

Water Specialist EI Control Valve Programming and Cover Drawing Manual

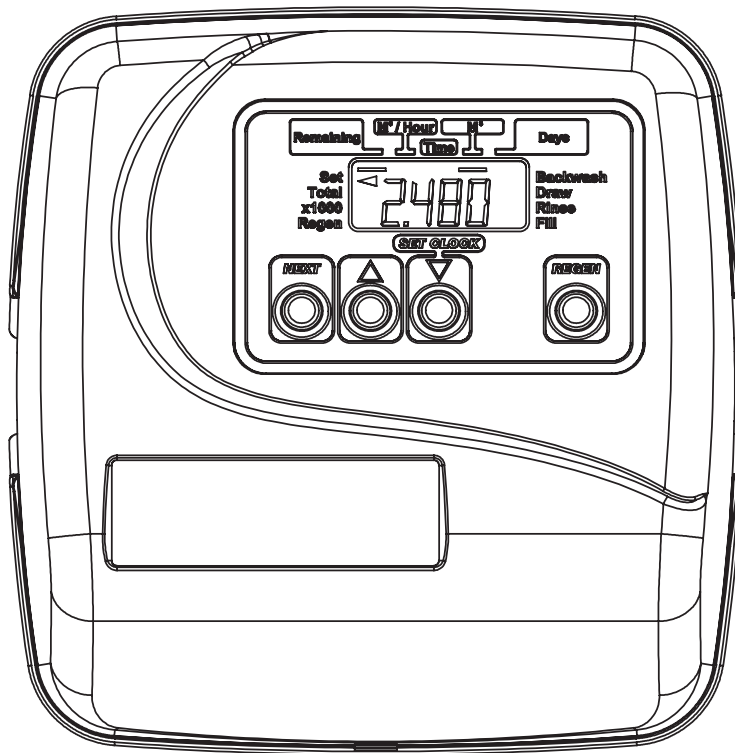


Table of Contents

- EI Front Cover and Drive Assembly4
- Regeneration and Error Screens5
- User Displays6
- Installer Display Settings7
- Setting Regeneration Cycle Times9
- Configurations Settings10
- Alternator Programming Guide13
- Diagnostics14

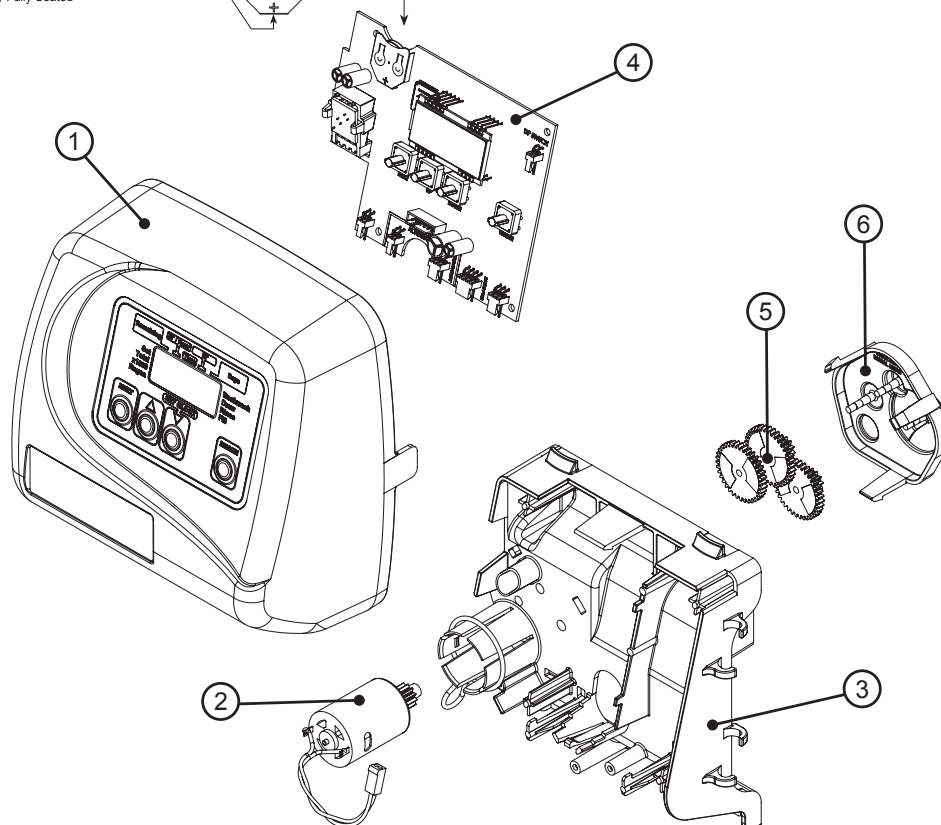
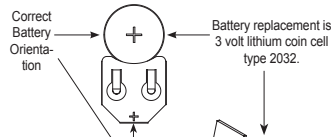
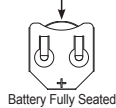
EI Front Cover and Drive Assembly

Drawing No.	Order No.	Description	Quantity
1	V3175EI-01	WS1EI FRONT COVER ASSEMBLY	1
2	V3107-01	WS1 MOTOR	1
3	V3106-01	WS1 DRIVE BRACKET & SPRING CLIP	1
4	V3408EI-02BOARD	WS1THRU2L EI PCBRD MAV/ALT REPL	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3
6	V3109	WS1 DRIVE GEAR COVER	1
Not Shown	V3186	WS1 AC ADAPTER 110V-12V	1
	V3186EU	WS1 AC ADAPTER 220-240V-12V EU	
	V3186UK	WS1 AC ADAPTER 220-240V-12V UK	
	V3186-01	WS1 AC ADAPTER CORD ONLY	
Not Shown	V3178	WS1 Drive Back Plate	1

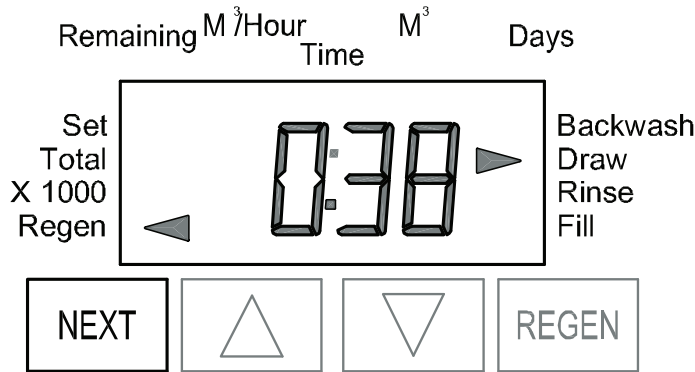
Refer to Control Valve Service Manual for other drawings and part numbers.

AC Adapter	U.S.	International
Supply Voltage	120 V AC	230V AC
Supply Frequency	60 Hz	50 Hz
Output Voltage	12 V AC	12 V AC
Output Current	500 mA	500 mA

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

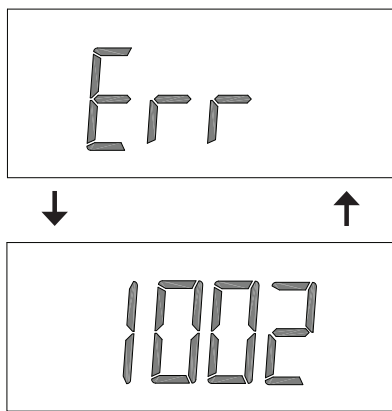


Regeneration and Error Screens



Regen Screen

Displays the time remaining in the current cycle. Pressing REGEN advances to the next cycle.



Error Screen

Alternated flashing Err and error code every 3 seconds. Clear by disconnecting the power supply at the PC board and reconnecting, or press the NEXT and REGEN buttons simultaneously for 3 seconds.

Button Operation and Function



Scrolls to the next display.



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



Changes variable being displayed.



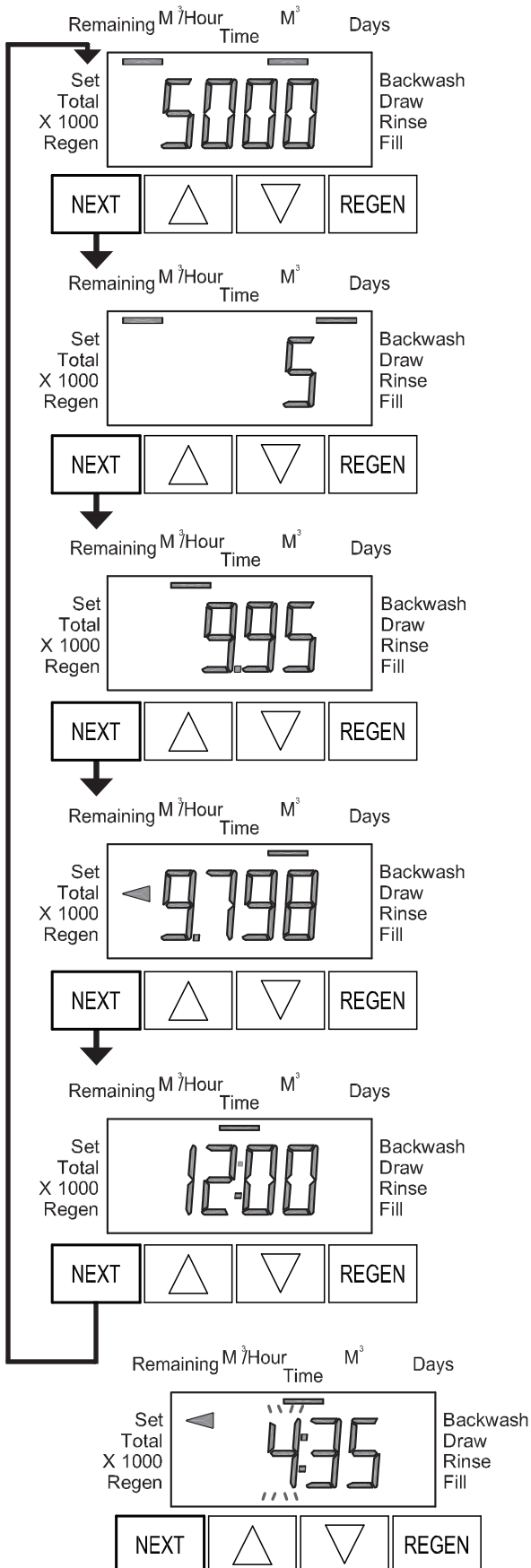
Key sequence to lock and unlock program settings.



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

User Displays

General Operation



When the system is operating, one of five displays may be shown. Pressing NEXT will alternate between the displays shown below.

User 1

Typical user display. If volume is selected in Configuration Settings Step 3CS, shows volume remaining to regeneration. If volume is not selected in Configuration Settings Step 3CS, this screen will not be shown. If a meter is not used this display will not change.

User 2

Displays number of days to next regeneration.

User 3

Displays flow rate $M^3/Hour$. If a meter is not used this display will be shown but 0 will be displayed.

User 4

Displays total flow in cubic meters since last reset. If a meter is not used this display will be shown but 0 will be displayed.

PRESS THE DOWN ▼ ARROW FOR 3 SECONDS TO RESET TO 0.

User 5

Shows current time.

Setting Time of Day

Push NEXT button until time of day screen is displayed. Press and hold the ▲ arrow until the SET indicator is displayed and the hour flashes. Press the ▲ or ▼ arrow until the correct hour is displayed.

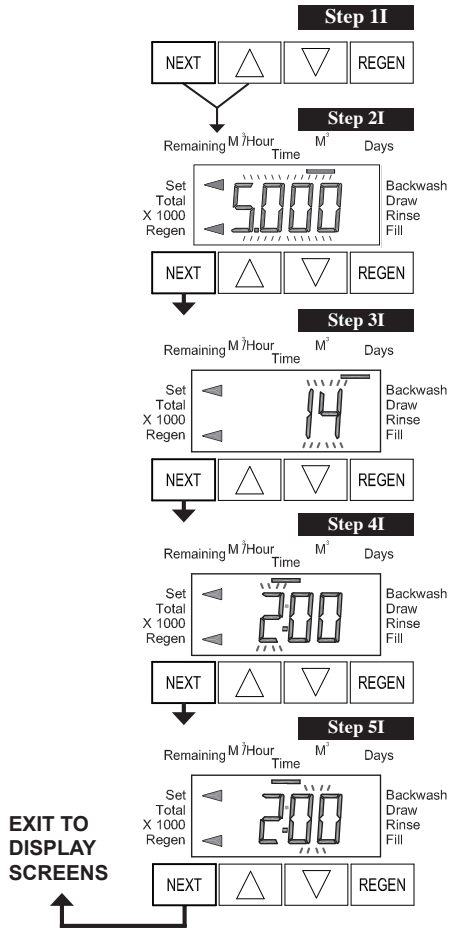
Then press the NEXT button. The minutes will flash. Press the ▲ or ▼ arrow until the correct minute is displayed.

Press the NEXT button to return to the Display Screens. Time of day should only need to be set after power outages lasting more than 8 hours, if the battery has been depleted and a power outage occurs, or when daylight saving time begins or ends. If a power outage lasting more than 8 hours occurs, the time of day will flash on and off which indicates the time of day should be reset. If a power outage lasts less than 8 hours and the time of day flashes on and off, the time of day should be reset and the battery replaced.

Installer Display Settings

One of three sets of displays will be shown depending on what was selected in Configuration Settings Step 3CS.

Volume (M³) selected in Configuration Settings Step 3CS



Step 1I - To enter Installer Display press the NEXT and ▲ buttons simultaneously for 5 seconds and release.

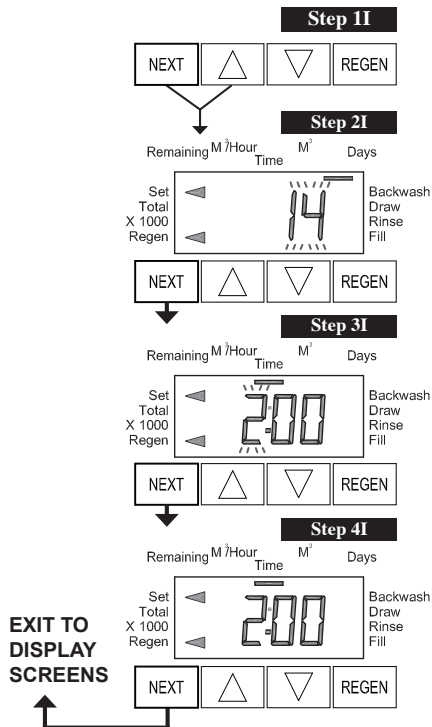
Step 2I - Volumetric capacity in cubic meters to regeneration. Press NEXT to go to Step 3I. Press REGEN to exit Installer Display.

Step 3I - Adjust day override from 1 - 28 or OFF. Press NEXT to go to Step 4I. Press REGEN to return to previous step.

Step 4I - Use ▲ or ▼ buttons to set the regen hour. Press NEXT to go to Step 5I. Press REGEN to return to the previous step.

Step 5I - Use ▲ or ▼ buttons to set the regen minutes. Press NEXT to exit Installer Display. Press REGEN to return to previous step.

28 Day or 28/Volume (M³) selected in Configuration Settings Step 3CS



Step 1I - To enter Installer Display press the NEXT and ▲ buttons simultaneously for five seconds and release.

Step 2I - Adjust days from 1 - 28. Press NEXT to go to Step 3I. Press REGEN to exit Installer Display.

Step 3I - Use ▲ or ▼ buttons to set time of the regen hour. Press NEXT to go to Step 4I. Press REGEN to return to previous step.

Step 4I - Use ▲ and ▼ buttons to set the regen minutes. Press NEXT to exit Installer Display. Press REGEN to return to previous step.

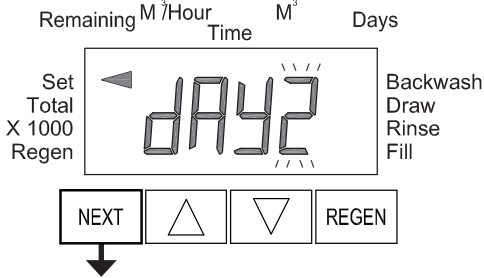
7 Day or 7/Volume (M³) selected in Configuration Settings Step 3CS

Step 1I



Step 1I - To enter Installer Display press the NEXT and ▲ buttons simultaneously for 5 seconds and release.

Step 2I



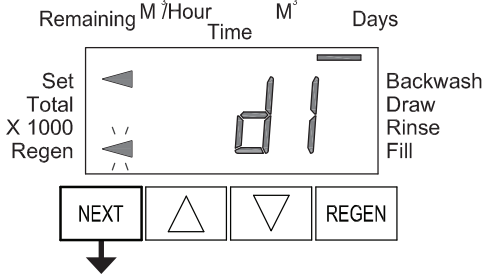
Step 2I - Use ▲ or ▼ buttons to set the current day of the week.

Default = 2 (Monday)

- 1 = SUNDAY
- 2 = MONDAY
- 3 = TUESDAY
- 4 = WEDNESDAY
- 5 = THURSDAY
- 6 = FRIDAY
- 7 = SATURDAY

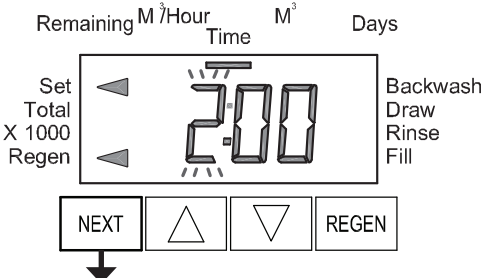
Press NEXT to go to Step 3I. Press REGEN to exit Installer Display.

Step 3I



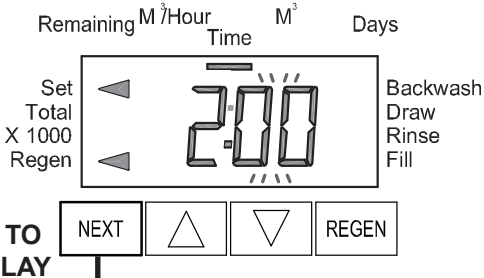
Step 3I - Scroll through days 1 to 7 using the NEXT button. Use the ▲ or ▼ buttons to turn regen on or off for each individual day (regen indicator on means regeneration will happen). After completing the 7th day, press NEXT to go to Step 4I. Press REGEN to go to previous display.

Step 4I



Step 4I - Use the ▲ or ▼ buttons to set the regen hour. Press NEXT to go to Step 5I. Press REGEN to go to previous display.

Step 5I

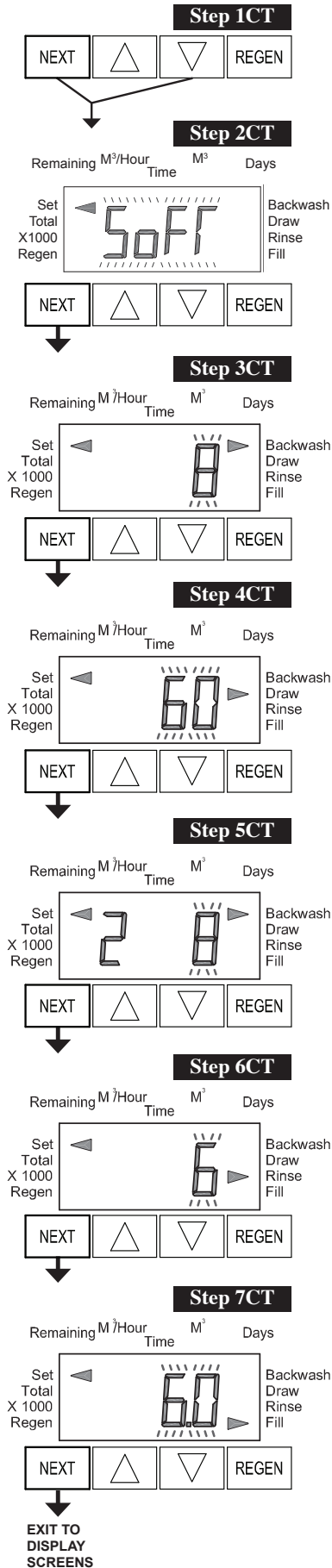


Step 5I - Use the ▲ or ▼ buttons to set the regen minutes. Press NEXT to exit Installer Display. Press REGEN to return to previous display.

EXIT TO DISPLAY SCREENS



Setting Regeneration Cycle Times



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

Step 2CT - Select between SOFTENING or FILTERING. When set to FLTr, 7CT is not set to OFF, and 2CS is set to 25, a fixed 30-second Backwash is automatically added to the regen cycle program after Rinse 6CT. The status display for this extra backwash will appear as just another cycle step in sequence. Press NEXT to go to Step 3CT. Press REGEN to exit Regeneration Cycle Times.

Step 3CT - Adjust the length of the backwash from 1-20 minutes or OFF using the ▲ or ▼ buttons.

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

Step 4CT - Adjust the length of the regenerant draw from 1-99 minutes or OFF using the ▲ or ▼ buttons.

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

Step 5CT - Adjust the length of the second backwash from 1-20 minutes or OFF using the ▲ or ▼ buttons.

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

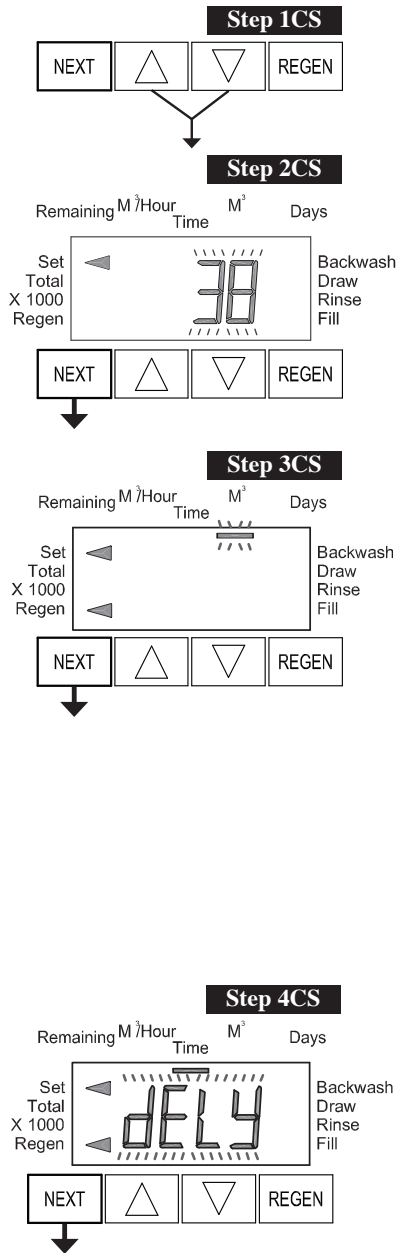
Step 6CT - Adjust the length of rinse from 1-20 minutes or OFF using the ▲ or ▼ buttons.

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

Step 7CT - Adjust the length of fill from 0.1-99.9 minutes or OFF. WS2 valves are shipped from the factory with a refill flow control of 2.2 gpm (8.3 lpm). All other control valves are shipped from the factory with a refill flow control of 0.5 gpm (1.9 lpm).

Press NEXT to exit Regeneration Cycle Times. Press REGEN to return to previous step.

Configuration Settings



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

Step 2CS – Select 25 for 1” (25 mm), 32 for 1.25” (32 mm), 38 for 1.5” (38 mm), 50L for 2L (50mm) or 50 for 2” (50mm)¹. Press NEXT to go to Step 3CS. Press REGEN to exit Configuration Settings.

Step 3CS – Press the ▲ or ▼ buttons to select one of the following:

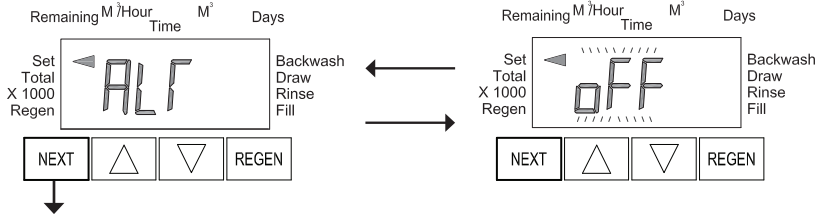
- If Volume (M³) is selected the regeneration will occur after the specific volume has been used or on the day override (if selected) whichever comes first.
- If 28 is selected the regeneration will occur on the day (1 through 28) selected in Installer Display Settings. The total flow and flow rate user displays and the volume display in Diagnostics will not be shown even if a meter is used.
- If 28/Volume (M³) is selected the regeneration will occur on the day (1 through 28) selected in Installer Display Settings. If a meter is not used the total flow and flow rate user displays and the volume display in Diagnostics will be shown as 0.
- If 7 is selected the regeneration will occur on the selected day(s) of the week (see instructions contained in Installer Display Settings). The total flow and flow rate user displays and the volume display in Diagnostics will not be shown even if a meter is used.
- If 7/Volume (M³) is selected the regeneration will occur on the selected day(s) of the week (see instructions contained in Installer Display Settings). If a meter is not used the total flow and flow rate user displays and the volume display in Diagnostics will be shown as 0.

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

Step 4CS – Press the ▲ or ▼ buttons to select to regenerate immediately on 0 or at delayed time. Immediately on 0 can only be selected if Volume (M³) was selected in step 3CS and a meter must be installed. Delay is the only option for the other Step 3CS selections. Press NEXT to go to Step 5CS. Press REGEN to return to previous step.

¹ When using the WS2 control valve, the circuit board software must have meter selection choices of 50 and 50L. The WS2 valve must be set for the 50 meter selection during programming. If the software version does not have both the 50 and 50L selections, consult your equipment supplier for a replacement circuit board. When using the WS2L valve with older version software that does not have both 50 and 50L selection choices, the valve must be set to 50 during programming. If a WS2L valve is being used with newer version software that has both 50 and 50L selection choices, the valve must be set for 50L during programming.

Step 5CS



Step 5CS – Allows selection of one of the following:

- the Control Valve to act as an alternator; or
- the Control Valve to have no hard water bypass.

Selecting the Control Valve to act as an alternator:

NOTE: In step 3CS you must select Volume, Step 4CS select Regeneration Time Option “on 0” and in Step 3I select Day Override “oFF.”

Select oFF when feature not used.

Select ALTA for the control valve that has the two pin connector labeled DRIVE connected to the alternator valve motor.

Select ALTb for the control valve that will not be connected to the alternator valve motor.

1/1.25 2-Way MAV (FF or FM)

Configuring the Control Valve for No Hard Water Bypass Operation: nHbP - Selection requires that a connection from a Clack Motorized No Hard Water Bypass Valve (NHBP) is made to the two pin connector labeled ALTERNATOR DRIVE located on the printed circuit board. The A port of the NHBP must be connected to the outlet of the control valve. The NHBP 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 is in an error state during regeneration mode the no hard water bypass valve will remain closed until the error is corrected and reset.

1/1.25 3-Way MAV (FF or FM)

Configuring the Control Valve for Separate Source Backwash Operation: During programming nHbP must be selected. This selection requires that a connection from a Clack Motorized Alternator Valve (MAV) is made to the two pin connector labeled ALTERNATOR DRIVE located on the printed circuit board. The Common port of the MAV must be connected to the inlet of the control valve. The A port will become the inlet for the separate source backwash water supply. The B port will become the inlet for the untreated water supply. The MAV 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 is in an error state during regeneration mode the 3-Way MAV Motorized Alternator Valve will close the B port and keep open the A port until the error is corrected and reset.

1.5” MAV/ 2” MAV (Old Style MAV and REV 2 New Style)

Configuring the Control Valve for No Hard Water Bypass Operation: nHbP - Selection requires that a connection from a Clack Motorized Alternator Valve (MAV) is made to the two pin connector labeled ALTERNATOR DRIVE located on the printed circuit board. The A port of the MAV must be plugged and the valve outlet connected to the B port. The MAV 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 is in an error state during regeneration mode the no hard water bypass valve will remain closed until the error is corrected and reset.

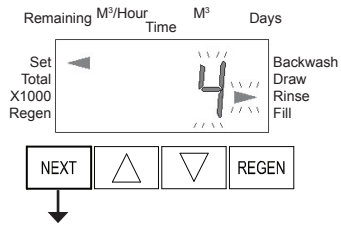
1.5” 3-Way MAV/ 2” MAV (Old Style MAV and REV 2 New Style)

Configuring the Control Valve for Separate Source Backwash Operation: During programming nHbP must be selected. This selection requires that a connection from a Clack Motorized Alternator Valve (MAV) is made to the two pin connector labeled ALTERNATOR DRIVE located on the printed circuit board. The Common port of the MAV must be connected to the inlet of the control valve. The A port will become the inlet for the separate source backwash water supply. The B port will become the inlet for the untreated water supply. The MAV 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 is in an error state during regeneration mode the 3-Way MAV Motorized Alternator Valve will close the B port and keep open the A port until the error is corrected and reset.

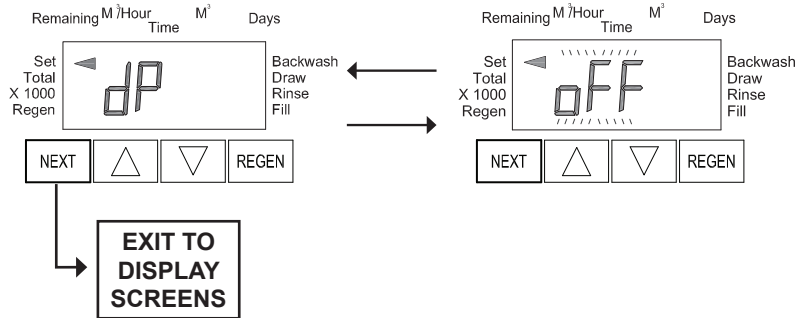
Press NEXT to go to Step 6CS. Press REGEN to return to previous step.

Step 6CS



Step 6CS – Set duration of the special rinse cycle to be performed prior to a valve returning to Service. Selectable from 1-20 minutes or OFF. Only viewed if 50 is set in 2CS, and ALTA or ALTb is set in 5CS. Press NEXT to go to Step 7CS. Press REGEN to return to previous step.

Step 7CS



Step 7CS – Selecting the use of an outside signal to initiate 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
 - on0 - If the dP switch is closed for an accumulative time of 2 minutes a regeneration will occur immediately.
 - dELy - If the dP switch is closed for an accumulative time of 2 minutes a regeneration will occur at the scheduled regeneration time.
 - HoLd - If the dP switch is closed a regeneration will be prevented from occurring.
- Not viewed if Step 5CS is set to ALTA or ALTb.

Press NEXT to exit Configuration Settings. Press REGEN to return to previous step.

Alternator Programming Guide

The following instruction must be followed when programming the WS1EI – WS2EI as an alternator.

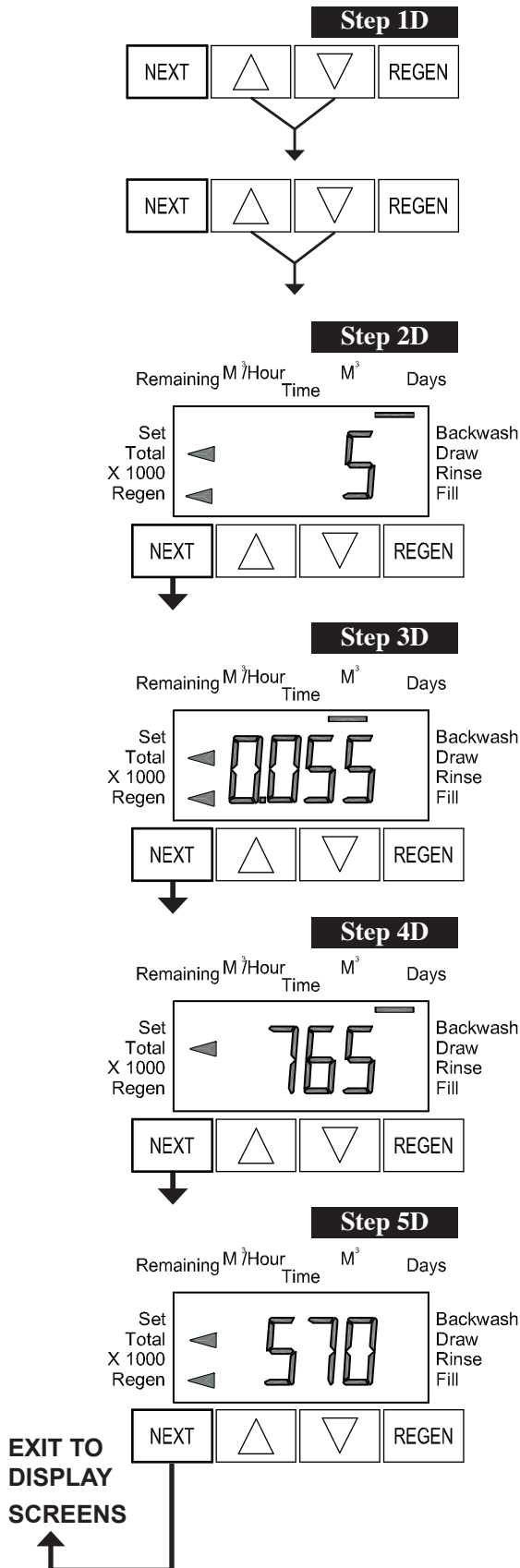
Valve A:

1. In Configuration Settings Step 3CS, VOLUME (M3) must be selected.
2. In Configuration Settings Step 4CS, “On 0” must be selected.
3. In Configuration Settings Step 5CS, Alt A must be selected. The “A” control is the one connected to the “A” port of the MAV Motorized Alternating Valve and has the two pin wire connector from the MAV Motorized Alternating Valve connected to it.
4. In Volume Installer Display Settings Step 2I, enter the volumetric capacity for the system.
5. In Volume Installer Display Settings Step 3I, set Days Override to OFF.

Valve B:

1. In Configuration Settings Step 3CS, VOLUME (M3) must be selected.
2. In Configuration Settings Step 4CS, “On 0” must be selected.
3. In Configuration Settings Step 5CS, Alt B must be selected. The “B” control will be connected to the “B” port of the MAV Motorized Alternating Valve and will have no electrical connection to the MAV.
4. In Volume Installer Display Settings Step 2I, enter the volumetric capacity for the system. (This must be the same as Valve A.)
5. In Volume Installer Display Settings Step 3I, set Days Override to OFF.

Diagnostics



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

Step 2D - Display shows the number of days since a regeneration last occurred. Press NEXT to go to Step 3D. Press REGEN to exit Diagnostics.

Step 3D - Display shows the volume of water treated in M³ treated since the last regeneration. If Volume (M³), 28/Volume (M³), or 7/Volume (M³) was selected in Step 3CS and no meter is installed this display will read 0. Press NEXT to go to Step 4D. Press REGEN to return to previous step.

Step 4D - Display shows the days in service since start up. Press NEXT to go to Step 5D. Press REGEN to return to previous step.

Step 5D - Display shows the total number of regeneration cycles since start up. Press NEXT to exit Diagnostics. Press REGEN to return to previous step.

Revision History:

5/29/08

Moved common valve drawings to V3435 WS1.5/2L Drawing and Service Manual.

7/08/08

PAGE 8:

Added Softening or Filtering selection (Step 2CT).

PAGE 9:

Added 32mm option (Step 2CS).

PAGE 8:

Added special Rinse cycle (Step 2CT).

8/01/08

PAGE 6:

Updated display for Step2I

PAGE 7:

Updated display for Step2I and Step3I

PAGE 8:

Updated display for Step2CT

PAGE 9:

Step2CS: Select 25 for 1" (25 mm), 32 for 1.25" (32 mm), 38 for 1.5" (38 mm), 50L for 2L (50mm) or 50 for 2" (50mm).

PAGE 10:

Updated display for Step7CS

10/13/08

PAGE 10:

Revised No Hard Water Bypass instructions.

PAGE 12:

Added MAV instructions.

1/5/2009

PAGES 9:

Updated the instructions for Step 7CT.