

# EC5 Series Water Treatment System Installation and Service Manual



*Rain Soft*®  
Taking the Worry Out of Water ...Since 1953



This product is manufactured in an ISO 9001:2015 certified facility

Part No.:16843  
Rev. C. 09/23

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## Application Limitations

On hardness levels of 60 grains and higher, the system may not achieve a hardness of less than 1 grain, due to high Total Dissolved Solids; some bleed through is possible. Bleed through is also caused by sodium levels higher than 1000 parts per million. In either case, the system can be programmed to minimize these effects. Chlorine or Chloramine levels on municipality treated water supplies should not exceed 4 parts per million.\* In applications where high levels are a concern, pre-filtration is necessary to reduce the Chlorine or Chloramine to an acceptable level. When this system is installed on water with ferrous iron, also known as clear water iron, the maximum range of removal is based on local water conditions. The range is generally 2 to 10 parts per million. The system may require special programming, along with an additive to the brine tank, to maximize the equipment's ability to remove iron.

## Operational Specifications

### Plumbing

3/4 inch to 1 1/4 inch I.D.

### Drain Line

1/2 inch I.D.

Water Pressure

20 psi-120 psi (1.38 bar-6.89 bar)

### Operating Temperatures

40° F-100° F (4.4° C-37.8° C)

### Electrical Requirements

A properly grounded alternating current supply (110 VAC 60 Hz or 230 VDC 50 Hz) is required for system operation. The system operates at 24VDC 1.0 Amps, as provided by the included power supply.

### Bypass Valve

The manually operated bypass valve enables the conditioner to be isolated from the water service line for maintenance and service.

### Existing Plumbing Conditions

Plumbing should be free from lime and/or iron buildup. Piping that contains large amounts of lime and/or iron should be replaced.

### Additional Specifications

- Do not install this system where water is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
- This system must be installed in accordance with all applicable state and local laws and regulations.
- This system must be installed in an area not affected by extreme heat, cold, or the elements. The selected installation area must be adequate for easy service and accessibility.
- The installation must be on a cold water supply.

# Installation Instructions

## 1. Safety Precautions

- To prevent accidents and/or injuries, do not hoist the equipment over your shoulder; use a hand truck to transport the equipment.
- Do not lay the system on its side.
- Wear safety glasses and work gloves during installation and service.

## 2. Test the Raw Water

- If water contains iron, manganese or hydrogen sulfide, a separate iron removal system is suggested to be installed prior to the conditioner, consulting with your local dealer.

## 3. Check the Water Pressure

- Use a pressure gauge to confirm that the water pressure does not exceed 120 psi. If the water pressure does exceed this limit, install a pressure regulator on the inlet pipe of the system. The minimum water pressure for a conditioner is 20 psi; 60 psi is the optimum operating pressure.

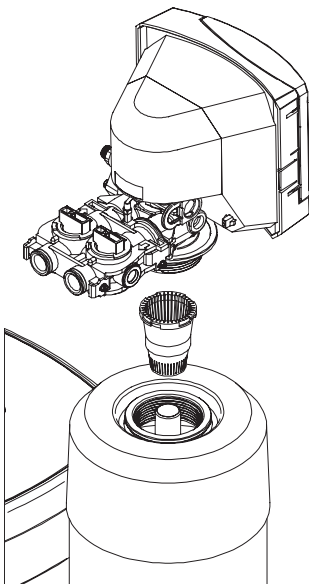
## 4. Locate a Site for the System

- There are three primary requirements needed for a site: a main water source, an air-gap drain, and a grounded electrical connection. Locate the system as close to these items as practical; Drain lines over 50 feet long, may need to be increased in size to allow proper flow.
- Place the system in the desired location. The location should have a level, smooth, and clean surface.
- If the system is installed outdoors, the outdoor model must be used. The system must also be protected from direct sunlight; direct sunlight can damage the fiberglass and system components. If necessary, build a box or shed.

## 5. Install the Valve Head

- Remove the cap plug from the tank.
- Lubricate the riser pipe O-ring and tank O-ring with Dow 111 silicone-based lubricant or equivalent.
- Attach the supplied upper basket to the bottom of the control valve; twist to lock in place. Do not use if water contains any amount of iron.

Figure 1



- Align the upper basket with the riser pipe and slowly lower the control valve onto the riser pipe, using a twisting motion.
- Align the control valve with the tank. Push down on the control valve and continue to turn it clockwise until the valve O-ring seals against the tank.

### 6. Turn Off the Water and Drain the Plumbing

- Turn off the water at the meter or the pressure tank.
- To drain the plumbing system, open all faucets in the house and flush the toilets. The water will drain out of the lowest faucet or outlet.
- Do not sweat pipes with water in them or while attached to the system; steam will damage the plastic parts in the valve.
- Do not point the soldering torch directly at the mineral tank or control valve. These composite materials will last a lifetime, but cannot withstand the intense heat from a torch.
- Avoid short connections of pipe between the system and the water heater. If you can't avoid a short connection, move the system to another location. As a last resort, install a heat trap or check valve. If this causes "water hammer", install a water hammer suppressor..

### 7. Provide Untreated Water for Irrigation or Outdoor Watering

- If available, run an untreated water line to outside faucet or provide a hose connection on untreated line prior to system.

### 8. Install the Yoke to the Bypass Valve

- Once the plumbing is complete, connect the yoke to the bypass valve (see figure 2).
- Support all plumbing connected to the yoke.
- Connect the raw water supply to the inlet pipe connection of the yoke. When looking at the front of the system, the inlet is the pipe connection on the right side of the valve (see figure 3). The arrow molded into valve indicates the direction of flow.
- Connect the treated water pipe to the outlet pipe connection on the yoke. When looking at the front of the system, the outlet is the pipe connection on the left side of the valve (see figure 3). The arrow molded into the valve indicates the direction of flow.

**Important Note:** Water heaters can some-times transmit heat back down the cold water pipe into the control valve. It may be necessary to install a back-flow prevention device to prevent this from occurring.

**Important Note:** The bypass valve is not designed to withstand heat from soldering or twisting from the attached threaded connections.

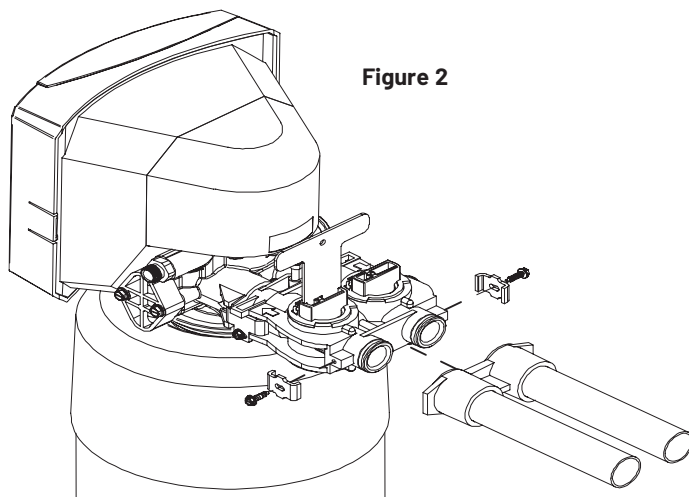


Figure 2

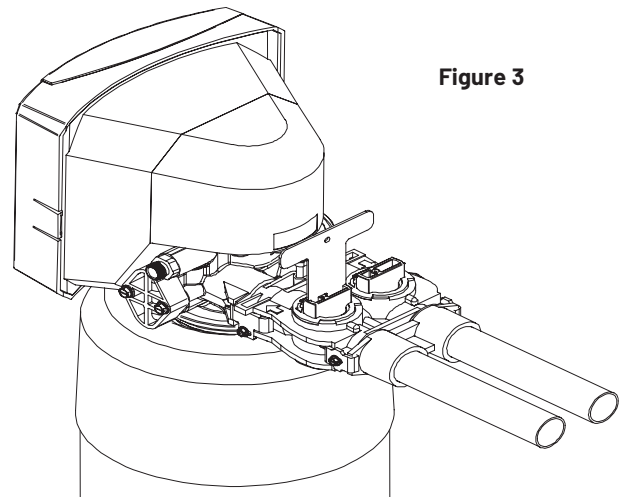
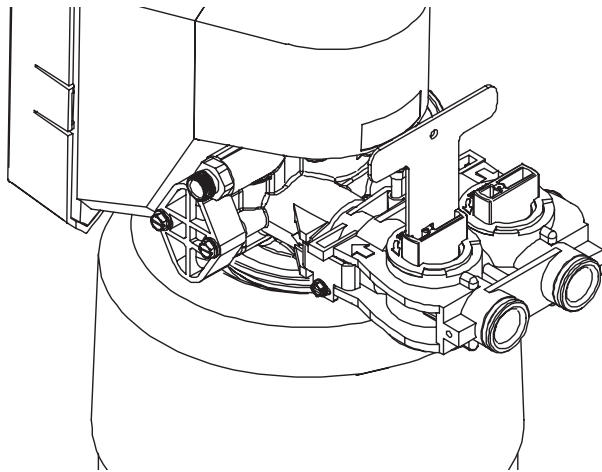


Figure 3

- Ensure that the bypass valve is in Bypass position. The valve handles should be perpendicular to the pipes (see Figure 4).

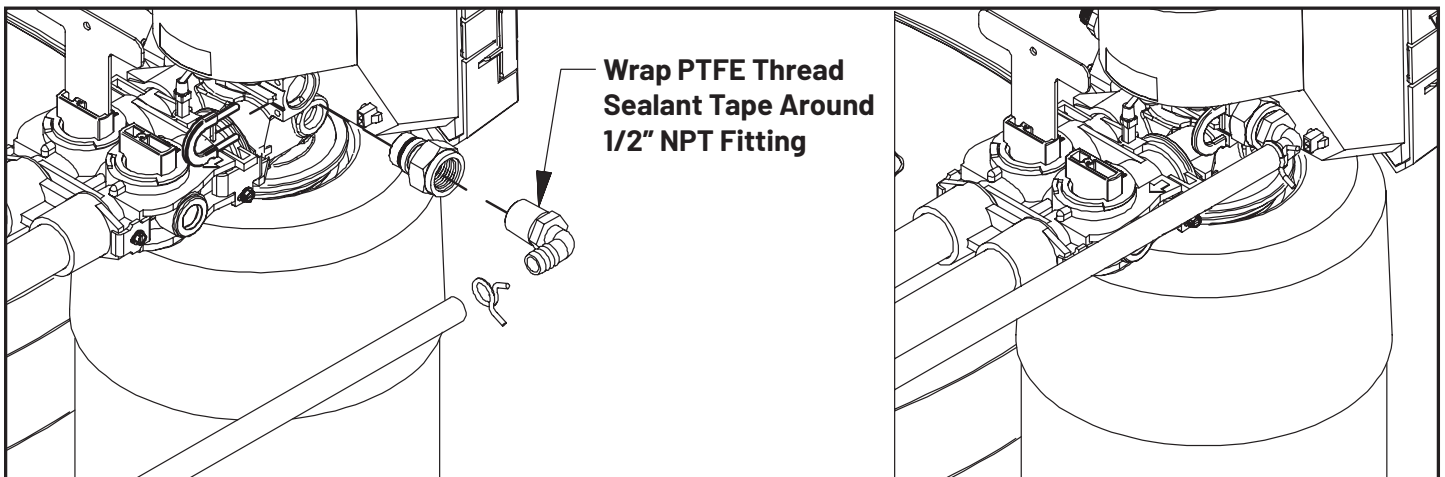
Figure 4



**9. Install the Drain Line and Air Gap (Air Gap Not Supplied)**

- For all drain lines, use at least a 1/2 inch I.D. line.
- Connect the drain line to the drain outlet on back of the valve, opposite the inlet connection (see figure 5). A fitting is required to connect the female pipe thread to the drain line

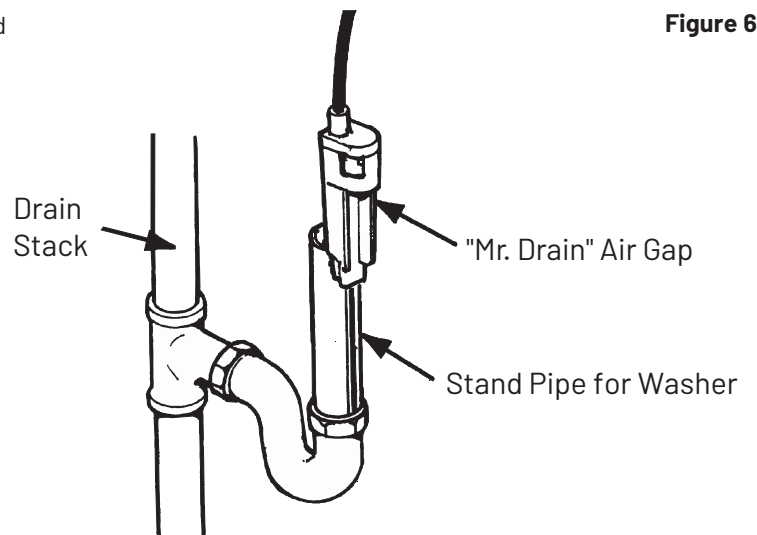
Figure 5



- Run the drain line to the air gap. The air gap must be installed between the end of the drain line and the drain to prevent possible back-siphoning (see fig 6).

Figure 6

**Important Note:** The air gap should be two times the diameter of the drain line or a minimum of two inches. Please check your local plumbing codes to ensure compliance.

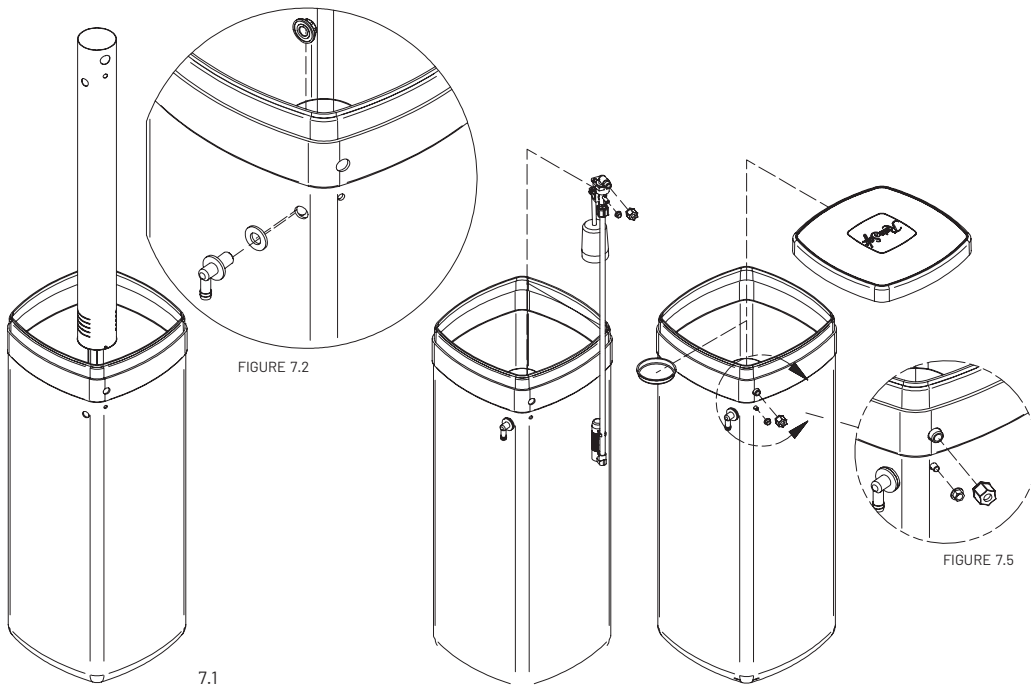


## 10. Install the Brine Safety Float

- Insert the brine well into the brine tank ( see figure 7.1)
- Attach the brine well to the brine tank with the overflow elbow. (see figure 7.2)
- Insert the safety float into the brine well. The top of the safety float should be about 5 inches from the overflow elbow (see Figure 7.3).

**Important Note:** Not Applicable for EC5-CAB models.

**Figure 7**

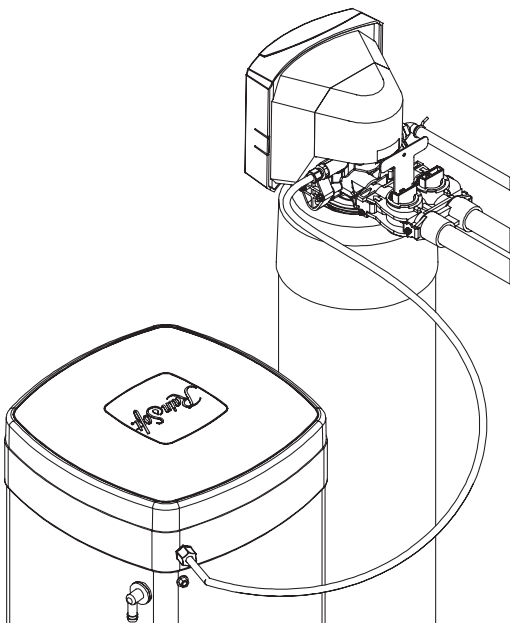


## 11. Install the Brine Line

- Slide the brass compression nut over the end of the brine line, followed by the ferrule and tube support. Attach the brine line to the brass fitting on the right side of the valve (see Figure 8).
- Insert a tube support into the other end of the brine line and push the brine line into the brine safety float elbow. Use a locking clip to secure the connection (see Figure 8).

**Important Note:** Not Applicable for EC5-CAB models.

**Figure 8**



**Important Note for EC5-CAB Models:**  
The overflow elbow is located on the back of the brine cabinet tank (not shown).

**Important Note:** The brine over-flow line must not be higher than the overflow elbow on the brine tank. (This is a gravity overflow.) This line is used only when other overflow valves fail.

## 12. Install the Brine Overflow Line (indoors)

- Run a 1/2 inch I.D. brine overflow line from the overflow elbow on the side of the brine tank to an approved drain. 13 Attached the Electrical Connection
- Insert the barrel plug from the DC power supply into the mating jack in the back of the control box.
- Plug the DC power supply into a 110 VAC 60 Hz or 230 VAC 50 Hz outlet.

## System Start Up

### 1. Turn on the Water and Check for Leaks

- Close all faucets and turn the water back on at the water meter or pressure tank.
- Check for leaks. If a leak is present, drain the plumbing again before soldering.

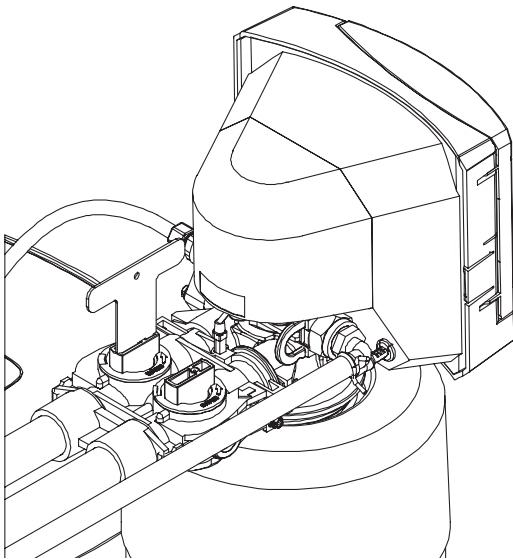
### 2. Flush the Remaining Debris from the System

- Open the cold water faucet on a bathtub.
- Allow the system to flush the remaining dirt and debris into the bathtub, until the water runs clear.
- Open all remaining faucets and allow the plumbing to release any trapped air in the system.
- Close all of the faucets.

### 3. Open the Bypass Valve

- Move the bypass valve handles to the service position. The valve handles should be parallel to the pipes (see figure 9).
- Open a cold water tap and allow the appliance to flush for 20 minutes or until approximately 100 gallons has passed through the appliance.

**Helpful Hint:** This procedure will prevent dirt and debris from entering the valve.



**Figure 9**

**Helpful Hint:** It is common for new systems to have some color in the water. The color should disappear after you completely flush the system.

### 4. Flush the Hot Water Heater

- Run hot water in the bathtub until the water tests soft.

### 5. Add Salt to Brine Tank

#### Salt Recommendations

RainSoft Water conditioners use water softener Block Salt, Bag Salt (Pellet), or Potassium Chloride. Go to the Main Menu, > Configure Settings, >Salt Settings, to change Salt Type (Sodium or Potassium) and Salt Form (Bag or Block)

## Adding Salt to your Brine Tank

- 1) Fill the Salt Tank with Block Salt, bag Salt (Pellet) or Potassium Chloride. For maximum salt capacity of the brine tank, see table on page 11 for the maximum setting salt levels.
  - Bag Salt and Potassium Chloride generally come in 40 lbs. Pellet Form Bags. Fill tank with pellets by emptying contents right into center of brine tank.
  - Block Salt comes in 25 lbs. blocks or 50 lbs. blocks. See Block Stacking Figures on page 14 for correct and incorrect stacking of block salt.
- 2) On the EC5, press any button from the home screen to enter the Main Menu, then select >SALT LEVEL, Press Enter or Right Arrow button. Using the Up and Down Arrows, set the Salt Level to the level of salt that is filled in the brine tank. You can reference the weight of salt you entered for more precise entering of amount of salt used. Level of 1.0 is equal to 50 lbs. [22kg] of salt.
- 3) Press Enter Button to save new salt level and exit salt level screen. Press the Left Arrow button to exit the Main Menu and return to the Home Screen.

**Note: Exiting Salt Level screen with the Left Arrow button will NOT save new salt settings.**

**Important Note:** Salt for your water conditioner can be readily purchased in either bag or block form. Bagged salt (sodium chloride) may be described on the packaging as pellet, flake, crystal, or solar salt. Any of these are fine, with the most important point being that the salt is clean, high purity, or labeled specifically as suitable for water softeners.

Salt used for melting ice, such as rock salt, is typically high in impurities and should not be used, since dirt can clog the brine system. Very fine, granulated salt is also not recommended. The use of granulated salt may cause service problems. Salt in block form should also be labeled as high purity, solar or suitable for water softeners. Blocks sold as cattle licks should not be used, since these may be high in impurities.

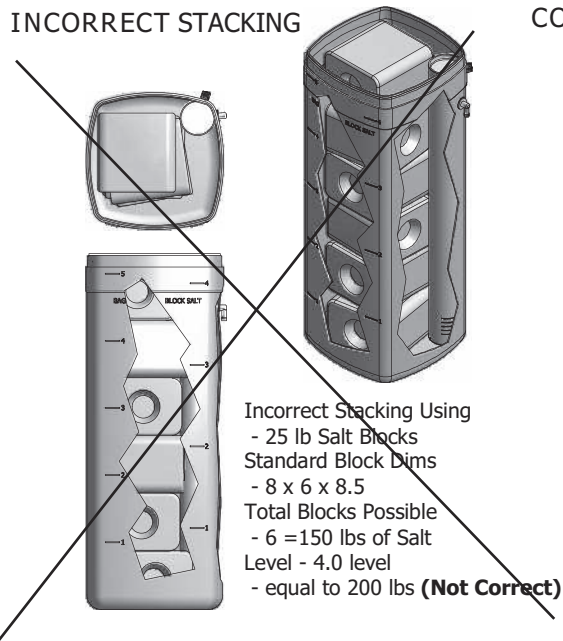
You can also use potassium chloride instead of sodium chloride. Potassium chloride is usually available only in bags and sold specifically for this purpose.

**Important Note:** It is important to maintain at least 15 lbs. to 30 lbs. of salt in your brine tank to correctly regenerate your System and to continue to enjoy soft water. LOW SALT ALERTS will activate for salt levels under 30 lbs.

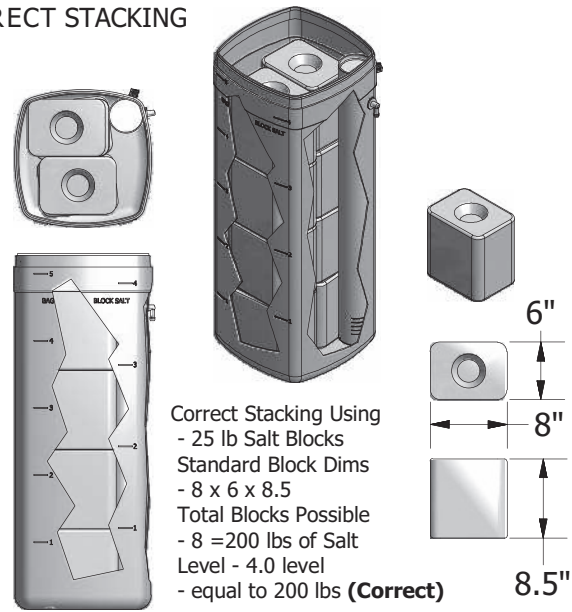
**Important Note:** Recommendations: If choosing to use both Block and Pellet form of salt when filling the brine tank, we recommend you maintain your settings on Pellet Form. We do not recommend this method of filling your brine tank for system sizes of EC5 150 and higher. The total volume of salt in the full brine tank will not allow enough room for water to make the appropriate amount of brine solution to regenerate the system fully.

## STACKING BLOCK SALT - 25 lbs BLOCKS

### INCORRECT STACKING

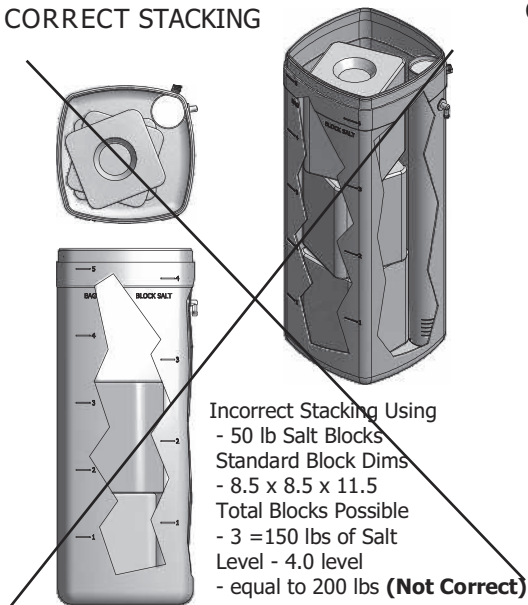


### CORRECT STACKING

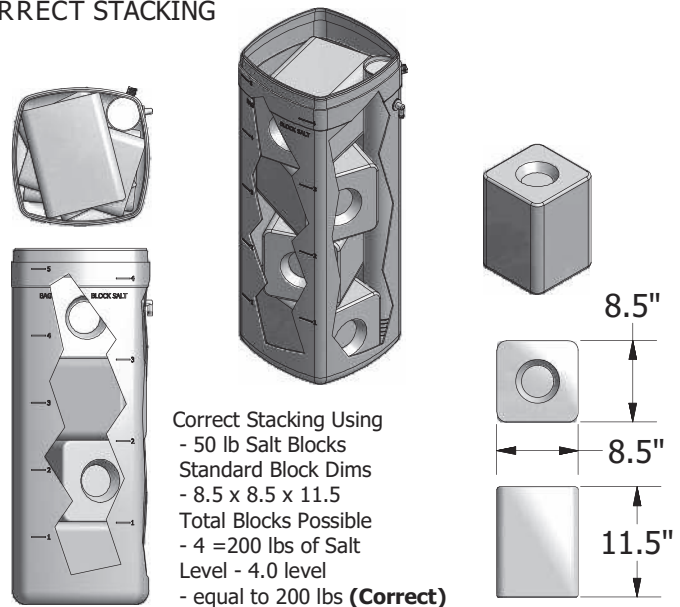


## STACKING BLOCK SALT - 50 lbs BLOCKS

### INCORRECT STACKING



### CORRECT STACKING



## 6. Sanitize the Conditioner

- Mix a 3/4 cup of common (unscented) 5.25% household bleach with 1 quart of water. Pour this solution into the brine well.
- Initiate a manual regeneration. The solution will be drawn into the conditioner during the regeneration process.
- After the system has completed a manual regeneration, the conditioner will be sanitized and ready for use.

## 7. System Selectable Setting, Customer Menu, Service Menu and Hidden Keys

- See page 11-16 for System selectable settings, Customer menu, Service menu and Hidden key.

# System Selectable Settings

## EC5 SYSTEM MODEL SETTINGS & DEFAULTS

		Model Type _ [EC5-75-CV]		Capacity Info	Default Settings			Max Setting Salt Levels		Salt Lbs Used	
#	Model	Unit Size (Name)	MEDIA TYPES Selectable	Actual RESIN (Cu.ft)	Injector Size	Backwash Flow Control	Refill Flow Control	Max Salt Level BAG (DEFAULT)	Max Salt Level Block	Minum Salting Dose (Lbs)	Maximum Salting Dose (Lbs)
Default	EC5	30	V, CV, T, CT	0.30	#00	1.5	0.25	2.0	1.0	0.90	4.50
		30SS	V, CV, T, CT	0.30	#00	1.5	0.25	2.0	2.0	0.90	4.50
		50	V, CV, T, CT	0.50	#00	1.5	0.25	5.0	4.0	1.50	7.50
		60S	V, CV, T, CT	0.60	#00	2.0	0.25	5.0	4.0	1.80	9.00
		60SS	V, CV, T, CT	0.60	#00	2.0	0.25	2.0	2.0	1.80	9.00
		75	V, CV, T, CT	0.75	#00	1.5	0.25	5.0	4.0	2.25	11.25
		100	V, CV, T, CT	1.00	#00	2.0	0.25	5.0	4.0	2.50	15.00
		100S	V, CV, T, CT	1.00	#00	2.0	0.25	5.0	4.0	2.50	15.00
		150	V, CV, T, CT	1.50	#00	2.0	0.25	5.0	4.0	3.75	22.50
		250	V, CV, T, CT	2.50	#0	3.0	0.50	10.0	10.0	6.25	37.50
		400	V, CV, T, CT	4.00	#0	4.0	0.50	10.0	10.0	10.00	60.00

Default	EC5-Cab	30SS-	V, CV, T, CT	0.30	#00	1.5	0.25	2.0	2.0	0.90	4.50
		60SS-	V, CV, T, CT	0.60	#00	2.0	0.25	2.0	2.0	1.80	9.00
		60	V, CV, T, CT	0.60	#00	2.0	0.25	5.0	4.0	1.80	9.00
		100	V, CV, T, CT	1.00	#00	2.0	0.25	5.0	4.0	2.50	15.00

## EC5 FILTER LINK MODEL SETTINGS & DEFAULTS

#	Model	Unit Size (Name)	MEDIA TYPES Selectable	Actual RESIN (Cu.ft)
Default	EC5-FLT	50	H	0.50
		75	H	0.75
		100	H, A, AS	1.00
		150	H, A, AS	1.50
		250	H, A, AS	2.50

## Additional System Settings

### Drinking Water

Types:	None	Service Intervals
	Ultrefiner	Time: 6 to 84 months
	Hydrefiner	
	Other	

### House FILTER

Types:	None	Service Intervals
	Carbon	Time: 6 to 84 months
	Neutralizer	Volume: 10K to 990K GALS
	Sediment	
	Other	

### System 1

Types:	None	Service Intervals
	Clean Start	Time: 6 to 84 months
	AirMaster	
	UV	
	Ultra Filter	
	Other	

### System 2

Types:	None	Service Intervals
	Clean Start	Time: 6 to 84 months
	AirMaster	
	UV	
	Ultra Filter	
	Other	

# EC5 FLOW CHART; CUSTOMER MENU Program RS VER - 1.2 – 1.4

## EC5 Home Screen



Turns on Back Light

Press Any Button

Enter Main Menu

Press Any Button

- MAIN MENU**
- >SALT LEVEL
  - >SYSTEM INFORMATION
  - >START REGENERATION
  - >CONFIGURE SETTING
  - >WI-FI SETTINGS
  - >FILTER LINK\*\*

**\*\* Filter Link Menu**  
Not Displayed when Filter Link is Turned Off in Service Menu / Configure Settings

## MAIN CUSTOMER MENU

**SALT LEVEL**  
SALT LEVEL: 5.0

SALT TYPE: 250 lbs  
SODIUM PELLET

Adjust Salt Level using the Up & Down Arrow Buttons. Press **ENTER TO SAVE & LEFT Arrow TO EXIT WITHOUT Saving.**

- SYSTEM INFORMATION**
- >SYSTEM ALERTS
  - >ALARM HISTORY
  - >SYSTEM SETTINGS
  - >SYSTEM STATS
  - >ADDITIONAL SYSTEMS
  - >DEALER INFO

System Information does not have any adjustable settings via the customer menu

**START REGENERATION**

>Regenerate Now?  
>Start Regen Later?  
Off / On – Time?

**Regen Later** – set time for EC5 to initiate a Regen at later time.

**CONFIGURE SETTINGS**

SET REGEN TIME:  
02:00 AM

- >SALT SETTINGS
- >VACATION MODE
- >TIME/DATE SET

**Regen Time** – set time for EC5 to Regen. Regen Process starts 2 Hours Before scheduled time with Cycles 1 & 2

**WI-FI SETTINGS**

Wi-Fi On/Off?  
ON / Off

Mobile App Connect?  
NO/YES

Registration Status  
None/Pending/OK

Network Status  
000.000.0.000

**Wi-Fi On/Off** – Turns Wireless reporting on or off. On is default even if not connected.

**Mobile App Connect** – Turns on direct connect mode for users to connect EC5 to Wireless network via REMIND App..

**FILTER LINK \*\***

Filter Model  
Model – Size - Type

Filter Install Date  
00/00/0000

Filter Last Regen  
00/00/0000

Filter Regen Now?  
Confirm: No/Yes

Filter Regen Time:  
00:00 PM

Filter Days Set  
2-30 Days

**Filter Regen Now** – will initiate an immediate regen of the filter.

**Filter Days Set** – sets the days between filter regenerations.

**Filter Regen Time** – setting is not adjustable. The start time is = 2:05 Hours before Regen time + Total Filter Regen Cycle Time.

## SYSTEM INFORMATION

DATE TIME:  
ALERT Description  
List of last 4 Alerts

DATE TIME:  
ALARM Description  
List of last 4 Alarms

SYSTEM SETTINGS  
Model  
Model – Size – Resin Type  
System Serial #  
1121113  
Installation Date  
00/00/0000  
Water Hardness  
00 grains / gallon  
Water Iron Level  
0.0 ppm

SYSTEM STATS  
CURRENT WATER FLOW  
0.0 GPM  
AVG WATER USE  
000 Gallon/Day  
TOTAL WATER 28 DAYS  
00000 Gallons  
TOTAL WATER USED  
0000000 Gallons  
LAST REGEN DATE  
00/00/00  
GAL SINCE LAST REGEN  
00 Gallons  
AVG WEEKLY SALT  
00 lbs  
REGENS LAST 28 DAYS  
0

ADDITIONAL SYSTEMS  
Drinking Water  
None / TYPE (install Date)  
House Filter  
None/Type (install Date)  
System 1  
None/Type (install Date)  
System 2  
None/Type (install Date)

DEALER INFO  
DEALER  
RainSoft (or Custom)  
PHONE  
800-724-6763 (or Custom)  
Email Address  
Remind@rainsoft.com (or Custom)

## START REGENERATION

CONFIRM REGEN NOW?  
YES / NO

*Regen Now will exit to Home Screen. Count down from 10 will begin. Press Any Button to Cancel Regen.*

SALT SETTINGS  
SET LOW SALT ALERT  
OFF / ON  
SALT AUDIBLE TIME  
05:00 PM  
SALT TYPE  
Sodium / Potassium  
SALT FORM  
Pellet / Block

*Salt Alert will sound Audible Alerts at set time when Low Salt Status is active.*

*Salt Type – Sodium or Potassium – Customers can change Salt types.*

*Salt Form – Pellet or Block – This affects the Salt Level Max Height On most units.*

VACATION MODE  
Vacation Mode  
OFF / ON  
Set Total Days Away  
2 - 180

*Vacation Mode – Turning On VM will cause any Days override settings to not Regen until out of VM. Conditioner and Filter Link.*

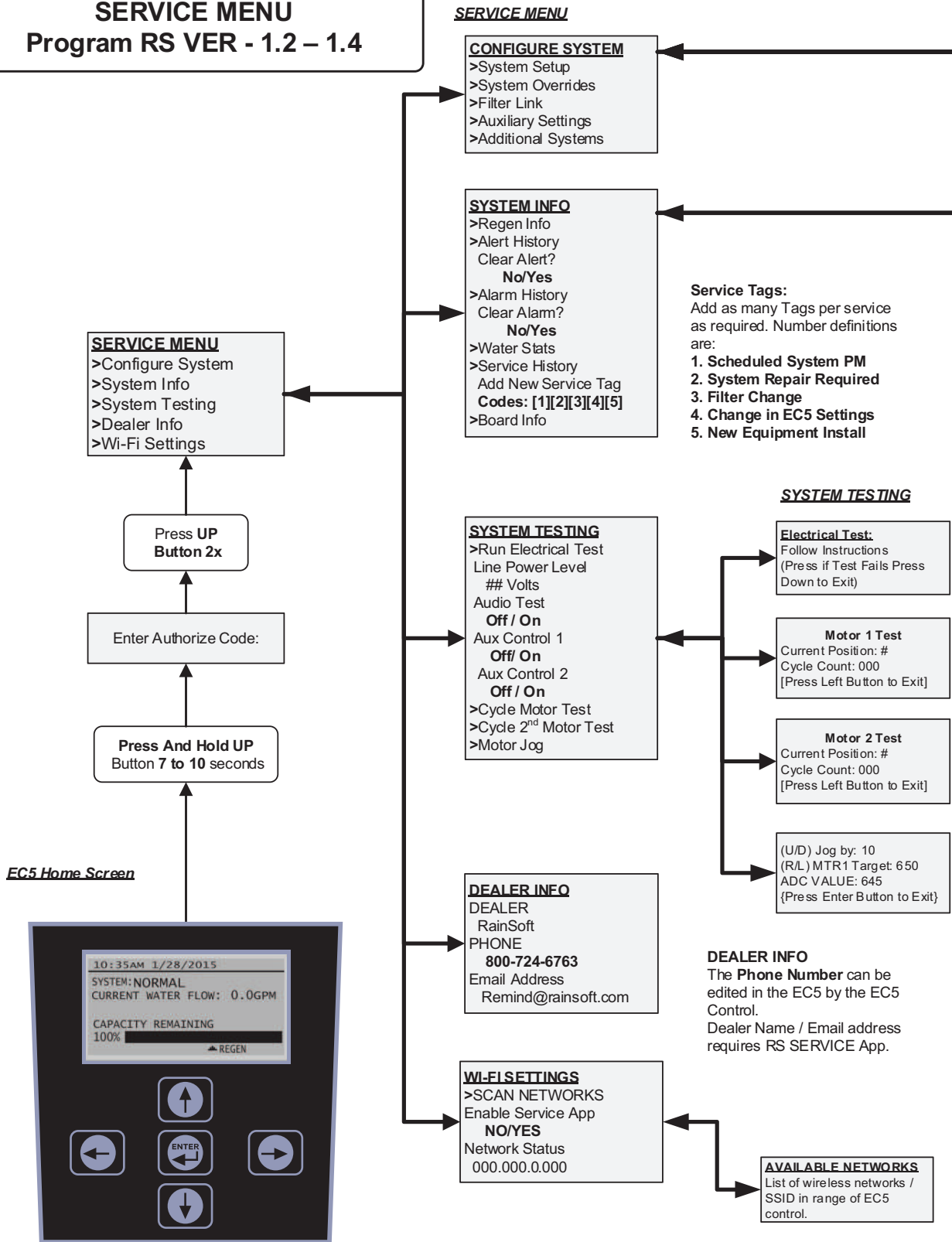
SET TIME & DATE  
Set Time  
00:00 AM  
Set Day of Week  
Monday  
Set Date  
00/00/0000  
Daylight Savings  
On / Off  
Set Time Zone  
UTC #

*Time & Date Settings – Maintain Time Settings to insure regens take place on correct schedule.*

*TIME ZONE – Correct UTC Time setting is important for Wi-Fi Settings to ensure info is transmitted correctly.*

# Flow Chart Service Menu

## EC5 FLOW CHART; SERVICE MENU Program RS VER - 1.2 – 1.4



**CONFIGURE SYSTEM MENU**

**Additional Systems Menu**

**SYSTEM SETUP**  
 Units  
**English / Metric**  
 Model  
**EC5 / EC5-CAB**  
 Unit Size  
 {Size of System}  
 Media Type  
**V, CV, T, CT**  
 Hardness  
**01-99 grains/ gallon**  
 Iron  
**0.0 ppm**  
 Time of Regen  
**02:00 AM**  
 Start Capacity  
**30%-80%**  
 Water Pressure  
**20 to 100 PSI**  
 System Serial #  
**1121113**  
 Installation Date  
**00/00/0000**  
 Total Capacity  
 ### Gallons  
 Water to Start Regen  
 ## Gallons

**SYSTEM OVERRIDES**  
 90% Exhausted Regn  
**Immediate / Delayed**  
 Injector Size  
**00 / 0 / 1**  
 Backwash Control  
**Sizes (1 thru 10)**  
 Max Salt Override  
**Off (or set max level)**  
 Regen Days Override  
**Off / 1 thru 30 Days**  
 >Mod Cycle Times  
 LED output Override  
**OFF / ON**

**MOD CYCLE TIMES**  
 C1 – Brine Fill  
**Add 0 to 15 Minutes**  
 C2 – Brine Make up  
**120 – 60 Minutes**  
 C3 – Backwash  
**1 – 30 Minutes**  
 C4 – Brine/S-Rinse  
**Add 0 to 20 Minutes**  
 C5 – F-Rinse  
**Add 0 to 10 Minutes**

**FILTER LINK**  
 Filter Model  
**Off / EC5-FLT**  
 Filter Size  
 {Size of Filter System}  
 Filter Type  
**H, A, AS, Y, YZ, R,**  
 Filter Install Date  
**00/00/0000**  
 Filter Cycle 3 Time  
**1 to 40 Minutes**  
 Filter Cycle 4 Time  
**0 to 60 Minutes**  
 Filter Cycle 5 Time  
**1 to 40 Minutes**  
 Filter Regen Time  
 {Calculated Start time}  
 Filter Days Set  
**1 to 30 Days**  
 Service Reminders  
**Off / Time / Volume**  
 Service Intervals  
**None/Months/Gallons**  
 Time/Volume Remain  
 0 # Months/# Gallons  
 Service Reminder  
**Reset: No / Yes**

**AUXILIARY SETTINGS**  
 Activate Aux 1  
**OFF / 1 / 2 / 3**  
 Activate Aux 2  
**OFF / 1 / 2 / 3**

**AUX Settings**  
 - Setting (1) Aux Output Signal on during; REGEN Cycles [3],[4],[5] Both EC5 and FILTER LINK  
 - Setting (2) Aux Output Signal on during; REGEN Cycles [4] EC5  
 - Setting (3) Aux Output Signal on during; REGEN Cycles [3],[4],[5] FILTER LINK Only

USE LEFT & RIGHT ARROW BUTTONS TO NAVIGATE BETWEEN ADDITIONAL SYSTEMS MENU

**< Drinking Water >**  
 Type:  
**None/Ultrrefiner/Hydrefiner/Other**  
 Install Date:  
**00/00/0000**  
 Service Interval  
**Off /Time: 6 to 84 Months**  
 Service Remaining  
 # Months RESET: No / Yes

**< House Filter >**  
 Type:  
**None /Carbon/Neutralizer/Sediment/Other**  
 Install Date:  
**00/00/0000**  
 Service Interval  
**Off /Time/Vol: 6 to 84 Months 10K to 990K Gals**  
 Service Remaining  
 # Months / GALS RESET: No / Yes

**< System 1 >**  
 Type:  
**None /Clean Start/ AirMaster/ UV / Ultra filter / Other**  
 Install Date:  
**00/00/0000**  
 Service Interval  
**Off /Time: 6 to 84 Months**  
 Service Remaining  
 # Months RESET: No / Yes

**< System 2 >**  
 Type:  
**None /Clean Start/ AirMaster/ UV / Ultra filter / Other**  
 Install Date:  
**00/00/0000**  
 Service Interval  
**Off /Time: 6 to 84 Months**  
 Service Remaining  
 # Months RESET: No / Yes

**SYSTEM INFO MENU**

**REGEN INFO**  
 >Last Regen Info  
 >Last 5 Regens  
 Regens last 14 Days  
 #  
 Regens last 28 Days  
 #  
 Total Regenerations  
 #  
 Avg Weekly Salt Used  
 # lbs

**Last Regen Info Listed:**  
 Date / Time  
 Total Gallons before regen  
 Salt lbs Calculated  
 Cycle 1 thru 5 Times

**Last 5 Regen Info Listed:**  
 Date / Time of Last 5

**DATE TIME:**  
 ALERT Description  
 List of last 4 Alerts

**DATE TIME:**  
 ALARM Description  
 List of last 4 Alarms

**WATER STATS**  
 Total Capacity  
 ## Gallons  
 Water To Start Regen  
 ## Gallons  
 Water Available  
 # Gallons  
 Avg Water per Day  
 # Gallons/Day  
 Water Last 28 Days  
 ## Gallons  
 Total Water Used  
 ### Gallons

**Service History**  
 Date / Time  
 Service Tags: #, #  
 List of last 4 Service Tags

**BOARD INFO:**  
 Program Revision  
 RS-EC5-VER-##  
 EEPROM Revision  
 EEPROM-EC5-VER- ##

# Flow Chart Service Menu

**EC5 FLOW CHART;  
EC5 HIDDEN KEYS  
Program RS VER - 1.2 – 1.4**

**EC5 SERVICE MENU Screen**

**SERVICE MENU**  
>Configure System  
>System Info  
>System Testing  
>Dealer Info  
>Wi-Fi Settings

Press UP  
ARROW 2x

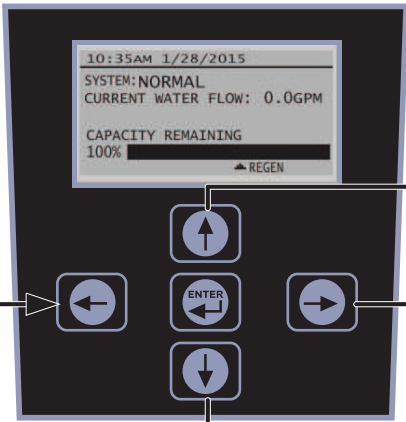
Enter Authorize Code:

Press & Hold UP  
ARROW 5 to 7  
Seconds –  
SERVICE MENU.

Press & Hold RIGHT  
ARROW 5 Seconds –  
During Regen to  
Progress thru Cycles.

PROGRESS THRU EACH  
REGENERATION STEP,  
ONLY DURING REGEN.

**EC5 Home Screen**



Press & Hold LEFT  
ARROW 5 to 7  
Seconds – Access  
Additional Systems  
Screens.

Press & Hold DOWN  
ARROW 5 to 7  
Seconds – to clear all  
active alarms and  
alerts

CLEAR ALARMS &  
ALERT MESSAGES

**Additional Systems**

< Drinking Water >  
Type:  
None/Ultrafilter/Hydrorefiner/Other  
Install Date:  
00/00/0000  
Service Interval  
Off /Time: 6 to 84 Months  
Service Remaining  
# Months RESET: No / Yes

< House Filter >  
Type:  
None /Carbon/Neutralizer/Sediment/Other  
Install Date:  
00/00/0000  
Service Interval  
Off /Time/Vol: 6 to 84 Months 10K to 990K  
Gals  
Service Remaining  
# Months / GALS RESET: No / Yes

< System 1 >  
Type:  
None /Clean Start/ AirMaster/ UV / Ultra  
filter / Other  
Install Date:  
00/00/0000  
Service Interval  
Off /Time: 6 to 84 Months  
Service Remaining  
# Months RESET: No / Yes

< System 2 >  
Type:  
None /Clean Start/ AirMaster/ UV / Ultra  
filter / Other  
Install Date:  
00/00/0000  
Service Interval  
Off /Time: 6 to 84 Months  
Service Remaining  
# Months RESET: No / Yes

USE LEFT & RIGHT ARROW BUTTONS  
TO NAVIGATE BETWEEN ADDITIONAL  
SYSTEMS MENUS

## Incoming Water Conditions (Hardness Settings/ Iron Settings)

Hardness setting is adjustable to match incoming water hardness in grains/gallon. Range is 2 – 200 grains per gallon(gpg), in increments of 1, with a default of 10.

Iron level is adjustable to match incoming iron level in parts per million (ppm). Range is 0 – 3 parts per million (ppm), in increments of 0.5, with a default of 0.

A combined hardness setting is calculated as follows:

- Combined hardness setting = hardness setting (gpg) + (iron level (ppm) x 6 gpg/ppm)
- Combined hardness setting is never displayed, but used in capacity calculations.
- Iron Level of greater than or equal to 0.5 ppm will change the START CAPACITY to change to 50% and only allow for adjustment from 50% to 80%.

Example: Hardness set at 10 Grains, Iron Set at 1.5 ppm = Capacity calculations use 19 Grains / 50% Start Capacity before Regen can be triggered.

### Metric Conversion Factors (Units) Settings

- Gal / Grain / AM:PM (Imperial Settings)
- L / PPM / 24:00 (Metric)
- L / TH / 24:00 (Metric - French Degrees)

1 gallon = 3.785 liters (l)

1 grain/gallon = 17.1 ppm = 1.71 th

1 lb. = .454 kilograms (kg)

Metric - Clock is displayed in 24-hour mode without AM or PM

Metric - Date is displayed as DD/MM/YY instead of MM/DD/YY.

In general, all calculations are based on Imperial units, then converted for display purposes to metric when metric units are selected.

Hardness settings in Metric, increase is every 17.1 ppm per 1 grain (Imperial) and in Metric French Degree, 1.71 th per 1 grain (Imperial)

## Troubleshooting Guide

Symptom	Cause	Solution
1. Hard water/ Hard water bleed-through	<ol style="list-style-type: none"> <li>The system is not regenerating often enough.</li> <li>The check ball behind the injector is not seating.</li> <li>The system is out of salt.</li> <li>The system has lost power.</li> <li>The bypass valve is open or partially open.</li> <li>The plumbing is not properly connected to the system.</li> <li>Salt is bridged in the brine tank.</li> <li>The system will not draw brine.</li> <li>Worn internal seals.</li> <li>Bypass seals have failed.</li> </ol>	<ol style="list-style-type: none"> <li>System is running out of capacity because the hardness or capacity setting is incorrect. Test the raw water, verify model, and reset if necessary.</li> <li>Replace the check ball seat assembly.</li> <li>Add salt to the brine tank.</li> <li>Check the power connection to the system.</li> <li>Close the bypass valve completely.</li> <li>Replumb the system.</li> <li>Bag salt can sometimes form a bridge, which will not allow the water to dissolve the salt. Pour hot water along the sides of the brine tank and use a tool to break the bridge.</li> <li>See Symptom 6.</li> <li>See Symptom 6.</li> <li>Replace the bypass seals.</li> </ol>
2. System is using large amounts of salt	<ol style="list-style-type: none"> <li>Soft water is being used to water the lawn.</li> <li>The capacity or hardness setting is improperly set.</li> <li>The brine refill rate is incorrect.</li> </ol>	<ol style="list-style-type: none"> <li>Bypass the outside faucet(s) or show the customer how the use the bypass valve while watering the lawn.</li> <li>Verify that the settings are correct .</li> <li>See Symptom 7.</li> </ol>
3. Loss of resin to the plumbing	<ol style="list-style-type: none"> <li>The system is plumbed in backwards.</li> <li>The riser pipe distributor is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>Replumb the system.</li> <li>Replace the riser pipe.</li> </ol>
4. Loss of resin to the drain during backwash	<ol style="list-style-type: none"> <li>The backwash flow rate is too fast for the size of the tank.</li> </ol>	<ol style="list-style-type: none"> <li>Make sure the system has the proper backwash flow control (see below). 80 tanks - 1.5 gpm backwash flow control 100 tanks - 2.0 gpm backwash flow control 130 tanks - 3.0 gpm backwash flow control 140 tanks - 4.0 gpm backwash flow control</li> </ol>
5. Valve out of synchronization or does not stop in the correct position	<ol style="list-style-type: none"> <li>Rotary position sensor.</li> <li>Valve cam and brine cam are out of synchronization.</li> <li>Drive motor failed.</li> </ol>	<ol style="list-style-type: none"> <li>Replace the motor sensor Assy.</li> <li>Realign cams.</li> <li>Replace the drive motor.</li> </ol>

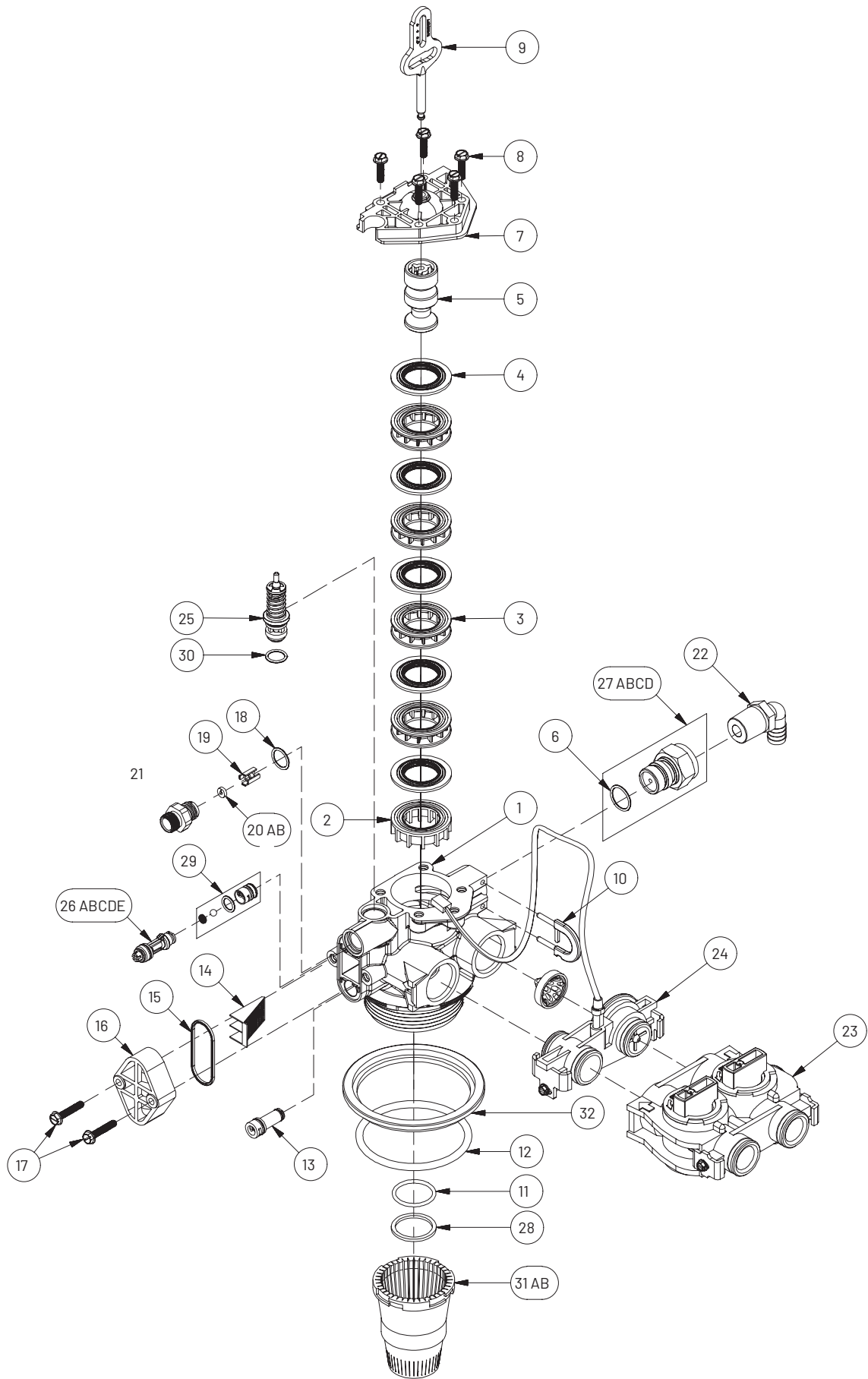
If the troubleshooting guide did not resolve the symptom, please contact Technical Support at 1-800-860-7638.

## Troubleshooting Guide

Symptom	Cause	Solution
6. No brine draw, poor brine draw, or loss of vacuum	<ol style="list-style-type: none"> <li>1. Low water pressure.</li> <li>2. Plugged injector or plugged injector screen. If the injector is completely plugged, there will be no flow to the drain. In most cases, the injector is partially plugged and the flow is reduced. Normal flow to the drain is about <math>\frac{1}{2}</math> the rate of backwash.</li> <li>3. The internal seals are worn. If the internal seals are worn, flow to the drain is greater than normal. Normal flow to the drain is about <math>\frac{1}{2}</math> the rate of backwash.</li> <li>4. Brine cam Lobe is worn or broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. The water pressure must be above 20 psi.</li> <li>2. Inspect the injector and injector screen for debris; clean or replace if necessary.</li> <li>3. Inspect the internal seals; replace if necessary.</li> <li>4. Replace the Brine cam.</li> </ol>
7. Insufficient brine refill or no brine refill	<ol style="list-style-type: none"> <li>1. The brine refill flow control is plugged or restricted.</li> <li>2. The brine refill flow control is not the correct size.</li> <li>3. Low water pressure.</li> <li>4. Water pressure is set too high on the control.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect and clean the flow control and housing.</li> <li>2. Replace with the correct size.</li> <li>3. Increase the water pressure.</li> <li>4. Check incoming pressure and set control to match.</li> </ol>
8. Excessive water in the brine tank	<ol style="list-style-type: none"> <li>1. Debris is stuck in the refill stem.</li> <li>2. The system is not drawing brine.</li> <li>3. Air leak on the brine line connection.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the brine line from the valve. If water is coming out of the fitting, clean the brine refill stem. Verify that the brine refill stem is not depressed. If the stem is depressed, the valve is not in the service position.</li> <li>2. See Symptom 6.</li> <li>3. Inspect the connections.</li> </ol>
9. Water is leaking at the drain	<ol style="list-style-type: none"> <li>1. Water is leaking past the upper valve seals due to worn seals or high water pressure.</li> <li>2. The valve is not in the Service position.</li> <li>3. Drive cam is worn.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the internal seals or install a pressure regulator.</li> <li>2. Verify the position of the valve.</li> <li>3. Replace the drive cam.</li> </ol>
10. Salty water after regeneration	<ol style="list-style-type: none"> <li>1. Low water pressure.</li> <li>2. Poor brine draw.</li> <li>3. The drain line is clogged or pinched.</li> <li>4. Excessive water use during regeneration.</li> </ol>	<ol style="list-style-type: none"> <li>1. The water pressure must be above 20 psi.</li> <li>2. See Symptom 6.</li> <li>3. Inspect the drain line.</li> <li>4. Instruct customer not to use water during regeneration.</li> </ol>
11. Loss of water pressure	<ol style="list-style-type: none"> <li>1. Fouled resin due to iron/mineral accumulation.</li> <li>2. The resin is broken-down.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the valve and mineral bed with iron cleaner or replace the resin.</li> <li>2. Replace the resin.</li> </ol>

If the troubleshooting guide did not resolve the symptom, please contact Technical Support at 1-800-860-7638.

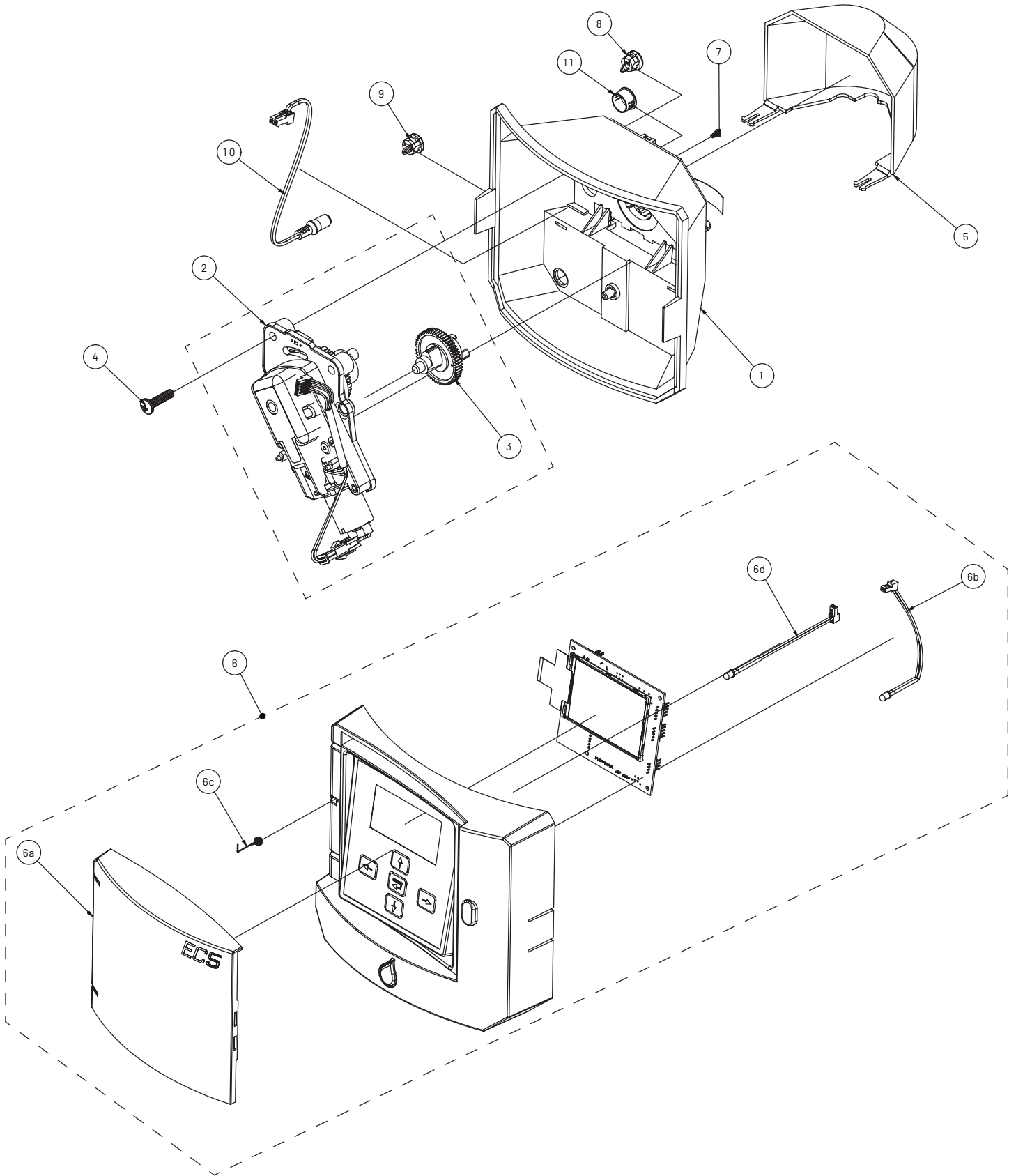
# Valve Exploded View



## Valve Parts List

Item	Quantity	Part Number	Description
1	1	17863	Composite Valve Body
2	1	17864	Spacer End
3	4	17865	Internal Spacer
4	5	17866	Internal Seal
5	1	18160	Retainer & Down Flow Piston
6	1	13328	O-Ring - 017
7	1	17869	End Plug Assembly
8	5	17870	10-24 X .812 Screw Hex Washer Head
9	1	17871	Piston Rod
10	1	17887	Retainer Drain
11	1	17888	O-Ring - 121
12	1	17889	O-Ring - 336
13	1	17617	Injector Plug Assembly
14	1	17948	Injector Screen
15	1	17949	Injector Seal
16	1	17950	Injector Cap
17	2	17951	Screw Hex Washer Head 10-24 X 1.0
18	1	17958	O-Ring - 015
19	1	17953	Retainer BLFC Button
20A	1	17954	Flow Control Washer 0.25 Gpm
20B	1	19610	Refill Flow Control .5 Gpm Composite
21	1	17957	Adapter BLFC 0.25 Gpm
22	1	17939	1/2 Npt X 1/2 Barb Poly Elbow
23	1	17557	Composite Bypass Valve
24	1	17558	Turbine Meter Assembly With Cable
25	1	17812	Refill Shut-Off Assembly
26A	1	17893	C-Injector #00 Assembly (Purple)
26B	1	17947	C-Injector #0 Assembly (Red)
26C	1	18194	C-Injector #1 Assembly (White)
26D	1	19318	C-Injector #2 Assembly (Blue)
26E	1	19393	C-Injector #3 Assembly (Yellow)
27A	1	17991	1.5 Drain Line Flow Control Assembly
27B	1	17992	2.0 Drain Line Flow Control Assembly
27C	1	17994	3.0 Drain Line Flow Control Assembly
27D	1	18286	4.0 Drain Line Flow Control Assembly
28	1	18445	Riser Pipe Retainer
29	1	19739	Check Ball Cage Assembly
30	1	13329	O-Ring - 014
31A	1	17941	Diffuser Upper Basket 1 X .008 Red
31B	1	18985	Diffuser Upper Basket 1 X .02 White
32	1	19328	Tank Retainer Seal

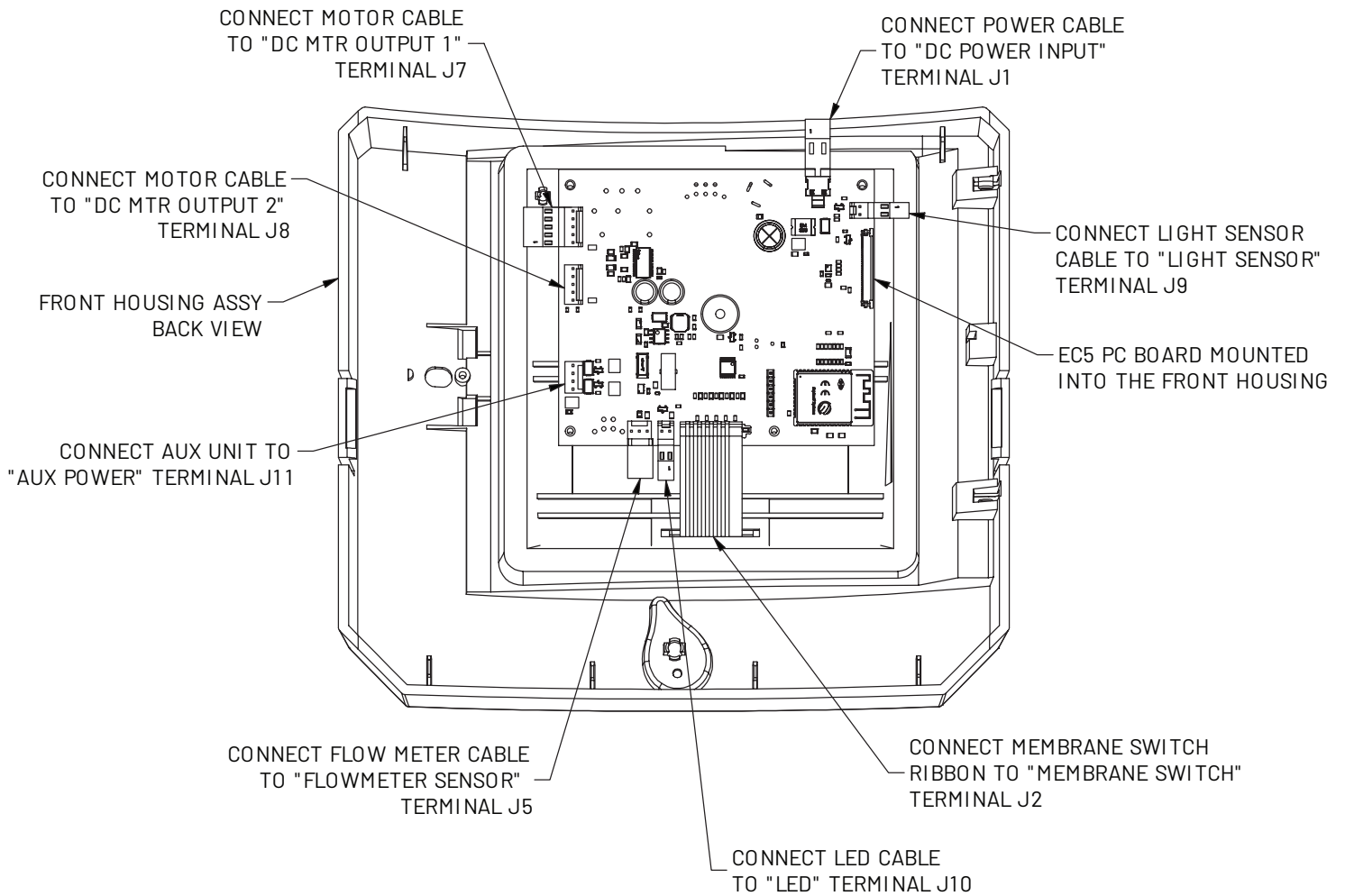
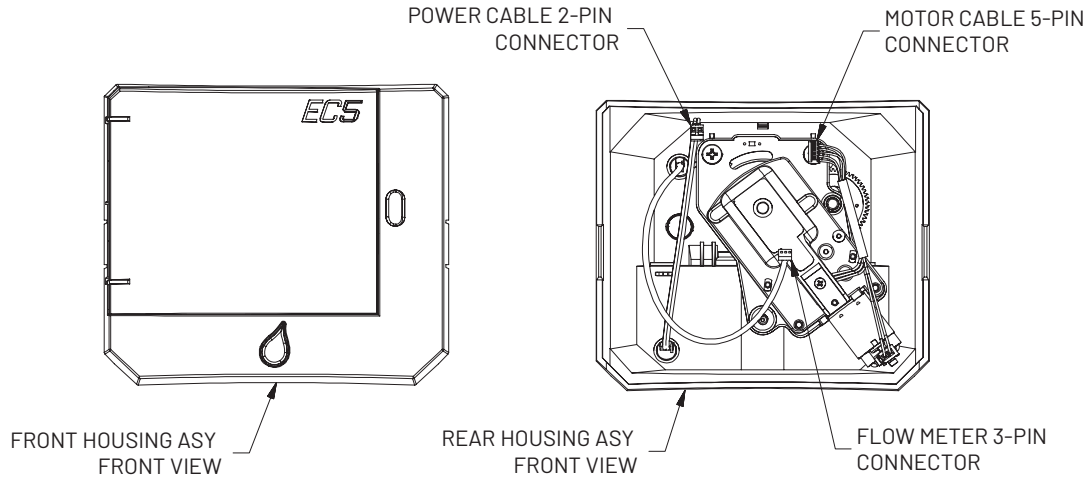
# Control Exploded View



## Control Parts List

Item Number	Sub Item	Qty	Part Number	Description
1		1	51920	Gen 5-Rear Housing Assembly
2		1	51921	RPS Motor Gear Drive Assembly
3		1	17501	Brine Gear/Cam
4		2	51918	Screw 1/4-20 X 1in Phil Pan S.S.
5		1	51902	Gen 5-Rear Cover
6		1	52593	EC5 Front Housing PCB Assy
	6a	1	51904	Gen5-Door EC5
	6b	1	51911	Led Blue Wire Harness Gen5
	6c	1	51907	Spring Gen 5 Front Housing Door
	6d	1	4006975	Ambient Light Sensor - Cable Assembly
7		1	51919	Screw #4-20 X 1/4in, Phil Pan Plastite
8		1	72134	28-8-7 Heyco SR5P4 4 Lead (Heyco Flowmeter Cable)
9		1	72250	Heyco SR 4k-4 Bushing (.500 Dia Hole)(Heyco Power Cable)
10		1	51912	Power Wire Harness Gen 5
11		1	71611	28-244-4 Hole Plug .625 Dia Hole
NOT SHOWN		1	51922	DC Supply 24v 1 Amp Straight Us Wall
NOT SHOWN		1	52164	DC Supply 24v 1 Amp Multi Blade Wall (Includes Euro, Uk, Australia, China Plugs)

# Control Wiring Diagrams

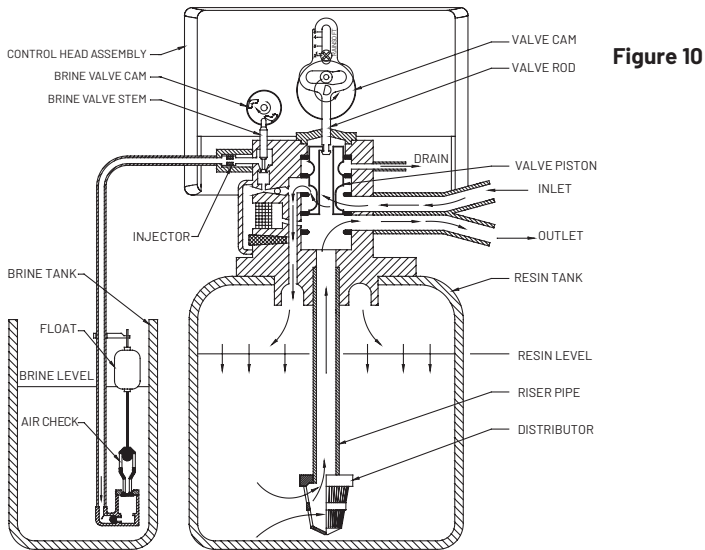


## Water Flow Diagrams

When servicing water treatment equipment, it is important to study the operation and flow of the valve.

### Service

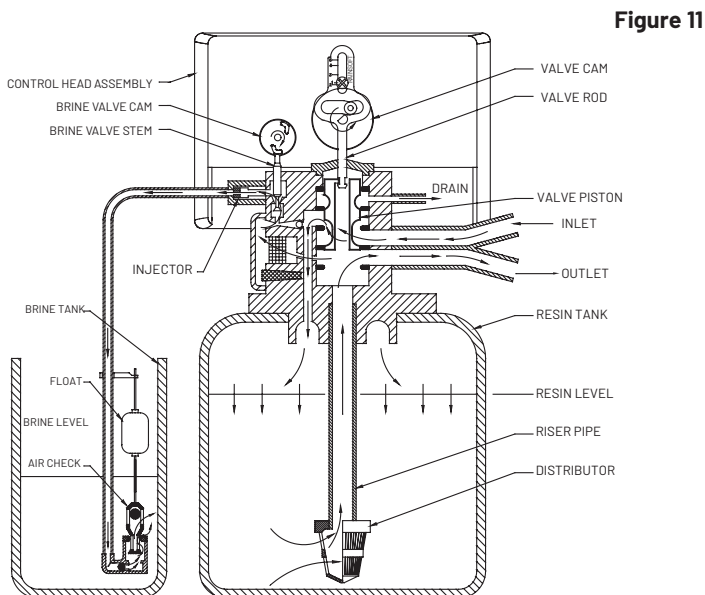
The untreated water enters the valve and flows around the piston between the number 2 and 4 seals. The water flows down the side of the valve and down through the mineral tank where the water is treated. The treated water enters the riser pipe and exits out of the outlet port. See Figure 10.



**Helpful Hint:** In this cycle, the system is providing treated water to the outlet.

### Brine Refill

The piston moves slightly upward and the brine cam presses down on the brine refill stem. The water flows through the inlet port and around the piston between the number 2 and 4 seals. The water flows down the side of the valve and down through the mineral tank where the water is treated. The treated water flows up the riser pipe and passes through the injector screen and into the injector throat. The water flows past the brine refill stem and through the brine refill flow control before entering the brine tank. See Figure 11.



## Brine Make Up

The valve rests in the Service position for 2 hours, while the water dissolves the salt in the brine tank.

## Backwash

The piston moves slightly down and away from the 4th seal. The water enters the valve and flows around the 4th seal and into the outlet port. The water flows past the bottom of the piston and the 5th seal, before entering the riser pipe. As the water exits the riser pipe, it flows up through the mineral bed and causes the mineral to expand. When the water exits the mineral tank, it flows up through the side of the valve. The water passes between the 2nd and 3rd seal and out through the drain. See Figure 12.

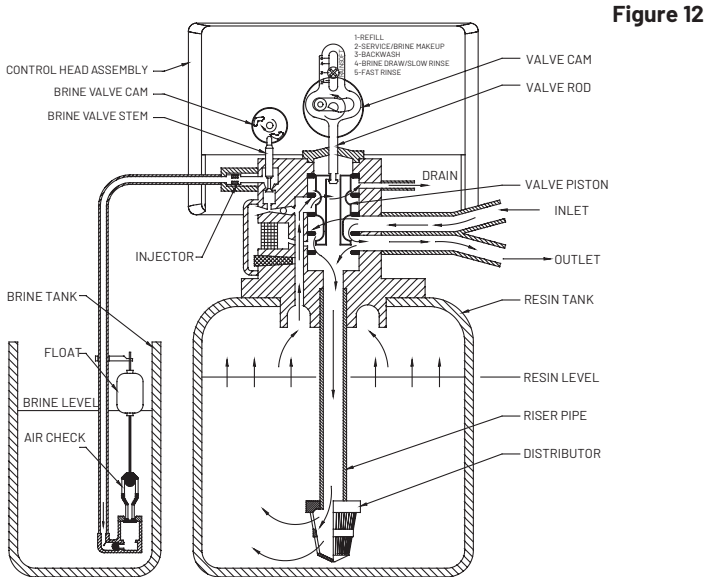


Figure 12

**Helpful Hint:** In this cycle, the system is on internal bypass. Any water used during this cycle will be untreated.

## Brine

The piston moves down and presses against the 5th seal. The brine cam rotates and presses down on the brine refill stem. The water enters the valve and passes around the piston and through the injector screen into the brine injector. When the water passes through the brine injector, it creates a vacuum. This vacuum causes the brine to be pulled from the brine tank and into the valve where the water and brine mix flow into the mineral tank. After the

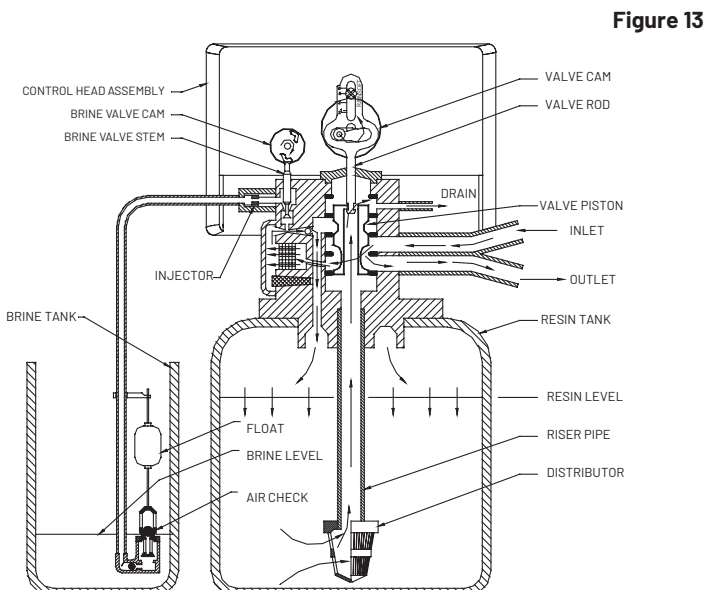


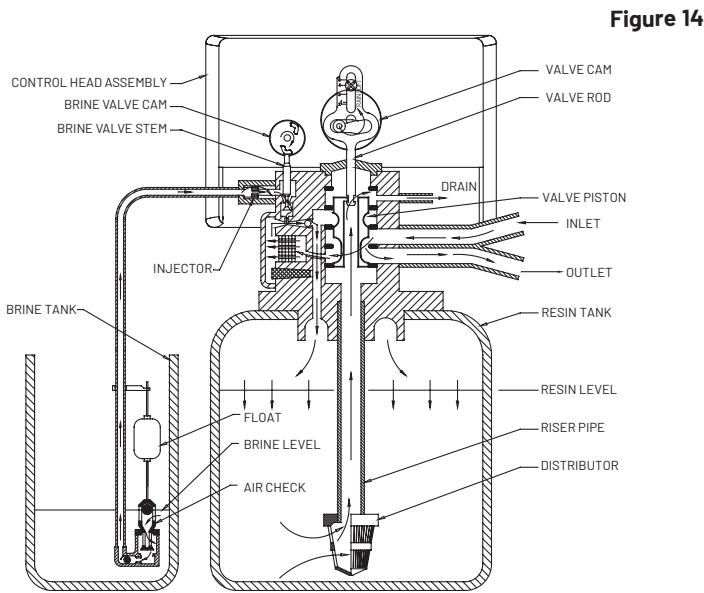
Figure 13

**Helpful Hint:** In this cycle, the system is providing treated water to the outlet.

brine solution passes through the resin, it flows up the riser and through the center of the piston. The water flows over the top of the piston past the number 1 seal and out through the drain. See Figure 13.

## Slow Rinse

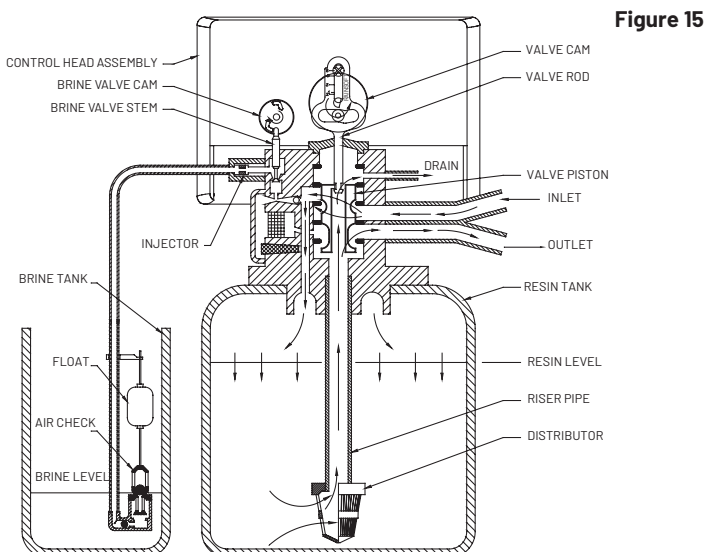
After all the brine solution is pulled from the brine tank, the air check ball in the brine float seats. This prevents any air from entering the mineral tank. The water continues to flow in the pattern of the brine cycle and then rinses the mineral bed free from any salt. See Figure 14.



**Helpful Hint:** In this cycle, the system is on internal bypass. Any water used during this cycle will be untreated.

## Fast Rinse

The piston lowers and the water flows through the inlet port and around the piston between the number 2 and 4 seals. The water then flows down the side of the valve and into the mineral tank where the bed is compacted. It continues to flow up the riser pipe and through the center of the piston. As the water exits the top of the piston, it flows out through the drain port between the number 1 and 2 seals. See Figure 15.



**Helpful Hint:** In this cycle, the system is providing treated water to the outlet.

## 8 Steps to Successful Service

The following procedure is a complete system check to help diagnose problems with the equipment. If the system fails to perform properly in any of the following steps, please refer to "Troubleshooting Guide for the 8 Steps to Successful Service" on pages 31-32.

### 1. Understanding the Nature of the Call

- Understanding the nature of the call can be the difference between a successful service call and a return visit. With understanding the customer's expectations, it is very easy to test the system, find that it is functioning mechanically correct, and yet overlook the customer's real concerns.

**Helpful Hint:** The system may be running out of capacity, providing a false reading.

### 2. Test the Cold, Hot, and Raw Water

- Hot/hard; Cold/soft: Problem with capacity or incorrect settings. Hot/soft; Cold/hard: Problem with capacity or incorrect settings. Hot/slightly hard; Cold/slightly hard: Bleed through problem. Hot/hard; Cold/hard: Major mechanical problem.
- Document the results on the service order.

### 3. Perform a Visual Inspection and Check the Programming

- Verify that the bypass valve is in the service position.
- Does the brine tank have salt and the correct amount of water? Computer units should have about 3 inches of water in the brine tank, except in a regeneration cycle.
- Verify that the valve is in Service. The piston rod alignment screw should be aligned with the number 2 on the piston rod.
- Verify that the computer is programmed to the correct values in terms of the capacity of the system, raw water hardness, and/or iron increases or decreases.
- Document the diagnostics on the service order.

### 4. Perform a Mechanical Function Test

- Press any key from the home screen to get to the main menu.
- Select START REGENERATION from the main menu and pressing either the ENTER or RIGHT button takes you to the options of initiating a manual regeneration. This menu offers two options: Start a regeneration now or start it later.
- **Regen Now ?** Press the Enter button while this item is highlighted . Screen will show confirm **REGEN NOW**.
- Press ENTER while "YES" is highlighted.
- The computer will provide a 10 second countdown before regeneration.
- The system is now in **Cycle 1**(Brine Refill). The piston rod cycle indicator is aligned with position number 1, the brine stem is depressed, and water is flowing to the brine tank.
- Disconnect the brine line from the brine float and use a container to measure the brine refill rate. The brine refill rate should be close to the value shown in the table below based on your current settings.

**Important Note:**The EC5 will adjust brine refill time based on incoming pressure. Please measure and set incoming pressure on the EC5 control for most accurate brine refill.

Pressure (psi)	Valve with 00 Injector and 0.25 gpm Flow control	Valve with 0 Injector and 0.5 gpm Flow control
20	0.15	0.26
40	0.20	0.39
60	0.24	0.46
80	0.29	0.51

- Allow the brine tank to fill for five minutes. Reattach the brine line and pull up on the brine float rod. This will shut off the water that is flowing into the brine valve and will pressurize the brine system.

- Inspect for leaks at the fittings and brine shut-off valve.
- Press and hold the **Right Arrow** to advance to **Cycle 2** (Brine Make Up). The piston rod cycle indicator is aligned with position number 2, and no water is flowing to the brine tank or drain. Disconnect both lines (brine and drain) and check for water flow; reconnect the lines.
- Press and hold the **Right Arrow** to advance to **Cycle 3** (Backwash). The piston rod cycle indicator is aligned with position number 3, and water is flowing down the drain line removing any solids caught during service. Allow the drain water to flow for five minutes to reach the full bed expansion
- Confirm that the amount of water flowing to the drain is correct for the size of the equipment
- Confirm that there is no resin in the backwash water that is flowing to the drain. Press and hold the **Right Arrow** to advance to **Cycle 4** (Brine / Slow Rinse). The piston rod cycle indicator is aligned with position number 4, the brine stem is pressed down, the brine solution level is lowering in the brine tank, and water is flowing down the drain line to the drain (slower than backwash). If the water tested hard on arrival, allow the system to draw brine for 5 minutes.
- Remove the brine line from the valve. Insert the vacuum gauge (P/N 17975) and confirm the proper amount of vacuum. The gauge should read between 10 and 30 inches of vacuum. Reconnect the brine line.
- Remove the brine valve from the brine tank and submerge it in water to test the air-check; reinsert the brine valve.
- Press and hold the **Right Arrow** to advance to **Cycle 5** (Fast Rinse). The piston rod cycle indicator is aligned with cycle number 5, water is rapidly flowing down the drain (equal to backwash), no water is flowing to the brine tank, and the brine stem is not depressed. Allow the system to fast rinse until the cycle ends. The valve will automatically advance to Service.
- In Service, the piston rod cycle indicator is aligned with cycle position number 2, no water is flowing to the drain or brine tank, and soft water is delivered to all treated faucets.
- To flush out any salty water present in the system, turn on a faucet for approximately 5 minutes.

### 5. Make the Necessary Repairs

- If the system failed to perform properly in one or more of the cycles, make the necessary repairs.
- If the system passed the function test by delivering soft water at the end of Step 4 and the water tested hard on arrival, the problem is related to a program or application error. Check the programming and hardness setting, then make the necessary adjustments.

### 6. Repeat the Mechanical Function Test

- After the repairs have been made, repeat Step 4 again to verify that the system is operating properly. In some cases, we recommend repeating Step 4 several times to ensure that the problem is fixed.

### 7. Retest for Soft Water

- If the water was hard on arrival, the cold water should be soft on departure. If the water still tests hard, verify that all brine was flushed from the system; use a TDS meter.

### 8. Review the Service Call with the Customer

- When reviewing the service call with the customer, explain what repairs or adjustments were made to the equipment. Confirm that the customer completely understands how to operate the system, from programming the computer to operating the bypass valve.

**Helpful Hint:** The cycle and time remaining will be displayed on the computer.

**Helpful Hint:** The brine solution is drawn from the brine tank and injected into the resin bed to begin the ion-exchange process of replacing hardness ions for sodium ions.

**Important Note:** The water flow at the drain should be about 30% of backwash.

**Important Note:** Do not over-tighten the brine line nut.

**Helpful Hint:** Salty water will occur when the brine solution is drawn during the brine cycle and not properly rinsed.

# Troubleshooting Guide for the 8 Steps to Successful Service

## Understanding the Nature of the Service Call

- If the customer reports that the system is producing hard water, the problem is either mechanical or programming in nature.
- If the customer describes salty water, noisy operation, the system is using too much salt, or water running to the drain, the problem is not mechanical in nature. Solutions to these non-mechanical problems are covered in the "Troubleshooting Guide" on pages 18-19.

## Test the Cold, Hot, and Raw Water

- If both the hot and cold water test hard on arrival, the problem may be mechanical or a capacity issue related to programming.
- If the cold water is soft and the hot water tests hard, the problem is most likely a capacity issue related to the programming.

## Perform a Visual Inspection and Check the Programming

- Verify that the control is properly programmed for the water condition and the size of the equipment.
- Verify that there are no leaks in the plumbing; something as simple as a toilet that does not shut off properly can allow many gallons to pass through undetected, causing a loss of capacity. Any leak under 0.25 GPM will not register on the meter.
- Verify that the system is plumbed correctly.
- Document the diagnostics for future reference; many of the diagnostics will reset when the system is cycled.

## Perform a Mechanical Function Test

### Cycle 1

- If the brine refill rate is too slow, inspect the brine refill screen, injector, and the brine refill flow control. In applications where iron is present, inspect the injector screen as the brine refill water passes through.
- If there is no water flowing, verify that the control is in the Brine Refill position. The brine refill shut-off assembly should be depressed and the piston rod cycle indicator should be aligned with position number 1.
- If the piston is properly aligned and the brine refill shut-off assembly is not depressed, the brine cam is out of synchronization with the drive cam. Remove the drive cam and realign it with the brine cam.
- If the control displays **Cycle 1**, the piston rod cycle indicator is in position 3, 4, or 5, and water is flowing from the drain, position sensing is malfunctioning; replace the RPS motor gear drive assembly (item # 2 on page 22-23).

### Cycle 3

- If the backwash rate is too slow or fast, the backwash flow control may be the wrong size for the tank.
- If resin is in the backwash water, reduce the size of the flow control. Resin loss may also be caused by temperature changes in the water. The colder the water, the more the resin will expand when the system regenerates.

### Cycle 4

- When the system advances to Cycle 4 (Brine Draw), it is important to listen for a significant sound difference as the drain water is diverted through the injector. The flow at the drain should reduce to approximately 30% of the backwash rate.

- If the system does not draw brine, check the flow of water at the drain. If the flow is fast like backwash, the water is bypassing the injector, indicating that the piston seals may be the problem. Remove, inspect, and replace the seals if necessary.
- Verify that the piston is in the right location (number 4) and that the brine refill shut-off assembly is depressed. If the piston is properly aligned and the refill shut-off assembly is not depressed, the brine cam is out of synchronization with the drive cam. Remove the drive cam and realign it with the brine cam.
- If the flow of water to the drain is very slow (less than 20% of the backwash rate), the brine injector or injector screen is plugged or partially plugged; clean or replace as necessary.
- If the vacuum tested poor (below 10 inches), low water pressure, an undersized, kinked, or an obstructed drain line may be the cause. A partially plugged injector or bad seal can also cause poor vacuum. Replace, clean, or repair as necessary.

### Cycle 5

- A malfunction rarely occurs in Cycle 5 (Fast Rinse). However, if the system is allowed to draw brine, it is important to ensure that the salt is thoroughly rinsed. Allow the system to complete the entire rinse cycle and return to Service automatically.
- If the system does not count gallons, verify that the sensor cable is attached to the computer board in the proper direction. The connectors are keyed and do not fit properly if reversed.
- Verify that the other end of the sensor cable is firmly pressed into the flow wheel housing.
- If the system is still not counting gallons, disassemble the rotor assembly and check for any obstructions in the housing; remove any visible obstructions.

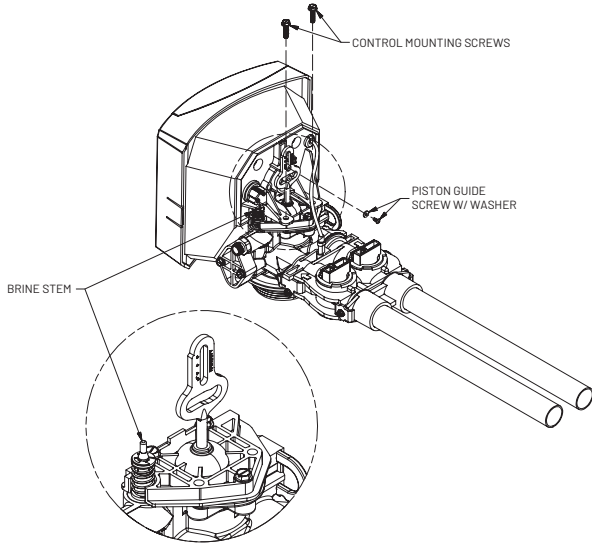
**For additional assistance with troubleshooting the "8 Steps to Successful Service", please contact RainSoft Technical Support at 1- 800-860-7638.**

# Disassembly Instructions

## Removing the Control Head

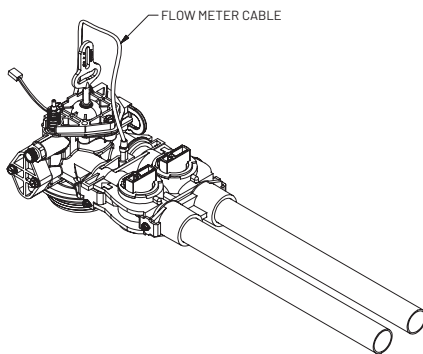
- Disconnect the power cord from the back of the control and place the system on bypass.
- Remove the rear cover and depress the brine stem to relieve the water pressure (see Figure 16).
- Remove the piston guide screw and the control head mounting screws (see Figure 16).

Figure 16



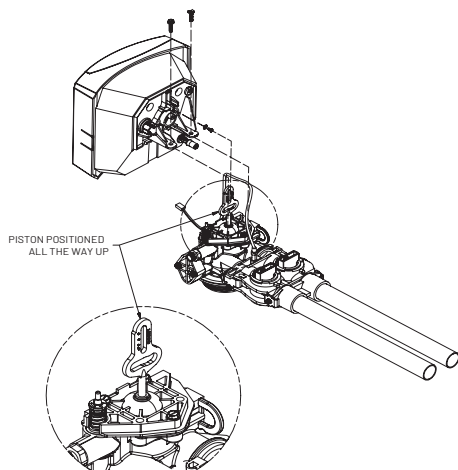
**Important Note:** Be careful not to pull on the flow sensor cable; it may damage the computer board. If you need to completely remove the control head from the valve, remove the flow sensor cable from the flowmeter housing.

Figure 17



- Reverse the procedure for reassembly. To ensure alignment with the cam shaft, make sure the piston is all the way up (see Figure 18).

Figure 18



## Replacing the Brine Stem

- Remove the control head; see page 33.
- Remove the screws and end plug assembly (see Figure 19). Pull the brine stem from the valve body (see Figure 19). Remove and inspect the O-ring at the bottom of the brine stem hole; replace if necessary. Apply a silicone-based lubricant to the O-ring and reinstall.
- Apply a silicone-based lubricant to the upper O-ring on the brine stem and press the brine stem into place.
- Reverse the remaining steps for reassembly. To ensure alignment with the cam shaft, make sure the piston is all the way up (see Figure 18 on page 33).

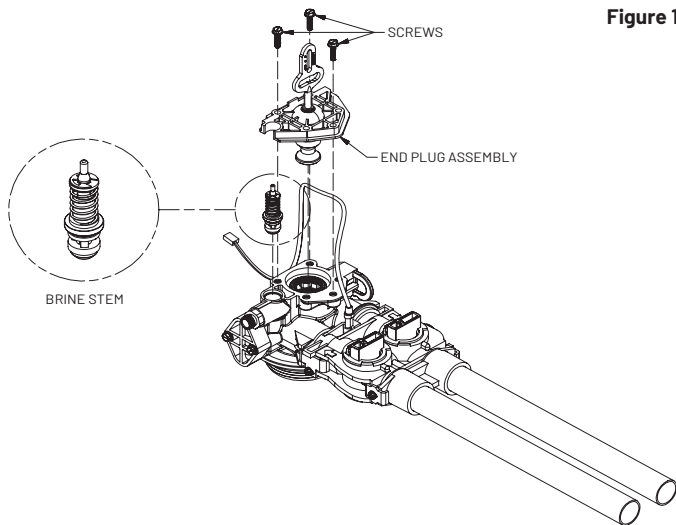


Figure 19

**Important Note:** The shoulder on the bushing should be flush with the valve body.

## Replacing the Seals and Spacers

- Remove the control head; see instructions page on 33.
- Remove the screws and end plug assembly (see Figure 21).
- Remove the seals and spacers with your fingers (see Figure 21). If a spacer is difficult to remove, use a spacer removal tool.
- Inspect the inside of the valve for foreign debris.
- Apply a silicone-based lubricant to the seals before installation.
- Install the new seals and spacers with your fingers (see Figure 21). Please note that the bottom spacer is different and must be installed first. If you have difficulty inserting the spacers to a level position, use the seal stuffer tool.
- Reverse the procedure for reassembly. To ensure alignment with the cam shaft, make sure the piston is all the way up (see Figure 18 on page 33).

## Replacing the Piston

- Remove the control head; see page 33.
- Remove the screws and end plug assembly (see Figures 19 and 20).
- Pull upward on the piston and end plug assembly (see Figure 20).
- Inspect the inside of the valve to verify that the seals and spacers are in place and remove any foreign debris.
- Use the end plug to push the new piston and end plug assembly into the valve.
- Reverse the procedure for reassembly. To ensure alignment with the cam shaft, make sure the piston is all the way up (see Figure 18 on page 33).

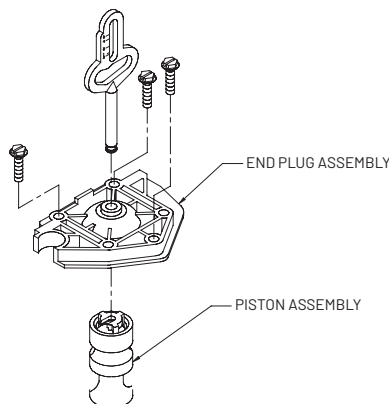


Figure 20

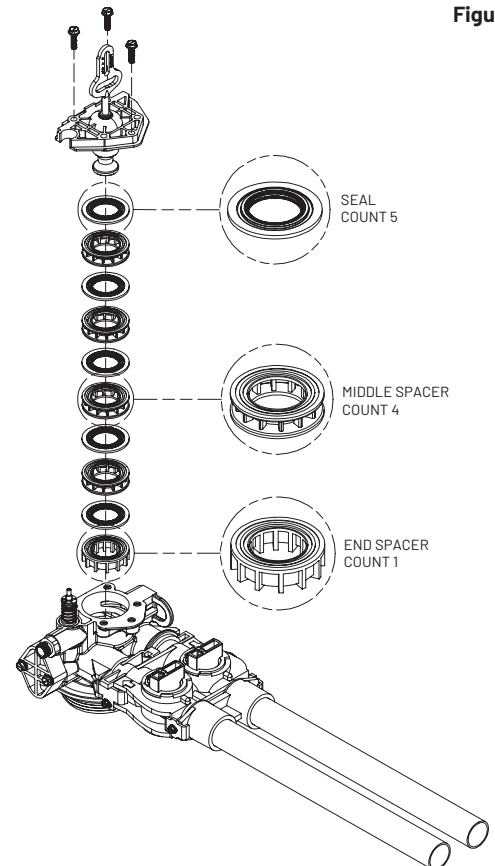


Figure 21

### Replacing the Brine Injector and Screen

- Remove the control head; see page 33.
- Remove the injector cap screws and injector cap (see Figure 22).
- With a small, flat screwdriver, pry out the injector (see Figure 22). To disassemble the injector, pry the throat away from the nozzle and inspect for debris; clean or replace if necessary.
- Inspect the gasket (see Figure 22) for damage; replace if necessary.
- Remove the screen with your fingers or a small pair of pliers (see Figure 22). Inspect for debris; replace if necessary.
- Reverse the procedure for reassembly.

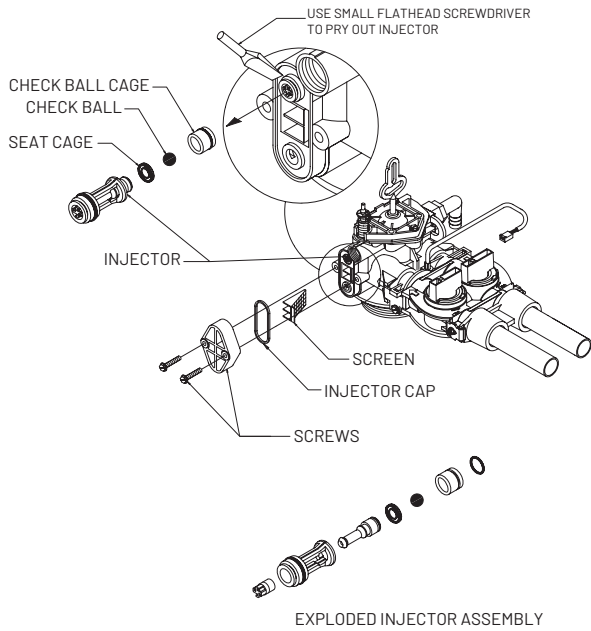


Figure 22

### Replacing the Meter Turbine and Sensor Assembly

- Disconnect the power cord from the back of the control and place the system on bypass.
- Remove the rear cover and depress the brine stem to relieve the water pressure (see Figure 16 on page 33).
- Remove the piston guide screw, control head mounting screws, and control head (see Figures 16 and 17 on page 33).
- Remove the screws and mounting clips (see Figure 23).
- Using a screwdriver, gently pry the meter turbine from the valve (see Figure 23).

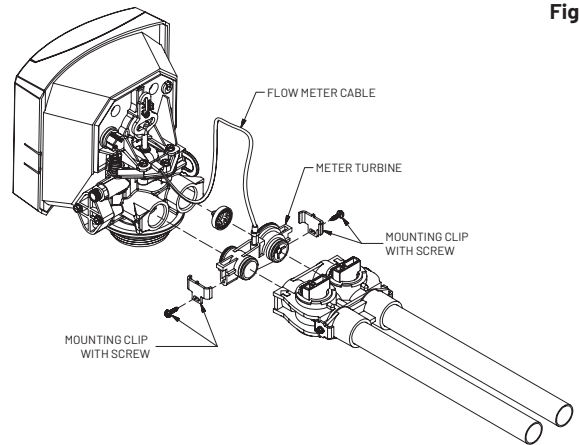


Figure 23

- To verify that the turbine meter is not restricted, blow through the inlet side (see Figure 24A) of the meter turbine assembly. The meter turbine should spin without restraint. If the meter turbine does not spin, please proceed to the next step.
- To access the inside of the meter turbine, unscrew the inlet side of the turbine (see Figure 24A), remove the components (see Figure 24B), and check for damage or debris.
- Lubricate all 4 O-rings with a silicone-based lubricant and reverse the procedure for reassembly.

Figure 24A

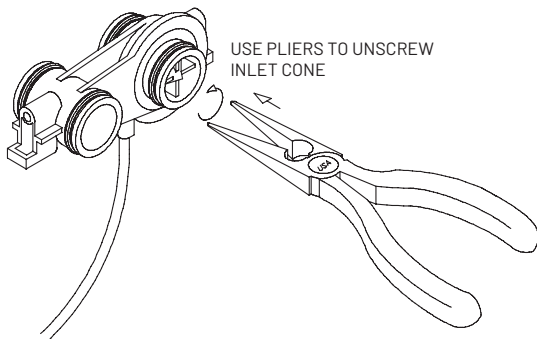
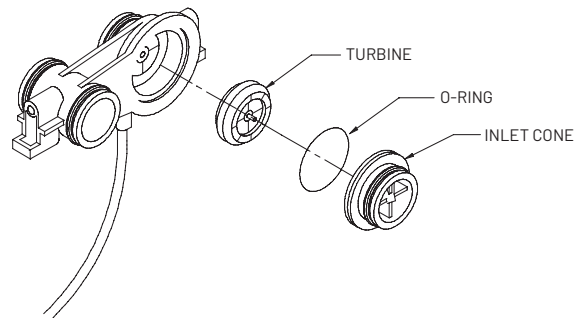
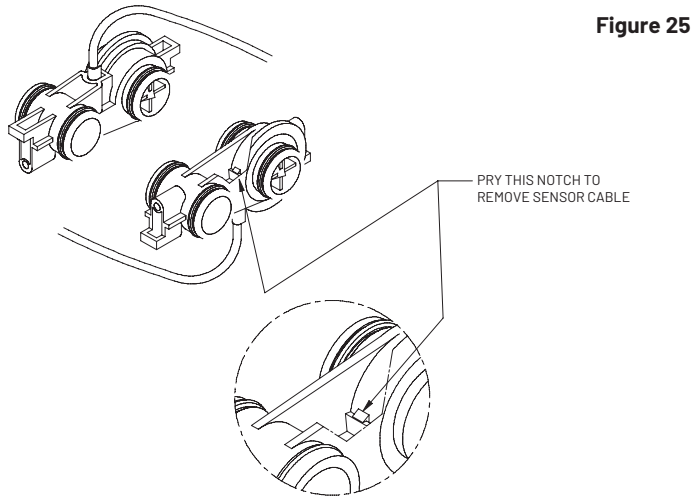


Figure 24B



- To remove the sensor cable, press on the barbed end of the cable with a small flat head screw driver (see Figure 25).



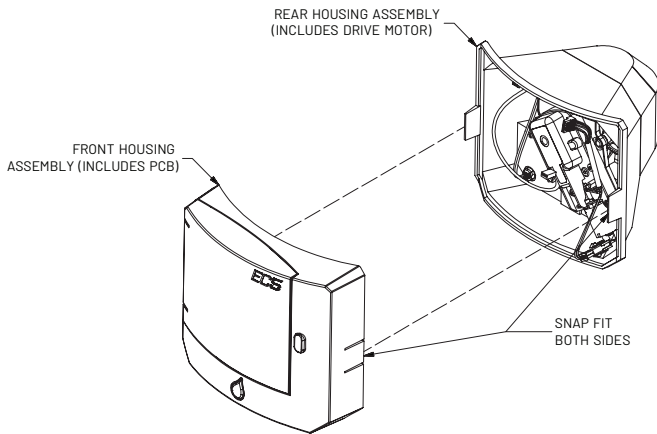
**Figure 25**

- If it is necessary to remove the sensor cable from the computer board, see "Removing the Computer Board" below.

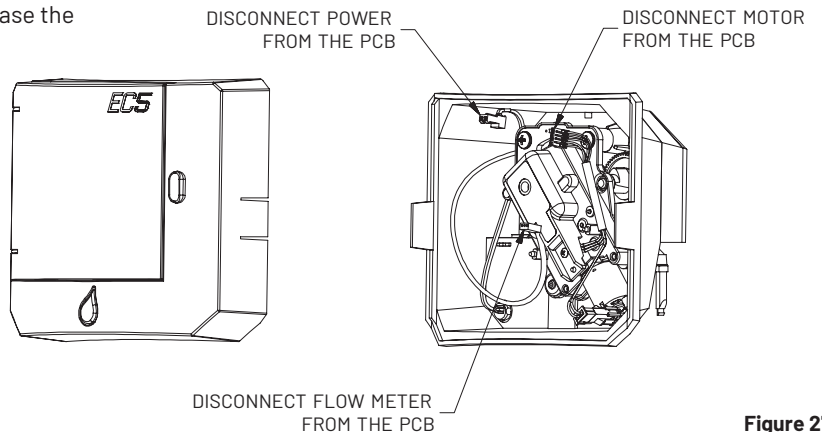
**Removing the front housing / Computer board**

- Disconnect the power cord from the back of the control.
- Remove the front cover by releasing the latches on the sides of the cover. (see Figure 26).

**Figure 26**



- Disconnect the power cable, flow meter cable and motor cable from the computer board (see Figure 27).
- Disconnect the led blue wire harness cable and membrane switch ribbon from the computer board.
- Remove the screws from the computer board and release the latches on the side of the board
- Reverse the procedure for reassembly.



**Figure 27**

## Replacing the Drive Motor

- Before removing the drive motor, make sure the valve is in the Service position. If the valve is not in the Service position, the drive cam will not line up with the brine cam.
- Remove the front cover see page 38.
- Disconnect the wires from the drive motor (see Figure 27).
- Unscrew the drive motor screws and pull the motor and brine gear cam out.( see fig 28).
- For reassembly, make sure the brine cam stays in place. The female notch of the brine cam must be line with the male side of the drive cam ( see fig 29).
- Reverse the remaining steps for reassembly.

## Servicing the Brine Valve Float Assembly

Figure 28

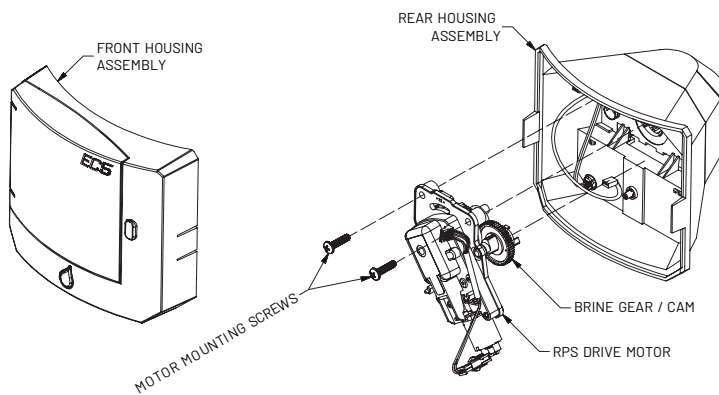
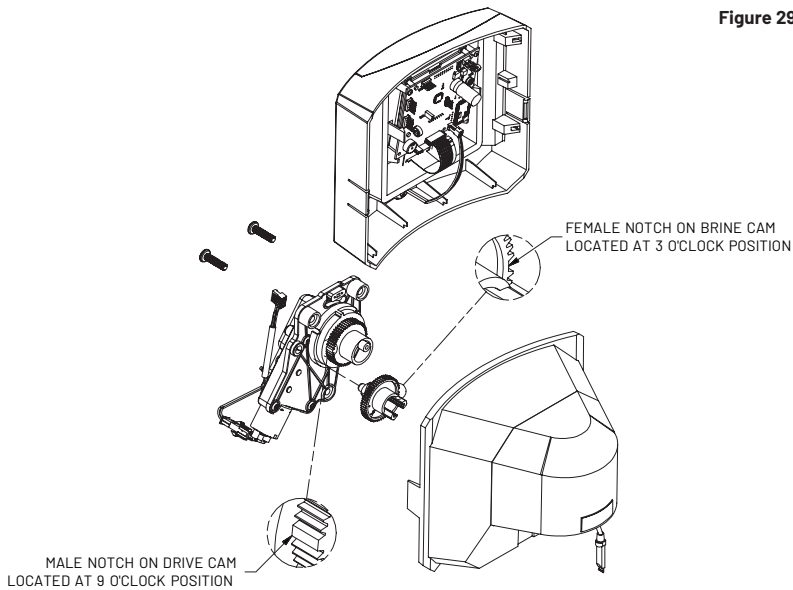
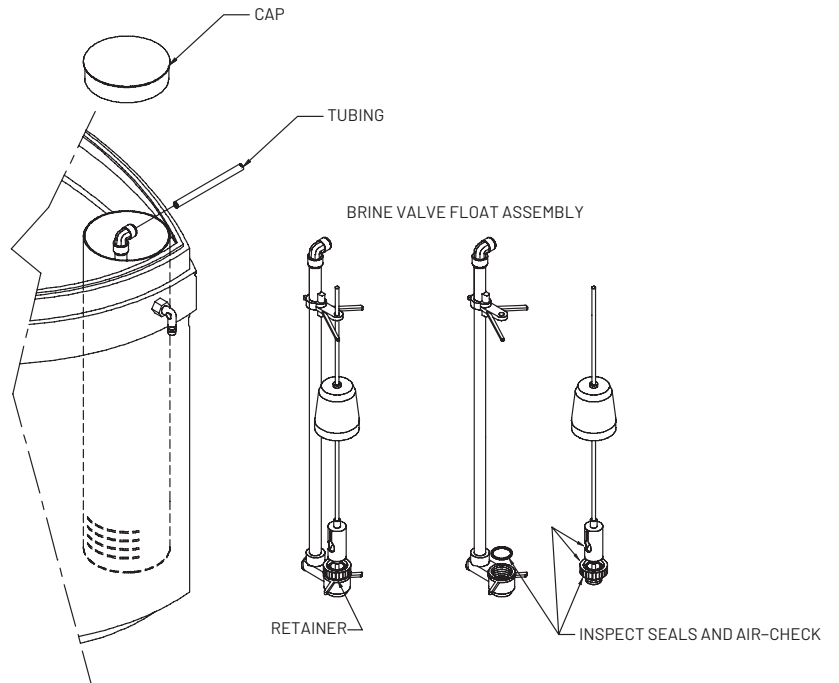


Figure 29

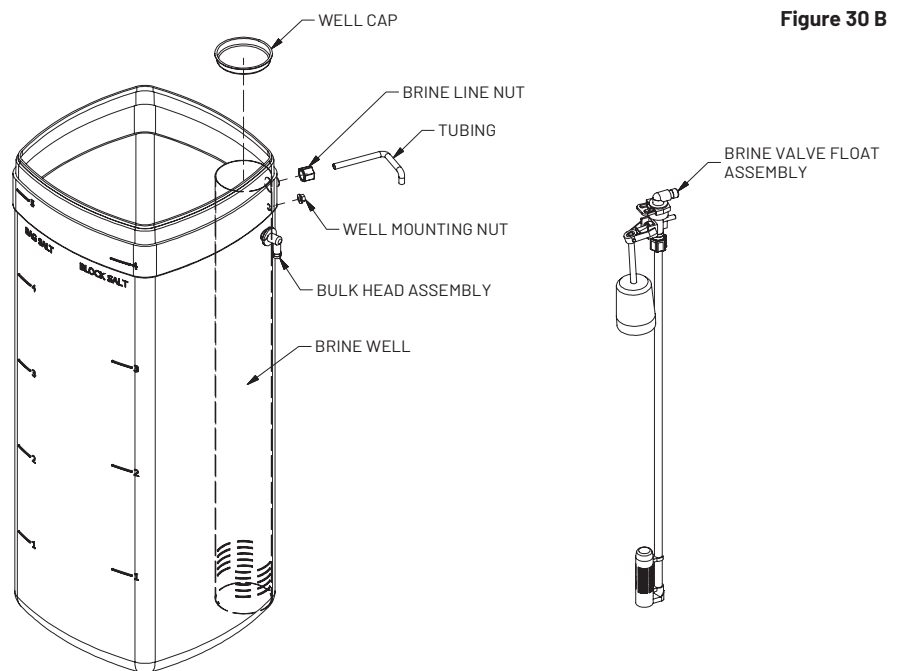


- EC5 units use two different types of brine valves (see Figure 30A and 30 B).
- Before servicing the brine valve float assembly, the valve must be in the Service position.
- Remove the cap from the top of the brine well.
- Disconnect the tubing from the brine line.
- Remove the brine valve float assembly from the tank .
- For the 1st type of brine valve (Figure 30A ). Remove the bottom retainer and inspect the air-check and seals ; clean or replace if necessary.
- For the 2 type of brine valve (Figure 30B ). Inspect the assembly; clean or replace if necessary.
- Reverse the procedure for reassembly.

**Figure 30 A**



**Figure 30 B**



## Notes

## Notes



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