RINSER MANUAL

BEVCO MODEL: M150 ION/AIR/WATER

CUSTOMER:

05-MARCH-2013
SERIAL NO: -----

Supplied By:
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OPERATION & SERVICE MANUAL

TABLE OF CONTENTS

Chapter 5. (cont)

Chapter 6. Gauges & Controls

Chapter 7. Machine Maintenance & Information

Chapter 8. Troubleshooting

Chapter 9. Recommended Spare Parts

Chapter 10. Electrical Information

Chapter 11. Supplemental Information

Chapter 1

1.1. GENERAL INFORMATION

The equipment supplied under this contract is designed to operate with a minimum of operational supervision. However, as with all mechanical systems, care and attention must be given to the equipment to ensure ongoing performance. This manual covers basic installation, operation and maintenance requirements. It does not, however, cover all details or variations in equipment, nor does it provide for every possible contingency to be met in connection with operation or maintenance.

Should further information be required or should particular problems arise which are not covered, please refer to:

Head Office and Factory;

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Chapter 1

RINSER DESCRIPTION:

MODEL:	M150 (I/AIR)(WATER)	**SERIAL:**	J-----

TYPES OF CONTAINERS IT WAS DESIGNED TO HANDLE: HDPE

SIZE RANGE:	**MIN DIA:**	1.5”
	MAX DIA:	5.5”
	MIN HEIGHT:	0”
	MAX HEIGHT:	12.00”
	MIN SPEED:	
	MAX SPEED:	Varies By Container

APPROXIMATE WEIGHT: 3000 LBS.

ELECTRICAL REQUIREMENTS:

VOLTS:	??? V	**PHASE:**	3 PH	**CYCLES:**	?? HZ	**AMPS:**	

AIR REQUIREMENTS: 24 SCFM@ 40 PSI
30 SCFM@ 30 PSI

WATER REQUIREMENTS: N/A

Chapter 2

OPTIONAL ACCESSORIES

2.1. Remote I/O or DeviceNet Communications (optional)

As an option, the rinser could be ordered as a slave unit to a BEVCO line control system on the Remote I/O or DeviceNET networks. The MicroLogix controller unit is replaced with either a Remote I/O block or a DeviceNET block. In addition, a Remote I/O or a DeviceNET communication module is added for the inverter to accept speed commands through the network. All standard rinser functions are controlled in the same manner as described in the rest of the manual except:

1. Rinser speed is adjusted over the Remote I/O or DeviceNET networks following commands from the line controls PLC.
2. Inverter parameters are written/read directly to/from from the line controls.
3. Rinser inputs and outputs are monitored and controlled by the host line controls PLC and used for other functions as required

Please refer to the rinser section of your line control manual for further information if this option has been included in your purchase.

Additional Optional Equipment

2.2. DH+ Communications (optional)

As an option, the rinser could be ordered with the capability to communicate on a local DH+ network. In this case, the MicroLogix unit is replaced with a modular SLC5/04 PLC with one 2I/2O analog module 1746-NIO4V. The rinser will be capable of operation as a stand-alone unit or follow a speed reference signal from the receiving machine or the line controls. The reference signal could be a 4-20 mA or 0-10 VDC or a digital value over the DH+ network. All standard rinser functions are controlled in the same manner as described in the rest of this manual. However, the control program will be modified to accommodate DH+ communications as required.

2.3. Air Ionizer (optional)

The optional air Ionizer produces a high velocity stream of positive and negative air ions. The charged containers passing above the ionizing nozzles will attract ions of the opposite polarity until the static charge is neutralized. It is important that the Ionizer nozzles are kept clean in order to prevent a short circuit. Although the short circuit will not harm the unit, the ionization process will not be effective during this condition. Also, the high voltage cable connecting the Ionizer nozzles to the power supply should be free of damage to prevent short circuits. Any damage to this cable or the nozzles should be immediately reported to maintenance staff in order to be repaired or replaced.

The Ionizer is operational when the Ionizer / Air relay (3CR) is energized. This relay is energized when the rinser is in run mode, containers are present at the infeed, and when there is no discharge backup condition present for longer than the timer T4:3 preset value.

2.4. Vacuum System (optional)

The DC 3500 vacuum unit is rated to remove over 150 cubic feet of air per minute at the inlet. This volume creates a flow of air in the rinser that is considerably greater than that of the air nozzles. This contributes to the efficient air removal of particulates dislodged from the containers. Cleaning and servicing of the vacuum unit should be carried out as specified by the manufacturer user manual supplied with the vacuum unit. The vacuum filters should be inspected on a regular basis and if needed, the filters should be changed to facilitate proper vacuum build up and particulate removal.

The vacuum unit is controlled by a full voltage starter in the rinser control cabinet and is on / off controlled in conjunction with the Ionizer / Air solenoid (3CR).

2.5. Start-Up Assistance and Training

Bevco can provide start-up assistance and training for your line personal as well as your mechanics and supervisors. A qualified Bevco Service Representative will go over the installation to insure that the rinser has been integrated into the line properly, then test the rinser for correct operation prior to meeting with those who will be involved in the training seminar.

Training will consist of some classroom time but is mainly tailored around "hands on" learning. Each student will become proficient in the following aspects of your rinser;

1. The safety aspects of your rinser and why they are important,
2. The correct way to set up *your* rinser for *your* containers,
3. How to set the running speed(s) for optimum through-put,
4. What function each of the internal and line controls perform,
5. What function each of the sensors performs,
6. How to trouble shoot any perceived deficiencies in the least amount of time,
7. Identify and know how to change grippers, flights, sprockets, bearings, etc.
8. Lubrication requirements,
9. Sanitation procedures.

At the completion of the training seminar there is a short written quiz that each trainee will fill out and then mark. This quiz will point out to the individual any areas that he/she should perhaps review before the Bevco Service Representative leaves the plant. Please contact the Bevco Service Department at **1 800 663-0090** for Training Rates.

2.6. Service

Bevco has Service Technicians available to assist your plant personnel in minor and major overhauls of your rinser. Taking advantage of the assistance of a Bevco Service Technician insures that your rinser is brought back to factory standards for optimum performance. The Service Technician is also able to keep your personnel apprised of any improvements that may be to your benefit while at the same time upgrading your mechanics on the proper overhaul procedures that are sure to save you time and money in the future. Please contact the Bevco Service Department at 1 800 663-0090 for Service Rates.

Chapter 3

3. 1. **Safety Requirements**

WARNING: Bevco rinsers are automated, and once energized the equipment will start or stop at any time. All equipment must be LOCKED OUT electrically and mechanically before any maintenance or work of any kind is performed on the equipment.

A. All maintenance and repair work must be performed by qualified personnel
B. No equipment shall be operated with protective guards, covers or railings removed.
C. Care and attention shall be taken at all times in the vicinity of any operating equipment
D. Worker's Compensation Board (Occupational Safety and Health of America) Regulations shall be adhered to in all cases.
E. Be aware, this equipment has many moving parts and pinch points, and Extreme caution is advised when the rinser is in operation.
F. Safety warning stickers have been affixed to the equipment and must not be removed.
G. Hand wheel adjustment should only be made when machine is empty of all containers.
I. All electrical components on the rinser are water resistant. Do not use high pressure hoses for cleaning and do not use a direct steam of water on drives, panel or photo-cells.

***The foregoing and following safety suggestions should not be considered as limiting in safety precautions to be followed. Local conditions, environment and prudent judgment in safety should be paramount at all times.

SAFETY

3.2. **Recommended Lock-Out Procedure**

The following checklist is designed to be followed when it is necessary to deactivate a rinser in order to perform maintenance or inspection. The objective is to deactivate the equipment in such a manner that it cannot be mistakenly energized. The preferred method of deactivation is to "lock-out" as opposed to "tag-out".

1. Notify the operator and supervisor of impending lockout and the reason for the action.
2. Shut down the equipment using the normal, recommended shutdown procedures.
3. Disconnect and lockout supply voltage at distribution panel.
4. Open equipment control panel door and test circuit on the supply side and the load side after opening the disconnect. NOTE, Check the voltage tester on a known energized source before testing the circuit.
5. If there are electrical interlocks, lock them out as necessary.
6. After performing voltage tests in 4 above, recheck the voltage tester on a known energized source.
7. Operate control switch, button etc. to make sure equipment is deactivated.
8. Discharge any electrical, pneumatic, or water sources that could hold potential energy.
9. If more than one person will be working on the deactivated equipment then each person shall attach their lock or lockout to that equipment.

When the equipment is ready to be activated the following procedure should be adhered to.

A. Inspect the work area to ensure that non-essential items have been removed and to ensure that the equipment is operationally intact.
B. Remove the lock-out/padlocks
C. Ensure that all employees are clear of the equipment.
D. Begin energizing the circuitry starting at the furthest disconnect. When it comes time to energize the actual piece of equipment ensure that any switches etc. are in the "off" position.
E. Energize the equipment for testing. Follow recommended start-up procedure. If for any reason the equipment must be shut back down for further trouble shooting or repair then the entire lockout procedure must be followed.

Chapter 4

OPERATIONAL CHECKLIST

4.1. **Recommended Installation**

By using this detailed, step by step outline as a checklist you will be assured that nothing has been overlooked and your rinser will perform to its' maximum efficiency.

All rinsers are test run in our plant for a minimum 12 hours to insure that all systems perform as promised and to reduce the chance of misunderstanding in the field. Load readings are checked and recorded, all lubrication points are serviced, necessary inverter programming is completed and test sample containers run.

Upon completion of the test run and quality control check, your rinser was crated for maximum protection during shipment, and to ease unloading and placement within your plant without subjecting the rinser to handling procedures which could cause damage. It is important to inspect the rinser thoroughly when it arrives at your site and to record and report any damage immediately.

1. The rinser can be removed from the truck using slings under the skid or by use of a forklift of sufficient capacity, with forks that are long enough to pass through both sides of the skid about midway from both ends (balance point may be slightly off center depending on location of power panel and the three drive motors).
2. Unit can be moved on a relatively smooth floor using rollers under the skid or, if rinser is removed from the skid, by using roller cradles under each screwpad.
3. Rinser can be lifted off the skid using a forklift of sufficient capacity with forks that are long enough to pass through both sides of the rinser and placing the forks between the wooden skid and the frame structure on the bottom of the rinser. *Note: DO NOT PRY OR LIFT ON THE END COVERS AT ANYTIME*. Special lifting procedure is required for a model 150 and model 250 rinsers. Forks must go through both sides but 4X4's must be set on top of the forks and run lengthwise under the rinser and support the rinser under the cross braces on the legs.
4. Position the machine where required, level by adjusting the screwpad feet. Set correct height using the screwpad feet then anchor to the floor utilizing the holes provided in the base plate of the same screwpads.
5. Attach the infeed and discharge conveyors to the short, 14 inch long, infeed and discharge conveyor sections on the rinser. Do not adjust the height of these two, machine mounted conveyor sections. These were pre-set at the factory for optimum container handling. Any adjustments could cause containers to fall and jam.
6. Install water and/or air to the supply connection(s) on the rinser.
7. Connect the correct electrical supply voltage to rinser power panel. (You will have to drill a hole in the panel for power entry. We recommend entering from the bottom of the panel to prevent the possibility of water getting inside
8. Install photocell #2 (2PEC), [and photocell #3 (3PEC), if the rinser is two speed], at the recommended downstream location(s) and connect to the proper terminals inside the rinser power panel (refer to electrical schematic that was supplied with your machine). The electrical runs for these photocells must be in conduit without any other wiring. It will be necessary to drill a hole in the panel for wiring entry.

Chapter 5

: BOTTLE RINSER: Model M150

5.1. **Overview**

Your Bevco rinser is designed to slightly separate the containers as they enter the rinser, grip them gently and turn them upside down where they are sprayed internally and externally with a rinse medium (either air, water, or treated water). After rinsing, the containers remain upside down for at least 4 seconds minimum to insure proper drainage of the rinse medium. (In the case of an air rinse the "drain" time is of no concern). The containers are then inverted to an upright position and gently transferred to a discharge or take away conveyor. The three (3) drive motors are all connected to the same inverter inside the control panel. This way as the speed of the rinser is increased or decreased, the speed relationship of the three drives remain constant.

5.2. **Sequence**

- As the containers enter the infeed of the rinser they block photocell 1PEC. This turns on the rinse medium via a solenoid valve on the main supply line. This solenoid valve is on a time delay, controlled by the PLC inside the control panel. After the last container passes the photocell there is sufficient delay to insure the last container is rinsed before the rinse medium is turned off.

- At the discharge end of the rinser is a "Discharge Jam Switch". This switch will detect any abnormal downstream conditions that may exist that cause containers to back up into the rinser. When activated, it will shut the rinser down immediately with no "ramp down" time.

After the discharge end of the rinser, the containers travel on a conveyor that will have at least one photocell mounted on it. One of the photocells is designed to detect a backup towards the rinser. When this photocell is blocked for a predetermined time, the Rinser will ramp down to a stop. When the photocell can once again see the reflector, the rinser will ramp back up to the preset.

5.2. **Cont:**

4. If there is a second photocell, it will be further downstream from the first one and it will control two speeds on the rinser. When it can see the reflector, the rinser will run at a high speed setting according to what the speed pot in the control panel is set at. (Normally a few bottles a minute faster than the filler requires). When it is blocked the rinser will drop into a slower speed according to the setting of a second speed pot in the control panel. (This speed is normally a few bottles a minute less than the filler). This allows the rinser to drift between two speed settings without continually starting and stopping to satisfy the fillers requirements.

5.3. **Controls**

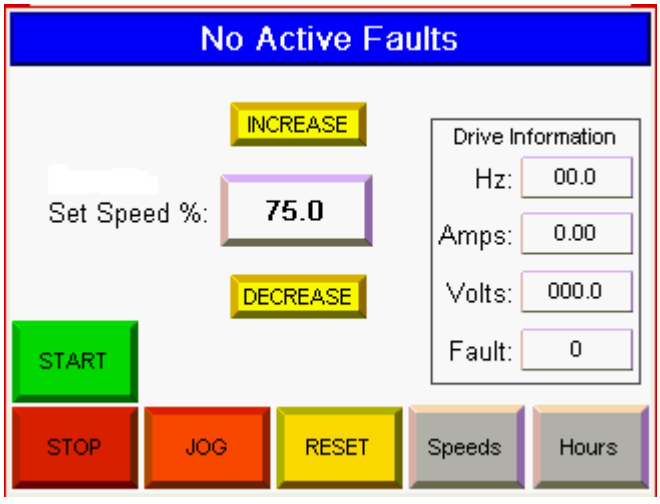
The control panel contains all necessary indicator lamps, function buttons and controls that are required for efficient operation.
The door of the control panel contains:

- The main disconnect switch handle
- **POWER ON** blue light,
- **FAULT** amber light,
- **START** green back lit button,
- **STOP** red button,
- **EMERGENCY STOP** mushroom button.
- **Panel View**

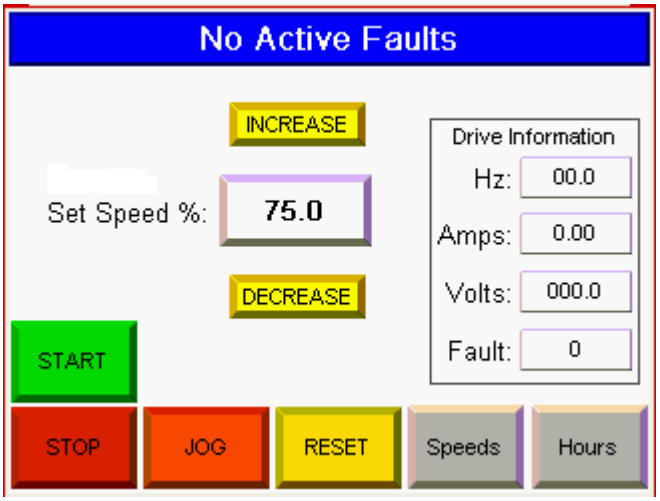
- If the blue light is on it indicates that the main disconnect switch is ON and the panel is powered.
- If the green light is on it means the Rinser is in the run mode and is either running or may start automatically at any time.
- If the yellow fault light is on it means there was/is an electronic fault that requires correction. To view the fault message touch anywhere on the panel view for one second. When corrected, push the green start button. Push the Yellow Reset button in the panel view only to reset a VFD Fault.

On the panel view at the top of the screen any Faults that require attention will be listed. Possible messages include:

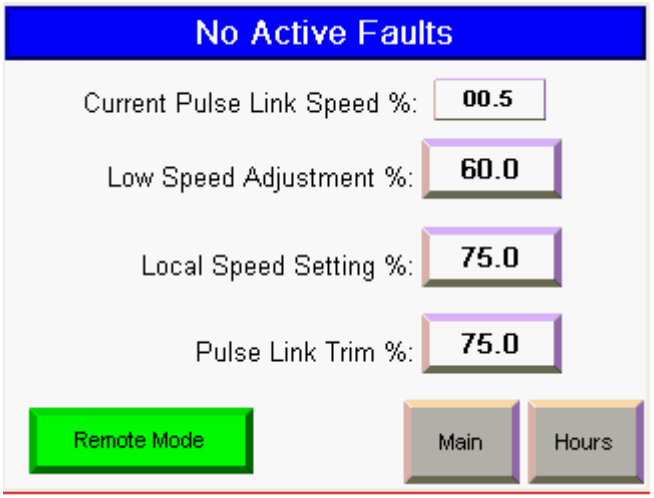
- No Active Faults
- Low Pressure Fault
- Discharge Jam
- VFD Fault
- Motor Overload Fault
- Vacuum Pump Fault
- Emergency Stop
- Low Speed Operation
- Paused Due to Container Backup
- Running



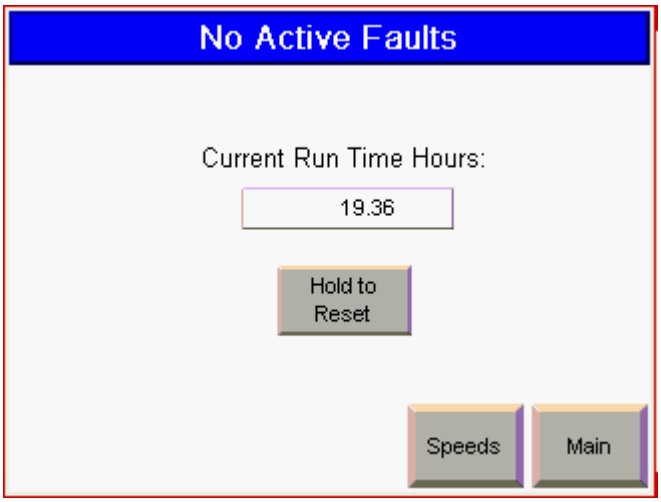
Panel View Screens



This is the main screen for the Rinser Panel View listing the drive information, and duplicating the control buttons found on the door of the electrical panel.
From this screen the Rinser speed can be adjusted. The drive information is also listed here.
Two more buttons will allow access to further screens. Speeds and hours.
The JOG button will allow you to jog the chains which will be used when setting up the Rinser
The Reset button is used after a VFD fault has tripped.



Speeds Screen, from here we can set the low speed and high speed if the Rinser is equipped with the second optional photocell.
Pushing on the screen where the value is will open the adjustment keypad where a number can be input.
Local speed setting is the same as on the previous screen. It is displayed in % of maximum 80Hz.
Pulse link trim allows you to scale the remote speed signal only displayed if applicable.



Hours is a Maintenance counter to track hours between maintenance cycles. The hours can be reset after maintenance is performed or just recorded depending upon plant policies.

Inside the control panel is the PLC, fuses, inverter, relays, contactors, transformer and all wiring terminals. The wiring schematics and PLC program sheets are provided in the pocket on the inside of the control panel door.

5.4. **Setup**

1. With the main disconnect switch on the panel door turned off;

2. Manually open or close the gripper conveyor by turning the adjustment handle in the direction indicated until the grippers just squeeze the container tight enough to hold it. This can best be accomplished by testing the container somewhere along the body of the rinser. There is a numeric counter behind the adjustment handwheel that can be used as a reference in the future by recording the reading for a given container after it has run successfully in the rinser.

3. Close and secure the panel door.

4. Turn the main disconnect switch to the on position.

5. Push the *JOG* button and let the rinser cycle for at least one full revolution. The rinser will only run when the Jog button is pushed. As soon as you release the button the rinser will stop. The jog speed is separate from the running speed. It is slower and usually set at 20Hz. Look and listen for any malfunctions while the rinser is running in the jog mode. Correct any deficiencies.

6. Put the tallest container at the infeed of the rinser and press the jog button until the container is upside down over the spray manifold. Adjust the height of the manifold until the nozzles are about 1/2 inch below the lip of the container. The manifold height is adjusted by loosening the four nuts on the end cover that the manifold is bolted to.

7. Push the green *START* button. The rinser should now start up and run at the preset speed according to the speed settings on the Panel View. If the rinser does not start, check the photocell downstream to insure it is seeing the reflector properly

8. Let one or two containers go into the rinser from the infeed conveyor and insure that the rinse medium came on when the first container entered the rinser and stayed on for a long enough period of time after the container passed over the spray manifold to insure it was rinsed. At this time you may want to re-adjust the grippers to hold the container more securely or less securely. Squeezing a glass container too tight will impose additional loads on the drive motors, wear strips and flights that can cause premature wear. Gripping a PET container too tight can cause deformation. Insufficient pressure can result in unstable containers, some may even fall out of the grippers while they are upside down.

9. With the rinser running, block the first downstream photocell. After the preset time delay the rinser should ramp to a stop. Unblock the photocell and the rinser should immediately ramp up to speed.

5.4. **Setup Cont:**

10. If the rinser is designed for two speeds then block the photocell that is furthest downstream and the rinser should slow to the preset slow speed according to the third speed setting on the Panel View Speed Menu. Remove the blockage of the photocell and the rinser should return to the higher preset speed.

11. If your rinser has the "speed link" option in the control panel, it should be properly wired to the appropriate downstream signal from the filler. (Refer to the wiring schematics supplied with your rinser). With the speed link option properly operating, the rinser speed is controlled by the speed of the filler. As the filler speed is increased or decreased the rinser speed will follow accordingly. If the filler is stopped the rinser will stop.

5.5. **Operation**

The two gripper chains are designed to run with a predetermined amount of slack in them. They had the proper amount of slack in them when they left the Bevco plant. Because the gripper chain is "*captured*" around the drive sprocket(s), there is no need to keep the chain tight, it can not jump teeth on the sprocket. This built in slack not only reduces wear on the drive and idler sprockets but it reduces the load on the wear strips, carrier flights, drive motors, gear boxes and prolongs the life of the gripper chain by reducing chain stretch. The proper amount of slack can be checked by moving the gripper chain back and forth by hand anywhere along the body section of the rinser. You should be able to move it back and forth the equivalent of 1 to 1-1/2 links. When the gripper chain becomes elongated it will rapidly increase the wear on the sprockets and shorten their useful operational life.

5.6. **Rinser Setup & Operation**

5.7. **Forward**

The following information will guide you through setting up and running a given container for the first time. This assumes the rinser has been properly installed and all control functions have been checked and operate as designed.

5.8. **Safety**

The rinser has the potential to start at any time if it is energized and in the run mode. Before starting the setup, make sure the disconnect switch on the control panel door is in the *"OFF"* position. Some set-up procedures will require you to make changes to controls inside the panel while it is energized -CAUTION- even when the disconnect handle is in the off position there is an energy hazard potential in the panel.

The rinse medium (water, chemical or air) can be at a pressure that could cause serious injury. While working on the rinser for maintenance or setup it is recommended that the rinse medium be turned off at the supply line into the rinser.

5.9. **Setup Sequence**

1. Visually and physically examine the rinser for any damage, wear or missing parts;

A. Replace any missing or damaged grippers. Report any abnormal wear patterns on the grippers.

B. Replace any broken flights. Report condition of wear on flights and wearstrips

C. Examine the gripper chain sprocket teeth at the infeed end of the rinser. Report if teeth are worn- examine both gripper sprockets.

D. Clean out any containers, debris etc. from the drain pan in the bottom of the rinser.

2. Obtain a sample of the container that is to be run. With the sample container on the infeed conveyor, about 8 to 12 inches into the grippers, open or close the gripper conveyors (using the handwheel) until the grippers are compressed about 1/8" on each side.

3. Turn the panel "Disconnect" switch handle to "ON".

4. Push the "JOG" button. The gripper conveyors should start. Hold the jog button in until your sample container just turns upside down. Release the button at this time. The gripper conveyors will stop.

5. Set the tips of the nozzles on the spray manifold are about 1/2 inch below the opening of the container.

6. Push the jog button again until the container is discharged from the rinser. Note if it was too loose or too tight while it traveled through the rinser, now is the time to open or close the grippers a little more. REMEMBER, never make this adjustment with containers in the rinser. Empty all containers out and then make adjustments.

7. Open the rinse medium supply line.

Setup Sequence Cont:

8. Push the "ON" button on the rinser panel. The rinser should now start up. Rinse medium will spray for a few seconds and then shut off.

9. Put about 1/2 dozen containers on the conveyor leading into the rinser and let them all go at once.

A. When the first container gets to the infeed of the grippers, the rinse medium will come on.
B. Each container will be separated while it is being gripped.
C. Each container will be rinsed and set onto the discharge conveyor.
D. After a pre-determined time, after the last container has gone by, the rinse medium will turn back off.

10. With the rinser still running, block the downstream photocell. After a preset amount of time (approx. 3 seconds) the rinser should ramp to a stop.

11. Unblock the photocell and the rinser should immediately ramp up to speed.

12. If your rinser is equipped with the optional 2 speed function then block the photocell that is furthest downstream. After a predetermined time the rinser should go to a slower speed, determined by the setting of the second speed pot inside the control panel.

13. Unblock this photocell and the rinser should immediately increase to the pre-set speed. NOTE, on the 2 speed function, when the two speed pots are properly set, the rinser will drift from a speed slightly faster than the filler to slightly less than the speed of the filler. The speed changes will hardly be noticeable.

14. With the rinser running, gently move the discharge jam plate to activate the jam switch. The rinser should shut down and the indicator light on the panel should come on.

The rinser setup is now complete with the exception of fine tuning the speed, which can only be done after production starts.

HINT:

If you record the gripper width setting from the counter behind the gripper hand wheel, and the speed settings on the Panel View, you will be able to save time the next time this container runs by going to all the "pre-sets"

5.10. **Quick Checks**

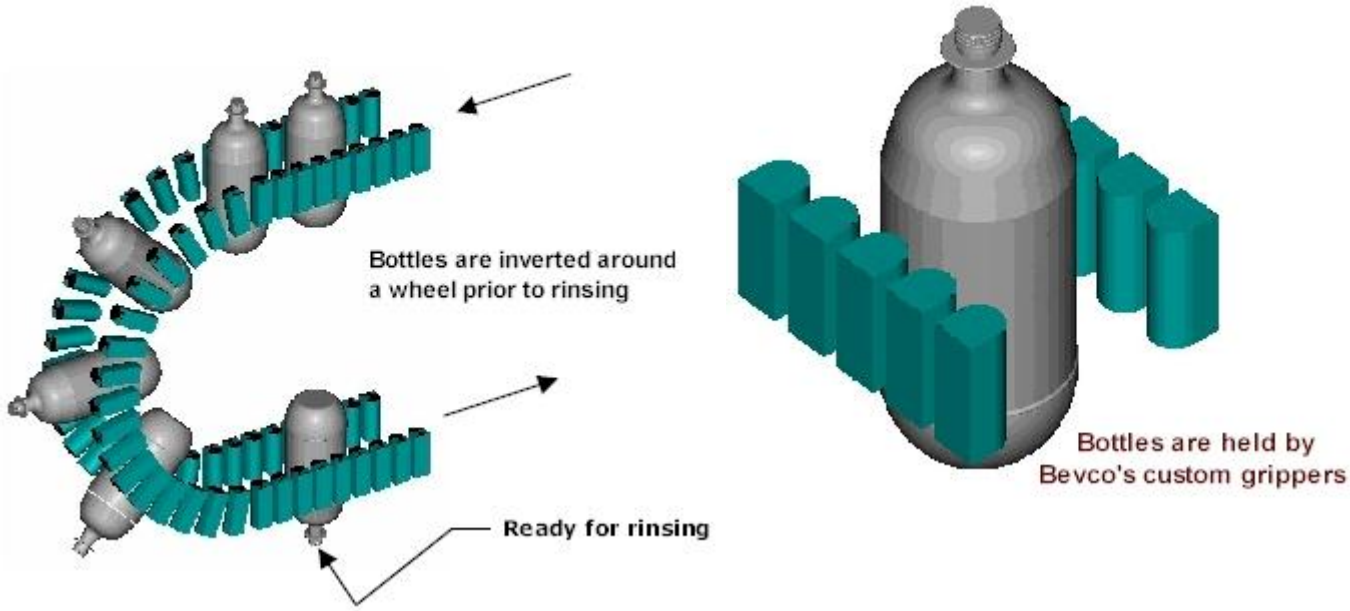
1. If the rinser stops within a few seconds of pushing the "*start*" button, check that the rinse medium is turned on. Lack of pressure will shut the rinser down and turn on the **Fault Message on the Panel View** on the panel door indicating low pressure.

2. If the rinser won't run after pushing the "*start"* button, but the **blue** power light on the panel door is on, then check the downstream photocell to insure that it is not blocked and it is seeing the reflector.

3. If the rinser won't start, check the panel view to see which fault is causing the problem. If the **discharge jam** fault is indicated then the discharge plates that the switch is mounted to may be pushed against the guide rails. Correct the problem.

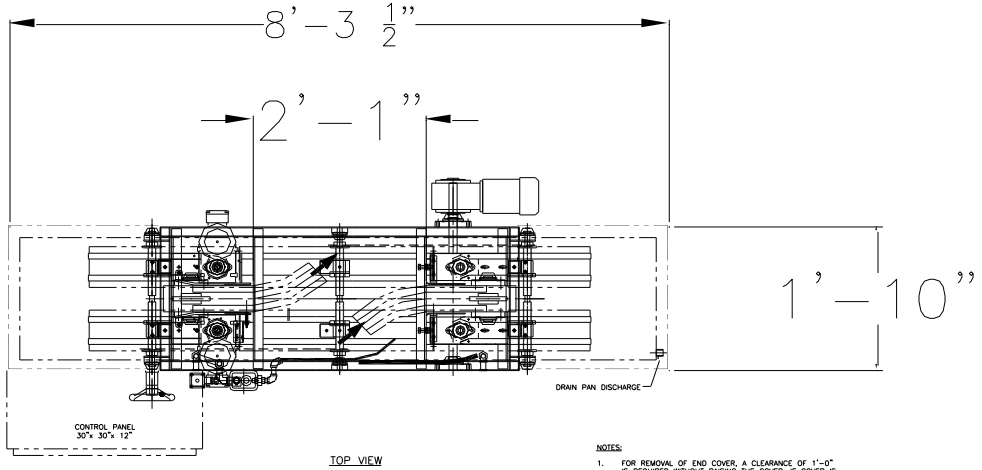
If you have any questions please contact Bevco on our toll free number1-800-663-0090

5:12 (Rinsing the bottles)



Bottles being inverted by grippers

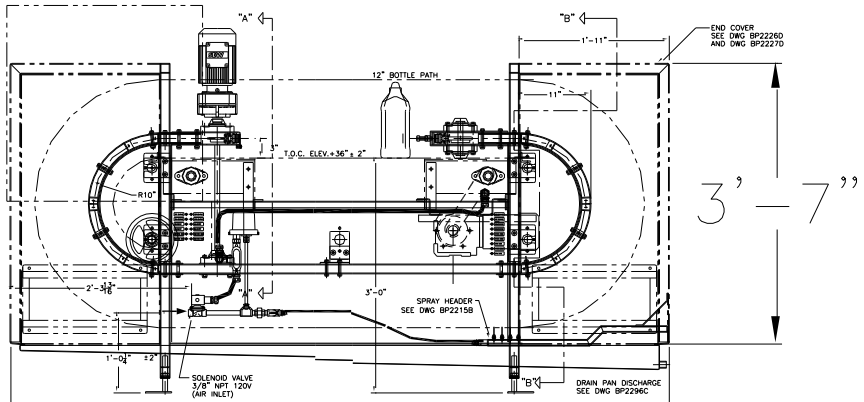
5.13 M150 RINSER SCHEMATIC



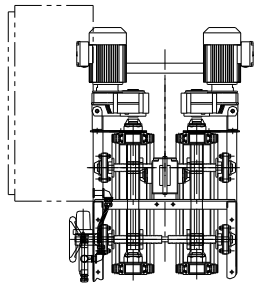
TOP VIEW

NOTES:

1. FOR REMOVAL OF END COVER, A CLEARANCE OF 1'-0" IS REQUIRED WITHOUT RAISING THE COVER. IF COVER IS LIFTED STRAIGHT UP, A CLEARANCE OF 3" IS SUFFICIENT.
2. RINSER SHOWN WITH #2 PANEL LOATION, #2 GRIPPER HANDWHEEL LOCATION, AND #3 INFEED DRIVE LOCATION. SEE SCOPE OF WORK FOR SPECIFIC HANDING OF EACH JOB.



ELEVATION



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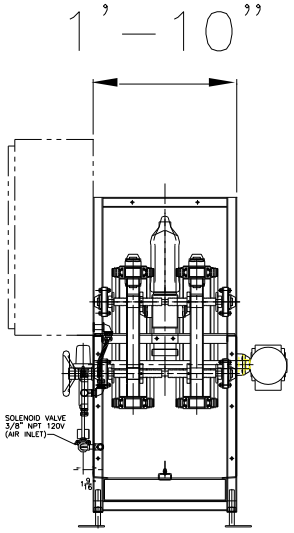

SECTION ON "B" - "B"

BEVCO	1-800-663-0090	
CHECKED BY:	ISSUED:	DRAWN BY:
DATE:	SCALE: 1 1/2"=1'-0"	DATE: MAR 04/98
CLIENT: BEVCO CONVEYING SYSTEMS M150 RINSER		
TITLE: GENERAL ASSEMBLY	NO:	REV.

Chapter 6

Gauges and Controls

6.1. Transparent Object Detector Setup

The Allen Bradley 42SMU-7261-QD photocell is designed for the detection of transparent glass and plastic objects. The supplied Container at Infeed, Container Backup and Speed Switch photocells are of this type. To properly set up and maintain the accuracy of these photocells, refer to the following setup instructions or the Allen Bradley technical documentation provided in the document package supplied with the rinser.

1. Ensure the photocell and reflectors are properly mounted to the conveyor.

2. Ensure that the control power to the rinser is turned on.

3. Ensure that there are no foreign objects obstructing the view of the photocell. These may include broken containers, guide rails, etc.

4. Ensure photocell is properly aligned with the reflector. The center of the photocell lens should be in line with the center of the reflector.

5. The photocell indicator lamp should be on if the photocell is reading the reflector.

6. If the indicator lamp is not on, adjust the photocell margin by using the margin adjustment pot. Turn the pot clockwise until the lamp turns on.

7. Place a product container in front of the photocell to obstruct the beam.

8. The indicator light should turn off. If the indicator light does not turn off with the product container in front of the photocell, the margin is too high. Turn the margin pot counter clockwise until the indicator light turns off.

9. Repeat steps 4 through 8 until the presence of a container in front of the photocell causes the indicator lamp to turn off, and the removal of the container causes the indicator lamp to turn on again with no adjustments necessary.

10. It may be necessary to adjust photocells due to varying product container materials.

11. The transparent object detector is water resistant but is not water proof . Any cleaning procedures should not include a direct stream of water against it or the photo eyes.

6.2 . **Sensors:**

6.3. **1PEC Container Present Photocell**

Purpose: Determines the presence of product at the infeed to the Rinser

Function: When no product is present at the infeed to the rinser for a determined amount of time (T4:0, [T4:1 after April 1998]), the water / air solenoid is de-energized to reduce rinse medium waste. This time value should be set to allow the bottles remaining in the rinser to pass the air / water spray header at low speed. When product is present at 1PEC for a period longer than (T4:1, [T4:2 after April 1998]), the water / air solenoid is re-opened.

6.4. 2PEC Container Back Up

Purpose: Determines line conditions downstream of the rinser outfeed

Function: When line conditions are running at normal operating speed, 2PEC monitors the line conditions to prevent a line back up from causing the rinser to jam. If 2PEC remains blocked for a determined amount of time (T4:2 prior to April 1998 or T4:3 after April 1998), the rinser will stop, the discharge jam indicator light will flash, and the rinser will wait for the line to clear ahead of the discharge. This timer value should be long enough to prevent stoppage at low speed with the correct gapping, but also should be long enough to prevent backup of containers into the rinser discharge at high speed. The rinser will then restart automatically after a short predetermined delay (T4:3 prior to April 1998, T4:4 after April 1998).

6.5. 3PEC Rinser Speed Switch

Purpose: Determines line conditions downstream of the rinser outfeed and downstream of 2PEC in order to slow rinser down when line backs up.

Function: When line conditions are running at normal operating speed 3PEC monitors the discharge conveyor to prevent a line back up from causing a cycle stop. If 3PEC remains blocked for a determined amount of time (T4:5), the rinser will slow down to the speed setting of Potentiometer #2 and wait for the line to clear ahead of the rinser. Once 3PEC has cleared, the rinser will speed up to the set point specified by Potentiometer #1 after a short predetermined time delay (T4:6).

6.6. 1LS Discharge Jam Limit Switch

Purpose: Provides discharge protection in the event of jammed or broken product.

Function: 1LS is tripped by excessive side pressure being placed upon the discharge side plates where product exits the grippers. If 1LS is activated, an Emergency stop condition is generated at the rinser. All rinser drives are stopped until the jam condition is manually cleared and the "START" button is pressed to restart the rinser. When a discharge jam occurs, the discharge jam indicator lamp will illuminate until the start button is pressed.

6.2. **Sensors Cont:**

6.7. 1PS Water/Air Pressure Switch

Purpose: Stops rinser operation due to lack of water / air pressure

Function: When water / air pressure falls below the 1PS setpoint for a predetermined time delay (T4:7). the low-pressure fault message will appear and all machine functions will stop. The pressure switch is bypassed during startup until the time delay expires (T4:4, prior to April 1998, T4:7 after April 1998). The rinser will start without air / water pressure, however if air / water pressure is not present at 1PS before the time delay expires the rinser will shut down again. To clear the fault, the low-pressure condition must be corrected, and the start button must be pressed to restart the rinser.

6.8. Electrical Faults:

6.9. 1MOL Infeed Conveyor

This device monitors and protects the infeed conveyor drive motor from electrical damage in the occurrence of an overload condition. This device should be set to the motor nameplate Full Load Current value.

6.10. 2MOL Rinser Drive #1

This device monitors and protects the rinser gripper drive #1 motor from electrical damage in the occurrence of an overload condition. This device should be set to the motor nameplate Full Load Current value.

6.11. 3MOL: Rinser Drive #2

This device monitors and protects the rinser gripper drive #2 motor from electrical damage in the occurrence of an overload condition. This device should be set to the motor nameplate Full Load Current value.

6.12. INVERTER Inverter Fault

When tripped, the drive display will show a fault message. Most common faults include over temperature, under voltage, and over current. If a drive fault occurs, please refer to the section elsewhere in this manual for complete fault descriptions or the Allen Bradley 1305 / 1336S user manual.

Allen-Bradley Variable Frequency Drive

6.13. Drive Operation

The rinser drives (MTR1, MTR2, MTR3) are controlled by an Allen Bradley Bulletin Power Flex 4 variable frequency inverter depending on rinsers size and voltage. The drive speeds are controlled by the panel mounted VFD, or by means of a remote speed reference signal sent from the filler to the rinser by an enable signal and a 4 to 20 mA *or* 0 to 10 v analog signal.

Start/Stop commands are sent to the drives from the MicroLogix controller or the inverter's enable input, wired through the emergency stop relay to disable the drive output on emergency stop.

6.14. Start up Procedure

1. Set VFD to 50HZ for set up, fine tune as required.

2. Push "Start" button. If the field wiring of 2PEC (and 3PEC on two speed rinsers) are correct then the rinser should run approximately 70% of its top speed.

3. Block 2PEC,. Rinser should slow to a stop and the Discharge Jam message will appear.

4. On two speed rinsers only Block 3PEC.Rinser should slow to the second speed option.

5. With the rinser drives running, gently move the jam detector plate at the discharge end of the rinser (the same end as the drive motors). The rinser should come to an immediate stop. Also the discharge jam indication should appear on the Panel View. 1LS switch should be set to activate with minimum movement of the jam plate. The switch and jam plate were properly set and tested prior to the rinser leaving Bevco. The start button on the control panel will have to be pushed to restart the rinser any time that 1LS has been activated.

6. With the rinser off, place a container between the gripper conveyors approximately 6 - 8 inches from the infeed end and, by turning the hand-wheel, adjust the gripper conveyors until the container is held snugly. If set too loose the container may fall or slip out of line while being processed through the rinser. If set too tight the additional load on the wear strips and drive motors will lead to accelerated wear and pre-mature failure. *Note: Do* not attempt to adjust the hand wheel while running containers through the rinser.

6.14. Cont:

7. Push the "Jog" button until the container is upside down over the internal spray manifold. Adjust the height of the manifold until the nozzles are approximately 1" (1/2" for air rinse) away from the container opening.

8. Set water or air regulator to supply sufficient pressure for proper rinsing. If set too high it could dislodge containers in the grippers, causing fallen containers at the discharge conveyor. Make sure water / air pressure is sufficient enough to activate the air / water pressure switch. This pressure switch is factory set at 20 P.S.I. If a lower pressure is desired, the pressure switch will need to be adjusted as per manufacturer literature included in the document package. This switch must be activated for the rinser to run.

9. The discharge conveyor speed can be slower than the rinser speed if desired in order to *partially* close up the gap between the containers as they leave the rinser. This can be very beneficial with unstable containers Caution must be exercised to insure that there is a small gap between containers so the 2PEC and 3PEC downstream are able to perform as designed. bottles per minute than what the filler speed requires.

10. Provide a supply of containers to the rinser at a rate of approximately 10% to 15% more bottles per minute than what the filler speed requires.

11. Set the VFD at a speed that is fast enough to supply containers to the filler at a rate 5% to 10 % faster than the filler requires.

12. VFD should be set as per step #1 but at a slightly reduced setting. i.e. 3% to 8% above filler speed.

13. Hi/low setting are set within the PLC program. Fine tuning between Hi and Low setting will be done on the VFD.

14. When running properly, the rinser should slowly cycle between high and low speed (by activating 3PEC) always supplying more than sufficient containers to the filler but not backing up far enough to shut the rinser down (activating 2PEC) unless the filler is slowed down for stops. Fine adjustments on the two speed function will provide a smooth uninterrupted flow of containers to the filler with minimum speed fluctuations on the rinser.

15. VFD settings for a given job can be recorded so that when the same container is run again the rinser can be readily preset, thus saving change-over and set up time.

Chapter 7

Preventative Maintenance

7.1. Routine as well as Shut-Down/Start up

All bearings on the rinser are sealed and have caps to insure maximum service life. There are four grease zerk banks on the rinser sides with a total of 26 zerks on the model 150 and 27 Zerks on the 250 rinser.

7.1. Routine

All grease zerks except the four(4) labeled **WEAR STRIP** require one pump stroke of the grease gun each 8 hours of running time. The WEAR STRIPS should receive five strokes on each zerk each 8 hours of operation slowly and while the rinser is running This will insure that the grease is properly distributed.

The bearings on each end of the adjustment shafts should have 5 strokes of grease twice a year.

7.2. Shut down/Start-up

Prior to shut down the rinser should be washed down, dried and greased as per the instructions above. Prior to start-up the three gearboxes should be checked for oil and brought up to the proper level with the correct oil. (Refer to the manufacturer information as supplied elsewhere in this manual for the correct levels and oil descriptions). Gearboxes should be checked twice a year for proper levels unless leakage is noted at which time the cause of the leak should be corrected and the gearbox topped up.

7.3. Daily Check List

The following is a general daily checklist that outlines general areas to be monitored by operating staff.

1. Lubricate all bearings - Keystone Pennwalt Nevastane HT-2, for food and beverage or equivalent.

2. Check drive units for signs of oil leakage. If there is any evidence of leakage, check oil level and top off if required - For Eurodrive gearboxes, refer to information that was in the information packet supplied with your rinser and generally shipped in the control panel.

3.Lubricate all drive chains with SAE 30 non-detergent oil.

4. Check alignment of equipment and report broken / damaged parts.

5. Check & tighten all loose assemblies.

6. Ensure all safety guards and covers are in place.

7. Test run all pieces of equipment without load and inspect for proper operation prior to container flow.

8. Check gripper spacing for the container. Adjust the gripper tension on the container using the upper, adjustment hand wheel. The container should be held firmly, but not too tight. Excessive pressure on the bottles will greatly increase the load on the drives and may cause the drives to overheat.

NOTE: *Do not attempt to adjust the width of the machine when containers are in the machine.*

9. Jog the rinser with containers, to ensure operation without binding.

10. Adjust the level of the bottom spray header to ensure proper container clearance. The spray nozzle should clear the containers by about 1” for water, 1/2” for air sprays.

11. Ensure all emergency stop switches are operational by running equipment and using emergency switches to shut down.

7.4. Regular Maintenance Requirements

a) **Bearings:**

Grease all bearings weekly during continuous operation - Keystone Pennwalt Nevastane T-2 food grade grease or equivalent.

b) **Drives:**

Check the oil level in all drives monthly. If oil is contaminated, burned or waxed, flush the gearbox and change the oil immediately. Under normal operation conditions, change the oil every two (2) years, or as recommended by the manufacturer in his information.

c) **Chain:**

As the rinser runs, the gripper chain will loosen up. Remove excess slack by adjusting the idler sprockets on the rinser. For proper operation, the chain should have 1" to 1-1/2" linear slack in it. **DO NOT OVERTIGHTEN**

d) **General:**

Maintain general cleanliness of machine areas and avoid any dust buildup. Bevco rinsers have an hour meter installed in the panel. This may be used to regulate maintenance schedules, but must not be tampered with. Disconnection or alteration of this meter will void all warranties

e) **Lubrication:**

The U.H.M.W. wear strips are internally lubricated from the main grease Zerk Manifold. **Under normal operation this should be done at least once a day.** When greasing the four Zerks labeled "WEAR STRIP" the machine should be running and grease should be pumped slowly. Over greasing will result in carry-over onto the containers.

7.5. Shutdown Procedures:

Extended

If the operation is to be shut down for an extended period of time, care must be taken to ensure problems are avoided on restart.

a) Grease all regular bearings.

b) Oil all linear bearings.

c) Check oil levels in drive units.

d) Lubricate drive chains.

e) Lock out electrical system.

f) Sweep down all components and wash down as required.

7.6. Sanitation of the BEVCO Series Rinsers:

Your Bevco rinser has been designed and built with ease of sanitation in mind. Whenever possible, all welds are continuous so as to prevent point sources of contamination. Sliding access doors, inspection holes in the conveyor sections, removable rubber grippers, and the location of attachment bolts have all been designed to facilitate your cleaning efforts.

The following is a "generic" cleaning schedule that should be modified to suit your specific product, location of machine, availability of manpower and your commitment to sanitation. Before the schedule, we believe that it is extremely important to define *clean* versus *sanitation.*

Cleaning equipment involves the physical elimination of contaminants. ***Sanitation*** is the virtual killing of living organisms, but not the killing of spore forming yeasts and molds. **Sterilization** has nothing to do with cleaning, manure can be sterilized.

Sanitation is a word that is thrown around quite a bit. It is not safe to consider a sanitized machine to be clean. Peroxides and chlorine will kill bacteria and yeast's by contact, but the sanitized, dead cells and soil, will only promote greater contamination in the future.

Only cleaning will eliminate all forms of contamination. Only a clean machine can be "effectively sanitized".

For your rinser to be sanitary, it must be cleaned thoroughly and regularly.

The following schedule is a **cleaning schedule**. Your methods or needs for sanitation should be dictated by your product, i.e.: fruit juices-acid residing bacteria, yeast's and molds; water-neutral pH molds and bacteria; wine-alcohol tolerant, acid residing bacteria and yeast's; etc. If you are sanitizing a clean machine, you will find that sanitation is effective and requires very low concentrations and volumes, as compared to sanitizing dirty equipment.

Because cleaning is the physical removal of dirt, it requires physical contact. Brushes, cleaning pads, sponges or at the very least, high pressure water, are essential. In addition, a suitable cleaning solution (detergent) is required. In some cases the cleaning solution is combined with a sanitizer (chlorine, quats, etc.).

7.7.Cleaning Schedule

Daily; Manually clean the drain pan and spray manifold using a scrub brush or pressure spray. (5 minutes).

Weekly; Manually clean the spray guard over the spray manifold. (3 minutes). With machine running, softly clean the rubber grippers as they pass by an open side panel, an irrigated car brush is ideal. (3 minutes). Clean off top and bottom surfaces of conveyor and cross members. (5 Min).

7.7. **Cont:**

Monthly; Manually clean the drain pan and spray manifold using a scrub brush. High pressure clean or scrub inside of entire end panels. Remove all guards and clean inside. (15 minutes).

Quarterly; Remove and inspect rubber grippers. Clean the base flights prior to replacing the rubber grippers by using a brush while running. Back off the end cover nuts at the overhead cross member to expose the backside of the frame and the overlap on the cover. Scrub clean. (5 minutes).

By following this schedule, or your own, you will maintain a clean machine thus allowing it to be sanitized easily. Your local supplier of cleaning materials should be able to supply you an inexpensive general-purpose cleaner/sanitizer that will be suitable to your product and situation.

The Bevco rinser is built of the highest quality corrosion resistant materials, however, many sanitizing agents can be severely corrosive to bearings (for example) and should be rinsed off immediately after their effective kill time (as stated by the manufacturer). Remember that your rinser is clean and longer sanitation exposure times than necessary are completely ineffective.

Strong cleaning chemicals and/or high pressure hoses can be detrimental to components on the rinser such as drives, bearings, grippers' controls, etc.

The most effective means of cleaning a Bevco water rinser is to gently wash it down with low pressure, low volume, warm water followed by wiping the rinser dry. A good quality stainless steel polish can be used to keep the units appearance in top shape. Washing the rinser with liquids can result in the removal of necessary lubrication from vital areas. This should be renewed as soon as cleaning is completed. **(Do not use a direct stream of water or high pressure water, against drive motors, control panel, photo eyes or transparent object detector).**

AIR RINSER CLEANING

To clean a Bevco air rinser, it should only be necessary to blow down the rinser using low pressure, low volume air. Wiping the rinser down using a good quality stainless steel polish can follow this. Lubrication servicing should be done at the same time if it is required.

7.8. Changing a PLC Timer Value:

PROGRAM CHANGES MUST BE DONE USING RsLOGIC SOFTWARE

Chapter 8

Troubleshooting

8.1. Troubleshooting Guide

The following troubleshooting guide assumes that the Bevco Rinser has been properly installed in accordance with the section containing Recommended Installation, and that the Bevco Rinser has been running prior to the current condition.

8.2. Rinser Does Not Start

1. Power Interruption: If *Power* Indication lamp on the Main Control is on, press the *Reset* push-button, then press the *Start* button.

2. Emergency Stop Pressed: Determine reason for the Emergency Stop condition, When safety conditions permit, restart machine by deactivating the E-Stop button (Pull E-Stop Button out), then press the *Start* push-button.

3. Low Rinse Pressure: If Low Air / Water Indicator lamp is illuminated, Correct the cause of the low-pressure condition. When corrected, press the *Start* push-button.

4. 2PEC Malfunction: Reflector may be dirty, out of alignment or sensitivity / margin may be set too low. Correct the problem and press the *Start* push-button to restart the rinser. (See also the chapter that contains the setup procedure for transparent object detector).

5. Discharge Jam: Product containers discharging from the rinser have activated 1LS. Correct the cause of the jam, press the *Stop* push-button to clear the fault, then press the *Start* push- button to restart the rinser.

6. Tripped Motor Overload: Fault indicator light is on. Verify which motor overload has tripped. This is indicated by a slightly raised yellow indicator dot between the red and blue buttons on the motor overload. To reset the overload, press the blue push-button on the overload. Press the *Start* push-button to restart the rinser.

7. Inverter Fault: Fault Indicator light is on. Verify the inverter fault by observing the display panel on the inverter-programming module. This fault can be referenced in the Allen Bradley Inverter manual supplied with the rinser. Press the *Reset* push-button on the Main Control Panel and press the *Start* button to restart the rinser.

8.3. Rinser Starts and Stops

1. The discharged containers are blocking 2PEC. This could be caused by improper setup of the photocell or because of insufficient gap between the product containers. Increase the speed of the discharge conveyor or decrease the speed of the rinser.

2. If there is sufficient space between containers the time delay on 2PEC may not be long enough.

3. The speed adjustment for 3PEC is set too low. This VFD should be set to approximately 60 percent of the value of the run speed.

4. The rinser is processing containers at a rate in excess of the filler speed. Slow the rinsers speed such so that it delivers product containers 2 to 5 percent faster than the filler requires.

8.4. Containers Fall Out Of Grippers

1. The gripper conveyors are not applying enough pressure to firmly hold containers in place through the rinser. Adjust gripper conveyor using adjustment handwheels.

2. The gripper conveyors are out of parallel.

3. There is insufficient gap between product containers to allow proper gripper pressure. This is a product over population condition at the infeed of the rinser. Reduce product flow into the rinser.

4. Missing or damaged grippers.

5. If the gripper conveyors are out of parallel, contact Bevco service for instructions on methods of correction. If product containers are crowding, reduce line pressure feeding the rinser so those containers are not being pushed along the conveyor.

8.5. Rinser Runs But No Rinse Media is Present

1. 1PEC, Container Present Photocell, located at the infeed of the rinser is not detecting product containers. Verify proper transparent object detector setup by following outlined procedures listed in this manual under the heading, Transparent Object Detector Setup.

2. Possibility of blocked or plugged spray nozzles. Remove, clean, and reinstall spray nozzles. Replace any damaged nozzles.

8.6. Containers Falling Over At Rinser Discharge

1. Gripper conveyor not applying enough pressure to product containers to maintain product placement in grippers through rinser. Container bottom is positioned too low to be discharged correctly.

2. The infeed and discharge conveyor heights are set improperly. Infeed and Discharge conveyors should be set at the same elevation.

3. The speed difference between the product containers leaving the gripper conveyor and the discharge conveyor is too large. Slow the discharge conveyor down to match the gripper conveyor.

8.7. Low Rinsing Efficiency(WATER)

1. Plugged or restricted nozzles.

2. Manifold set too low. Tips of spray nozzles should be approximately 3/8 to 3/4 of an inch below the lip of the container.

3. Spray nozzle orifice damaged such that stream of water is deflected away from product container opening.

4. Rinse pressure is set too low. Increase pressure and increase set point of 1PS pressure switch.

5. Insufficient rinse medium getting inside container. Decrease the rinser speed, increase the number of nozzles in the spray manifold or increase spray pressure. (See #4 above).

Chapter 9 Bevco Model M150 Rinser

9.1. REPLACEMENT PARTS LIST

Part No:	Description:	Quantity:
GRIPPER CHAIN		
TTC19120	E.D.P.M. GRIPPER	570
TTC18110	S.S. BASE CHAIN WITH FLIGHTS	47 FT.
TTC18101	REPLACEMENT FLIGHT	A.R.
TTC19070	S.S. BASE CHAIN CONNECTOR LINK	A.R.
BEARINGS		
BRG70116	DRIVE END BEARING OPEN	4
BRG70212	IDLER END BEARING CLOSED	4
BRG70118	INFEED DRIVE BEARING OPEN	2
BRG70116	INFEED CONVEYOR BEARING OPEN	1
BRG70216	INFEED CONVEYOR BEARING CLOSED	1
BRG70116	OUTFEED CONVEYOR BEARING CLOSED	2
BRG70212	ADJUSTMENT SHAFT BEARING CLOSED	7
BRG70112	ADJUSTMENT SHAFT BEARING OPEN	1
SPROCKETS		
SPR41717	DRIVE END SPROCKET	2
SPR42313	IDLER END SPROCKET	2
SPR42517	INFEED DRIVE SPROCKET	1
SPR41521	INFEED DRIVE SPROCKET (DRIVEN)	1
SPR44173	ADJUSTMENT SHAFT SPROCKET (U.H.M.W.)	8
WEARSTRIP		
EQR16051	WEARSTRIP PACKAGE (consisting of all straight and curve wearstrips as well as drive shoes)	1
RINSE MANIFOLD		
EQR33165	SOLENOID VALVE	1
ELC50770	PRESSURE SWITCH	1
SPRAY HEADER		
LUB41245`	S.S. SPRAY NOZZLE	4
SENSORS		
ELC50125	LIMIT SWITCH	1
ELC56834	TRANSPARENT OBJECT DETECTOR	2

9.2. RECOMMENDED SPARE PARTS LIST

Part No:	Description:	Quantity:
BRG70116	Drive end Bearing	2
BRG70212	Idler End Bearing	2
ELC18040	Overload Relay	1
ELC50125	Limit Switch	1
ELC50770	Pressure Switch	1
ELC56834	Transparent Object Detector	1
ELC60122	Power Fuse	3
ELC61113	Motor Fuse	3
ELC62501	Control Fuse	1
ELC61114	Control Fuse	2
EQR16050	Drive Shoes (Pair)	1
EQR33177	Solenoid Valve Repair Kit (EPDM)	1
LUB41245	Spray Nozzle	2
SPR41717	Drive end Sprocket	2
SPR42313	Idler End Sprocket	2
TTC18101	Flights	50
TTC19070	Base Chain Conn Link	2
TTC19120	Grippers	50

* Denotes Order As Required: Part numbers will vary according to individual machine voltage, frequency supplies and gear drives, please consult your electrical schematics or contact Bevco for model numbers and / or replacement parts.

Chapter 10

10.1. KBSI Board Setup (Analog Reference Following)(Optional Equipment)

If optionally equipped, the model M150, M250, M510, M610, M810 and M1010 rinsers will include a 0 - 10VDC/4 - 20 mA conversion board which will isolate common industrial reference signals and convert/scale them to be used with the Allen Bradley Power Flex4 Variable frequency drives. These boards provide a clean 0 - 10 VDC output signal that is used to control the output speed of the rinser drive motors. The output of this board is calibrated by Bevco to be used with a 0 - 10 VDC input and should not need to be re-calibrated in the field. However, depending on the source signal, minor setup is required in the field.

10.2. Input Mode Jumper

Factory Settings : Jumper is in the "Voltage" position.

Switch is labeled as "SW1"
Left socket is labeled "CURRENT"
Right socket is labeled "VOLTAGE"
Jumper is in the center socket and the right socket

10.3. Voltage Input Calibration

1. Verify that the above jumper at "SW1" is in "VLT" position.

2. Apply a calibrated voltmeter to output terminals 9 & 10.

3. Apply 0 volts at terminal 6 and adjust min. pot so that voltmeter reads 0 volts, or a very small plus voltage such as .001 volts

4. Apply 10 volts at terminal 6 and adjust the max. pot so that voltmeter reads 10 volts.

5. Repeat steps 3 and 4 above until no further calibration adjustments are necessary.

10.4. Current Input Calibration

1. Verify that the jumper at "SW1" is in "CUR" position.

2. Apply a calibrated voltmeter to output terminals 9 & 10.

3. Apply 4 mA at terminal 6 and adjust min. pot until voltmeter reads zero or a very small plus value such as .001

4. Apply 20-mA signal at terminal 6 and adjust the max. pot until the voltmeter reads 10 volts.

5. Repeat steps 3 and 4 above until no further calibration adjustments are necessary.

If further adjustments or information are required, please consult the Process Control Module user manual for more information.

10.5. Description of Operation

The rinser can either be set up to follow a speed reference signal from the filler, or can be self speed regulating. If being used as self speed regulating, the VFD should be set such that the rinser runs approximately 5% faster than filler speed requirements. If the rinser will be referenced from the filler, the PLC program will receive input from the filler.

When 3CR is not energized, the rinser will run at the prime speed as set by the VFD. This is to keep the infeed to the filler primed with product containers. While 3CR is energized, the speed reference will be taken from the filler or line controls. This filler speed may be offset / trimmed with the use of input from the filler. Both the Filler Trimmed Speed and the Prime Speed are processed through the PCM Isolation board.

On the output side of the PCM board, the conditioned speed reference signal is fed directly to the variable speed drive when line conditions at the discharge of the rinser are normal. If the two-speed photocell is blocked for the duration of the two-speed photocell delay timer, 4CR will de-energize and the rinser will slow down to the speed as set by Potentiometer #3. When the discharge conditions clear and 4CR energizes, the rinser will speed up to the output as set by the filler speed reference setting (trimmed by Pot #2) or the prime speed (set by Pot #1).

**** NOTE ****** The above description only applies to a system operating with a 0 to 10 VDC signal *to* the rinser.

Chapter 11 – Supplemental Materials

Scope Of Work – Job Specific

Drive Calculations – Job Specific

11.2. Electrical Panel Content

The following documentation is included inside the door of the electrical control panel:

- Allen Bradley Adjustable Frequency AC Drive User Manuals
- Electrical Schematics