

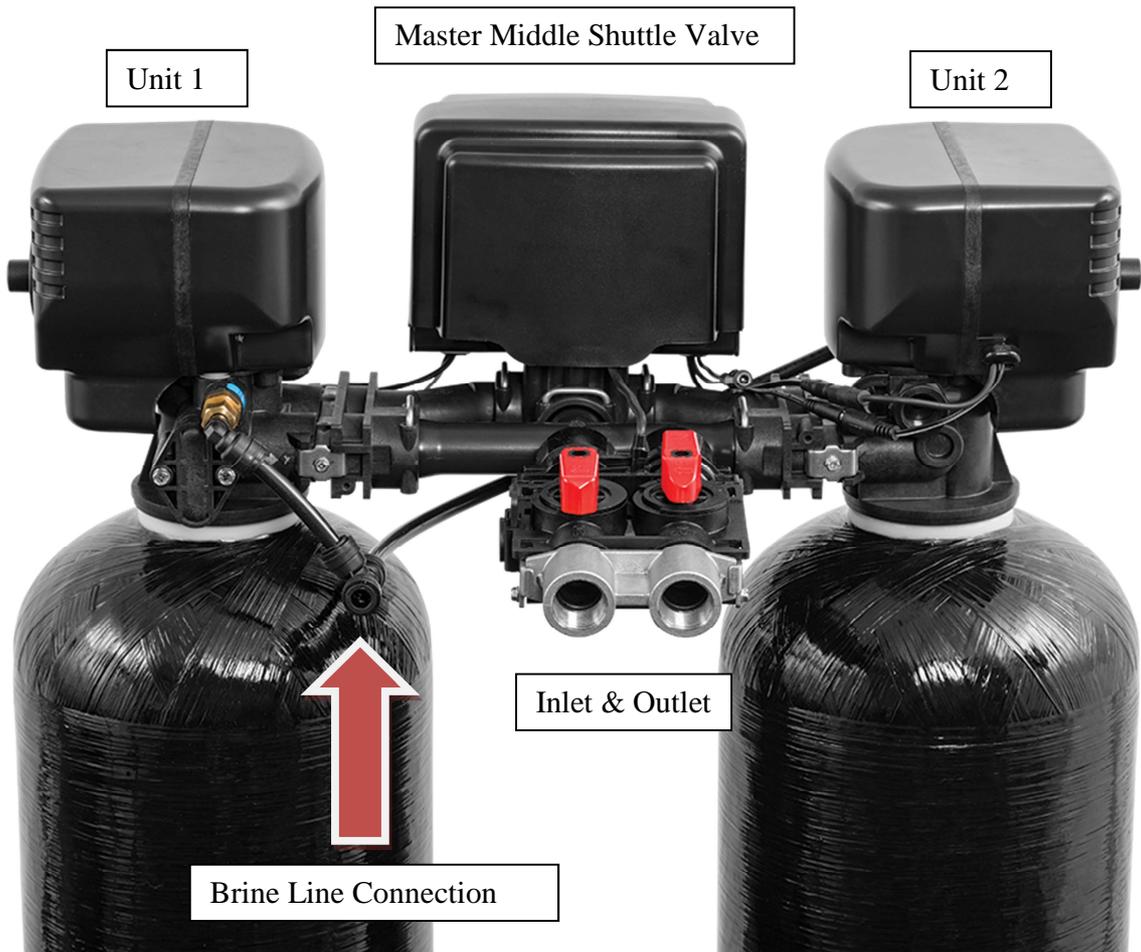
2300

Duplex Softener

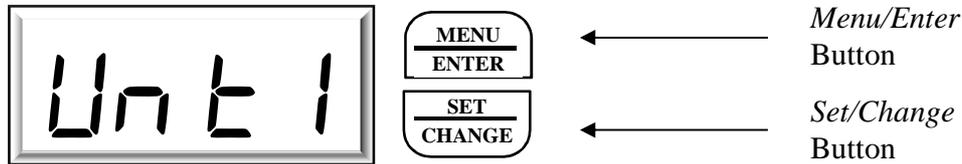
Service Manual



System Overview



Home Display



- Alternates between indicating which unit is in service (currently being used to soften the water) and how many gallons are remaining before that unit needs regenerated. If Softener Slave Unit #1 is in service the display will show [Unit 1]. If Softener Slave Unit #2 is in service the display will show [Unit 2].
- The gallons remaining will decrement as water is used. Once the gallons remaining gets to [0000] the shuttle valve will automatically switch the water flow to the Unit that is in standby.
- During the time that the shuttle valve is shuttling, the display will show the number of the softener unit that it is shuttling to and the last two digits will show rotating segments (ex. [2-' ']).
- Once done shuttling the display will again show the Softener Unit that is in service and the gallons remaining. Also the Softener Unit that was just taken out of service will begin its regeneration cycle.

Main Menu

- To enter main menu press the  button.
- The first menu item is for display only. It shows the status of the Softener Unit that is not currently in service (the unit that is in standby). It will alternate between showing the standby unit (ex. [Unit 1]) and the current status of the unit. The following are the different status indications that may be seen when viewing this item:
 - [rdy] – This indicates that the standby unit is ready to go into service.
 - [1-' '] – This indicates that the standby unit is motoring to position #1 (Backwash position). The last two digits will be rotating the outer segments of the digit to indicate that the motor is running. The display will be the same when motoring to other positions, except that the first digit which shows the position number that is being motored to (ex. Position 2 – “2”, Position 3 – “3”).
 - [1-05] – This indicates that the standby unit is in position #1 and has less than five minutes remaining in that position. The time will count down in each position to zero and will then automatically motor the Softener Unit to the next position. The display will be the same for the other positions except for the first digit which shows the position number that the unit is in.
 - *Note: While viewing this menu the Softener Unit that is regenerating can be forced through the cycle steps. While the display is showing the position with time remaining (ex. [3- 12]), press and hold the  button until the display shows the unit motoring to the next position (approximately 3 seconds).*
- To continue to the next menu item press the  button.

Control Start-Up Procedures (Cont'd)

- The second menu item is the hardness setting, and will show the current setting (ex. [H- 25]), the entire display will be flashing. The hardness setting should be set according to the water hardness of the water being treated. If there are any questions as to what value this should be set to, please consult with your Signature Series Softener supplier. The hardness setting is used to calculate the number of gallons of water that can be treated between softener unit regenerations.
 - To edit this setting Press the  button.
 - The lowest digit will begin flashing while the other digits are solid.
 - Press  to change the digit to the desired value.
 - Press  to accept the value of the current digit
 - Repeat last two steps for each digit.
 - Once the last digit is accepted all digits will flash.
- To continue to the next menu item press the  button.
- The third menu item is the regeneration day override setting and will show the current setting (ex. [R- 07]), the entire display will be flashing. This setting adjusts the number of days between forced regenerations (if the unit has not been regenerated because of normal water usage). This number will get reset to the programmed setting after any regeneration, and will count down once every 24 hours. If it reaches zero it will force the shuttle valve to switch softener units and will begin regeneration of the unit that leaves service.
 - To edit this setting Press the  button.
 - The lowest digit will begin flashing while the other digits are solid.
 - Press  to change the digit to the desired value.
 - Press  to accept the value of the current digit
 - Repeat last two steps for each digit.
 - Once the last digit is accepted all digits will flash.

Notes: - Maximum Value is 29.
- If value is set to 0, regeneration override will never occur
- To exit the Main Menu press the  button.
 - *Note: While in any part of the Main Menu, if no buttons are pressed for 60 seconds or longer the menu will automatically be exited.*

Flow Meter

- The Signature Series duplex softener has a built in flow meter. While at the home display, press and hold the  button for approximately 3 seconds in order to view the flow meter.



- The above example shows a water flow of 5.31 gallons per minute (gal/min).
- *Notes:*
 1. *The smallest continuous detectable flow is approximately 0.35 gal/min. If the flow is below this volume the display will intermittently switch from showing 0.00 gal/min and some small flow value.*
 2. *The flow meter value can be affected by plumbing connections. The value should be considered approximate and should not be used if a highly precise flow reading is needed.*
- To exit the Flow Meter Menu press the  button.
 - *Note: While in the Flow Meter Menu, if no buttons are pressed for 60 seconds or longer the menu will automatically be exited.*

Battery Backup (Uses a Standard 9-Volt Alkaline Battery)

- Installing the Battery
 - To install the battery the slide cover of the shuttle valve must be removed.
 - Next insert the battery into the battery holding clip and snap the 9 volt battery connector onto the battery.
 - Replace the cover.
- Features of Battery Backup
 - The battery backup continues to count down gallons remaining during power failure.
 - The battery backup allows the motor to complete running to the next valve position if power fail occurs while a valve transition is occurring.
 - The battery backup allows a regenerating softener slave unit to motor to a rest position that minimizes potential water flow during the power outage. Once power returns, the softener valve will pick back up where it was when power was lost.
- *Notes:*
 - *During power failures, the display is turned off to conserve battery power. However, to confirm that the battery is working, press either button and the display will turn on for five seconds.*
 - *When used without battery back-up, the unit acts like a standard mechanical valve—when a power failure occurs, the unit stops at its current point in the regeneration position and then restarts at that point when the power is restored.*

Starting an Immediate Regeneration Cycle

- To Start **Immediate Extra Cycle** → Press and Hold the *Set/Change* Button.
- After 3 Seconds the Regeneration Cycle will Begin
- See “Main Menu section for viewing the cycle steps and the time remaining. As well as how to manually step through each cycle step.

Regeneration Cycle Indications

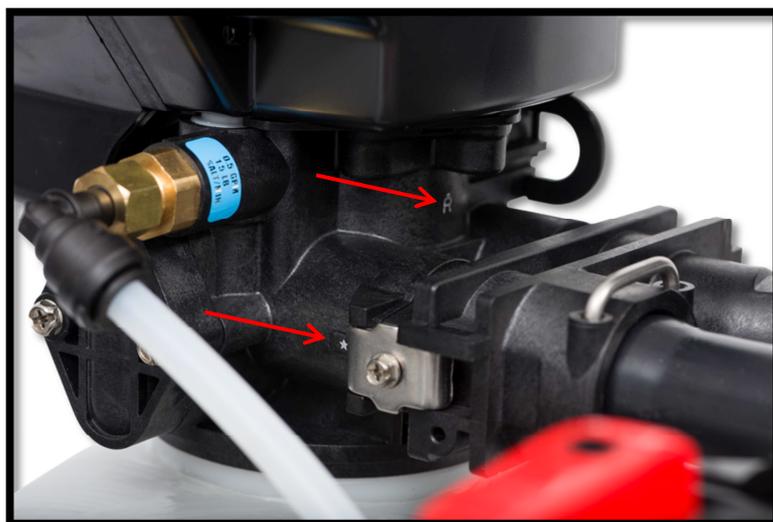
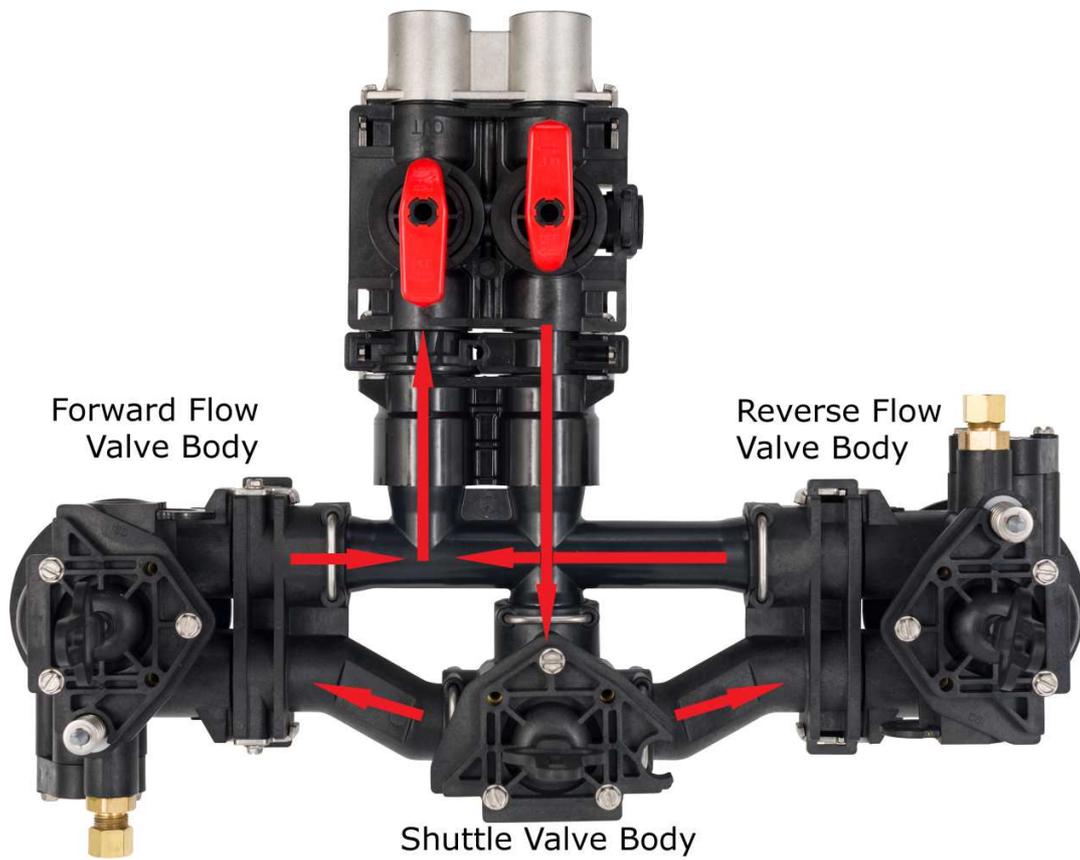
- The Softener Regeneration Cycle steps can be viewed both in the Main Menu and also on the valve position indicator wheel on the softener slave valve.
 - Step 1: Backwash
 - Step 2: Brine Draw / Rinse
 - Step 3: Rapid Rinse
 - Step 4: Brine Refill

Final Set-Up

With Proper Valve Operation Verified:

1. Add water in the brine tank to the top of the air check (Located inside the 4” brine well). Manually step one of the softener valves to the Brine Draw Position (Start an immediate Regeneration cycle and advance to the Brine Draw position, position step 2. See Main Menu section of the manual for details on advancing to the step 2). Allow the valve to draw water from the brine tank until it stops.
Note: The air check will close at approximately the midpoint of the screened intake area on the air check, stopping the any more water from being drawn out.
2. Next, manually step the valve to the Brine Refill Position (position step 4) and allow the valve to return to Service automatically.
3. Once the valve is back in Service, check that there is about 3.0” to 5.0” above the grid in the brine tank.
4. Fill the brine tank with salt to complete Set-Up. The control will run automatically as water is used.

Basic Operation



The reverse flow valve body is marked by a star on the flow direction arrows and an "R" just above the valve inlet and outlet ports.

Error Codes

An error can potentially occur on any of the three valves in the duplex system. If the error occurs on the Shuttle Valve the display will alternate showing [SHUTT] and the error code (ex. [ERR2]). If the error occurs on Unit 1 or Unit 2 the display will alternate showing the Unit (ex. [Unit 1]) and the error code. When an error occurs, it is important to note which valve unit has the error code that is displayed.

There are four (4) error codes which could indicate a possible problem with the control valve:

Error 2 - Homing slot expected but not found. Valve will begin searching for home
(Normal operation continues after valve finds home position)

Error 3 - Encoder is not sending a position signal
(Valve requires service to continue)

Error 4 - Unable to find homing slot
(Valve requires service to continue)

Error 5 - Motor overload (stalled position or shorted motor)
(Valve requires service to continue)

Error 3 Explanation: The unit is not receiving position information from the encoder. This can be caused by the motor not running, or the position encoder not sending a signal. If an Error 3 occurs, first check to make sure all of your wires are plugged in completely. Then unplug the power supply, wait a few seconds and plug it back in. The valve will try to run again, listen for the valve motor trying to run and look to see if the indicator wheel is turning (only applicable for the softener slave Units 1 and 2). If the Error 3 returns again the valve causing the error will need to be serviced.

Error 4 Explanation: The unit is not able to find the home position. The encoder wheel may be partially blocked, or the motor is not running smoothly (has intermittent hesitation or has partial internal gear failure). The valve causing the error will need to be serviced.

Error 5 Explanation: The unit thinks the motor is locked. This can only happen when the valve is running the motor, it is not seeing any change in the position encoder signal, and the motor is overloaded. This usually alerts the presence of corrosion inside the valve clogging the system

Master Programming Mode

To enter master programming mode, press and hold both the  button and the  button for 5 seconds.

*Note: All Master Programming functions have been preset at the factory. Unless a change is desired, it is **NOT** necessary to enter Master Programming Mode. Do not change these settings unless you understand the effect it will have on your softener system, or if Signature Series provider had directed you to make the changes.*

Regeneration Cycle Step Times (1)(2)(3)(4)

Example [1-20] – Step 1, 20 minutes

- The first 4 items in the Master Programming menu set the duration of time in minutes for each regeneration cycle step.
- The step number which is currently modifiable is indicated on the far left of the display screen. The number of minutes allotted for the selected regeneration step is displayed on the far right.
 - o To edit this setting Press the  button.
 - o The lowest digit will begin flashing while the other digits are solid.
 - o Press  to change the digit to the desired value.
 - o Press  to accept the value of the current digit
 - o Repeat last two steps for each digit.
 - o Once the last digit is accepted all digits will flash.
 - o Press  while all digits are flashing to move to the next menu item.

System Capacity in Grains

Example [c032] – 32,000 grain capacity

- Press the Menu/Enter button. This display is used to set the system capacity in grains and is used in conjunction with the hardness setting to calculate total gallons of treated water available between regenerations. This option is identified by the letter 'c' in the left digit. The maximum value for this item is 399.
 - o To edit this setting Press the  button.
 - o The lowest digit will begin flashing while the other digits are solid.
 - o Press  to change the digit to the desired value.
 - o Press  to accept the value of the current digit
 - o Repeat last two steps for each digit.
 - o Once the last digit is accepted all digits will flash.

To Exit the Master Programming Mode Press the  Button

Note: If no buttons are pressed for 60 seconds, the Master Programming Mode will be exited automatically.

Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	CORRECTION
1. Softener fails to regenerate automatically	Power supply plugged into intermittent or dead power source.	Connect to constant power source
	Disconnected meter cable	Reconnect cable
	Improper control valve programming	Reset program settings
	Defective power supply	Replace power supply
	Defective circuit board or meter	Call dealer, Replace or repair
	Defective drive motor	Check motor operation by activating the service button on back of motor
2. Loss of capacity	Increase raw water hardness Brine concentration and/or quantity	Reset unit to the new capacity. Keep brine tank full of salt at all times. Clean it yearly. Salt may be bridged. If using a salt grid pate, ensure refill water is over it.
	Resin fouling	Call dealer, find out how to confirm it. Clean the resin and prevent future fouling.
	Poor distribution, Channeling (uneven bed surface)	Call dealer. Check distributors and backwash flow.
	Internal valve leak	Call dealer. Replace spacers, seals and/or piston.
	Resin age	Call dealer. Check for resin oxidation caused by chlorine. Mushy resin.
	Resin loss	Call dealer. Check for correct bed depth. Broken distributors. Air or gas in bed: Well gas eliminator. Loose brine line.
3. Poor water quality	Check items listed in #1 & #2	
	Bypass valve open	Close by-pass valve
	Channeling	Check for too slow or high service flow. Check for media fouling.
4. High salt usage	High salt setting	Adjust brine tank refill time
	Excessive water in brine tank	See symptom #7
	Constant flow through the unit	Indicates plumbing leak (i.e. toilet tank)
	Improperly set hardness or regeneration day override programming	Reset programming

Troubleshooting Guide Cont'd

SYMPTOM	PROBABLE CAUSE	CORRECTION
5. Loss of water pressure	Scaling/fouling of inlet pipe	Clean or replace pipeline. Pretreat to prevent
	Fouled resin	Clean resin. Pretreat to prevent
	Improper backwash	Too many resin fines and/or sediment. Call dealer, reset backwash flow rate, and/or adjust
6. Excessive water in brine tank and/or salty water to service	Plugged drain line	Check flow to drain. Clean flow control
	Dirty or damaged brine valve	Clean or replace brine valve
	Plugged injector	Clean injector and replace screen
	Low inlet pressure	Increase pressure to allow injector to perform properly. (20 psig minimum)
	Excessive brine refill cycle time	Reset brine refill cycle time
7. Softener fails to use salt	Check items listed in #1	
	Improper control valve programming	Check and reset programming
	Plugged/restricted drain line	Clean drain line and/or flow control
	Injector is plugged	Clean or replace injector and screen
	No water in brine tank	Check for restriction in BLFC. Ensure safety float is not stuck. Check brine tank for leaks.
	Water pressure is too low	Line pressure must be at least 20 psi.
	Brine line injects air during brine draw	Check brine line for air leaks
	Internal control leak	Call dealer, check piston, seals and spacers for scratches and dents
8. Control cycles continuously	Faulty circuit board	Replace circuit board
9. Continuous flow to drain	Foreign material in control	Call dealer. Clean valve, rebuild unit
	Internal control leak	Same as above
	Valve jammed in backwash, brine, or Rapid rinse position	Same as above
	Motor stopped or jammed	Replace motor