SENTRY II

Series 960SM

Single Metered Water Softening System

Owner's Manual

Table of Contents

System Specifications

Water pressure: 40 psi minimum 100 psi Maximum

Water Temperature: 40°F to 110°F

Electrical Requirements:

- Supply Voltage: 120V
- Supply Frequency: 60Hz
- Output Voltage: 12V AC
- Output Current: Maximum 3.0 Amps

Water Meter:

- Pipe Size: 3/4”-1”
- Accuracy: ± 5%
- Minimum Flow : 0.25 GPM

Control Valve to Tank Connection: 2.5”-8UN

Control Valve Distributor Pipe Connection: 1”

Circuit Board Memory: NonVolatile EEPROM (**E**lectrical **E**rasable **P**rogrammable **R**ead **O**nly **M**emory)

Compatible with the following typical concentrations of regenerant chemicals: Sodium Chloride, Potassium Chloride, Potassium Permangenate, Sodium Bisulfite, Chlorine and Chloramines

Warnings

The control valve and fittings are not designed to support the weight of the system or the plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black O-rings.

Hydrocarbons such as kerosene, benzene, gasoline, etc., may damage products that contain O-rings or plastic components. Exposure to such hydrocarbons may cause the products to leak. Do not use the product(s) contained in this document on water supplies that contain hydrocarbons such as kerosene, benzene, gasoline, etc.

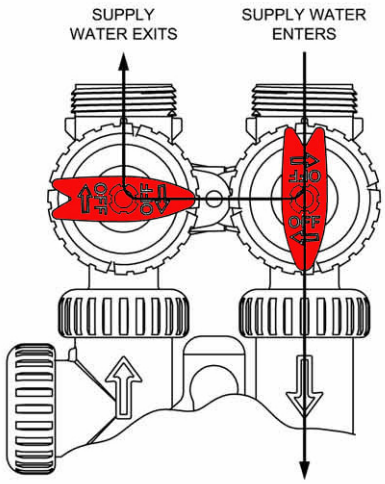
The water meter should not be used as the primary monitoring device for critical or health effect applications.

Do not use pipe dope or other sealants on threads. Teflon tape is recommended to be used on all threads. Use of pipe dope may break down the plastics in the control valve.

Start-Up

To begin, place the bypass in the position shown in Figure 1.

Figure 1



Place the softener in the Backwash cycle.

- To place the softener in the Backwash cycle press and hold the REGEN button (approx. 6 seconds) until the control valve initiates a regeneration cycle. The softener is now in the Backwash cycle. An initial burst of air will be released to the drain. Leave the unit in the Backwash cycle until the water running to the drain runs clear.
- Press the REGEN button to advance the controller to the next cycle. The softener is now in the Brine/Slow Rinse cycle.
- When the timer begins countdown press the REGEN button to advance the controller to the next cycle. The softener is now in the 2nd Backwash cycle.
- When the timer begins countdown press the REGEN button to advance the controller to the next cycle. The softener is now in the Fast Rinse cycle. Leave the unit in the Fast Rinse cycle for at least five minutes.
- While the system is rinsing manually fill the brine tank with fresh water until there is approximately 2” of water above the false bottom.
- Press the REGEN button to advance the controller to the next cycle. The softener is now in the Brine Tank Fill cycle. Leave the unit in the Brine Tank Fill cycle for at least one minute. This will ensure that there is no air trapped in the brine tubing and valve.

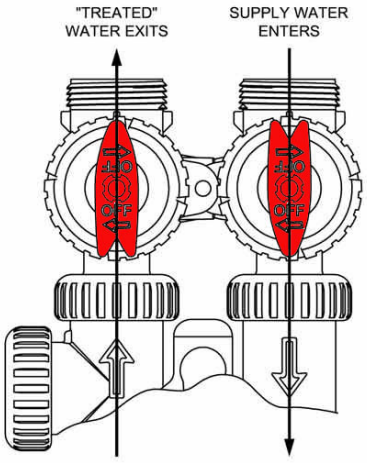
IMPORTANT:

After the unit has filled for approximately 1 minute, raise the float to shut off the flow of water and then check the float valve, brine tubing and connections for leaks.

- Press the REGEN button to advance the controller to the home position.
- Salt may be placed in the unit at this time.

To complete the Start-up place bypass in the position shown in Figure 2

Figure 2



Series 960
Control Valve Programming

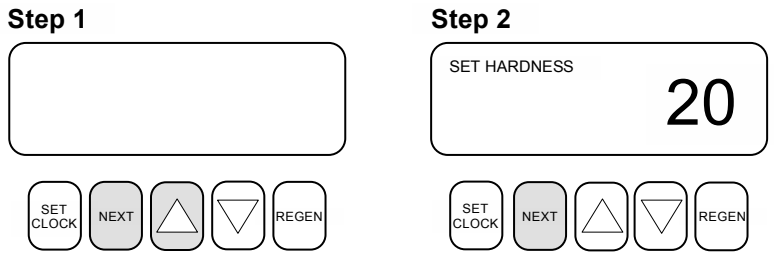
Control Valve Programming

Programming

The control valve has been pre-programmed from the factory with the correct regeneration cycle program and cycle times. The gallon capacity between regeneration can be changed by adjusting the water hardness.

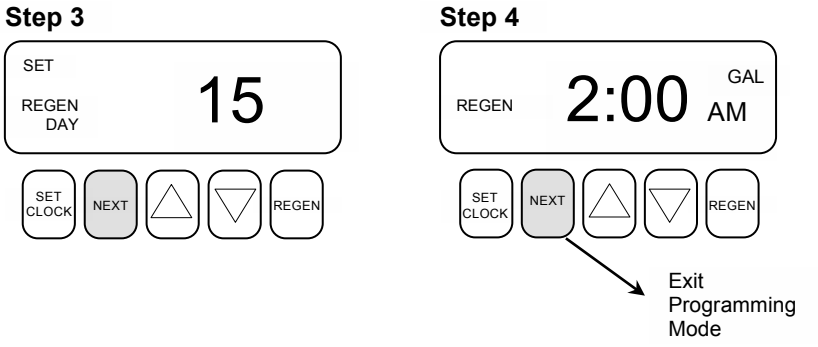
Step 1 - Press the **NEXT** and the **UP** Arrow buttons at the same time and hold for 3 seconds.

Step 2 - **Raw Water Hardness:** Adjust to the correct hardness by pressing the **UP** or **DOWN** arrow button. Default setting 20 grains per gallon. Press **NEXT** to go to Step 3.



Step 3 - **Day Override:** The factory default setting is **15 days**. Press **NEXT** to go to Step 4.

Step 4 - Regeneration Time: The system regenerates at **2:00 AM**. The regeneration cycle should be set for a time when no water will be used. (Typically this is during the night.) Press the **UP** or **DOWN** arrow buttons to adjust the regeneration hour. Press **NEXT** to adjust the regeneration time minutes then press **NEXT** to exit programming.



Control Valve Programming

Set the Time of Day

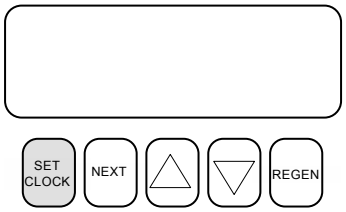
The time of day should only need to be set after initial installation or after an extended power outage. If an extended power outage has occurred, the time of day will flash indicating that it needs to be set.

Step 1 - Press **SET CLOCK**

Step 2 - **Current Time of Day - Hours:** Adjust to the correct hour by pressing the **UP** or **DOWN** arrow button. Press **NEXT** to go to Step 3.

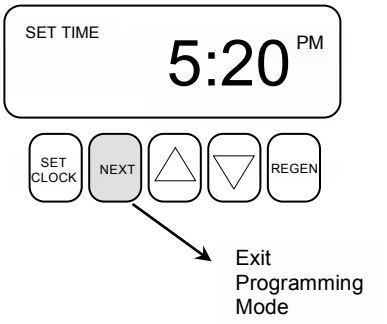
Step 3 - **Current Time of Day - Minutes:** Adjust to the correct minutes by pressing the up or down arrow button. Press **NEXT** to return to the normal operating screen.

Step 1



Step 2

Step 3



Normal Operating Screens

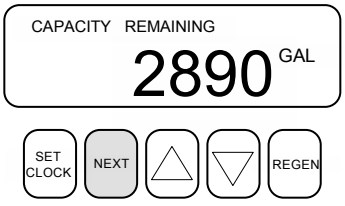
During normal operation one of three screens can be displayed. Pressing the **NEXT** button alternates between these screens.

Screen 1 - Current Time of Day

Screen 2 - Capacity Remaining in Gallons

Screen 1

Screen 2



Manually Regenerating the Water Softener

There are two different methods for manual regeneration of the water softener.

- **Delayed Regeneration**
- **Immediate Regeneration**

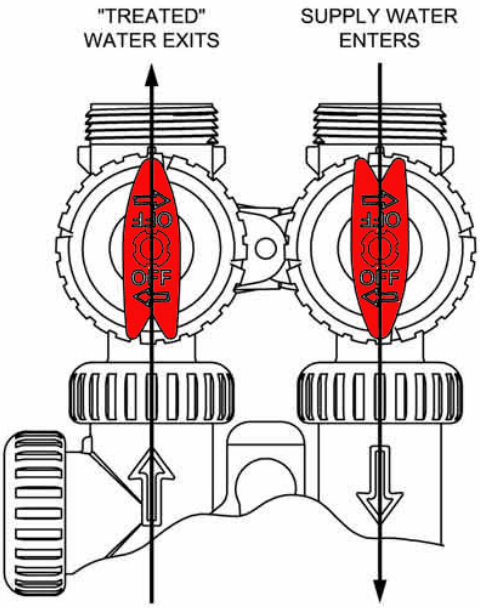
Reasons you may want to manually regenerate the water softener:

1. If the brine tank has run out of salt:
    - After adding salt to the brine tank manually regenerate the softener using the delayed regeneration method. *(The water needs time to dissolve the salt for a minimum of eight hours.)*
    - To initiate a delayed regeneration simply push the REGEN button one time. (*Don't hold the button down*) REGEN TODAY will appear on the left hand side of the screen. The softener is queued to regenerate that day at the preset regeneration time. *(Typically this is during the night.)* If for some reason you want to cancel the delayed regeneration just push the REGEN button again. REGEN TODAY will no longer be visible on the screen.
2. If you have guests coming to stay in your home:
    - The water softener is programmed to measure the specific water usage of your family and regenerates based on water usage history. If you know that there will be extra people using the water you may want to manual regenerate the softener using the delayed regeneration method.
    - To initiate a delayed regeneration simply push the REGEN button one time. (*Don't hold the button down*) REGEN TODAY will appear on the left hand side of the screen. The softener is queued to regenerate that day at the preset regeneration time. *(Typically this is during the night.)* If for some reason you want to cancel the delayed regeneration just push the REGEN button again. REGEN TODAY will no longer be visible on the screen.
3. If the water is hard:
    - The quickest way to get soft water in your home is by initiating an immediate regeneration of the water softener.
    - To initiate an immediate regeneration of the water softener push and hold the REGEN button for approximately six seconds. The unit will immediately begin its regeneration cycle and water will be running to the drain. *(When the softener has completed the manual regeneration the system will automatically return to its preset normal operations.)*

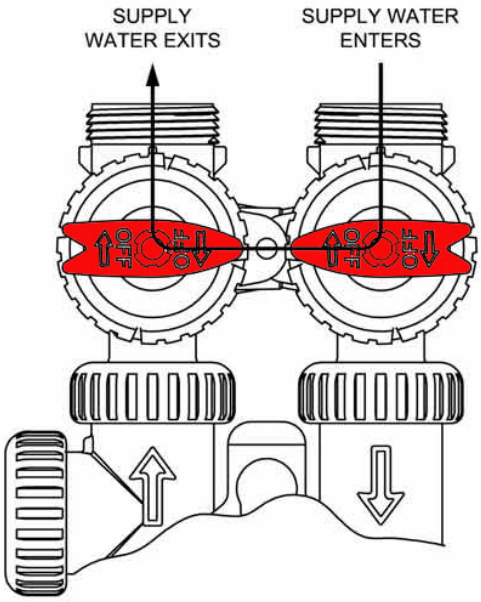
Note: After an immediate regeneration of the water softener there is typically a delay of three to four days to purge the system i.e. water heater, pipes etc. of the hard water. If you are experiencing hard water after the three to four day period has passed, you may need to contact a service professional.

Bypass Valve Operation

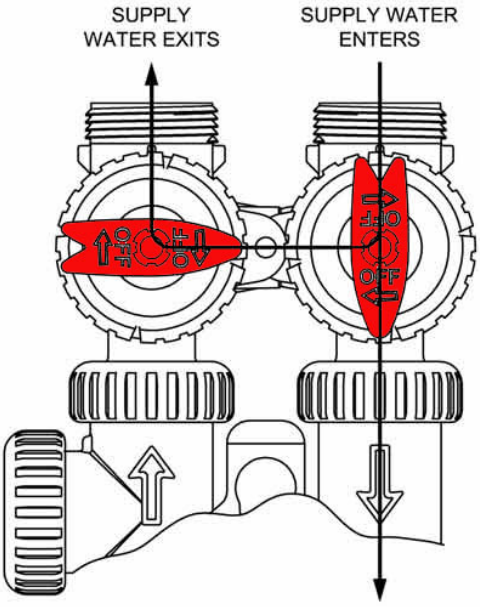
Normal Operation



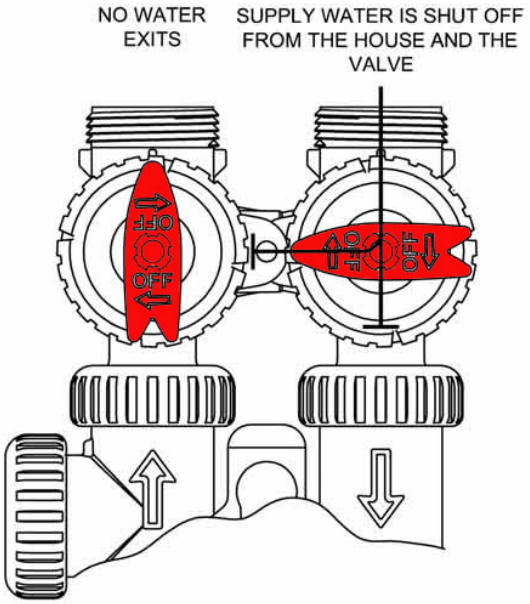
Bypass Operation



Diagnostic Mode



Shut Off Mode



Troubleshooting the Control Valve

Problem	Possible Cause	Solution
No display on Control Valve Circuit Board	No power at electrical outlet	Repair outlet or use working outlet
	Control Valve Power Cord not plugged onto Control Valve Circuit Board	Make sure Control Valve Power Cord is connected securely at both ends
	Improper power supply	Verify proper voltage is being delivered to Circuit Board
	Defective Circuit Board	Replace Circuit Board
Control Valve Circuit Board does not display correct time of day	Control Valve Power Cord plugged into electric outlet controlled by light switch	Use uninterrupted outlet
	Tripped Breaker Switch and/or tripped GFI	Reset Breaker Switch and/ or GFI switch
	Power outage	Reset time of day. If Circuit Board has battery back up present, the battery may be depleted. Replace if necessary.
	Defective Circuit Board	Replace Circuit Board
Display does not indicate that water is flowing. (Normally the word “Softening” flashes on the display when water is being used.)	Bypass valve in bypass position	Turn Bypass Handles to place Bypass in service position
	Meter is not connected to meter connection on Circuit Board or is not connected securely	Connect Meter to three-pin connection labeled METER on Circuit Board. Remove and reconnect to ensure proper connection
	Restricted/ stalled Meter Turbine	Remove Meter and check for rotation or foreign material
	Defective Meter	Replace Meter
	Defective Circuit Board	Replace Circuit Board
Time of day flashes on and off	Power outage	Reset time of day. If Circuit Board has battery back up present, the Battery may be depleted. Replace if necessary.
Control valve does not regenerate automatically when the REGEN button is depressed and held.	Broken Drive Gear or Drive Cap Assembly	Replace Drive Gear or Drive Cap Assembly
	Broken Piston Rod	Replace Piston Rod
	Defective PC Board	Defective PC Board
Control valve does not regenerate automatically but **does** when the REGEN button is depressed and held.	Bypass Valve in bypass position	Turn Bypass Handles to place Bypass in service position
	Meter is not connected to meter connection on Circuit Board or is not connected securely	Connect Meter to three pin connection labeled METER on Circuit Board. Remove and reconnect to ensure proper connection
	Restricted/ stalled Meter Turbine	Remove Meter and check for rotation or foreign material
	Incorrect programming	Check for programming error
	Defective Meter	Replace Meter
	Defective Circuit Board	Replace Circuit Board

Troubleshooting the Control Valve

Problem	Possible Cause	Solution
Hard or untreated water is being delivered	Bypass Valve is open or faulty	Fully close Bypass Valve or replace. Also check for multiple bypasses
	Media is exhausted due to high water usage	Check program settings or diagnostics for abnormal water usage
	Meter not registering	Remove Meter and check for rotation or foreign material
	No Salt or low level of Salt in Brine Tank	Add proper type of salt to Brine Tank
	Insufficient brine level in Brine Tank	Check refill setting in programming. Check Refill Flow Control for restrictions or debris and clean or replace
	Damaged Seal and Spacer Stack Assembly	Replace Seal and Spacer Stack Assembly
	Control valve body type and piston type mix matched	Verify proper control valve body type and piston type match
	Fouled media bed	Replace media bed
System uses too much salt	Improper refill setting	Check refill setting
	Improper program settings	Check program setting to make sure they are specific to the water quality and application needs
	Control valve regenerates frequently	Check for leaking fixtures that may be exhausting capacity or system is undersized
	Slow drip from brine refill tubing. Float Valve is not designed to shut off a drip	Replace Seal and Spacer Stack Assembly

To obtain a complete service manual with parts breakdown visit www.pacificwaterinc.com