Programming, Installation & Operation Manual

Intelligent Controller

1” & 1-1/4” EE/TC Series Control Valves

Water Softening and Backwashing Systems

Table of Contents

Start-Up Procedure

After the inlet, outlet, drain, and electrical connections are complete a proper start-up procedure is critical to minimize the potential for damage to the system. Follow the instructions below.

1: Plug in the power to the system, set the bypass to the **Bypass Mode** and cycle the valve to the **Backwash** cycle.

2: Slowly crack open the inlet of the bypass valve until you hear air going to the drain line. **Do not open fully!**

3: Allow the system to fill in the backwash position **very slowly!** (if this is a softener, add 2-3 gallons of water and 1.2 ounces of household bleach (5.25% Sodium Hypochlorite or appropriate sanitizing solution) per cubic foot of resin to the brine tank at this time)

4: As soon as water is coming out the drain, cycle the valve to the **Fast Rinse** Cycle and slowly open the inlet of the bypass valve to the full open position.

5: Unplug the power cord from the wall and carefully inspect the system for leaks. Allow the system to **Fast Rinse** for an extended period of time, typically no less than 30 minutes. If the water stops running to the drain during this time, check that the well can handle the systems regeneration cycle flow demands or cycle the system through a short backwash cycle to clear the bottom screen.

6: Plug the power back in and cycle the valve to the **Backwash** position. Allow the system to complete the regeneration process on its own.

7: Once the regeneration process is complete, run the system through a second regeneration process.

It is normal for the water to have variances in pH and color, along with air for the first couple weeks of operation. This start-up procedure helps to minimize this potential problem. Running the system through additional automated regeneration cycles can also lessen this common issue associated with the installation of new water quality improvement equipment. Media start-up procedures differ, but these general guidelines should satisfy most requirements. Some medias require up to 72 hours of soaking time, the extended **Fast Rinse** cycle helps to satisfy this.

Specifications

Minimum/Maximum Operating Pressures: 20 psi (138 kPa or 1.4 bar) -125 psi (862 kPa or 8.6 bar)
Minimum/Maximum Operating Temperatures: 40°F (4°C) - 110°F (43°C)
Power Adapter: Supply Voltage 120 VAC
Supply Frequency: 60 Hz
Output Voltage: 12 VAC
Output Current: 500 mA

CK10EE/CK10TC

1" valve flow rate @ 15 PSI drop: 27 GPM
1" valve maximum backwash rate @ 27 PSI drop: 15 GPM
1" valve distributor pilot: 1.05" (3/4" PVC)

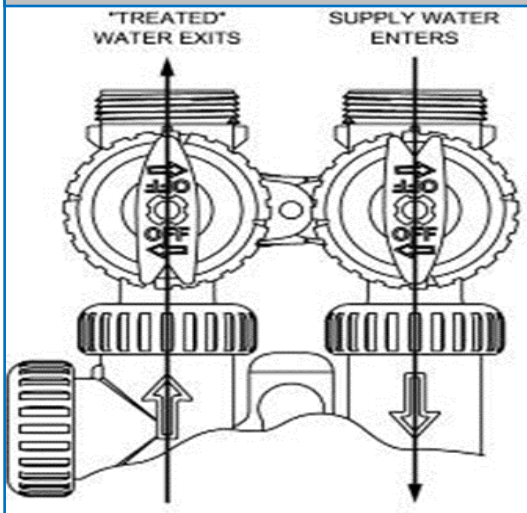
WS125EE/WS125TC

1-1/4" valve flow rate @ 15 PSI drop: 34 GPM
1-1/4" valve maximum backwash rate @ 25 PSI drop: 32 GPM
1-1/4" valve distributor pilot: 1.32" (1" PVC)

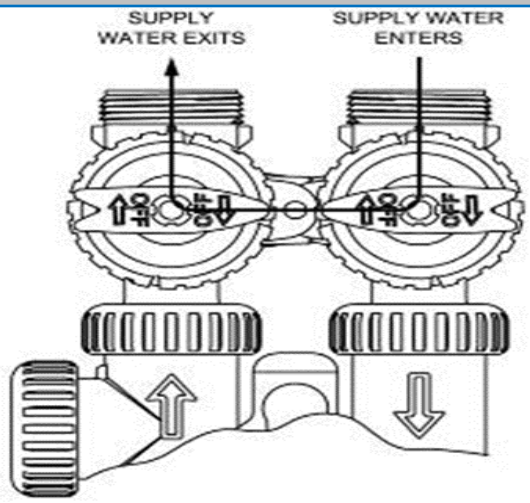
No user serviceable parts are on the PC board, the motor, or the power adapter. The means of disconnection from the main power supply is by unplugging the power adapter from the wall.

Bypass Valve Operation

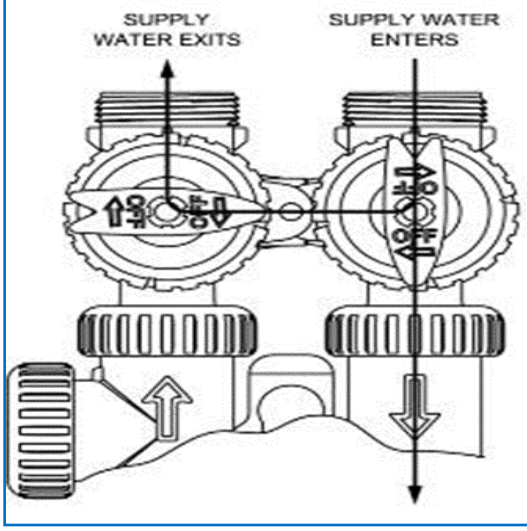
Service Mode



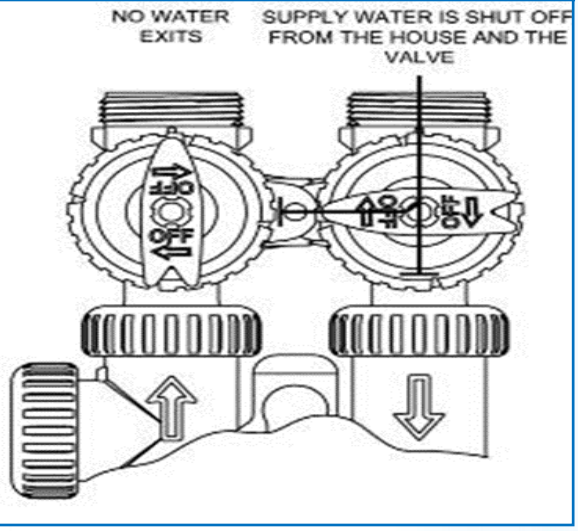
Bypass Mode



Diagnostic Mode



Shut Off Mode



CK10EE, WS1EE & WS125EE Meter Softener Programming

Setting Time of Day

Push **NEXT** until time of day screen is displayed. Press and hold ▽ until **SET TIME** is displayed and the hour flashes once. Press △ or ▽ until the correct hour is displayed. Then press **NEXT.** The minutes will flash. Press △ or ▽ until the correct minute is displayed. Press **NEXT** to return to the User Display.

Typical Installer Programming

1: Press the "**NEXT**" and △ simultaneously for ≈3 seconds.

2: Use up and down arrow buttons to set **HARDNESS** to the actual compensated hardness then press **"NEXT"**

3: Use up and down arrow buttons to set **REGEN DAY** to **21 (or desired alternate)** then press **"NEXT"**

4: Use up and down arrow buttons to set **TIME REGEN** to **2:00 AM (or desired alternate)** then press **"NEXT"**

The main screen will now display the time of day. By pressing the **NEXT** button the screen can display the following items.

Volume Remaining Until the Next Regeneration : Current Flow Rate : Totalizer : Time of Day

Typical OEM Programming

This "_____"grain unit is programmed for _____ grains to maintain salt efficiency. Please consult a water treatment professional if the settings are going to be altered as this will impact the units performance and efficiency.

1: Press the "**NEXT**" and ▽ simultaneously for ≈3 seconds.

2: Use up and down arrow buttons and set to **SOFTENING** then press **"NEXT"**

3: Use up and down arrow buttons and set to **REGEN dn BRINE** then press **"NEXT"**

4: Use up and down arrow buttons and set to **REGEN PoST FILL** then press **"NEXT"**

5: Use up and down arrow buttons and set to **1 BACKWASH 8 MIN** then press **"NEXT"**

6: Use up and down arrow buttons and set to **2 dn 60 MIN BRINE** then press **"NEXT"**

7: Use up and down arrow buttons and set to **3 BACKWASH 3 MIN** then press **"NEXT"**

8: Use up and down arrow buttons and set to **4 RINSE 8 MIN** then press **"NEXT"**

9: Use up and down arrow buttons and set to **5 FILL _____ LBS** then press **"NEXT"**

10: Use up and down arrow buttons and set to **CAPACITY _____x1000 then press "NEXT"**

11: Use up and down arrow buttons and set to **REGEN AUTo GAL** then press **"NEXT"**

12: Use up and down arrow buttons and set to **REGEN NORMAL** then press **"NEXT"**

13: Use up and down arrow buttons and set to **rELAY oFF** then press **"NEXT"**

The valve will now program itself.

Connector Set_____

Injector Size_____

DLFC GPM_____

Bypass_____

Assembler_____

Button Operation and Function

NEXT Scrolls to the next display.

REGEN Pressing once and releasing will schedule a regeneration at the preset delayed regeneration time. Pressing again and releasing will cancel the regeneration. Pressing and holding for 3 seconds will initiate an immediate regeneration. Pressing while in regeneration will advance to the next cycle.

▽ △ Changes variable being displayed.

▽ **NEXT** △ **REGEN** Key sequence to lock and unlock program settings.

NEXT **REGEN** Holding for 3 seconds initiates a control reset. The software version is displayed and the piston returns to the home/service position, resynchronizing the valve.

REGEN △ For twin alternating valve, holding for at least 3 seconds causes a switch in the tank in Service without cycling the regeneration valve. After tank switch, days remaining and capacity remaining status is retained for each tank until the next regeneration.

Setting Options Table
Filters should only use shaded options

Volume Capacity	Regeneration Time Option	Day Override	Result*
AUTO	NORMAL	oFF	Reserve capacity automatically estimated. Regeneration occurs when volume capacity falls below the reserve capacity at the next Regen Set Time.
AUTO	NORMAL	Any number	Reserve capacity automatically estimated. Regeneration occurs at the next Regen Set Time when volume capacity falls below the reserve capacity or the specified number of days between regenerations is reached.
Any number	NORMAL	oFF	Reserve capacity not automatically estimated. Regeneration occurs at the next Regen Set Time when volume capacity reaches 0.
oFF	NORMAL	Any number	Reserve capacity not automatically estimated. Regeneration occurs at the next Regen Set Time when the specified number of days between regenerations is reached.
Any number	NORMAL	Any number	Reserve capacity not automatically estimated. Regeneration occurs at the next Regen Set Time when volume capacity reaches 0 or the specified number of days between regenerations is reached.
AUTO	On 0	oFF	Reserve capacity NOT automatically estimated. Regeneration occurs immediately when volume capacity reaches 0. Time of regeneration will not be allowed to be set because regeneration will always occur when volume capacity reaches 0.
Any number	On 0	oFF	Reserve capacity NOT automatically estimated. Regeneration occurs immediately when volume capacity reaches 0. Time of regeneration will not be allowed to be set because regeneration will always occur when volume capacity reaches 0.
AUTO	NORMAL on 0	oFF	Reserve capacity automatically estimated. Regeneration occurs when volume capacity falls below the reserve capacity at the next Regen Set Time or regeneration occurs after 10 minutes of no water usage when volume capacity reaches 0.
AUTO	NORMAL on 0	Any number	Reserve capacity automatically estimated. Regeneration occurs at the next Regen Set Time when volume capacity falls below the reserve capacity or the specified number of days between regenerations is reached or regeneration occurs after 10 minutes of no water usage when volume capacity reaches 0.
Any number	NORMAL on 0	Any number	Reserve capacity not automatically estimated. Regeneration occurs at the next Regen Set Time when the specified number of days between regenerations is reached or regeneration occurs after 10 minutes of no water usage when volume capacity reaches 0.

*Reserve Capacity estimate is based on history of water usage. Reserve Capacity estimate is not available with alternator systems or Twin Tank Valve

CK10 & WS125 “TC” Backwash Programming

GENERAL OPERATION

When the system is operating one of two displays will be shown: Time of day or days until the next regeneration. Pressing the △ or ▽ button will toggle between the two choices.

TO SET TIME OF DAY

1. Accessed by pressing SET for ≈3 seconds.
2. Adjust hour with △ or ▽ Press SET to go to the next step.
3. Adjust minutes with △ or ▽ Press SET to complete and return to normal operation.

TO SET TIME OF REGENERATION AND DAYS BETWEEN REGENERATION

For initial set-up or to make adjustments, complete the steps as shown. Access this mode by pressing **SET** and △ for ≈3 seconds. The number of days between regenerations may need to be varied based on application and water conditions. (This step will not appear if the 7-day clock option is selected.)

1. Accessed by pressing SET and △ simultaneously for ≈3 seconds.
2. Set Regeneration Time Hour using △ or ▽ Press **SET** to go to the next step.
3. Set Regeneration Time Minutes using △ or ▽ Press **SET** to go to the next step.
4. Set number of Days between regeneration cycles.
5. Press SET to complete and return to normal operation.

• The user can initiate manual regeneration. The user has the option to request the manual regeneration at the delayed regeneration time or to have the regeneration occur immediately. Simultaneously press △ and ▽ to start a regeneration at the next delayed regeneration time. If a regeneration is to occur “today” an arrow will point to REGEN. For immediate regeneration, simultaneously press and hold □ and □ for three seconds.

When in regeneration, step through the different regeneration cycles by pressing △ or ▽.

General Backwashing Filter Guidelines

Backwashing systems should be programmed to backwash at a different time than other water treatment equipment to lessen the potential for over running the drainage system. Backwash lengths and frequencies vary by the application. Below are typical for common medias.

Municipal Applications

Carbon: Every 14-28 days for 5-10, P7 or P8

Sediment Reduction Medias: Every 7-28 days, P7 or P8

Well Applications

Carbon used for iron/chlorine reduction: Every 2-7 days, P7 or P8

Sediment Reduction Medias: Every 2-7 days, P7, P8, or P9

Arsenic Reduction Medias: Every 14-28 days, P7

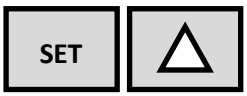
Iron Reduction Medias: Every 2-7 Days, P7, P8 or P9

Neutralizing Medias: Every 3-7 days, P7 or P8

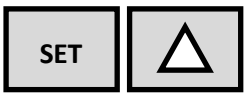
Potassium Permanganate or Chlorine Tablet Regeneration: P4

These are general use guidelines only. Regular testing should be done to determine proper frequency and duration.

OEM System Setup



Step 1: From normal mode press SET and △ buttons simultaneously for ≈3 seconds and release



Step 2: Press SET and △ buttons simultaneously again for ≈3 seconds and release

Step 3: Select the desired program below by pressing the △ or ▽ buttons. Press the **SET** button to go to step 4.

Regeneration Cycles and Times for Different Programs

Program	All times in Minutes				
	C1 1st Backwash	C2 Regenerate	C3 2nd Backwash	C4 Rinse	C5 Fill
P0	3	50	3	3	1-99
P1	8	50	8	4	1-99
P2	8	70	10	6	1-99
P3	12	70	12	8	1-99
P4	10	50	<1	8	1-99
P5	4	50	<1	4	1-99
P6	12	6	<1	12	1-99
P7	6	Skipped	Skipped	4	Skipped
P8	10	Skipped	Skipped	6	Skipped
P9	14	Skipped	Skipped	8	Skipped

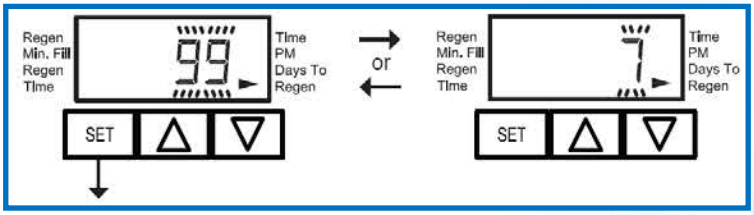
Note: There is a short second backwash during P4, P5, and P6

STEP 4 – If program P0 through P6 was selected, enter in the minutes of fill using △ or ▽ buttons. If program P7, P8 or P9 was selected, this screen will not appear. Press SET button to go to Step 5. Note: For each minute of fill 0.5 gallons of water is added to the solution tank. With Sodium Chloride, each 0.5 gallon of water will dissolve 1.5 pounds of salt.

STEP 5 - Use △ or ▽ to switch between:

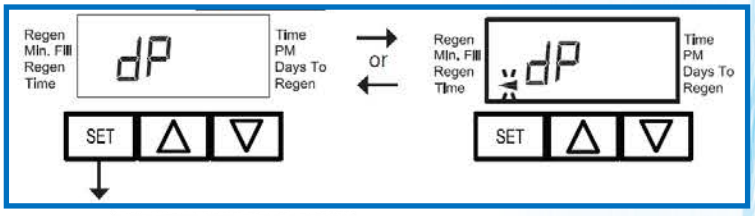
• "99" 1-99 Days Between Regeneration - Regeneration is determined by the number of days that have passed since the last regeneration scheduled.

• **"7"** 7-Day - Regeneration is scheduled for specific days of the week.



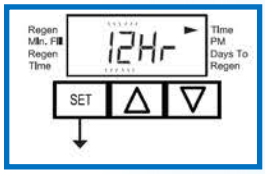
Press the **SET** button to go to step 6.

STEP 6 - If you intend to use a differential pressure switch please contact your dealer for assistance. If not, settings in this display are ignored. Press **SET** to go to Step 7



STEP 7 - Use △ or ▽ to select "12Hr" for 12 hour AM/PM format or 24 for 24 hour format.

Press SET to exit OEM System Setup.



General Warnings

The control valve, fittings and/or bypass are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing. 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. THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone for the unit. A silicone lubricant may be used on black O-rings but is not necessary.

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. If necessary, pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place a screwdriver in the slots on caps and/or tap with a hammer.

Do not use pipe dope or other sealants on threads. Use Teflon tape on the threaded inlet, outlet and drain fittings. Teflon tape is not necessary on the nut connections or caps with of O-ring seals.

After completing any valve maintenance involving the drive/piston assembly, unplug power source jack from the printed circuit board (black wire), wait 3 seconds and plug back in or:

- For valves that use a TC circuit board (three buttons) press and hold SET and DOWN buttons for 3 seconds. The cover button may have other names like “SET HOUR”, “CLOCK” or “SET CLOCK” but the circuit board is labeled with SET.
- For all other valves press and hold NEXT and REGEN buttons for 3 seconds.

This resets the electronics and establishes the service piston position. The display should flash all of the available LCD’s, then flash the software version and then reset the valve to the service position.

All plumbing should be done in accordance with local plumbing codes. The pipe size for the drain line should be a minimum of ½”. Backwash flow rates in excess of 7 gpm (26.5 lpm) or length in excess of 20’ (6.1m) require ¾” drain line.

Solder joints near the drain must be done prior to connecting the drain line flow control fitting. Leave at least 6” between the drain line control fitting and solder joints when soldering pipes that are connected on the drain line control fitting. Failure to do this could cause interior damage to the drain line flow control fitting.

When assembling the installation fitting package (inlet and outlet), connect the fitting to the plumbing system first and then attach the nut, split ring and O-ring. Heat from soldering or solvent cements may damage the nut, split ring or O-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and O-ring. Avoid getting primer and solvent cement on any part of the O-rings, split rings, bypass valve or control valve.

Plug into an electrical outlet. Note: All electrical connections must be connected according to local codes. (Be certain the outlet is uninterrupted.)

Install grounding strap on metal pipes.

Fully detailed CK10 & WS1.25, System Controller, EE, CS, and many more drawings and Service/Programming Manuals are available by request.

This glass filled Noryl® (or equivalent) fully automatic control valve is designed as the primary control center to direct and regulate all cycles of a water softener or filter. When the CK10 or WS125 control valve is manufactured as a softener, the control valve can be ordered to perform downflow or upflow regeneration. When the CK10 or WS125 control valve is set up as a filter, the control valve can be set to perform downflow regeneration or simply backwash. The control valve can be set to regenerate on demand (consumption of a predetermined amount of water) and/or as a time clock (passage of a particular number of days). The control valve can be set so that a softener can meet the Water Quality Association (WQA) Standard S100 or NSF/ANSI Standard 44 efficiency rating.

It is not recommended to change control valves from downflow to upflow brining or vice versa in the field. The valve bodies for downflow and upflow are unique to the regeneration type and should not be interchanged. A mismatch of valve body and regeneration piston will result in hard water bypass during service.

The control valve is compatible with a variety of regenerants and resin cleaners. The control valve is capable of routing the flow of water in the necessary paths to regenerate or backwash water treatment systems. The injector regulates the flow of brine or other regenerants. The control valve regulates the flow rates for backwashing, rinsing, and the replenishing of treated water into a regenerant tank, when applicable.

The control valve uses no traditional fasteners (e.g. screws); instead clips, threaded caps, nuts and snap type latches are used. Caps and nuts only need to be firmly hand tightened because radial seals are used. Tools required to service the valve include one small blade screw driver, one large blade screw driver, pliers and a pair of hands. A plastic wrench is available which eliminates the need for screwdrivers and pliers. Disassembly for servicing takes much less time than comparable products currently on the market. Control valve installation is simplified as the distributor tube can be cut ½" above to ½" below the top of tank thread. The distributor tube is held in place by an O-ring seal and the control valve also has a bayonet lock feature for upper distributor baskets.

The AC adapter comes with a 15 foot power cord and is designed for use with the control valve. The AC adapter is for dry location use only. If the power goes out, the control valve remembers all settings until the battery power is depleted. After the battery power is depleted, the only item that needs to be reset is the time of day; other values are permanently stored in the nonvolatile memory. The control valve battery is not rechargeable but is replaceable.

A vacuum break is required any time a vacuum situation may occur. This is common on wells, systems with booster pumps after the unit, or when the system is installed in areas of varying altitudes. No warranty is considered if the system has been subjected to a vacuum. A vacuum break should be installed between the softener and the potential cause of a vacuum.

Typical multiple tank installation with pre and post filtration with UV. Special notes, a simple air gap is shown with a minimum of 2" of space between the drain tube and the P-Trap. A vacuum break must be installed on systems where a vacuum condition could occur. Install the vacuum break betwwen the systems and the potential vacuum source. A well, booster pump, or even a drain pipe running down a few feet can cause a vacuum condition that will damage the system. The brine tank has a small barbed fitting that can be run to a gravity drain but this is typically not necessary.

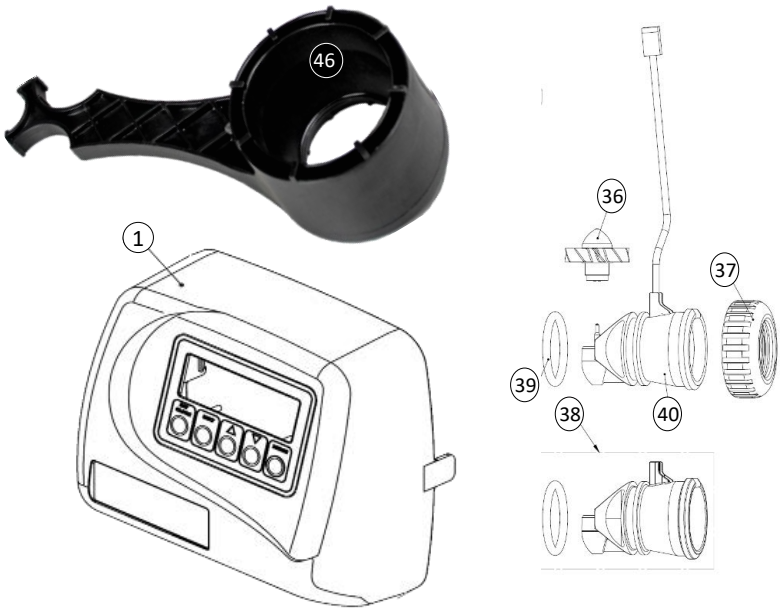
Service and Repair Parts

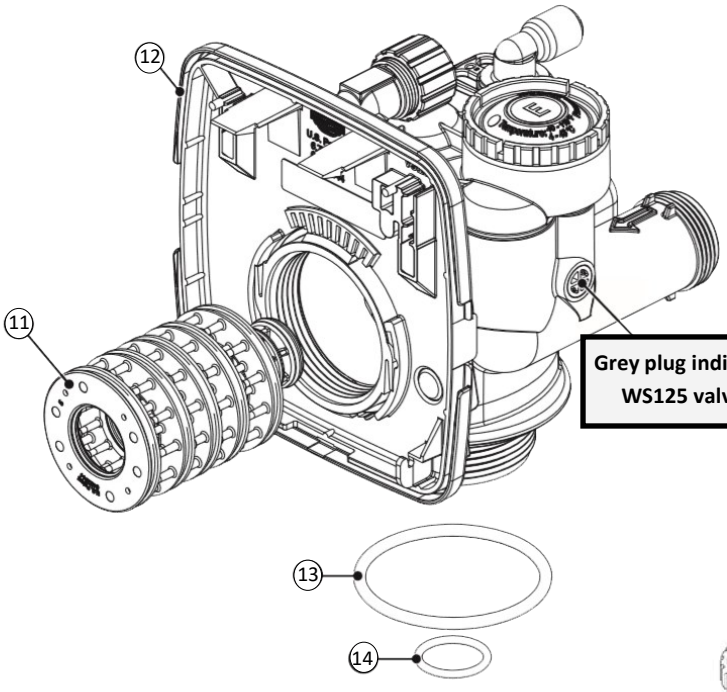
Item #	Valve Rebuild Kits*
39V-CK10-K	CK10 Softener Valve Rebuild Specify Injector Size.
39V-CK10-KF	CK10 Filter Valve Rebuild
39V-WS125-K	WS125 Softener Valve Rebuild Specify Injector Size
39V-WS125-KF	WS125Filter Valve Rebuild

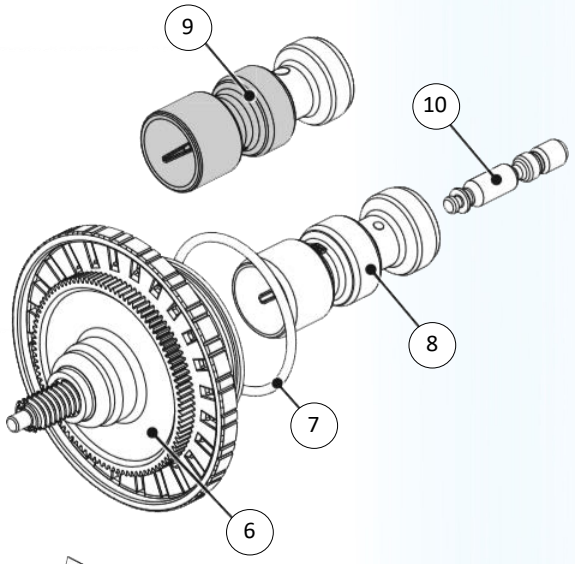
***Rebuild kit includes the most recommended replacement parts including piston, seal/spacer stack, Drive cap/gear assembly, several O-rings and the brinepiston and injector assembly for softener valves.**

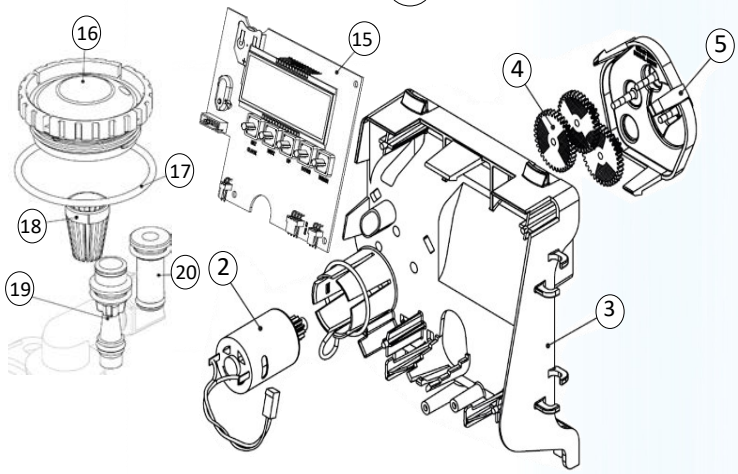
Item #	Description
39V-V3175EE-01	(1) 4 Button Cover
39V-V3175TC-01	(1) 3 Button Cover
39V-V3107-01	(2) 12V Motor
39V-V3106-01	(3) Drive Bracket & Spring Clip
39V-V3110	(4) Reducing Gear, order 3 pieces
39V-V3109	(5) Drive Gear Cover
39V-V3004	(6) Drive Cap Assy.
39V-V3135	(7) Tank Neck O-ring 228
39V-V3011	(8) Piston Downflow CK10
39V-V3407	(8) Piston Downflow WS125
39V-V3011-01	(9) Piston Upflow CK10
39V-V4042	(9) Piston Upflow WS125 (Black)
39V-V3174	(10) Regenerant piston
39V-V3005	(11) CK10 Seal Spacer Stack
39V-V3430	(11) WS125 Seal/Spacer Stack
39V-V3178	(12) Drive Plate
39V-V3180	(13) O-ring 337 Tank/Valve
39V-V3105	(14) CK10 Riser O-ring
39V-V3357	(14) CK125 Riser O-ring
39V-V3408EE-BOARD	(15) 4 Button EE Board
39V-V3818TC	(15) 3 Button TC Board
39V-V3176	(16) Injector Cap
39V-V3152	(17) Injector Cap O-ring
39V-V3177-01	(18) Injector Screen
39V-V3010-Z	(20) Injector Plug
39V-V3330-01	(21) Brine Elbow Assy. ⅜”

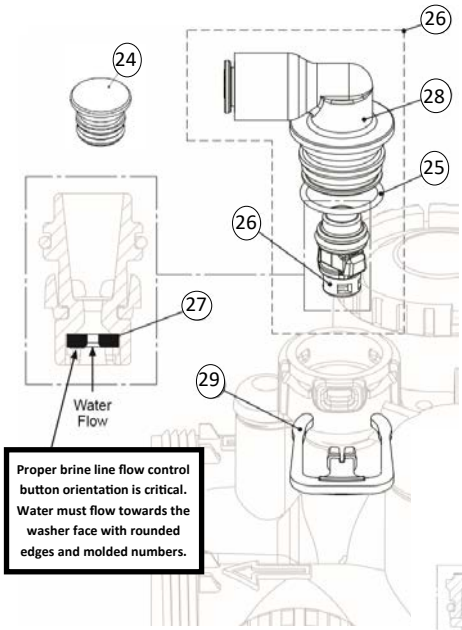
Item #	Description
39V-V3552	(21) Brine Elbow Assy. ½”
39V-V3195-01	(24) Refill Plug
39V-V3163	(25) O-ring
39V-V4144-01	(26) RFC Assy. w/.5 GPM button
39V-V3182	(27) RFC Button .5 GPM
39V-H4628	(28) Brine Elbow Legris Liquifit
39V-H4615	(29) Red RFC/Drain Clip
39V-V3192K	(31) ¾” x ⅝” Drain Nut & Tube Insert
39V-V3158-02	(32) Drain Elbow (No Silencer)
39V-V3158-01	(32) Drain Elbow (Silencer)
39V-V3962	(32-34) Drain Elbow Assy. (No Silencer)
39V-V3163	(33) O-ring
39V-V3159-01	(34) DLFC Retainer
39V-V3162-...	(35) Small Button, See DLFC Page
39V-V3118-01	(36) Turbine Assembly
39V-V3151	(37) QC Nut
39V-V3003-01	(38) Meter Plug Assembly
39V-V3104	(39) QC O-ring
39V-V3003	(40) Meter includes 36, 39
39V-3150	(41) Split Ring
39V-V3167	(42) 1” Drain Fitting Adapter
39V-V3166	(43) Drain Fitting Body 1” MNPT
39V-V3008-04	(44) 1” Drain Assembly
39V-V3193-02	(46) Service Wrench

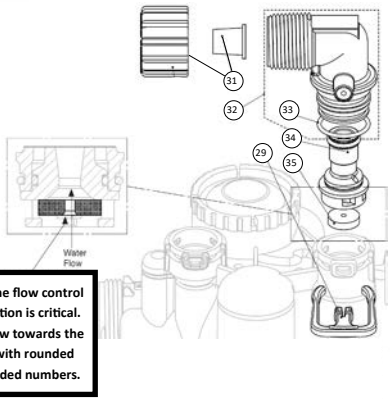


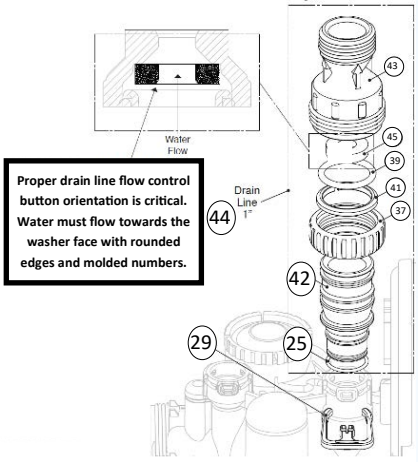


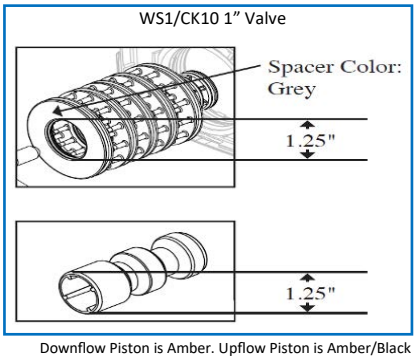




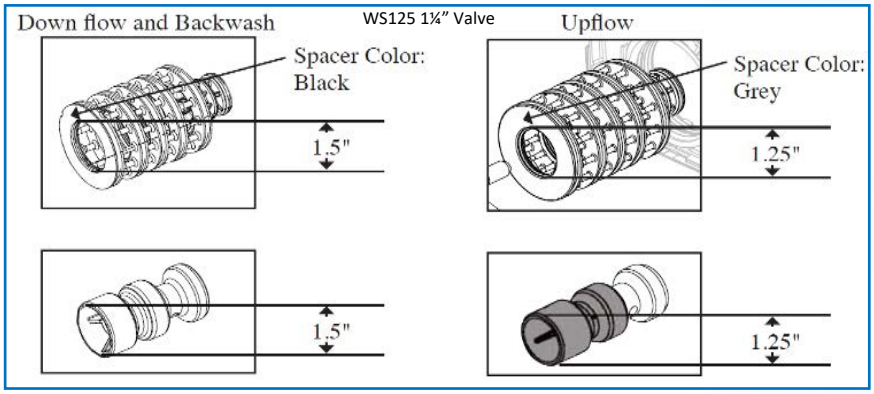








Downflow Piston is Amber. Upflow Piston is Amber/Black



Drain Line low Control Buttons and Injectors

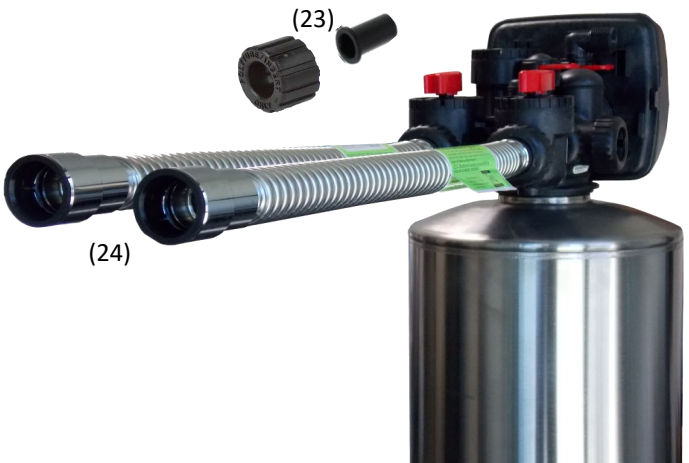
Clack Small DLFC Button	DLFC GPM
39V-V3162-007	0.7
39V-V3162-100	1.0
39V-V3162-013	1.3
39V-V3162-017	1.7
39V-V3162-022	2.2
39V-V3162-027	2.7
39V-V3162-032	3.2
39V-V3162-042	4.2
39V-V3162-053	5.3
39V-V3162-065	6.5
39V-V3162-075	7.5
39V-V3162-090	9.0
39V-V3162-100	10

Clack Large DLFC Button	DLFC GPM
39V-V3190-065	6.5
39V-V3190-075	7.5
39V-V3190-090	9.0
39V-V3190-110	11
39V-V3190-130	13
39V-V3190-170	17
39V-V3190-200	20
39V-V3190-250	25

Clack WS1/WS125 Injector Chart	Color	Typical Use	Draw/Rinse Rate @ 60 PSI
39V-V3010-1A	Black	6” Down/8” Up	.06/.17
39V-V3010-1B	Brown	7” Down/9” Up	.14/.21
39V-V3010-1C	Violet	8” Down/10” Up	.18/.29
39V-V3010-1D	Red	9” Down/12” Up	.22/.34
39V-V3010-1E	White	10” Down/13” Up	.27/.39
39V-V3010-1F	Blue	12 Down/14” Up	.37/.55
39V-V3010-1G	Yellow	13” Down/16” Up	.45/.68
39V-V3010-1H	Green	14” Down/18” Up	.46/.77
39V-V3010-1I	Orange	16” Down/22” Up	.62/1.1
39V-V3010-1J	Light Blue	18” Down	.70/1.4
39V-V3010-1K	Light Green	22” Down	.78/1.9

Installation Parts and Accessories

Item #	Description
39V-V3008-18 (1)	3/4” Plastic Male NPT
39V-V3007-04 (2)	1” Plastic Male NPT
39V-V3007-05 (3)	1.25” Plastic Male NPT
IWP-V3007-07T (4)	1.5” Plastic Male NPT
39V-V3007 (5)	1” PVC Male NPT Elbow
39V-V3007-01 (6)	3/4” x 1” PVC Solvent Elbow
39V-V3007-07 (7)	1.25” & 1.5” PVC Solvent
39V-V3007-03LF (8)	3/4” Brass Sweat (Lead Free)
39V-V3007-02LF (9)	1” Brass Sweat (Lead Free)
39V-V3007-09LF (10)	1.25” x 1.5” Brass Sweat (Lead Free)
39V-V3007-15 (11)	3/4” John Guest Elbow
39V-V3007-20 (12)	1” John Guest Elbow
IC-V3007-101 (13)	1.05” Inter-Connector for 8”-10” Tanks
IWP-V3007-GHT (14)	3/4” Garden Hose Thread x Clack Purge Kit
39V-V3191-01 (15)	Vertical 90˚Adapter
39V-V3006 (16)	Bypass Assembly
39V-V4099 (17)	External In-line Mixing Valve
39V-V3014 (18)	Micro switch Kit w/ Wire
39V-V3193-02 (19)	Clack Service Tool
39V-V3022 (20)	WS1 Stack Puller
39V-V3022-15 (21)	WS1.25/WS1.5 Stack Puller
39V-V3175WC-W (22)	White Weather Cover
39V-V3192K (23)	5/8” Nut (1/2” PEX) and Insert
51-331	Flex 304 SS Clack QC x 3/4” FNPT x 18”
51-449	Flex 304 SS Clack QC x 1” FNPT x 18”
51-451	Flex 304 SS Clack QC x 1” FNPT x 24”
51-333	Flex 3/4”John Guest x 3/4” Clack QC x 18”
51-453 (24)	Flex 1”John Guest x 1” Clack QC x 18”
51-457	Flex 304 SS Clack QC x Clack QC x 18”
51-459	Flex 304 SS Clack QC x Clack QC x 24”
39V-V4017-01	Twin Interconnect (Used for MAV)



Trouble Shooting and Error Codes

Filter valves TYPICALLY do not have meters, some sections may not apply

Problem	Possible Cause	Solution
Timer not on	Power adapter unplugged or defective, no power at outlet, defective board .	Connect or replace power adapter and/or board.
Time of day incorrect	Switched outlet or power outage.	Use un-switched outlet, reset time of day, replace battery if depleted.
Display does not show water flowing	Bypass valve open, meter not connected, worn, defective meter/cable.	Confirm bypass valve is in correct position, remove, inspect, repair or replace meter assembly.
System regenerates at wrong time of day	Time of day and/or regeneration is set correctly, valve is programmed for “Immediate Regeneration”.	Reset time of day/regeneration. Confirm master programming is set correctly.
Control valve will not regenerate manually	Bypass in wrong position, no electrical power, jammed piston, broken drive gear.	Check bypass, inspect piston and gears.
Control valve does not regenerate automatically but will manually	Programming error, meter not working.	Check master programming, inspect/repair meter.
Time of day flashes on and off	Power outage.	Reset time of day, reset time and replace battery if necessary.
No or low water pressure or flow	Worn resin or media, bypass valve in wrong position, water line closed, system undersized .	Inspect media inside tank, replace if worn. Inspect bypass valve, open main water line, check for any unusual water usage items i.e.: multiple head showers.
Salty Water	Worn valve internals, low incoming pressure, excessive back pressure on drain, worn resin, dirty or clogged injector, programming error.	Inspect and rebuild valve as needed, make sure water pressure consistently stays above 40 PSI for softener applications, repair/relocate drain line, clean or replace injector, reprogram valve.
Excessive salt usage	Leak in plumbing, leak in brine piston inside of valve, programming error.	Carefully inspect all plumbing locations to make sure there are no leaks. Even a small leak can equal hundreds of gallons of water each day. Inspect valve internals, rebuild if needed. Reprogram valve.
Resin or media loss to drain	Cold water, broken or missing top screen.	Adjust flow control based on water temperature. Colder water is denser. Replace top screen.
Resin or media in plumbing	System plumbed in backwards, damaged bottom screen.	Be absolutely sure the system is plumbed in the correct direction. Replace the bottom screen and add a Gravel underbedding for non Vortech tanks.
Water running to drain	Worn seal/spacer/piston, drive cap out of adjustment.	Rebuild valve, adjust drive cap assembly.

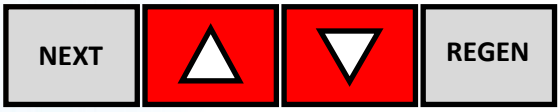
Error Codes	Symptom	Possible Cause	Solution
Err-101, Err-1001, E1	Control unable to sense motor movement.	Motor damages or not engaged, Circuit board not installed correctly, broken reduction gear.	Make sure motor is fully engaged and the wires are in good condition. Make sure motor is connected to board. Make sure board is properly aligned to the back plate. Inspect and replace gears if broken. Disconnect power from board for 5 seconds, then reconnect to reset and clear the error.
Err-102, Err-1002, E2	Control valve motor ran too short and was unable to find the next cycle, motor stalled.	Piston Jammed by foreign debris, Piston/ Seal spacer kit worn, main drive gear is too tight.	Remove piston/seal and spacer from valve and inspect for any debris, worn components, repair as needed. Flush valve while the piston is out to clear any debris. Adjust main gear and reset valve.
Err-103, Err-1003, E3	Motor ran too long and was unable to find the next cycle position.	Drive bracket not connected properly, worn piston/seal and spacer, motor failure or out of position.	Make sure the drive bracket is fully engaged and the electronic board is correctly installed. Remove piston/seal and spacer from valve and inspect for any debris, worn components, repair as needed. Reset valve.
Err-104, Err-1004, E4	Valve could not find home position.	Drive bracket or motor not locked in.	Inspect and repair as needed.
Err-106, Err-1006,	MAV/NHWBP/SEPS valve motor ran too long and did not find “Park”.	Valve programmed for ALT a or B, nHbP, SEPS, or AUX MAV without having one of the above attached to the main board. MAV/ NHWBP Wire not connected. MAV/NHWBP motor not fully engaged, worn or damaged piston/seal spacer.	Reset board and reprogram properly, connect wires, and correct motor position. Repair or replace MAW/NHWBP.
Err-107, Err-1007	MAV/NHWBP/SEPS valve motor ran too short and did not find “Park”.	MAV/NHWBP worn or damaged, foreign object in valve.	Inspect, repair or replace valve as needed.

How to Reset the Board

Unplug the power from the board, not the wall. Wait 10 seconds then reconnect the power.

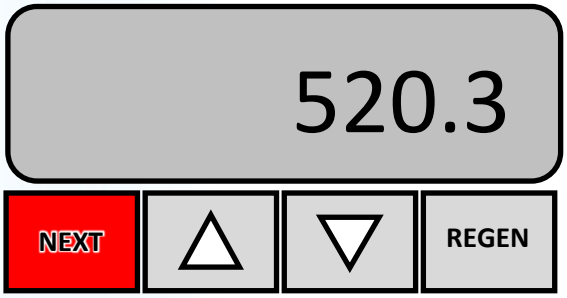
Diagnostics

Step 1



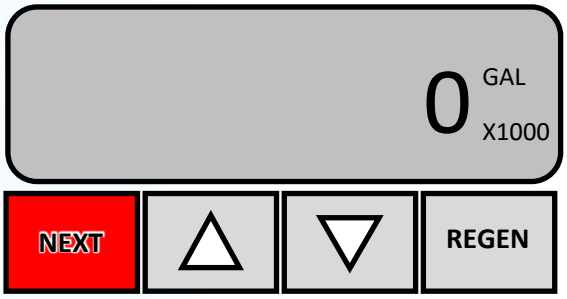
Step 1- Press ▲▼ simultaneously for 5 seconds and release. If screen in Step 2 does not appear the lock on the valve is activated. To unlock press ▽ NEXT △ REGEN In sequence, then press ▲▼ simultaneously for 5 seconds and release.

Step 2



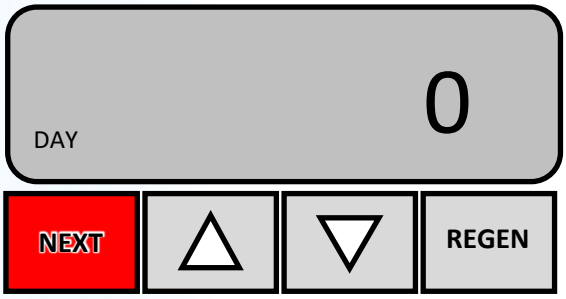
Step 2- Software Version. Press NEXT to go to Step 3. Press REGEN to exit Diagnostics.

Step 3



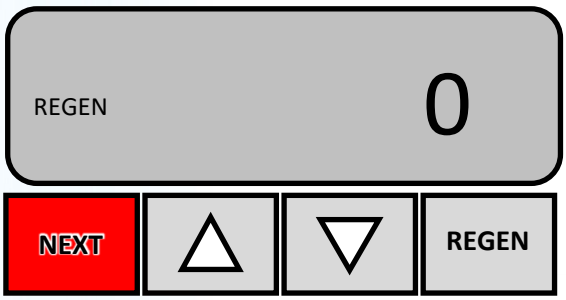
Step 3- Volume, total used since start-up: This display shows the total gallons treated since startup. This display will equal zero if a water meter is not installed. Press the NEXT button to go to Step 4. Press REGEN to return to previous step.

Step 4



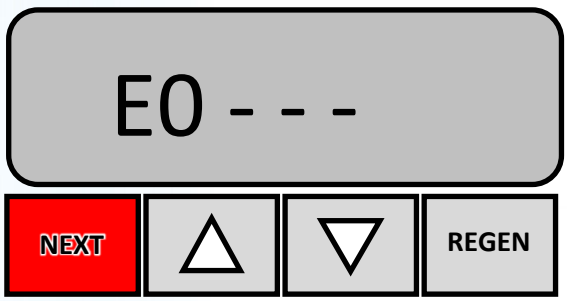
Step 4- Days, total since start-up: This display shows the total days since startup. Press the NEXT button to go to Step 5. Press REGEN to return to previous step.

Step 5



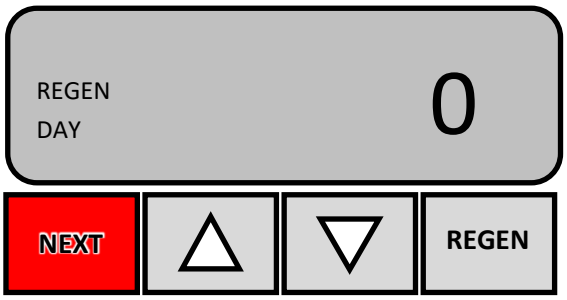
Step 5- Regenerations, total number since start-up: This display shows the total number of regenerations that have occurred since startup. Press the NEXT button to go to Step 6. Press REGEN to return to previous step.

Step 6



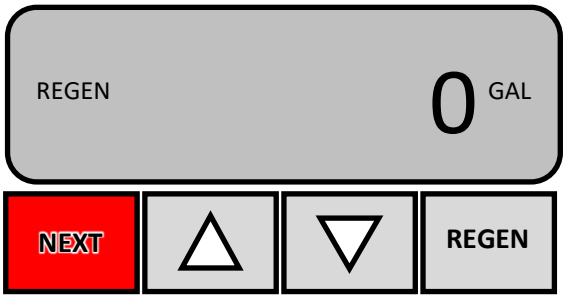
Step 6- Error Log: This display shows a history of the last 10 errors generated by the control during operation. Press ▲ or ▼ to view each recorded error. Press NEXT to go to Step 7. Press REGEN to return to previous step.

Step 7



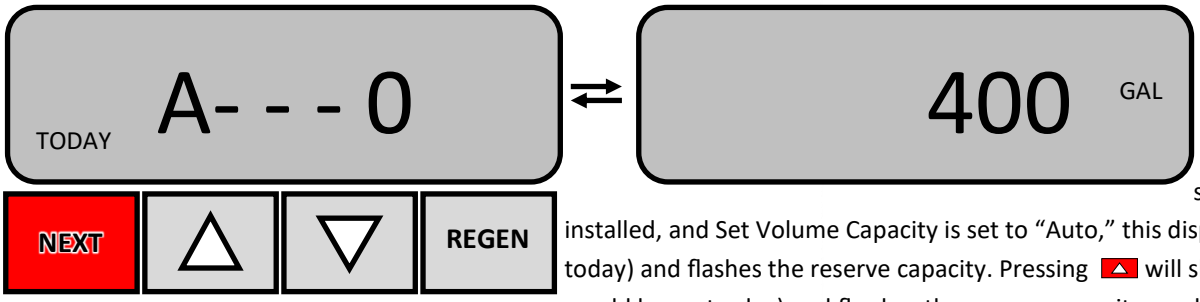
Step 7- Days, since last regeneration: This display shows the days since the last regeneration occurred. Press NEXT to go to Step 8. Press REGEN to return to previous step.

Step 8



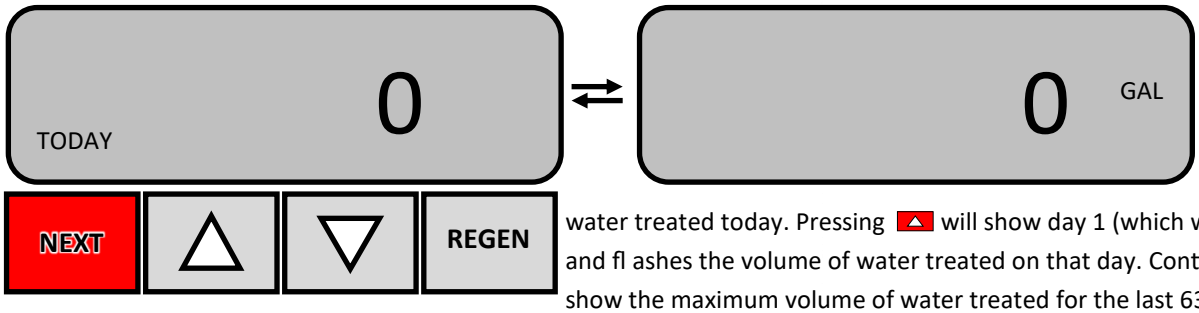
Step 8- Volume, since last regeneration: This display shows the volume of water that has been treated since the last regeneration. This display will equal zero when a water meter is not installed. Press NEXT to go to Step 9D. Press REGEN to return to previous step.

Step 9



Step 9- Volume, reserve capacity used for last 7 days: If the valve is set up as a softener, a meter is installed, and Set Volume Capacity is set to “Auto,” this display shows day 0 (for today) and flashes the reserve capacity. Pressing ▲ will show day 1 (which would be yesterday) and fl ashes the reserve capacity used. Pressing ▲ again will show day 2 (the day before yesterday) and the reserve capacity. Keep pressing ▲ to show the capacity for days 3, 4, 5 and 6. ▼ can be pressed to move backwards in the day series. This display does not appear if 1.0ſ is set in Step 2CS, if ALT A or ALT B are selected in Step 5CS, or anytime the reserve capacity is not determined by the control. Press NEXT at any time to go to Step 10. Press REGEN to return to previous step.

Step 10



Step 10- Volume, 63-day usage history: This display shows day 0 (for today) and fl ashes the volume of water treated today. Pressing ▲ will show day 1 (which would be yesterday) and fl ashes the volume of water treated on that day. Continue to press ▲ to show the maximum volume of water treated for the last 63 days. If a regeneration occurred on the day the word “REGEN” will also be displayed. This display will show dashes if a water meter is not installed. Press NEXT at any time to exit Diagnostics mode. Press REGEN to return to previous step.

When desired all information in Diagnostics may be reset to zero when the valve is moved to a new location. To reset to zero, press NEXT and ▼ simultaneously to go to the Service/OEM 1 screen, and release. Press ▲ and ▲ simultaneously to reset diagnostic values to zero. Screen will return to User Display.

We developed our POE product line using a less traveled path. Rather than using the **lowest cost** as a key motive, our systems feature only **quality** components with price being an important, yet secondary factor. We literally examined every component looking for the best quality while still maintaining a relatively competitive price. We also looked to buy **USA** made components wherever reasonable and if not, to source them from respected USA companies. Here is a list of some of the reasons our systems are a notch above…

1. USA labor by well trained, closely supervised, caring, permanent employees.
2. USA made NSF Certified mineral tanks whenever possible. The exceptions include unusual tank sizes that are not available by our US manufacturers.
3. USA made brine tank. High quality safety float assemblies in every system to act as a secondary shut off to prevent water damage.
4. Certified medias, even our quartz under-bedding is NSF listed!
5. Top of the line riser assemblies provide the highest flow and the best durability.
6. Optional high quality stainless steel, aluminum, or neoprene jackets. No thin plastic decorative wraps, our jackets perform!
7. Custom programmed to our customers needs ensuring excellent efficiency and water quality!
8. USA made heavy duty boxing. Note that our box does not make ambiguous implications by having "Made in the USA" printed on the box. Most of our components are USA made, but great care must be taken when making a "Made in the USA" claim.

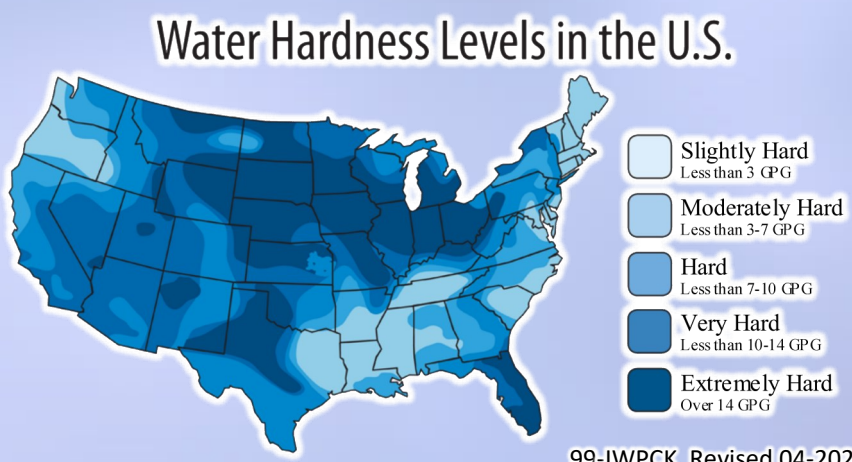
It is our intention to build and sell truly high quality systems, using only components made in the USA, sourced from USA companies or the very best of the overseas offerings. Our company philosophy is not just a motto, but a way of life.

"WE WILL NOT COMPETE IN THE RACE TO THE BOTTOM."

The inlet and outlet diameter of the water softener must match the diameter of the water supply piping at the location where the softener will be installed. UPC 610.2

Compensated Hardness Chart

Water Hardness	Multiply by
1 - 20 GPG	1.1
21 - 40 GPG	1.2
41 - 70 GPG	1.3
71 - 100 GPG	1.4
100+ GPG	1.5



99-IWPCK Revised 04-2021