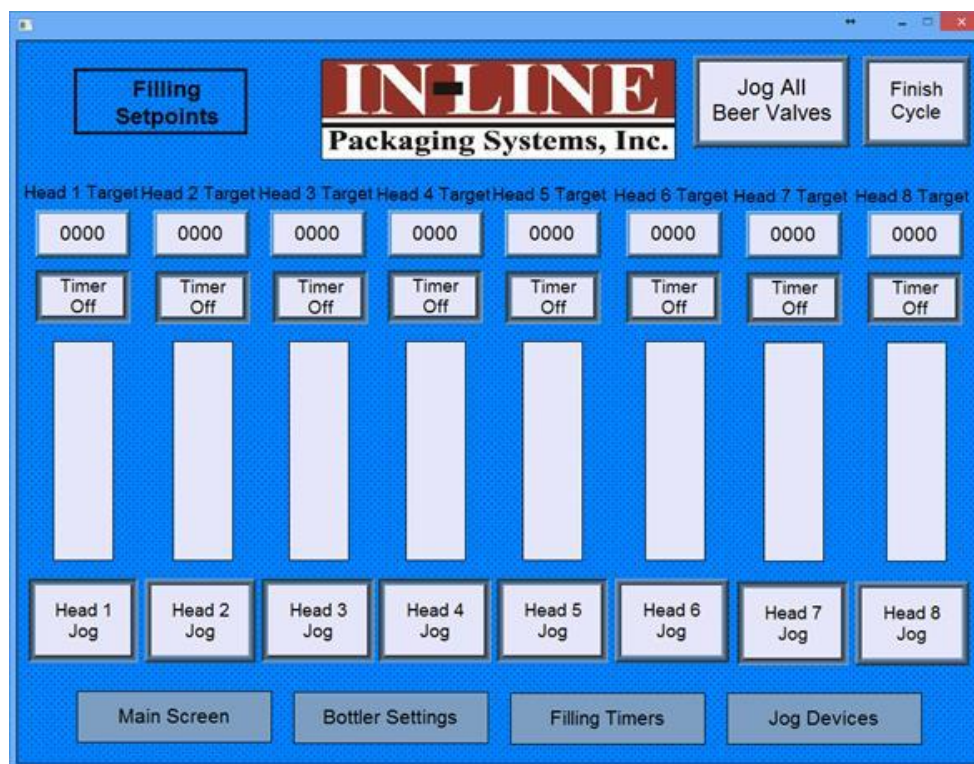
Each filling head (numbered from left to right) has its own set point target. This allows for dialing in to specific fill levels on each head. For the average twelve ounce bottle, a setting between 1000 and 1050 should yield a full twelve ounces.

When a cycle is running, each of the vertical bars will begin to fill in to show the progress of each fill head. When the filling has reached its set point, the color on the bar will change from a dark red to bright red. The last bottle to fill will remain a darker red to show which fill head has the slowest fill.

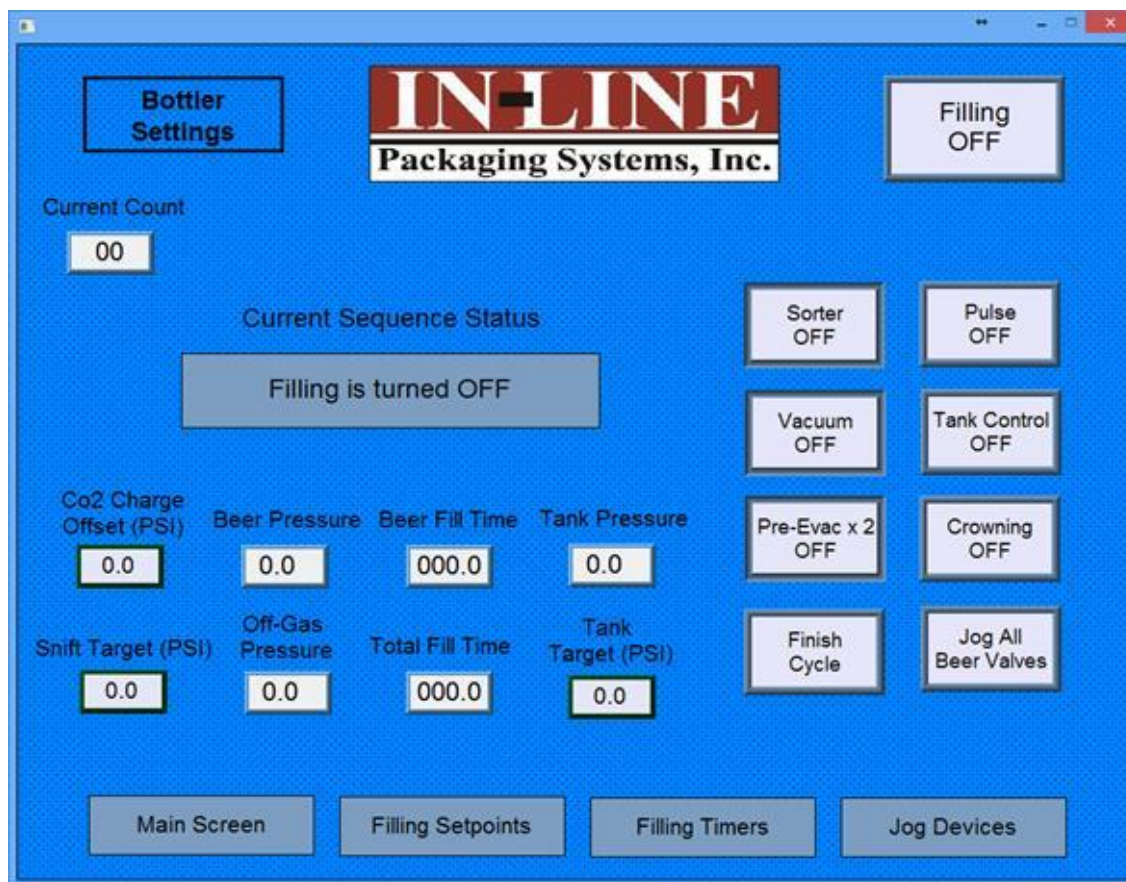
Below each bar is a *Jog* button. This button allows liquid to flow through the specified fill head to ensure each one is working properly or to remove any foam that may be present in the line. This allows for the user to go one by one and check that each one is good. However, in the top right there is a *Jog All Beer Valves* button that will open each fill head at once.

This should be used at the beginning to push product through, cool down all lines, and push any foam through the lines. It should also be used at the end of each run to allow for cleaning.

Also in the upper right corner is the *Finish Cycle* button, which should be used when filling is in progress and the machine has stopped. When the *Finish Cycle* button is pressed, each fill head and the speed valve will close, and the machine will go on into the snift cycle to completion. This lets you move on rather than stop the machine and clear out bottles.



6.2.2 Bottler Settings



Current Count	Displays the current count of bottles as the filling cycle is occurring
Sequence Status	Displays the current state in the cycle
CO2 Charge Offset	The machine takes the measurement of the beer pressure and adds to it the CO2 offset for the purpose of charging the bottles. So if the beer pressure is 14psi, then with a setting of -1.0 the bottle would stop purging at 13psi. If the offset is positive, then the bottles will pressurize above the beer pressure and when the valves open, the beer will be forced upward into the tube which will create more foam.
Snift Target	The low psi target that must be reached before the filling heads will lift from the bottles at the end of the cycle. This setting should allow the beer to foam in the neck of the bottle but not so aggressively that beer is lost over the top. A slight puff sound is what is desired as the heads lift.
Filling On/Off	If off, the Filling Manifold will never come down and engage
Sorter On/Off	Turns the sorter on/off
Pulse On/Off	At the end of the snift cycle, the pulse function will disturb the beer by jetting CO ₂ into the top of the bottle in an attempt to produce foam. There is a delay and dwell in the <i>Timer</i> screen.
Vacuum On/Off	Turns the Vacuum function (including pump) on or off
Tank Control	Turns the tank pressure control on or off. The tank pressure is displayed on the screen and the target setting is entered just below that. This setting should be adjusted so that the tank pressure measured at your tank is close to 15, if that is the max pressure your tank can hold.
Pre-Evac x 2	Forces the vacuuming and CO ₂ purge of the bottle to be done twice before filling. The

settings for vacuum length and CO₂ target are used for both cycles.

Crowning On/Off	Turns the Crowning Head on/off If off, the bottles will not stop in the Side Belts
Finish Cycle	This button completes the filling cycle and forces the machine into the snift cycle.
Jog All Beer Valves	As stated above, pushing this button will open all beer lines at once.

Beer Pressure and Off-Gas pressure are continuously displayed as the machine is running.

Each of the lower buttons takes you to a different screen.

6.2.3 Filling Timers

IN-LINE
Packaging Systems, Inc.

FillHeads Down Dly	0000	Vacuum Delay	0000	Purge Lines Delay	0000
Fill Start Delay	0000	Vacuum Time	0000	Purge Lines Time	0000
Entry Gate In Delay	0000	Beer Start Delay	0000	CO2 Pulse Delay	0000
Entry Gate Out Delay	0000	Speed Valve Delay	0000	CO2 Pulse Length	0000
Exit Gate Open Delay	0000	Snift Valve Delay	0000	Crown Head Delay	0000
Exit Gate Open Dwell	0000	Snift Target (PSI)	00.0	Crown Head Length	0000
CO2 Charge Offset	0.0	Vacuum Pump Time	0000	Straightener Delay	0000

Main Screen Filling Setpoints Bottler Settings Jog Devices

Fill Heads Down Delay	A delay after the straighteners have clamped the bottles and the downstream photo-eye has cleared before the fill heads go down into the bottles.
Fill Start Delay	A delay after the fill heads are down but before the entire filling cycle starts.
Entry Gate In Delay	After the fill heads are down, a delay before the entry gate cylinder extends out. If extended too soon it might prevent the full number of bottles from moving into position under the fill heads.
Entry Gate Out Delay	A delay before the entry gate cylinder retracts. If done too soon, bottles might get past the Exit Gate before it extends.
Exit Gate Open Delay	A delay after the straightener has released the completed bottles before the cylinder retracts.
Exit Gate Open Dwell	The length of time the exit gate remains open to allow the full group of bottles to pass before extending back out.
CO ₂ Charge Offset	The machine takes the current reading of beer pressure and adds/subtracts the offset to set a target psi that the bottles will be charged to before opening the beer valves.
Vacuum Delay	A delay after the filling cycle is started before the vacuum valve opens to evacuate the atmosphere in the bottles.
Vacuum Time	The length of time the vacuum valve is open to evacuate the bottles.
Beer Start Delay	After the bottles are vacuumed and then charged, a delay to start filling
Speed Valve Delay	A delay after beer starts before the speed valve opens to release gas.
Snift Valve Delay	A delay after all bottles have filled before the snift valve opens

Snift Target (psi)	The target bottle pressure that snifting will achieve before the heads lift
Vacuum Pump Time	The length of time the vacuum pump runs each cycle to replenish the vacuum used to evacuate the bottles
Purge Lines Delay	A delay after fill heads go up before the educator begins to run in order to purge the snift lines.
Purge Lines Time	The length of time the educator runs to purge lines
CO2 Pulse Delay	If pulse function is turned on, the delay after snifting has finished before the pulse function begins to create foam in the neck.
CO2 Pulse Length	The length of time the pulse function occurs
Crown Head Delay	After the Side Belts have stopped with the bottle in position, a delay before the Crowning Head goes down.
Crown Head Length	The length of time the Crowning Head is down to complete the crowning function.
Straightener Delay	After the bottles are fully counted before the straightener comes in to clamp them

Each of the lower buttons takes you to a different screen.

6.3 Rinser Settings



Rinsing On/Off Turns the rinse function on/off

Rinset OK Displays the current status of the Rinset

Backup CTRL This utilizes the backup control photo-eye to prevent the Rinset from over-running the need for rinsed bottles.

The bottom six buttons on the left are for jogging the devices of the Rinset while the machine is not running, to test the functions.

Forward and Reverse Speed This is the speed of the pivot arm back and forth

Start and Forward Position This is the position the pivot arm starts at and for the rinse. 8000 is 180 degrees.

Bottles per Cycle This should match the number of tubes on the Manifold

Backup Delay The length of time the backup photo-eye is blocked to pause the Rinset from releasing the next group of bottles

Pivot FWD delay The delay after the bottles are clamped before the arm moves

Pivot Back Delay The delay after the bottles have been drained before the arm returns home

Holdback Close Delay The delay before the holdback gate closes after counting the bottles per cycle

Holdback Open Delay The delay after the exit gate has opened before the entry gate opens

Exit Gate Open Delay The delay after the clamp releases the bottles to when the exit gate opens

Exit Gate Open Time	The length of time the exit gate is open for the full group of bottles to pass by
Water Pump Delay	The delay after bottles are inverted until the rinse begins
Water Pump Dwell	This is the rinse time for how long the solution is in the bottles
Drain Time	The length of time after the rinse finishes for the bottles to drain before being returned to the conveyor

Each of the lower buttons takes you to a different screen.

6.4 Labeler Settings



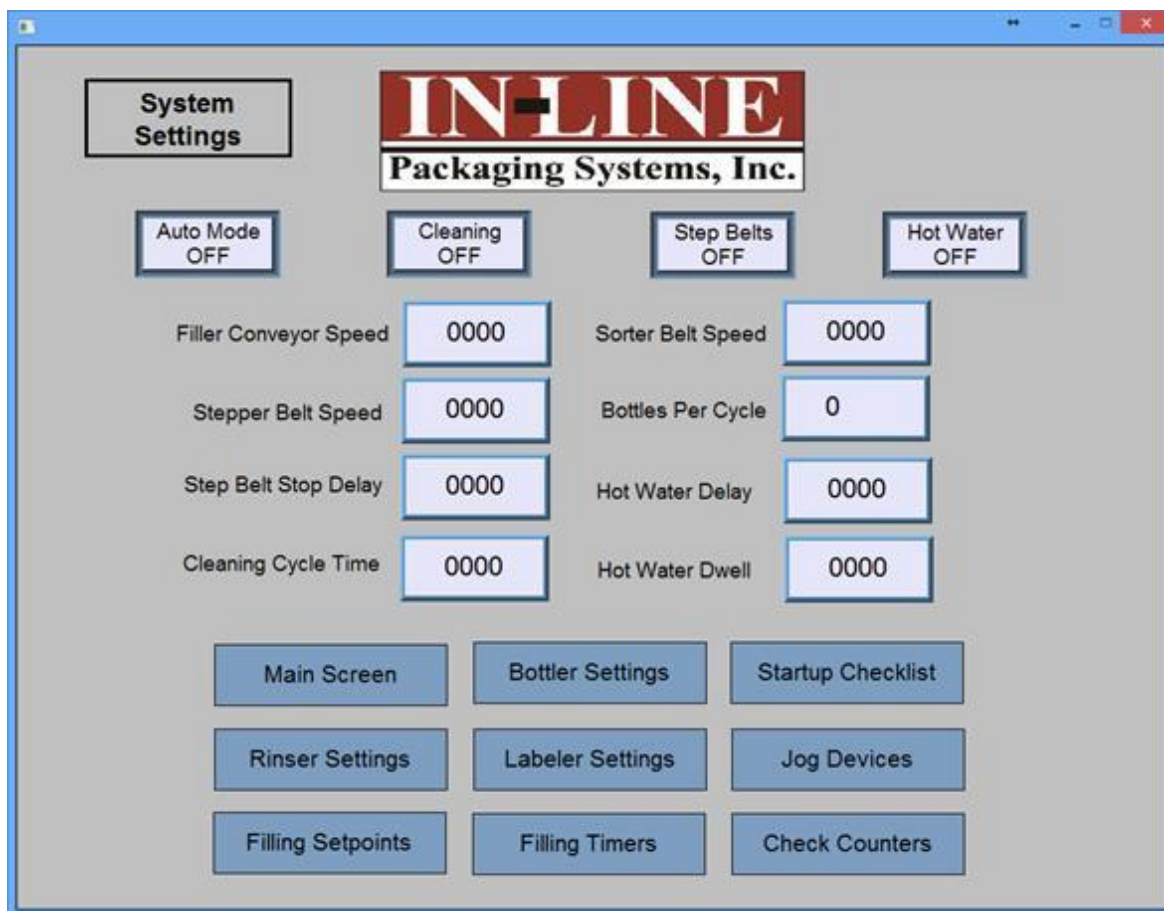
Label On/Off	Turns the labeling function On/Off
Jog Label	Press to jog one label through the machine when machine is not running
Backup Ctrl On	Turns on or off the backup control function, which starts and stops the Spacing Wheel based on the backup photo-eye being blocked or not
Spacing On	Turns on or off the spacing function
Wrap Belt On	Turns on or off the wrap belt
Date Code On or Off	Turns on or off the date coder function, which will send a signal to the coder
Code Signal	Can select to send a signal to the coder at the start of the label (thermal transfer or inkjet coders) or at the end of the label (Hotstamp coders)
Gap Error OK	If a gap error occurs where the machine begins to feed a label but sees no gap, then the machine will shut down and the error will display. Press the Stop Button or Error Reset button on the screen to clear the error
Label Error OK	If the label sensor malfunctions or no labels are present in the sensor, then the machine will timeout and stop after the label error is complete. This button will display that the error has happened. Press the Stop Button or Error Reset button to clear the error
Labeler OK	If the labeler has paused from backup, this will display the status
Error Reset	Clears the Label Error and the Gap Error
Label Start Delay	After the bottle is detected, the delay before the label begins feeding. This is

in inches of movement of the conveyor or the wrap belt

Label Stop Delay	This is the delay for the label to stop feeding after a gap between labels has been detected by the gap sensor. This is in inches of label feed
Label Ratio	This determines the speed of the label feeding versus the wrap belt. A ratio of 1.0 would mean the label speed is matching. A lower number slows the label feed and a larger number increases it
Wrap Belt Ratio	This number determines the ratio of the wrap belt to the main speed of the conveyor. A lower number slows it down and a higher number increases it
Conveyor Speed	This is the speed of the conveyor in inches per minute. This sets the main speed of the machine.
Backup Delay	When the backup sensor just after the wrap belt is blocked. A delay before the Spacing Wheel pauses to prevent more bottles from entering the machine
Code Start Delay	A delay before the signal to initiate a code is sent. This works in conjunction with the Code Signal Start button being set to "Start" or "End"
Code Signal Dwell	This is the length of the signal sent to the coder. For most devices, a value of 10 is more than enough
No Gap Timeout	After the label begins feeding, the machine is looking for the next gap between labels. If it does not see one in this time frame (a value of 500 is equal to 5 seconds), it will stop the machine and stop feeding labels
No Label timeout	If the machine is running and does not see any labels in the gap sensor, the machine will stop after this time (again, a value of 500 is equal to 5 seconds)

Each of the lower buttons takes you to a different screen.

6.5 System Settings



Auto Mode On/Off	Places machine in run mode for all components
Cleaning On/Off	Turn this on to initiate cleaning functions
Step Belts On/Off	Turns the Side Belts on/off
Hot Water On/Off	Turns Hot Water/CO ₂ Inserter on/off
Filler Conveyor Speed	This sets the speed of the conveyor and is in inches per minute. Maximum of 1200
Sorter Belt Speed	This sets the speed of the Micro Elevator belt
Stepper Belt Speed	This sets the speed of the Side Belts
Bottles per Cycle	This is the number of bottles the Filler will be counting as they enter
Step Belt Delay	This is the time that the Side Belts will continue to move after breaking the crowning photo-eye before they stop. Used for positioning the bottle under the Crowning Head
Hot Water Delay	This is the lag time from when the photo-eye is blocked to when the Hot Water Inset is triggered.
Cleaning Cycle Time	This is the time for the cycle to run; this number is in seconds 300 = 5 minutes
Hot Water Dwell	This is how much time the Hot Water runs prior to turning back off

Each of the lower buttons takes you to a different screen.

6.5.1 Jog Devices



Each button will jog a specified function. This is a very useful screen for setup and troubleshooting purposes.

Each of the lower buttons takes you to a different screen.

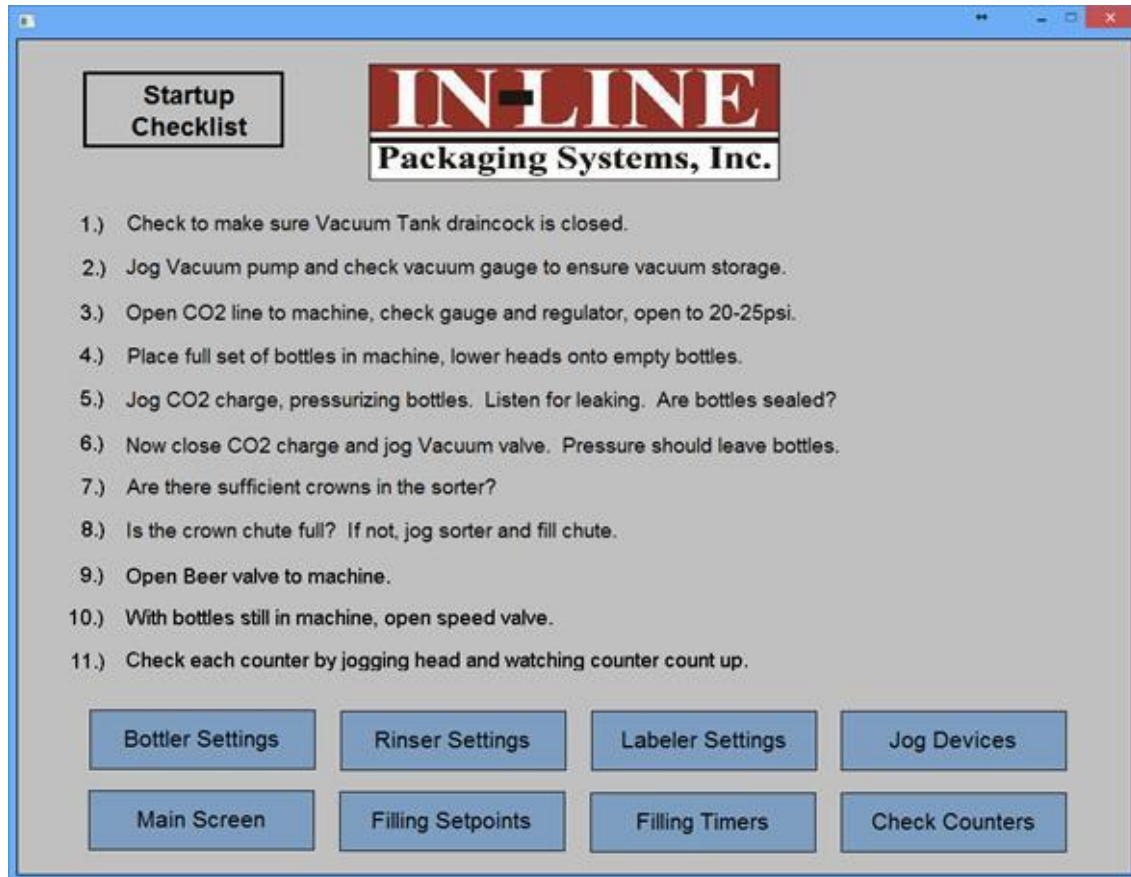
6.5.2 Check Counters



This screen allows you to check the counter functions to ensure they are working properly. You can jog each head individually and see the counter moving. Or during operation you can see the values change as each cycle occurs. A counter not counting up either has a connection issue or has failed.

Each of the lower buttons takes you to a different screen.

6.5.3 Startup Checklist



Use this checklist prior to starting a run.

Each of the lower buttons takes you to a different screen.

SECTION 7 - CLEANING CYCLE

1. Lower heads onto bottles
2. Connect sanitizer
3. Open beer valves
4. Open speed valve for 2 minutes
5. Close speed valve
6. Open snift valve for 2 minutes
7. Close snift valve
8. Open vacuum valve for 2 minutes
 - a. Remove top tube on vacuum tank, when sanitizer comes out, open bottom valves
9. Flush with hot water at the end of the cycle

SECTION 8 - PART NUMBERS LIST

MICRO FILLER (MF)

000	CROWN GAUGE	006	ELECTRICAL CABINET ASSEMBLY
001	TOTAL ASSEMBLY	006-1	ELECTRICAL SUBPANEL
002	OVERALL WELDMENT	007	PNEUMATIC CABINET ASSEMBLY
003	CONVEYOR ASSEMBLY	007-1	PNEUMATIC SUBPANEL
004	FILLER ASSEMBLY	008	CROWN CHUTE
005	CROWNER ASSEMBLY	009	SNIFT ORIFICE

WELDMENTS

021	BASE FRAME ASSEMBLY	025	CROWNER WELDMENT
022	BASE FRAME WELDMENT - BOT	026	DRIP TRAY ASSEMBLY
023	BASE FRAME WELDMENT - TOP	027	BASE FRAME TOP WELDMENT
024	FILLER FRAME WELDMENT		

STAINLESS TUBING

031	LEG	053	LONG HORIZ. MID
032	LONG	054	SHORT HORIZ. TOP
033	SHORT	055	SHORT HORIZ. MID
034	LONG RIGHT	056	VERTICAL
035	LONG LEFT	057	VERTICAL W TIES
036	SHORT OUTSIDE	058	LONG HORIZ
037	SHORT FILLER	059	SHORT HORIZ
038	SHORT W DRAIN	060	VERTICAL FOR DOOR
039	GUIDE ROD TUBING	061	DRIP TRAY BASE
040	DRAIN TUBING	062	DRIP TRAY SIDE
041	ACME	063	VERTICAL
042	ELEVATOR	064	HORIZONTAL
043	CONVEYOR ALIGNMENT	065	SHORT HORIZONTAL
044	ELEVATOR PIVOT	066	HORIZONTAL TOP
045	ELEVATOR PIVOT	067	HORIZONTAL
046	CONVEYOR ALIGNMENT END	068	VERTICAL
047	LEG	069	ELEVATOR SUPPORT
048	TURNBUCKLE	070	CAP FOR MF069
049	VERTICAL	071	MIDDLE FOR HOT WATER
050	VERTICAL LEFT	072	LOWER BRACE SHORT
051	LONG HORIZ. RIGHT	073	LONG LEG
052	LONG HORIZ. LEFT	074	ALUMINUM EXTENSION PLATE

FILLER CONVEYOR

081	FILLER CONVEYOR ASSEMBLY	091	EXTRUSION RAIL
082	FILLER CONVEYOR FRAME	092	CONNECTOR
083	ALUMINUM STRIP	093	STRAIGHTENER SPACER
084	ALUMINUM STRIP	094	SPACER
085	CHAIN GUIDE	095	FILLER CONVEYOR BASE ASSY
086	CHAIN PLASTIC	096	SPACER w FLAT
087	IDLER PLATE	097	MOTOR SHAFT
088	MOTOR MOUNT PLATE	098	BEARING MOUNT PLATE
089	CYLINDER BRACKET	099	IDLER SHAFT
090	SPACER	100	BOTTLE STOP PLATE

CROWNER CONVEYOR

101	CROWNER CONVEYOR ASSEMBLY	113	SIDE BELT BOT PLATE - LEFT
102	CROWNER CONVEYOR FRAME	114	SIDE BELT TOP PLATE - LEFT
103	RT HAND ACME	115	SPACER FOR BELTS
104	LT HAND ACME	116	ACME ATTACH
105	RT HAND BLOCK	117	VERTICAL POST
106	LT HAND BLOCK	118	SPACER
107	SHAFT BLOCK	119	MOTOR MOUNT PLATE
108	SPACER	120	LEFT SIDE BELT ASSEMBLY
109	AL BASE PLATE	121	RIGHT SIDE BELT ASSEMBLY
110	DEAD PLATE	122	IDLER PULLEY ASSEMBLY
111	SIDE BELT BOT PLATE - RIGHT	123	IDLER PULLEY
112	SIDE BELT TOP PLATE - RIGHT	124	IDLER FLANGE

FILLER

126	FILLER BAR VERTICAL ADJUSTMENT ASSY	128	DELTRIN MANIFOLD ASSEMBLY
127	FILLER BAR ASSEMBLY	129	PINCH VALVE ASSEMBLY
131	PINCH PLATE BACK	144	LEXAN TOP PLATE
132	PINCH PLATE TOP	145	STAINLESS PLATE
133	DELTRIN MANIFOLD SPACER	146	ANGLED SLOT COVER
134	PINCH PLATE	147	MANIFOLD
135	SPACER	148	MANIFOLD BRACKET
136	LIFT MAIN PLATE	149	ACME ROD
137	GUIDE ROD	150	TOUCHSCREEN ENCLOSURE
138	ACME BRACKET	151	VACUUM PUMP ANGLE
139	CHANNEL	152	END PLATES
140	LEXAN SIDE PLATE FRONT	153	MOUNT BAR
141	LEXAN SIDE PLATE BACK	154	NUT PLATE
142	LEXAN DOOR	155	PLUNGER
143	DOOR HANDLE		

CROWNER

156	CRIMP ASSEMBLY	176	BRONZE PUSH-OFF
157	CROWN DELIVERY	177	CROWN GUIDE EXTENSION
158	CROWNER SHELL	178	3/4-10 WASHER
161	TOP PLATE	179	RINSER BRACKET
162	LEXAN SIDE PLATE	180	RINSER BRACKET
163	LEXAN LEFT PLATE	181	MAIN MOUNT PLATE
164	LEXAN DOOR	182	SLOT PLATE
165	DOOR HANDLE	183	UPPER PLATE
166	CRIMP PLATE	184	UPPER SHORT PLATE
167	CRIMP SHELL	185	BOTTOM INSIDE PLATE
168	ACME ROD	186	BOTTOM OUTSIDE PLATE
169	LEXAN SIDE PLATE	187	UPPER SPACER
170	TOP PLATE	188	PHOTEYE BRACKET
171	GUIDE ROD	189	PLATE
172	CROWN GUIDE PLATE		
173	3/4-10 THREADED ROD		
174	LEXAN SIDE PLATE - SMALL		
175	SENSOR MOUNT		

MISCELLANEOUS

196	DEADPLATE
197	ALIGNMENT STRAP
198	ANGLE BRACKET

STRAIGHTENER CHANGE PARTS

300	STRAIGHTENER ASSEMBLY	321	STRAIGHTENER ASSEMBLY
301	Ø 2.40" SS CHANNEL	322	Ø 2.63" SS CHANNEL
302	STRAIGHTENER	323	STRAIGHTENER
303	STRAIGHTENER ASSEMBLY	324	STRAIGHTENER ASSEMBLY
304	Ø 2.56" SS CHANNEL	325	Ø 3.50" SS CHANNEL
305	STRAIGHTENER	326	STRAIGHTENER
306	STRAIGHTENER ASSEMBLY	327	STRAIGHTENER ASSEMBLY
307	Ø 2.61" SS CHANNEL	328	Ø 2.77" SS CHANNEL
308	STRAIGHTENER	329	STRAIGHTENER
309	STRAIGHTENER ASSEMBLY	330	STRAIGHTENER ASSEMBLY
310	Ø 2.92" SS CHANNEL	331	Ø 3.31" SS CHANNEL
311	STRAIGHTENER	332	STRAIGHTENER
312	STRAIGHTENER ASSEMBLY	333	STRAIGHTENER ASSEMBLY
313	Ø 2.79" SS CHANNEL	334	Ø 2.67" SS CHANNEL
314	STRAIGHTENER ASSEMBLY	335	STRAIGHTENER
315	Ø 2.38" SS CHANNEL	336	STRAIGHTENER ASSEMBLY
316	STRAIGHTENER ASSEMBLY	337	Ø 2.48" SS CHANNEL
317	Ø 2.65" SS CHANNEL		STRAIGHTENER
318	STRAIGHTENER ASSEMBLY		
319	Ø 3.14" SS CHANNEL		
320	STRAIGHTENER		

MANIFOLD CHANGE PARTS

400		MANIFOLD ASSEMBLY	421		MANIFOLD ASSEMBLY
401	Ø 2.40"	MANIFOLD	422	Ø 3.50"	MANIFOLD
402		RETAINER	423		RETAINER
403		MANIFOLD ASSEMBLY	424		MANIFOLD ASSEMBLY
404	Ø 2.56"	MANIFOLD	425	Ø 2.63"	MANIFOLD
405		RETAINER	426		RETAINER
406		MANIFOLD ASSEMBLY	427		MANIFOLD ASSEMBLY
407	Ø 2.92"	MANIFOLD	428	Ø 3.31"	MANIFOLD
408		RETAINER	429		RETAINER
409		MANIFOLD ASSEMBLY	430		MANIFOLD ASSEMBLY
410	Ø 2.38"	MANIFOLD	431	Ø 3.31"	MANIFOLD
411		RETAINER	432		RETAINER
412		MANIFOLD ASSEMBLY	433		MANIFOLD ASSEMBLY
413	Ø 2.65"	MANIFOLD	434	Ø 2.48"	MANIFOLD
414		RETAINER	435		RETAINER
415		MANIFOLD ASSEMBLY			
416	Ø3.14"	MANIFOLD			
417		RETAINER			
418		MANIFOLD ASSEMBLY			
419	Ø2.61"	MANIFOLD			
420		RETAINER			

FILL TUBE CHANGE PARTS

500	9" BOTTLE	504	11.375" BOTTLE
501	8" BOTTLE	505	9.5" BOTTLE
502	10.81" BOTTLE	506	6.5" BOTTLE
503	10.375" BOTTLE		

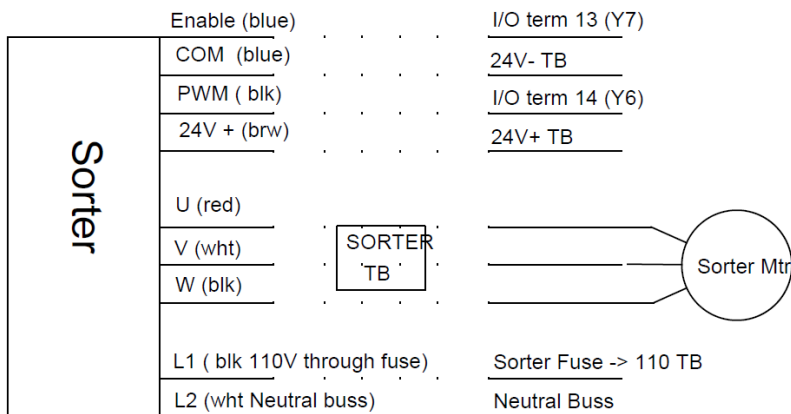
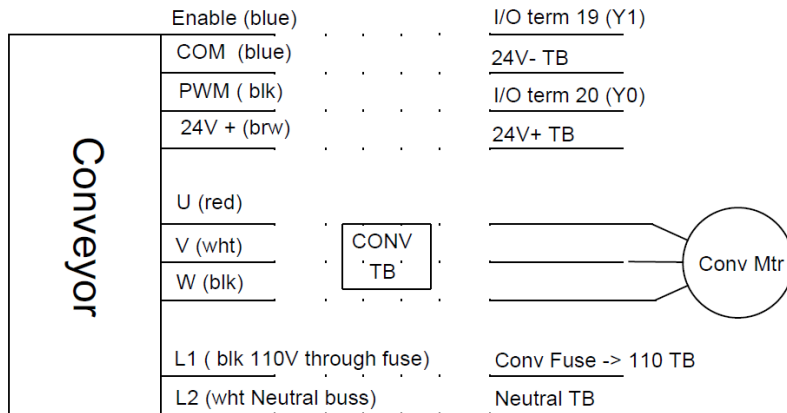
References

Zahm & Nagel. "Volumes of CO₂ Gas Dissolved in Water." *Www.zahmnagel.com*. N.p., Apr. 2016. Web. 4 Jan. 2017.

WIRING BLOCK DIAGRAMS.

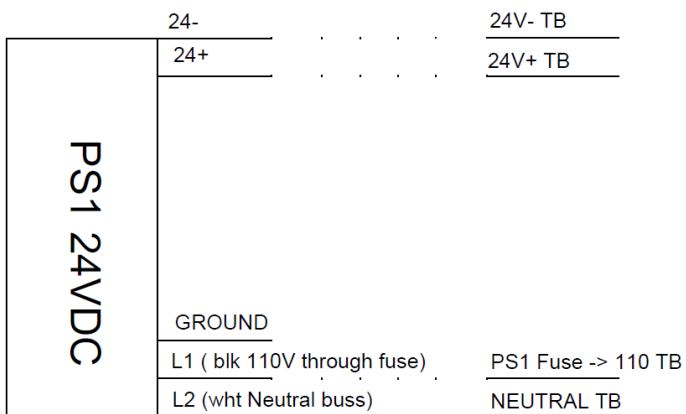
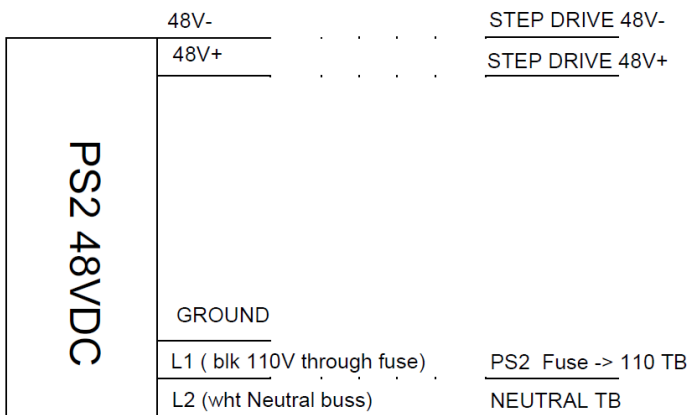
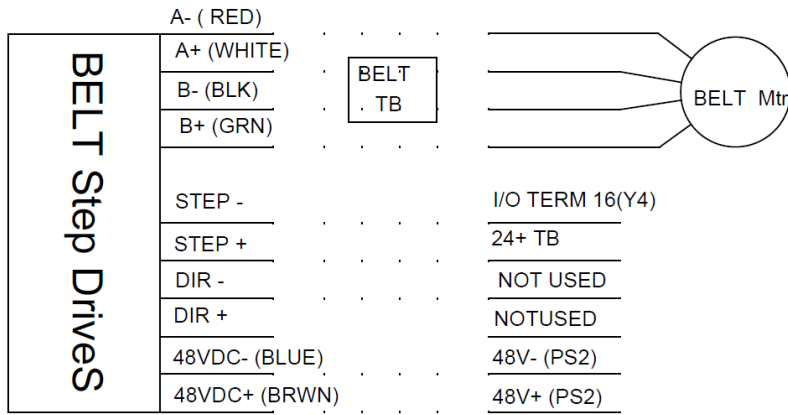
Microline Page 1

Conveyor, Sorter, and Transfer belts Controlled by PLC2 ALL CONNECTIONS BELOW ON PLC2 OUTPUT TB



Microline Page 2

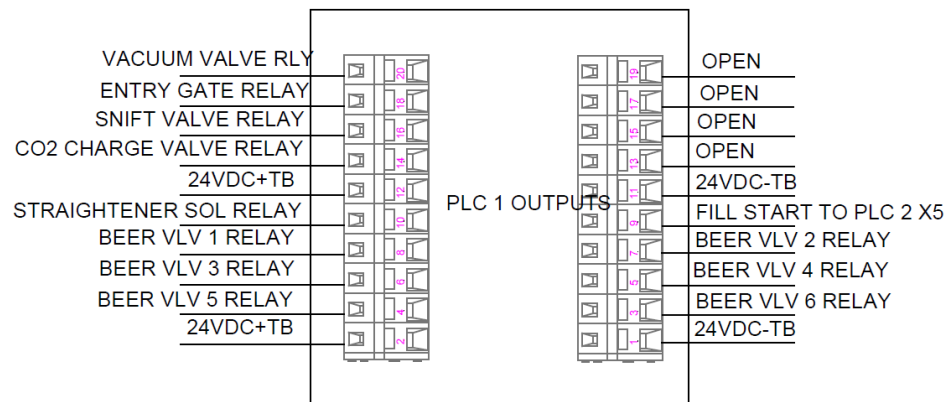
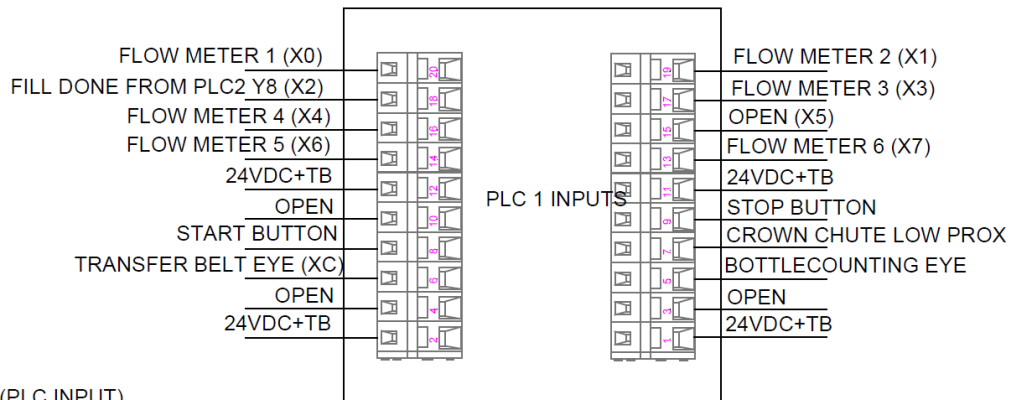
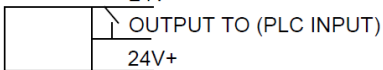
NOTE THERE IS A RIGHT AND LEFT BELT, THEY HAVE SEPARATE DRIVES BUT THEY SHARE A POWER SUPPLY AND STEP OUTPUT FROM PLC2



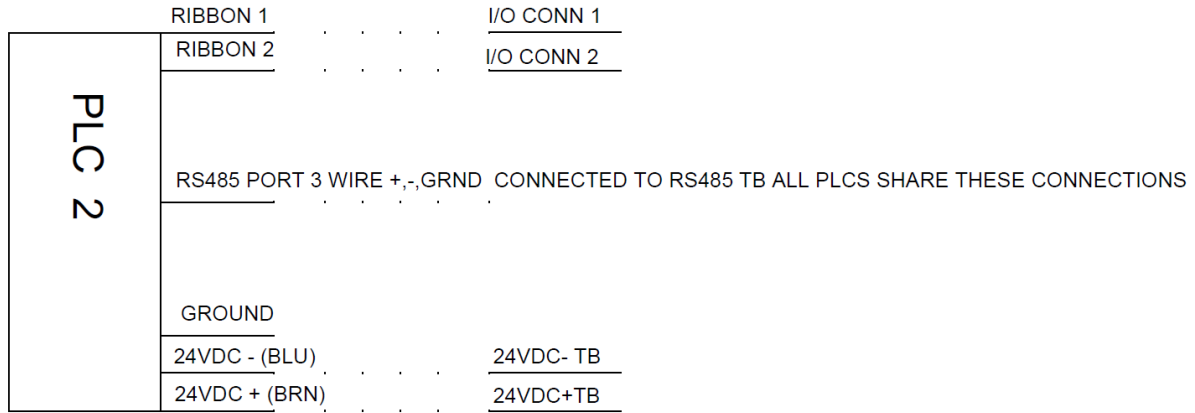
Microline Page 3

PLC 1	RIBBON 1	I/O CONN 1
	RIBBON 2	I/O CONN 2
	DIN CONNECTOR	HMI CONNECTION
	RS485 PORT 3 WIRE +,-,GRND	CONNECTED TO RS485 TB ALL PLCS SHARE THESE CONNECTIONS
	GROUND	
	24VDC - (BLU)	24VDC- TB
	24VDC + (BRN)	24VDC+TB

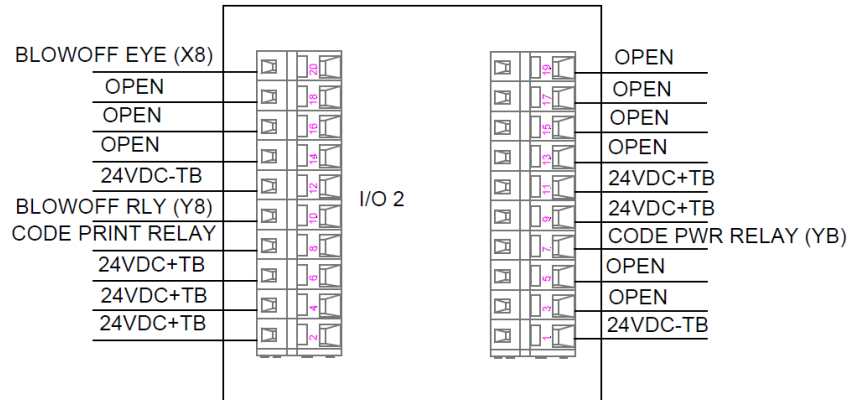
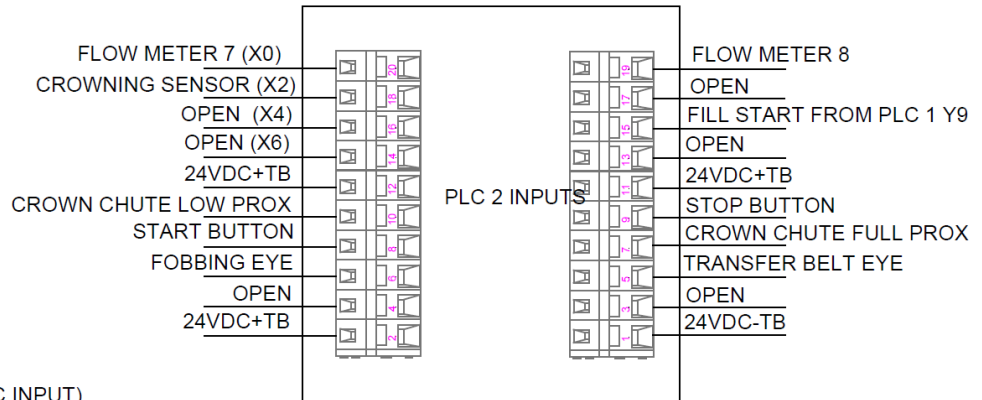
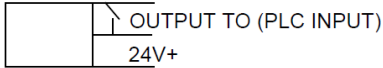
TYPICAL
SENSOR
OR FLOWMETER
24V-



Microline Page 4



TYPICAL
SENSOR
OR FLOWMETER
24V-



NEW MICROLINE BEER FILLER AND CROWNER		UP TO 8 HEADS			
MAIN PLC					
INPUTS	INPUT	TERM	OUTPUT	COMMENT	MODULE
FLOW METER HEAD 1 (WHT WIRE)	X0	20		COUNTER	MAIN PLC
FLOW METER HEAD 2	X1	19		COUNTER	MAIN PLC
FILL DONE FROM PLC #2 Y8	X2	18			MAIN PLC
FLOW METER HEAD 3	X3	17		COUNTER	MAIN PLC
FLOW METER HEAD 4	X4	16		COUNTER	MAIN PLC
	X5	15			MAIN PLC
FLOW METER HEAD 5	X6	14		COUNTER	MAIN PLC
FLOW METER HEAD 6	X7	13		COUNTER	MAIN PLC
24 VOLT +	24+	12			
24 VOLT +	24+	11			
	X8	10			MAIN PLC
STOP BUTTON	X9	9			MAIN PLC
START BUTTON	XA	8			MAIN PLC
CROWN CHUTE LOW PROX (BLK WIRE)	XB	7		JUMPER TO X8 PIN 10 ON PLC2	MAIN PLC
TRANSFER BELT EYE (BY CAP CHUTE)	XC	6		BEFORE TRANS BELTS JUMP TO XD PIN 5 ON PLC 2	MAIN PLC
BOTTLE COUNTING EYE	XD	5			MAIN PLC
	XE	4			MAIN PLC
	XF	3			MAIN PLC
24 VOLT +	24+	2			
24 VOLT +	24+	1			

MAIN PLC					
OUTPUTS	INPUT	TERM	OUTPUT	COMMENT	TYPE
VACUUM BOTTLE SOLENOID RELAY		20	Y0		MAIN PLC
SPEED VALVE RELAY		19	Y1		MAIN PLC
ENTRY GATE SOLENOID RELAY		18	Y2		MAIN PLC
EXIT GATE SOLENOID RELAY		17	Y3		MAIN PLC
SNIFT VALVE RELAY		16	Y4		MAIN PLC
FILLHEAD SOLENOID UP/DOWN RLY		15	Y5		MAIN PLC
CO2 CHARGE RELAY		14	Y6		MAIN PLC
OPEN		13	Y7		MAIN PLC
24 VOLT POS		12	24 +		
24 VOLT NEG		11	24 -		
STRAIGHTENER SOLENOID RELAY		10	Y8		MAIN PLC
FILL START TO PLC #2 INPUT X5		9	Y9		MAIN PLC
BEER SOLENOID 1 RELAY		8	YA		MAIN PLC
BEER SOLENOID 2 RELAY		7	YB		MAIN PLC
BEER SOLENOID 3 RELAY		6	YC		MAIN PLC
BEER SOLENOID 4 RELAY		5	YD		MAIN PLC
BEER SOLENOID 5 RELAY		4	YE		MAIN PLC
BEER SOLENOID 6 RELAY		3	YF		MAIN PLC
24 VOLT POS		2	24 +		
24 VOLT NEG		1	24 -		

<u>PLC 2 INPUTS</u>	<u>INPUT</u>	<u>TERM</u>	<u>OUTPUT</u>	<u>COMMENT</u>	<u>TYPE</u>
FLOW METER HEAD 7	X0	20		COUNTER	PLC 2
FLOW METER HEAD 8	X1	19		COUNTER	PLC 2
CROWNING EYE	X2	18			PLC 2
	X3	17			PLC 2
	X4	16			PLC 2
FILL START FROM PLC #1 Y9	X5	15			PLC 2
	X6	14			PLC 2
	X7	13			PLC 2
24 VOLT +	24+	12			PLC 2
24 VOLT +	24+	11			PLC 2
CROWN CHUTE LOW PROX	X8	10		JUMPED FROM MAIN PLC PIN 7	PLC 2
STOP BUTTON	X9	9		JUMPED FROM MAIN PLC	PLC 2
START BUTTON	XA	8		JUMPED FROM MAIN PLC	PLC 2
CROWN CHUTE FULL PROX	XB	7			
FOBBING EYE	XC	6			PLC 2
TRANSFER BELT EYE (BY CHUTE)	XD	5		JUMPED FROM MAIN PLC PIN 6	PLC 2
	XE	4			PLC 2
	XF	3			PLC 2
24 VOLT +	24+	2			
24 VOLT +	24+	1			

<u>PLC 2 OUTPUTS</u>	<u>INPUT</u>	<u>TERM</u>	<u>OUTPUT</u>	<u>COMMENT</u>	<u>TYPE</u>
FILLER CONVEYOR PWM		20	Y0		PLC 2
FILLER CONVEYOR ENABLE		19	Y1		PLC 2
VAC EJECTOR/ISOLATE VALVES RELAY		18	Y2	ISOLATION VALVE AND EJECTOR AIR SAME RELAY	PLC 2
CROWN CHUTE AIRJET RELAY		17	Y3		PLC 2
STEP OUT BELTS		16	Y4		PLC 2
OPEN		15	Y5		PLC 2
SORTER PWM		14	Y6		PLC 2
SORTER ENABLE		13	Y7		PLC 2
24 VOLT POS		12			PLC 2
24 VOLT NEG		11			PLC 2
FILL DONE TO PLC#1 X2		10	Y8		PLC 2
CROWNING SOLENOID RELAY		9	Y9		PLC 2
BEER SOLENOID 7 RELAY		8	YA		PLC 2
BEER SOLENOID 8 RELAY		7	YB		PLC 2
TANK CONTROL FEED CO2 SOLENOID RELAY		6	YC		PLC 2
TANK CONTROL BLEED CO2 SOLENOID RELAY		5	YD		PLC 2
VACUUM PUMP RELAY		4	YE		PLC 2
FOBBING JET RELAY (CO2)		3	YF		PLC 2
24 VOLT POS		2			PLC 2
24 VOLT NEG		1			PLC 2

ANALOG INPUTS - FOUR INPUT MODULE				
OFF-GAS/BOTTLE PRESSURE	V0			
BEER PRESSURE	V1			
BRIGHT TANK PRESSURE	V2			
OPEN	V3			
24-	COM			
PRESSURE TRANSDUCERS	24V+	RED WIRE		
	24V-	BLK WIRE		
	GROUND	GROUND AND SHIELD		
	SIGNAL	WHITE WIRE		
PNEUMATIC CABINET	WIRECOLOR	TERM #	DEVICE	
multiconductor cable:	RED	1	SPEED	
	RED/WH	2	SNIFT	
	ORANGE	3	VAC ISOLATION VALVE (SHARES RELAY W VAC EJECTOR)	
	YEL	4	VAC VALVE	
	DARK GREEN	5	CO2 CHARGE	
	LIGHT GREEN	6	FOBBING SOLENOID	
	VIOLET	7	STRAIGHTENER	
	PINK	8	ENTRY GATE	
	GRAY	9	EXIT GATE	
	BROWN	10	CHUTE VIBRATOR	
	BR/WHITE	11	VAC EJECTOR AIR SUPPLY (SHARES RELAY W VAC ISOLATE VALVE)	
	BLK/WHITE	12	FILLING HEAD SOLENOID	
	WHITE	13	CROWNING HEAD	
	Shield, Black and Blue		-24vdc	
PLC JUMPER LIST BETWEEN I/O				
PLC1 I/O TERM NUMBER	PLC2 I/O TERM NUMBER			
INPUT TERM 6 (XC)	INPUT TERM 5 (XD)			TRANSFER BELT EYE (WHITE WIRE)

INPUT TERM 7 (XB)	INPUT TERM 10 (X8)			CROWN CHUTE LOW PROX (BLACK WIRE)
INPUT TERM 18 (X2)	OUTPUT TERM 10 (Y8)			
OUTPUT TERM 9 (Y9)	INPUT TERM 15 (X5)			
INPUT TERM 8 (XA)	INPUT TERM 8 (XA)			
INPUT TERM 9 (X9)	INPUT TERM 9 (X9)			
KEYENCE EYES (WHITE OUTPUT WIRE), LEUZE EYES (BLACK OUTPUT WIRE) PROXIMITY SENSORS (BLACK OUTPUT WIRE)				