



# *NovoClear 465 Series Iron Filter Manual*

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Read all instructions carefully before operation.  
Rev 3, October 12, 2009

A Division of  
**Canature**  
NORTH AMERICA

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# System Specifications

Item #	Model	Media	Flow Rate USGPM			Iron Removal Capacity (ppm)	KMnO <sub>4</sub> Regen (oz)	Mineral Tank Size	Pipe Size inches (MM)	Ship Weight Lbs
		Cu.Ft	Service	Peak	Backwash					
15030001	NIS75	0.75	3.0	4.0	3.5	4,500	2	8 x 44	¾	120
15030002	NIS100	1.0	3.0	5.0	4.0	6,000	4	9 x 48	¾	135
15030003	NIS150	1.5	4.0	8.0	5.0	9,000	6	10 x 54	¾	185

Figure 1. Specifications

**Caution:** These water filters are not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

- Maximum Water Temperature = 110°F (43°C)
- Maximum Operating Pressure = 100 PSIG (689 kPa)
- Voltage = 110 volts standard
- Pipe Size = 3/4"
- Peak flow rates are intended for intermittent use only and are for residential application only.
- KMnO<sub>4</sub> refers to Potassium Permanganate.
- At the stated service flow rates, the pressure drop through these devices will not exceed 15 psig.
- The manufacturer reserves the right to make product improvements which may deviate from the specifications and descriptions stated herein, without obligation to change previously manufactured products or to note the change.

## How The System Works

The system consists of three major components: a back washable filter containing oxygen charged manganese greensand, a chemical feeder with shutoff float which delivers an accurately measured volume of potassium permanganate solution for each regeneration, and a meter initiated control valve which governs the operation of the system.

As water passes through the filter bed, it comes in contact with the oxygen charged media. This causes iron, manganese and sulfur to oxidize. The undesirable compounds are then trapped in the filter bed. Eventually the oxygen in the filter becomes depleted and regeneration is necessary.

Regeneration takes place during the night while you sleep. First, backwashing cleans the filter bed, and then concentrated potassium permanganate solution is passed through it, recharging the bed with oxygen. A rapid rinse removes any remaining potassium and a volume of water is returned to the feeder to dissolve enough potassium permanganate for the next regeneration. All functions are performed automatically.

This valve is controlled with simple, user-friendly electronics displayed on a large LCD screen. The main page displays the current date and time. In addition, the main page also shows key valve information and statistics including; current capacity setting, volume remaining, date of last regeneration, current flow rate, and peak flow rate.

MAY 8, 2009 9:05 AM	CAPACITY 1,350 GAL	VOLUME REMAINING 1,125 GAL
REGEN DAYS 7 DAYS	REMAINING DAYS 5 DAYS	REGENERATION TIME 2:00 AM
LAST REGEN MAY 4, 2009	CURRENT FLOW 1.5 GPM	PEAK FLOW 5.8 GPM

Figure 2. Main Page Display

Your automatic iron filter can be set to operate according to your needs by programming the appropriate settings. On the days your filter regenerates, the operating cycles will be automatically performed. In the service position, filtered water is supplied for household use.

- Step 1** - The automatic control reverses the flow of the water through the filter, backwashing minerals trapped in the filter to the drain.
- Step 2** - The control pulls a vacuum on the feeder. This causes an exact volume of saturated potassium permanganate solution to be drawn into the filter tank. The control slowly rinses the chemical through the media tank. The potassium permanganate supplies oxygen to the filter media.
- Step 3** - The control fast rinses the media bed to settle it and to ensure that all the chemical and mineral precipitate is removed.
- Step 4** - The control adds water to entirely fill the previously evacuated feeder. The feeder is now ready for the next regeneration. The control puts the system into service, supplying iron-free water to the household. All this is performed automatically over a period of 2.5 hours.

**NOTE:** REGEN DAYS and REMAINING DAYS are only shown in the CALENDAR CLOCK mode or METER OVERRIDE mode.

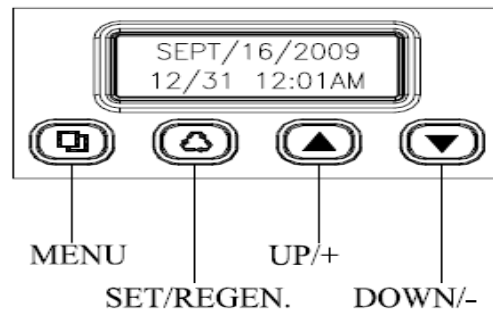


Figure 3. Key Pad Configuration

- MENU BUTTON “□”:** The function of this key is to enter the level one programming mode where the valve settings can be adjusted.
- SET / REGEN BUTTON “♻️”:** This button has two functions. The first is to initiate a manual regeneration by holding the button for 3 or more seconds. The second function is while in programming mode, pressing this key allows the user to change the value of each setting.
- UP / DOWN “▲▼”:** These buttons are used to increase or decrease the value of the settings while in the programming mode.

## System Initialization

When power is first supplied, the valve may take up to two minutes to initialize the valve. During this time the valve will show “INITIALIZING WAIT PLEASE”. Do not touch any buttons at this time. When the valve reaches the service position, it will display the current date and time.

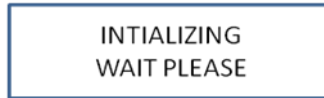


Figure 4. Initializing Display

## Main Valve Functions

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### Regeneration Mode

There are four ways of initiating regeneration:

1. METER DELAYED
2. METER IMMEDIATE
3. CALENDAR CLOCK
4. METER OVERRIDE

### Capacity Calculation

The control can automatically calculate the capacity of the system using the parameters entered in Level I programming. If you prefer to enter the capacity manually, choose the MANUAL option.

1. AUTOMATIC
2. MANUAL

### Adjustable Cycles

All of the valve cycles are fully adjustable.

1. BACKWASH
2. BRINE / RINSE
3. RINSE
4. REFILL

**NOTE: Refer to Level Two User Programming for description of each mode.**

During a regeneration cycle, the valve will display what position it is advancing to. Once in the correct position, the valve will display the current position along with the time remaining for that cycle. On the bottom row, the time remaining is also graphically displayed.

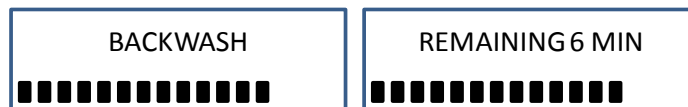


Figure 5 Regeneration Cycle Valve Display

### Manual Regeneration

If you run out of filtered water because of inadequate regeneration frequency, inadequate reserve capacity, power failure or unusually high water usage, you can initiate a manual regeneration. The filter will now automatically complete a regeneration cycle and return to service. If possible, avoid water use during the regeneration cycle.

Once you have set your filter you may experience frequent loss of water pressure, you may have to increase the frequency of regeneration by decreasing the number of gallons between regeneration.

Press “♻️” for three seconds to initiate a manual regeneration. When the valve reaches any cycle position, pressing any key will automatically advance the valve to the next position.

## Potassium Permanganate Feeder

The potassium permanganate feeder assembly incorporates a non-pressurized storage tank, grid, and float valve. The tank has a potassium permanganate capacity of 30 lbs and a liquid capacity of 5 gallons. The cover is securely fastened with three stainless steel safety screws to prevent access by children and pets. The potassium chemical tank should be placed where it is free from possible upset or access by children or pets. Chemical warning label and drain caution label are affixed to unit.

## Sizing Requirements

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### Water Pressure

The water system must have a pump big enough to deliver the recommended backwash rate with a minimum pressure at the inlet of the filter of 20 psi. If the existing system cannot do this, it must be upgraded to do so. Whenever possible, the water system should be adjusted to deliver at least 30 psi for even more satisfactory results.

### Backwash Flow Rates

The most important criteria in sizing an iron filter is the capacity of the pump. The water must pass through the filter media at a service flow rate that allows it to oxidize and collect the iron. The filter must also be backwashed at a flow rate sufficient to dislodge and remove the captured iron. Failure to provide sufficient water will cause a build-up of iron in the filter media, impairing its iron removing ability and resulting in iron bleeding out into the service water. In order for your filter to backwash and rinse properly, your pump must be capable of providing the backwash flow rates indicated on page 3.

### CHECK YOUR WATER PRESSURE AND PUMPING RATE

Two water system conditions must be checked carefully to avoid unsatisfactory operation or equipment damage:

1. Minimum water pressure required at the filter tank inlet is 20 psi.
2. Measuring the pumping rate of your pump:
  - a. With the pressure tank full, draw water into a container of known volume, and measure the number of gallons drawn until the pump starts again. This is draw-down. Divide this figure by cycle time and multiply the result by 60 to arrive at the pumping rate in gallons per minute (gpm). To aid in your calculation, insert the date in the following formula:

DRAW-DOWN \_\_\_\_\_ ÷ CYCLE TIME \_\_\_\_\_ x 60 = PUMPING RATE \_\_\_\_\_ (gals) (secs.) (Gpm)

**EXAMPLE:** CYCLE TIME is 53 seconds. DRAW-DOWN is 6 gallons; then, PUMPING RATE equals:  
6 gallons ÷ 53 seconds x 60 = 6.8 gpm

See chart on page 3 for minimum flow rates.

**NOTE:** If your pumping rate is inadequate for the model, do not install your filter until the problem has been corrected.

## Capacity


An iron filter with one cubic foot of filter media regenerated with one Potassium Permanganate feeder will work well for most residential applications. For example, with iron in the range of 3-6 ppm, most filters will need to regenerate every two or three days providing an average family size of four or five people. The specification chart on page 3 shows the iron removal capacity in ppm that can be expected on automatic iron filters. The specifications are based on obtaining 6,000 ppm of capacity for each cubic foot of filter media. Two different Potassium Permanganate feeders are available – one feeding 2 oz. per regeneration, the other feeding 4 oz. In order to obtain the above capacities, the pH of the water being treated must be 7.0 or above. In the event the water is below 7.0, it must be treated with the appropriate equipment before going through the filter.

## Removal of Iron, Manganese & Hydrogen Sulfide \*\*\* IMPORTANT \*\*\*

For the purpose of sizing a filter, consider 1 ppm of manganese equal to 2 ppm of iron and 1 ppm of hydrogen sulphide equal to 3 ppm of iron. Manganese and hydrogen sulphide (sulphur) are more difficult to oxidize than iron. Therefore, we suggest that, when making your sizing calculations and regeneration frequency calculations, calculate iron x 1, manganese x 2 and hydrogen sulphide x 3. All three must equal less than 10 ppm. Manganese is often present in water when iron is present. Hydrogen sulphide can normally be identified by a strong rotten egg odour.

## General Installation

Water Pressure	Minimum 25 PSI
Electrical Supply	Uninterrupted AC
Existing Plumbing	Free of any deposits or build-ups inside pipes.
Unit Location	Locate close to drain and connect according to plumbing codes
Bypass Valves	Always provide for bypass valve if unit is not equipped with one.
Plumbing	Softener and or other water treatment equipment should be installed to local plumbing codes

	<b>CAUTION</b> <ul style="list-style-type: none"><li>Do not exceed 120 psi water pressure.</li><li>Do not exceed 110°F water temperature.</li><li>Do not subject unit to freezing conditions.</li></ul>
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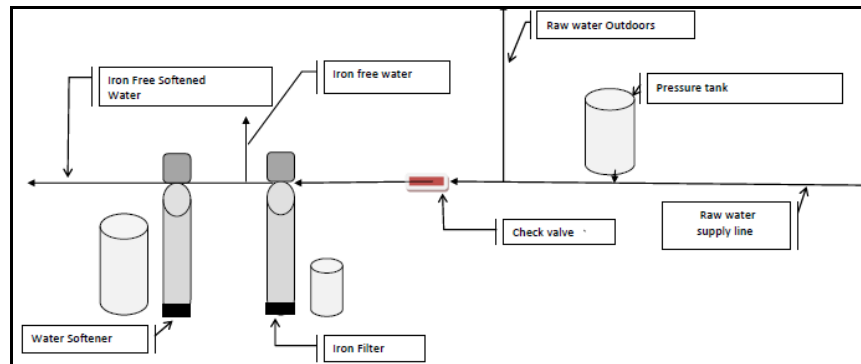


Figure 6 Typical Rural Installation

1. Locate the filter tank and chemical feed tank close to a drain where the system will be installed. The surface should be clean and level.
2. Perform all plumbing according to local plumbing codes.
3. Use a ½" minimum pipe or tubing size for the drain line.
4. Use a ¾" pipe or tubing for backwash flow rates that exceed 7 gpm or length that exceeds 20ft (6 m)

5. Any solder joints near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the valve and joints when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.
6. If the valve is not installed on the tank, cut the 1" central pipe flush with top of each tank. Lubricate the large o-ring on the valve that seals against the tank. Screw the valve on to the tank. Be careful to not cross thread the valve into the tank. Only use silicone lubricant.
7. Connect the drain line to the valve. Only use Teflon tape on the drain fitting.
8. Connect the 3/8" tubing from the chemical feed tank to the valve.
9. Attach the 5/8" hose (supplied) to the over flow fitting on the feeder and run the hose to the floor drain.
10. Add water until there is approximately 1" (25 mm) of water above the grid plate. Do not add any chemical to the tank at this time.
11. Place the unit in the bypass position.
12. Slowly turn on the main water supply.
13. At the nearest cold treated water tap nearby remove the faucet screen, open the faucet and let water run a few minutes or until the system is free of any air or foreign material resulting from the plumbing work. Close the water tap when water runs clean, and then proceed to start up instructions.

## Start-Up Instructions

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1. Plug the valve into an approved power source.
2. When power is supplied to the control, the screen will display "INITIALIZING WAIT PLEASE" while it finds the service position.
3. Press "⏪" and hold for 3 seconds to initiate a manual regeneration and advance the valve to the Backwash position. Open the inlet on the bypass valve slowly and allow water to enter the unit. Allow all air to escape from the unit before turning the water on fully then allow water to run to drain for 3-4 minutes or until all media fines are washed out of the filter.
4. Press the "⏩" to advance to the BRINE/RINSE position. Check the water level in the chemical feed tank to insure the valve is drawing brine properly.
5. Press the "⏩" to advance to the RINSE position. Check the drain line flow. Allow the water to run for 3-4 minutes or until the water is clear.
6. Press the "⏩" to advance to the REFILL position. Check that the valve is filling water into the chemical storage tank, allow to refill until float shuts off the water flow.
7. Press any button to advance to the SERVICE position. Open the outlet valve to the bypass, then open the nearest treated water faucet and allow the water to run until clear, close the tap and replace the faucet screen.
8. Cautiously pour the Potassium Permanganate into the feeder and replace the cover and safety screws.
9. Manually initiate regeneration after about one hour (time for the potassium permanganate to dissolve) to activate the manganese greensand.

## Plumbing System Clean-Up

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The following procedures are guidelines only but have proven successful in most instances. Under no circumstances should any procedure outlined below be followed if contrary to the appliance manufacturer's instructions. Should there be any questions concerning the advisability of performing a procedure, it is strongly recommended the manufacturer's authorized service outlet be consulted prior to performing the procedure.

The plumbing system and water using appliances that have been exposed, even for a short time, to iron-fouled water need to be cleaned of the precipitated iron that has collected in them or iron bleed (staining) will continue to be a problem.

Depending on the amount of iron in the water and the length of time the water system has been exposed to iron fouling, select from the following procedures those that apply to the type of system and appliances that need to be cleaned to assure iron-free water at all points of use.

### Softener

It isn't uncommon that the softener was installed in an effort to remove ferrous (clear water) iron from the water supply. Typically a softener will remove some ferrous iron until the resin bed becomes fouled to the extent that it will lose both hardness removal capacity and the limited capacity for iron removal. This is the condition to expect the softener to be in when planning a system clean-up. Prior to closing the main supply valve or turning power off to a private well system and preparatory to installing the filter system, do the following:

1. Disconnect the brine draw line from the brine cabinet and place the loose end into a five gallon plastic pail filled with a solution of warm water and 4 oz. of Pro Res Care resin mineral cleaner.
2. Advance the control timer to the brine draw position (refer to instructions provided with your softener). Allow all the warm mineral cleaner solution to be drawn into the mineral bed.
3. Then immediately close the main water supply valve or turn the power off to the pump and proceed with the filter installation. During the time required to install the filter system, the iron-fouled softener resin will be chemically cleaned.
4. After the filter installation is completed and final adjustments have been made, with the water turned on and the brine draw tube reconnected, reposition the timer on the softener to the backwash position. Allow the timer to perform an automatic regeneration cycle. During backwash of the softener, all iron cleaned from the resin will be washed down the drain. It is advisable, after chemically cleaning the softener, to regenerate the system twice to fully restore capacity lost due to iron-fouling.

### Water Heater

If the water heater has been exposed to both iron and hardness for a long period of time, replacement of the heater tank may be the only practical solution to prevent continued staining originating from this source. After completing the installation of your iron filter, clean the water heater by following these instructions:

1. Shut off the energy supply to the water heater and close the heater inlet water valve.
2. Drain hot water tank completely. Open inlet water valve, allowing heater tank to be refilled with iron-free water. Continue flushing until the water runs clear to the drain.

- If, after approximately 30 minutes of flushing, water does not clear, terminate the flushing operation. Refill hot water heater with water and pour approximately 1/2 gallon of household bleach into the top of the heater tank. Allow bleach solution to stand in tank for 20 to 30 minutes. Flush the tank again until water is clear at the drain. Turn energy supply on.

**NOTE:** If water does not clear in approximately 10 minutes, water heater should probably be replaced.

## Level I User Programming

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### Setting Current Time

- Press “**□**” for 3 seconds to unlock screen. Press “**□**” again to enter level one programming mode and adjust CURRENT TIME.
- Press “**⏪**” to adjust hours. When you have entered the change value mode, the cursor will blink. Press “**▲** or **▼**” arrows to change the hour values. Press “**⏪**” again to accept the hour value and advance to change the minutes value. Press “**▲** or **▼**” arrows to change the minute values. Press “**⏪**” again to accept the minute values and advance to adjust the AM/PM values. Press “**▲** or **▼**” to change the AM/PM value. Press “**⏪**” again to accept the AM/PM value and exit. When you have exited the change value mode, the cursor will stop flashing.

### Setting Current Date

- Press “**▼**” to advance to CURRENT DATE.
- Using the same procedure as setting the time, press “**⏪**” to enter value change mode.

### Setting Number of People

- Press “**▼**” to advance to NUMBER OF PEOPLE.
- Press the “**⏪**” to change the value. Press up or down arrows to change the values.

### Setting Feed water Iron \*\* SEE IMPORTANT INFO ON PAGE6 FOR CALCULATING TOTAL IRON \*\*\*

- Press “**▼**” to advance to FEEDWATER IRON.
- Press the “**⏪**” to change the value. Press “**▲** or **▼**” to change the values.

### Setting Vacation Mode

- Press “**▼**” to advance to VACATION MODE.
- Press the “**⏪**” to change the value. Press “**▲** or **▼**” to change the values.

### Exiting Level One User Program Mode

- At any time, press the “**□**” to accept all changes and return to main page display.

Level I User Program Mode (Iron Filter)			
PARAMETER	OPTIONS	DESCRIPTION	
1	CURRENT TIME		This option is the current time of day.
2	CURRENT DATE		This option is the current date. The date is used to track the last time the system regenerated.
3	NUMBER PEOPLE		This value is the number of people living in the home. It is used to calculate the amount of water needed for daily use and the reserve capacity of the system.
4	FEEDWATER IRON		This value is the compensated feed water iron in PPM of the raw water supply. 1 ppm of manganese = 2 ppm of iron; 1 ppm of hydrogen sulfide = 3 ppm of iron. It is used to calculate the system capacity.
5	VACATION MODE	Yes	This function may be activated by the user during a prolonged absence such as vacation. The system will perform a brief backwash and rinse based on the advanced setting. The purpose is to keep the
		No	

Figure 7. Level I Program Options

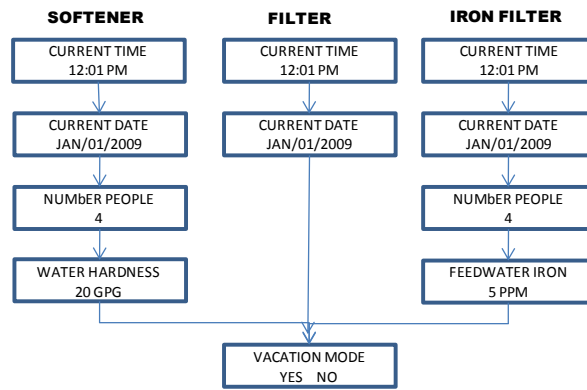





Figure 8. Level I Program Flow Chart



## Control Operation During A Power Failure

In the event of power failure, the valve will keep track of the time and day for 48 hours. The programmed settings are stored in a non-volatile memory and will not be lost during a power failure. If power fails while the unit is in regeneration, the valve will finish regeneration from the point it is at once power is restored. However, since the unit did not complete its regeneration, it will queue regeneration at the next scheduled regeneration time. If the valve misses a scheduled regeneration due to a power failure, it will queue regeneration at the next regeneration time once power is restored.

## Diagnostics Mode

1. Press “” for three seconds to unlock screen.
2. Press and hold the “”DOWN buttons for three seconds to enter Level Diagnostics Mode. Use the down button to toggle through the diagnostics to assist in trouble shooting and problem solving. In addition, the values can be reset to zero individually by pressing “” for 3 seconds

## Vacation Settings Mode

1. Press “” for three seconds to unlock screen.
2. Press and hold the “” up for three seconds to enter the Vacation Settings Mode.




In this mode the length of time for backwash and rinse along with the frequency are set while the valve is in vacation mode.

PARAMETER	DESCRIPTION
REGEN. DAYS	This value is the frequency of how often the unit should perform a brief backwash and rinse.
BACKWASH	This option controls the length of time in minutes for the unit to briefly clean the bed by reversing the flow of water upwards through the bed and out to the drain.
RINSE	This option controls the length of time to give the tank a brief rinse from the top to the bottom in order to remove any stale or stagnant water from the tank.

Figure 9. Vacation Mode Settings

## Level II User Programming

When the Level Two Master Programming Mode is entered, all available option setting displays may be viewed and set as needed. Depending on current option settings, some parameters cannot be viewed or set.

1. Press “” for three seconds to unlock screen.
2. Press and hold “ ” for three seconds to enter Level Two Master Programming.

PARAMETER		OPTIONS	DESCRIPTION
1	SYSTEM LANGUAGE	ENGLISH	This option controls which language should be used in the valve display.
		FRENCH	
		SPANISH	
2	VALVE OPERATION	SOFTENER	There are three basic operating modes to choose depending on the system application.
		FILTER	
		IRON FILTER	
3	REGEN. MODE	METER DELAYED	This is the most common setting. When the volume remaining reaches zero gallons, the system will initiate a regeneration at the next pre-set regeneration time.
		METER IMMEDIATE	The unit will initiate a regeneration immediately after the volume remaining reaches zero.
		CALENDAR CLOCK	The unit will initiate a regeneration at the next pre-set regeneration time based on the interval of days between regeneration days.
		METER OVERRIDE	When the volume remaining reaches zero gallons, the system will initiate a regeneration at the next pre-set regeneration time. If the days between regeneration is reached before the remaining volume reaches zero, the system will override the meter setting and initiate a regeneration.
4	REGENERATION TIME		This setting controls the time of day when a regeneration cycle will start.
5	CAPACITY CALC.	AUTOMATIC	This option automatically calculates the capacity (in gallons for meter units), refill time (in minutes), or regeneration day intervals (days for calendar clock mode).
		MANUAL	The user can manually enter values for capacity, refill time, or regeneration day intervals.
6	RESIN VOLUME		This value should be the amount of resin in cubic feet that is loaded in to the tank. The value is used to calculate the system capacity and refill time.
7	SALT SETTING		This value is the salt dosage (pounds per cubic foot) to be used when regenerating the system.
8	REFILL FLOW RATE		This value is the flow rate(gallons per minute) of the brine line flow control (BLFC) button installed in the valve and is used to calculate the refill time to precisely measure the amount of water into the brine tank. (Note: This value is factory preset and should not be changed unless the BLFC button has been changed to a different size.)
9	UNIT CAPACITY		This value (GRAINS for softeners, PPM for IRON FILTERS) is the total capacity of the system. It is used to calculate the capacity of the system in gallons.
10	CAPACITY		In MANUAL CAPACITY CALC. mode, the CAPACITY can be adjusted by the user. In AUTOMATIC CAPACITY CALC. mode, the current calculated value is displayed but cannot be adjusted.
		FORMULA	$CAPACITY = (UNIT\ CAPACITY / WATER\ HARDNESS) - (NUMBER\ PEOPLE * DAILY\ USAGE)$
11	DAILY USAGE		This value is the average amount of water used per person per day. It is used to calculate the REGEN. DAYS for calendar clocks.
12	RESERVE CAPACITY		This value is the amount of water per person in gallons to be saved for a reserve capacity. It is used to calculate the CAPACITY of the system.
13	REGEN. DAYS		This value is the interval (days) between regenerations. It is used to determine how many days between regenerations in the CALENDAR CLOCK mode. It is also used as the value for the METER OVERRIDE mode. It can be set by the user in MANUAL CALC. MODE. In AUTOMATIC CAPACITY CALC. mode, the current calculated value is displayed but cannot be adjusted.
		FORMULA	$REGEN.\ DAYS = ((UNIT\ CAPACITY / WATER\ HARDNESS) / (NUMBER\ PEOPLE * DAILY\ USAGE)) - 1$
14	BACKWASH		This option controls the length of time in minutes for the unit to clean the bed by reversing the flow of water upwards through the bed and out to the drain.
15	BRINE / RINSE		This option controls the length of time in minutes for the unit to draw regenerant (brine for softeners) from the second tank and slowly rinse it from the top to bottom of the tank.
16	RINSE		This option controls the length of time to give the tank a final rinse from the top to the bottom in order to remove any last traces of the regenerant (brine) from the tank.
17	REFILL		This option controls the length of time the brine valve will open to refill the second tank (brine tank for softeners) with water in order to produce the regenerate solution (brine for softeners) for the next regeneration cycle. The water is accurately measured through the valves brine line flow control to make a precise quantity of regenerant solution. In MANUAL CAPACITY CALC. mode, the REFILL time can be adjusted by the user. In AUTOMATIC CAPACITY CALC. mode, the current calculated value is displayed but cannot be adjusted.
		FORMULA	$REFILL = 0.45 * SALT\ SETTING * RESIN\ VOLUME / REFILL\ FLOW\ RATE$
18	RESTORE DEFAULT	YES	This option allows the current settings to be erased and changed back to the default settings.
		NO	

Figure 10. Level II Program Options

## Level II User Programming Softener Flow Chart

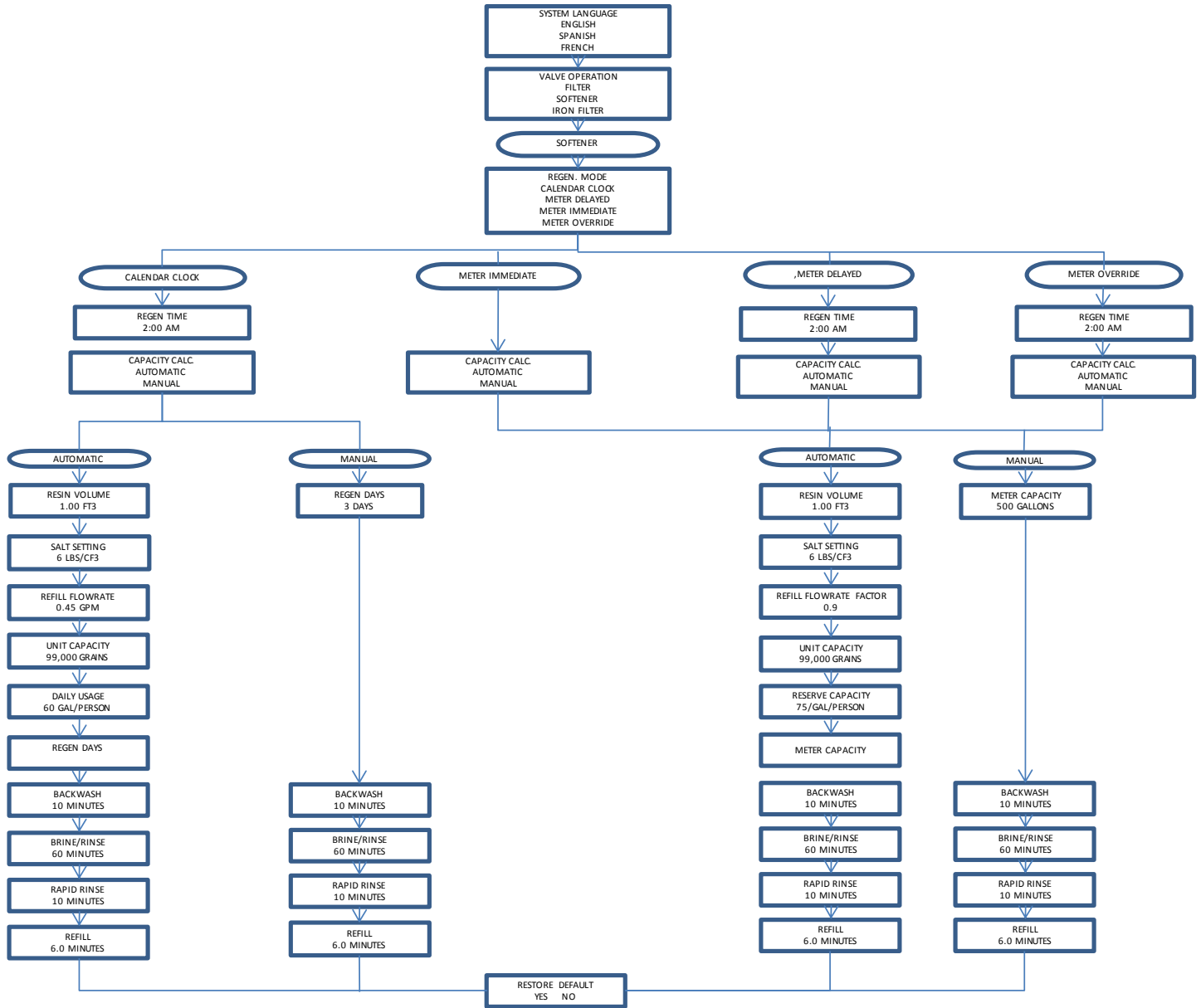


Figure 11. Level II Program Flow Chart

### Diagnostics Mode

1. Press “**Q**” for three seconds to unlock screen.
2. Press and hold the “**▲**”DOWN buttons for three seconds to enter Level Diagnostics Mode.  
In this mode, key diagnostics can be viewed for trouble shooting and problem solving. In addition, the values can be reset to zero individually by pressing “**↻**” for 3 seconds

### Vacation Settings Mode

1. Press “**Q**” for three seconds to unlock screen.
2. Press and hold the “**▼**” for three seconds to enter the Vacation Settings Mode.  
In this mode the length of time for backwash and rinse along with the frequency are set while the valve is in vacation mode.

PARAMETER	DESCRIPTION
REGEN. DAYS	This value is the frequency of how often the unit should perform a brief backwash and rinse.
BACKWASH	This option controls the length of time in minutes for the unit to briefly clean the bed by reversing the flow of water upwards through the bed and out to the drain.
RINSE	This option controls the length of time to give the tank a brief rinse from the top to the bottom in order to remove any stale or stagnant water from the tank.

Figure 12. Vacation Mode Setting Chart

## System Configuration

### Injector and Drain Line Flow Control

Suggested Iron Filter Valve Configuration			
Tank Size (Diameter)	Injector	Brine Line Flow Control (BLFC)	Drain Line Flow Control (DLFC)
8"	#2 Blue (PVC)	(0.70 GPM)	#4 (3.5 GPM)
9"			#6 (4.0 GPM)
10"			#7 (5.0 GPM)
12"			none

Figure 13. Valve Configuration

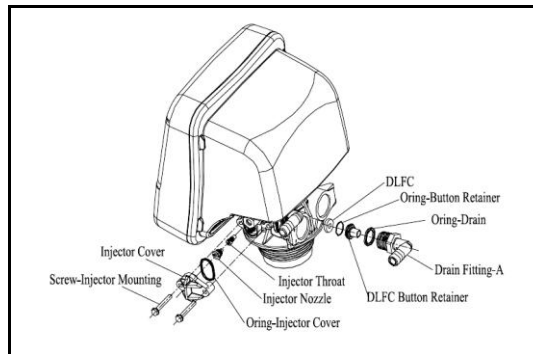


Figure 14. Valve Configuration View

### Installation Of Bypass

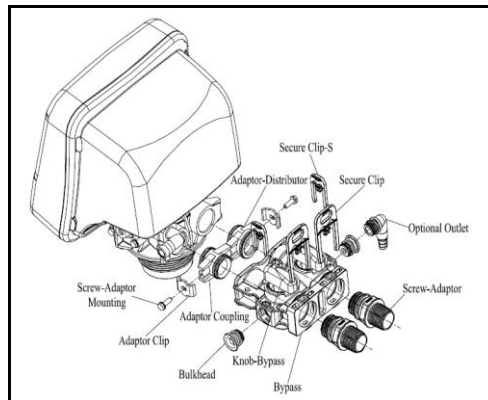


Figure 15. Bypass Installation View

**Automatic Bypass:** The regeneration cycle lasts approximately 2 hours, after which filtered water service will be restored. During regeneration, untreated water is automatically bypassed for use in the household. Hot water should be used as little as possible during this time to prevent untreated water from filling the water heater. This is why automatic regeneration is set for sometime during the night and manual regenerations should be performed when little or no water will be used in the household.

**New Sounds:** You may notice new sounds as your water filter operates. The regeneration cycle lasts approximately 2 hours. During this time, you may hear water running intermittently to the drain.

**Manual Bypass:** In the case of emergency, such as an overflowing potassium tank, you can isolate your water filter from the water supply using the bypass valve located at the back of the control. In normal operation the bypass is open with the on/off knobs in line with the inlet and outlet pipes. To isolate the filter, simply rotate the knobs counter clockwise until they lock. You can use your water related fixtures and appliances as the water supply is bypassing the filter.

## Maintenance

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Maintenance of your new water filter requires very little time or effort but it is essential. Regular maintenance will ensure many years of efficient and trouble-free operation.

1. Periodically make sure your pump is performing satisfactorily to ensure sufficient water is available for backwashing the filter.
2. Check that the Potassium feeder tank has adequate Potassium Permanganate in it. Generally speaking if the unit regenerates every 3 days it will require refilling in 3 months, 4 days= 4 months etc.
3. Periodically test your raw and filtered water to ensure conditions are still the same for your original settings and that the unit is working they way it is intended to. *Periodic water testing is the best way to determine when the filter media will require replacement.*
4. Periodically check that the drain line is clear and free from any obstructions.

### Cleaning the Injector Assembly:

Sediment, iron and silt will restrict or clog the injector. Regular cleaning of the injectors (at least semi annually) will help prevent this from happening and prolong the life of your filter and filter bed. The injector assembly is located on the right side of the control valve. This assembly is easy to clean.

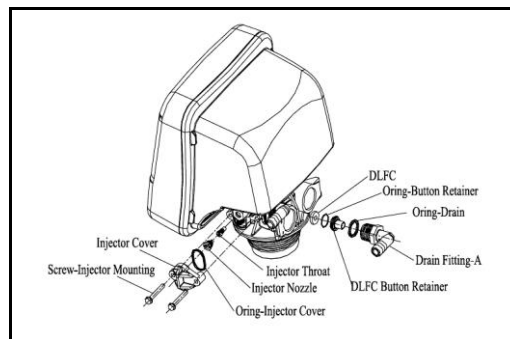
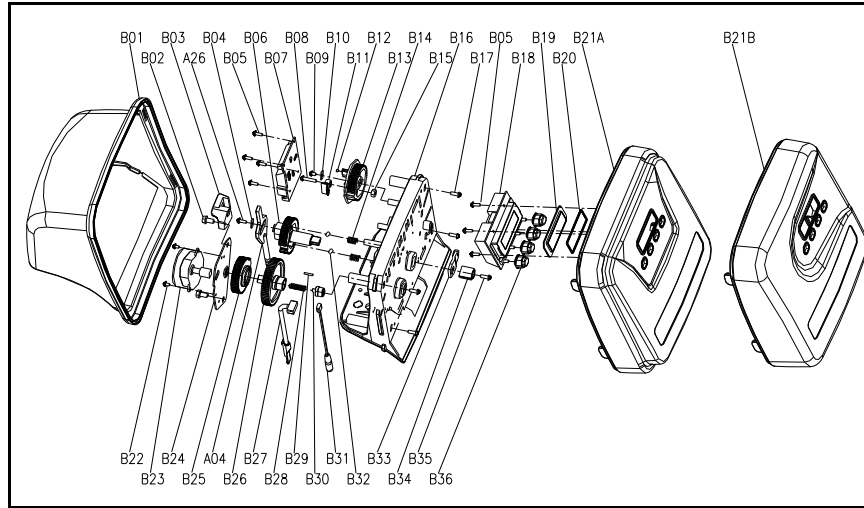


Figure 16. Injector Assembly

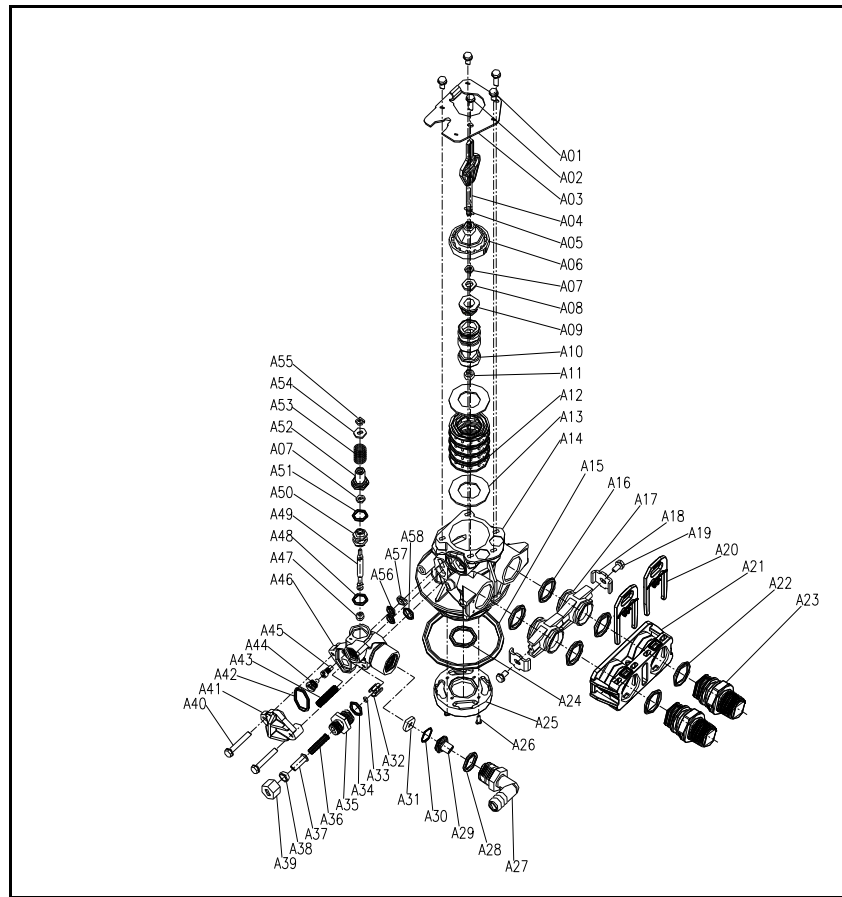
Shut off the water supply to your filter and reduce the pressure by opening a cold treated water faucet. Using a screwdriver, remove the two screws holding the injector cover to the control valve body. Carefully remove the assembly and disassemble as shown in Figure 13. The injector orifice is removed from the valve body by carefully turning it out with a large screwdriver. Remove the injector throat the same way. Carefully flush all parts including the screen. Use a mild acid such as vinegar or Pro-Rust Out to clean the small holes in the orifice and throat. Reassemble using the reverse procedure.

# Drive Assembly Exploded View



Item No.	Part No.	Part Description	Quantity
B01	05056523	BNT365 Cover	1
B02	05056136	Screw-ST3.5X13 (Hexagon with Washer)	2
B03	05010045	Piston Stem Holder	1
A26	13000426	Screw-ST2.9X13 (Large Washer)	1
B04	05056139	Washer-3x13	1
B05	05010037	Screw-ST2.9X10	8
B06	05056005	Main Gear	1
B07	05030010	Bnt#85 Main Pcb	1
B08	05056083	Screw-M 4x14	1
B09	05056166	Screw-ST4.2X12 (Large Washer)	1
B10	05056141	Washer-4x12	1
B11	05056016	Brine Regulator	1
B12	05010023	Magnet-#8 X2.7	1
B13	05056015	Brine Gear	1
B14	05056095	Spring Detent	2
B15	05056089	Nut-M 4	1
B16	05056522	Bnt#65 Housing	1
B17	05056084	Screw-ST3.5x13	4
B18	05030020	Bnt#85-Display (NO VO)	1
B19	05056528	Pcb Cover	1
B20	26010047	O-Ring-#42.5X1.8	1
B21	05056527	Bnt#65 Front Cover	1
B22	05056082	Screw-M 3X6	2
B23	05056510	Motor-12v,2rpm	1
	05030014	Motor Power Cable	1
	11700005	Wire Connector	2
B24	05056045	Motor Mounting Plate	1
B25	05056501	Drive Gear	1
A04	05010081	Bnt#65 Piston Rod	1
B26	05056002	Idle Gear	1
B27	05010031	Meter Assembly	1
	05010046	Meter Strain Relief	1
B28	05056094	Spring Idle	1
B29	05056098	Motor Pin	1
B30	05056502	Spring Retainer	1
B31	05010029	Power Cable	1
	05056013	Power Strain Relief	1
B32	05056092	Ball-1/4inch	2
B33	05056503	Magnet Holder	1
B34	05056554	Locking Knob	1
B35	05056561	Screw-ST3.5X15 (CSK)	1
B36	05056529	Bnt#65 Button	4

# Control Valve Assembly Exploded View



Item No.	Part No.	Part Description	Quantity	Item No.	Part No.	Part Description	Quantity
A01	05056087	Screw -M 5x2 (Hexagon)	3	A32	05056035	BLFC Button Retainer	1
A02	05056088	Screw -M 5x6 (Hexagon with Washer)	2	A33	05056191	BLFC-2#	1
A03	05056047	End Plug Retainer	1	A34	05056138	O-Ring-Ø4x1.8	1
A04	05010081	Bottom Piston Rod	1	A35	05056100B	BLFC Fitting	1
A05	05056097	Piston Pin	1	A36	05056106	Brite Line Screen	1
A06	05056023	End Plug	1	A37	05056107	BLFC Tube Insert	1
A07	05056070	Quad Ring	2	A38	05056033	BLFC Ferrule	1
A08	05056024	End Plug Washer	1	A39	05056108	BLFC Fitting Nut	1
A09	05056022	Piston Retainer	1	A40	05056086	Screw -M 5x0 (Hexagon with Washer)	2
A10	05056181	Piston (Electra)	1	A41	05056029	Injector Cover	1
A11	05056104	Muffler	1	A42	05056072	O-Ring-Ø2.4x2	1
A12	05056021	Spacer	4	A43	05056103	Injector Screen	1
A13	05056073	Seal	5	A44	05056027	Injector Nozzle	1
A14	05056019	Bottom Valve Body	1	A45	05056028	Injector Throat	1
A15	05056063	O-ring-Ø8.74x6.33	1	A46	05056177	Injector Body	1
A16	05056129	O-ring-Ø3x3	4	A47	05056075	Injector Seat	1
A17	05056025	Adaptor Coupling	2	A48	05056134	O-Ring-Ø2x2	1
A18	05056044	Adaptor Clip	2	A49	05056054	Injector Stem	1
A19	05056090	Screw -ST 4.2x3 (Hexagon with Washer)	2	A50	05056031	Injector Spacer	1
A20	21709003	Secure Clip	2	A51	05056081	O-Ring-Ø2.5x1.8	1
A21	05056140	Valve Connector	1	A52	05056030	Injector Cap	1
A22	05056065	O-ring-Ø3.6x2.65	2	A53	05056093	Injector Screen	1
A23	21319006	Screw Adaptor	2	A54	05010049	Special Washer	1
A24	26010103	O-ring-Ø5x0.55	1	A55	05056105	Retaining Ring	1
A25	07060007	Valve Bottom Connector	1	A56	05056067	O-Ring-Ø7.8x4.9	2
A26	13000426	Screw -ST 2.9x3 (Large Washer)	2	A57	05056037	Air Dispenser	1
A27	05056038	Main Fitting	1	A58	05056066	O-Ring-Ø1x2	1
A28	26010003	O-Ring-Ø8x2.65	1	A59	05056055	BLFC Plug	1
A29	05056036	DLFC Button Retainer	1	A60	05056156	Injector Nozzle (Filter)	1
A30	05056079	O-Ring-Ø4.5x0.8	1	A61	05056117	Injector Plug	1
A31	05056143	DLFC-2#	1				

## Trouble Shooting

Issue	Possible Cause	Possible Solution
A. Unit fails to initiate a regeneration cycle.	1. No power supply.	Check electrical service, fuse, etc.
	2. Defective circuit board.	Replace faulty parts.
	3. Power failure.	Reset time of day.
B. Water is red.	1. By-pass valve open.	Close by-pass valve.
	2. Out of KMnO <sub>4</sub> .	Add to tank.
	3. Plugged injector / screen.	Clean parts.
	4. Flow of water blocked to chemical tank.	Check for flow to tank.
	5. Rusty water in hot water tank. Sediment in tank disturbed.	Repeat flushing of hot water tank required.
	6. Leak between valve and central tube.	Check if central tube is cracked or o-ring is damaged. Replace faulty parts.
	7. Internal valve leak.	Replace valve seals, spacer, and piston
C. Chemical use is high.	1. Defective chemical tank system.	Replace chemical tank.
D. Low water pressure.	1. Iron or scale build up in line feeding	Clean pipes.
	2. Iron build up inside valve or tank.	Clean control and add resin cleaner to clean bed. Increase regeneration frequency.
	3. Inlet of control plugged due to foreign material.	Remove piston and clean control valve.
E. Filter media in drain line.	1. Air in water system.	Check well system for proper air eliminator control.
	2. Incorrect drain line flow control (DLFC) button.	Check for proper flow rate.
F. Too much water in brine tank.	1. Plugged injector or screen.	Clean parts.
	2. Valve not regenerating.	Replace circuit board, motor, or control.
	3. Foreign material in brine valve.	Clean parts.
G. Unit fails to draw regenerate chemicals.	1. Drain line flow control is plugged.	Clean parts.
	2. Injector or screen is plugged.	Clean parts.
	3. Inlet pressure too low.	Increase pressure to 25 PSI.
	4. Internal valve leak.	Replace seals, spacers, and piston assembly.
H. Valve continuously cycles.	1. Defective position sensor PCB.	Replace faulty parts.
I. Flow to drain continuously.	1. Valve settings incorrect.	Check valve settings.
	2. Foreign material in control valve.	Clean control.
	3. Internal leak.	Replace seals, spacers, and piston assembly.
J. Pink color in water. Chemical taste.	1. Poor water pressure.	Be sure pump is set to min. 20 psi and is capable of proper flow rate for filter system.
	2. Chemical in supply line.	Decrease frequency of regeneration cycles.

# NovoClear Guarantee

**Novo Water Conditioning Products** guarantees that your new filter is built of quality material and workmanship. When properly installed and maintained, it will give years of trouble-free service.

## Seven Year Complete Parts Guarantee

**Novo Water Conditioning Products** will replace any part which fails within 84 months from date of manufacture, as indicated by the serial number, provided the failure is due to a defect in material or workmanship. The only exception shall be when proof of purchase or installation is provided and then the warranty period shall be from the date thereof.

## Lifetime Guarantee on Mineral Tanks and Brine Tanks

**Novo Water Conditioning Products** will provide a replacement mineral tank or brine tank to any original equipment purchaser in possession of a tank that fails, provided that the water conditioner is at all times operated in accordance with specifications and not subject to freezing.

## Exceptions

**Novo Water Conditioning Products** will not guarantee filtration media beds as varied water quality and regular maintenance are required for proper performance.

## General Provisions

**Novo Water Conditioning Products** assumes no responsibility for consequential damage, labour or expense incurred as a result of a defect or for failure to meet the terms of these guarantees because of circumstances beyond its control.

