



CAP STERILIZER MANUAL

ZPPI-Length'

**MONTH JUNE 2013
SERIAL NO: JXXXXX**

Supplied By:
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OPERATION & SERVICE MANUAL

TABLE OF CONTENTS

		Page
Chapter 1. General		
1.1.	General Information	1.1
1.2.	Cap Sterilizer Specifications	1.2
Chapter 2. Cap Sterilizer		
2.1	Overview	2.1
2.2	Safety	2.1
2.3	Sequence	2.1
2.4	Controls	2.1
2.5	Set-Up	2.2
2.6	Operation	2.3
2.7	Forward	2.3
2.8	Set-Up Sequence	2.4
2.9	Quick Checks	2.4
Chapter 3. Safety		
3.1	Safety Requirements	3.1
3.2	Recommended Lock-Out Procedure	3.2
Chapter 4. Operational Checklist		
4.1	Recommended Installation	4.1
Chapter 5. Options (If provided)		
5.1	Remote I/O or DeviceNET Communications	5.1
5.2	DH-485 Communications	5.1
5.3	DH+ Communications	5.2
5.4	Start-Up Assistance	5.2
5.5	Service Assistance	5.3
5.6	Recommended Spare Parts Kit	5.4

Chapter 6. Preventative Maintenance

6.1	Routine	6.1
6.2	Shut down/Start Up	6.2
6.3	Daily Check List	6.3
6.4	Regular Maintenance Requirements	6.4
6.5	Shut Down Procedures	6.5
6.6	Equipment Sanitation	6.6
6.7	Cleaning Schedule	6.7

Chapter 7. Supplemental Information

5.1	Scope	5.1
5.2	Material Transaction	5.1
5.3	Drive Specs	5.2
5.4	Unit Photos	5.2
5.5	Machine Layout	5.3

1.1. GENERAL INFORMATION

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

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

Head Office and Factory

BEVCO

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Chapter 1

ZPPI CAP STERILIZER DESCRIPTION:

MODEL:	<input type="text" value="Length"/>	SERIAL:	<input type="text" value="JXXXXX"/>
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TYPES OF CONTAINERS IT WAS DESIGNED TO HANDLE:	<input type="text" value="PET/GLASS ETC."/>
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SIZE RANGE:

MIN DIA:	<input type="text" value="1.5"/>
MAX DIA:	<input type="text" value="9"/>
MIN HEIGHT:	<input type="text" value="0"/>
MAX HEIGHT:	<input type="text" value="13"/>
MIN SPEED:	<input type="text" value="0"/>
MAX SPEED:	<input type="text" value="Varies"/>
CONTACT TIME (SEC)	<input type="text" value="Varies"/>

APPROXIMATE WEIGHT:	<input type="text" value="4000 lbs"/>
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ELECTRICAL REQUIREMENTS:

VOLTS:	<input type="text" value="V"/>	PHASE:	<input type="text" value="PH"/>	CYCLES:	<input type="text" value="HZ"/>	AMPS:	<input type="text"/>
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CHAPTER 2

2.1. Overview

Your Bevco Zero Pressure Product Inverter (ZPPI) cap sterilizer is designed to tip full hot filled bottles on their side allowing hot liquid to sterilize the inside of the cap. The ZPPI lays the bottles on their sides without any squeeze pressure on the bottles, and thus, no resulting bottle distortion.

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 connected to two different inverters inside the control panel. The infeed chain and the 4 ½" ZPPI chain are on one inverter, and the 7 ½" ZPPI chain is on its own inverter. This way the inverters can be adjusted for the ZPPI chains to match speeds perfectly through the machine.

2.2. Safety

The ZPPI cap sterilizer has the potential to start at any time if it is energized and in the run mode. Before starting the machine, 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.

Guarding has been installed on the ZPPI to eliminate or reduce the number of potential pinch points. The machine should never be run without all provided guarding in place

2.3. Sequence

1. At the discharge end of the cap sterilizer there is a "Discharge Jam Switch". This switch detects any abnormal downstream conditions that may exist that cause containers to back up into the cap sterilizer. When activated, the discharge jam switch shuts down the cap sterilizer immediately with no "ramp down" time.
2. After the discharge end of the cap sterilizer, the containers travel on a conveyor that will have at least one photocell mounted on it. This photocell is designed to detect a backup towards the cap sterilizer. When this photocell is blocked for a predetermined time, the machine will stop. The unit will restart when the photoeye is clear again.

Note: No adjustment on the unit is needed to change bottle sizes or shapes.

2.4. Controls

The control panel contains all necessary equipment for safe and efficient operation of the ZPPI. The door of the control panel contains an HMI touch screen for easy set up and operation of your new ZPPI. The following are standard features: a main disconnect switch handle; a POWER ON blue light; a Red FAULT light. The door also contains the green START button, the red STOP button, and the EMERGENCY STOP mushroom.

Inside the control panel (If supplied) are fuses, inverters, relays, contactors, transformer and all wiring terminals. Normally the wiring schematics and PLC program sheets are contained within the panel it self.

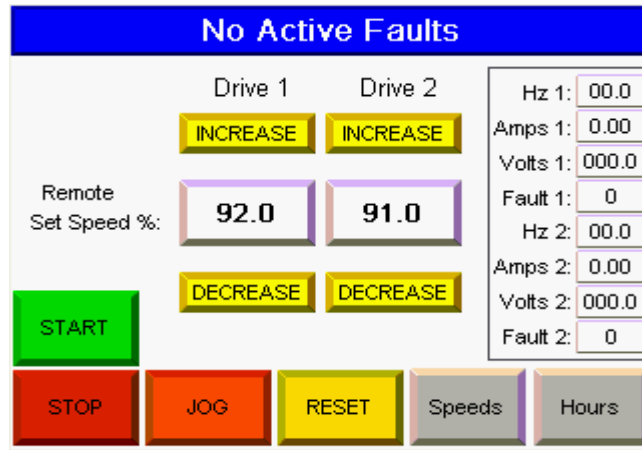


If the blue light is on it indicates that the main disconnect switch is ON and the panel is powered, and the machine could start at any time.

2.4. Continued.....

If the red Fault light is on it means there is one of the following faults.

Discharge Jam
VFD Fault
Motor Overload Fault
Emergency Stop



These faults would appear in the Main screen view. In the location where it says "No Active Faults".

If a fault does occur determine the fault, rectify the problem and press Start to restart the machine.

If a "VFD Fault" does occur you will need to press reset on the main HMI screen.

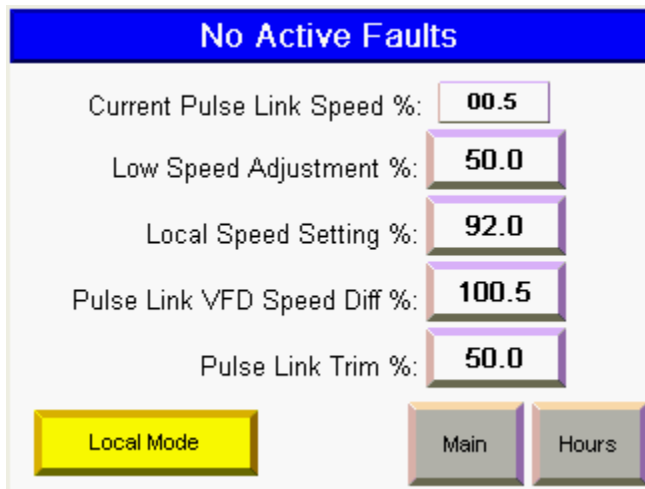
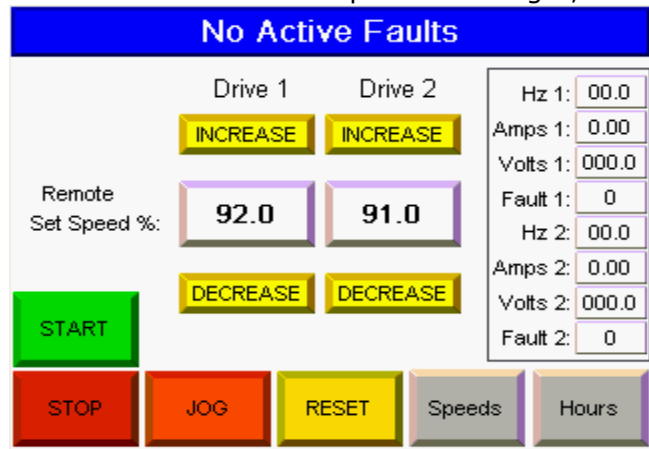
2.5. Setup

1. Make sure the ZPPI cap sterilizer is turned off;
2. Manually open or close the Guide rail brackets at the Infeed and outfeed sections of the ZPPI cap sterilizer. The guide rails should be open until the bottles freely flow through the Infeed and Outfeed guide rails for a given container.
3. Push the green *START* button. The cap sterilizer should now start up and run at the preset speed according to the interior speed pot. If the cap sterilizer does not start, check the photocell downstream to insure it is seeing the reflector properly
4. Let one or two containers go into the cap sterilizer from the infeed conveyor and insure that the bottle is laid down and invert it back to a vertical position with no issues. At this time you may want to re-adjust the Guide rail settings.
5. With the cap sterilizer running, block the first downstream photocell. After the preset time delay the cap sterilizer should ramp to a stop. Unblock the photocell and the cap sterilizer should immediately ramp up to speed.

2.6. Operation

The two running chains (4 1/2" and 7 1/2" wide chain) are designed to run at the same speed. The two chains had the proper amount of slack set in them when they left the Bevco plant. The chains are "captured" around the drive sprocket(s), so there is no need to keep the chain tight, it can not jump teeth on the sprocket. This built in slack reduces wear on the drive and idler sprockets and reduces the load on the wear strips, chain links, drive motors, gear boxes and prolongs the life of the wear strip.

This current view of the HMI is called "Local Mode" this screen would be used to set up your machine and test and "Jog" product through. The 4 1/2" and 7 1/2" twist chain are running on 2 separate drives, and these chain speeds need to be matched perfectly to reduce the twist on the bottles as they run through the machine. To achieve matching chain speeds you will need to adjust one of the "Remote Set Speeds" up or down so that both twist chains are running at equal FPM through the machine.



This screen here to the left would be called the "Speeds" screen. This screen shows all the possible options on a ZPPI, if your machine does not have a specific option the function will not show up on this screen. This screen here would be used to set the "Low Speed Adjustment" and "Local Speed Setting". If your machine came equipped with Pulse Link you will need to use "Pulse Link VFD Diff%" to match the speeds of the 2 twist chains.

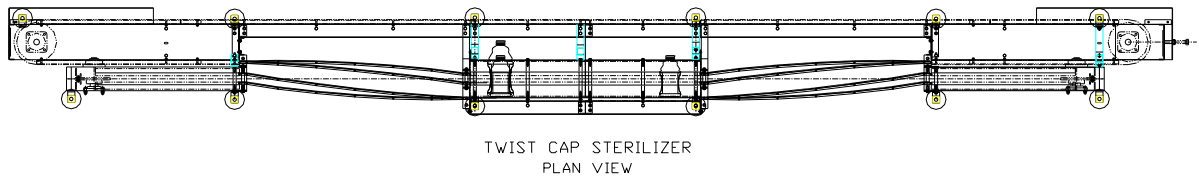
"Pulse Link Trim" is the value that will scale the pulse link signal.

This final screen list the current run time hours.

If a fault does occur, it will be displayed at the top of any of the three display screens. The fault itself can still only be reset from the "Main" or "Local Mode"



Diagrams



2.7. Forward

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

2.8 Setup Sequence

1. Visually and physically examine the cap sterilizer for any damage, wear or missing parts;
 - A. Replace any missing or damaged chain flights. Report any abnormal wear patterns on the chain and or wearstrip.
 - B. Replace any broken chain link. Report condition of wear on flights and wearstrips
2. Turn the panel "Disconnect" switch handle to "ON".
3. Push the "ON" button on the cap sterilizer panel.
4. Put about 1/2 dozen containers on the conveyor leading into the cap sterilizer, let the containers all go at once.
5. With the cap sterilizer still running, block the downstream photocell. After a preset amount of time (approx. 3 seconds) the cap sterilizer should ramp to a stop.
6. Unblock the photocell and the cap sterilizer should immediately ramp up to speed.
7. With the cap sterilizer running, gently move the discharge jam plate to activate the jam switch. The cap sterilizer should shut down and the indicator light on the panel should come on.

2.9.Quick Checks

1. If the cap sterilizer 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.

2. If the cap sterilizer won't start, check the HMI display to see which fault is on. If the fault is the discharge jam switch, then the discharge plates that the switch is mounted to may be pushed against the guide rails. Correct the problem.

3. Always make sure that the lamps in the indicator lights are functioning. A burnt out lamp will only increase the time it takes to trouble shoot a problem you may be encountering.

If you have any questions please contact Bevco on our toll free number.

Chapter 3

3.1 SAFETY REQUIREMENTS

WARNING: Bevco ZPPI cap sterilizers 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 ZPPI cap sterilizer is in operation. All guarding **MUST** be in place during operation.
- f) Safety warning stickers have been affixed to the equipment and must not be removed.
- g) All electrical components on the ZPPI cap sterilizer are water resistant. Do not use high pressure hoses for cleaning and do not use a direct stream of water on drives, panel or photo-cells.
- h) Plastic chain and insert rubber are hot liquid temperature resistant up to 180 F under continuous operations.

***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.

CHAPTER 3: (CONT)

SAFETY

3.2. Recommended Lock-out Procedure

The following checklist is designed to be followed when it is necessary to deactivate a cap sterilizer 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 shut down 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 cap sterilizer will perform to its' maximum efficiency.

All cap sterilizers 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 ZPPI cap sterilizer was crated for maximum protection during shipment, and to ease unloading and placement within your plant without subjecting the cap sterilizer to handling procedures which could cause damage. It is important to inspect the cap sterilizer thoroughly when it arrives at your site and to record and report any damage immediately.

1. The cap sterilizer crate 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 drive motors).

2. ZPPI cap sterilizer unit is sent in three main parts. i. - Infeed section, ii. - Outfeed section and iii. - Mid section(s). Every unit can be lifted off the skid using a forklift of sufficient capacity. The Infeed and Outfeed section will require two pieces of 2"x4" x 10' lg wooden pieces to assist with the move. Forks must go through both sides but 2X4's must be set on top of the forks and run lengthwise under the cap sterilizer and support the cap sterilizer under the cross braces on the legs. (Tubes that ties leg assemblies).

The mid sections can be lifted by the bottom part of the frame.

Note: use some wood to prevent any scratch or damage on the unit itself.

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.

Chapter 4 (CONT)

Recommended Installation (Cont.)

5. Attach the infeed and discharge conveyors to the infeed and discharge conveyor sections of the cap sterilizer. Adjust the height of the machine while mounting conveyor sections. The ZPPI cap sterilizer was pre-set at the factory for optimum container handling.

6. Connect the correct electrical supply voltage to cap sterilizer 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.

7. Install photocell #2 (2PEC), at the recommended downstream location(s) and connect to the proper terminals inside the cap sterilizer 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

OPTIONAL SERVICES

5.1. Start-Up Assistance and Training (optional)

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 cap sterilizer has been integrated into the line properly, then test the cap sterilizer 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 cap sterilizer and why they are important,
2. The correct way to set up *your* cap sterilizer 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 belt links, sprockets, bearings, etc.
8. Lubrication requirements,
9. Sanitation procedures.

5.2. Service

Bevco has Service Technicians available to assist your plant personnel in minor and major overhauls of your cap sterilizer. Taking advantage of the assistance of a Bevco Service Technician insures that your cap sterilizer 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.

5.6 Recommended Spare Parts List

QTY	PART NO.	DESCRIPTION
10	TTC18145	4 1/2" Side Flex Chain with Flight
10	TTC18176	7 1/2" Chain with Flights
1	BRG70221	1 1/4" - 4 HOLE POLYAMIDE BRG - closed cap
2	BRG70218	1 1/4" - 2 HOLE POLYAMIDE BRG - closed cap
1	EQR16110	DRIVE SHOES (PAIR)

Chapter 6A

ZPPI Preventative Maintenance

6A.1. Routine as well as Shut-Down/Start up

All bearings on the ZPPI are sealed and have caps to insure maximum service life.

6A.1. Routine

All bearing grease zerks require one pump/stroke of the grease gun each month, dependent on the Production schedule.

The WEAR STRIPS should only be lubricated while the machine is running, one to two strokes of grease should be applied slowly every 24hrs of operation or dependent on the Production Schedule.

6A.2. Shut down/Start-up

Prior to shut down the ZPPI 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.

6A.3. Daily Check List

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

1. 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 ZPPI and generally shipped in the control panel.
2. Check alignment of equipment and report broken / damaged parts.
3. Check & tighten all loose assemblies.
4. Ensure all safety guards and covers are in place.
5. Test run all pieces of equipment without load and inspect for proper operation prior to container flow.
6. Ensure all emergency stop switches are operational by running equipment and using emergency switches to shut down.

6A.3. Weekly 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.

6A.4. Regular Maintenance Requirements

a) **Bearings:**

Grease all bearings monthly 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 ZPPI runs, the chain will loosen up. Remove excess slack by adjusting the idler sprockets on the ZPPI. 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 and grime buildup. Bevco ZPPIs 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 point. **Under normal operation this should be done at least once a day.** When greasing the Zerks labeled "WEAR STRIP" the machine should be running and grease should be pumped slowly. Over greasing could result in carry-over onto the containers.

6A.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) Check oil levels in drive units.
- c) Lubricate drive chains.
- d) Lock out electrical system.
- e) Wipe down all components and wash down as required.

6A.6. Sanitation of the ZPPI:

Your Bevco ZPPI 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.

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.

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 ZPPI 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.).

6A.7. Cleaning Schedule

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

Weekly; Clean off top and bottom surfaces of conveyor and cross members. (5 Min).

Monthly; Manually clean the drain pan. (5 minutes). High pressure clean or scrub inside of entire end ZPPI. Remove all guards and clean inside. (15 minutes).

Quarterly; Inspect plastic chain flights for wear and/or cracks. Clean the base flights by using a brush while running. (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.

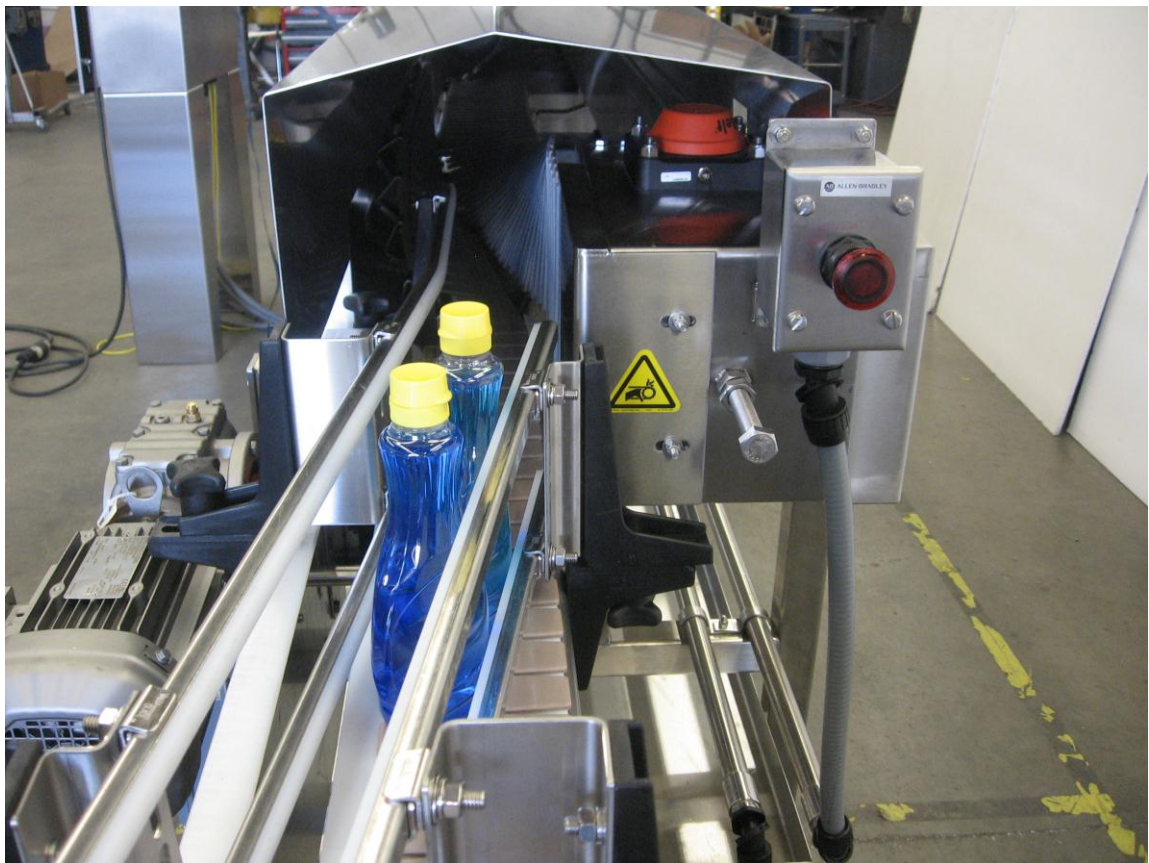
The Bevco ZPPI is built of the highest quality corrosion resistant materials, however, many sanitizing agents can be severely corrosive to bearings (for example) and should be rinsed off immediately after their effective kill time (as stated by the manufacturer). Remember that your ZPPI is clean and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

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

The most effective means of cleaning a Bevco ZPPI is to gently wash it down with low pressure, low volume, warm water followed by wiping the ZPPI dry. A good quality stainless steel polish can be used to keep the units appearance in top shape. Washing the ZPPI 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 proximity sensors).**



INFEEED END TRANSFER, MOTOR AND DISCONNECT



INFEEED TWIST, AND E-STOP



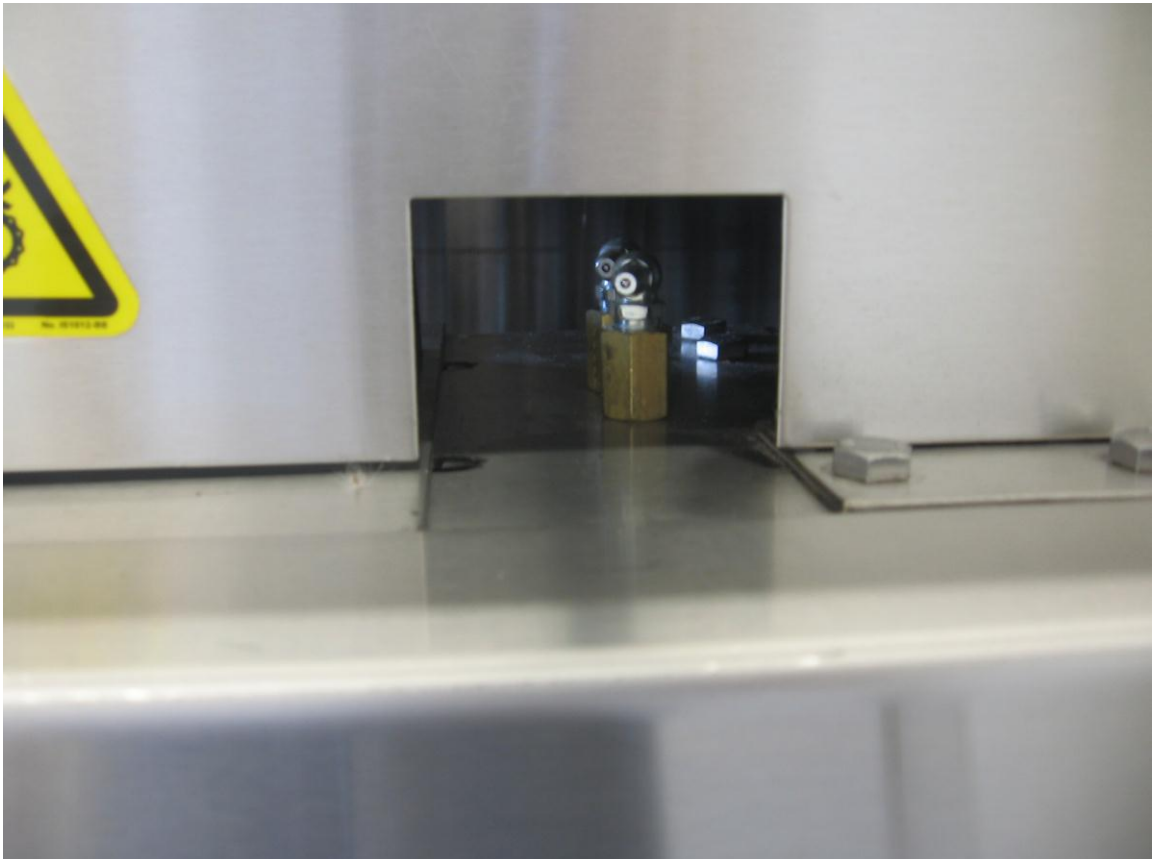
INFEEED TWIST



INFEEED AND OUTFEED TWIST GUARDING



WEARSTRIP LUBE POINTS AT INFEEED OF MID SECTION



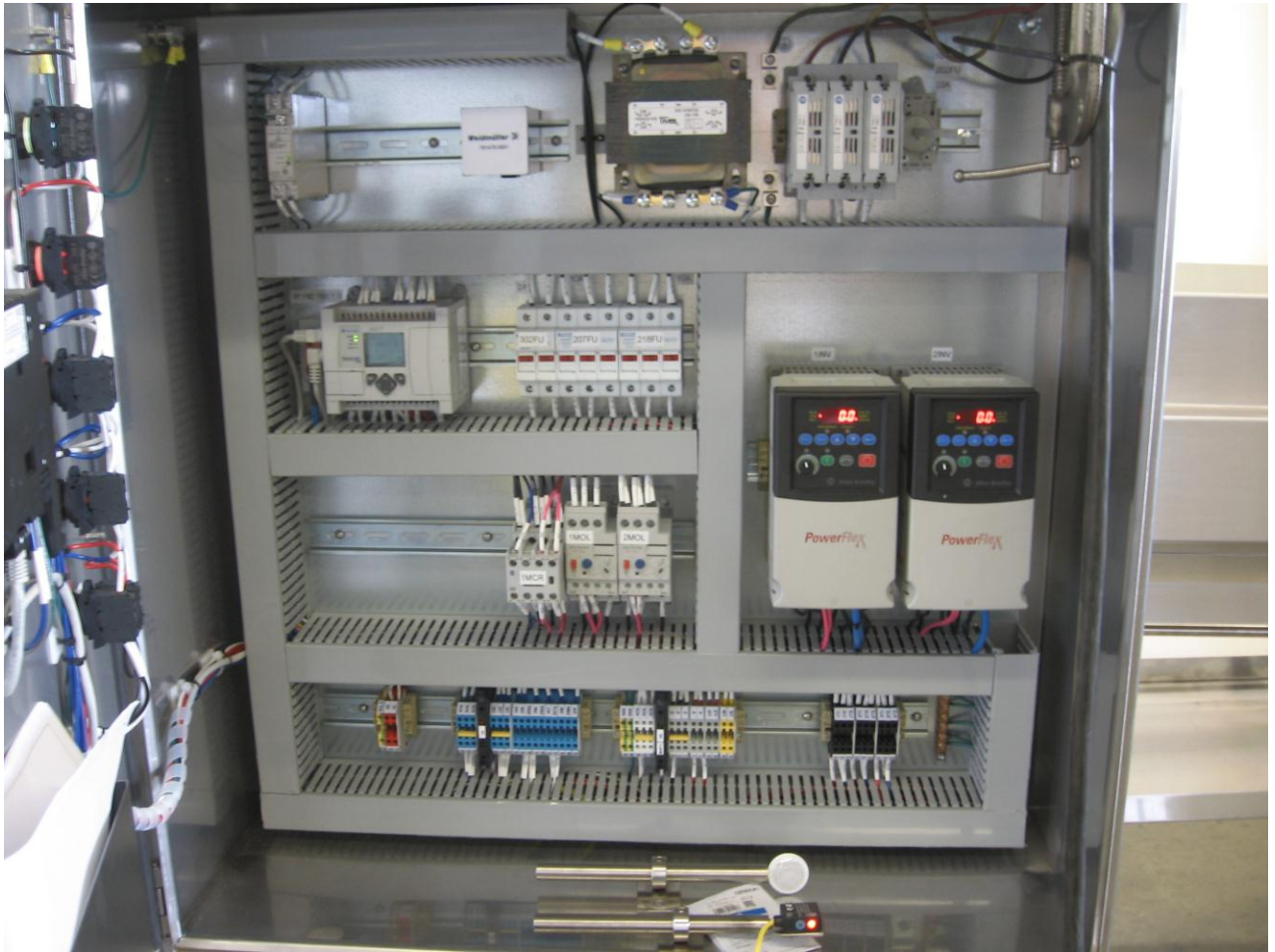
WEASRSTRIP LUBE POINTS AT INFEEED END



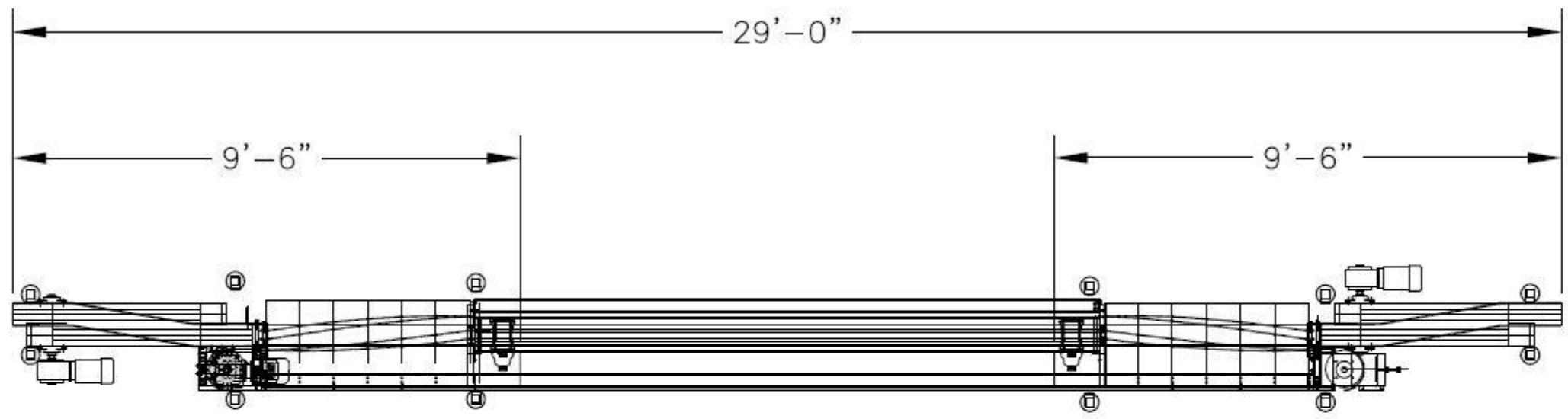
OUTFEED TWIST GUARDING



OUTFEED TRANSFER AND TWIST COVER



ELECTRICAL CONTROL PANEL INTERI



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CHECKED BY:	ISSUED:	DRAWN BY: JW
DATE:	SCALE: NTS	DATE: JUNE 23 2009
CLIENT: BEVCO SALES INTERNATIONAL INC. SURREY, BC		
TITLE: 29FT ZPPI BLOCK	NO: 29FT ZPPI	REV.