Rocky Mountain PLC

Matrix Bottle Filler Manual
REV 1.1.2020

Important Safety Instructions

Misuse of the bottle filling machine can result in serious injury or death. Do not use the machine in any way not covered in this manual or for any purpose other than those explained in the following pages. Severe product damage and/or injury could result from the use of unqualified Service Technicians. All repairs must be performed by a qualified Service Technicians. Electrical shock or fire could result if the electrical supply for the bottle filler covered in this manual is not correctly installed or if the bottle filler has been improperly grounded. Do not use the bottle filler covered in this manual unless you are certain the electrical supply has been correctly installed or the bottle filler has been properly grounded

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Introduction .1

We guarantee our products and workmanship. The equipment will be repaired or replaced if, upon inspection at the factory, the equipment is found defective. This does not apply from normal wear and tear, abuse or shipping. The guarantee will be rendered invalid if the customer has made repairs or alteration to the machine without consulting with Rocky Mountain PLC LLC

Know your equipment .2

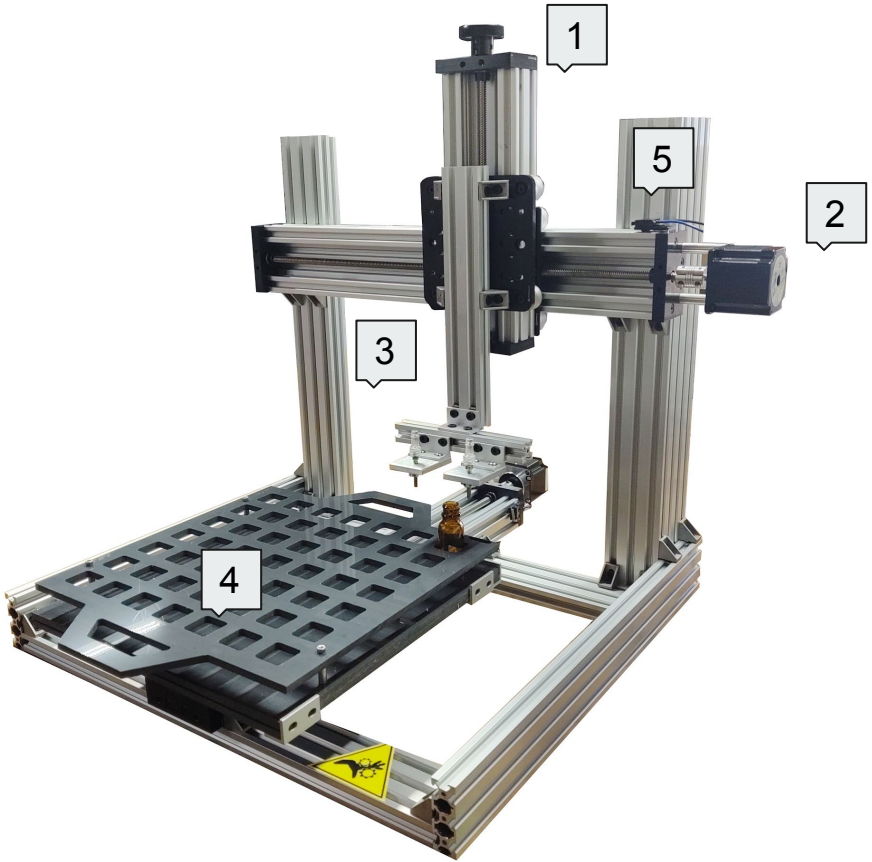
Standard Footprints:

1. 21.5" x 20"
2. 21.5” x 43”

30 - 60 LBS Depending on configuration

Standard Power:
120VAC 60HZ 7 AMPS MAX

Tools you will need:
Allen wrench set standard and metric



1. Jog knob for adjusting nozzle up and down.
2. Motors that move axis
3. Nozzle mounts
4. Bottle positioning trays
5. Limit switches used during homing

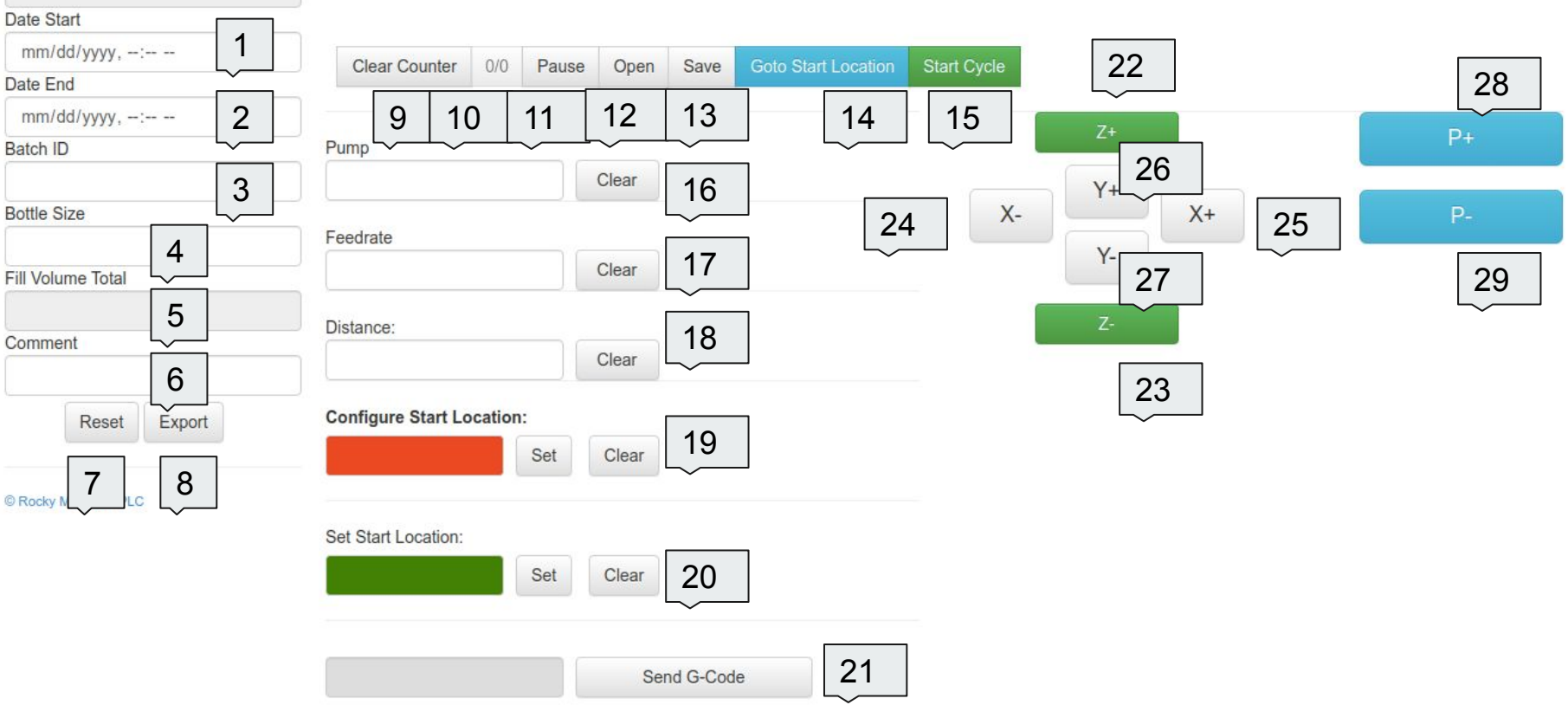
Machine architecture

1. Key switch
2. Power status light
3. E-stop
4. Filling Pumps

Cabinet architecture

Interface architecture Part 1

1. **File name:** Shows opened program. To reopen a program load a different program. Then reload the program you are try to reopen.
2. **Home:** Home the machine any time you power up the machine or reset the machine. Whenever homing the machine always hit reset then home to clear the machines buffer.
3. **Number of cycle:** How many times the machine ran.
4. **Reset:** A soft reset to stop the machine.
5. **Exit:** Used to exit out of the user interface.
6. **Status:** See the status of the machine.
7. **Terminal:** Used to see the status on the machine line by line.
8. **Bottles Per Hour:** See how many bottle per hour you are running.
9. **Bottle Quantity:** See how many bottles you've filled
10. **Fill Count:** Tell the machine how many bottles to fill per cycle. Note: On single nozzle fillers this is "bottle count"
11. **Fill Speed:** How fast to fill the bottles.
12. **Fill Volume:** How much product to fill into each bottle. Each box is for each pump head. You can have up to 6 pump heads.
13. **Reverse Fill:** After each fill you can reverse or suck back product to stop dripping.
14. **Travel Feedrate:** How fast the machine moves bottle to bottle
15. **Row Quantity:** How many rows are on the tray. Rows are back to front.
16. **Row Distance:** The spacing between each row.
17. **Column Quantity:** How many columns there are on the tray. Columns are right to left.
18. **Column Distance:** The space between each column.
19. **Nozzle Distance:** Used for the machine to automatically put the nozzle in a bottle. (if installed)
20. **Nozzle Clearance:** Used if the machine can fill from the bottom up. It lets you bring the nozzle out of the bottle after each fill

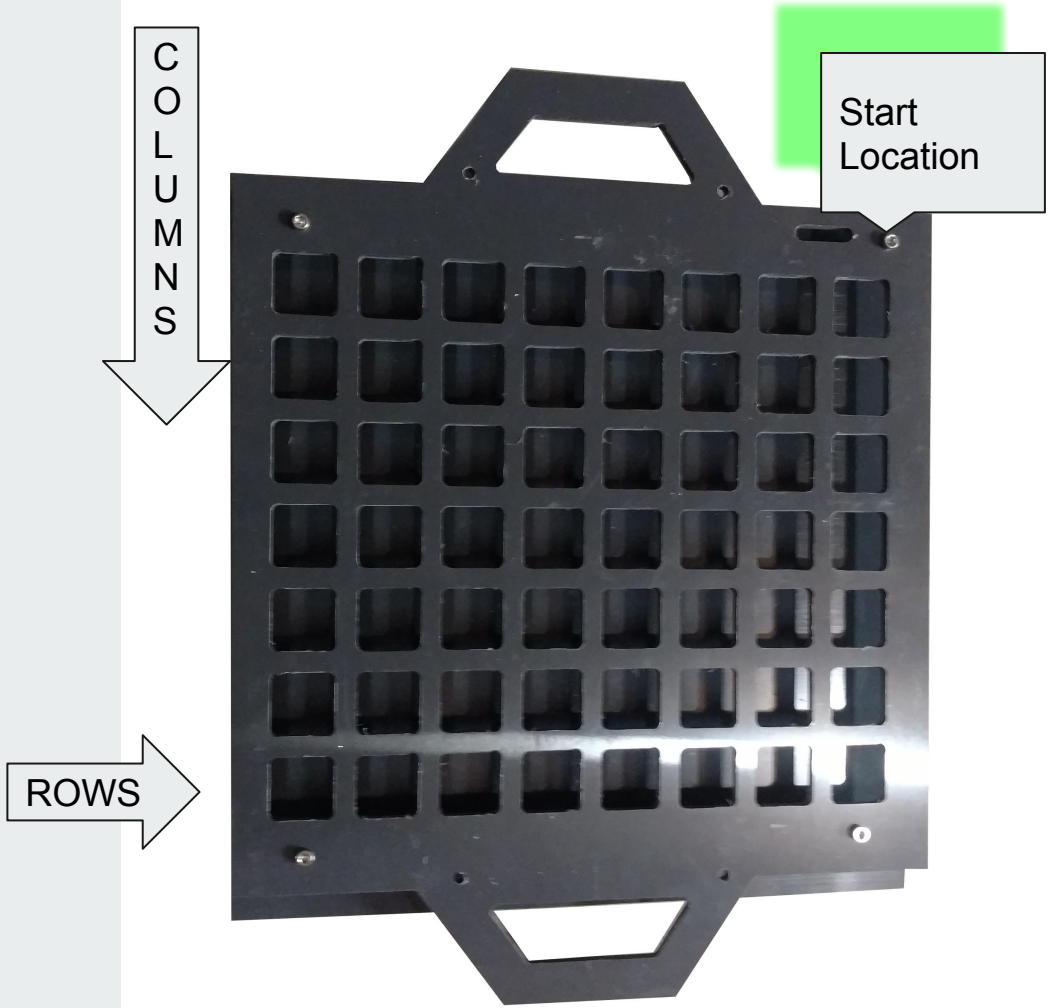


Interface architecture Part 2

1. **Date Start:** The date for the batch being ran.
2. **Date Ran:** The date for the batch to end.
3. **Batch ID:** The batch number for the data collected.
4. **Bottle size:** The size of bottle being filled.
5. **Fill Volume total:** The programed volume being filled.
6. **Comment:** User notes about the batch.
7. **Reset:** Reset the data collected.
8. **Export:** Export the data collected to CSV
9. **Clear Counter:** Clear cycle count.
10. **Status:** How many commands are left.
11. **Pause:** Pause the filling mid cycle.
12. **Open:** Open a saved program.
13. **Save:** Save a program. It will always act as a “save as”.
14. **Goto Start Location:** Use this to goto the start location loaded in the “set start location box.
15. **Start Cycle:** Start the filling cycle.
16. **Pump:** Pick which pump to run manually. If using a single head filler this won't be there.
17. **Feedrate:** Controls the speed of the pumps and axis for manual movements.
18. **Distance:** How far to manually move a axis or pump.
19. **Configure Start Location:** Use this to set a new start location the machine can save up to 6 start locations.
20. **Set Start Location:** Set which start location you want to use with the program. The variable saves with the program.
21. **Send Gcode:** Send commands for debugging.
22. **Z+:** Jog the nozzle up.
23. **Z-:** Jog the nozzle down.
24. **X-:** Jog the nozzle left.
25. **X+:** Jog the nozzle right.
26. **Y+:** Jog the tray away from you.
27. **Y-:** Jog the tray to you.
28. **P+:** Jog the pump to fill.
29. **P-:** Jog the pump to reverse or suck back.

Setting Tray Positions .3

You may need to configure trays locations after shipping, new trays or machine changes.



You can watch the Youtube video here: https://youtu.be/CZyU0uvsr1E
Nozzle down locations: : https://youtu.be/t8T62qSLpMk
Fill up locations: https://youtu.be/GB7fFYaRpdQ

Start	Movement	Configure	Configure	Test and Run
Reset and home the machine. Set a distance and feed rate in the boxes. Below the row of control buttons. Normally a distance of 10 and feed rate of 1000 until you get used to moving around the nozzles.	Use the buttons to the right of the feed rate and distance boxes to move the axis to the bottle in the ***far right corner of the tray.*** As you get closer to the bottle lower your distance down to a small number to get the nozzle right where you want it.	Scroll down to the "configure start location". It will be a RED box. If anything is in the box clear it out. Now use the drop down and select the start location you want to use. You can configure up to 6 start locations.	If you are unsure which start location you want to program you can look in the "set start location box. Its the GREEN box. And match that number. Once you select the start location you want to use push the "set button" next to the RED box or "configure start location"	Now that you configured the start location. Make sure the GREEN box or "set start location" matches. Now click the "goto start location button". The machine should not move as its already in the start location you configured.

Setting Tray Positions

Adjusting Rows and Columns

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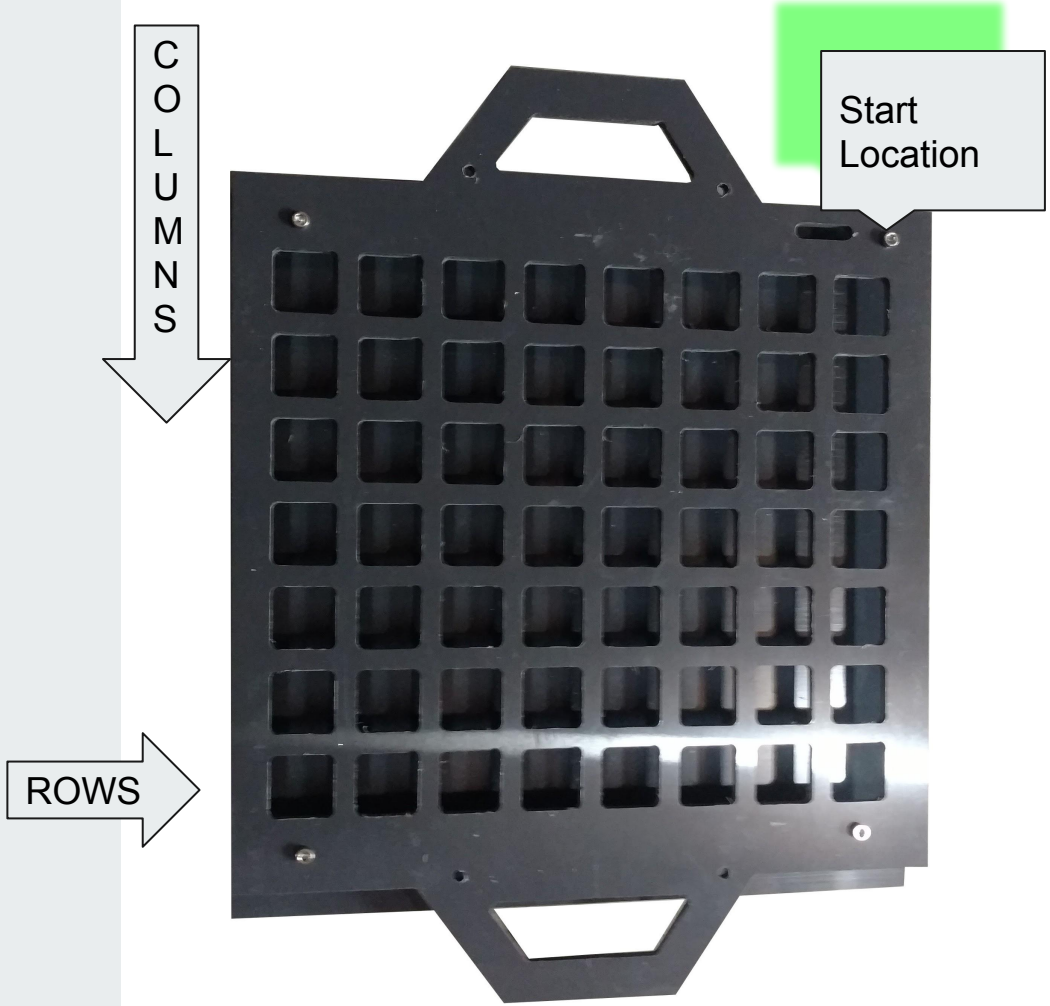

You can watch the Youtube video here: https://www.youtube.com/watch?v=X2IP8gMURKA
Aligning multiple pump head fixtures: https://youtu.be/-LzxWXHH2OA

Rows

When the nozzle is filling the first row you want to watch it. Make sure it is staying center on your bottles. If the nozzle start to drift to the left side of the bottles as it is going down the row you want to adjust your row distance to a smaller distance value. If the nozzle starts drifting to the right side of the bottles you want it rise your row distance value.

Columns

As the nozzle works its way to the front of the tray you want to watch it. Make sure it is staying center on your bottles. If the nozzle start to drift to the front side of the bottles as it is going down the columns you want to adjust your column distance down. If the nozzle starts drifting to the back of the bottles you want it rise your column distance

Note

To make sure your nozzle will be in the right position when filling. Run a dry run by setting your fill volume to 0 and the reverse fill to 0.

Pressure Tanks .5

Adding a pressure tank is a patented process that we have developed that helps assist the meter pumps to push fluid through the line. This helps push products like lotion though the lines to increase production.

Example:
https://www.youtube.com/watch?v=P6IDVZ-UMsY

Troubleshooting .6

Find a quick solution to a problem.

01	Machine not homing	Hit reset and home again. If the axis is too far over the homing cycle will need to run twice.
02	Uneven fills	Make sure the tubing is not getting blocked or resting on side of fluid reservoir. Slow down the feed rate of the pump.
03	Pump motor whining and no fluid is going out of the tubing	Slow down the feed rate of the pump.
04	When starting a cycle the nozzle(s) are not going to the starting bottle position.	Reference Setting tray positions chapter 3.
05	No green light on cabinet	Check the E-stop Key Switch Safely breaker in cabinet. That the machine is plugged in

06	Nozzle dripping	Seal the nozzle connections better using thread tape or paste. Make sure air can't get into the nozzle.
07	Nozzle housing plate or fill platform is loose	The wheels need to be tighten. This will happen if the machine stalls out on something or over time. Use the wrench that came with the machine to tighten. You can see a video here https://youtu.be/psgMf9q2EvA
08	Luer locks keep breaking	Make sure the tubing is getting held at the top of the nozzle height adjustment bar using a zip tie.
09	Adjusting riser height	If you need to adjust your riser height to give your nozzle more clearance you can see a video here. https://youtu.be/f-eFiSy_Tqw
10	Control screen not coming on	On the back of the control screen you have a set of buttons the top button is used to turn the screen on and off. Hold the screen for 5 seconds to turn on or off.

How to Videos
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1. Wiring - https://youtu.be/oGl-1ZphQgw
2. Powering up - https://youtu.be/HAAO17_2JU0
3. Filling - https://youtu.be/yDNIIaFNPKM
4. Setting new start locations if needed - https://youtu.be/CZyU0uvsr1E
5. Setting nozzle down locations - https://youtu.be/t8T62qSLpMk
6. Setting fill up locations - https://youtu.be/GB7fFYaRpdQ