



## Whole House Chlorine Reduction System

Whole House Carbon Backwashing Filter WH-CB-BW



1. Read all instructions carefully before operation.
2. Avoid pinched o-rings during installation by applying NSF certified lubricant to all seals (provided with install kit.)
3. This system is not intended for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

Tier1 Technical Support:  
1-855-378-9116

# 2 Table of Contents

<b>READ THIS PAGE FIRST</b>	
<b>BEFORE STARTING INSTALLATION .....</b>	<b>3</b>
<b>SPECIFICATIONS</b>	
<b>SPECIFICATIONS .....</b>	<b>4</b>
<b>SYSTEM DIMENSIONS .....</b>	<b>5</b>
<b>BASIC PRINCIPLES.....</b>	<b>5</b>
<b>INSTALLATION</b>	
<b>UNPACKING/INSPECTION .....</b>	<b>7</b>
<b>BEFORE INSTALLATION .....</b>	<b>8</b>
<b>PREPARATIONS .....</b>	<b>9</b>
<b>INSTALLATION STEPS.....</b>	<b>10</b>
<b>INSTALLATION.....</b>	<b>11</b>
<b>BASIC PRINCIPLES</b>	
<b>STARTUP INSTRUCTIONS.....</b>	<b>12</b>
<b>TROUBLESHOOTING GUIDE .....</b>	<b>14</b>
<b>MASTER PROGRAMMING.....</b>	<b>15</b>

TIER1-WH-CB-BW-948  
TIER1-WH-CB-BW-1054

TIER1\_T1W\_WH\_CB\_BW\_948  
TIER1\_T1W\_WH\_CB\_BW\_1054

# READ THIS PAGE FIRST

## BEFORE STARTING INSTALLATION

- ▶ Read this manual thoroughly to become familiar with the device and its capabilities before installing or operating your water filter. Failure to follow instructions in this manual could result in personal injury or property damage. This manual will also help you to get the most out of your filter.
- ▶ This system's installation must comply with all state or local regulations. Check with your local public works department for plumbing and sanitation codes. In the event the codes conflict with any content in this manual the local codes should be followed. Consult your licensed plumber for installation of this system.
- ▶ This water filter is designed to operate on pressures of 30 psi to 125 psi. If the water pressure is higher than the maximum use a pressure reducing valve in the water supply line to the filter.
- ▶ This unit is capable of operating at temperatures between 40°F and 110°F (4°C - 43°C). Do not use this water filter on hot water supplies.
- ▶ Do not install this unit where it may be exposed to wet weather, direct sunlight, or temperatures outside of the range specified above.
- ▶ Avoid pinched o-rings during installation by applying (provided with install kit) NSF certified lubricant to all seals.
- ▶ Filters are commonly exposed to high levels of iron, manganese, sulfur, and sediments. Damage to pistons, seals, and or spacers within the control valve are not covered in this warranty due to the harsh environment.
- ▶ It is recommended to regularly inspect and service the control valve on an annual basis. Cleaning and or replacement of piston, seals, and or spacers may be necessary depending on how harsh the conditions are.
- ▶ Do not use water that is microbiologically unsafe without adequate disinfection before or after this system.
- ▶ This publication is based on information available when approved for printing. Continuing design refinement could cause changes that may not be included in this publication. The manufacturer reserves the right to change the specifications referred to in this literature at any time, without prior notice.

### INSTALL NOTES & SAFETY MESSAGES

Watch for the following messages in this manual:

#### NOTE

Do not remove or destroy the serial number. It must be referenced on request for warranty repair or replacement

**NOTE:** used to emphasize installation, operation or maintenance information which is important but does not present a hazard.



#### CAUTION!

Disassembly while under pressure can result in flooding.

**CAUTION:** used when failure to follow directions could result in damage to equipment or property.



#### WARNING!

##### ELECTRICAL SHOCK HAZARD!

Unplug the unit before removing the cover or accessing any internal control ports.

**WARNING:** used to indicate a hazard which could cause injury or death if ignored.

# PERFORMANCE DATA SHEET

Point-of-use and point-of-entry systems intended to reduce substances affecting the aesthetic quality of the water or to add chemicals for scale control, or both. Certification demonstrates that all materials safety and structural integrity (as applicable) requirements have been met.

To be installed in accordance with the manufacturer's installation instructions and the requirements of the latest edition of the Uniform Plumbing Code®.

Point-of-Entry products certified to this standard also comply with the health effects materials safety requirements listed in NSF/ANSI 61.

Products listed on this certificate have been tested by an IAPMO R&T recognized laboratory. This recognition has been granted based upon the laboratory's compliance to the applicable requirements of ISO/IEC 17025.

This system has been tested according to NSF/ANSI 42 for reduction of the substances listed below.

The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance Influent Challenge Concentration Reduction Requirement : Chlorine 2.0 mg/L +/- 10% >= 50%

Model	TIER1-WH-CB-BW-948	TIER1-WH-CB-BW-1054	TIER1-WH-CB-BW-1252
Tank Diameter (in)	9	10	12
Rated Service Level (GPM)	5.2	7.2	10.2
Loose Media Volume (ft3)	1	1.5	2
Capacity (gal)	750,000	1,100,000	1,500,000

## OPERATING CONDITIONS

<b>Working Temperature</b>	34-110°F (1-43°C) (Do not subject the unit to freezing temperatures)
<b>Working Pressure</b>	30-125 PSIG (137-861 kPa)
<b>Voltage</b>	120V / 60 Hz

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.

While testing was performed under standard laboratory conditions, actual performance may vary. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system

Peak flow rates intended for intermittent use only (10 minutes or less) and are for residential applications only. Do not use peak flow rate for commercial applications or for a continuous rate when treated water supplies are geothermal heat pump, swimming pool, etc.

For satisfactory operation, the pumping rate of the well system must equal or exceed indicated backwash flow rate.

## WATER AND TIME CONSUMED DURING REGENERATION

UNIT SIZE	BACKWASH MINUTES	RAPID RINSE MINUTES	TOTAL TIME OF REGENERATION	TOTAL WATER CONSUMED DURING REGENERATION (GAL)
TIER1-WH-CB-BW-948	10	10	20	80
TIER1-WH-CB-BW-1054	10	10	20	100

# 4



Models TIER1-WH-CB-948, TIER1-WH-CB-1054 and TIER1-WH-CB-1252 have been certified by IAPMO R&T against NSF/ANSI 42 for the effective reduction of Chlorine Taste and Odor.

### Model Number

TIER1-WH-CB-BW-948

TIER1-WH-CB-BW-1054

TIER1-WH-CB-BW-1252

### Capacity (Gallons)

750,000

1,100,000

1,500,000

### Claim

Chlorine, Taste and Odor

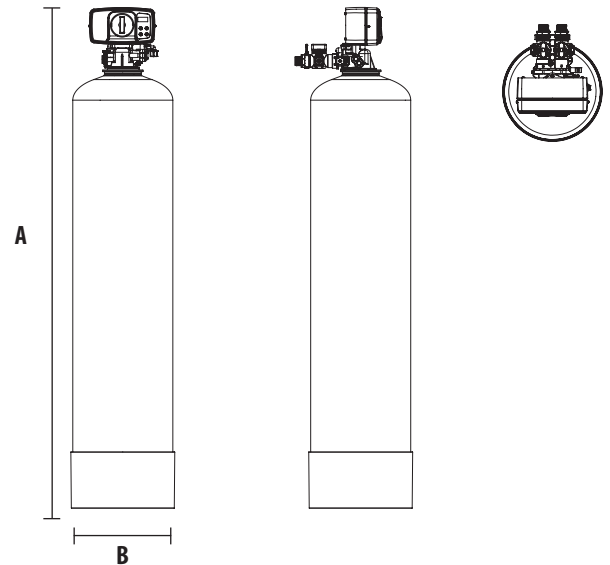
Chlorine, Taste and Odor

Chlorine, Taste and Odor

# SPECIFICATIONS

## SYSTEM DIMENSIONS

MODELS	A (INCHES)	B (INCHES)
TIER1-WH-CB-BW-948	55.5	9
TIER1-WH-CB-BW-1054	61.5	10



## BASIC PRINCIPLES

The success of the installation will depend, to a great extent, on advanced planning and preparation. Careful attention to the location of the unit, accessibility to electrical and drain facilities, and the availability of the proper tools will ensure a professional-looking installation.

Of utmost importance is the assurance that the filter has been properly applied and meets all specifications.

### APPLICATION

Correct application is directly associated with the performance and life expectancy of any water filter. It is important, therefore, to understand how your Water Filter functions and to know its capabilities and limitations so that a correct application can be made.

By following the guidelines and recommendations set forth in this manual, you can be certain your filter is applied correctly.

### CARBON (TASTE & ODOR) BACKWASHING FILTER

Automatic Water Filter with Activated Media will control chlorine taste and odor, and it will also remove most objectionable organic colors. It will not remove hydrogen sulfide. It is important to note that whenever the cause of an objectionable taste or odor has not been established, health authorities should determine if the water is safe to drink.

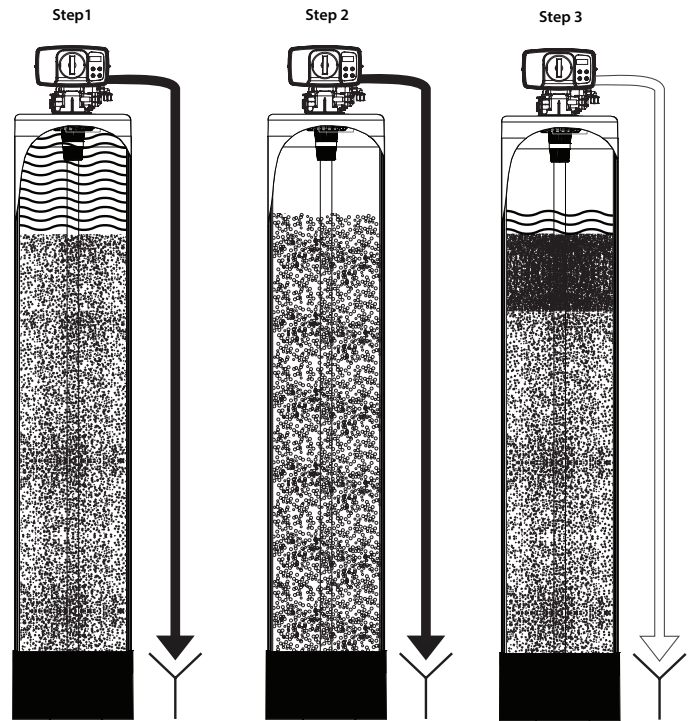
Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

# BASIC PRINCIPLES

## CONTROL VALVE REGENERATION SEQUENCE

The regeneration cycle goes through 3 steps.

1. **Backwash (minimum 30 psi inlet pressure required):** During the backwash cycle, water flows upwards through the bed, expanding the media and carrying any contaminants trapped within it to the drain.
2. **Rapid Rinse:** During the rapid rinse cycle, water flows downwards through the bed, settling the media and carrying any precipitated contaminants trapped within it to the drain.
3. **In-Service Position:** The unit then returns to the In-Service position. While this happens water continues to enter the tank.



### CAUTION!

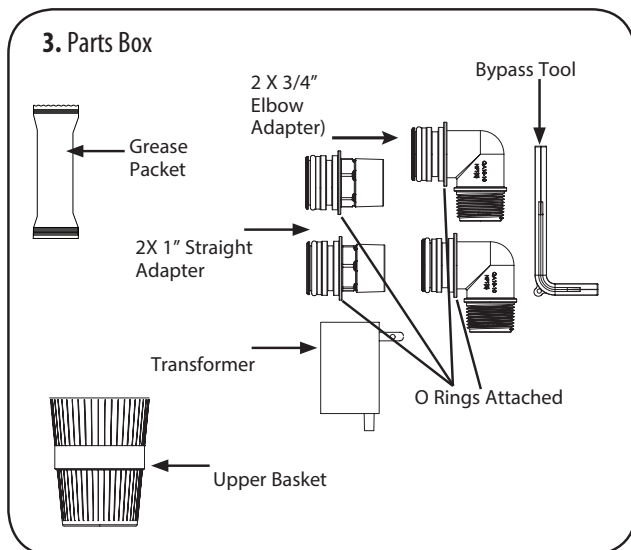
Do not use where the water is microbiologically unsafe or with water of unknown quality without adequate disinfection before or after the unit.

# UNPACKING/INSPECTION

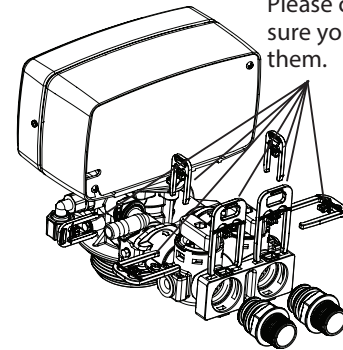
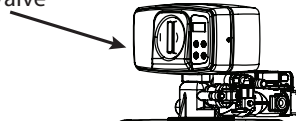
Be sure to check the entire unit for any shipping damage or parts loss. Also note damage to the shipping cartons. Contact the transportation company for all damage and loss claims. The manufacturer is not responsible for damages in transit. Small parts, needed to install the filter, are in a parts box. To avoid loss of the small parts, keep them in the parts bag until you are ready to use them.

## What is included in the box?

1. Control Valve
2. Tank
3. Parts Box
4. Owner's Manual
5. Drain Hose & Clamp

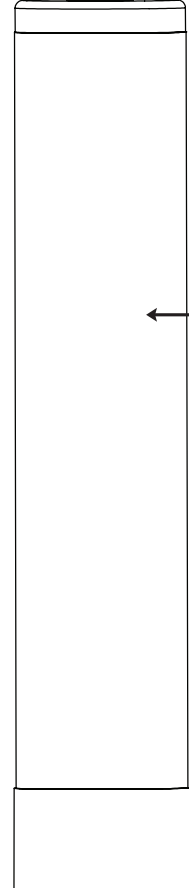


1. Control Valve



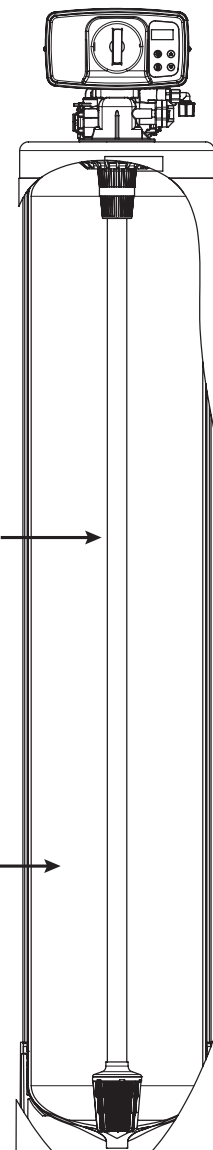
There are 7 Red clips. Please check to make sure you have all of them.

2. Tank



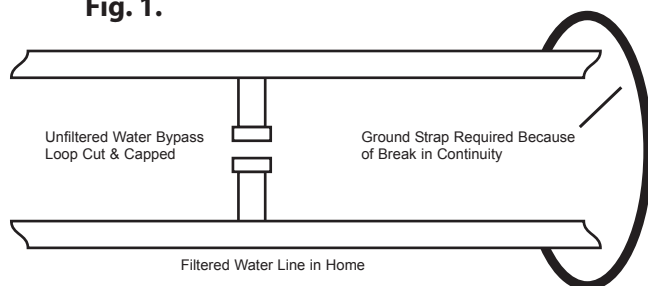
Distributor Tube Inside the Tank

Media Inside the Tank.



# BEFORE INSTALLATION

Fig. 1.



## Inspecting and Handling\*

Inspect the equipment for any shipping damage. If damaged, notify the transportation company and request a damage inspection. Damage to cartons should also be noted.

Handle the filter unit with care. Damage can result if it is dropped or set on sharp, uneven projections on the floor.

Do not turn the filter unit upside down.

## To Ensure this Product Functions Properly:

**Your feed water line size to the unit must be a minimum of 3/4 inch with an operating pressure of no less than 30 psi and no more than 125 psi.**

## MECHANICAL:

Do not use petroleum based lubricants such as petroleum jelly, oils or hydrocarbon based lubricants. Use only 100% silicone lubricants (grease packet provided in parts kit). All plastic connections should be hand tightened only. Teflon tape may be used on connections that do not use an O-ring seal. Do not use pliers or pipe wrenches except where indicated by Nut shape (eg. pipe adapters) All plumbing must be completed according to local codes. Soldering connections should be done before connecting any pieces to the pipe as excessive heat can damage them.

## Tools Required for Installation:

**NOTE: We recommend installation only be completed by a competent installer or plumbing professional to insure this product is installed in accordance with local plumbing codes.**

- ▶ Two adjustable wrenches
- ▶ Additional tools may be required if modification to home plumbing is required.
- ▶ Plastic inlet and outlet fittings are included with the filter. To maintain full valve flow, 3/4" or 1" pipes to and from the filter fittings are recommended. You should maintain the same, or larger, pipe size as the water supply pipe, up to the filter inlet and outlet.

▶ Use copper, brass, or PEX pipe and fittings.

▶ Some codes may also allow PVC plastic pipe.

▶ ALWAYS install the included bypass valve, or 3 shut-off valves. Bypass valves let you turn off water to the filter for repairs if needed, but still have water in the house pipes.

▶ 5/8" OD drain line is needed for the valve drain.

## NOTE

All government codes and regulations governing the installation of these devices must be observed.



## CAUTION!

If the ground from the electrical panel or breaker box to the water meter or underground copper pipe is tied to the copper water lines and these lines are cut during installation of the Nor-ryl bypass valve and/or poly pipe, an approved grounding strap must be used between the two lines that have been cut in order to maintain continuity. The length of the grounding strap will depend upon the number of units being installed and/or the amount of copper pipe being replaced with plastic pipe.

See Fig. 1.

## NOTE

Check your local electrical code for the correct clamp and cable size.

## NOTE

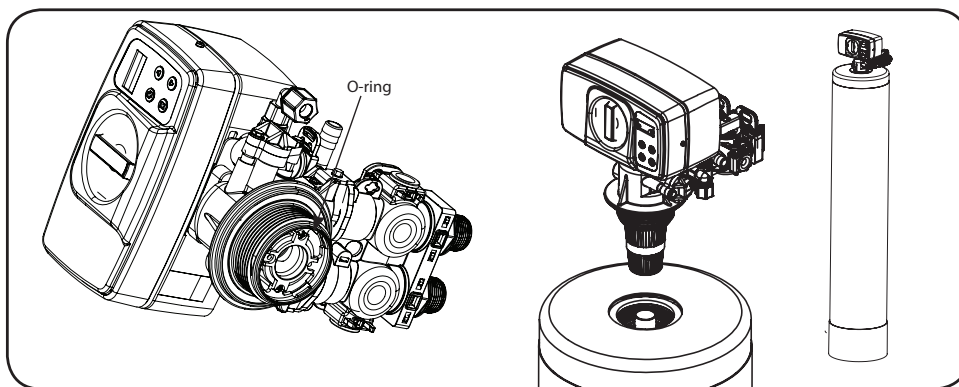
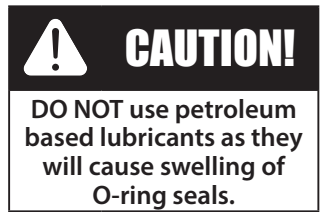
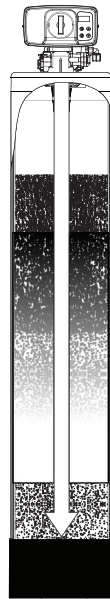
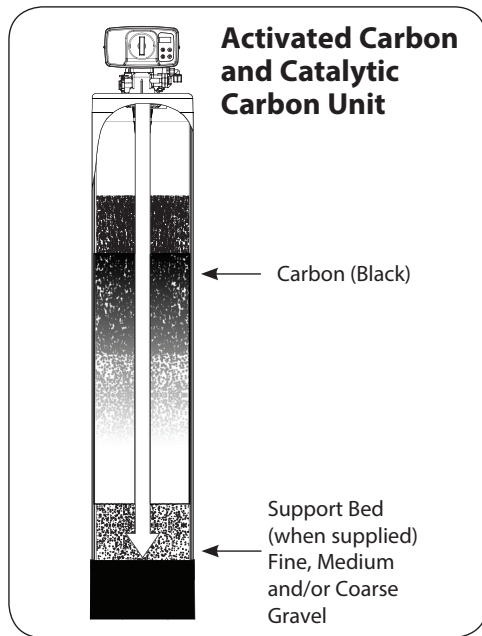
If a severe loss in water pressure is observed when the filter unit is initially placed in service, the filter tank may have been laid on its side during transit. If this occurs, backwash the filter to "reclassify" the media.

## \*NOTE

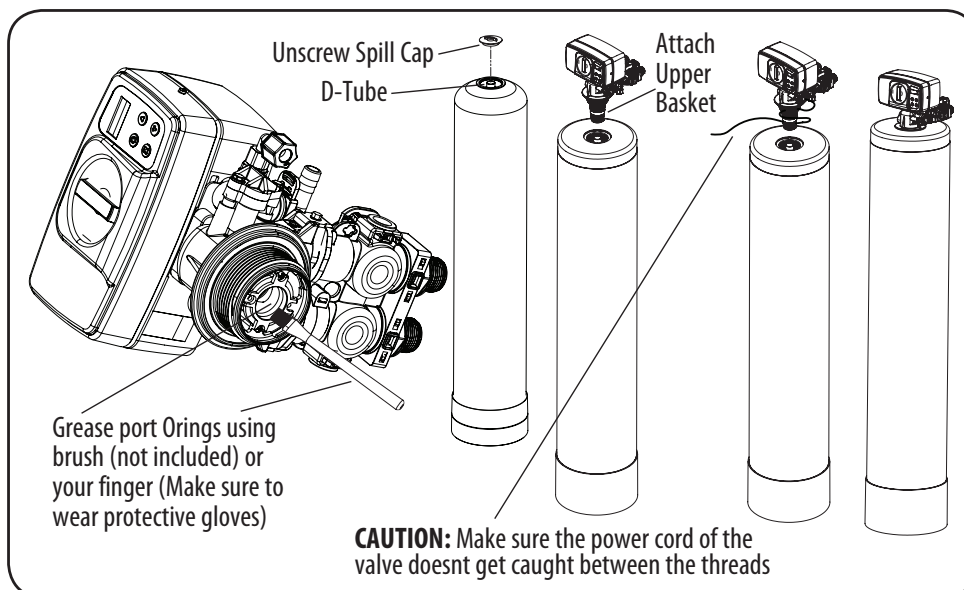
Due to transportation and climatic conditions all connections including the valve to the tank need to be checked at time of installation and tightened if necessary.



# PREPARATIONS



Unplug the riser tube, carefully position the valve over it and turn the valve into the threads in the fiberglass tank, tightening securely into tank. **Note:** Ensure that the internal O-ring in the valve fits securely over the riser tube. Silicone grease or other food grade lubricant may be applied to the O-ring to ease installation of the riser tube.

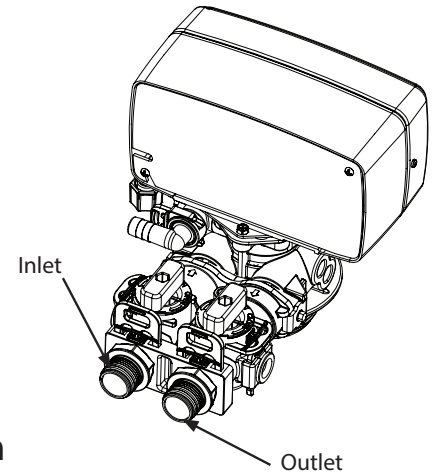


# PREPARATIONS

## INSTALLATION STEPS

Determine the best location for your water filter system, bearing in mind the location of your water supply lines, drain line and 120 volt AC electrical outlet. Subjecting the system to freezing or temperatures above 110°F will void the warranty.

Please notice the inlet and outlet labels on the valve as shown here to determine the position of the equipment

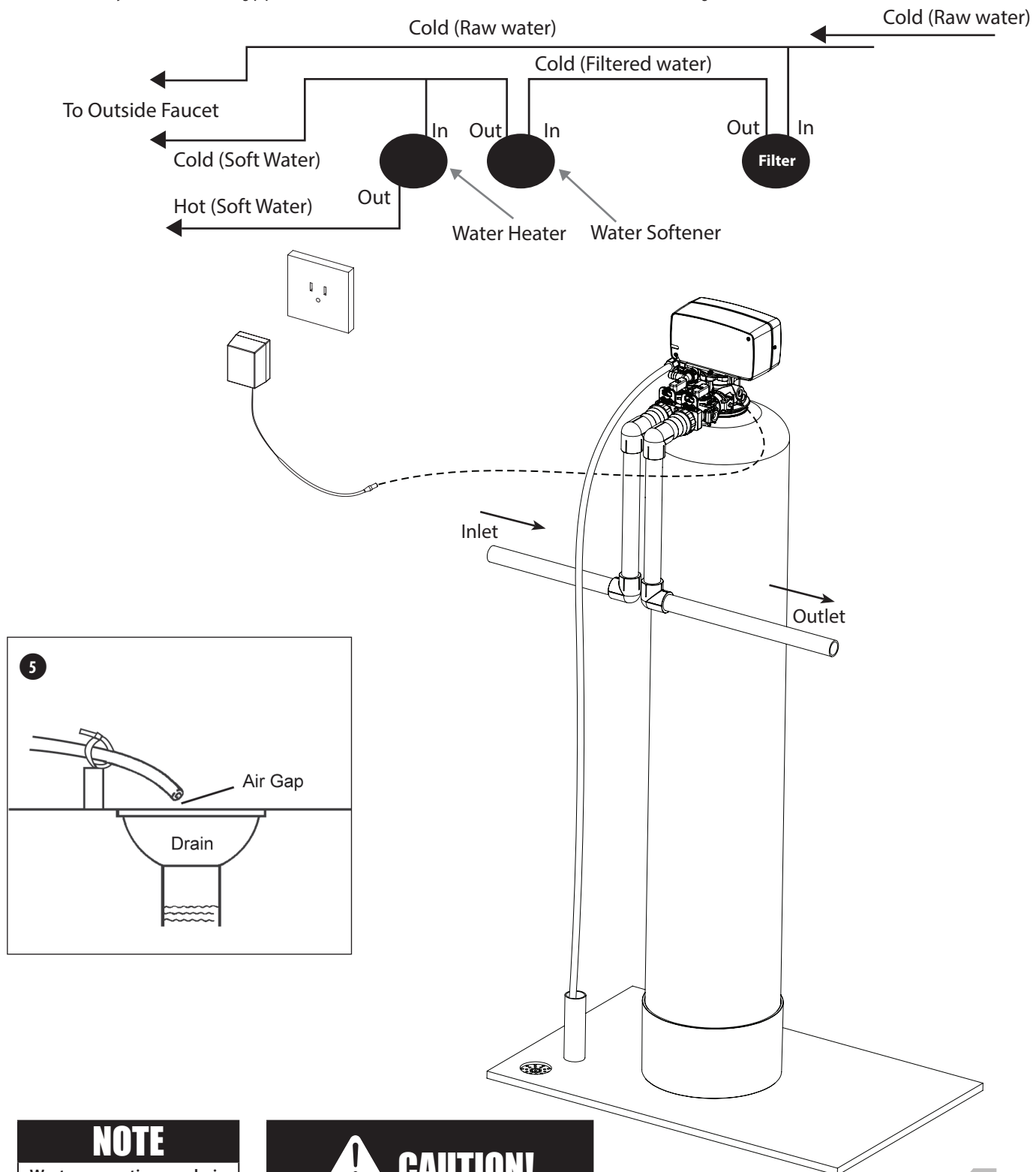


### Facts to Remember When Planning Your Installation

1. All installation procedures must conform to local and state plumbing codes.
2. Outside faucets used to water lawns and gardens should not supply untreated water, replace untreated water with feed water to the unit. If necessary to do this please install check valve. A new water line is often required to be connected to supply untreated water to the inlet of the water filter and to the outside faucets.
3. Make sure the bypass is attached well to the control valve. Connect the straight or elbow connectors to the bypass with red clips. Connect the inlet and outlet of the water filter to the plumbing of the house. The control valve must not be submitted to temperatures above 43°C (110°F). When sweat fittings are used, to avoid damaging the control valve, solder the threaded copper adapters to the copper pipe and then, using Teflon tape, screw the assembly into the bypass valve. Do not use pipe thread compound as it may attack the material in the valve body.
4. Apply Teflon Tape and O-rings to the fittings.
5. Connect Filter to the house plumbing. 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. **Drain Line connection:** Using Teflon tape, screw the 1/2" hose barb and attach o-ring into the drain port in the valve. Attach drain hose to the hose barb and tighten securely with a hose clamp. Run the drain line to a floor drain or a laundry drain. Complete any necessary plumbing.
7. Using the Allen Key (included), place the unit in the bypass position. Slowly turn on the main water supply. 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.
8. Make sure there are no leaks in the plumbing system before proceeding. Close the water tap when water runs clean.

# INSTALLATION

Connect Filter to the house plumbing. 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.



## NOTE

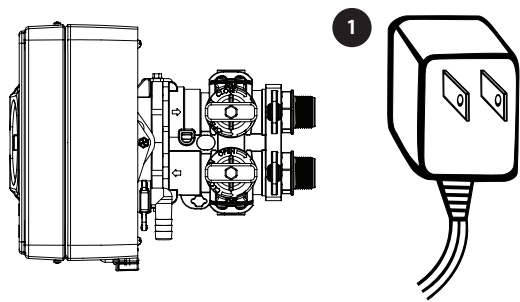
Waste connections or drain outlet shall be designed and constructed to provide for connection to the sanitary waste system through an air-gap of 2 pipe diameters or 1 inch (22 mm) whichever is larger.



## CAUTION!

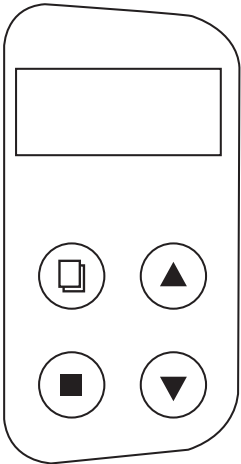
Never insert drain line directly into a drain, sewer line, or trap. Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the conditioner.

# STARTUP INSTRUCTIONS







1. Connect the transformer to the valve. Plug the 12-volt transformer into a 120 VAC 60 Hz outlet.

## Familiarize with Button Configuration:



## Key Pad Configuration:

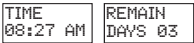
-  This function is to enter the basic set up information required at the time of installation.
-  This function is to accept the values if changed and advance to the next page in the menu.
-   These buttons are used to increase or decrease the value of the settings while in the programming mode.














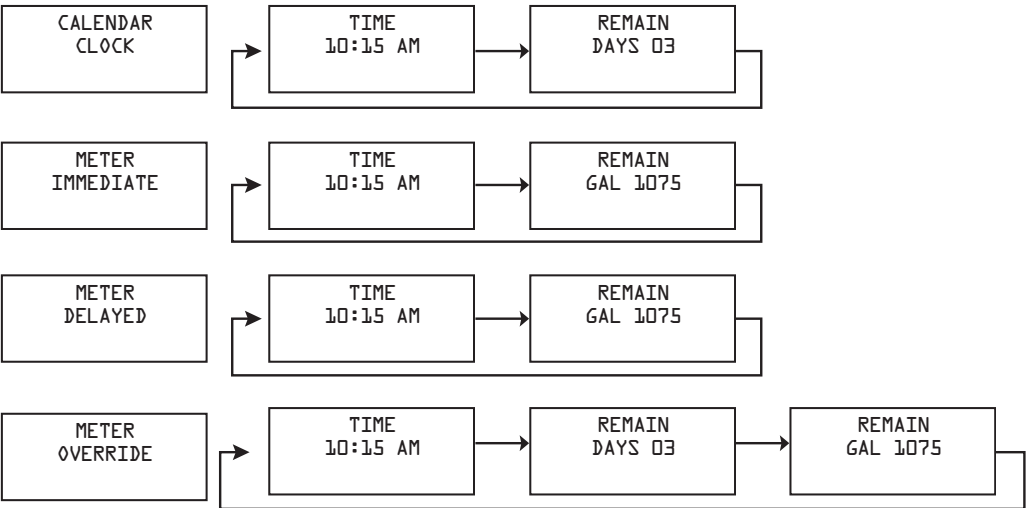
KEYPAD

## 3. Power and Program the Valve

Attach the Transformer cable to the valve and plug in the transformer to the 110V Power outlet. you will notice the two screens on right will alternate.



- Press MENU key  to advance to TIME OF DAY. TIME OF DAY will flash. 
- Press the UP or DOWN key   to adjust the TIME OF DAY. Press & hold the UP or DOWN key   to quickly advance the hour and minutes. When desired time is displayed press SET  to advance to the DAYS setting. DAYSwill flash. 
- Press the UP or DOWN key   to adjust the DAYS (Min 1.Max 199). When desired days is displayed press SET 



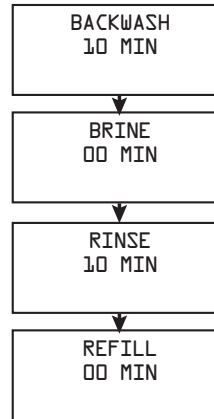
# MANUAL REGENERATION

## Manual Regeneration Using Keypad

Press "Setting Key" Once for Delayed Regenerations or Hold for 5 Seconds for Immediate Regeneration

Below is the sequence of Regeneration cycles

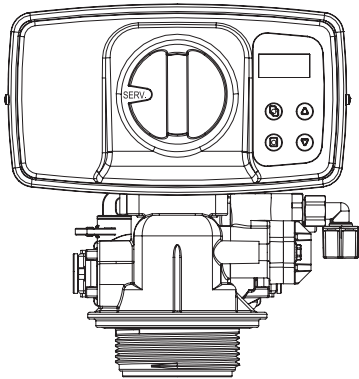
1. Backwash
2. Brine
3. Rinse
4. Brine Refill



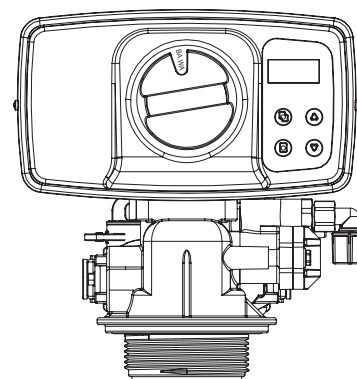
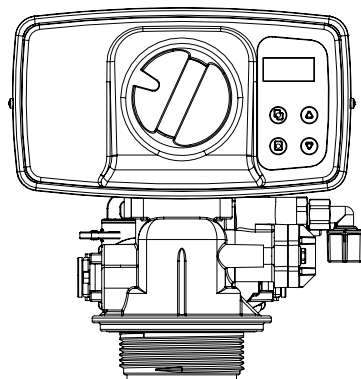
## Manual Regeneration

To start an immediate regeneration turn the knob clockwise from the service position (9:00) to the 10:00 position. Within a few seconds the an immediate regeneration will begin. Using the knob you can manually advance to the next position. Pressing any button will also advance to the next position.

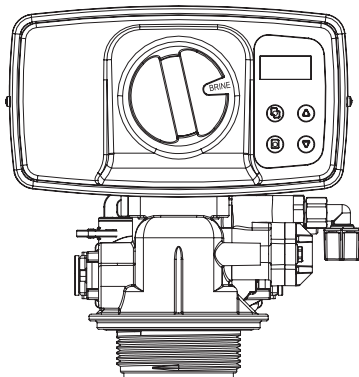
*For Delayed Regeneration, Press Settings Button Once*



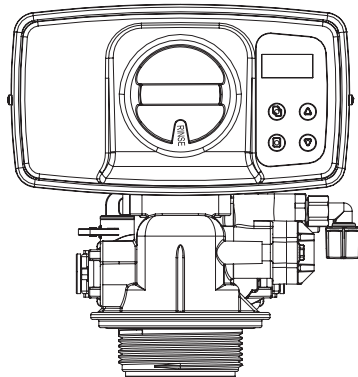
**SERV.**  
Service



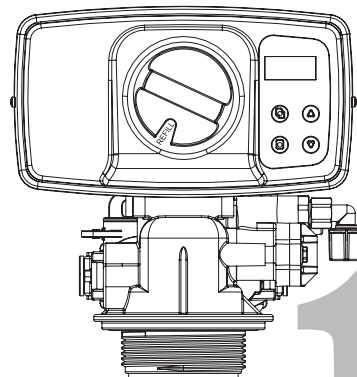
**BA.WA.**  
BACKWASH



**BRINE**



**RINSE**



**REFILL**


# TROUBLESHOOTING GUIDE

Problem	Cause	Correction
<b>1. Filter bleeds taste and odor or sediment</b>	<ul style="list-style-type: none"> <li>A. Bypass valve is open</li> <li>B. Electrical service to unit has been interrupted</li> <li>C. Defective or stripped media bed</li> <li>D. Quality of water has worsened</li> <li>E. Filter capacity too small</li> <li>F. Filter not backwashing enough</li> <li>G. Excessive water usage - calendar clock models</li> </ul>	<ul style="list-style-type: none"> <li>A. Close bypass valve</li> <li>B. Assure permanent electrical service (check fuse, plug or switch)</li> <li>C. Replace media</li> <li>D. Have water sample analyzed to determine any change</li> <li>E. Replace with larger unit or add another filter</li> <li>F. Be sure flow control is not clogged or drain line restricted. Be sure water pressure has not dropped and that pump has sufficient capacity</li> <li>G. Increase frequency of regeneration. Make sure there are no leaks in toilets or sinks</li> </ul>
<b>2. Filter fails to regenerate</b>	<ul style="list-style-type: none"> <li>A. Electrical service to unit has been interrupted</li> <li>B. Timer is defective</li> <li>C. Power failure</li> <li>D. Timer motor does not run</li> </ul>	<ul style="list-style-type: none"> <li>A. Assure permanent electrical service (check fuse, plug or switch)</li> <li>B. Replace timer</li> <li>C. Reset time of day</li> <li>D. Replace defective motor</li> </ul>
<b>3. Filter regenerates every day</b>	<ul style="list-style-type: none"> <li>A. Faulty gear train</li> </ul>	<ul style="list-style-type: none"> <li>A. Check the mechanical linkage on the timer control to eliminate possible binding in the gear train</li> </ul>
<b>4. Loss of water pressure</b>	<ul style="list-style-type: none"> <li>A. Iron or turbidity build-up in filter</li> <li>B. Filter not regenerating often enough</li> <li>C. Not enough water volume or pressure to backwash properly</li> </ul>	<ul style="list-style-type: none"> <li>A. Clean control and treat bed with Iron Out. Increase frequency of regeneration</li> <li>B. Increase frequency of regeneration</li> <li>C. Correct water supply problem</li> </ul>
<b>5. Loss of media through drain line</b>	<ul style="list-style-type: none"> <li>A. Air in water system</li> <li>B. Backwash rate too fast</li> </ul>	<ul style="list-style-type: none"> <li>A. Assure that well system has proper air eliminator control. Check for dry well condition</li> <li>B. Check drain flow control for proper flow rates</li> </ul>
<b>6. Drain flows continuously</b>	<ul style="list-style-type: none"> <li>A. Foreign material in control</li> <li>B. Timer motor stopped or jammed</li> </ul>	<ul style="list-style-type: none"> <li>A. Remove piston assembly and inspect bore. Remove foreign material and check control in various regeneration positions</li> <li>B. Replace timer motor</li> </ul>


# MASTER PROGRAMMING

## Familiarize with Button Configuration:


### Key Pad Configuration:

- 


**MENU**

This function is to enter the basic set up information required at the time of installation.
- 

**SET**

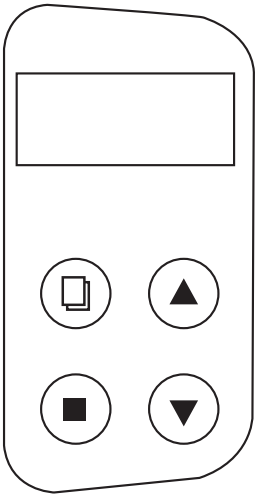
This function is to accept the values if changed and advance to the next page in the menu.
- 

**+**



**-**

These buttons are used to increase or decrease the value of the settings while in the programming mode.



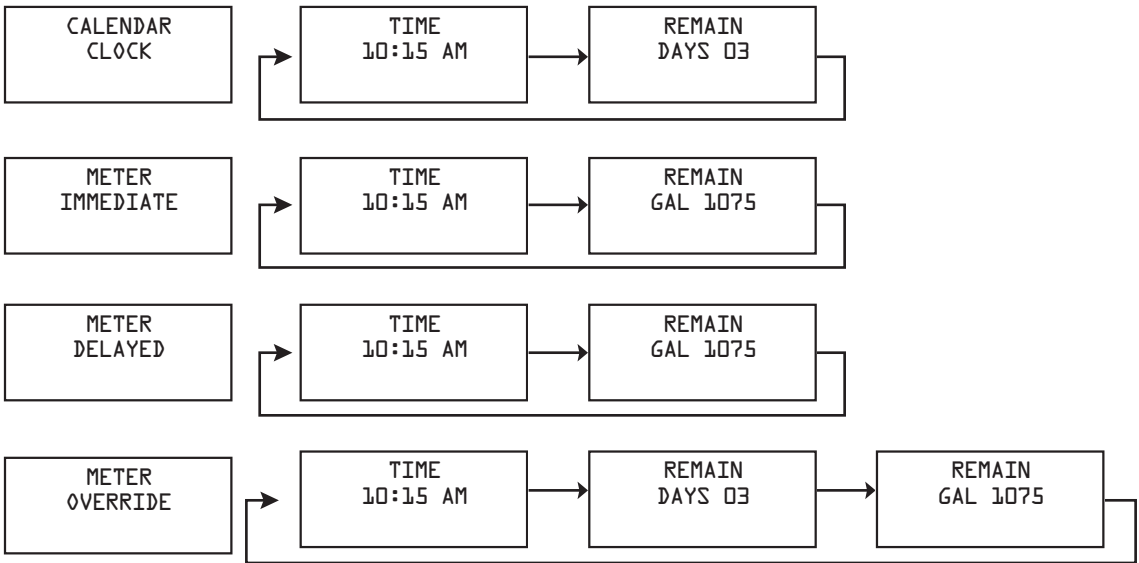
## PROGRAMMING LEVELS

There are 3 levels to the valve program. Master options and Factory options are typically adjusted at the factory. These options link the PCB function with the type of control valve and should not be tampered with. Advanced options are used to configure the unit when the valve is assembled to the tank so that it can function as the proper size and intended system operation. Settings are the final options chosen when the unit is installed to a specific location.

PROGRAM LEVEL	USER ACCESS
MASTER (III)	These settings are programmed by the factory. The settings are important for the operation of the valve that should only be changed by a qualified person.
FACTORY (II)	These settings are programmed by the factory and should be adjusted when the valve is assembled into a unit or system. It contains important settings so the valve will operate properly for the type of system it is intended for. The settings should only be changed by qualified person.
USER SETTINGS(I)	These settings are programmed when the unit is installed. The settings should only be adjusted by a qualified person.

## MAIN DISPLAY OPTIONS

The main display page according to the regeneration mode setting. The display will alternate between the time of day, remaining gallons, and remaining days..



# MASTER PROGRAMMING

## MASTER OPTIONS (LEVEL III)

Press **SET** key  **UP** or **DOWN** key   Hold until you hear a beep (3 seconds).

Press **UP** or **DOWN** key   to advance each page.

Press **SET** key  to initiate a change.

Press **UP** or **DOWN** key   to change value.

Press **SET** key  to accept value. Press **UP** or **DOWN** key   to advance to next page.

### VALVE TYPE

The valve must be designated as either **SOFTENER** or **FILTER**. This change will determine what options are available in the Factory Settings.

### METER RATIO

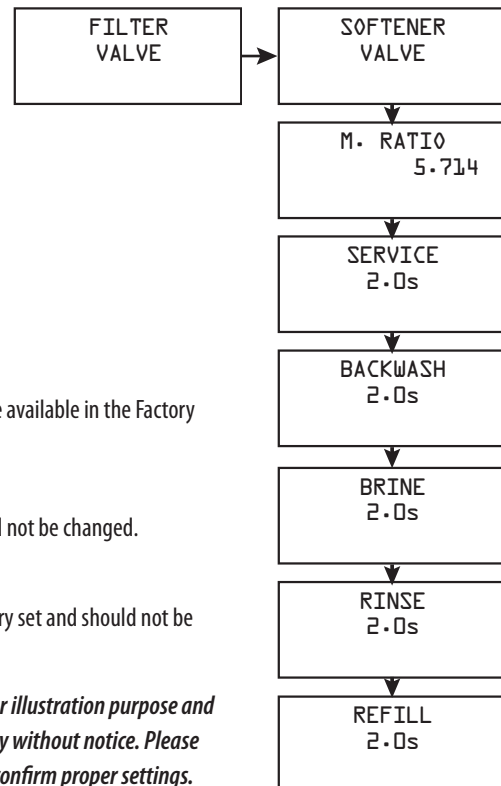
The meter ratio calibrates the pulse from the flow meter into gallons. This value is factory set and should not be changed.

### DELAY SETTINGS

The delay settings are used to precisely stop the motor / piston in the correct position. This value is factory set and should not be changed.

#### **CAUTION:**

*The values in this page are for illustration purpose and can be changed by the factory without notice. Please contact Customer Service to confirm proper settings.*





# MASTER PROGRAMMING

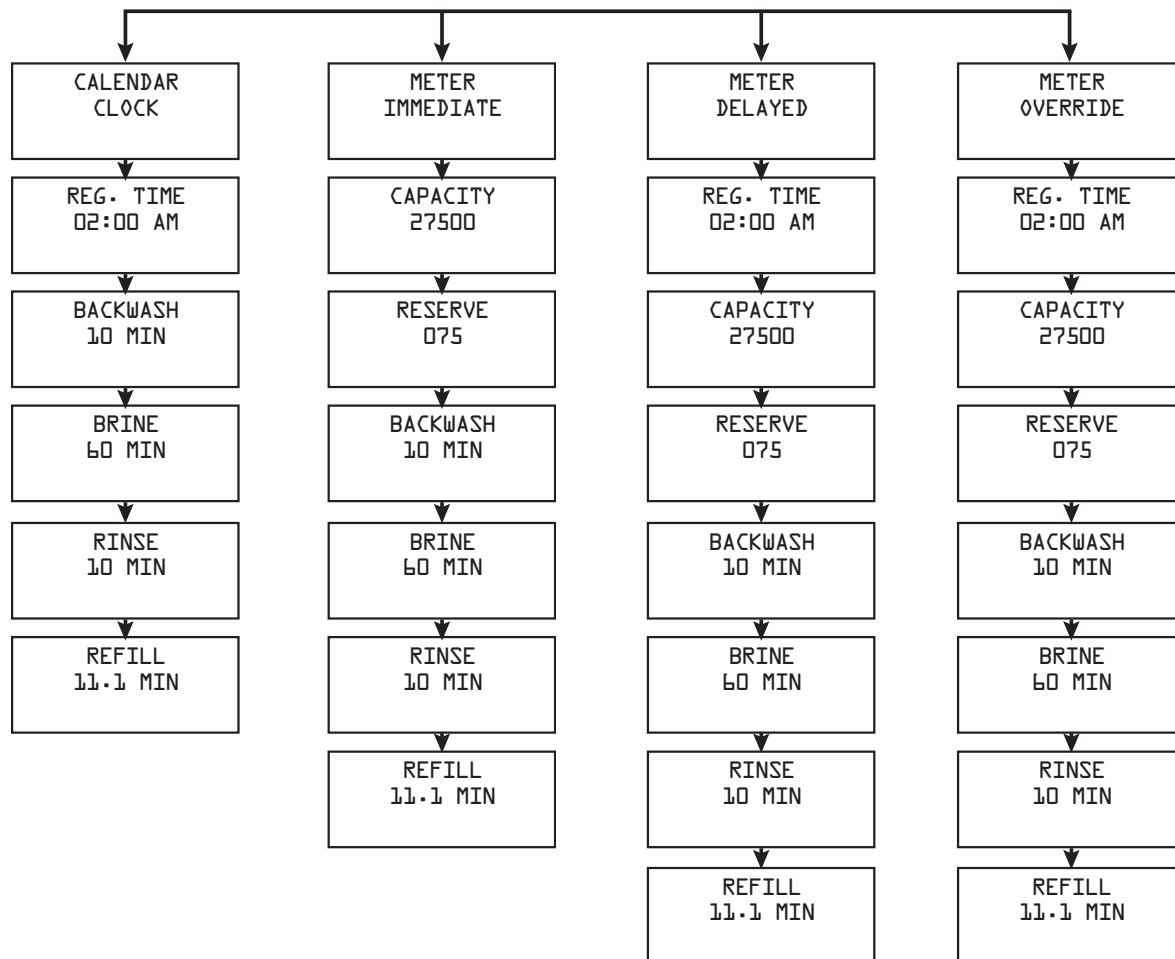
## FACTORY OPTIONS (LEVEL II)

Press UP or DOWN key   Hold until you hear a beep (3 seconds).

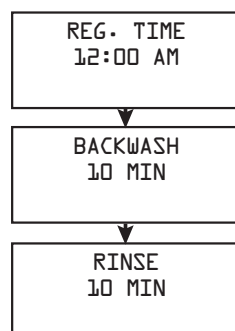
Press UP or DOWN key   to change value.

Press SET key  accept change and advance to next page.

## SOFTENER MODE



## FILTER MODE



### CAUTION:

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# MASTER PROGRAMMING

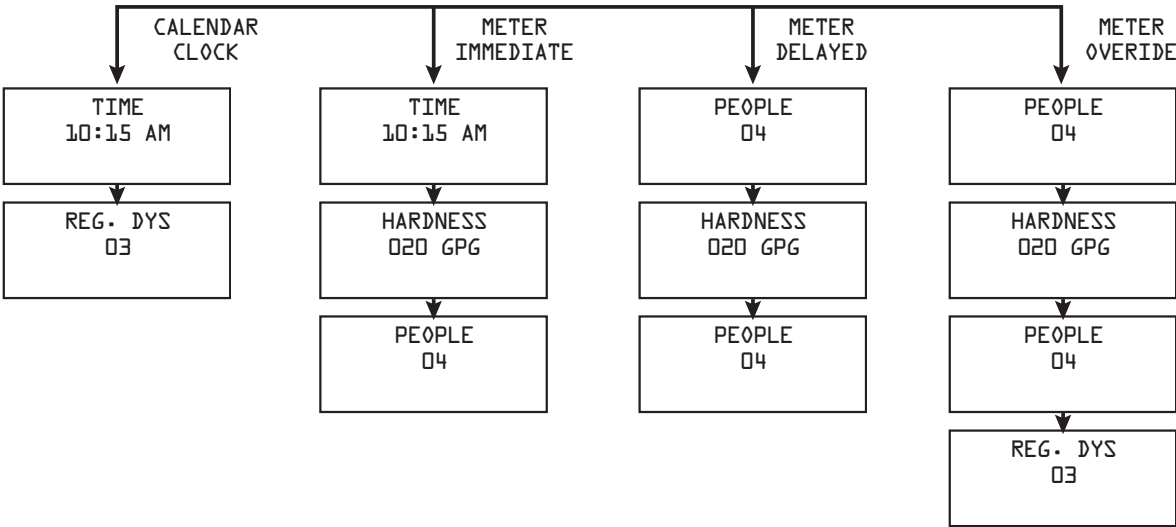
## USER SETTINGS (LEVEL I)

Press **SET** key

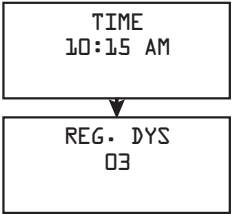
Press **UP** or **DOWN** key to change value.

Press **SELECT** to accept change and advance to next page.

### SOFTENER MODE



### FILTER MODE



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# TECHNICAL SUPPORT

## QUESTIONS?



For questions about your Tier1 whole home water system product installation or performance troubleshooting, please call Tier1 Technical Support at **1-855-378-9116** Monday - Friday, 8 am - 5 pm central time or send an email to [support@tier1water.com](mailto:support@tier1water.com).



[www.tier1water.com](http://www.tier1water.com)

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