



Diamond LINQ DLF-AC
Carbon Filter Product Manual





Diamond LINQ DLF-AC Iron Filter Product Manual

Set Up Instructions for DLF-AC Series Single Tank

Inspect the packaging of the equipment to confirm that nothing was damaged during shipping. (Figure 1)

Remove the media tank(s) and valve(s) from the packaging. Make sure everything is included and without damage. Notice that the valve(s), Brine Line 'T', brine line hose, and MAV valve will be found in the brine tank. Below is a checklist with everything you should have received.

- _____ 1) Control Valve
(Figure 2)



Figure 2: Control Valve

- _____ 3) Filter Tank (Figure 3)



Figure 3:
Filter Tank

- _____ 5) Correct Amount of Gravel (from Model and Media Requirements Table on page 2)
- _____ 6) Correct Amount of Media (from Model and Media Requirements Table on page 2)

Call Diamond H2O right away if anything is missing. Contact the freight company **immediately** if anything is damaged. Diamond H2O will not be liable for any damage received after shipping.

Packaged By: _____

Date: _____

Received By: _____

Date: _____



Figure 1: Original Packaging of DLS Single Tank System
This is how the packages will generally arrive



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Table 1: Media Requirements.

Example: A DLF-150-100-AC would require 1.5 cubic feet of media and 20 pounds of gravel per tank.

Model Number	Amount of Media per Tank (cu. ft.)	Amount of Gravel per Tank (pounds)
DLF-100-100-AC	1.0	0
DLF-150-100-AC	1.5	0
DLF-200-100-AC	2.0	0
DLF-250-100-AC	2.5	20

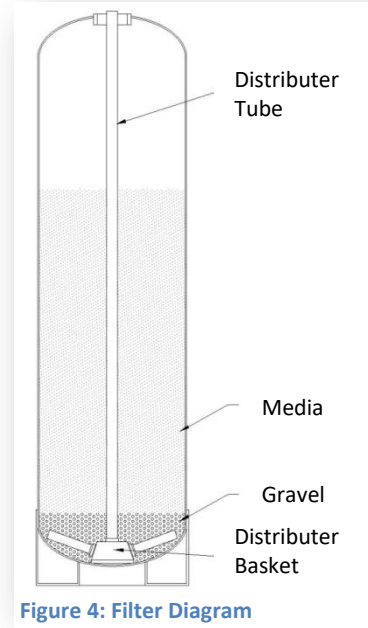


Figure 4: Filter Diagram

Table 2: Filter Specifications

Model	Chlorine Removal Capacity @ 1ppm	Tank Size		Media	Flow Rate Dependent on Contaminants	Drain Flow	Water per Backwash	Shipping Weight
	gallons	Dia in	SS in	Vol (cuft)	Service* GPM	GPM	Gal	lbs
DLF-100-100-AC	1,000,000	9	x 48	1	5.0	5	95	70
DLF-150-100-AC	1,500,000	10	x 54	1.5	5.5	7	118	93
DLF-200-100-AC	2,000,000	12	x 52	2	6.5	9	170	125
DLF-250-100-AC	2,500,000	13	x 54	2.5	7.0	11	199	148

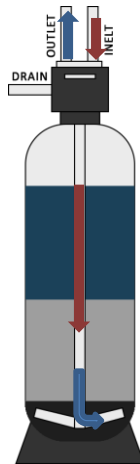
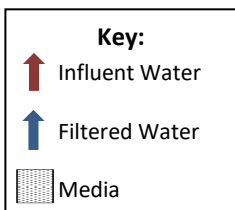
*Service flow rate determined by free chlorine reduction testing

Please read the entire Owner's Manual and Instruction before installation.

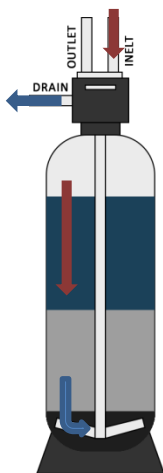
This Owner's Manual must stay with the unit.



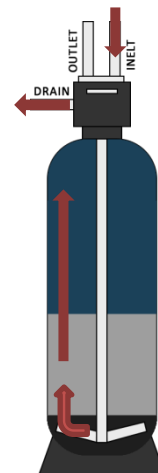
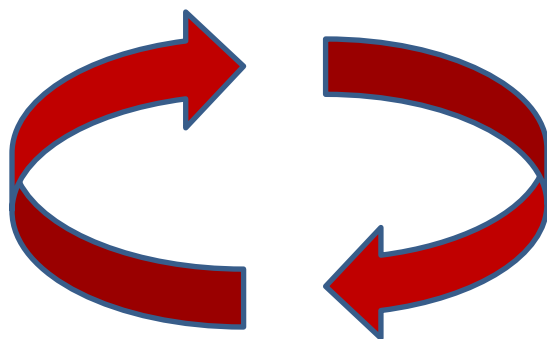
Figure 5: General Filter Operations



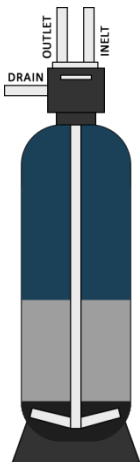
Service/Operation



Fast Rinse:
Water travels through the media bed and up the riser tube to drain



Backwash:
Flow reversed to flush debris from media bed to drain.



Rest:
System is given time to rest and let media settle to the bottom.



Installation Requirements

- A level floor position ahead of piping into water heater.
- Unit must be installed at least 10' ahead of the inlet to a water heater to prevent damage due to back-up of hot water.
- DO NOT install the unit in an area of direct sunlight or where freezing temperatures may occur!
- (See Installation Diagrams for proper placement and plumbing connections.)

-Major System Components-

1. Media Tank - This tank contains the filtering media. Water flows through the filter under pressure to come into contact with the media for water filtering.
2. Control Valve - The valve directs water through the filter for water filtering and controls the flow of water / air during the regeneration process.

-Filter Location / Other Requirements-

- If household plumbing is galvanized and you intend to make the installation with copper (or vice versa), obtain di-electric unions to prevent dissimilar metal corrosion.
- Where the drain line is elevated above the control valve or exceeds 20 feet in length to reach the drain, use 3/4" I.D. drain line tubing instead of 1/2" I.D. Drain line tubing is not included.
- All plumbing lines not requiring "treated" water should be connected "upstream" of the filter.

Caution

- If sweat soldering copper pipe (remember to always use lead free solder and flux), cover bypass valve with wet rags to prevent heat damage to connections and control valve
- If using PVC or plastic pipe primers and solvent cements specifically recommended for use with potable water are required.
- Do not "TEE" to the main drain line from control valve.

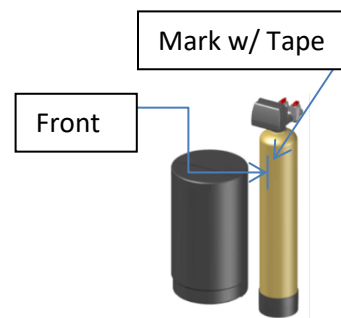


1. Obtain the required tools listed below:

- A. Utility Knife
- B. Pliers
- C. Phillips Screwdriver
- D. Hammer
- E. Level
- F. Media filling funnel

2. Place the tanks near a water source.

- A. Select a position near a floor drain that has adequate carrying capacity to handle the backwash flow rate.
- B. Place the filter(s) and brine tank on a level, firm foundation, like concrete.
- C. **Determine the “front” of each tank** received. For each tank:
 - a. Make sure that the distributor riser is flush with the top of the media tank (Figure 10 on page 6).



- b. Before placing any water, gravel, or media in the media tank, screw in the control valve to the point where it is secure. The valve does not need to be forced on, but should be snug.

- c. Mark the “front” of each media tank (shown in Figure 8) with either a marker or tape. The front of the media tank is determined by the location of the face of the control valve once it has been secured to the face of the control valve. Make sure that the system is positioned in a way that the plumbing can be installed.

Figure 6: Filter Front



Figure 7: How to Block Distributer Tube

D. Before Filling the Tanks:

- a. Remove the valve(s)
 - b. Ensure that the front(s) of the tank(s) is/are positioned correctly. Once filled, the media tanks will be very difficult to move.
 - c. Cover the exposed end of the distributor riser(s) to make sure no media gets inside. Covering up the riser(s) with duct tape is one option, shown in Figure 8.
 - d. Obtain a funnel to assist placing the media in the media tanks. (A funnel designed specifically for our media tanks can be ordered from Diamond H2O Conditioning.)



3. Setting up the tank:

- A. Fill the tank up to 30% full of water.
- B. Check the system specifications on page 2 to determine the correct amount of gravel and media needed for your system.
- C. Position the distributor tube so it is in the center of the tank, shown in Figure 10.



Figure 8: Centered Distributer Tube

- D. **SLOWLY**, pour the correct amount of support gravel into the tank without getting any gravel into the distributor tube.
- E. Visually confirm that the gravel is level and covering the distributor basket and radials, if it is not, contact Diamond H2O Conditioning.
- F. **SLOWLY**, pour the correct amount of media into the tank. Try to keep the media level by carefully rocking the tank back and forth.

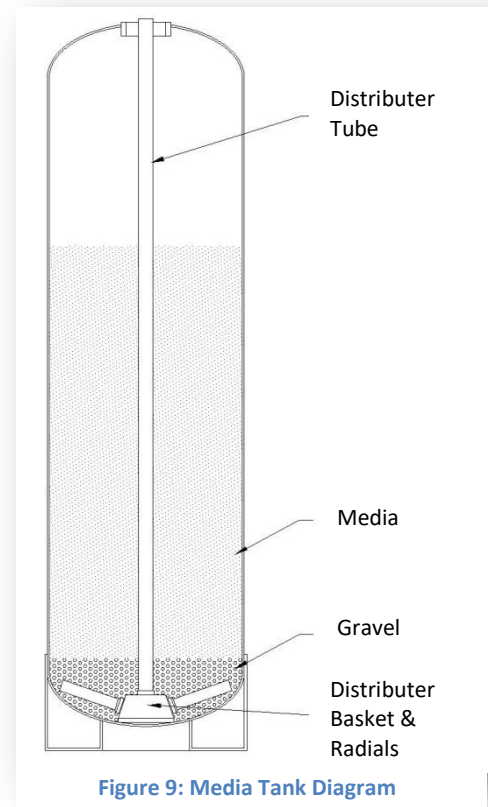


Figure 9: Media Tank Diagram

- G. Fill the rest of the tank with water to prevent air from getting in the tanks and potentially losing media.
- H. Verify that there is a large O-ring on the control valve(s) adapter base. (Figure 12)
- I. Place the control valve on the tank, making sure that the distributor tube fits into the bottom of the control valve.
- J. Tighten the control valve onto the tank to the point that it is snug. Double check that the valve is in a correct position to be able to install the plumbing. (Figure 15)

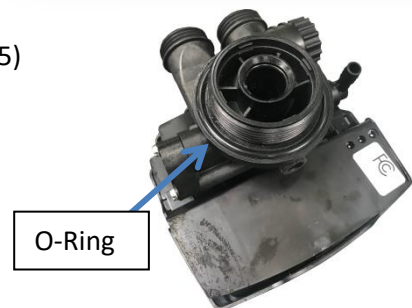


Figure 10: Valve Underside

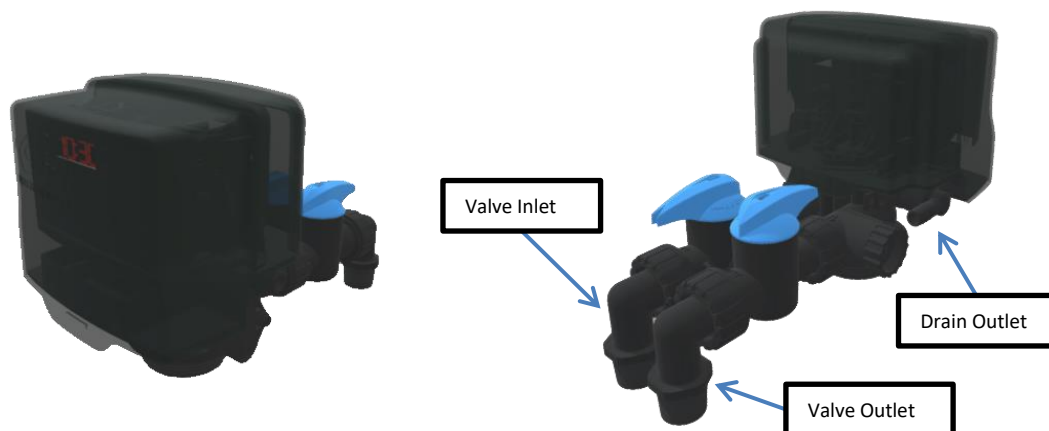


Figure 15: Control Valve Diagram

4. Connect the Valves to the Water Source

- A. Pipe or tube a line from the Control Valve Drain (Figure 15) to the drain.
- B. If this valve is being installed on metallic water supply systems being used as an electrical ground, install a properly sized electrical bonding jumper across the inlet/outlet pipes serving these devices to ensure the valve does not interrupt the electrical continuity of the path to ground.

DO NOT

- install a valve in this line
 - use a pipe smaller than the unit’s inlet or outlet
 - make a direct connection to the drain
 - Provide an air gap at least four times the diameter of the drain pipe to conform to sanitation codes and be able to observe the drain flow.
 - use an excessive amount of elbows in the plumbing
- C. Turn off the main water supply and open nearest faucet to relieve pressure. Connect the facility plumbing to the control valve inlet and outlet following all local codes.
- Note:** Make sure all piping is free of thread chips and other foreign matter.
- D. Turn the bypass valve to the “bypass” position (shown below).



Figure 16: Bypass Valve Positions

- E. Turn the main supply on to restore water service to the home.
- F. Open the nearest faucet to evacuate air and re-pressurize plumbing lines.
- G. Check for leaks.



5. Connect the power supply

Connect the power cord and plug power supply into a 115 volt / 60 Hz receptacle.

Electronic Connections

P = Power Supply

B = Powered in Backwash Step Only
(Cycle #1)

S = Powered for Entire Regen. Cycle



Figure 17: Power Supply

6. Start up the system for the first time.

- A. Double check that the tanks are filled with water.
- B. Manually put the control valve into regeneration (Hold the SET/CHANGE button or press the “regen now” button in the Diamond LINQ app)



Figure 18: Valve Buttons

NOTE: The initial backwash water will contain some mineral particles. The media bed should be backwashed until the drain water is clear.

CAUTION: Media should never come out of the drain. If media begins to come out of the drain, close the manual inlet valve until the media is no longer present in the drain flow.

CAUTION: Activated Carbon media should be allowed to soak for 12 – 24 hours to pre-wet the carbon particles. If the Carbon media is not pre-soaked, it must be backwashed very slowly to prevent the media from being flushed into the drain.

- C. While the system is in backwash (cycle 1), slowly change the adjust the bypass valve to the “service” position.
- D. A mixture of air, fine mineral particles, and water will flow from the drain line.
- E. Once the tank is filled, only water will be coming out of the drain line. Put the system back into bypass operation. Run each step of the regen cycle (Figure 7) for a few minutes each. You can advance to the next step by holding the SET/CHANGE button.
- F. Program the Valve. Most of the settings were programed to Diamond H2O’s default values. The rest of the site-specific settings should be set by an installer after the water quality (pH, TDS, total hardness, iron, chlorine, etc.) have been determined. These settings can be changed with the valve’s two buttons (page 10) or by using the Diamond LINQ app (page 11).



7. Programming
Normal Operation

1. Home Display

- a. Alternates between the display of Time of Day and Number of Days until the Next Backwash. (Metered Softeners will alternate between time of days and gallons remaining until next regeneration)
 - Days Remaining until the Next Backwash will count down from the entered value until it reaches 1 day remaining.
 - A Backwash Cycle will then be initiated at the next designated regeneration time.

2. Battery Back-Up (Uses a standard 9-volt alkaline battery.)

Features of Battery Back-Up:

- During power failures, the battery will maintain the time of day as long as the battery has power. The display is turned off to conserve battery power during this time. To confirm that the battery is working, press either button and the display will turn on for five (5) seconds.
- If power failure occurs while system is regenerating, the DLF valve will motor to a shut off position to prevent constant flow to drain. Depending upon system pressure and other factors, it is possible to observe a reduced flow to drain during this step. After power is restored, the DLF valve will return and finish the cycle where it left off prior to the power interruption.
- When used without battery back-up, during a power failure, the unit stops at its current point in the regeneration position and then restarts at that point when the power is restored. The time will be offset by the increment of time the unit was without power, so it is necessary to reset the time of day on the unit. No other system will be affected.

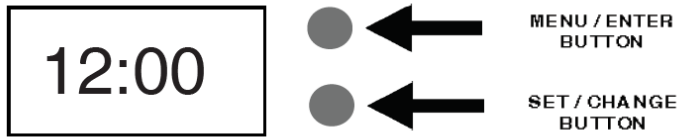
Starting Extra Regeneration Cycle

1. To Start **Delayed Extra Cycle** Example (1)
 If Days Remaining Until Next Backwash does not read '1', press and hold the **Set/Change** button for 3 seconds until the display reads '1'.
 - Backwash cycle will initiate at the next designated backwash time.
2. To start **Immediate Extra Cycle** **➡** First complete above step.
 - With Days Remaining Until Next Regeneration at '1'.
 - Press and hold the **Set/Change** button.
 - After 3 seconds, the backwash cycle will begin.
3. To **Fast Cycle** thru regeneration **➡** First complete above 2 steps.
Note: Press and hold the **Set/Change** button for 3 seconds to advance to the next cycle step. Fast Cycle is not necessary unless desired to manually step through each cycle step. (Repeat until valve returns to the home display)

Filters		Default (Min)
Step 1	Backwash	10
Step 2	Rest	5
Step 3	Rapid Rinse	10
Step 4	Not Used	0



Main Menu



1. To enter Main Menu, press the **Menu/Enter** button.
(Time of Day will flash)

2. To set the **Time of Day**, press the **Set/Change** button.
(First digit will flash) Example (12:00)
To change digit value, press the **Set/Change** button.
 - To accept the digit value, press the **Menu/Enter** button.
 - Next digit will flash to begin setting.
 - Once the last digit display is accepted, all digits will flash.

3. To set **A.M.** or **P.M.**, press the **Menu/Enter** button. Example (A)
 - To change digit value, press the **Set/Change** button.
 - To accept the digit value, press the **Menu/Enter** button.
 - Once A.M. or P.M. is accepted, the next menu item will flash.

4. a. To set the **Number of Days between Backwash Cycles (A)**, press the **Set/Change** button. Example (A - 06)
Repeat instructions from step (2).
Notes: 1) Maximum value is 29.
2) If value set to 0, Automatic Backwash will never occur.
3) Default setting is 6 days for filters.

5. To Exit Main Menu, press the **Menu/Enter** button.
Note: If no buttons are pressed for 60 seconds, the Main Menu will be exited automatically.



8. Diamond LINQ Application

For simplified set up and control, please install the Diamond LINQ on a compatible Bluetooth 4.0+ enabled smart phone or tablet.

A. Depending on your device, download and install the Diamond LINQ app from:

- Google Play Store
- Apple App Store



Figure 19: LINQ App Icon

B. Open the Diamond LINQ app

- Ensure your Bluetooth connectivity is turned on.
- Choose a valve device at any time from the list of available devices to connect to by clicking on it.
- If the valve you want to connect to doesn't show up, or there is a problem connecting to a device you can press the "Scan for Devices" button or the Diamond LINQ logo at any time to refresh the list and start the process over.
- If the valve device is a BTLE valve and it has a password other than the default password, the first time you connect to it the app will ask you to enter the password. After entering it the first time you should not need to enter it again unless it changes.

C. BTLE Valve devices can be updated by the App. When the app is updated from the Google Play Store or the Apple App Store, it may contain an updated firmware program for the valve devices. These updates could contain new features or operational improvements. It is up to the user to allow these updates to be sent to the valve device.

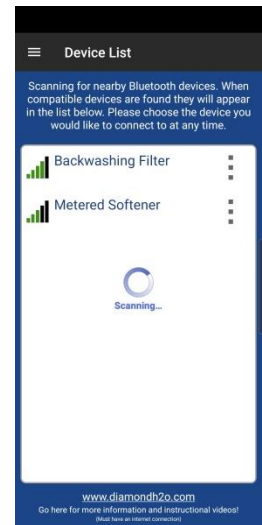



Figure 20: Device List

D. Navigation and Regeneration

The navigation menu can be accessed by pressing the menu key  or swiping from the left in portrait mode. The menu is shown at all times in landscape mode.

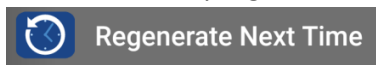
You can manually start regeneration by pressing:



During regeneration, you can skip to the next cycle by pressing:



You can manually regenerate at the next programmed regeneration time by pressing:



Diamond H2O contact information and app version information can be found by pressing the Diamond H2O Logo:

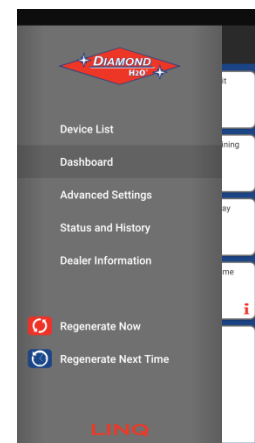


Figure 21: Navigation



E. Dashboard

The dashboard will contain general information for monitoring your filter which is contained in blocks.

Blocks with a red **“Set”** can be changed or updated. Other blocks are read only.

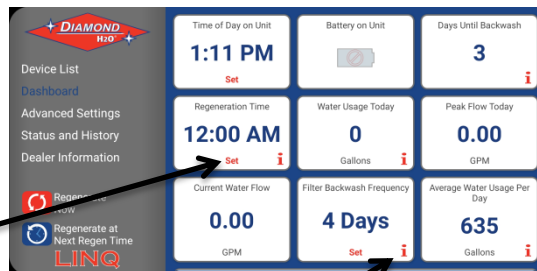



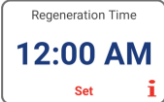
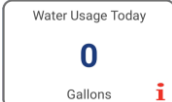
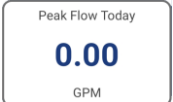





Figure 22: Dashboard

NOTE: Consult your dealer before making any changes from the Dashboard. Dealer contact information can be found in the navigation menu.

Press the **i** button in the bottom right corner of a block for more information.

Table 4: Dashboard Block Information Table

<p>Time of Day</p>  <p>Displays Unit Time. Press “set” to set time based on device time</p>	<p>Battery on Unit</p>  <p>Displays the battery backup charge if available</p>	<p>Days Until Backwash</p>  <p>Displays the days remaining until the next backwash.</p>
<p>Regeneration Time</p>  <p>Displays the time that the system will regenerate/backwash</p>	<p>Water Usage Today</p>  <p>Displays the gallons used today in gallons</p>	<p>Peak Flow Today</p>  <p>Displays the peak flow rate used today in GPM (gallons per minute)</p>
<p>Current Water Flow</p>  <p>Displays the current flow rate passing through the unit in GPM (gallons per minute)</p>	<p>Filter Backwash Frequency</p>  <p>Displays the number of days between backwashes.</p>	<p>Average Water Usage Per Day</p>  <p>Displays the average water usage per day in gallons.</p>



F. Advanced Settings

The advanced settings section of the app should only be programmed by a dealer. These settings contain values that will affect the performance of the water filter and the quality of the treated water. These settings will vary from system to system.

Most advanced settings will be set by the manufacturer.



Figure 23: Advanced Settings

Table 5: Advanced Settings Block Information Table

<p>Backwash</p> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> <p>Backwash</p> <p>10 min.</p> <p>Set i</p> </div> <p>Displays the amount of time(in minutes) for the back wash cycle</p>	<p>Rest</p> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> <p>Rest</p> <p>5 min.</p> <p>Set i</p> </div> <p>Displays the number of minutes the system will rest.</p>	<p>Rapid Rinse</p> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> <p>Rapid Rinse</p> <p>8 min.</p> <p>Set i</p> </div> <p>Displays the amount of time (minutes) for a rapid rinse. This runs a rinse at a high rate in the same direction as normal water flow to reset the media bed.</p>
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G. Status and History

The status and history screen displays statistics which can be used to increase system efficiency and diagnose certain issues. The system includes a totalizer which keeps track of total water usage and regeneration data. Water usage between regenerations and peak flow per day graphs are available by scrolling down on this screen.

Graphs can be expanded and viewed in full screen by pressing the desired graph.



Figure 24: Status and History

Table 6: Status and History Block Information Table

<p>Current Water Flow</p> <p>Current Water Flow</p> <p>0.00</p> <p>GPM</p> <p>Displays the current flow rate passing through the unit in GPM (gallons per minute)</p>	<p>Total Gallons Treated</p> <p>Total Gallons Treated</p> <p>4,280</p> <p>Total Gallons Treated Since Last Reset</p> <p>4,280</p> <p>Reset</p> <p>Displays the number of gallons the unit has treated since start up. The Total Treated Since Last Reset displays the number of gallons treated since the last time the reset button was pressed.</p>	
<p>Total Regenerations</p> <p>Total Regenerations</p> <p>14</p> <p>Total Regenerations Since Last Reset</p> <p>14</p> <p>Reset</p> <p>Displays the number of regenerations since start up. The Total Since Last Reset displays the number of regenerations since the last time the reset button was pressed.</p>		<p>Water Usage: Gallons per Day</p> <p>This chart displays the total number of gallons used per day</p>
<p>Water Usage: Gallons Between Regenerations</p> <p>This chart displays gallons used between regenerations</p>	<p>Peak Flow Recorded Per Day</p> <p>The chart displays the peak flow rates in gpm per day</p>	



9. Troubleshooting

SYMPTOM	PROBABLE CAUSE	CORRECTION
1. Filter Fails to Regenerate Automatically	Power supply plugged into intermittent or dead power source	Connect to constant power source
	Improper control valve programming	Reset program settings
	Defective power supply	Replace power supply
	Defective Drive motor	Replace motor
2. Regeneration at Wrong Time	Time of day improperly set, due to power failure	Reset time of day programming and install 9-volt battery.
	Regeneration time set improperly	Reset regeneration time programming
4. Poor Water Quality	Check items listed in #1 and #2	
	Bypass valve open	Close bypass valve.
	Channeling	Check for too slow or high service flow. Check for media fouling.
6. Loss of Water Pressure	Scaling / fouling of inlet pipe	Clean or replace pipeline. Pretreat to prevent.
	Fouled media	Clean media. Pretreat to prevent.
	Improper backwash setting	Backwash more frequently
7. Continuous Flow to Drain	Foreign material in control	Call dealer. Clean valve and replace piston and seals
	Internal control leak	Same as above.
	Valve jammed in backwash, brine or rapid rinse position	Same as above.
	Motor stopped or jammed	Check for jammed piston. Replace piston and seals. Replace motor if motor is unresponsive.



Control Valve Error Code Diagnosis

Under normal operating conditions, when your control valve is in the "in service" position, the display should alternate between the current time of day and the number of days remaining (for filters and time clock softeners) or gallons remaining (for metered softeners) until the next regeneration. This is the "home display." If the valve is currently going through a regeneration cycle, the display will show the cycle step on the left side of the display and the number of minutes remaining in that step on the right side of the display. If any other information is being displayed, then the valve is informing you of an issue. There are five error codes which could indicate an issue with the control valve. When an error is being displayed, the valve will be in a stopped position, and the buttons will not respond to being pressed. Even if the cause of the error code is corrected, the error code will not clear until the power supply has been disconnected and reconnected (this will be referred to as "cycling" the power). All error codes are displayed as the letters "Err" followed by a flashing number 2-6:

Error 2 - Valve is searching for homing slot.

Allow valve to continue running. If the homing slot is found, the valve will return to the home display, otherwise, another error code will appear.

Error 3 - No encoder slots are being seen.

This occurs when the motor is running, but the encoder is not seeing any of the slots in the encoder wheel. This can happen if the encoder has been disconnected, but most commonly occurs when debris in the valve body has stopped the piston, causing the encoder wheel to be unable to turn.

1. Check encoder connection. If the encoder is plugged in and snapped into place, skip to step #2 below. If encoder is disconnected, reconnect it and cycle power to clear the error.
2. Disconnect powerhead from valve body, cycle power to clear the error code. Manually cycle the powerhead through the regeneration cycle steps to verify that the motor can cycle properly while the powerhead is disconnected from the valve body. If the error 3 does not reappear, skip to step #3 below. If the error 3 does reappear, order a board & motor kit to replace the circuit board & motor.
3. Remove piston and seals from the valve body and inspect valve body for debris. Replace the seal & spacer kit. Inspect piston and replace piston if Teflon coating is worn

Error 4 - Unable to find homing slot.

1. Check encoder wheel for debris.
2. Cycle power. Valve should either find home or go to a different error code. If error 4 returns, replace powerhead assembly.

Error 5 - Motor overload.

This occurs when the motor current is too high. This could be caused by an issue with the motor itself, but is typically caused by friction in the valve body

1. Disconnect powerhead from valve body and cycle power to clear the error code.
2. If the error 5 returns, replace the motor. Otherwise, manually cycle the powerhead through the regeneration cycle steps to verify that the motor can cycle properly while the powerhead is disconnected from the valve body. Either way, proceed to the next step.
3. Remove piston and seals from the valve body and inspect valve body for debris. Replace the seal & spacer kit. Inspect piston and replace piston if Teflon coating is worn.

Error 6 - No motor current.

This typically occurs if the motor cable has come unplugged from the circuit board. Check that the motor cable is plugged into the circuit board and attached to the motor. If this is not the issue, the motor or circuit board may need to be replaced.

No Display

If your display is blank, there is no power going to the circuit board due to one of the following factors:

- The electrical outlet is not powered or is switched off
- The power cable has come unplugged from the circuit board
- The power supply has come unplugged from your electrical outlet
- The power supply has come unplugged from the control valve
- The power supply is not working