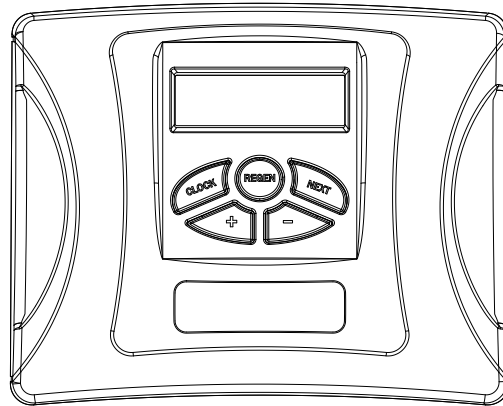
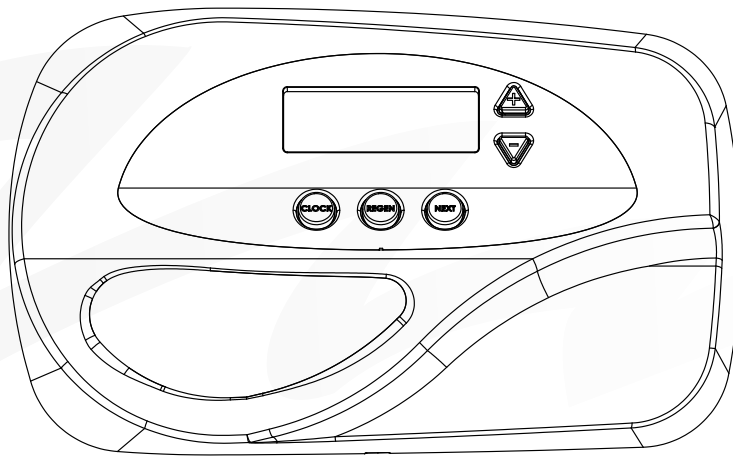


Water Specialist Control Valve Programming and Cover Drawing Manual

WC



WD



WM

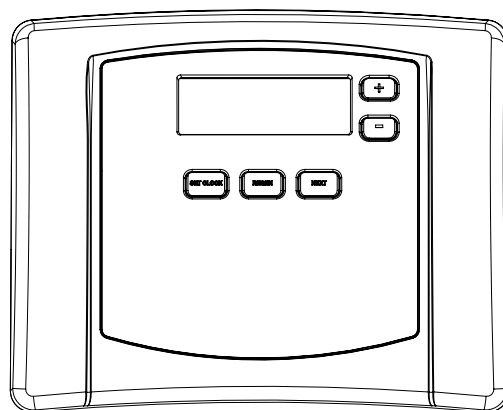




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WC Front Cover and Drive Assembly

Drawing No.	Order No.	Description	Quantity
1	V3837-01	WK & WN FRONT COVER ASY BLK/NONAME/BL	1
2	V3107-01	WS1 MOTOR ASY	1
3	V3106-01	WS1 DRIVE BRACKET & SPRING CLIP	1
4	V4050WC	WS1 THRU 2 WC PC BOARD	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3
6	V3109	WS1 DRIVE GEAR COVER	1
Not Shown	V3526	WS1 WTRGT POWER SUPPLY 15VDC	1
	V3526EU	WS1 WTRGT POWER SUPPLY 220/15VDC	
Not Shown	V3541	WS1 WS DRIVE BACK PLATE	1

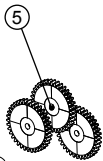
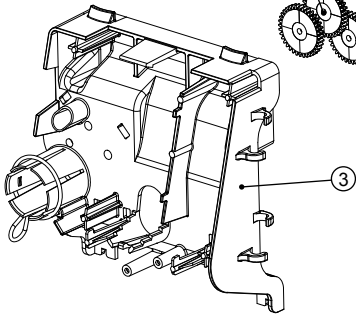
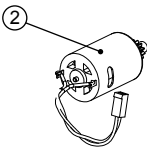
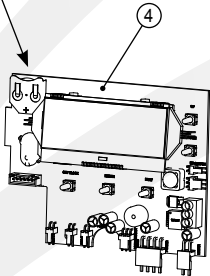
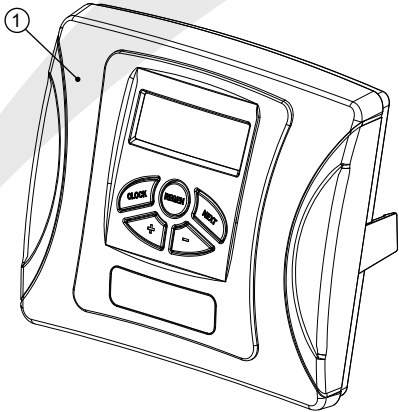
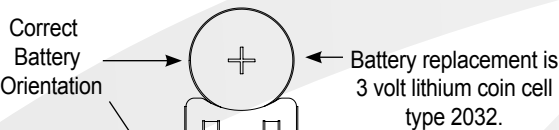
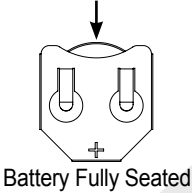
Refer to Control Valve Service Manual for other drawings and part numbers.

Relay Specifications: 12V DC Relay with a coil resistance not less than 80 ohms. If mounting the relay under the cover check for proper mounting location dimensions on the backplate.

AC Adapter	U.S.	International
Supply Voltage	120 V AC	230V AC
Supply Frequency	60 Hz	50 Hz
Output Voltage	15VDC	15VDC
Output Current	1.2A	1.2A

Wiring For Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RLY 1	Coil -
COM	Coil +
RLY 2	Second relay not available

When replacing the battery, align positives and push down to fully seat.



WD and WM Front Cover and Drive Assembly

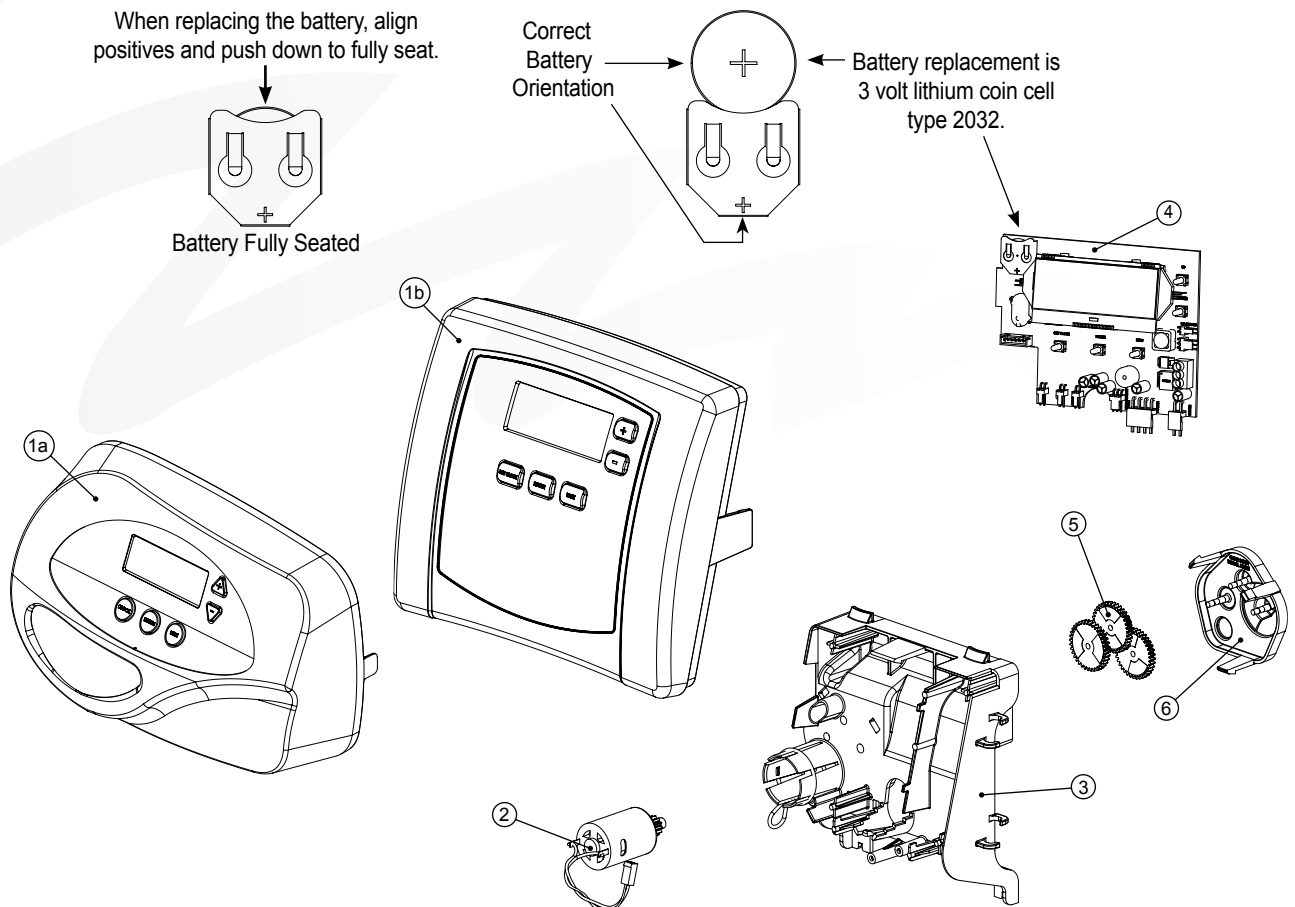
Drawing No.	Order No.	Description	Quantity
1a	V3367-01	WS1WE FRONT COVER ASY BLACK	1
1b	V3540-NOLAB	WS1WS FRONT COVER ASSEMBLY NO LABEL	
2	V3107-01	WS1 MOTOR ASY	1
3	V3106-01	WS1 DRIVE BRACKET & SPRING CLIP	1
4	V3502WD-03BOARD	WS1 THRU 2 WD PCB XMEGA	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3
6	V3109	WS1 DRIVE GEAR COVER	1
Not Shown	V3526	WS1 WTRGT POWER SUPPLY 15VDC	1
	V3526EU	WS1 WTRGT POWER SUPPLY 220/15VDC	
Not Shown	V3541	WS1 WS DRIVE BACK PLATE	1
Not Shown	V3368	WS1WE DRIVE BACK PLATE FOR WD VALVES	1
Not Shown	V3541	WS1WS DRIVE BACK PLATE FOR WG AND WM VALVES	

Refer to Control Valve Service Manual for other drawings and part numbers.

Relay Specifications: 12V DC Relay with a coil resistance not less than 80 ohms. If mounting the relay under the cover check for proper mounting location dimensions on the backplate.

AC Adapter	U.S.	International
Supply Voltage	120 V AC	230V AC
Supply Frequency	60 Hz	50 Hz
Output Voltage	15VDC	15VDC
Output Current	1.2A	1.2A

Wiring For Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RLY 1	Coil -
COM	Coil +
RLY 2	Second relay not available



OEM General Programming Instructions

The control valve offers multiple procedures that allow the valve to be modified to suit the needs of the installation. These procedures are:

- OEM Configuration Setup
- OEM Softener System Setup
- OEM Filter System Setup
- Installer Display Settings
- User Display Settings
- Diagnostics
- Valve History

Tables 1 and 2 show examples when the valve is set up as a softener or filter.

Table 1: Regeneration Cycles Softening

Downflow Regenerant Refill After Rinse	Downflow Regenerant Prefill	WS1WD only Upflow Regenerant Refill After Rinse	WS1WD only Upflow Regenerant Prefill
1 st Cycle: Backwash 2 nd Cycle: dn Brine 3 rd Cycle: Backwash 4 th Cycle: Rinse 5 th Cycle: Fill 6 th Cycle: End	1 st Cycle: Fill 2 nd Cycle: Softening 3 rd Cycle: Backwash 4 th Cycle: dn Brine 5 th Cycle: Backwash 6 th Cycle: Rinse 7 th Cycle: End	1 st Cycle: UP Brine 2 nd Cycle: Backwash 3 rd Cycle: Rinse 4 th Cycle: Fill 5 th Cycle: End	1 st Cycle: Fill 2 nd Cycle: Softening 3 rd Cycle: UP Brine 4 th Cycle: Backwash 5 th Cycle: Rinse 6 th Cycle: End

Table 2: Regeneration Cycles Filtering

Downflow Regenerant Refill After Rinse	Downflow Regenerant Prefill	No Regenerant
1 st Cycle: Backwash 2 nd Cycle: dn Brine 3 rd Cycle: Backwash 4 th Cycle: Rinse 5 th Cycle: Fill 6 th Cycle: End	1 st Cycle: Fill 2 nd Cycle: Filtering 3 rd Cycle: Backwash 4 th Cycle: dn Brine 5 th Cycle: Backwash 6 th Cycle: Rinse 7 th Cycle: End	1 st Cycle: Backwash 2 nd Cycle: Rinse 3 rd Cycle: Backwash 4 th Cycle: Rinse 5 th Cycle: End

The control valve with a water meter can be set for Demand Initiated Regeneration (DIR) only, Time Clock operation only or DIR and Time Clock which ever comes first, depending upon what settings are selected for Day Override and Volume Capacity.¹ See Table 3.

If a control valve does not contain a meter, the valve can only act as a time clock, and day override should be set to any number and volume capacity should be set to off.

**Table 3
DIR/Time Clock Options**

DIR	Time Clock	Reserve Capacity	Softener	Filter		Settings ²	
				Regenerant	Backwash Only	Days to REGEN	Volume Capacity
Yes		Automatically calculated	Yes			Off	Auto
Yes		If desired enter a value less than estimated capacity	Yes	Yes	Yes	Off	Any Number
Yes	Yes	Automatically calculated	Yes			Any Number	Auto
Yes	Yes	If desired enter a value less than estimated capacity	Yes	Yes	Yes	Any Number	Any number
	Yes	None	Yes	Yes	Yes	Any Number	Off

For DIR Softeners, there are three options for setting the Reserve Calculations. The Volume Capacity is automatically calculated if set to AUTO. AUTO will automatically calculate a capacity and reserve based on volume used. OFF is set when a time clock initiated regeneration cycle is desired and will not be an option if days between regeneration is set to OFF. VOLUME CAPACITY (M³) does not automatically calculate a reserve.

A unique feature of this control valve is the ability to display actual water usage for the last 90 days. The values are initially stored as “----”. This means the value is unknown. As days pass values are stored as “0” for no flow or the actual volume. The counting of the volume starts at the regeneration time. If no regeneration time can be set (i.e. when the valve is set for immediate regeneration) the counting of volume starts at 00:00. Day 1 is yesterday, day 2 the day before yesterday, etc. As new values are added the oldest history disappears.

Another unique feature is that the valve automatically calculates a reserve capacity when set up as a softener with “Reserve Calculator” set to “AUTO” and the “Regeneration Time Option” set to “DELAY REGENERATION” or “BOTH”. The actual reserve capacity is compared to the volume capacity remaining immediately prior to the preset regeneration time. A regeneration will occur if the actual reserve capacity is less than the volume capacity remaining. The actual reserve capacity is calculated by using the estimated reserve capacity and adjusting it up or down for actual usage.

The estimated reserve capacity for a given day of the week is the maximum value stored for the last three non-trivial water usages (i.e. more than 20 gallons/day) in seven day intervals.

¹ See Installer Display Settings, OEM Softener System Setup and OEM Filter System Setup for explanations of Day Override and Reserve Calculator.

² Days to REGEN and Reserve Calculator cannot both be set to “OFF” at the same time.

Once the OEM Configuration Setup has been set, the other procedures can be accessed in any order. Details on each of the procedures are provided on the following pages.

To “lock out” access to diagnostic and valve history displays and modifications to settings except hardness, day override, time of regeneration and time of day by anyone but the manufacturer, press ▼, NEXT, ▲, and SET CLOCK in sequence after settings are made. To “unlock”, so other displays can be viewed and changes can be made, press ▼, NEXT, ▲, and SET CLOCK in sequence.

When in operation normal user displays such as time of day, volume remaining before regeneration, present flow rate or days remaining before regeneration are shown. When stepping through a procedure, if no buttons are pressed within five minutes, the display returns to a normal user display. Any changes made prior to the five minute time out are incorporated.

To quickly exit OEM Softener Setup, OEM Filter Setup, Installer Display Settings, Diagnostics or Valve History press SET CLOCK. Any changes made prior to the exit are incorporated.

When desired all information in Diagnostics may be reset to zero when the valve is installed in a new location. To reset, press NEXT and ▼ buttons simultaneously to go to the Softening/Filtering screen. Press ▲ and ▼ simultaneously to reset diagnostic values to zero. Screen will then return to User Display.

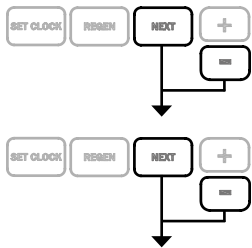
Sometimes it is desirable to have the valve initiate and complete two regenerations within 24 hours and then return to the preset regeneration procedure. It is possible to do a double regeneration if the control valve is set to “DELAYED REGENERATION” or “BOTH” in OEM Softener System Setup or OEM Filter System Setup. To do a double regeneration:

1. Press the “REGEN” button once. REGEN TODAY will flash on the display.
2. Press and hold the “REGEN” button for three seconds until the valve regeneration initiates.

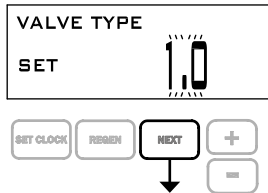
Once the valve has completed the immediate regeneration, the valve will regenerate one more time at the preset regeneration time.

For Valve Type 1.0T, press and hold SET CLOCK and ▲ for about 3 seconds to initiate an exchange of 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.

OEM Configuration Setup

STEP 1CS

Step 1CS – Press NEXT and ▼ simultaneously for 3 seconds and release. Then press NEXT and ▼ simultaneously for 3 seconds and release. If screen in Step 2CS does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and SET CLOCK in sequence, then press NEXT and ▼ simultaneously for 3 seconds and release. Then press NEXT and ▼ simultaneously for 3 seconds and release.

STEP 2CS

Step 2CS – Use ▲ or ▼ to select 1.0 for 1" valve, 1.25 for 1.25" valve, 1.5 for 1.5" valve, 2.0 for 2" valve or 1.0T for Clack Twin Tank Valve.

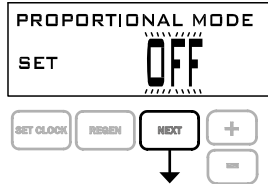
Press NEXT to go to Step 3CS.

Press REGEN to exit OEM Configuration Setup.

STEP 3CS

Step 3CS – When 2.0 is selected, an additional screen will appear. It is used to select which size flow meter is to be used with the valve, 1.5, 2.0, 3.0 or Variable Meter.

Press NEXT to go to Step 4CS. Press REGEN to return to previous step.

STEP 4CS

Step 4CS - Allows selection of one of the following using ▼ or ▲:

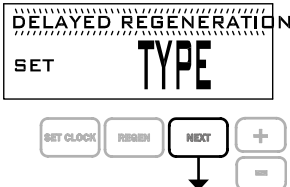
- Proportional Mode REGEN;
- Proportional Mode FILL;
- Proportional Mode BOTH; or
- Proportional Mode OFF.

When set to REGEN, Backwash and Rinse durations will be variable, adjusted in direct proportion to actual water usage. This adjustment is based on the percentage of volumetric capacity used at the time of regeneration, versus the total capacity. When set to FILL, Fill duration will be variable, adjusted proportionally to actual water usage. The actual volumetric capacity is divided by volume used, then multiplied by a selected percentage (50%-150%). A Day Override regeneration has a variable Fill with a minimum Fill time of 20%. A Manual Immediate regeneration has a normal, non-variable Fill. Proportional Fill will only be available when the control is configured as a Pre-fill Up-flow valve.

When set to BOTH, Backwash, Rinse and Fill will all be in Proportional Mode.

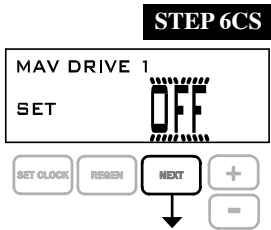
OFF deactivates this function.

When Proportional Fill is set to REGEN or BOTH, the rate of Drain Line Flow must be set. This is used to calculate the water efficiency data that is viewed in Diagnostics 6 & 7. Press NEXT to go to Step 5CS. Press REGEN to return to previous step.

**STEP 5CS**

Step 5CS – Set Regeneration Time Options using ▼ or ▲. If value is set to:

- DELAYED REGENERATION means regeneration will occur at the preset time;
 - IMMEDIATE REGENERATION means regeneration will occur immediately when the volume capacity reaches 0 (zero);
 - or
 - BOTH means regeneration will occur at one of the following:
 - the preset time when the volume capacity falls below the reserve or the specified number of days between regenerations is reached whichever comes first; or
 - immediately after 10 minutes of no water usage when the volume capacity reaches 0 (zero).
- DELAYED REGENERATION is the default if Step 6CS is set to ALT A or ALT B, and BOTH will not be available. IMMEDIATE REGENERATION is the default if Step 2CS is set to 1.0T, and BOTH will not be available. This setting will not be viewed if System Controller is set in Step 6CS. See Setting Options Table for more detail. Press NEXT to go to Step 6CS. Press REGEN to return to previous step.



Step 6CS – Step 6CS - Allows selection of one of the following using ▼ or ▲:
the Control Valve to act as an alternator; or
the Control Valve to have a no hard water bypass; or
the Control Valve to have a Separate Source during the regeneration cycle; or
the Control Valve to operate with the Clack System Controller; or
the alternator to operate at a set time in reference to the start of regeneration for a preset length of time; or
OFF when none of these features are used.

This display will not appear when Valve Type 1.0T is set in Step 2CS.

Only use Clack No Hard Water Bypass Valves or Clack Motorized Alternating Valves (MAV) with these selections. Clack No Hard Water Bypass Valves (1” or 1.25” V3070FF or V3070FM) are not designed to be used with the alternator or separate source functions. The V3063 and V3063BSPT motorized alternating valves are not designed to be used as a no hard water bypass or separate source inlet if the pressure differential is more than 60 psi.

Configuring the Control Valve for No Hard Water Bypass Operation:



Select NO HARD BYPASS for control operation.
For no hard water bypass operation the three wire connector is not used.

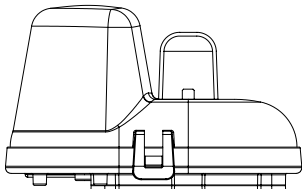
Selection requires that a connection to MAV or a No Hard Water Bypass Valve is made to the two pin connector labeled MAV 1 located on the printed circuit board. If using a MAV, the A port of the MAV must be plugged and the valve outlet connected to the B port. When set to NO HARD BYPASS the MAV or No Hard Water Bypass Valve will be driven closed before the first regeneration cycle that is not FILL or SOFTENING or FILTERING, and be driven open after the last regeneration cycle that is not FILL.

NOTE: If the control valve enters into an error state during regeneration mode, the no hard water bypass valve will remain in its current state until the error is corrected and reset.

Selecting the Control Valve to act as an alternator:

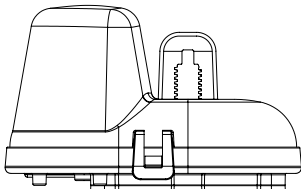
Prior to starting the programming steps, connect the three pin wire to each control valve board’s three pin connector labeled “COMM CABLE”. Also connect the meter cord to either control valve to the three pin connector labeled “METER”.			
Valve Programming Steps			
Installer Display Setting	Step 4I	Set Day Over ride to “OFF”	Set Day Over ride to “OFF”
OEM Configuration Setup	Step3CS	Set to ALT A Connect ALT A valve to the MAV’s A port and connect the MAV’s two pin wire connector to the two pin connector labeled “MAV 1” on the ALT A valve	Set to ALT B Connect ALT B valve to the MAV’s B port. No connections between the ALT B valve and the MAV are made.
OEM Configuration Setup	Step 5CS	Set regeneration time option to “IMMEDIATE”.	Set regeneration time option to “IMMEDIATE”.
OEM Softener System Setup	Step 8S	Set Volume Capacity (m³) to “AUTO”	Set Volume Capacity (m³) to “AUTO”
OEM Filter System Setup	Step 3F	Set Volume Capacity (m³) to a number	Set Volume Capacity (m³) to a number

NOTE: If the control valve is in an error state during regeneration mode the MAV will close the B port and keep open the A port until the error is corrected and reset.



Retracted

Valve “A” in Service Position =
MAV piston rod Retracted



Extended

Valve “B” in Service Position = MAV
piston rod Extended

Note: Clack Twin Alternator Operations

- Twin alternating systems can be programmed with a day override setting combined with the normal volume-based regeneration programming. A twin alternating system in this configuration will then regenerate based on the volume used or the day override if there is a period of low water usage.
- Twin alternating systems can be programmed as a time clock only based regenerating system. In this configuration, the days remaining are counted only on the unit that is in service. The unit in Stand-by Mode only notes days in diagnostics, which results in time clock only twin regeneration initiation.
- Twin alternating systems can be programmed for a delayed regeneration time. The system will allow an immediate transfer of the MAV to switch tanks and place a fully regenerated unit in service once a unit becomes exhausted. The exhausted unit will then be placed into Stand-by Mode and allowed to have a delayed regeneration at the pre-set time.

WS1, WS1.25 AND WS1.5 Valves

ALTERNATOR SYSTEM

SET ALT A

↓

DELAYED RINSE+FILL

SET OFF

WS2 Valves

ALTERNATOR SYSTEM

SET ALT A

↓

PRE-SERVICE RINSE

SET 5 MIN

SEPARATE SOURCE

SET MAV 1

SYSTEM CONTROLLER

SET MAV 1

TIME

SET MAV 1

↓

MAV 1 SETPOINT

SET 10:00 MIN

↓

MAV 1 DURATION

SET 15:00 MIN

For Clack Corporation alternator systems using WS1, WS1.25 and WS1.5 valves, the last two cycles of regeneration (only “Rinse” and “Fill”) can be delayed. This feature splits the regeneration into two portions. The first portion of the regeneration will start immediately and all programmed cycles before the “Rinse” and “Fill” cycles will be performed. After all programmed cycles before “Rinse” and “Fill” are completed the control valve will drive to the service position, displaying “Delayed Rinse + Fill Pending”. When the volume of the on-line unit is depleted to 10% of its programmed capacity, the control valve will be triggered to finish the second portion of the regeneration. Once “Rinse” and “Fill” are completed, the valve will re-enter Standby mode until requested to come on-line for Service. This selection is not available when set to Filtering, Step 4S is set to OFF, Step 18S, 19S or 20S is active, or Step 5CS is set to BOTH.

For Clack Corporation alternator systems using the WS2 valve, when NEXT is pressed after selecting ALT A or ALT B, a display will allow the user to set the amount of pre-service rinse time for the standby tank just prior to returning to service.

Configuring the Control Valve for Separate Source Operation:

Select Separate Source for control operation. For separate source operation, the three wire connector is not used. Selection requires that a connection to a Clack Motorized Alternator Valve (MAV) is made to the two pin connector labeled MAV1 located on the printed circuit board. The C port of the MAV must be connected to the valve inlet and the A port connected to the separate source used during regeneration. The B port must be connected to the feed water supply. When set to Separate Source the MAV will be driven closed before the first regeneration cycle, and be driven open after the last regeneration cycle.

NOTE: If the control valve enters into an error state during regeneration mode, the MAV will either remain in Service or be returned to Service until the error is corrected and reset.

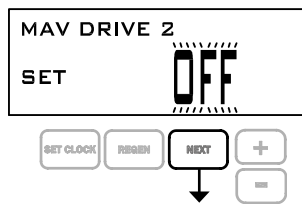
Configuring the Control Valve to operate with Clack System Controller:

Select System Controller to link the Control Valve to the Clack System Controller. For communication between the Control Valve and the System Controller a three wire communication cable is required.

Configuring the Control Valve to operate in TIME mode:

Allows the MAV to switch positions at a set time in relation to the start of regeneration for a preset duration, independently of the actual regeneration status. This output is inactive during the Alternate Regeneration cycle.

Press NEXT to go to Step 7CS. Press REGEN to return to previous step.

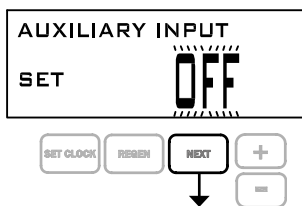
STEP 7CS

Step 7CS – Allows selection of one of the following using ▲ or ▼:

- the Control Valve to have no hard water bypass;
- the Control Valve to have a Separate Source during the regeneration cycle;
- the alternator to operate at a set time in reference to the start of regeneration for a preset length of time; or
- OFF when none of these features are used.

See Step 6CS for instructions for these modes.

Press NEXT to go to Step 8CS. Press REGEN to return to previous step.

STEP 8CS

Step 8CS – This allows the use of an outside signal to control the initiation of a regeneration.

Selection only matters if a connection is made to the two pin connector labeled DP SWITCH located on the printed circuit board. Following is an explanation of the options:

OFF – Feature not used.

NOTE: In a twin alternating system each control must have a separate dP signal or dP switch. One dP signal or one dP switch cannot be used for both controls.

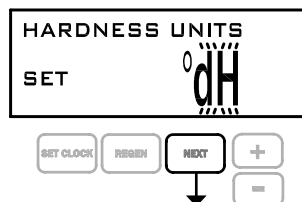
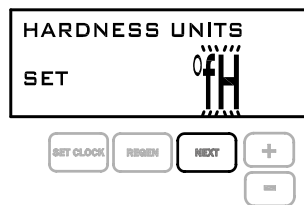
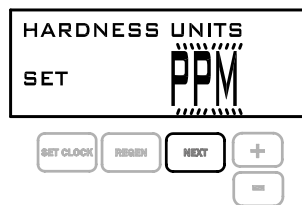
IMMED REG – If the dP switch is closed for an accumulative time of 2 minutes a regeneration will be signaled to the unit. In a twin alternating system the MAV will transition first to switch units so that the signaled unit can start regeneration. After the MAV is fully transitioned the regeneration begins immediately. Note: For WS1 – WS1.5 control valves programmed for twin alternating: if the dP function “IMMED REG” is set, the Delayed Rinse and Fill feature is not available.

DELAY REG – If the dP switch is closed for an accumulative time of 2 minutes a regeneration will occur at the scheduled delayed regeneration time. In a twin alternating system, once the dP switch is triggered the PC board will display REGEN TODAY and switch tanks immediately. At the Delayed Regeneration Time, the triggered unit will then regenerate. Note: For WS1 – WS1.5 control valves programmed for twin alternating: if the dP function “DELAY REG” is set, the Delayed Rinse and Fill feature is not available.

HOLD REG – If the dP switch is closed a regeneration will be prevented from occurring while there is switch closure. In a twin alternating system the regeneration of a unit can be prevented upon switch closure. If the unit depletes the capacity down to zero it will not be allowed to switch tanks to regenerate until the switch is open. Note: For WS1 – WS1.5 control valves programmed for twin alternating the Delayed Rinse and Fill feature can be set in conjunction with the “HOLD REG” if desired.

ALARM – Upon switch closure, the Alarm Buzzer will activate, and error 204 Leak Detected will display.

Press NEXT to go to Step 9CS. Press REGEN to return to previous step.

STEP 9CS

Step 9CS – Determine the measurement to calculate volumetric capacity. The choices are:

PPM parts per million

°fH French degrees

°dH German degrees

NOTE: If control is going to be used in a filter application this step will not appear.

Press NEXT to go to Step 10CS. Press REGEN to return to previous step.

STEP 10CS

Step 10CS: Set Relay 1 operation using ▲ or ▼. The choices are:

- Set TIME: Relay activates after a set time at the beginning of a regeneration and then deactivates after a set period of time. The start of regeneration is defined as the first backwash cycle or Regenerant Draw UP or DN, whichever comes first.
- Set LITERS: Relay activates after a set number of liters have been used while in service and then deactivates after a set period of time or after the meter stops registering flow, whichever comes first.
- Set REGEN L: Relay activates after a set number of liters have been used while in service or during regeneration and then deactivates after a set period of time or after the meter stops registering flow, whichever comes first.
- Set ERROR: Relay closes whenever a valve or MAV errors.
- Set FLOW: Relay closes whenever flow is detected by the control.
- Set PULSE: Relay powers the Clack Reed Relay PCB, which generates a dry-contact signal output of fixed ON duration, with a variable OFF duration referenced to the actual flow meter signal.
- Set OFF.

If set to OFF, ERROR, FLOW or PULSE, Steps 11CS and 12CS will not be shown.

Press NEXT to go to Step 11CS. Press REGEN to return to previous step.

STEP 11CS

Step 11CS: Set Relay 1 SETPOINT TIME, LITERS or REGEN L using ▲ or ▼. The choices are:

- Relay Actuation TIME: After the start of a regeneration the amount of time that should pass prior to activating the relay. The start of regeneration is defined as the first backwash cycle or Regenerant Draw UP or DN, whichever comes first. Ranges from 0 to 500 minutes.
- Relay Actuation LITERS or REGEN L: Relay activates after a set number of liters have passed. Ranges from 1 to 400 liters.

Press NEXT to go to Step 12CS. Press REGEN to return to previous step.

STEP 12CS

Step 12CS: Set Relay 1 DURATION TIME using ▲ or ▼.

- If Set TIME is selected in Step 10CS, the relay will deactivate after the time set has expired. Ranges from 0:01 to 500:00 minutes.
- If Set LITERS or Set REGEN L is selected in Step 10CS, the relay will deactivate after the time set has expired or after the meter stops registering flow, whichever comes first.

Press NEXT to go to Step 13CS. Press REGEN to return to previous step.

STEP 13CS

Step 13CS: Set Relay TRIGGER operation using ▲ or ▼. The choices are:

Set TIME: Relay activates after a set time at the beginning of a regeneration and then deactivates after a set period of time. The start of regeneration is defined as the first backwash cycle or Regenerant Draw UP or DN, whichever comes first.

Set LITERS: Relay activates after a set number of liters have been used while in service and then deactivates after a set period of time or after the meter stops registering flow, whichever comes first.

Set REGEN L: Relay activates after a set number of liters have been used while in service or during regeneration and then deactivates after a set period of time or after the meter stops registering flow, whichever comes first.

Set ERROR: Relay closes whenever a valve or MAV errors.

Set FLOW: Relay closes whenever flow is detected by the control.

Set PULSE: Relay powers the Clack Reed Relay PCB, which generates a dry-contact signal output of fixed ON duration, with a variable OFF duration referenced to the actual flow meter signal.

Set OFF.

If set to OFF or ERROR, FLOW or Pulse, Steps 14CS and 15CS will not be shown.

Press NEXT to go to Step 14CS. Press REGEN to return to previous step.

STEP 14CS

RELAY 2 SETPOINT	
SET	5.0 L
SET CLOCK	REGEN
NEXT	+
	-

Step 14CS: Set Relay 2 SETPOINT TIME, LITERS or REGEN L using ▲ or ▼. The choices are:

- Relay Actuation TIME: After the start of a regeneration the amount of time that should pass prior to activating the relay. The start of regeneration is defined as the first backwash cycle or Regenerant Draw UP or DN, whichever comes first. Ranges from 0 to 500 minutes.
- Relay Actuation LITERS or REGEN L: Relay activates after a set number of liters have passed. Ranges from 1 to 400 liters.

Press NEXT to go to Step 15CS. Press REGEN to return to previous step.

STEP 15CS

RELAY 2 DURATION	
SET	0:30 MIN
SET CLOCK	REGEN
NEXT	+
	-

Step 15CS: Set Relay 2 DURATION TIME using ▲ or ▼.

- If Set TIME is selected in Step 13CS, the relay will deactivate after the time set has expired. Ranges from 0:01 to 500:00 minutes.
- If Set LITERS or Set REGEN L is selected in Step 13CS, the relay will deactivate after the time set has expired or after the meter stops registering flow, whichever comes first.

Press NEXT to go to Step 16CS. Press REGEN to return to previous step.

STEP 16CS

FILL UNITS	
SET	kg
SET CLOCK	REGEN
NEXT	+
	-

Step 16CS: Fill Units: If set as a softener, if Step 2CS is set to 1.5, and FILL is part of the Softener System Setup, FILL UNITS of MIN or kg can be selected. Press NEXT to exit Configuration Setup. Press REGEN to return to previous step.

FILL UNITS	
SET	MIN

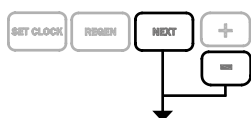
RETURN TO NORMAL MODE

OEM Softener System Setup

In OEM Softener System Setup the OEM chooses the order of the cycles as well as the cycle duration, and specifies other operating parameters for the system. The upper and lower limits of the allowable values for the cycles are as follows:

Cycle Options	Units	Lower/Upper Limit
Backwash	Minutes	1 to 120
Rinse (fast)	Minutes	1 to 120
Regenerant DRAW DN (combination of brining and slow rinse)	Minutes	1 to 180
Regenerant DRAW UP (combination of brining and slow rinse)	Minutes	1 to 180
Fill for all valves except WS2	kg	0.05 to 100
Fill for WS2 valves or WS1.5 set to "MIN"	Minutes	0.1 to 99
Service	Minutes	1 to 480

STEP 1S



Step 1S – Press NEXT and ▼ simultaneously for 3 seconds and release. If screen in Step 2S does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and SET CLOCK in sequence, then press NEXT and ▼ simultaneously for 3 seconds and release.

STEP 2S



Step 2S – Choose SOFTENING using ▼ or ▲. Press NEXT to go to Step 3S. Press REGEN to exit OEM Softener System Setup.

STEP 3S



Step 3S – Set System Capacity using ▼ or ▲. See chart. The System Capacity setting should be based on the volume of resin and Kg of salt fill set in Step 7S. When using PPM, °dH, or °fH the system capacity and hardness levels entered are used to determine the Volume Capacity. Press NEXT to go to Step 4S. Press REGEN to return to previous step.

Setting	Units	Limits
PPM	Kg of CaCO ₃	0.10 - 200
°dH or °fH	m ³	1 - 6000

STEP 4S



Step 4S – Set Reserve Calculator using ▲ or ▼. If value is set to:

- “AUTO” capacity will be automatically calculated and reserve capacity will be automatically estimated.
- “OFF” regeneration will be based solely on the day override set (see Installer Display Settings Step 3I).
- Volume Capacity (m³) will be based off the value specified.

If “OFF” or a number is used, hardness display will not be allowed to be set in Installer Display Settings.

If “OFF” is selected, Regeneration Time is automatically “Delayed”, so Step 5CS will not appear. See Setting Options Table for more detail.

Press NEXT to go to Step 5S. Press REGEN to return to previous step.

STEP 5S

DOUBLE REGEN
SET > 10%

SET CLOCK REGEN NEXT +

Step 5S – Set the Double Regeneration trigger point using ▲ or ▼. When the treated water is overrun by this percentage, the unit will regenerate two nights in a row. This screen will not be shown if Step 4S is set to OFF, Step 2CS is set to 1.0T, or Step 6CS is set to ALT A or ALT B. Ranges from 5% to 100% in 5% increments, or OFF. Press NEXT to go to Step 6S. Press REGEN to return to previous step.

STEP 6S

FILL
SET CYCLE 1 # 1

SET CLOCK REGEN NEXT +

Step 6S – Select first cycle, which in this case is FILL. Press NEXT to go to Step 7S. Press REGEN to return to previous step.

Note: #1 only appears if an alternate regeneration has been set (Steps 18S, 19S or 20S).

STEP 7S

FILL
SET 4.25 kg

SET CLOCK REGEN NEXT +

Step 7S – Set Kg of regenerant for the FILL cycle. NOTE: If Step 2CS is set to 2.0, or Step 16CS is set to MIN, fill will be in minutes. Press NEXT to go to Step 8S. Press REGEN to return to previous step.

STEP 8S

SOFTENING
SET CYCLE 2 # 1

SET CLOCK REGEN NEXT +

Step 8S – Select second cycle, which in this case is SOFTENING. Press NEXT to go to Step 9S. Press REGEN to return to previous step.

STEP 9S

SOFTENING TIME
SET 240:00 MIN

SET CLOCK REGEN NEXT +

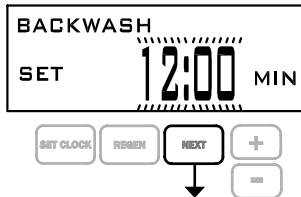
Step 9S – Set time for second cycle. Press NEXT to go to Step 10S. Press REGEN to return to previous step.

STEP 10S

BACKWASH
SET CYCLE 3 # 1

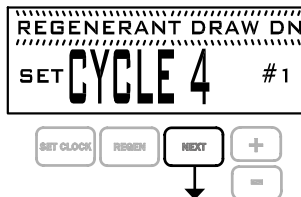
SET CLOCK REGEN NEXT +

Step 10S – Set time for second cycle. Press NEXT to go to Step 10S. Press REGEN to return to previous step.

STEP 11S

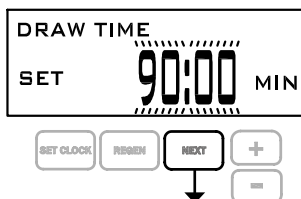
Step 11S – Step 11S – Set time for third cycle.

Press NEXT to go to Step 12S. Press REGEN to return to previous step.

STEP 12S

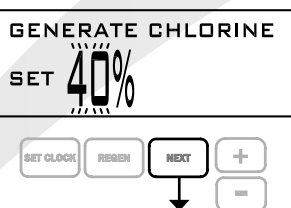
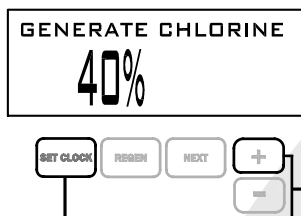
Step 12S – Select fourth cycle, which in this case is DOWN BRINE.

Press NEXT to go to Step 13S. Press REGEN to return to previous step.

STEP 13S

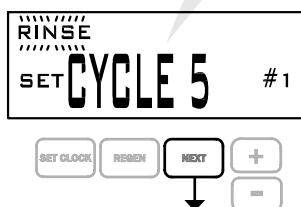
Step 13S – Set time for fourth cycle.

Press NEXT to go to Step 14S. Press REGEN to return to previous step.

STEP 14S

Step 14S – Set level of current used to power the chlorinator during any brine cycle. Hold SET CLOCK and UP buttons to set the level (5% to 100%) or OFF.

Press NEXT to go to Step 15S. Press REGEN to return to previous step.

STEP 15S

Step 15S – Select fifth cycle, which in this case is RINSE.

Press NEXT to go to Step 16S. Press REGEN to return to previous step.

STEP 16S

Step 16S – Set time for fifth cycle.

Press NEXT to go to Step 17S. Press REGEN to return to previous step.

STEP 17S

Step 17S – After all cycles have been selected, add an END cycle.

Press NEXT to go to Step 18S. Press REGEN to return to previous step.

STEP 18S

Step 18S – Select the number of standard regenerations which would trigger one alternate regeneration. Ranges from 1 to 99 or OFF.

Press NEXT to go to Step 19S. Press REGEN to return to previous step.

STEP 19S

Step 19S – Select the number of Liters since last alternate regeneration that would trigger another alternate regeneration. Ranges from 100 to 375,000 L or OFF.

Press NEXT to go to Step 20S. Press REGEN to return to previous step.

STEP 20S

Step 20S – Select the number of Days since last alternate regeneration that would trigger another alternate regeneration. Ranges from 1 to 365 days or OFF.

If an Alternate Regeneration sequence has been selected in Steps 17S, 18S or 19S, press NEXT to go to Step 21S. If no Alternate Regeneration sequence has been selected, NEXT will exit OEM Softener System Setup. Press REGEN to return to previous step.

STEP 21S

Step 21S – Select cycles and cycle times of Alternate Regeneration. Up to 14 cycles can be selected.

When finished, press NEXT to exit OEM Softener System Setup.

Setting Options Table
Filters should only use shaded options.

Reserve Calculator	Regeneration Time Option	Day Override	Result ³
AUTO	DELAYED REGENERATION	OFF	Reserve capacity automatically estimated. Regeneration occurs when volume capacity falls below the reserve capacity at the next Regen Set Time
AUTO	DELAYED REGENERATION	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	DELAYED REGENERATION	OFF	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when volume capacity reaches 0.
OFF	DELAYED REGENERATION	Any number	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when the specified number of days between regenerations is reached.
Any number	DELAYED REGENERATION	Any number	Reserve capacity <u>not</u> 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	IMMEDIATE REGENERATION	OFF	Reserve capacity <u>not</u> 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	IMMEDIATE REGENERATION	OFF	Reserve capacity <u>not</u> 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	BOTH	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	BOTH	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	BOTH	Any number	Reserve capacity <u>not</u> 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.

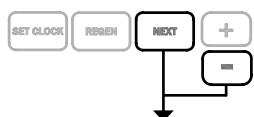
³ Reserve Capacity estimate is based on history of water usage. Reserve Capacity estimate is not available with alternator systems or Twin Tank Valve.

OEM Filter System Setup

In OEM Filter System Setup the OEM chooses the order of the cycles as well as the cycle duration, and specifies other operating parameters for the system. The upper and lower limits of the allowable values for the cycles are as follows:

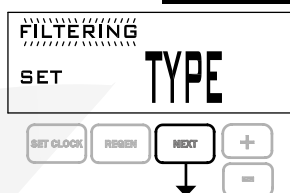
Cycle Options	Units	Lower/Upper Limit
Backwash	Minutes	1 to 120
Rinse (fast)	Minutes	1 to 120
Regenerant Draw DN (combination of regenerant and slow rinse)	Minutes	1 to 180
Fill for all valves except WS2	Liters	0.20 to 76.00
Fill for WS2 valves	Minutes	0.1 to 99.0
Service	Minutes	1 to 480

STEP 1F



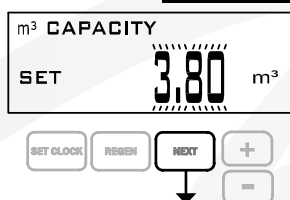
Step 1F - Press NEXT and ▼ simultaneously for 3 seconds and release. If screen in Step 2F does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and SET CLOCK in sequence, then press NEXT and ▼ simultaneously for 3 seconds and release.

STEP 2F



Step 2F – Choose FILTERING using ▼ or ▲.
Press NEXT to go to Step 3F. Press REGEN to exit OEM Filter System Setup.

STEP 3F

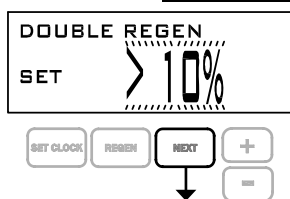


Step 3F - Set Filtering Capacity using ▲ or ▼. If value is set to:

- “OFF” regeneration will be based solely on the day override set (see Installer Display/Settings Step 4I); or
- as a number regeneration initiation will be based off the value specified. Range 0.02 – 5700.00 M³. See Setting Options Table for more detail.

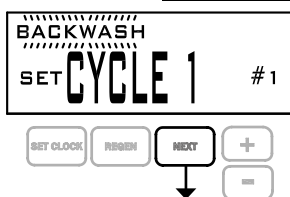
Press NEXT to go to Step 4F. Press REGEN to return to previous step.

STEP 4F



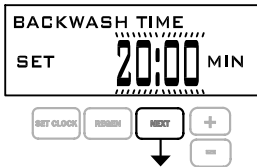
Step 4F – Set the Double Regeneration trigger point using ▲ or ▼. When the treated water is overrun by this percentage, the unit will regenerate two nights in a row. This screen will not be shown if Step 3F is set to OFF, Step 2CS is set to 1.0T, or Step 6CS is set to ALT A or ALT B. Ranges from 5% to 100% in 5% increments, or OFF.
Press NEXT to go to Step 5F. Press REGEN to return to previous step.

STEP 5F



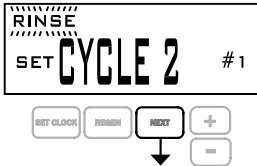
Step 5F – Select first cycle, which in this case is BACKWASH.
Press NEXT to go to Step 6F. Press REGEN to return to previous step.

Note: #1 only appears if an alternate regeneration has been set (steps 10F, 11F or 12F)

STEP 6F

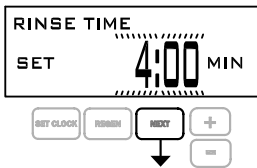
Step 6F – Set time for first cycle.

Press NEXT to go to Step 7F. Press REGEN to return to previous step.

STEP 7F

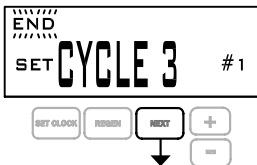
Step 7F – Select second cycle, which in this case is RINSE.

Press NEXT to go to Step 8F. Press REGEN to return to previous step.

STEP 8F

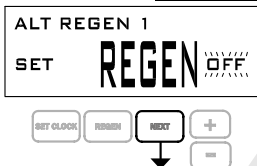
Step 8F – Set time for second cycle.

Press NEXT to go to Step 9F. Press REGEN to return to previous step.

STEP 9F

Step 9F – After all cycles have been selected, add an END cycle.

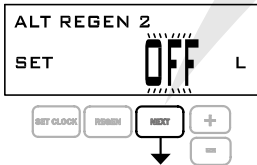
Press NEXT to go to Step 10F. Press REGEN to return to previous step.

STEP 10F

Step 10F – Select the number of standard regenerations which would trigger one alternate regeneration.

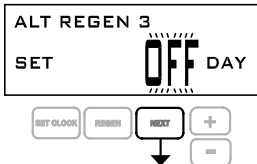
Ranges from 1 to 99 or OFF.

Press NEXT to go to Step 11F. Press REGEN to return to previous step.

STEP 11F

Step 11F – Select the number of Liters since last alternate regeneration that would trigger another alternate regeneration. Ranges from 100 to 375,000 L or OFF.

Press NEXT to go to Step 12F. Press REGEN to return to previous step.

STEP 12F

Step 12F – Select the number of Days since last alternate regeneration that would trigger another alternate regeneration. Ranges from 1 to 365 days or OFF.

If an Alternate Regeneration sequence has been selected in Steps 10F, 11F or 12F, press NEXT to go to Step 13F. If no Alternate Regeneration sequence has been selected, NEXT will exit OEM Filter System Setup. Press REGEN to return to previous step.

STEP 13F

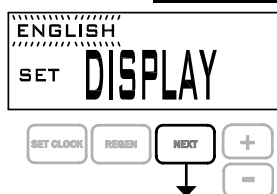
Step 13F – Select cycles and cycle times of Alternate Regeneration. Up to 14 cycles can be selected.

When finished, press NEXT to exit OEM Softener System Setup.

Installer Display Settings

STEP 1I

STEP 1I - Press NEXT and ▲ simultaneously for 3 seconds.

STEP 2I

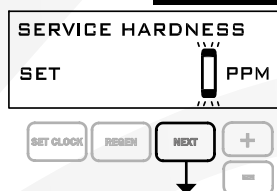
STEP 2I – Display Language: Select English, German, French, Spanish or Italian. Press NEXT to go to Step 3I. Press REGEN to exit Installer Display Settings.

STEP 3I

STEP 3I – Water Hardness: Set the amount of influent hardness using ▼ or ▲. This display will not appear if “FILTER” is selected in Step 2F OR if “OFF” or a number was selected in Step 4S. Press NEXT to go to step 4I. Press REGEN to exit Installer Display Settings.

Units	Allowable Range
PPM	1-2500
°fH	1-250
°dH	1-150

Allowable range may vary depending on system capacity selected.

STEP 4I

STEP 4I – Service Hardness: If using a mixing valve, set the amount of effluent hardness using the ▼ or ▲ buttons. Range of available values may vary depending on system capacity selected and hardness selected in Step 3I. This display will not appear if “FILTER” is selected in Step 2F OR if “OFF” or a number was selected in Step 4S. Press NEXT to go to Step 5I. Press REGEN to return to previous step.

STEP 5I

STEP 5I – Day Override: When Step 4S or 3F, m³ Capacity is set to “OFF”, sets the number of days between regenerations. When reserve calculator is set to AUTO or to a number, sets the maximum number of days between regenerations. If value set to “OFF”, regeneration initiation is based solely on volume used. If value is set as a number a regeneration initiation will be called for on that day even if sufficient volume of water were not used to call for a regeneration. Set Day Override using ▼ or ▲:

- number of days between regeneration (1 to 28). Press CLOCK and ▲ simultaneously to go to REGENS PER DAY, and select 1 to 6 or OFF.
- “OFF”.

See Setting Options Table for more detail on setup. Press NEXT to go to step 6I. Press REGEN to return to previous step.

STEP 6I

STEP 6I – Next Regeneration Time (hour): Set the hour of day for regeneration using ▼ or ▲. The default time is 2:00. This display will not appear if “IMMEDIATE REGENERATION” is selected in Set Regeneration Time Option in OEM Softener System Setup Step 5CS. Press NEXT to go to step 7I. Press REGEN to return to previous step.

STEP 7I

REGEN TIME MINUTES
SET 2:00

SET CLOCK REGEN NEXT +
=

STEP 7I – Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▼ or ▲. This display will not be shown if “IMMEDIATE” is selected in Set Regeneration Time Option in OEM Softener System Setup Step 5CS. Press NEXT to go to Step 8I. Press REGEN to return to previous step.

STEP 8I

SERVICE ALARM
SET OFF m³

SET CLOCK REGEN NEXT +
=

STEP 8I – Set number of cubic meters between service alarms. The range is 100 to 50,000 m³ or OFF. Press NEXT to go to Step 9I. Press REGEN to return to previous step.

STEP 9I

SERVICE ALARM
SET OFF YR

SET CLOCK REGEN NEXT +
=

STEP 9I – Set the amount of time between service alarms. Adjustable in .25 year increments from .25 year to 9.75 years or OFF. Press NEXT to go to Step 10I. Press REGEN to return to previous step.

STEP 10I

ALARM BUZZER
SET ON

SET CLOCK REGEN NEXT +
=

STEP 10I – Alarm Buzzer – Setting ON will operate an alarm buzzer for ½ second every 3 seconds when a valve or MAV error, Check Salt or Low DC Voltage reminder is generated (active only between the time periods selected). If OFF is selected, press NEXT to go to Step 13I. If ON is selected, press NEXT to go to Step 11I. Press REGEN to return to previous step.

STEP 11I

ALARM BUZZER START
SET 6:00

SET CLOCK REGEN NEXT +
=

STEP 11I – Set the hour to start the Service Alarm buzzer. Press NEXT to go to Step 12I.

STEP 12I

ALARM BUZZER END
SET 22:00

SET CLOCK REGEN NEXT +
=

STEP 12I – Set the hour to end the Service Alarm buzzer. Press NEXT to go to Step 13I. Press REGEN to return to previous step.

STEP 13I

LIGHT NORMALLY
SET ON

SET CLOCK REGEN NEXT +
=

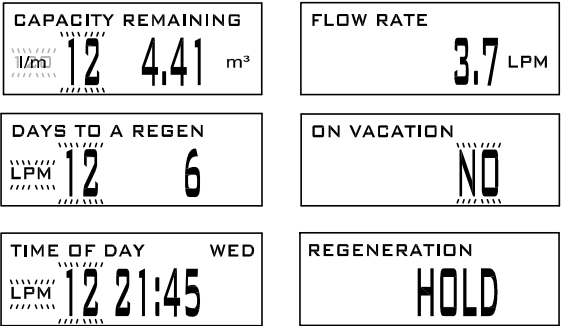
STEP 13I – Set LCD display backlight operation. ON: Display backlight always on. OFF: Display backlight will go off after 5 minutes of no activity. When the light is off, pressing any button will only activate the backlight, all other functions normally initiated with the button push will be ignored. Press NEXT to exit Installer Display Settings. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

User Display Settings

General Operation

When the system is operating, one of several displays may be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day. The second display shows the current treated water flow rate through the system. Capacity Remaining is the volume that will be treated before the system goes through a regeneration cycle. Pressing ▼ while in the Capacity Remaining display will decrease the capacity remaining in 0.01m³ increments and will also increase the volume used impacting the recorded values in Step 3D Volume Since Regen. Days To A Regen is the number of days left before the system goes through a regeneration cycle. Another display will show either “REGENERATION DP” or “REGENERATION HOLD” if the dP switch is closed. If the system has called for a regeneration that will occur at the preset time of regeneration, the words REGEN TODAY will alternate with the header on the display. If a water meter is installed, LPM flashes on the display when water is being treated (i.e. water is flowing through the system). In alternator systems with a unit in Standby, the Flow Rate Display and Flashing Flow Rate Value/“LPM” will not be viewed.



ON VACATION NO or YES – If set to YES, no regenerations will occur until 0.19 cubic meters of water use is detected. If 0.19 cubic meters of water use is detected, a delayed regeneration will be scheduled.

REGEN PENDING will be displayed in Alternator Systems whenever a unit is waiting to initiate the first cycle step of regeneration. A flashing MAV 1 or MAV 2 may appear in the lower portion of the display to indicate the MAV is transitioning.



STAND BY will be displayed in Alternator Systems when a valve is in Standby state. A flashing MAV 1 or MAV 2 may appear in the lower portion of the display to indicate the MAV is transitioning.

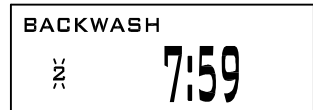


DELAYED RINSE+FILL PENDING will be displayed whenever a zero-capacity tank has transferred to an off-line state and is currently waiting to initiate the second portion of a regeneration cycle. Viewed only when Delayed Rinse and Fill is set to ON.



Regeneration Mode

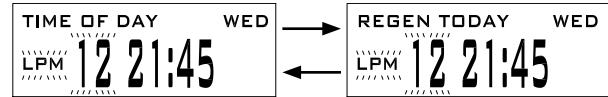
Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used.



When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

Manual Regeneration

Sometimes there is a need to regenerate the system sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.



To initiate a manual regeneration at the preset delayed regeneration time, when the regeneration time option is set to "DELAYED REGENERATION" or "BOTH", press and release "REGEN". The words "REGEN TODAY" will periodically be shown on the display to indicate that the system will regenerate at the preset delayed regeneration time. If you pressed the "REGEN" button in error, pressing the button again will cancel the request. Note: If the regeneration time option is set to "IMMEDIATE REGENERATION" there is no set delayed regeneration time so "REGEN TODAY" will not activate if "REGEN" button is pressed.

To initiate a manual regeneration immediately, press and hold the "REGEN" button for about three seconds. The system will begin to regenerate immediately. The request cannot be cancelled.

Note: For softeners, if brine tank does not contain salt, fill with salt and wait at least two hours before regenerating.

Set Time of Day

The user can also set the time of day. Time of day should only need to be set if the battery has been depleted because of extended power outages or when daylight saving time begins or ends. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset. The non rechargeable battery should also be replaced.



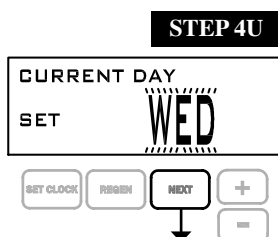
STEP 1U – Press SET CLOCK.



STEP 2U - Current Time (hour): Set the hour of the day using ▼ or ▲. Press NEXT to go to Step 3U.



STEP 3U - Current Time (minutes): Set the minutes of the day using ▼ or ▲. Press NEXT to go to Step 4U. Press REGEN to return to previous step.



STEP 4U – Set Current Day. Set the current day of the week using ▼ or ▲. Press NEXT to exit Set Time of Day. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

Power Loss

If the power goes out the system will keep time until the battery is depleted. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset and the non rechargeable battery replaced. The system will remember the rest.

**Error Message**

If the word “ERROR” and a number are displayed contact the OEM for help. This indicates that the valve was not able to function properly.

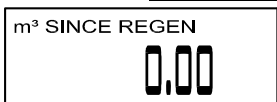
Diagnostics

STEP 1D

STEP 1D – Press ▲ and ▼ simultaneously for three seconds.

STEP 2D

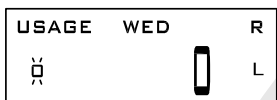
STEP 2D – Days, since last regeneration: This display shows the days since the last regeneration occurred. Press the NEXT button to go to Step 3D. Press REGEN to exit Diagnostics.

STEP 3D

STEP 3D – Volume, since last regeneration: This display shows the volume of water that has been treated since the last regeneration. This display will equal zero if a water meter is not installed. Press the NEXT button to go to Step 4D. Press REGEN to return to previous step.

STEP 4D

STEP 4D – Reserve History Volume used for last 7 days: If the valve is set up as a softener, a meter is installed and Reserve Calculator is set to “AUTO,” this display shows 0 day (for today) and the reserve capacity. Pressing ▲ will show day 1 (which would be yesterday) and 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 screen is not displayed if filter, time clock, meter immediate, alternator or volume override regeneration is selected. This display will not appear when Valve Type 1.0T is set in Step 2CS. Press the NEXT button at any time to go to Step 5D. Press REGEN to return to previous step.

STEP 5D

STEP 5D - Volume, 90-day usage history: This display shows day 0 (for today), day 1 (for yesterday), etc., and the volume of water treated that day. Press ▲ to show the volume of water treated for the last 90 days. If a regeneration occurred on the day the letter “R” will also be displayed.

Additional letters may be shown on a day to indicate the following:

M= A regen cycle was manually initiated

E= A valve error occurred on that day

S= During regen the valve was manually advanced

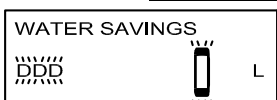
This display will show dashes if a water meter is not installed. Press ▲ and ▼ for about 3 seconds to check volume per hour for a given day.

Press the NEXT button at any time to go to Step 6D. Press REGEN to return to previous step.

STEP 6D

STEP 6D - Salt Savings: When the Proportional Fill feature is active, this display will show the cumulative difference in actual salt used for regeneration from the normal fill amount. Display can be reset by pressing and holding ▲ and ▼. DDD = Days since the display was last reset.

Press NEXT to go to Step 7D. Press REGEN to return to previous step.

STEP 7D

STEP 7D - Water Savings: When the Proportional Regen feature is active, this display will show the cumulative difference in actual water used from the normal amount. Display can be reset by pressing and holding ▲ and ▼. DDD = Days since the display was last reset.

Press NEXT to go to Step 8D. Press REGEN to return to previous step.

STEP 8D

Y 3 DAYS 13:35
A→B 0.00 m³

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 8D – Tank Transfer History: Only displays when 1.0T was selected in Step 2CS. Use ▲ or ▼ to scroll through the last 10 tank transfers.

“1” = Transfer number (10 transfers maximum)

“A” = Tank transferring

“3” = Days since transfer (99 days maximum)

“0.00” = m³ used at time of transfer

“13:35” = time of transfer.

Press NEXT to go to Step 9D. Press REGEN to return to previous step.

STEP 9D

MAX FLOW HISTORY
MON 21 LPM

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 9D – Flow rate, maximum last seven days: Use ▲ or ▼ to display the maximum flow rate in liters per minute that occurred in each of the last seven days. This display will equal zero if a water meter is not installed. Press the NEXT button to go to Step 10D. Press REGEN to return to previous step.

STEP 10D

TOTAL m³
0.00

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 10D – Total volume treated since startup. (Not the same display as in History Level.)

Press NEXT to go to Step 11D. Press REGEN to return to previous step.

STEP 11D

TOTAL DAYS
0

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 11D – Total days since startup. (Not the same display as in History Level.)

Press NEXT to go to Step 12D. Press REGEN to return to previous step.

STEP 12D

TOTAL REGENS
0

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 12D – Total regenerations since startup. (Not the same display as in History Level.)

Press NEXT to go to Step 13D. Press REGEN to return to previous step.

STEP 13D

REGEN %BRINE
A 15 90

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 13D – Brine Concentration for the last 50 regenerations. A regeneration sequence indicator (A) will be recorded if the Alternate Regeneration feature was active for this regeneration. This screen will not appear if Step 14S is set to OFF.

Press NEXT to go to Step 14D. Press REGEN to return to previous step.

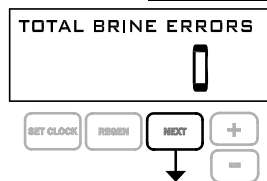
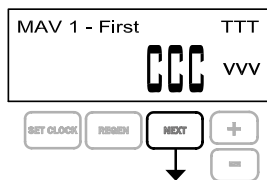
STEP 14D

BRINE DRAW TIME
VLT 6.4 5:00 MIN

Buttons: SET CLOCK, REGEN, NEXT, +, -

STEP 14D – Chlorinator History for the last 50 regenerations. Displays the voltage required to obtain the % current set point (recorded before checking brine concentration.) Displays time from the start of brine draw until full voltage (begins after checking brine concentration.) This screen will not appear if Step 14S is set to OFF.

Press NEXT to go to Step 15D. Press REGEN to return to previous step.

STEP 15D**STEP 16D**

STEP 15D – Total brine errors since startup. This screen will not appear if Step 14S is set to OFF. (Not the same display as in History Level.)

Press NEXT to go to Step 16D. Press REGEN to return to previous step.

STEP 16D – MAV Drive History: Displays the drive time histories of all active MAV drives. Use ▲ or ▼ to review the history of all active MAV outputs.

TTT – measured MAV drive time in 1/100 of a second; a 19.34 second move is displayed as 1934;

VVV– measured MAV drive voltage;

CCC – total number of drives (in or out);

“-” indicates piston drive into MAV;

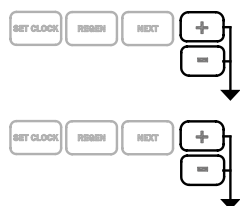
“+” indicates piston drive out of MAV.

MAV Drive History can be manually reset from Step 16D by pressing and holding ▲ and ▼ for about 3 seconds.

NOTE: After a MAV error occurs or there is a manual reset of MAV data, the drive data for that MAV is automatically moved to another set of displays for later viewing. These displays may be viewed from Step 16D by pressing SET CLOCK and ▲. Press NEXT to exit Diagnostics. Press REGEN to return to previous step.

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

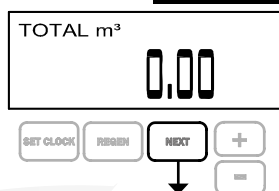
Valve History

STEP 1VH

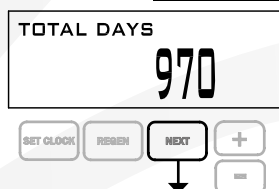
STEP 1VH – Press ▲ and ▼ simultaneously for three seconds and release. Then press ▲ and ▼ simultaneously and release.

STEP 2VH

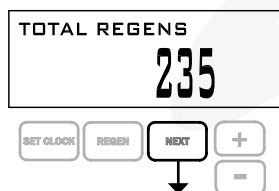
STEP 2VH⁴ – Displays the software version. Press NEXT to go to Step 3VH. Press REGEN to exit Valve History.

STEP 3VH

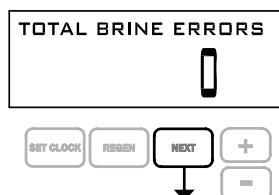
STEP 3VH – Volume, total treated since start-up: This display shows the total volume treated since startup. This display will equal zero if a water meter is not installed. Press the NEXT button to go to Step 4VH. Press REGEN to return to previous step.

STEP 4VH

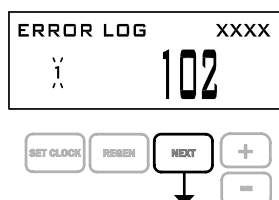
STEP 4VH – Days, total since start-up: This display shows the total days since startup. Press the NEXT button to go to Step 5VH. Press REGEN to return to previous step.

STEP 5VH

STEP 5VH – 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 6VH. Press REGEN to return to previous step.

STEP 6VH

STEP 6VH – Step 6VH – Brine Errors – Displays the number of times the Chlorinator detected and error. Press NEXT to go to Step 7VH. Press REGEN to return to previous step.

STEP 7VH

STEP 7VH – Error Log: This display shows a history of the last 10 errors generated by the control during operation. Press ▲ or ▼ to view each error recorded. For all drive errors, the piston position count or drive time at the time of stall detection is recorded (XXXX). Press NEXT button to exit Valve History. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

⁴ Values in steps 2VH through 7VH cannot be reset.



Revision History:

1/28/2013

PAGE 4

Step 5CS – DELAYED REGENERATION is the default if 1.0T is selected in Step 2CS, and BOTH will not be available.

PAGE 10

Step 8CS - In a twin alternating system, once the dP switch is triggered the PC board will display REGEN TODAY and switch tanks immediately. At the Delayed Regeneration Time, the triggered unit will then regenerate.

PAGE 17

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

PAGE 26

Step 14D – TTT – measured MAV drive time in 1/100 of a second; a 19.34 second move is displayed as 1934.

10/31/2013

PAGE 5

A unique feature of this control valve is the ability to display actual water usage for the last 90 days.

PAGE 7

Step 4CS - When Proportional Fill is set to REGEN or BOTH, the rate of Drain Line Flow can be set. This is used to calculate the water efficiency data that is viewed in Diagnostics 6 & 7.

Step 5CS - IMMEDIATE REGENERATION is the default if Step 2CS is set to 1.0T, and BOTH will not be available.

PAGE 14

NOTE: If Step 2CS is set to 2.0, or Step 16CS is set to MIN, fill will be in minutes.

PAGE 20

Step 2I – Display Language: Select English, German, French, Spanish or Italian.

PAGE 24

New error display.

PAGE 25

New displays for Steps 3D, 4D.

New steps 6D Salt Savings and 7D Water Savings.

PAGE 26

New display for Step 10D.

11/15/2013

COVER PAGE

Added WC Valve Cover image

PAGE 3

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WC Front Cover and Drive Assembly

