CS SERIES

# AQUA MAGIC

# Owner and Operational Manual


Model: _____

Serial Number: _____

Install Date: _____

Installed By:_____

Service Phone:_____

Sold By: _____

**Please read this manual carefully before proceeding with installation. Your failure to follow any of these instructions or operating parameters may lead to personal injury or damage to the equipment and/or personal property. Do not use this water treatment system with water that is microbiologically unsafe or of unknown quality, without adequate disinfection before or after the system. This water treatment system contains replaceable treatment components critical for effective performance. It is the user's responsibility to periodically test the product water to verify the system is performing satisfactorily. Failure to properly maintain this water treatment system may cause a health risk.**

**Save this manual for future reference**

LEGACY VIEW

Bluetooth®

ANDROID APP ON Google play

Available on the App Store

NSF/ANSI/CAN 61

IAPMO R&T ®

FRAKCO

Aqua Magic CS 121 Series
4.17.2024 SB

# Table of Contents



## Register your product online at

www.chandlersystemsinc.com

### WARNING:

**Lubricants**

Do NOT use Vaseline, oils, hydrocarbon lubricants or spray silicone anywhere! Petroleum base lubricants will cause swelling of o-rings and seals. The use of other lubricants may attack plastic Noryl®. It is recommended that Dow Corning® silicone grease be used as a lubricant for all control valves. Dow Corning® 7 Release Compound is used in the manufacture of Chandler Systems control valves. (Part # LT-150)

**Sealants**

Pipe dope and liquid thread sealers may contain a carrier that attacks some plastic materials. It is recommended that only Teflon® tape be used to seal plastic Noryl® threaded fittings.

FCC Compliance Statement:
http://www.chandlersystemsinc.com/files/FCC_Compliance_Statement.pdf

Industry Canada Compliance Statement:
http://www.chandlersystemsinc.com/files/Industry_Canada_Compliance_Statement.pdf

One or more features of this product are covered by U.S. patents, visit http://csih2o.com/patents.php for more information.

# LEGACY VIEW

## Setup
## Control
## View History
## Modify Settings
## Monitor Water Usage

Bluetooth™

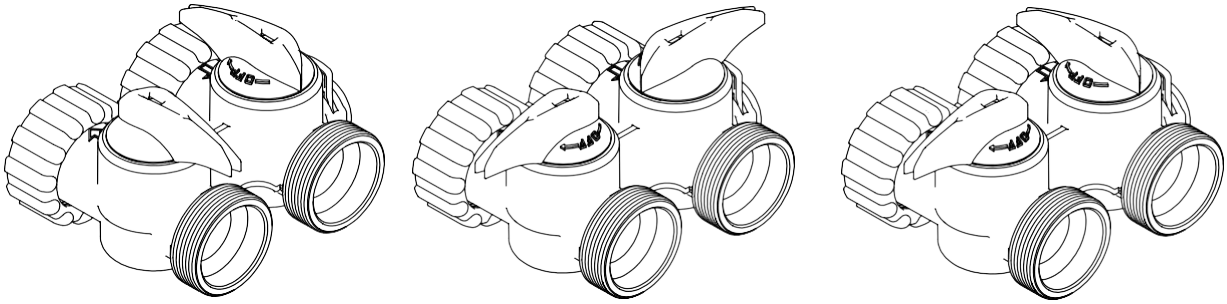

# Detailed Valve Description

The CSB121 Bluetooth valve has fully automatic control mechanisms that direct and regulate all cycles of the water treatment unit. The control valve has been designed to make it easily serviceable. The inlet, outlet, drain and access to the water meter are all hand only tighten nuts making them quick and convenient to service. Accessing the injector or the brine port plug is quick access plug-in style with a clip, possibly only needing a flat head screwdriver to open the plug. Accessing the piston and seals only requires removing 5 Philips head screws and separating a few plastic clips by hand. All of this means that the valve is quick and simple to service and you do not need any specialized tools to work on the valve.

The control valve has two piston options. The first is a hardwater bypass piston, which allows hard water to be bypassed from inlet to outlet during the valve regeneration cycle. This is typical on a single tank softening or filtering system. The other option is a non-hardwater bypass piston option, which does not bypass hardwater from the inlet to the outlet during the valve regeneration cycle. All pistons have a patented water shutoff position (U.S. Patents 9714715 & 10012319). The Bluetooth can command valves to be in service, providing treated water, or in stand-by with outlet water shut off waiting for when it is needed. If your valve is using the “no hard water by pass piston, during the regeneration process, inlet water is used to perform the steps of the regeneration of the softener tank and the outlet water port is shut off when in. The control valves / pistons are only available in downflow regeneration.

The Bluetooth valve includes a turbine flow meter that is integral to the valve body. The meter is quick to access without having to separate any plumbing in case of needing to service the meter. Simply turn the bypass valve to bypass or turn the water off in the Legacy View App and loosen the nut securing the water meter, if necessary, use a flathead screwdriver under the edge to remove the flow meter from the outlet port of the valve. The meter uses set pulses per gallon over the entire flow range and has excellent accuracy at all flows above 0.75 gallons per minute. The meter allows the Bluetooth to monitor water usage and look for potential problems.

### CSB121 Bypass Operation



# Advanced Configuration of Valve Device Components

**These products will come with the board already setup, ready to use for most installations.**

Valves from the factory are preset as follows:

- Softeners
- Backwashing Filters

All these settings are on the Advanced Settings page in the app.

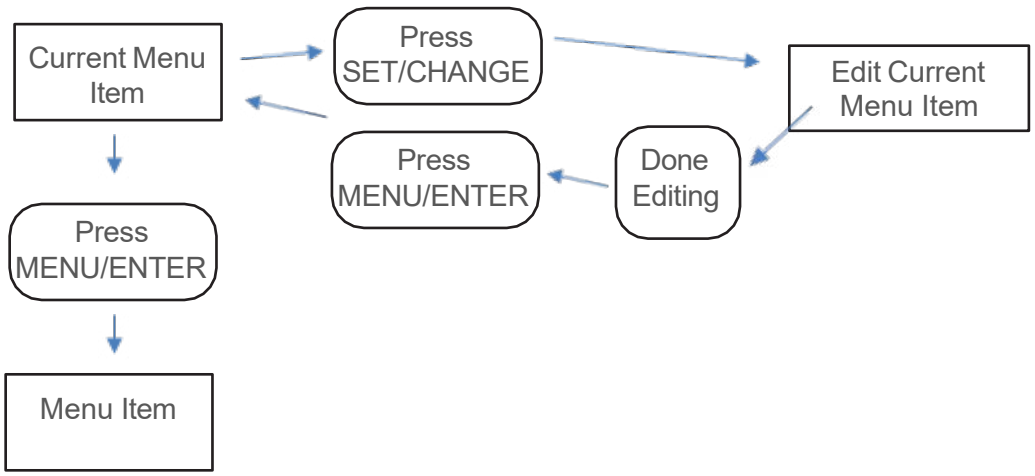
These factory presets allow for simple setup without the need for Advanced programming in a majority of installations. Some situations, however, may cause you to need to change the configuration of the board. There are up to 5 settings available on the commercial valve board configuration.

1. Regeneration Day Override. Up to 29 days.
2. Reserve Capacity. Metered systems count the gallons of water used to determine when the resin capacity will be depleted. The reserve percentage will ensure the tank can provide treated water until the scheduled regeneration time.
3. The softener resin capacity. This is available if the first option is set to Softener. The capacity can be set to 45k, 60k, 75k, 90k, 120k, 150k, 210k and 300k. These are quick common settings, that should be set according to the amount of resin in the media tank.
4. Optional Display ON/OFF.
5. Brine Pre-Fill. Set system to fill the brine tank right before a regen cycle.

Tap this icon in the Legacy View app to view information for each configuration setting.

## Manual Configuration of Valve Device Components

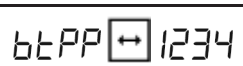
To enter the Main Menu Press the MENU/ENTER button, time of day will begin to flash.
To edit a menu item:



| Main Menu Items | Example | Notes |
|---|---|---|
| Set Time of Day | 12:00 | |
| AM/PM Setting | A or P | |
| Water Hardness setting | H 25 | Tested water hardness of the water this softener is treating. Measured in grains per gallon. This will only appear for metered softener type valves. If value is set to 0, Automatic Regeneration from water usage will be disabled. Maximum setting is 99. |
| Backwash Day | A 06 | Number of Days between Backwash cycles. This will only appear in this menu for filter type valves. If value is set to 0, Automatic Back-wash cycle will be disabled. Maximum setting is 29. |

To enter the Advanced Menu simultaneously press and hold both buttons for 5 seconds. Once Regeneration Time of Day appears and is flashing release the buttons.
***Note: Advanced Programming functions can affect the efficiencies and the ability to properly treat the incoming water. Use caution when adjusting these settings.***

| Advanced Menu Items | Example | Notes |
|---|---|---|
| Regeneration Time of Day | r 2A | When regeneration or backwash will occur, this example is 2 am. |
| Regeneration Day Override | A 14 | Number of Days between Regeneration cycles. This will only appear in this menu for softener type valves. If value is set to 0, Automatic Regeneration cycle by day override will be disabled. Maximum setting is 29. |
| Regeneration Step Times | 1 08 | Indicates adjustable time in minutes for each step of the regeneration or backwash cycle. If value is set to 0, that step will be skipped in the cycle sequence. The following are the steps for Softeners and Filters.<br><br><u>Softener Cycle Steps</u>:<br>1: 1st Backwash Step<br>2: Brine Draw / Slow Rinse Step<br>3: 2nd Backwash Step<br>4: Rapid Rinse Step<br>Note: The 5th cycle step is Brine Fill, but it is adjusted using the "SALT" setting.<br><br><u>Backwash Cycle Steps</u>:<br>1: Backwash Step<br>2: Rest Step<br>3: Rapid Rinse Step |

| Advanced Menu Items | Example | Notes |
|---|---|---|
| Salt Dose | SALt 015 | This setting is the amount of salt that will be used per regeneration cycle to regenerate the softener resin. This will only appear for softener type valves. Maximum setting is 199. |
| System Capacity in Grains | c050 | The physical capacity in treatable grains of hardness that the softener can treat before needing to regenerate. This will only appear for softener type valves. Maximum setting 399. |
| Reserve Capacity | P 25 | The treatable tank capacity percentage that is reserved for the last day before regenerating so hard water break through does not occur. This will only appear for softener type valves. Maximum setting is 49. |
| Bluetooth Enable | bE 1 | This enables or disables the ability for the valve to be connected to via a Bluetooth connection using the Legacy View app. 1 enables Bluetooth, 0 disables Bluetooth. |
| Bluetooth Password |  | The 4 digit password that is required for a user to be able to use the Legacy View app to connect to a Bluetooth valve. This value is set to 1234 by default. Legacy View will attempt to use 1234 for any valve that it has not connected to before. If the password was changed by a user Legacy View will prompt asking for the password. The password can always be viewed through the menus, so the valve should be in a secure location if limiting access is required. |
| Brine Prefill Enable | PE 0 | This enables or disables brine prefill. When enabled the valve will wait to fill the brine tank with water until just prior to a regeneration cycle. When disabled the valve will fill the brine tank as the last step of the regeneration process. This will only appear for softener type valves. 1 enables the prefill, 0 disables the prefill. |
| Prefill Brine Soak Duration | Pd 3 | This setting determines the length of time in hours to allow the water to absorb the salt and make the brine solution in the brine tank. This will only appear when Brine Prefill is enabled. Maximum setting is 4. |
| Display Off | do 0 | This setting when enabled turns the LED display off. 1 turns the display off, 0 turns the display on. |

# Valve specifications, Quick Reference Table

| Valve Series - Piston Type<br>Tank Opening | CSB121 – NHWB – 2.5" with Bypass Valve | CSB121 – HWB – 2.5" with Bypass Valve |
|---|---|---|
| Service Flow Rate @ 15 psig (with meter) | 25.5 | 27.7 |
| Service Flow Rate @ 25 psig (with meter) | 32.2 | 35.6 |
| Backwash Flow Rate @ 25 psig | 27.2 | 24.4 |
| Min./Max. Operating Pressure | 20 – 125 psig | |
| Min./Max. Operating Temperature | 40°F – 120°F | |
| Outlet water state during regeneration | Shut-off | Inlet Bypassed |
| Brine Refill Rate | 1.0 gpm Brine Line Flow Control | |
| Drain Line Flow Controls | 2.4 / 3.2 / 4 / 5 / 8 / 9 / 10 / 12 / 15 / 20 / 25 / 32 gpm | |
| Brine Draw Injector Rates @ 60 psi (see injector charts for details) | Red #0 (p/n: CS125-0#) – 0.25 gpm<br>White #1 (p/n: CS125-1#) – 0.35 gpm<br>Blue #2 (p/n: CS125-2#) – 0.5 gpm<br>Yellow #3 (p/n: CS125-3#) – 0.63 gpm | |
| Distributor Tube Opening | 1" O.D. (1" NPS) | |
| Tank Thread | 2 ½" – 8 NPSM | |
| Drain Line Connection | 1" NPT Male | |
| Brine Line Connection | 3/8" Push-Lock | |
| Default Inlet / Outlet Connections | 1 " NPT Male | |
| Commercial Control Board | EVB-019-BT-C | |
| Power Adapter | 12 VDC, 2.5mm x 5.5mm Barrel, Center Positive, 1000 mA Min. | |

# Valve Control Board Connections

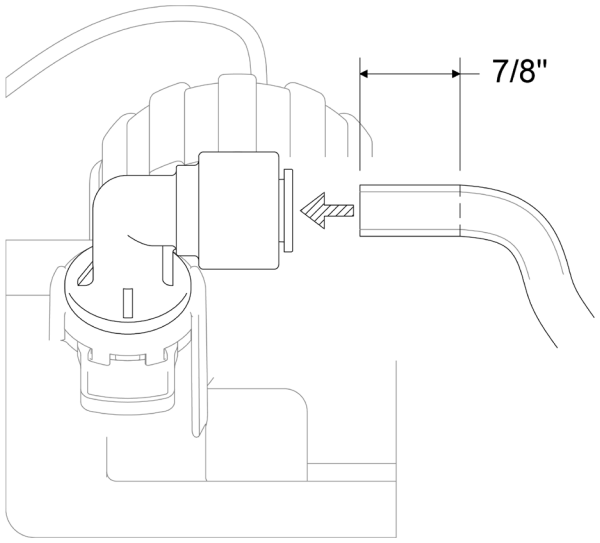

**EBV-019-BT-C**

The valve board wiring connections are labeled clearly according to their function. “Salt Sensor”, “Ext. Valve” and “Ext Water Meter” are for future use and for now should not be connected to.

# Brine Line Push-Lock Connection

To connect the brine tubing to the brine port on the valve:

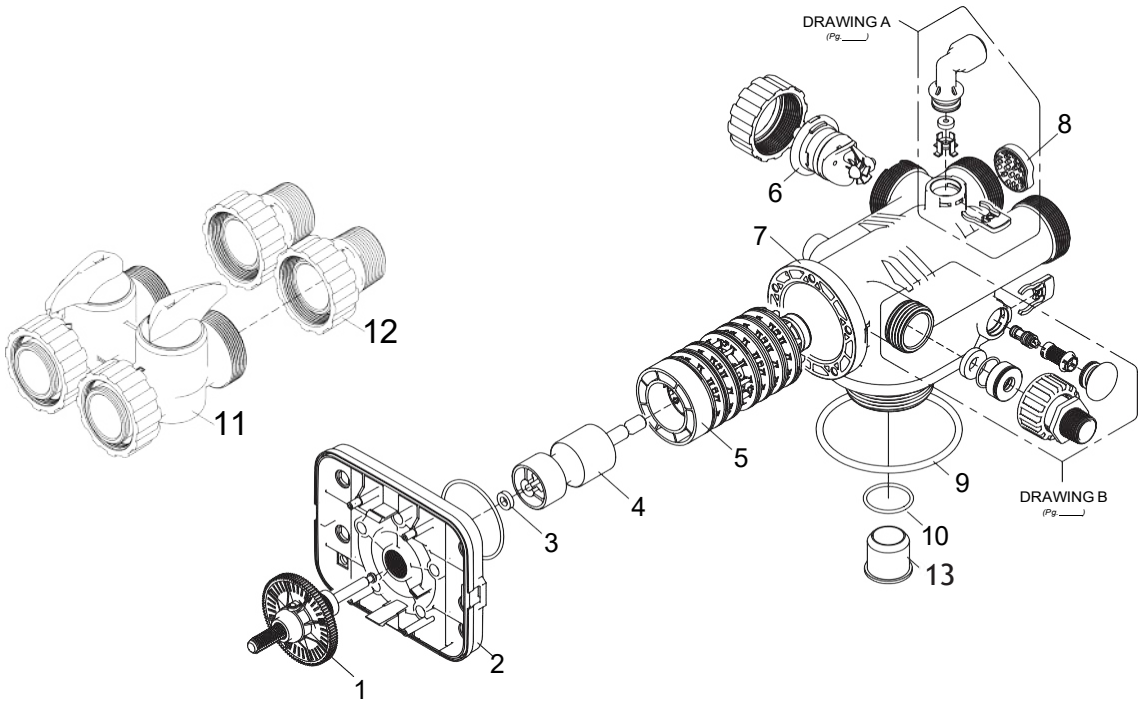
1. Make sure the 3/8” brine tubing is cut squarely on the end.
2. Push the tubing into the fitting 7/8” to be sure it is past the O-ring seal.




To release the brine tubing from the brine port on the valve:

1. Remove the orange locking clip from the brine port fitting.
2. Push in on the gray ring surrounding the brine tube, at the same time pull out on the brine tube.

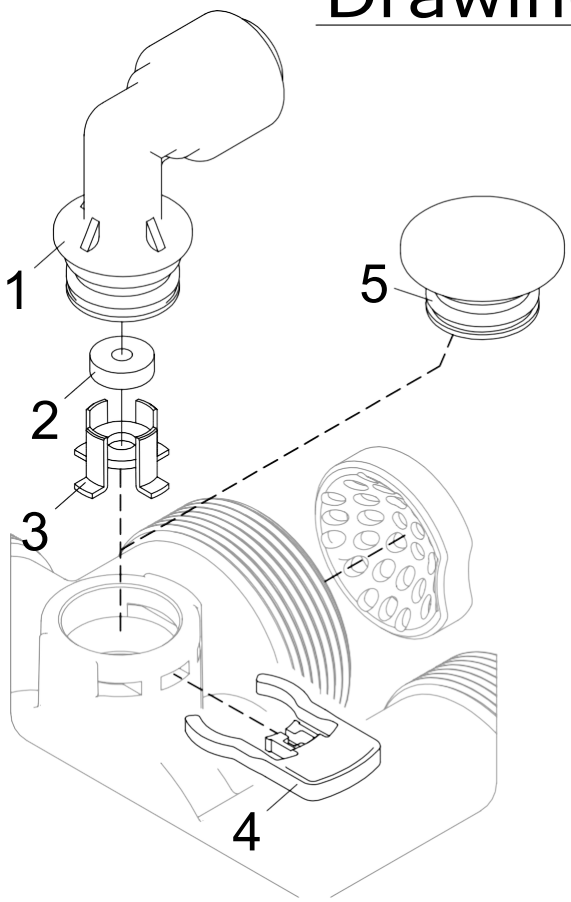
# CSB121 VALVE PARTS - VALVE BREAKDOWN




| No. | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 20125X001 | Encoder Wheel and Piston Rod Assy. | 1 |
| 2 | 20125X002 | Valve Body Seal Plate with O-Ring | 1 |
| 3 | 20125X003 | Piston Spacer / Stall Ring | 1 |
| 4 | 20125X004 | Softener Piston (Hardwater Bypass) | 1 |
| | 20125X005 | Softener Piston (No Hardwater Bypass) | |
| | 20125X023 | Filter Piston (Hardwater Bypass) | |
| | 20125X024 | Filter Piston (No Hardwater Bypass) | |
| 5 | 20125X006 | Seal & Spacer Stack | 1 |
| 6 | 20125X007 | Water Meter | 1 |
| | 20125X007-P | Water Meter / Pressure Sensor Combo (Optional) | |
| 7 | 20125X008 | CS121 Valve Body (HW) | 1 |
| | 20125X013 | CS121 Valve Body (NHW) | |
| 8 | 20125X032 | Flow Straightener | 1 |
| 9 | 20125X010 | Tank Seal O-ring | 1 |
| 10 | 20125X011 | Riser Tube O-ring | 1 |
| 11 | CS125-BP | 1.25” CS Bypass (Optional) | 1 |
| 12 | 20125X030 | 1” NPT Yoke for Inlet / Outlet | 1 |
| 13 | HPS210430 | Distributor Tube Adapter | 1 |

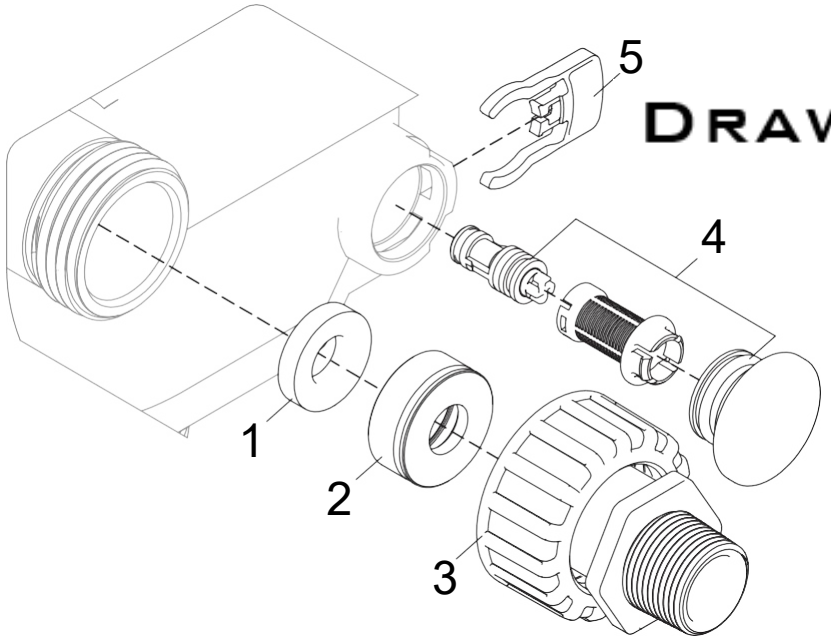
# CSB121 VALVE PARTS - BRINE CONNECTION

Drawing A




| No. | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 20125X034 | 3/8” Push-Lock Brine Line Fitting | 1 |
| 2 | 20125X035 | Brine Line Flow Control, 1.0 gpm | 1 |
| 3 | 20125X014 | Brine Line Flow Control Retainer | 1 |
| 4 | 20125X015 | Red Locking Clip | 1 |
| 5 | 20125X025 | Optional Brine Plug for Filter Valves | 1 |

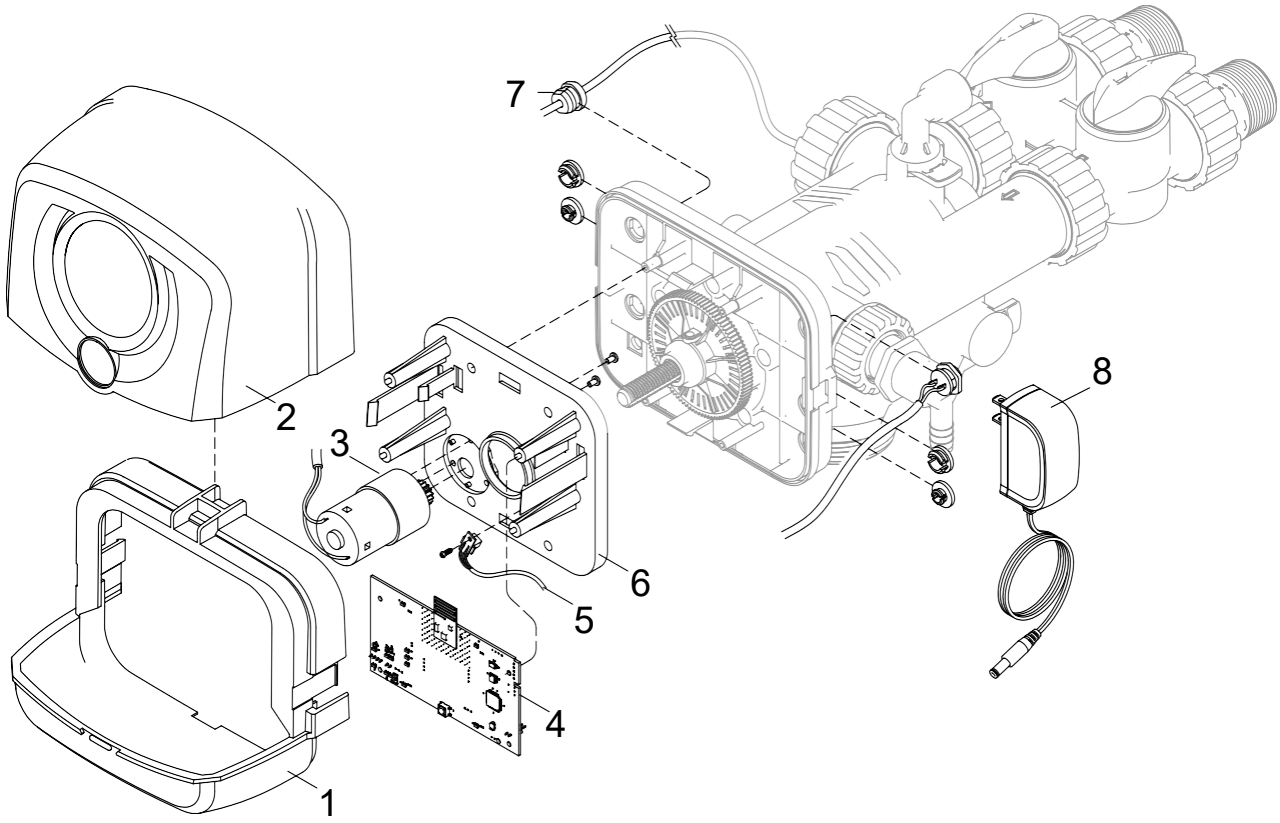
# CSB121 VALVE PARTS - INJECTOR ASSY.




DRAWING B

| No. | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | CS-DLFC-2.4 | Drain Line Flow Control, 2.4 gpm | 1 |
| | CS-DLFC-3.5 | Drain Line Flow Control, 3.5 gpm | |
| | CS-DLFC-4 | Drain Line Flow Control, 4 gpm | |
| | CS-DLFC-5 | Drain Line Flow Control, 5gpm | |
| | CS-DLFC-8 | Drain Line Flow Control, 8 gpm | |
| | CS-DLFC-9 | Drain Line Flow Control, 9 gpm | |
| | CS-DLFC-10 | Drain Line Flow Control, 10 gpm | |
| | CS-DLFC-12 | Drain Line Flow Control, 12 gpm | |
| | CS-DLFC-15 | Drain Line Flow Control, 15 gpm | |
| | CS-DLFC-20 | Drain Line Flow Control, 20 gpm | |
| | CS-DLFC-25 | Drain Line Flow Control, 25 gpm | |
| | CS-DLFC-32 | Drain Line Flow Control, 32 gpm | |
| 2 | 20125X016 | DLFC Retainer | 1 |
| 3 | 20125X033 | 1” NPT Drain Line Connector | 1 |
| 4 | CS125-0# | Red #0 Injector, with screen and cap, CS125 | 1 |
| | CS125-1# | White #1 Injector, with screen and cap, CS125 | |
| | CS125-2# | Blue #2 Injector, with screen and cap, CS125 | |
| | CS125-3# | Yellow #3 Injector, with screen and cap, CS125 | |
| | 20125X026 | Brine Injector Plug for Filters, with screen and cap | |
| 5 | 20125X015 | Red Locking Clip | 1 |

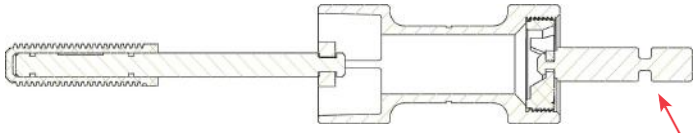
# CSB121 POWERHEAD




| No. | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | 20125X017 | Commercial Slide Cover Bracket | 1 |
| 2 | 20125X018 | Commercial Slide Cover | 1 |
| 3 | 20125X019 | Geared Piston Motor | 1 |
| 4 | EVB-019-BT-C | Commercial Control Board | 1 |
| 5 | 20125X020 | Optical Position Encoder | 1 |
| 6 | 20125X021 | Commercial Power Head Backplate | 1 |
| 7 | 20125X007 | Meter Assembly | 1 |
| 8 | 20125X027 | Power Supply 1A 12VDC 10 ft. Cord | 1 |

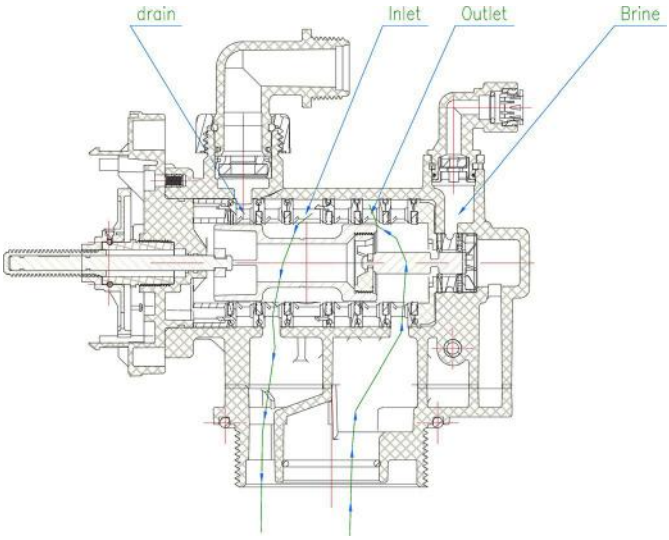
# VALVE BODY FLOW DIAGRAMS

## Untreated water bypassing during regeneration piston

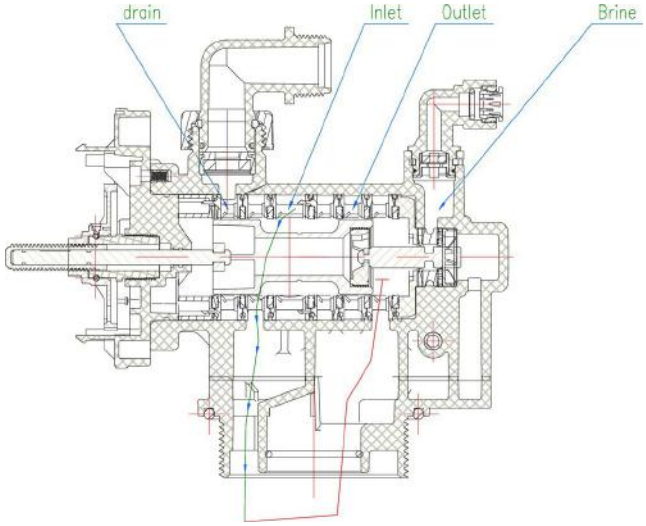


Note: Brine Piston for Softeners only

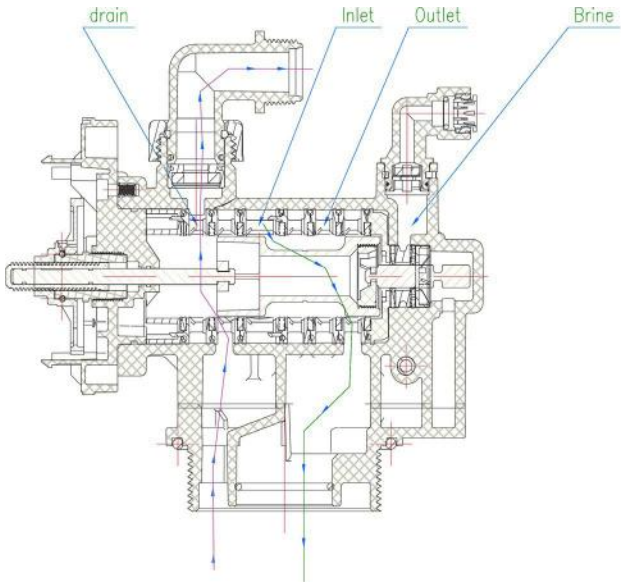
## Service



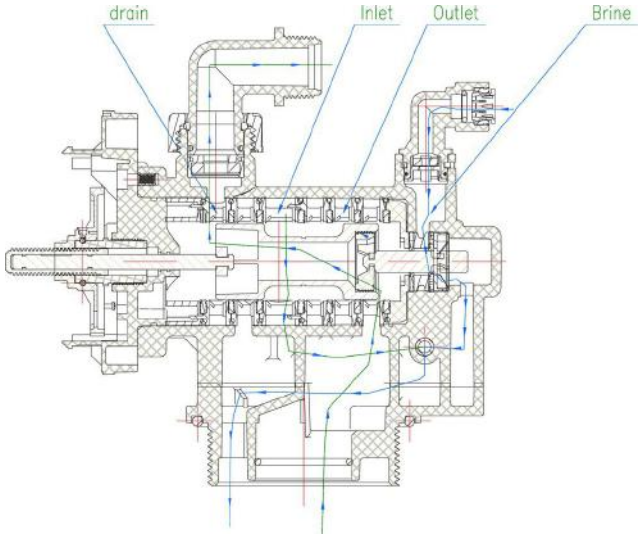

## Outlet Shutoff



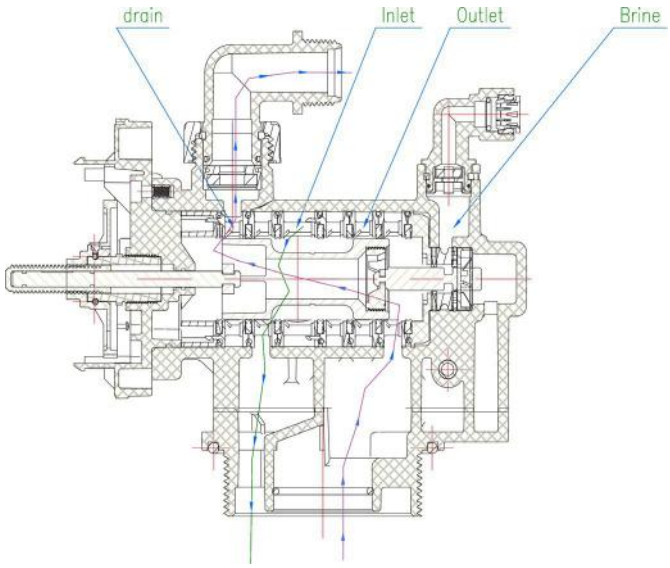
## Backwash



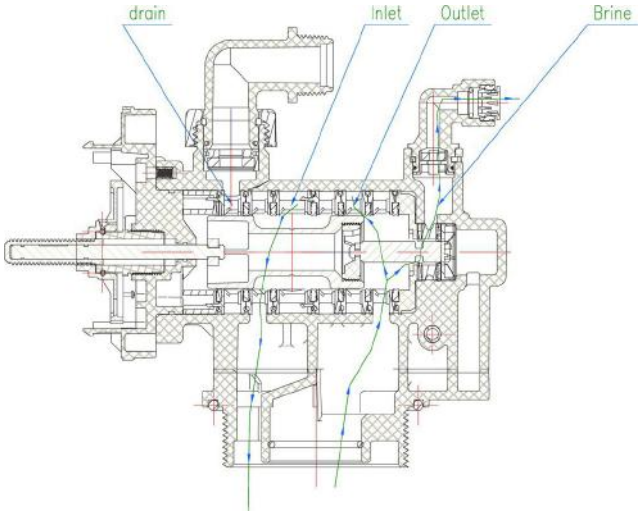

## Downflow Brine



## Rinse

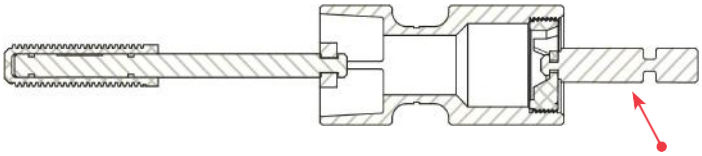



## Brine Fill



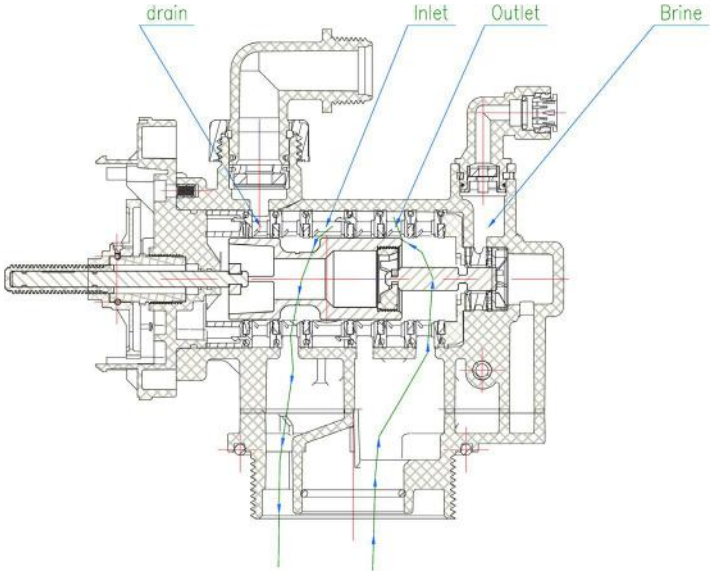
# VALVE BODY FLOW DIAGRAMS

## Outlet water shutoff during regeneration piston

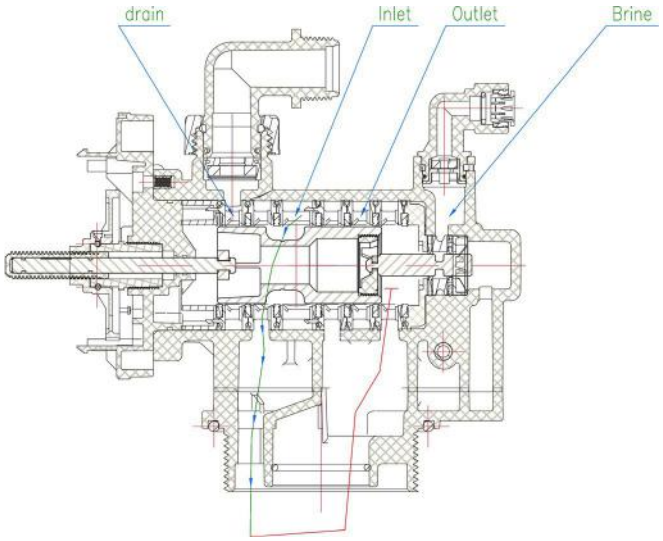


Note: Brine Piston for Softeners only

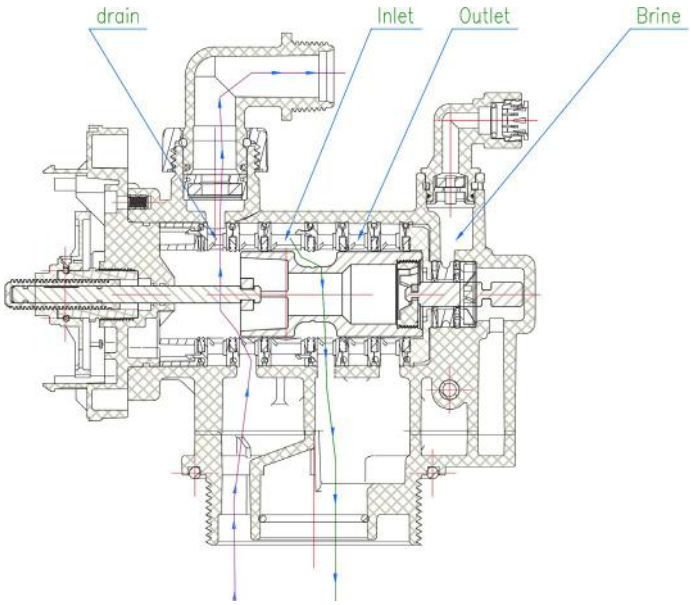
## Service



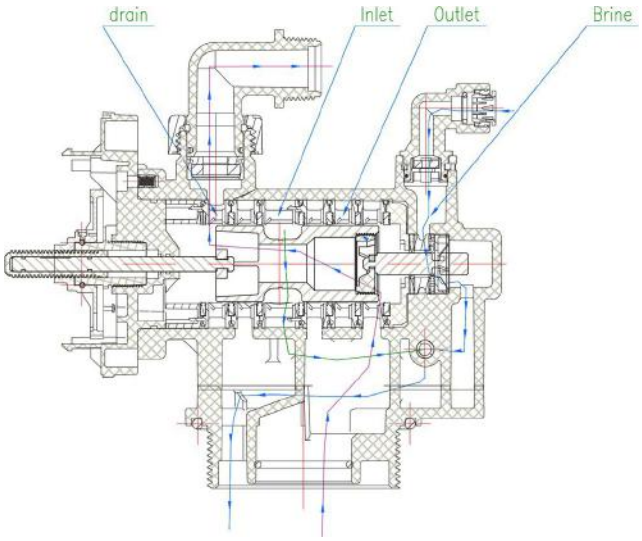

## Outlet Shutoff



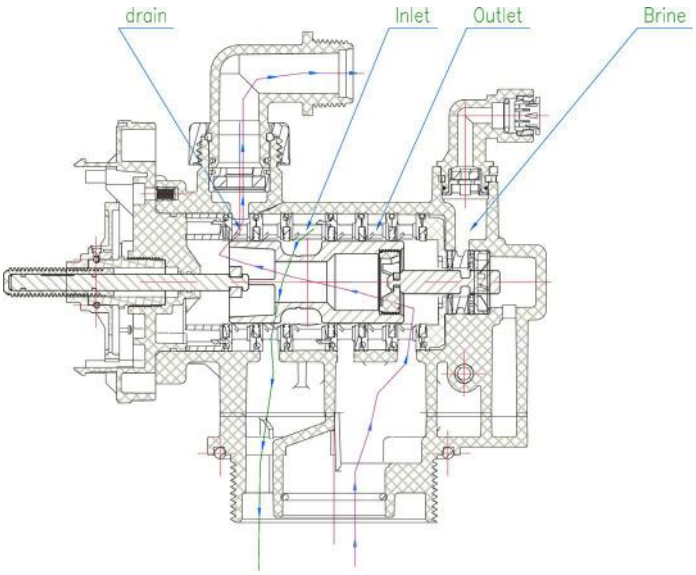
## Backwash



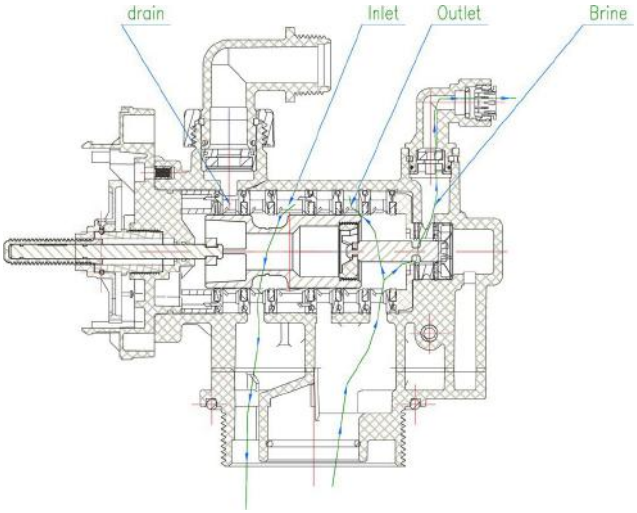

## Downflow Brine



## Rinse




## Brine Fill



# Water Treatment System Warranty

This quality FRAKCO water softener is designed and built to provide many years of satisfactory performance under normal use. FRAKCO, INC. pledges to the original owner that for sixty months, all non-wearable items of the above-described water treatment system proven to be defective due to workmanship and/or materials will be replaced or repaired. FRAKCO also pledges that the fiberglass media tank is covered under this warranty for ten years if owned by the original purchaser. Our pledge does not apply if the damage is caused by defective installation; water pressure in excess of eighty pounds per square inch; water temperature in excess of 110° F.; misuse; unauthorized alterations; freezing; accident; fire; neglect; or damage caused by shipping.

To obtain service under this warranty, notify FRAKCO, INC in writing of any defects in workmanship within thirty days of the appearance of such defects. Such written notice must include the date of purchase, the part number, and a description of the defect. Upon receiving such notice and determining that the defect is covered by this warranty, FRAKCO, INC. will replace or repair the defective item. Replacement of a defective item will be at FRAKCO'S factory in Luverne, MN, and the purchaser must ship the defective item at its own expense to FRAKCO'S factory. Replacement items will be shipped by FRAKCO F.O.B. Luverne, Minnesota, with a shipping carton furnished. In the event certain models or colors of the replacement item are out of stock, FRAKCO, INC. may, after notifying the purchaser, furnish another model or color of the replacement item. The factory will not pay for service charges and will not perform any repair or service functions other than at its home office. Please follow the enclosed instructions and local codes in installing your water treatment system. Failure to do so will void this warranty. Nothing in the warranty may be construed as involving the factory in the relationship between Dealer and Owner.

This warranty gives the purchaser specific legal rights. The purchase may also have implied warranty rights. In the event of a problem with warranty service or performance, the purchaser may be able to go to a Small Claims Court, a State Court, or a Federal District Court. This warranty complies with the 1975 Federal Warranty Law.

Model No. _____ Serial No._____

Date Installed _____ Dealer _____

Address_____

*MANUFACTURED BY: FRAKCO, INC.*
*500 N BLUE MOUND AVE*
*LUVERNE, MINNESOTA*
*56156 WWW.FRAKCO.COM*