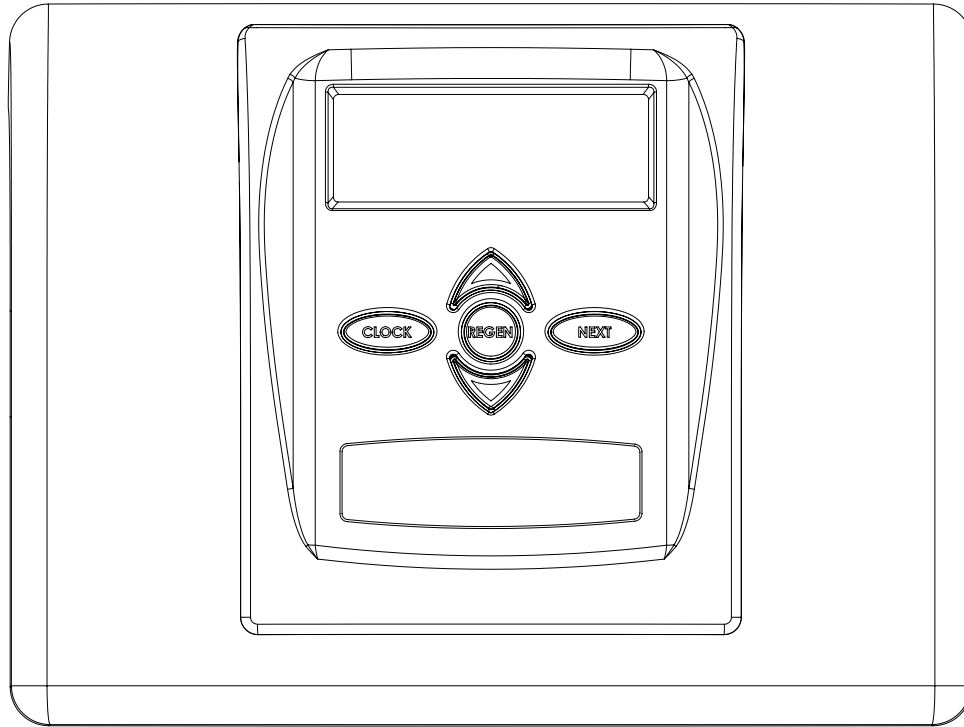


Water Specialist CK Control Valve Programming Manual



OPERATION AND INSTRUCTION MANUAL FOR OEM ONLY

Please Note: This operation and instruction manual is for the training of the OEM and for the OEM to use to train their customers.

This document is not to be used as the complete system manual.

Table of Contents

Front Cover and Drive Assembly 4

OEM General Programming Instructions 5

OEM Cycle Sequence 7

OEM Softener System Setup 11

Setting Options Table 14

OEM Filter System Setup 15

Installer Display Settings 18

User Display Settings 19

Diagnostics.....22

Valve History 24

Front Cover and Drive Assembly

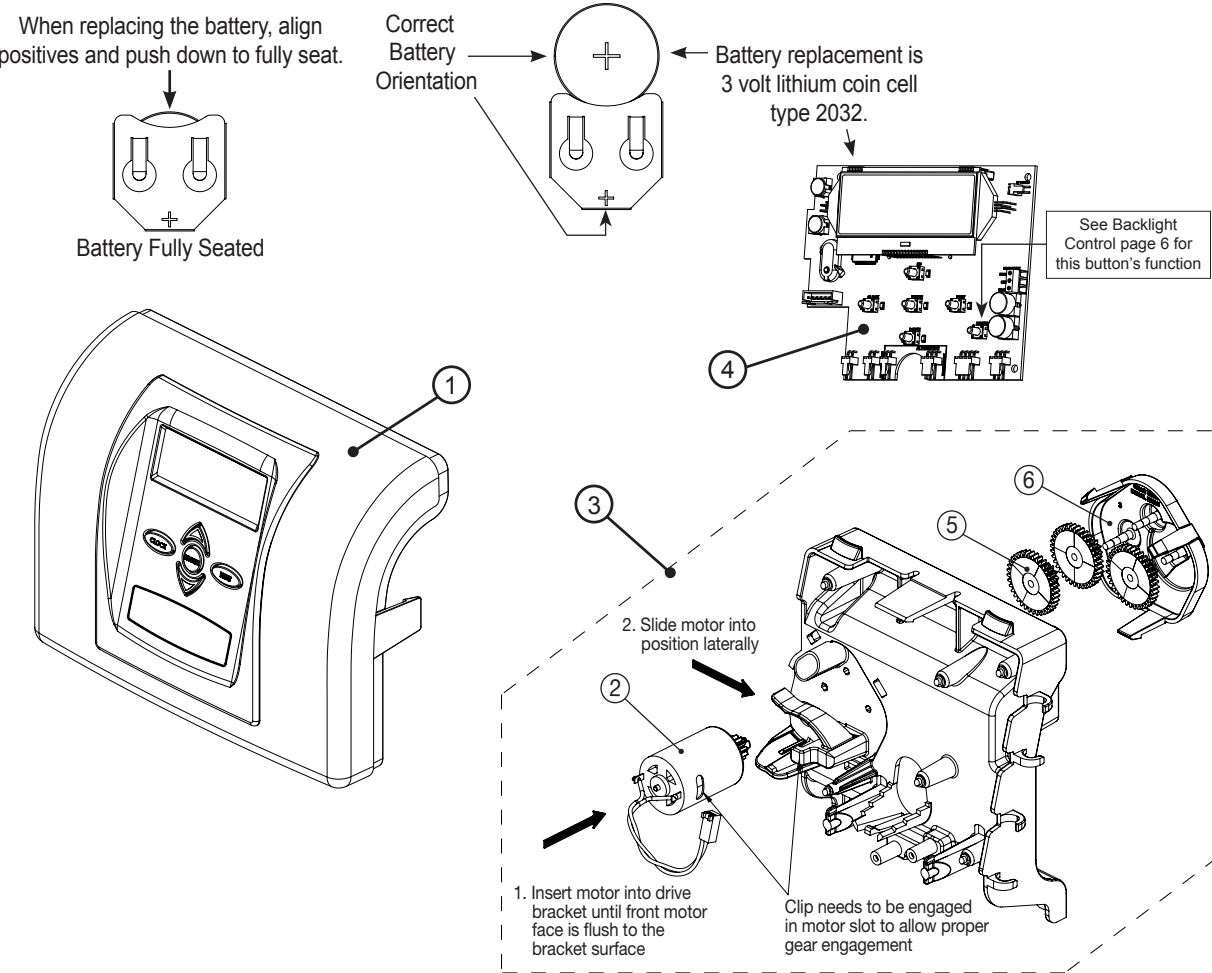
Drawing No.	Order No.	Description	Quantity
1	V3692-01GD	WS1LP FRONT COVER ASSEMBLY GD	1
2	V3107-01	WS1 MOTOR ASY	1
3	V3002	WS1 DRIVE BRACKET ASY W/ MOTOR	1
4	V3757CK-03BOARD	WS1 THRU 2 CK PC BRD REPL	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3
6	V3109	WS1 DRIVE GEAR COVER	1
Not Shown	V3186-06	WS1 POWER SUPPLY US 15VDC HOC	1
	V3186AUS-05OD	WS1 POWER SUPPLY AUS 15VDC VI OUTDOOR	
	V3186EU-06	WS1 POWER SUPPLY EU 15VDC HOC	
	V3186UK-06	WS1 POWER SUPPLY UK 15VDC HOC	
	V3186-01	WS1 POWER CORD ONLY	
Not Shown	V3690	WS1 LP DRIVE BACKPLATE	1

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

Relay Driver Output Type: Dual Solid-State 12 VDC wet contacts - N.O.
Relay Driver Output Capacity: 12 VDC @100 mA per relay output (total current through both outputs not to exceed 200 mA).
Note: Check for proper mounting dimensions on valve backplate prior to mounting an external relay under control cover.
We recommend that each externally wired relay contain a suppressor diode, which is normally placed across the relay coil in order to protect the control against back EMF at relay coil deactivation.

Power Supply	U.S.	International
Supply Voltage	100 – 120 VAC	100 – 240 VAC
Supply Frequency	50/60 Hz	50/60 Hz
Output Voltage	15 VDC	15 VDC
Output Current	500 mA	500 mA

Wiring For Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RLY 1	Coil -
V +	Coil +
RLY 2	Coil -



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

Once the OEM Cycle Sequence has been set, the other procedures can be accessed in any order.

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

Table 1: Typical Regeneration Cycles (Softening)

Downflow Regenerant Refill After Rinse	Downflow Regenerant Pre-Fill	Upflow Regenerant Refill After Rinse	Upflow Regenerant Pre-Fill
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: Typical Regeneration Cycles (Filtering)

Downflow Regenerant Refill After Rinse	Downflow Regenerant Pre-Fill	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 (whichever 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. 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	Day Override	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 2 options for setting Volume Capacity. Volume Capacity is automatically calculated if set to *AUTO*. Reserve capacity is automatically estimated based on water usage if *AUTO* is used. The other option is to set Volume Capacity to a specific number. If a specific number is set, reserve capacity is zero unless the value is manually set (i.e., the manufacturer intentionally sets the volume capacity number below the calculated capacity of the system).

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

² Day Override and Volume Capacity cannot both be set to *OFF* at the same time.

A unique feature of this control valve is the ability to display actual water usage for the last 63 days. The values are initially stored as dashes, meaning the value is unknown. As days pass, values are stored as 0 for no flow or the actual volume of water. The system begins counting water usage at the regeneration time. If no regeneration time can be set (i.e., when the valve is set for immediate regeneration), the system begins counting water usage at 12 a.m. Day 1 is yesterday, day 2 the day before yesterday, etc.

Another unique feature is that the valve automatically calculates a reserve capacity when set up as a softener with Volume Capacity set to *AUTO* and Regeneration Time Option set to *DELAY REGEN* or *BOTH*. The actual reserve capacity is compared to the capacity remaining immediately prior to the preset regeneration time. Regeneration will occur when the capacity remaining is less than the reserve capacity determined for that day. 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 is the maximum value stored for the last 3 non-trivial water usages in 7-day intervals. Non-trivial water use is defined as more than 0.08 m³ in a single day.

To lock out access to Diagnostics, Valve History, and settings modifications (except hardness, day override, time of regeneration, and time of day) by anyone but the manufacturer, press ▼, NEXT, ▲, and CLOCK in sequence after settings are made. To unlock so other displays can be viewed and changes can be made, press ▼, NEXT, ▲, and 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 5 minutes, the display returns to a normal user display. Any changes made prior to the 5 minute time-out are incorporated.

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

To clear the service call reminder, press ▼ and ▲ simultaneously while the reminder screen is displayed.

When desired, all information in Diagnostics and programming may be reset to defaults when the valve is installed in a new location. To reset, press NEXT and ▼ simultaneously to go to the Treatment Type display. Press ▼ and ▲ simultaneously to reset programming and diagnostic values. Screen will return to User displays.

Sometimes, it is desirable to have the valve initiate and complete 2 regenerations within 24 hours and then return to the preset regeneration procedure. It is possible to do a double regeneration if the Regeneration Time Option is set to *DELAYED REGEN* or *BOTH*. To do a double regeneration:

1. Press REGEN once. *REGEN TODAY* will flash on the display.
2. Press and hold REGEN for 3 seconds until the valve regeneration initiates.

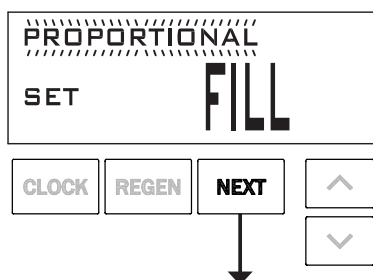
Once the valve has completed the immediate regeneration, the valve will regenerate one more time at the preset regeneration time.

For Valve Types 1.0T and 1.5T, press and hold 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.

Prior to selecting the upflow regeneration cycle, verify that the correct body, main piston, regenerant piston, and stack are being used and that the injector plug(s) are in the correct location. Refer to the Service Manual for drawings and part numbers.

Proportional Brining:

If the system is set up as a pre-fill upflow softener the control valve can also be set to normal or proportional brining.



This step will appear after Step 4S and before Step 5S if the system is set up appropriately. The following options can be selected:

- **NORMAL FILL:** System always pre-fills with the salt level selected.
- **PROPORTIONAL FILL:** If proportional brining is selected, the actual salt fill time will be calculated by dividing the actual volume of treated water used by the full volumetric capacity, then multiplying this value by the maximum salt fill time.

Press NEXT to go to the next step. Press REGEN to return to the previous step.

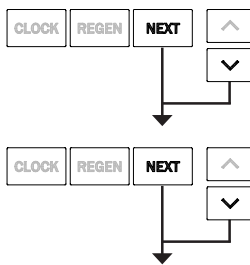
Backlight Control:

As an energy-saving feature, the control will automatically turn off the display backlight after 5 minutes of inactivity. Any keypad activity will re-illuminate the display for 5 minutes. To toggle Energy Saver, press and hold the Master Illumination button located in the lower right hand portion of the board for about 5 seconds.

By default, Energy Saver is *ON*. Press and hold the Master Illumination button to turn Energy Saver to *OFF*. The display will show *ENERGY SAVER OFF* and the display backlight will remain illuminated.

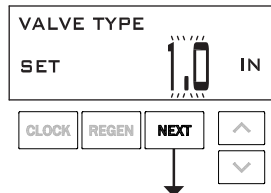
OEM Cycle Sequence

STEP 1CS



Step 1CS – Press NEXT and ▼ simultaneously for 3 seconds and release. Then, press NEXT and ▼ simultaneously for 3 seconds again 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 CLOCK in sequence, and try again.

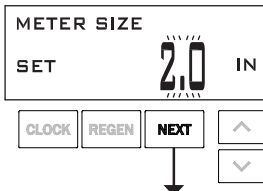
STEP 2CS



Step 2CS – Valve Type: 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, 1.0T for 1.0" twin valve, or 1.5T for 1.5" twin valve.

Press NEXT to go to Step 3CS. Press REGEN to return to exit OEM Cycle Sequence.

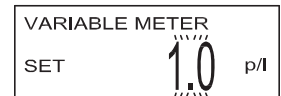
STEP 3CS



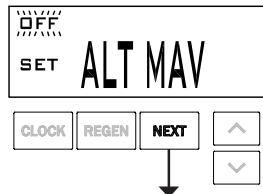
Step 3CS – Meter Size: Use ▼ or ▲ to select which size flow meter is to be used with the valve: 1.5, 2.0, 3.0, or 1.0r. Variable meter pulses of 0.1 – 150 PPL can also be selected.

This display will only appear if Step 2CS is set to 1.5 or 2.0.

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



STEP 4CS



Step 4CS – Alt MAV Output: Use ▼ or ▲ to select one of the following options:

- **NO HARD BYPASS**: The control valve operates with a no hard water bypass.
- **VALVE A** or **VALVE B**: The control valve acts as an alternator.
- **SEPARATE SOURCE**: The control valve has a separate source during the regeneration cycle.
- **SYSTEM CONTROLLER**: The control valve operates with a Clack system controller.
- **OFF**: None of these features are used.

Only use Clack no hard water bypass valves or Clack motorized alternating valves (MAVs) 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.

Configuring the Control Valve for No Hard Water Bypass Operation:

Select **NO HARD BYPASS** for control operation. For no hard water bypass operation, the 3-wire connector is not used. Selection requires that a connection to a Clack MAV or no hard water bypass valve is made to the 2-pin connector labeled **MAV MTR** located on the printed circuit board. If using a MAV, the A port of the MAV must be plugged and the B port connected to the valve outlet. When set to No Hard Bypass, the MAV will be driven closed before the first regeneration cycle that is not Fill, Softening, or Filtering and be driven open after the last regeneration cycle that is not Fill.

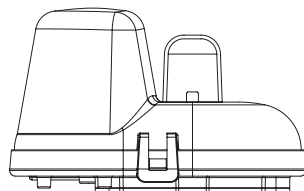
Note: If the control valve enters into an error state during regeneration, the no hard water bypass valve will either remain in service or return to service until the error is corrected and reset.



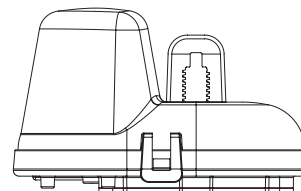
Configuring the Control Valve to Act as an Alternator:

Prior to starting the programming steps, connect the communication cable to each control valve board's 3-pin connector labeled *COMM CABLE*. Also connect the meter cable to either control valve to the 3-pin connector labeled *METER*.

Softener Valve Programming Steps			
OEM Cycle Sequence	Step 4CS	Set to <i>VALVE A</i> . Connect the outlet plumbing of Valve A to the MAV's A port and connect the MAV's 2-pin cable to the 2-pin connector labeled <i>DRIVE</i> on Valve A	Set to <i>VALVE B</i> . Connect the outlet plumbing of VALVE B to the MAV's B port. No electrical connections are required between Valve B and the MAV.
OEM Softener System Setup	Step 5S	Set Volume Capacity to <i>AUTO</i>	Set Volume Capacity to <i>AUTO</i>
OEM Softener System Setup	Step 6S	Set Regeneration Time Option to <i>IMMEDIATE REGEN</i>	Set Regeneration Time Option to <i>IMMEDIATE REGEN</i>
Installer Display Settings	Step 5I	Set Day Override to <i>OFF</i>	Set Day Override to <i>OFF</i>
If set up for a filter, Set Volume Capacity in Step 4F; set Regeneration Time Option in Step 5F to <i>IMMEDIATE</i> ; and set Day Override in Step 5I to <i>OFF</i> .			

**Retracted**

Valve A in service position =
MAV piston rod retracted

**Extended**

Valve B in service position =
MAV piston rod extended

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 standby 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 standby mode and allowed to have a delayed regeneration at the pre-set time.

Delayed Rinse and Fill: For Clack alternator systems using **WS1, WS1.25, or WS1.5** valves, there is an option to delay the last 2 cycles of regeneration (only Rinse and Fill). When this option is enabled, regeneration is split into 2 portions. During the first portion, all programmed cycles before Rinse and Fill are performed immediately when regeneration is triggered. Then, the control valve will drive to the service position and display *Delayed Rinse + Fill Pending*. Regeneration finishes when the volume of the online unit is depleted to 10% of its programmed capacity. At this point, Rinse and Fill will occur, and, when complete, the valve will re-enter standby mode until requested to come online for service.



Pre-Service Rinse: For Clack alternator systems using the **WS2** valve, when NEXT is pressed after selecting *VALVE A* or *VALVE 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.



If Step 2CS is set to *1.0T* or *1.5T*, the same display will appear and is set in a similar manner.

Configuring the Control Valve for Separate Source Operation:

Select *SEPARATE SOURCE* for control operation. For separate source operation, the 3-wire connector is not used. Selection requires that a connection to a Clack MAV is made to the 2-pin connector labeled *MAV MTR* located on the printed circuit board. The C port of the MAV must be connected to the valve inlet, the A port connected to the separate source used during regeneration, and the B port 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, the MAV will either remain in service or be returned to service until the error is corrected and reset.

```

SEPARATE SOURCE
SET  ALT MAV
  
```

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 3-wire communication cable is required. Selection requires that a connection to a Clack no hard water bypass be made to the 2-pin connector labeled *MAV* located on the printed circuit board.

```

SYSTEM CONTROLLER
SET  ALT MAV
  
```

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

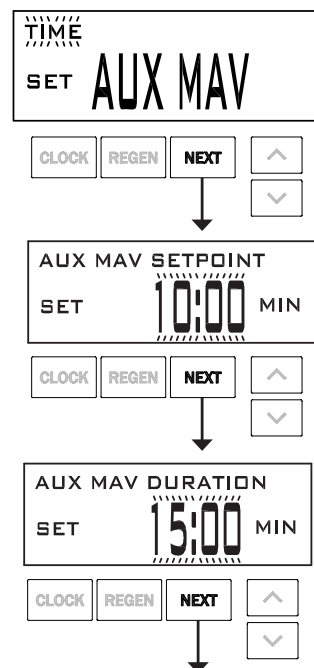


Step 5CS – Auxiliary MAV Output: Use ▼ or ▲ to select one of the following options:

- *TIME*: Allows auxiliary 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. If this option is selected, 2 additional displays will appear to choose the setpoint and duration.
- *SEPARATE SOURCE*: Allows auxiliary MAV to switch positions before the start of regeneration and then switch back at the end of regeneration.
- *OFF*: Deactivates this output.

Note: Only use Clack motorized alternating valves (MAVs) with these selections. Clack no hard water bypass valves (1" or 1.25" V3070FF or V3070FM) are not designed to be used with this function.

Press NEXT to go to Step 6CS. Press REGEN to return to previous step.

Additional Time Displays

STEP 6CS

AUXILIARY INPUT	
SET	OFF
CLOCK	REGEN
NEXT	▲
	▼

Step 6CS – Auxiliary (dP) Input: Allows for use of an outside signal to control the initiation of a regeneration. Selection only needed if a connection is made to the 2-pin connector labeled *DP SWITCH* located on the printed circuit board.

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. **For Alternator Systems only:** The DP input is ignored on units while in Regeneration or Standby.

Use ▼ or ▲ to select one of the following options:

- *oFF*: Feature not used.
- *IMMED REG*: Regeneration will occur immediately if the dP switch is closed for 2 uninterrupted minutes. 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. If this option is selected, the Delayed Rinse and Fill feature will not be available for WS1 – WS1.5 control valves programmed for twin alternating.
- *DELAY REG*: Regeneration will occur at the scheduled delayed regeneration time if the dP switch is closed for 2 uninterrupted minutes. In a twin alternating system, once the dP switch is triggered, the PC Board will display *REGEN TODAY*. At the delayed regeneration time, the control will switch tanks and the triggered unit will go into regeneration. If this option is selected, the Delayed Rinse and Fill feature will not be available for WS1 – WS1.5 control valves programmed for twin alternating.
- *HOLD REG*: Regeneration will be prevented from occurring while the dP switch is closed. 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. The Delayed Rinse and Fill feature can be set in conjunction with this option if desired.

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

STEP 7CS

HARDNESS UNITS	
SET	PPM
CLOCK	REGEN
NEXT	▲
	▼

Step 7CS – Hardness Units: Use ▼ or ▲ to select the measurement to calculate volumetric capacity:

- *PPM*: parts per million
- *FH*: French degrees
- *dH*: German degrees

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

STEP 8CS

BACKWASH	
SET	CYCLE 1
CLOCK	REGEN
NEXT	▲
	▼

Step 8CS – Regeneration Cycle Sequence: Use ▼ or ▲ to select the first cycle, then press NEXT to select the next cycle. The available cycle options include *BACKWASH*, *SOFTENING* or *FILTERING*, *FILL*, *REGENERANT DRAW DN* or *REGENERANT DRAW UP*, *RINSE*, and *END*. Up to 9 cycles may be selected in any order. **END must be used as the last cycle option.**

Refer to Table 1 for examples of typical cycle sequences for various applications.

Note: Prior to selecting the upflow regeneration cycle, verify that the correct body, main piston, regenerant piston, and stack are being used, and that the injector plug(s) are in the correct location. Refer to the Service Manual for drawings and part numbers.

After selecting *END*, press NEXT to go to Step 9CS. Press REGEN to return to previous step.

STEP 9CS

FILL UNITS	
SET	kg
CLOCK	REGEN
NEXT	▲
	▼

Step 9CS – Fill Units: Use ▼ or ▲ to select *KG* or *MIN*.

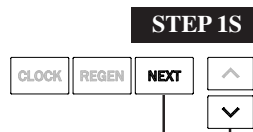
This display will only appear if the system is set as a softener, Step 2CS is set to *1.5* or *1.5T*, and Fill is part of the Regeneration Cycle Sequence.

Press NEXT to exit OEM Cycle Sequence. Press REGEN to return to previous step.

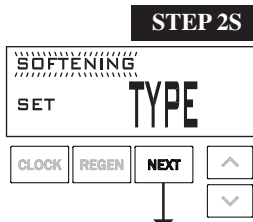
FILL UNITS	
SET	MIN

RETURN TO NORMAL MODE

OEM Softener System Setup



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 CLOCK in sequence, and try again.



Step 2S – Treatment Type: Use ▼ or ▲ to select *SOFTENING*. Press NEXT to go to Step 3S. Press REGEN to exit OEM Softener System Setup.

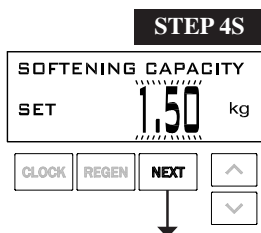


Step 3S – Cycle Durations: Use ▼ or ▲ to set the value for the first cycle selected in Step 8CS. Value ranges and units will vary depending on the cycle, see Table 4 for more detail. Press NEXT to set the value for the next cycle. Repeat for all cycles. The End cycle does not have a value and will not appear.

Table 4: Cycle Options Value Ranges (Softening)

Cycle Options	Units	Range
Backwash	Minutes	1 – 120
Rinse (fast)	Minutes	1 – 120
Regenerant Draw DN (combination of brining and slow rinse)	Minutes	1 – 180
Regenerant DRAW UP (combination of brining and slow rinse)	Minutes	1 – 180
Fill for all valves except WS2	Kilograms	0.05 – 100
Fill for WS2 valves or WS1.5 set to <i>MIN</i>	Minutes	0.1 – 99
Softening	Minutes	1 – 480

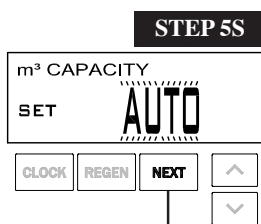
Press NEXT to go to Step 4S. Press REGEN to return to previous step.



Step 4S – Ionic Capacity: Use ▼ or ▲ to set a value for the ionic capacity. Value ranges and units vary depending on the selection made in Step 7CS, see chart for detail. Ionic Capacity should be based on the volume of resin and kg of salt for the Fill cycle set in Step 3S. The capacity and hardness levels entered are used to determine the reserve capacity when Volume Capacity is set to *AUTO*.

Setting	Units	Range	Default
PPM	kg	0.10 – 200	1.5
°fH	m ³	1 – 6000	160
°dH	m ³	1 – 6000	80

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

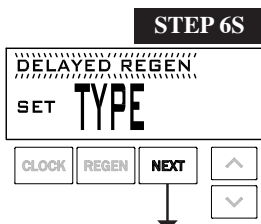


Step 5S – Volume Capacity: Use ▼ or ▲ to select one of the following options:

- *AUTO*: Capacity will be automatically calculated and reserve capacity will be automatically estimated.
- *OFF*: Regeneration will be based solely on Day Override set in Step 5I.
- A number: Regeneration initiation will be based off the value specified.

See Setting Options Table for more detail.

Press NEXT to go to Step 6S. Press REGEN to return to previous step.



Step 6S – Regeneration Time Option: Use ▼ or ▲ to select one of the following options:

- *DELAYED REGEN*: Regeneration will occur at the preset time.
- *IMMEDIATE REGEN*: Regeneration will occur immediately when the volume capacity reaches 0 (zero).
- *BOTH*: 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).
 This option will not be available if Step 4CS is set to *VALVE A* or *VALVE B* or if Step 2CS is set to *1.0T* or *1.5T*.

This display will not appear if Step 5S is set to *OFF* or Step 4CS is set to *SYSTEM CONTROLLER*.

See Setting Options Table for more detail.

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

STEP 7S

REGEN TIME
SET RELAY 1

CLOCK REGEN NEXT

Up arrow, Down arrow

Step 7S – Relay 1 Output: Use ▼ or ▲ to select one of the following options:

- **REGEN TIME:** Relay activates a set time after the beginning of regeneration and deactivates after a set period of time. The start of regeneration is defined as the first Backwash, Regenerant Draw UP (1" only), or Regenerant Draw DN cycle, whichever comes first.
 - **VOLUME:** Relay activates after a set volume has been used while in service and deactivates after the meter stops registering flow and the set time period has expired.
 - **REGEN VOLUME:** Relay activates after a set volume has been used while in service or during regeneration and deactivates after the meter stops registering flow and the set time period has expired.
 - **OFF:** Feature not used. Step 7S(A) and Step 7S(B) will not appear if this option is selected.
- Press NEXT to go to Step 7S(A) or Step 8S. Press REGEN to return to previous step.

STEP 7S(A)

RELAY 1 SETPOINT
SET 10 MIN

CLOCK REGEN NEXT

Up arrow, Down arrow

Step 7S(A) – Relay 1 Setpoint: Use ▼ or ▲ to set the actuation value. The unit and range will vary depending on the selection made in Step 7S.

- **Regen Time:** Set the length of time after the start of regeneration prior to relay activation (Range: 0 – 500 minutes).
- **Volume or Regen Volume:** Set the volume of water that will be treated prior to relay activation (Range: 1 – 200 liters).

Press NEXT to go to Step 7S(B). Press REGEN to return to previous step.

STEP 7S(B)

RELAY 1 DURATION
SET 5:00 MIN

CLOCK REGEN NEXT

Up arrow, Down arrow

Step 7S(B) – Relay 1 Duration: Use ▼ or ▲ to set the length of time the relay will stay active prior to deactivation (Range: 1 second – 500 minutes).

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

STEP 8S

VOLUME
SET RELAY 2

CLOCK REGEN NEXT

Up arrow, Down arrow

Step 8S – Relay 2 Output: Use ▼ or ▲ to select one of the following options:

- **REGEN TIME:** Relay activates a set time after the beginning of regeneration and deactivates after a set period of time. The start of regeneration is defined as the first Backwash, Regenerant Draw UP (1" only), or Regenerant Draw DN cycle, whichever comes first.
 - **VOLUME:** Relay activates after a set volume has been used while in service and deactivates after the meter stops registering flow and the set time period has expired.
 - **REGEN VOLUME:** Relay activates after a set volume has been used while in service or during regeneration and deactivates after the meter stops registering flow and the set time period has expired.
 - **ERROR MONITOR:** Relay activates when the control enters an error state and immediately deactivates when the control exits the error state. Step 8S(A) and Step 8S(B) will not appear if this option is selected.
 - **OFF:** Feature not used. Steps 8S(A) and 8S(B) will not appear if this option is selected.
- Press NEXT to go to Step 8S(A) or Step 9S. Press REGEN to return to previous step.

STEP 8S(A)

RELAY 2 SETPOINT
SET 20 L

CLOCK REGEN NEXT

Up arrow, Down arrow

Step 8S(A) – Relay 2 Setpoint: Use ▼ or ▲ to set the actuation value. The unit and range will vary depending on the selection made in Step 8S.

- **Regen Time:** Set the length of time after the start of regeneration prior to relay activation (Range: 0 – 500 minutes).
- **Volume or Regen Volume:** Set the volume of water that will be treated prior to relay activation (Range: 1 – 200 liters).

Press NEXT to go to Step 8S(B). Press REGEN to return to previous step.

STEP 8S(B)

RELAY 2 DURATION
SET 5:00 MIN

CLOCK REGEN NEXT

Up arrow, Down arrow

Step 8S(B) – Relay 2 Duration: Use ▼ or ▲ to set the length of time the relay will stay active prior to deactivation (Range: 1 second – 500 minutes).

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

STEP 9S

SERVICE ALARM	
SET	OFF
CLOCK	REGEN
NEXT	▲
	▼

Step 9S – Scheduled Service Alarm: Use ▼ or ▲ to select one of the following options:

- **TIME:** Activates the service alarm after a set duration of time.
- **m³:** Activates the service alarm after a set volume of water is treated.
- **BOTH:** Activates the service alarm after a set duration of time or after a set volume of water is treated, whichever comes first.
- **OFF:** Disables this feature. Step 9S(A) – Step 9S(D) will not appear if this option is selected. Press NEXT to go to Step 9S(A) or Step 10S. Press REGEN to return to previous step.

Note: To clear the Service Call reminder, press ▲ and ▼ simultaneously while the reminder screen is displayed.

STEP 9S(A)

SCHEDULED SERVICE	
SET	0.25 yr
CLOCK	REGEN
NEXT	▲
	▼

Step 9S(A) – Service Alarm (Time): Use ▼ or ▲ to set the length of time between service alarms (Range: 0.25 – 9.75 years). This display will only appear if Step 9S is set to **TIME** or **BOTH**. Press NEXT to go to Step 9S(B) or Step 9S(C). Press REGEN to return to previous step.

STEP 9S(B)

SCHEDULED SERVICE	
SET	50000 m ³
CLOCK	REGEN
NEXT	▲
	▼

Step 9S(B) – Service Alarm (Volume): Use ▼ or ▲ to set the volume of water treated between service alarms. This display will only appear if Step 9S is set to **m³** or **BOTH**.

Press NEXT to go to Step 9S(C) or Step 9S(D). Press REGEN to return to previous step.

STEP 9S(C)

SCHEDULE SERVICE	
IN	91 days
CLOCK	REGEN
NEXT	▲
	▼

Step 9S(C) – Status Display (Time): Time remaining until service alarm generation. This display will only appear if Step 9S is set to **TIME** or **BOTH**. To reset this value to the value set in Step 9S(A), press ▼ and ▲ simultaneously for 3 seconds.

Press NEXT to go to Step 9S(D) or Step 10S. Press REGEN to return to previous step.

STEP 9S(D)

SCHEDULE SERVICE	
IN	50000 m ³
CLOCK	REGEN
NEXT	▲
	▼

Step 9S(D) – Status Display (Volume): Capacity remaining until service alarm generation. This display will only appear if Step 9S is set to **m³** or **BOTH**. To reset this value to the value set in Step 9S(B), press ▼ and ▲ simultaneously for 3 seconds.

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

STEP 10S

SALT LEVEL ALARM	
SET	OFF
CLOCK	REGEN
NEXT	▲
	▼

Step 10S – Salt Level Alarm: Use ▼ or ▲ to set the trigger level for the activation of the Check Salt Level display (Range: 5 – 200 kg or **OFF**).

This display will not appear if Step 2S is set to **FILTERING**, Step 2CS is set to 2.0, or Step 2CS is set to 1.5 or 1.5T with Step 9CS set to **MIN**.

Press NEXT to exit OEM Softener System Setup. Press REGEN to return to previous step.

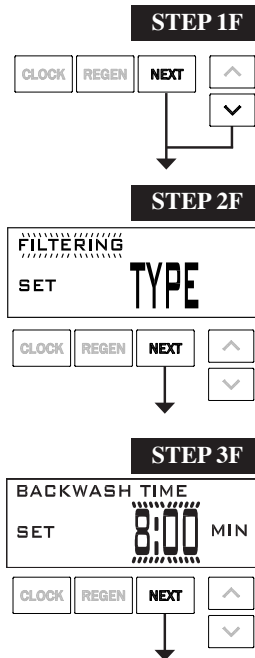
RETURN TO NORMAL MODE

Setting Options Table
Filters should only use shaded options.

Volume Capacity	Regeneration Time Option	Day Override	Result ³
AUTO	DELAYED REGEN	OFF	Reserve capacity automatically estimated. Regeneration occurs when volume capacity falls below the reserve capacity at the next Regen Set Time
AUTO	DELAYED REGEN	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, whichever comes first.
Any number	DELAYED REGEN	OFF	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when volume capacity reaches 0.
OFF	DELAYED REGEN	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 REGEN	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, whichever comes first.
AUTO	IMMEDIATE REGEN	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 REGEN	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, whichever comes first, 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



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 CLOCK in sequence, and try again.

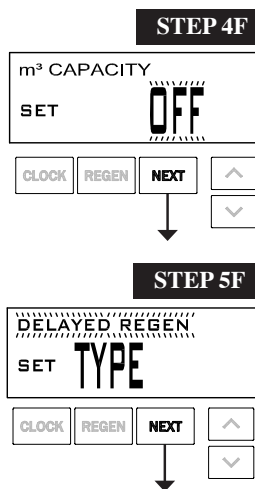
Step 2F – Treatment Type: Use ▼ or ▲ to select *FILTERING*. Press NEXT to go to Step 3F. Press REGEN to exit OEM Filter System Setup.

Step 3F – Cycle Durations: Use ▼ or ▲ to set the value for the first cycle selected in Step 8CS. Value ranges and units will vary depending on the cycle, see Table 5 for more detail. Press NEXT to set the value for the next cycle. Repeat for all cycles. The End cycle does not have a value and will not appear.

Table 5: Cycle Options Value Ranges (Filtering)

Cycle Options	Units	Range
Backwash	Minutes	1 – 120
Rinse (fast)	Minutes	1 – 120
Regenerant Draw DN (combination of regenerant and slow rinse)	Minutes	1 – 180
Fill for all valves except WS2	Liters	0.2 – 76
Fill for WS2 valves	Minutes	0.1 – 99
Filtering	Minutes	1 – 480

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



Step 4F – Volume Capacity: Use ▼ or ▲ to select one of the following options:

- *OFF*: Regeneration will be based solely on Day Override set in Step 5I.
 - A number: Regeneration initiation will be based off the value specified.
- See Setting Options Table for more detail.

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

Step 5F – Regeneration Time Option: Use ▼ or ▲ to select one of the following options:

- *DELAYED REGEN*: Regeneration will occur at the preset time.
- *IMMEDIATE REGEN*: Regeneration will occur immediately when the volume capacity reaches 0 (zero).
- *BOTH*: 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).

This option will not be available if Step 4CS is set to *VALVE A* or *VALVE B* or if Step 2CS is set to *1.0T* or *1.5T*.

This display will not appear if Step 4F is set to *OFF* or Step 4CS is set to *SYSTEM CONTROLLER*. See Setting Options Table for more detail.

Press NEXT to go to Step 6F. Press REGEN to return to previous step.

STEP 6F

Step 6F – Relay 1 Output: Use ▼ or ▲ to select one of the following options:

- **REGEN TIME:** Relay activates a set time after the beginning of regeneration and deactivates after a set period of time. The start of regeneration is defined as the first Backwash, Regenerant Draw UP (1" only), or Regenerant Draw DN cycle, whichever comes first.
- **VOLUME:** Relay activates after a set volume has been used while in service and deactivates after the meter stops registering flow and the set time period has expired.
- **REGEN VOLUME:** Relay activates after a set volume has been used while in service or during regeneration and deactivates after the meter stops registering flow and the set time period has expired.
- **OFF:** Feature not used. Steps 6F(A) and 6F(B) will not appear if this option is selected. Press NEXT to go to Step 6F(A) or Step 7F. Press REGEN to return to previous step.

STEP 6F(A)

Step 6F(A) – Relay 1 Setpoint: Use ▼ or ▲ to set the actuation value. The unit and range will vary depending on the selection made in Step 6F.

- **Regen Time:** Set the length of time after the start of regeneration prior to relay activation (Range: 0 – 500 minutes).
- **Volume or Regen Volume:** Set the volume of water that will be treated prior to relay activation (Range: 1 – 200 liters).

Press NEXT to go to Step 6F(B). Press REGEN to return to previous step.

STEP 6F(B)

Step 6F(B) – Relay 1 Duration: Use ▼ or ▲ to set the length of time the relay will stay active prior to deactivation (Range: 1 second – 500 minutes).

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

STEP 7F

Step 7F – Relay 2 Output: Use ▼ or ▲ to select one of the following options:

- **REGEN TIME:** Relay activates a set time after the beginning of regeneration and deactivates after a set period of time. The start of regeneration is defined as the first Backwash, Regenerant Draw UP (1" only), or Regenerant Draw DN cycle, whichever comes first.
- **VOLUME:** Relay activates after a set volume has been used while in service and deactivates after the meter stops registering flow and the set time period has expired.
- **REGEN VOLUME:** Relay activates after a set volume has been used while in service or during regeneration and deactivates after the meter stops registering flow and the set time period has expired.
- **ERROR MONITOR:** Relay activates when the control enters an error state and immediately deactivates when the control exits the error state. Step 7F(A) and Step 7F(B) will not appear if this option is selected.
- **OFF:** Feature not used. Steps 7F(A) and 7F(B) will not appear if this option is selected. Press NEXT to go to Step 7F(A) or Step 8F. Press REGEN to return to previous step.

STEP 7F(A)

Step 7F(A) – Relay 2 Setpoint: Use ▼ or ▲ to set the actuation value. The unit and range will vary depending on the selection made in Step 7F.

- **Regen Time:** Set the length of time after the start of regeneration prior to relay activation (Range: 0 – 500 minutes).
- **Volume or Regen Volume:** Set the volume of water that will be treated prior to relay activation (Range: 1 – 200 liters).

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

STEP 7F(B)

Step 7F(B) – Relay 2 Duration: Use ▼ or ▲ to set the length of time the relay will stay active prior to deactivation (Range: 1 second – 500 minutes).

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

STEP 8F

SERVICE ALARM			
SET	OFF		
CLOCK	REGEN	NEXT	▲ ▼

Step 8F – Scheduled Service Alarm: Use ▼ or ▲ to select one of the following options:

- **TIME:** Activates the service alarm after a set duration of time.
- **m³:** Activates the service alarm after a set volume of water is treated.
- **BOTH:** Activates the service alarm after a set duration of time or after a set volume of water is treated, whichever comes first.
- **OFF:** Disables this feature. Step 8F(A) – Step 8F(D) will not appear if this option is selected.

Press NEXT to go to Step 8F(A) or exit OEM Filter System Setup. Press REGEN to return to previous step.

Note: To clear the Service Call reminder, press ▲ and ▼ simultaneously while the reminder screen is displayed.

STEP 8F(A)

SCHEDULED SERVICE			
SET	0.25 yr		
CLOCK	REGEN	NEXT	▲ ▼

Step 8F(A) – Service Alarm (Time): Use ▼ or ▲ to set the length of time between service alarms (Range: 0.25 – 9.75 years). This display will only appear if Step 8F is set to *TIME* or *BOTH*. Press NEXT to go to Step 8F(B) or Step 8F(C). Press REGEN to return to previous step.

STEP 8F(B)

SCHEDULED SERVICE			
SET	50000 m ³		
CLOCK	REGEN	NEXT	▲ ▼

Step 8F(B) – Service Alarm (Volume): Use ▼ or ▲ to set the volume of water treated between service alarms. This display will only appear if Step 8F is set to *m³* or *BOTH*.

Press NEXT to go to Step 8F(C) or Step 8F(D). Press REGEN to return to previous step.

STEP 8F(C)

SCHEDULE SERVICE			
IN	91 days		
CLOCK	REGEN	NEXT	▲ ▼

Step 8F(C) – Status Display (Time): Time remaining until service alarm generation. This display will only appear if Step 8F is set to *TIME* or *BOTH*. To reset this value to the value set in Step 8F(A), press ▼ and ▲ simultaneously for 3 seconds.

Press NEXT to go to Step 8F(D) or exit OEM Filter System Setup. Press REGEN to return to previous step.

STEP 8F(D)

SCHEDULE SERVICE			
IN	50000 m ³		
CLOCK	REGEN	NEXT	▲ ▼

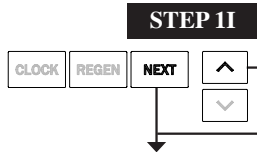
Step 8F(D) – Status Display (Volume): Capacity remaining until service alarm generation. This display will only appear if Step 8F is set to *m³* or *BOTH*. To reset this value to the value set in Step 8F(B), press ▼ and ▲ simultaneously for 3 seconds.

Press NEXT to exit OEM Filter System Setup. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

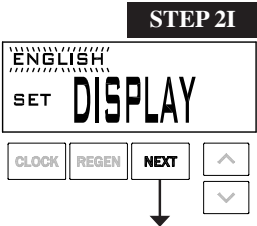
Installer Display Settings

Step 1I – Press NEXT and ▲ simultaneously for 3 seconds.



Step 2I – Display Language: Use ▼ or ▲ to select *ENGLISH*, *GERMAN*, *FRENCH*, *SPANISH*, *TURKISH*, *POLISH*, or *ITALIAN*.

Press NEXT to go to Step 3I. Press REGEN to exit Installer Display Settings.



Step 3I – Hardness: Use ▼ or ▲ to set the amount of influent hardness. Ranges and defaults will vary depending on the selection made in Step 7CS, see table for details.

This display will only appear if Step 2S is set to *SOFTENING* and Step 5S is set to *AUTO*.

Press NEXT to go to Step 4I. Press REGEN to exit Installer Display Settings.

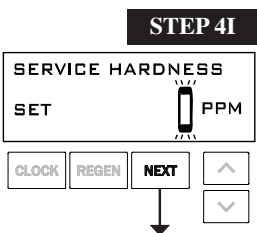
Unit	Range	Default
PPM	1 – 2500	340
°fH	1 – 250	34
°dH	1 – 150	18



Step 4I – Service Water Hardness: If a mixing valve is installed in the valve, service hardness needs to be set. Setting range is always less than the setting in Step 3I.

This display will not appear if Step 2CS is set to *1.5*, *2.0*, or *1.5T*, Step 2F is set to *FILTERING*, or Volume Capacity is set anything other than *AUTO*.

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

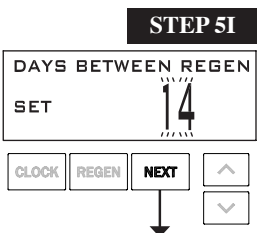


Step 5I – Day Override: When Volume Capacity is set to *OFF*, sets the number of days between regenerations. When Volume Capacity is set to *AUTO* or to a number, sets the maximum number of days between regenerations. Use ▼ or ▲ to select one of the following options:

- A number (1 – 28): Regeneration initiation will be called for every set number of days even if sufficient volume of water was not used to call for a regeneration.
- *OFF*: Regeneration initiation is based solely on volume used.

See Setting Options Table for more detail.

Press NEXT to go to Step 6I. Press REGEN to return to previous step.



Step 6I – Regeneration Time: Use ▼ or ▲ to set the hour of day for regeneration. The default time is 2:00. Press NEXT to set the minutes.

This display will not appear if Regeneration Time Option is set to *IMMEDIATE REGEN*.

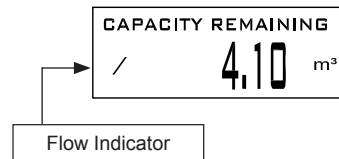
Once the minutes are set, press NEXT to exit Installer Display Settings. Press REGEN to return to previous step.



RETURN TO NORMAL MODE

User Display Settings

When the system is operating, several displays may be shown. Press NEXT to alternate between the displays. One of the displays is the current time of day. Capacity Remaining is the volume of water that will be treated before the system goes through a regeneration. Press ▼ while in the Capacity Remaining display to decrease the capacity remaining in 0.01 m³ increments and increase the volume used impacting the recorded values in Diagnostics Step 3D and Step 4D and Valve History Step 5VH. Days To A Regen is the number of days left before the system regenerates. Press ▼ while in the Days To A Regen display to decrease the displayed value by 1 day. If a water meter is installed, the flow indicator appears on the display when water is being treated (i.e., water is flowing through the system). Flow Rate shows the current rate treated water is flowing through the system.



TIME OF DAY
/
21:00

DAYS TO A REGEN
/
14

FLOW RATE
10 LPM

SCHEDULED SERVICE

REGENERATION
HOLD

If Contact Information is set, it will be displayed on the Service Call reminder. For concerns with phone number or banner text displays, contact OEM for instructions.

Note: To clear the Service Call reminder, press ▼ and ▲ simultaneously while the reminder screen is displayed.

Either *DP* or *HOLD* will be displayed if the dP switch is closed.

Additional Displays:

REGEN PENDING is displayed in alternator systems whenever a unit is waiting to initiate the first cycle step of regeneration.

REGEN PENDING
ALT MAV

STAND BY is displayed in alternator systems when a valve is in standby mode.

STAND BY
AUX MAV

DELAYED RINSE+FILL PENDING is 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. This display only appears if Delayed Rinse and Fill is set to *ON*.

DELAYED RINSE+FILL PENDING

Regeneration Mode:

Typically, a system is set to regenerate at a time of low water usage (e.g., 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 current cycle display will alternate with the regen time remaining screen. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

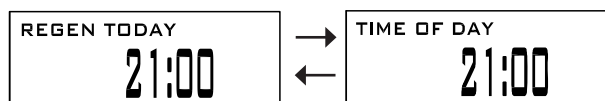
BACKWASH
6:36 MIN

↓ ↑
DISPLAYS
ALTERNATE
BEING VIEWED

REGENERATION COMPLETED IN
10:36 MIN

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 REGEN* 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. Press REGEN again to cancel the request.

Note: If the Regeneration Time Option is set to *IMMEDIATE REGEN*, there is no set delayed regeneration time, so *REGEN TODAY* will not activate if REGEN is pressed.

To initiate a manual regeneration immediately, press and hold REGEN for 3 seconds. The system will begin to regenerate immediately. The request cannot be canceled.

Note: For softeners, if brine tank does not contain salt, fill with salt and wait at least 2 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, which indicates the time of day should be reset and the non-rechargeable battery should be replaced.

STEP 1U

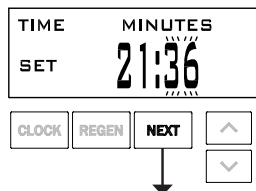
Step 1U – Press CLOCK.

**STEP 2U**

Step 2U – Current Time (Hour): Use ▼ or ▲ to set the hour of the day. Press NEXT to go to Step 3U.

**STEP 3U**

Step 3U – Current Time (Minutes): Use ▼ or ▲ to set the minutes of the day. Press NEXT to exit Set Time of Day. Press REGEN to return to previous step.



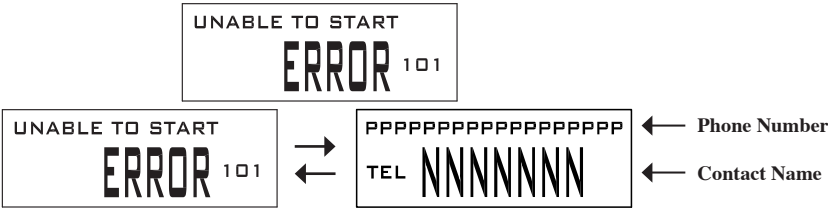
RETURN TO NORMAL MODE

Power Loss:

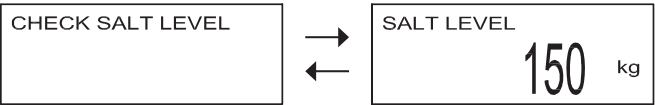
If the power goes out, the system will keep time until the battery is depleted. If an extended power outage occurs, the time of day will flash, which indicates the time of day should be reset and the non-rechargeable battery replaced. The system will retain all valve programming and diagnostic information.

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. If the number and banner text in the Contact Screens has been set, the 2 displays below will alternate.



Add Salt:

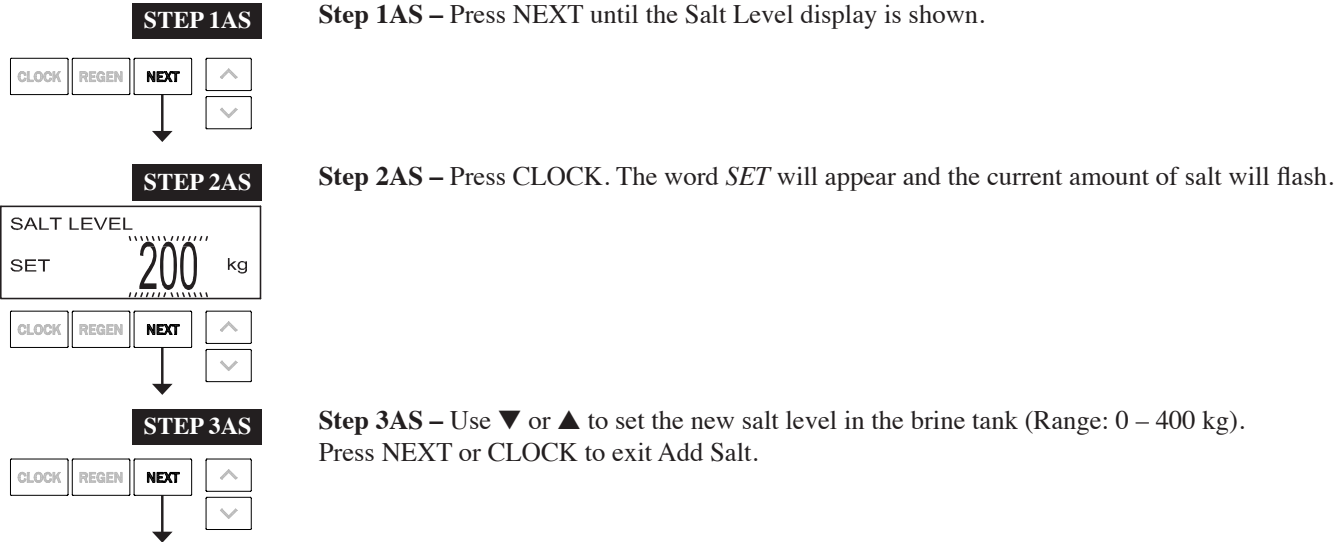


If the Salt Level Alarm was activated in Step 10S, the above displays will appear in the User displays.

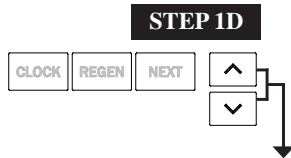
Note: The salt used per regeneration setting can be set in increments of 0.05 kg, but the Kg REMAINING screen will round up or down to the closest whole number.

Once the salt remaining has gone below the set point, the Check Salt Level display will automatically alternate with the Salt Level display.

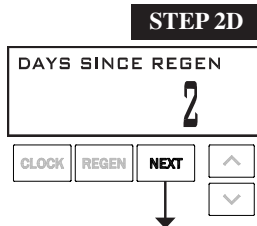
When adding salt to the brine tank, the following steps must be completed:



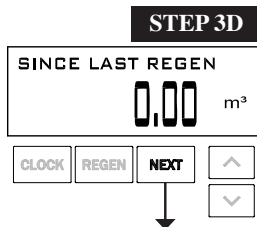
Diagnostics



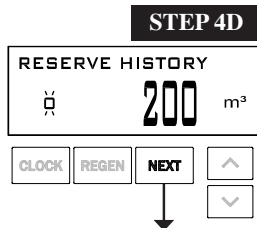
Step 1D – Press ▼ and ▲ simultaneously for 3 seconds. If screen in Step 2D does not appear in 5 seconds, the lock on the valve is activated. To unlock, press ▼, NEXT, ▲, and CLOCK in sequence, and try again.



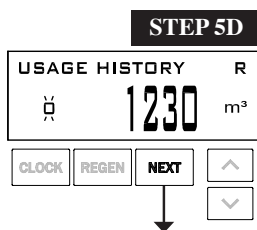
Step 2D – Days Since Last Regeneration.
Press NEXT to go to Step 3D. Press REGEN to exit Diagnostics.



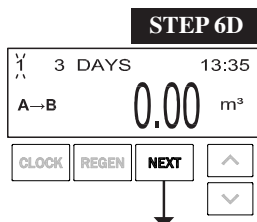
Step 3D – Volume Since Last Regeneration: This display will show zero if a water meter is not installed.
Press NEXT to go to Step 4D. Press REGEN to return to previous step.



Step 4D – Reserve History, Last 7 Days: If the valve is set up as a softener, a meter is installed, and Volume Capacity is set to *AUTO*, this display shows the reserve capacity for each of the last 7 days. Day 0 is today, day 1 is yesterday, etc. Use ▼ or ▲ to scroll. This display will not appear if filter, time clock, meter immediate, alternator, or volume override regeneration is selected.
Press NEXT at any time to go to Step 5D. Press REGEN to return to previous step.



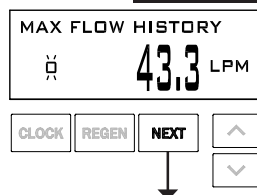
Step 5D – Usage History, Last 63 Days: This display shows the volume of water treated on each of the last 63 days. Day 0 is today, day 1 is yesterday, etc. Use ▼ or ▲ to scroll. If a regeneration occurred on the day, the letter *R* will also be displayed. This display will show dashes if a water meter is not installed.
Press NEXT at any time to go to Step 6D. Press REGEN to return to previous step.



Step 6D – Tank Transfer History: This display will only appear if Step 2CS is set to *1.0T* or *1.5T*. Use ▼ or ▲ to scroll through the last 10 tank transfers. This display shows:

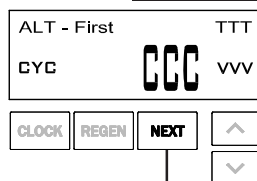
- The transfer number (1 – 10)
- The tank transferring (A or B)
- How many days ago the transfer occurred (99-day maximum)
- The time the transfer occurred
- The volume used at time of tank transfer

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

STEP 7D

Step 7D – Maximum Flow Rate, Last 7 Days: Use ▼ or ▲ to scroll through the maximum flow rate in liters per minute that occurred on each of the last 7 days. This display will show zero if a water meter is not installed.

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

STEP 8D

**RETURN TO
NORMAL MODE**

Step 8D – MAV Drive History: Use ▼ or ▲ to scroll through the drive time history of all active MAV outputs. The display can be read as follows:

- TTT: Measured MAV drive time
- VVV: Measured MAV drive voltage
- CCC: Total number of drives (in or out); (-) indicates piston drive into MAV; (+) indicates piston drive out of MAV.

Note: When a MAV is replaced, it is recommended that the diagnostics screen for that MAV be cleared. That is done by selecting the + or – screen for that MAV. Press and hold ▼ and ▲ for about 3 seconds. Failure to do this may result in inconsistent MAV operation.

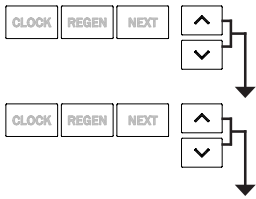
When a MAV error occurs, the Drive History will automatically be reset. To view previously recorded history, press and hold SET CLOCK and ▲. The display will be similar to the normal MAV Drive History display, with the addition of EEE: MAV error code present at the time of reset. If the display shows dashes, there was no MAV error before the reset.

Press NEXT to exit Diagnostics. Press REGEN to return to previous step.

When desired, all information in Diagnostics and programming may be reset to defaults when the valve is installed in a new location. To reset, press NEXT and ▼ simultaneously to go to the Treatment Type display. Press ▼ and ▲ simultaneously to reset programming and diagnostic values. Screen will return to User displays.

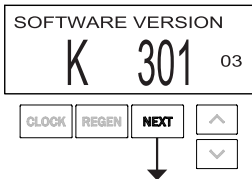
Valve History

STEP 1VH



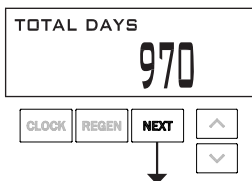
Step 1VH – Press ▼ and ▲ simultaneously for 3 seconds and release. Then, press ▼ and ▲ simultaneously for 3 seconds again and release. If screen in Step 2VH does not appear in 5 seconds, the lock on the valve is activated. To unlock, press ▼, NEXT, ▲, and CLOCK in sequence, and try again.

STEP 2VH



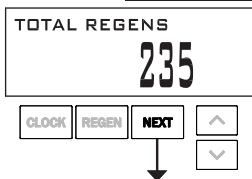
Step 2VH – Software version.
Press NEXT to go to Step 3VH. Press REGEN to exit Valve History.

STEP 3VH



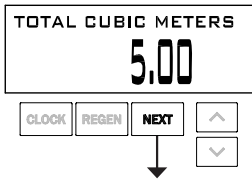
Step 3VH⁵ – Total Days Since Startup.
Press NEXT to go to Step 4VH. Press REGEN to return to previous step.

STEP 4VH



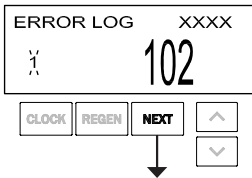
Step 4VH – Total Regenerations Since Startup.
Press NEXT to go to Step 5VH. Press REGEN to return to previous step.

STEP 5VH



Step 5VH – Total Volume Used Since Startup: This display will show zero if a water meter is not installed.
Press NEXT to go to Step 6VH. Press REGEN to return to previous step.

STEP 6VH



Step 6VH – Error Log: Use ▼ or ▲ to scroll through the last 10 errors generated by the control during operation. XXXX indicates the position of the drive at the time of stall detection.
Press NEXT to exit Valve History. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

⁵ Values in Step 3VH – Step 6VH cannot be reset.

Revision History:

10/10/2018

PAGE 4:

Update Power Supply information

8/26/2019

PAGE 7:

Step 3CS: When 1.5 or 2.0 is selected,

4/23/2020

PAGE 4:

Removed #7 V3106-01 from table and drawing.

Not Shown	V3186-06	WS1 POWER SUPPLY US 15VDC HOCP	1
	V3186AUS-05OD	WS1 POWER SUPPLY AUS 15VDC VI OUTDOOR	
	V3186EU-06	WS1 POWER SUPPLY EU 15VDC HOCP	
	V3186UK-06	WS1 POWER SUPPLY UK 15VDC HOCP	
	V3186-01	WS1 POWER CORD ONLY	

8/23/2024

PAGE 4:

3	V3002	WS1 DRIVE BRACKET ASY W/ MOTOR	1
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Updated drawing

“We recommend that each externally wired relay contain a suppressor diode, which is normally placed across the relay coil in order to protect the control against back EMF at relay coil deactivation.”

PAGE 10:

Condensed Step 8CS – Step 12CS

PAGE 11:

Condensed Step 3S – Step 6S

PAGE 13:

Added Step 9S(A) – Step 9S(D)

PAGE 15:

Condensed Step 3F – Step 6F

PAGE 17:

Added Step 8F(A) – Step 8F(D)

PAGE 22:

Step 2VH: Updated display

PAGES 6, 7, 10, 11, 13, 15, 18, & 22:

Added 1.5T option

Various grammatical and formatting changes throughout

