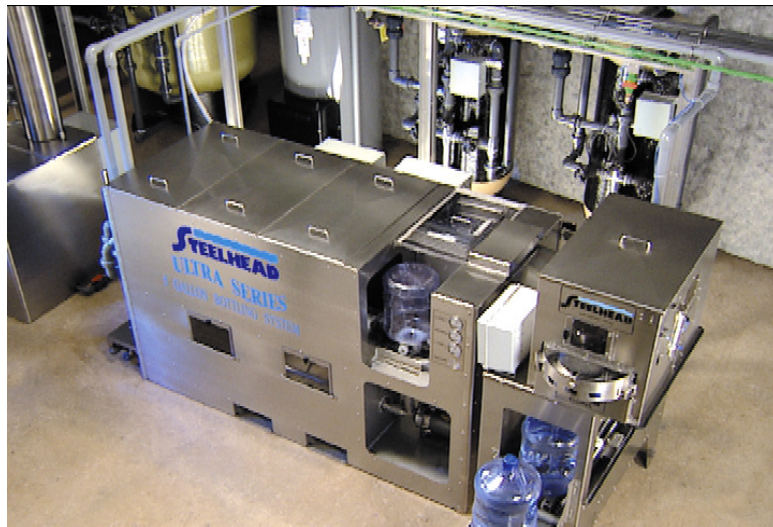


# ULTRA SERIES

## 5/3-GALLON BOTTLING SYSTEM

150 - 350 BPH



In 1985 Steelhead invented the “one operator” bottling system. While the idea was so good that it had to be copied by our competitors, the style, function, and efficiency of our machines have never been duplicated.

The following pages provide a comprehensive overview to explain why. It goes beyond a simple specification sheet, and tells you the real story about Steelhead’s latest innovations in

**“One Operator Bottling”.**

## MACHINE CONSTRUCTION

### **BODY CONSTRUCTION**

Imagine a machine that uses #3 polished stainless steel heavy enough to stand on it's own without a tube frame. Imagine if the designers were innovative enough to use stainless square tubing for horizontal support braces, but used them for fluid piping at the same time. What if they made other bracing usable as fork guides to allow easy movement of the machine? Is there anyone out there that has a design so innovative that no one other manufacturer has ever been able to copy it? Yes, Steelhead has been providing this kind of innovation since we introduced the Mini-Plant Bottling System in 1985.

Steelhead construction techniques are so innovative that no one has ever been able to copy them. These design techniques begin with 100% computer modeled assemblies and the use of only the **highest quality parts**. A few of the hundreds of amazing construction features are listed below for your review.

- All stainless parts are designed and programmed for laser cutting by Steelhead engineers. This means that each machine is **precisely** documented and each manufactured part reproducible with **exact** standards.
- Heavy wall stainless is used in construction of the outer shell. This greatly increases the **strength** of the machine while eliminating the need for a tubular frame to support weaker material.
- The height of the machine is designed to allow simple access from the top of the machine for maintenance, observation and cleaning. This **eliminates** the need for side access windows that leak, fog up, cake over with scale etc. We even provide a back step on the machine for better viewing and access. (This stainless step cleverly covers the **single connection drain manifold** that comes standard with Ultra systems).
- Multiple tank access doors are **easily** removable and large enough to enable easy cleaning and maintenance.
- Steelhead's **unique** "come back" bottle movement system uses 2" stainless steel chain and **UHMWPE** heavy-duty sprockets. Bottle holders constructed from stainless and UHMWPE (only uhmwpe contacts the bottle) are connected to the chain and guided around the machine on a track. Bottle alignment is assured through use of the track, a precision DC gear motor, and an LED alignment sensor.
- All fluid separation boundaries are constructed of stainless steel for easy cleaning, and **elimination** of possible bacteria buildup in string curtains.
- The unloading area is fully covered to eliminate **exposure** to the clean bottle.
- All plumbing is accomplished within the body of the washer (except drains) but is easily accessible. This provides a clean and unique look for the machine but still allows for easy maintenance.
- The Ultra system has **dedicated** pumps for wash recirculation, post rinse recirculation, and sterilizer rinse recirculation. All pumps are stainless steel, **wash down** pumps. Use of these high quality pumps eliminates worries of shorting out motors and the need for cumbersome access panels.

## WASHER SYSTEM

### **Washer Operation and Timing**

The Steelhead Ultra Series provides the most **effective** wash and sterilization cycles in the industry. Bottles are exposed to 4 **distinct** cycles in the washer that combine to produce a clean, thoroughly sterilized and well rinsed bottle. These stages are as follows:

#### Wash Section

The wash section of an Ultra System utilizes a built in tank, high volume stainless steel pump, external high efficiency heater with thermostat, and an air operated brass control valve, to apply and control the spray inside and on the bottles. Bottles are sprayed inside and out at several stations by stainless steel nozzles. The outside nozzles are located in 4 places around each bottle. Additional outside nozzles are located under the bottle at angles to thoroughly wash **the neck and crown area** of the bottle.

*Exposure time in this section ranges from 48 seconds to 72 seconds depending on the machine speed chosen by the operator.*

#### **Post Rinse Section**

Steelhead features a rinse section directly following the wash section. This station facilitates removal of the soap prior to sterilization. The post rinse system utilizes a built in tank, high volume stainless steel pump, and a stainless body air operated control valve to apply and control the spray inside and outside the bottle. Four stainless nozzles spray rinse water around the outside of the bottle. Two additional stainless nozzles spray water up at an angle on the neck and crown of the bottle. Rinse water is sprayed inside as well. *Exposure time in this section ranges from 12 to 17 seconds depending on the machine speed chosen by the operator.*

#### **Sterilizer Section**

Steelhead features the most comprehensive bottle sterilization in the industry. This system utilizes a built in tank, high volume stainless steel pump, stainless body air operated control valves, and an ozone production and recirculation system. Ozone laden water is sprayed inside the bottle by stainless steel nozzles in several stations. This solution is recirculated (not thrown away) and is constantly recharged with ozone gas to maintain a level of ozone capable of destroying all bacteria. **Exposure time in this section ranges from 48 seconds to 72 seconds depending on the machine speed chosen by the operator. This section has been NSF certified for bacteriological reduction of over 6 log.**

#### **Final Rinse Section**

Ultra systems provide a final rinse station for the inside of the bottle. This system uses water supplied either from the process water connection (domestic supply) or the filler supply connection (product supply) and utilizes a stainless air operated valve to control the flow. A unique feature provided by Steelhead for the final rinse station is a pulsating rinse. The operator can change the final rinse from a continuous spray to a pulsating spray through the man-machine interface. Pulsating spray saves water (when using product water) while still creating an aggressive rinse action.

#### **Wash Tank Makeup**

The wash detergent tank on the Ultra systems features an automatic makeup system that keeps the tank topped off with the correct detergent concentration. Water for this makeup is drawn from the used rinse water to conserve total water usage. Soap is pumped in via a pulsating pneumatic pump. Pump stroke frequency is controlled by the operator, via the man-machine interface.

#### **Water Usage**

The Ultra system is an incredible miser when it comes to water usage. This system conserves water through the following method.

Water used in the final rinse station drains into the sterilizing rinse tank. Ozone is applied here and this water is used for the sterilization. The repeated introduction final rinse water to the sterilizer tank

causes it to overflow. This overflow is directed to the post rinse tank and is used for removing the soap from the bottles. The water in this tank then overflows to the drain. However, anytime the soap tank needs addition of water (due to dragout and steam loss), it is drawn from the post rinse tank, conserving usage even further. The result is a total usage of less than 1 gallon per bottle when using the continuous final rinse. If the pulsing option is initiated, usage drops below ½ gallon per bottle.

Steelhead accomplishes overall fluid conservation in two other distinct ways. When bottles are indexed from one position to the next, the sprays are turned off. This eliminates sprays being misdirected, which often results in fluid loss and mixing of fluids. The second, equally important, feature is the washer door. The entire area where washing and rinsing takes place (except final rinse) is closed off by a single stainless steel door, anytime sprays are on. This seals in the steam (and heat) as well as the ozone gas during spray operations.

## **SYSTEM ELECTRICAL AND ELECTRONIC CONTROLS**

### **Machine Controller**

The Steelhead Ultra Bottling Systems use top of the line programmable logic controllers to operate the automated systems of the machine. These controllers are extremely reliable, easy to monitor, and simple to change. Monitoring of program functions is made even simpler by the connection a man-machine interface display unit, described below. Together, these state-of-the-art units greatly enhance the operation of the machine.

### **Operator Controls**

The Steelhead Ultra Bottling Systems are designed to group operator controls for maximum functionality. Steelhead set the standard for this functionality when we introduced the Mini-Plant concept in 1985. All controls and information necessary for the proper operation of the machine are located on one panel in the exact spot that the operator must stand to operate the machine. On today's machines this includes:

- Man-Machine Interface Display Unit – Displays machine speed, current production, fill status and many other parameters. Allows programming of fill height (not just time) in the bottle, machine speed and many other items. Also displays start-up check-list screens, alarm screens to indicate malfunctions, activation of certain automated functions, and reminders for certain service requirements.
- Analog display of spray pressures and wash temperature.
- Large, easy to use switches for all functions of the machine.

### **Electrical Controls**

Ultra Bottling Systems group all electrical systems into one NEMA 4 enclosure. This enclosure is protected by a main disconnect switch which prevents access to the high voltage areas while power is applied. All wire routing is accomplished through sealed stainless steel channels that are integrated into the chassis of the machine. All flex connections are accomplished with approved non-metallic conduit and connections. These are just some of the features that allow Steelhead systems to meet UL, CSA and CE requirements for electrical controls.

Steelhead equipment can be built for any single or 3 phase voltage requirement in the world. Where 120V service is not available, Steelhead will integrate a step-down transformer into the machine at no extra charge. Electrical connection to a Steelhead machine is as simple as connecting the required circuit to the single point terminal specified in the connection diagram.

## FILLER/CAPPER SYSTEM

Steelhead's Ultra Bottling Systems incorporate the most advanced filling and capping systems available on the market. From the volumetric fill control to Steelhead's complete cap delivery system, it can't be matched.

### ***Bottle Handling System***

Steelhead's unique system for bottle handling and movement reduces wear and breakage of the bottles. Unloading from the washer to the filler is accomplished with robotic arms as opposed to dumping it out and letting it slide down a chute. The arms gently place it in the upright position on UHMWPE runners and a pneumatic piston moves it to the filling position. After filling it is moved to the capping position in the same way.

### ***Bottle Filling Control System***

Because of the technology used, Steelhead filling systems do not have to insert the nozzle in the bottle to accomplish the fill. Water spillage and *repeated pressure on the container* is eliminated (with proper operation) through precise measurement of the water flow and a two-stage fast fill/slow fill control system. We call it "volumetric fill control", and it works like this.

- A volumetric flow sensor measures the water flow as it travels to the bottles. This information is received and processed by the plc.
- The plc monitors the current flow and compares it to presets entered by the operator.
- The 1<sup>st</sup> stage fill (fast fill) shuts down when the water level reaches the crown of the bottle. (This level is determined by the operator).
- The 2<sup>nd</sup> stage fill (slow fill) shuts down when the volume of water filled equals the volume specified as a preset by the operator. Fill amounts are controlled precisely and no spillage or overflow occurs.

In addition to providing precise fill volumes, this system eliminates spout movement (simplified operation), mechanical contact with the bottle (no possibility of damage or contamination to the bottle), and the need for overflow piping which may be connected to pipes that lead to drains or tanks (possible contamination points).

### ***Capping System***

Steelhead has developed its own unique capping system that handles the caps from the hopper all the way to delivery on the bottle's neck. This is accomplished with no exposure to the open atmosphere or human intervention and minimal distress on the cap. The system is constructed 100% from Stainless Steel and is incorporated into the overall design of the machine. This means it not only works better, it looks better too! The basic operation of the system is as follows:

1. Caps are poured into the stainless hopper and covered by a stainless lid.
2. The cap sorter bowl has a sensor that detects the absence of caps. When caps are required, the plc signals doors inside the hopper to open, and a vibrator to gently move caps into the sorter bowl. Caps are gently orientated and sorted and placed in the cap delivery chute.
3. As the bottle moves from the filler to the capper position, it passes through the cap chute and a cap is placed on the neck. This cap has been warmed as it passed through the chute. Warming makes cap placement less stressful for the machine and bottle. The cap will also be sprayed with ozonated water (optional) before delivery.
4. The bottle reaches the capping position with the cap on the neck and partially depressed. A pneumatic cap ram pushes the cap completely onto the bottle at this point. The pressure used to push on the cap is adjustable by the operator. The bottle is not moving during this operation.

The result of this system is reliable positive cap placement and depression on every bottle.

MACHINE COMPLIANCE, CERTIFICATIONS, AND APPROVALS:

