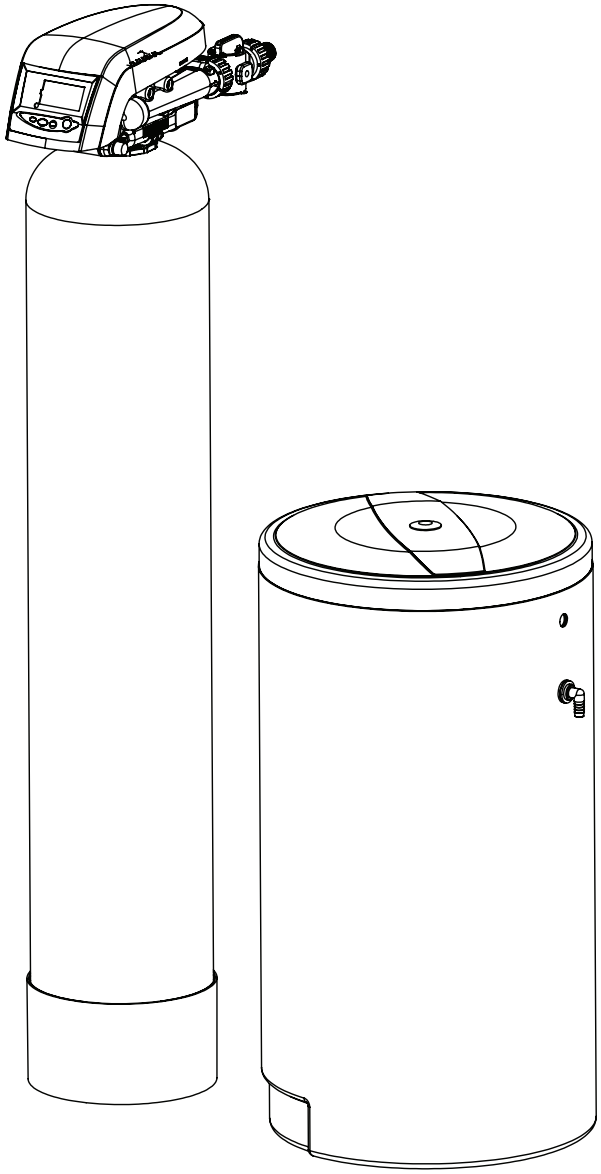
PENTAIR

WaterTrust Pro Series™

WHOLE HOUSE WATER SOFTENING SYSTEMS
1.0, 1.5, 2.0 INSTALLATION AND SERVICE MANUAL



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SYSTEM INFORMATION

POWER REQUIREMENTS

The computer board receives power from an external wall-mount transformer, supplied with each system.
Voltage: The voltage supplied to the computer board is 12V AC.
Frequency: The line frequency is 60 Hz.

WATER PRESSURE

A minimum of 20 pounds of water pressure is required for proper operation of the system. The stated operating pressure range is 20 psi - 125 psi (138 kPa - 862 kPa).

BYPASS VALVE

The bypass valve enables the customer to bypass the system in situations of: emergency leaks in the equipment, service calls and/or outdoor water use.

TEMPERATURE OPERATING RANGES

Operating Temperature Range: 40° F - 100° F (4.4° C - 38° C)

Storage Range: The computer board can be stored at temperatures from -20°C (-4°F) to 70°C (158°F).

Humidity: The computer board operates properly with relative humidity from 10% to 95%, non-condensing.

ENVIRONMENTAL REQUIREMENTS

Location: The water softener and control cannot be exposed to outdoor elements, such as direct sunlight or atmospheric precipitation. The system may be installed in a covered, open-air structure such as a carport, residential or commercial building.

OPERATIONAL SPECIFICATIONS

UNIT SIZE	MODEL	SERVICE FLOW RATE (GAL/MIN)	PSI DROP AT SERVICE FLOW RATE	DRAIN FLOW RATE (GAL/MIN)	CAPACITY AT LOW SALT SETTING(GRAINS)	CAPACITY AT MEDIUM SALT SETTING(GRAINS)	CAPACITY AT HIGH SALT SETTING(GRAINS)	EFFICIENCY (GRAINS/LB. OF SALT)
1.0	PENTAIR WATER SOFTENING SYSTEM 1.0	11	11	2.7	17,113 @ 3.3 LBS	24,575 @ 9.0 LBS.	31,280 @ 15.0 LBS.	5185 @ 3.3 LBS
1.5	PENTAIR WATER SOFTENING SYSTEM 1.5	11	15	2.7	27,076 @ 4.95 LBS	38,883 @ 13.5 LBS	49,491 @ 15.0 LBS	5470 @ 4.9 LBS
2.0	PENTAIR WATER SOFTENING SYSTEM 2.0	14.5	15	3.9	36,102 @ 6.6 LBS	51,844 @ 18 LBS	65,988 @ 30 LBS	5470 AT 6.6 LBS

SYSTEMS TESTED AND CERTIFIED BY WQA ACCORDING TO NSF/ANSI 44 FOR THE REDUCTION CLAIMS SPECIFIED ON THE PERFORMANCE DATASHEET, CSA B483.1 AND NSF/ANSI 372.

APPLICATION LIMITATIONS

- This system may be applied on municipality or well water systems. On hardness levels of 60 grains and higher, the system may not achieve a hardness of less than 1 grain, due to high Total Dissolved Solids. (Some bleed through is possible.) Bleed through can also be caused by Sodium levels higher than 1000 ppm. In either case, your system can be programmed to minimize these effects. See page 10.
- When this system is installed on water with ferrous iron, also known as clear water iron, the maximum range of reduction is based on local water conditions. The range is generally below 3 parts per million. Your equipment may require special programming, along with an additive to the brine tank, to maximize the equipment's ability to reduce iron. See page 10.

MAINTENANCE REQUIREMENTS

SALT RECOMMENDATIONS

Two kinds of salt are recommended for water conditioners:

1. Block Salt: Water conditioner block salt is reasonably priced, low in impurities and will not cake in the salt container. Block Salt is pressed into the shape of a cattle block.
2. Solar Salt: Solar Salt is 98% pure salt, reasonably priced and low in impurities. Solar Salt is in the shape of pellets.

THE REGENERATION VALVE

The regeneration valve is designed to last many years, but from time to time it may be necessary to clean and lubricate the moving parts. Your water quality and the amount of regenerations necessary will affect this maintenance schedule.

TESTING THE WATER

The water should be tested periodically (2 times a year minimum) with hardness test strips to ensure that the system is performing accurately. Additional test strips can be purchased from the Order Department. Test strip order number: 38306 pack of 50 test strips.

PRE-INSTALLATION INSTRUCTIONS

- Do not install this system where water is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
- This system must be installed in an area that is not affected by extreme heat, cold or the elements. The selected installation area must be adequate for easy service of all parts.
- This system must be installed in accordance with all applicable state and local laws and regulations.
- This system is designed to treat cold water only and can be installed on any cold water supply.

INSTALLATION INSTRUCTIONS

1. SAFETY PRECAUTIONS

- To prevent accident or injury, do not hoist the unit over your shoulder. Use a hand truck to transport the unit. *Note: Do not lay the unit on its side during transportation and/or installation.*
- Wear safety glasses and work gloves during installation and service.

2. TEST THE WATER HARDNESS

- The test strip provided is for testing the water hardness after the installation is complete to ensure the system is functioning properly and for periodic testing. When programming the control it is necessary to know the exact water hardness in grains per gallon. If you are using municipal water, your local water providers should be able to give you the hardness level. If you are using water from a private well, if may be necessary to have the water tested locally.

3. CHECK WATER PRESSURE

- Use a pressure gauge to confirm that the water pressure does not exceed 125 psi. If the water pressure does exceed this limit, install a pressure regulator on the inlet pipe of the unit. The minimum pressure for a conditioner is 20 psi. 60 psi is the optimum operating pressure.

4. LOCATE A SITE FOR THE UNIT

- There are three primary requirements needed for a site: the main water source, a drain (the drain may be a floor drain, a sewer trap, utility sink, vent stack, dry well, etc., depending on local plumbing codes) and an electrical connection. Locate the system as close to these items as practical. Avoid drain lines over 25 feet long. In most applications, bypass any outside faucets.
- Place the unit in the desired location. The location must have a level, smooth surface.
- If the system is located outdoors, protect the unit from direct sunlight. (Direct sunlight can damage the fiberglass and other system components.) If necessary, build a box or shed. *Note: The system can only be installed outdoors in climates that do not reach freezing levels.*

5. TURN OFF THE WATER AND DRAIN THE PLUMBING

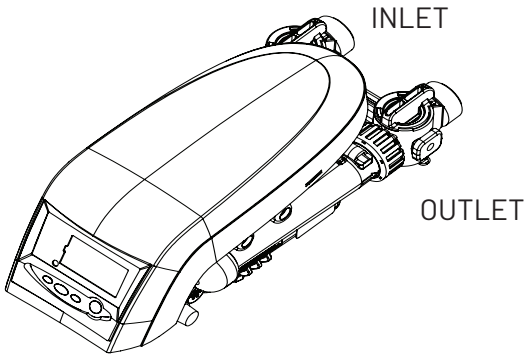
- Turn off the water at the meter or the pressure tank.
- Drain all the pipes. Do not sweat the pipes with water in them; steam will damage plastic parts in the valve.
- To drain the plumbing system, open all the faucets in the house and flush the toilets. This procedure will allow air to enter the plumbing system. The water will drain out of the lowest faucet or outlet.

6. BYPASS THE OUTSIDE FAUCETS

- When possible it is best to bypass the outside faucets. However in some cases the outside faucets can not be accessed. In this situation the bypass valve should be used whenever watering outside for extended periods of time. If the installation is outside or in a garage a faucet can be installed on the inlet water side to provide an option for untreated water.

7. CONNECT THE PLUMBING TO THE BYPASS VALVE AND BRINE TANK

- Do not point the soldering torch directly at the system. The thermo-plastic material will last a lifetime, within normal operating temperatures, but will melt in a torch flame.
- To prevent hot water from backing up into the conditioner, avoid short connections of pipe between the conditioner and the hot water heater. If you can't avoid a short connection, move the equipment to another location. As a last resort, install a check valve. If the check valve causes "water hammer", install a water hammer suppressor.
- Connect the raw water pipe to the INLET pipe connection of the bypass valve. When looking at the front of the unit, the inlet is the pipe connection on the LEFT side of the valve.
- Connect the treated water pipe to the OUTLET pipe connec tion of the bypass valve. When looking at the front of the unit, the outlet is the pipe connection on the RIGHT side of the valve.
- Install the brine line to the brine tank.



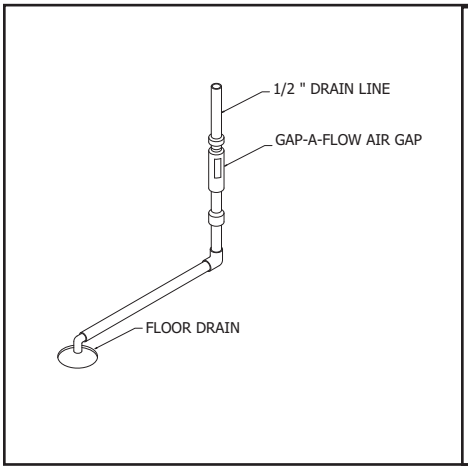
8. PLUMBING GROUND CONNECTION

- In some homes, metal piping may serve as a ground connection for the home electrical system. Installing a Pentair Softener with its nonmetallic valve body will interrupt the ground connection. Whenever a system is installed on metallic plumbing, we recommend you use grounding pipe clamps and a ground cable to maintain continuity of the ground connection from the inlet to the outlet pipe. ¼" bare stranded wire is recommended for the ground cable. Check electrical continuity of the connection after installation.

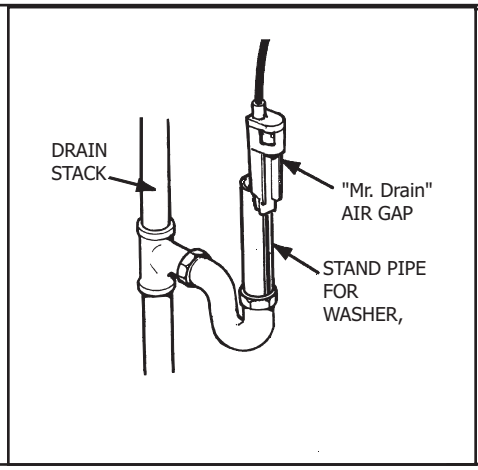
9. INSTALL THE DRAIN LINE AND AIR GAP (AIR GAP NOT INCLUDED WITH THE UNIT)

- Using the supplied drain line fitting use Teflon tape on the threads and attach to the top of the valve. Run 1/2 inch I.D. flexible drain line tubing (not supplied) to an appropriate drain. Most local codes require an air gap. See pictures below.

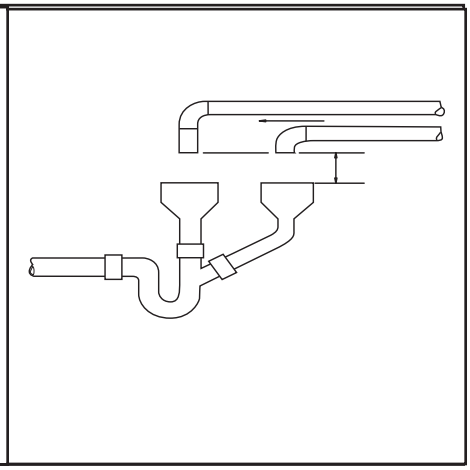
Note: Drain line may be plumbed with rigid pipe or PEX, If required by local code. The drain connection on the valve will accommodate any standard 3/4 inch NPT fitting.



Air Gap - Floor Drain
Part Number: 13142

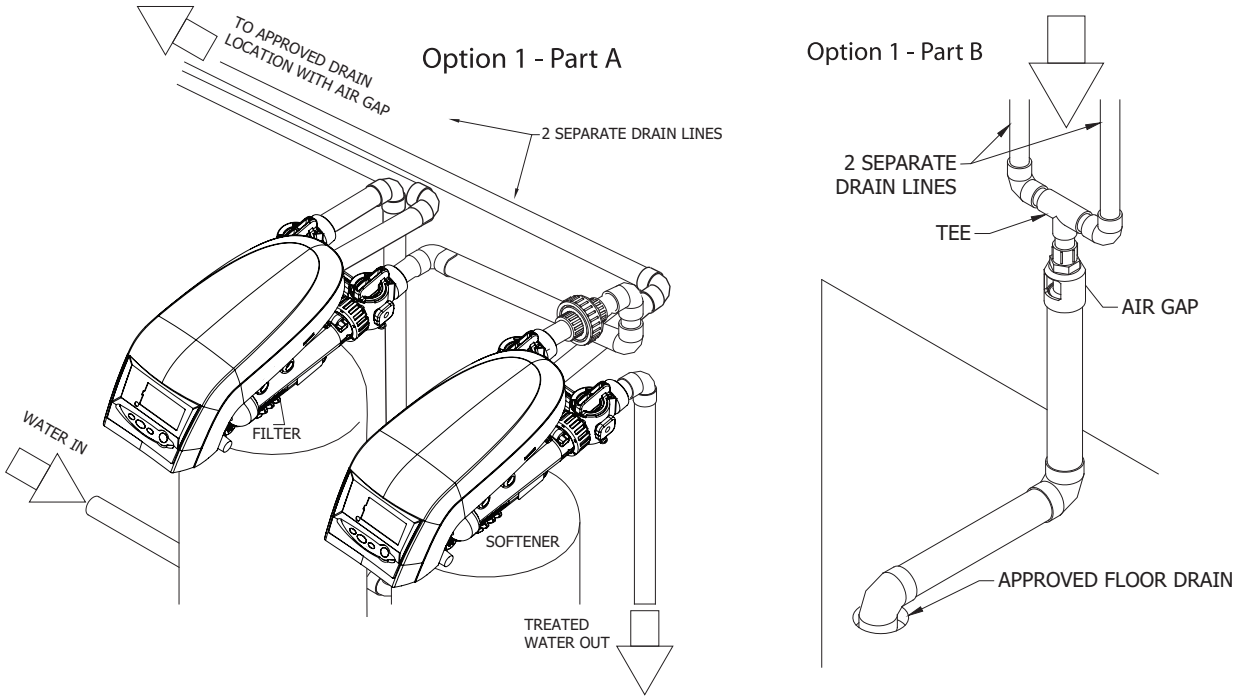


Air Gap - "Mr. Drain"
Part Number: 14199

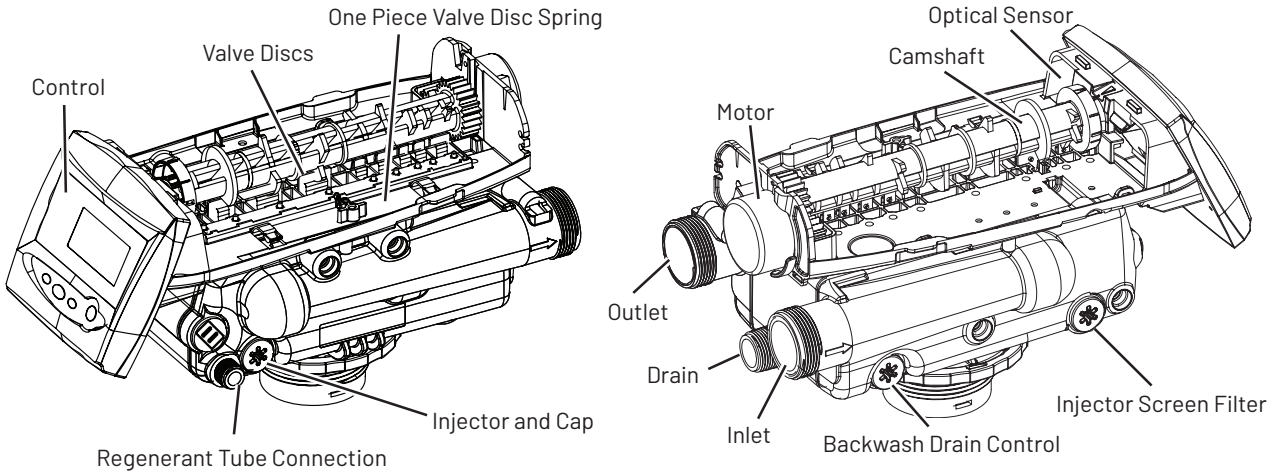


Standard Air Gap

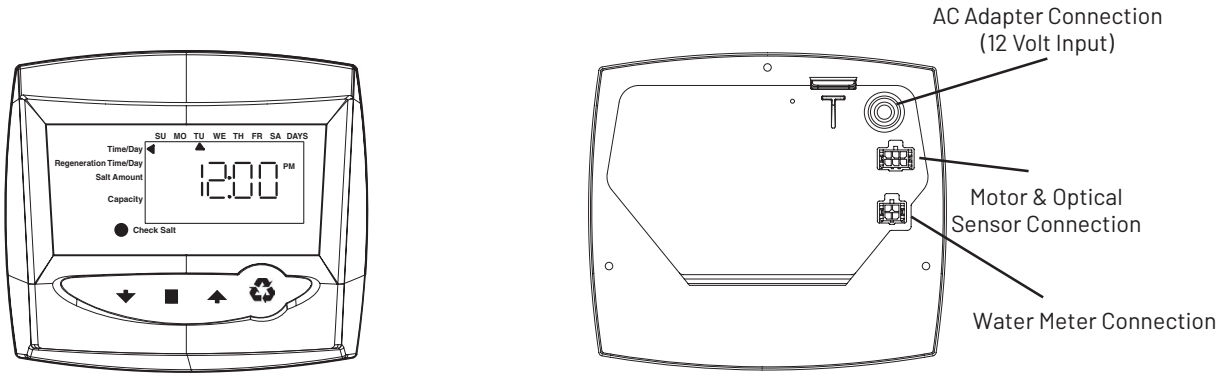
Install the drain lines from both systems (see Part A). Then terminate the lines separately using an air gap device or connect them together as shown in Part B.



VALVE LAYOUT



CONTROL LAYOUT



DISPLAYS, ICONS AND CURSORS

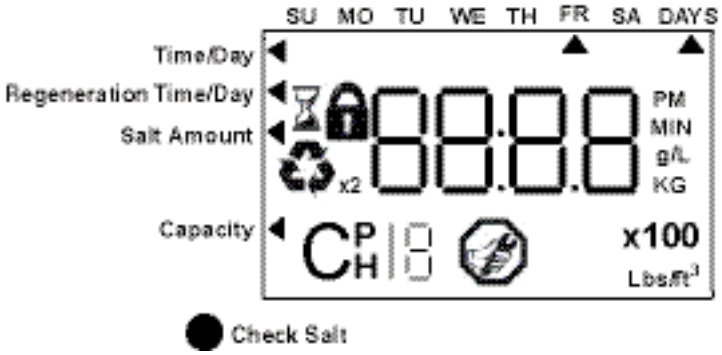


Figure 15.

Note: In normal operation and during programming, only a few of the icons will actually be displayed.

1. Used to select and indicate the actual Day of the Week setting.
2. This cursor is displayed when programming the Days Override.
3. PM indicator displayed when setting Time of Day and Time of Regeneration. Note: There is no AM indicator.
4. Indicates displayed value in minute increments.
5. Indicated kilograins or kilograms when estimated capacity is displayed.
6. Used to display "P", "H", and "C" parameter.
7. Indicates access into "H" Level IV History viewing.
8. Indicates access into "P" Level II programming.
9. Used to display cycle position during regeneration. Also indicates access into "C" Level III cycle programming.
10. This cursor is displayed during Level I programming: Time of Day, Regen Time, Day, Salt, etc.
11. When flashing, this indicates regeneration is to occur at next Time of Regen. Appears as a solid icon during regeneration.
12. When hourglass is flashing, this indicates that the control is moving to a regeneration cycle. Appears as a solid icon during a cancelled regeneration and the control is cycling directly back to the home position.
13. Indicates the selected program setting has been locked out. Lock settings are changed in Level II programming.
14. Indicates double regeneration.
15. Normally off. Will glow red if salt brine is not reaching the valve during recharge. Indicates out-of-salt condition.
16. Maintenance display turns on if the months in service exceed the value programmed in P11 "Service Interval".
17. When Lbs/ft^3 is displayed, the value for regenerant amount entered is in pounds per cubic foot.
18. X100 multiplier for large values.
19. When "g/L" is displayed the valve is in grams per liter.

BUTTON FUNCTIONS

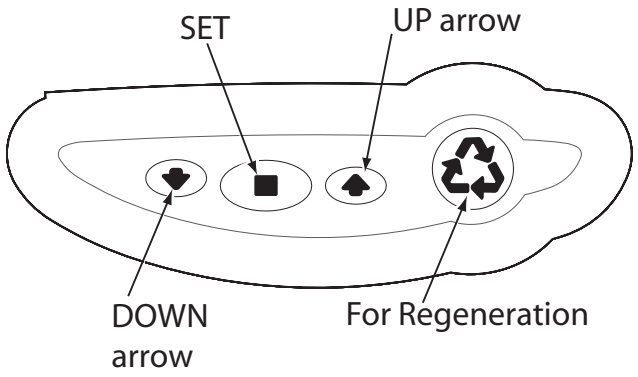


Figure 16.

DOWN and UP Arrows: Used to scroll through settings or change setting value.

SET: Used to enter a setting into memory or activate a setting to be changed.

REGEN: Used to command the control to regenerate and enable or disable lockout setting.

PROGRAMMING OVERVIEW

The control includes multiple program levels that allow the Wat er Treatment Professional to customize the system for many water conditions. Additionally, historical data can be viewed allowing quick and easy troubleshooting. In most cases, Level I programming is all that is required to set up the water conditioning system for proper operation. A brief description of each program level is listed below.

- Level I: Used to program control for normal applications..
- Level II: (P-Values) Allows the installer to customize programming for non-standard applications.
- Level III: (C-Values) Allows the installer to adjust the length of select cycles for non-standard applications.
- Level IV: History (H-Values) Allows access to historical information for troubleshooting the system.

Note: If a button is not pushed for thirty seconds, the control returns to normal operation mode.

CONTROL OPERATION

Power Loss Memory Retention

The control features battery-free Time of Day and Day of Week retention during loss of power. A super capacitor is designed to hold the information in memory for 8 to 24 hours depending on the installation. If the super capacitor is exhausted, the control will display four dashes (- - :- -) immediately upon po wer up. The Time of Day and Day of Week must be reset.

All other programmed parameters are stored in the static memory and are retained during power outages.

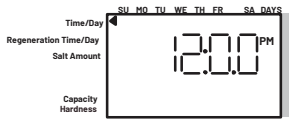
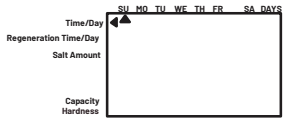
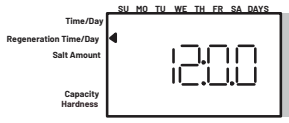
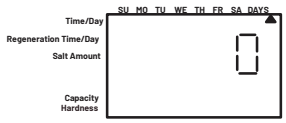
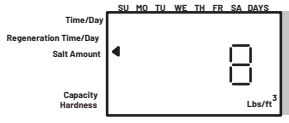
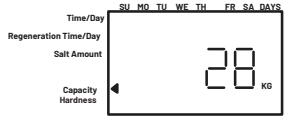
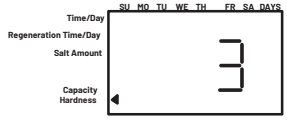
LEVEL I PROGRAMMING

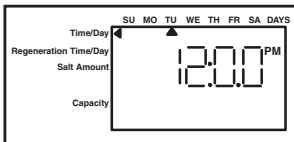
The control can be quickly programmed by following the sequential procedure on the following page. Level I program parameters are those that can be accessed by pressing the UP or DOWN buttons.

- Time of Day: Includes PM indicator. Can be set to display as a 24-hour clock. See Level II Programming.
- Day of Week: Set to actual day of the week.
- Time of Regeneration: Fully adjustable. Default is 2:00 AM.
- Days Override: Range 0.5 to 99 days. Leave at 0 to disable.
- Salt Dosage: Set at pounds of salt per cubic foot of resin in the conditioner tank.
- Hardness: Range xx to xx grains.

Note: When the control is set up for a twelve-hour clock a PM indicator will illuminate when the displayed time is in the PM hours. There is no AM indicator.

SOFTENER QUICK PROGRAMMING

Screen	Buttons to	Description	Range
	press ■ then ▼ or ▲ press ■	**1. Time of Day (12 hr.)** Set to time of day Note: Setting includes PM indicator.	
	press ■ then ▼ or ▲ press ■	**2. Day of Week.** Set to actual day of the week	
	press ■ then ▼ or ▲ press ■	**3. Time of Regeneration** Set to desired time of regeneration	
	press ■ then ▼ or ▲ press ■	**4. Days Override** Leave at 0 to disable or set to desired days between regeneration	Days: 1 to 30
	press ■ then ▼ or ▲ press ■	**5. Salt Dosage** Set to desired desired dosage lbs per cubic feet of resin	Lbs/ft^3: 3 to 18
	press ■ then ▼ or ▲ press ■	**6. Capacity** System capacity is displayed in total kilograins or kilograms of hardness removed before a regeneration is necessary. The value is calculated from the system's resin volume input and salt amount input, therefore it does not need any adjustments.	
	press ■ then ▼ or ▲ press ■	**7. Hardness** Set the inlet water hardness at installation site. Default hardness setting is 25 grains	



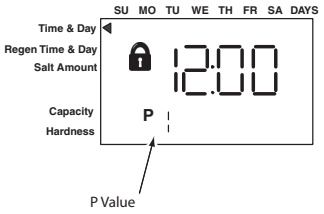
Service Display
Displays actual day of the week and time of day.
in alternance with the remaining capacity

Note:

Upon completing the Level I Programming, the Regen icon will begin flashing, indicating that a delayed regeneration will occur at the next programmed time of regeneration. If a delayed regeneration is not desired, press the REGEN button to disable the delayed regeneration and the system will regenerate by water usage.

LEVEL II PROGRAMMING – P VALUES

Level II program parameters can be adjusted and used to fine-tune the conditioner's operation. The parameters are accessible by pressing and holding the UP and DOWN buttons until the control displays a "P" value. Note: The control must be in the home position to change settings. See Table below for Level II parameters. Typically the Level II parameters will not need to be adjusted, as the default settings accommodate most applications. Contact your Water Treatment Professional before attempting any programming.



The 742/762 features a special programming level that allows the installing dealer to make changes to the control for more demanding applications. The home owner/end user should never have to access this level.

To enter Level II programming press and hold UP and DOWN for 5 seconds. A "P" value will be displayed indicating Level II.

Level II menus include:

P1 = Time of day

P2 = Day of week

P3 = Time of regeneration

P4 = Number of days between regeneration (99 day calendar override)

P5 = Not used (742 only)

P6 = Amount of regenerant used per regeneration or filter backwash time (salt setting)

P7 = System capacity

P8 = Hardness

P9 = Units of measure

P10 = Clock mode

P11 = Service interval

P12 = Remote regeneration switch delay

P13 = Refill sensor control (conditioner only)

0 = Off

1 = Salt detector only

2 = Chlorine generation

P14 = Refill rate (conditioner only)

P15 = Draw rate (conditioner only)

P16 = Reserve type

P17 = Initial average or fixed reserve

P18 = Flow sensor select

P19 = K-factor or pulse equivalent

Pr = Refill First option

Pd = Remote switch operation (742 only)

See the Logix Professional dealers manual for further details on setting Level II parameters.

Accessing History Values

The 742/762 features a review level that displays the operation history of the system. This is a great troubleshooting tool for the control valve.

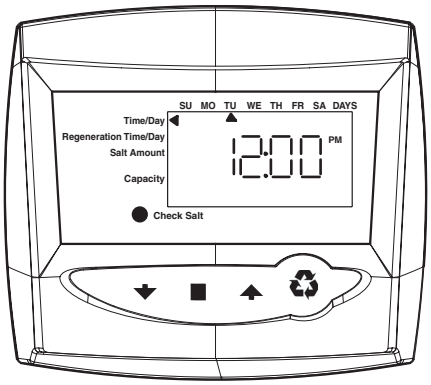
To access history values, press and hold SET and DOWN for five seconds to view the "H" levels.

History Values

	Description	Range	Notes
H0	Initial setting value	Cubic feet or liters	Resin volume
H1	Days since last regeneration	0 – 255	
H2	Current flow rate	Depends on turbine used	762 only
H3	Water used today in gallons/m^3 since Time of Regeneration	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H4	Water used since last regeneration in gallons/m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H5	Total water used since reset in 100s	0 – 999,900 gallons or 0 – 9,999 m^3	762 only
H6	Total water used since reset in 1,000,000	4,294 x 106 gallons or 4,264 x 104 m^3	762 only
H7	Average usage for Sunday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H8	Average usage for Monday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H9	Average usage for Tuesday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H10	Average usage for Wednesday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H11	Average usage for Thursday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H12	Average usage for Friday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H13	Average usage for Saturday in gallons or m^3	0 – 131,070 gallons or 0 – 61,310.70 m^3	762 only
H14	Average service cycle	0 - 255 days	762 only
H15	Peak flow rate	0 - 200 gpm or 1,000 Lpm	762 only
H16	Day and time of peak flow rate	Time and day that peak flow occurred	762 only
H17	Months since service	0 - 2,184 months	
Hr	Number of regenerations since last serviced	0 - 65,536	

PROGRAMMING THE LOCKOUT FEATURE

All parameters can be locked out when the control is in Level II programming. Simply press the REGEN button during Level II programming and a Lock icon will appear indicating that the specific setting has been locked out. When locked out, the setting cannot be adjusted. To disable the Lock Out Feature, press the REGEN button when in Level II. The lock icon will not be displayed.



LEVEL III CYCLE PROGRAMMING – C VALUES

Several Level III program parameters can be adjusted to fine-tune a conditioner's operation for non-standard applications. Typically these parameters will not need to be adjusted, as the default settings accommodate most applications. Contact your Water Treatment Professional before attempting any programming. The parameters are accessible by pressing and holding the UP and SET buttons until the display shows a "C" value.

Note: The control must be in the treated water position to change settings.

C#	Description	Range	Minimum Increments	Default Setting	Notes
C1	Backwash	0 – 200	1 Min	10	Flow rate dictated by size of drain line flow controller
C2	Regenerant Draw	Not Adjustable	1 Min	See Notes	Automatically calculated from resin volume and salt dosage settings
C3	Slow Rinse	0 – 200	1 Min	See Notes	Automatically calculated from resin volume and salt dosage settings
C4	Repressurization	0 – 200	1 Min	3	Allows system to equalize water pressure across valve discs
C5	Fast Rinse	0 – 200	1 Min	4	Rinses residual regenerant from tank
C6	2nd Backwash	0 – 200	1 Min	1	Disperses non-regenerated areas of the resin bed
C7	2nd Fast Rinse	0 – 200	1 Min	1	Rinses to Quality
C8	Regenerant Refill	Not Adjustable	1 Min	See Notes	Automatically calculated from resin volume and salt dosage settings
C0	Service/Brine Prep	0 - 200	1 Min	120	Used in fill first models only. Brine prep allows brine to come up to concentration after refill.

PLACING WATER CONDITIONING SYSTEM INTO OPERATION

Quick Cycling the Control

It is required that the control be quick cycled to specific regeneration cycles when placing the conditioner into operation. Please review the following instructions for quick cycling the control before proceeding to startup.

1. With the control in the treated water position, press and hold the REGEN button on the control for five seconds. This will initiate a manual regeneration. The control will display an hourglass indicating that the motor and camshaft are turning. The control also displays the total regeneration time remaining. When the control reaches the backwash cycle, the hourglass is no longer displayed and the motor will turn off. Pressing the SET button will display the time remaining for the current cycle.
2. Press and release the UP and SET buttons to move the control to the next cycle.

Note: The control can be sent directly back to the treated water position from any regeneration cycle. Press the UP and SET buttons (about 5 seconds) until the hourglass icon appears solid. The control will now skip all remaining regeneration cycles.

Startup

After you have programmed the control, the conditioner will need to be placed into operation. Follow these steps carefully.

1. Remove the cover from the valve. Removing the cover will allow you to see that the camshaft is turning, and in which cycle the camshaft is currently positioned.
2. With the supply water for the system still turned off, position the bypass valve to the "not in bypass" (normal operation) position.
3. Press and hold the REGEN button on the control for five seconds. This will initiate a manual regeneration. The control will display an hourglass, indicating that the motor and camshaft are turning to the backwash cycle (C1). The control also displays the total regeneration time remaining. When the control reaches the backwash cycle, the hourglass is no longer displayed and the motor will turn off. Pressing the SET button will display the time remaining for the current cycle.
4. Fill the media tank with water.
   A. While the control is in cycle (Backwash), open the water supply valve very slowly to approximately the 1/4 open position. Water will begin to enter the media tank. Air will begin to be purged to drain as the media tank fills with water.

WARNING: If the supply valve is opened too rapidly or too far, media may be lost out of the tank into the valve or the plumbing. In the 1/4 open position, you should hear air slowly escaping from the valve drain line.

   B. When all of the air has been purged from the media tank (water begins to flow steadily from the drain line), open the main supply valve all of the way. This will purge the remaining air from the tank.
   C. Allow water to run to drain until the water runs clear from the drain line. This purges any debris from the media bed.
5. Add water to the regenerant tank.
   D. With a bucket or hose, add approximately 4 gallons (15 liters) of water to the regenerant tank. If the tank has a salt platform in the bottom of the tank, add water until the water level is approximately 1 inch (25 mm) above the platform.

Note: It's recommended that you do not put regenerant into the tank until after the control valve has been put into operation. With no regenerant in the tank, it is much easier to view water flow and motion in the tank.

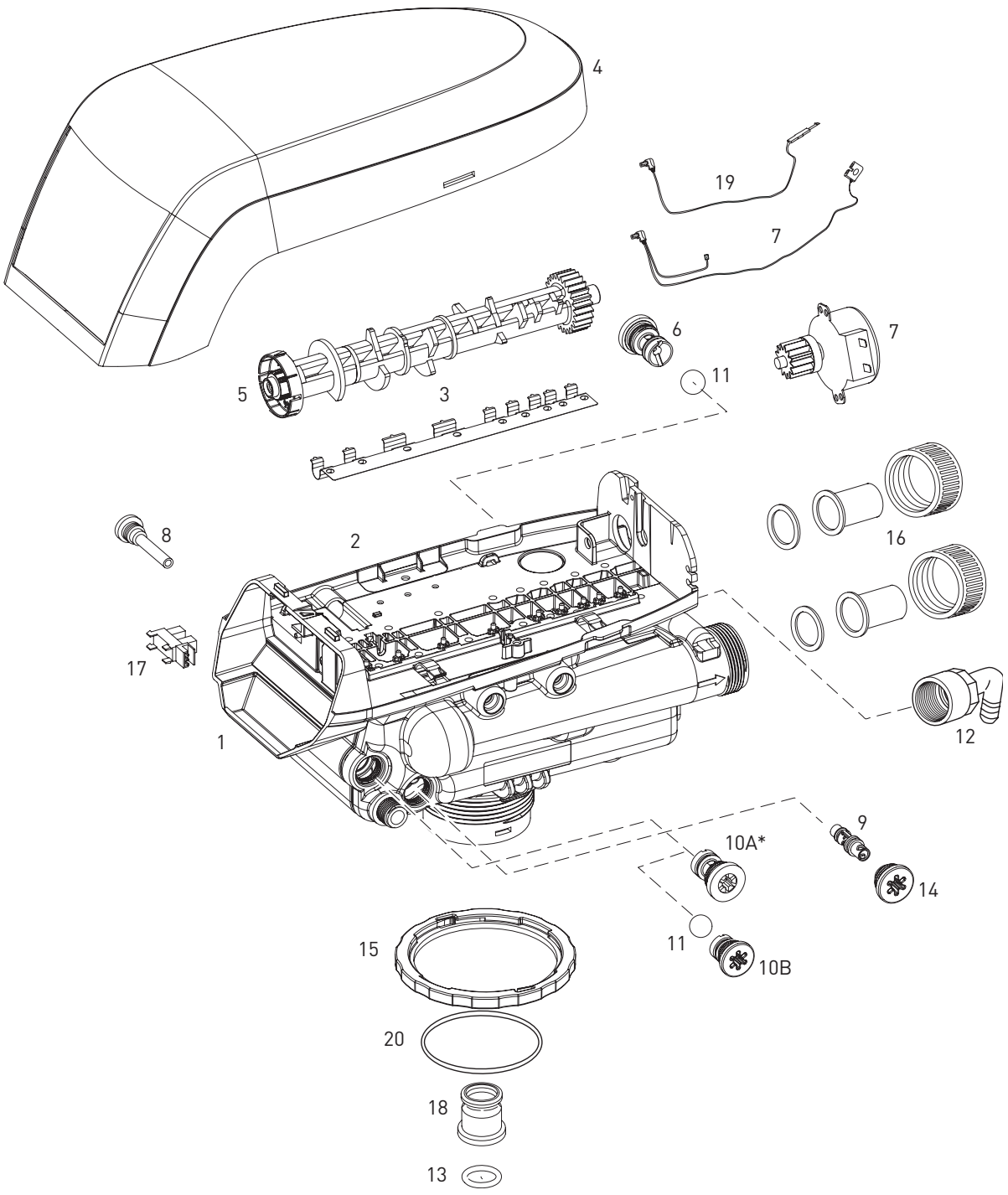
6. Prime the regenerant line.
   A. Slowly open the main water supply valve again to the fully open position. Be sure not to open too rapidly, as that would push the media out of the media tank.
   B. Quick cycle the control to the regenerant tank Refill position (C8).

Note: As you advance through each cycle, there will be a slight delay before you can advance to the next cycle. There will be a pause after the regenerant draw and slow rinse cycles. This cycle (C4) is a repressurization cycle and is designed to allow the water pressure to equalize on each side of the valve discs. Allow the control to repressurize (three minutes) before cycling the control to the regenerant tank refill position.

   C. The control will cycle to the regenerant tank refill cycle and water will be directed down through the regenerant line to the regenerant tank. Let the water flow through the line until all air bubbles have been purged from the line.
   D. Once the air is purged from the line, press the SET button and the UP button simultaneously to advance to Treated Water position.
7. Check Regenerant Draw.
   A. From the treated water position, initiate a manual regeneration.
   B. The control will begin a manual regeneration, and advance the control valve to the backwash cycle. Press the SET and UP button to advance to regenerant draw/slow rinse cycle.
   C. C2 will be displayed. With the control in this position, check to see that the water is being drawn out of the regenerant tank. The water level in the regenerant tank should recede very slowly.
   D. Observe that water is being drawn from the regenerant tank for at least three minutes. If the water level does not recede, check all regenerant line connections for air leaks.
8. If the water level is receding from the regenerant tank, you can quick cycle the control back to the treated water position by pressing SET and the UP buttons simultaneously.
9. Finally, turn on a faucet plumbed after the water conditioner. Run the faucet until the water runs clear.
10. Add the appropriate amount of regenerant to the regenerant tank.

THE WATER CONDITIONING SYSTEM IS NOW FULLY OPERATIONAL.

CONTROL EXPLODED VIEW

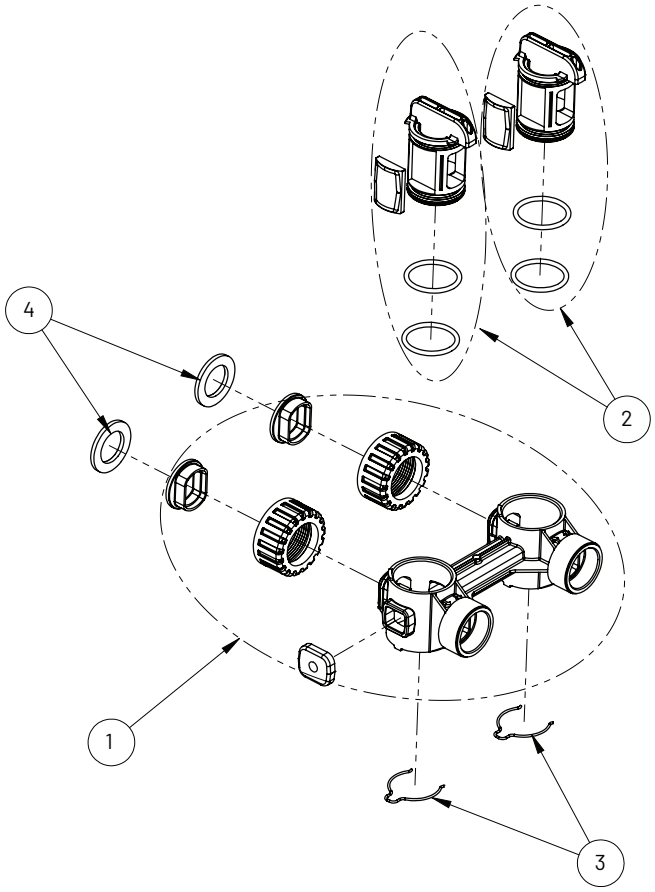


⚠ WARNING: Do not use the flow control ball with #10A.

CONTROL PARTS LIST

WHOLESALES SYSTEMS SERVICE PARTS			
*	1041174	Flappers Service Kit	1
WHOLESALES SYSTEMS REPAIR PARTS			
1	1244651	Valve Assembly W/O Flow Controls	1
2	1235338	Top Plate, 268/700 Series Valves	1
3	1235339	Valve Disc Spring, One Piece	1
4	1236246	Cover, Valve, 255/Performa 700/860 Series Controller	1
5	1235352	Camshaft Standard	1
	4000806	AIO Camshaft	1
6	1000212	Flow Control For 1.0 & 1.5 Softeners & Tannin	1
	1000213	Flow Control For 2.0 Softeners & Tannin	1
	1030355	Flow Control, Ext, 5 GPM	1
	1030356	Flow Control, Ext , 6 GPM	1
	1030357	Flow Control, Ext , 7 GPM	1
7	3019221	Motor/Optical Cable Assembly	1
8	1000226	Screen Cap Assembly With O-ring	1
9	1035734	Injector For 1.0 & 1.5 Cu Softeners	1
	1035735	Injector For 2.0 Cu Softeners	1
10	1000222	Brine Flow Control For Softeners & Tannin Filter	1
11	1030502	Ball, Refill Flow Control For Softeners & Tannin Filters	1
	1030334	Refill Plug For Carbon & Acid Filters	1
12	1002449	Drain Fitting Elbow	1
13	1010428	O-ring	1
14	1000269	Injector Cap With O-ring	1
15	1035622	Tank Ring	1
16	1001769	Autotrol 3/4" Connection Kit	1
	1001603	Autotrol 1" Connection Kit	1
*	1041174	Flappers Kit	1
*	38191	Valve Bypass	1
17	1235373	Optical Sensor	1
19	1235446	Turbine Cable	1
20	1010154	Tank Oring	1
*	1033444	Internal Turbine Meter	1
*	1233187	Motor Lock Pin	1
	44149	Autotrol 268 Valve Transformer US	1
	1242168	762 Controller NA	1
	1242162	742 Controller NA	1

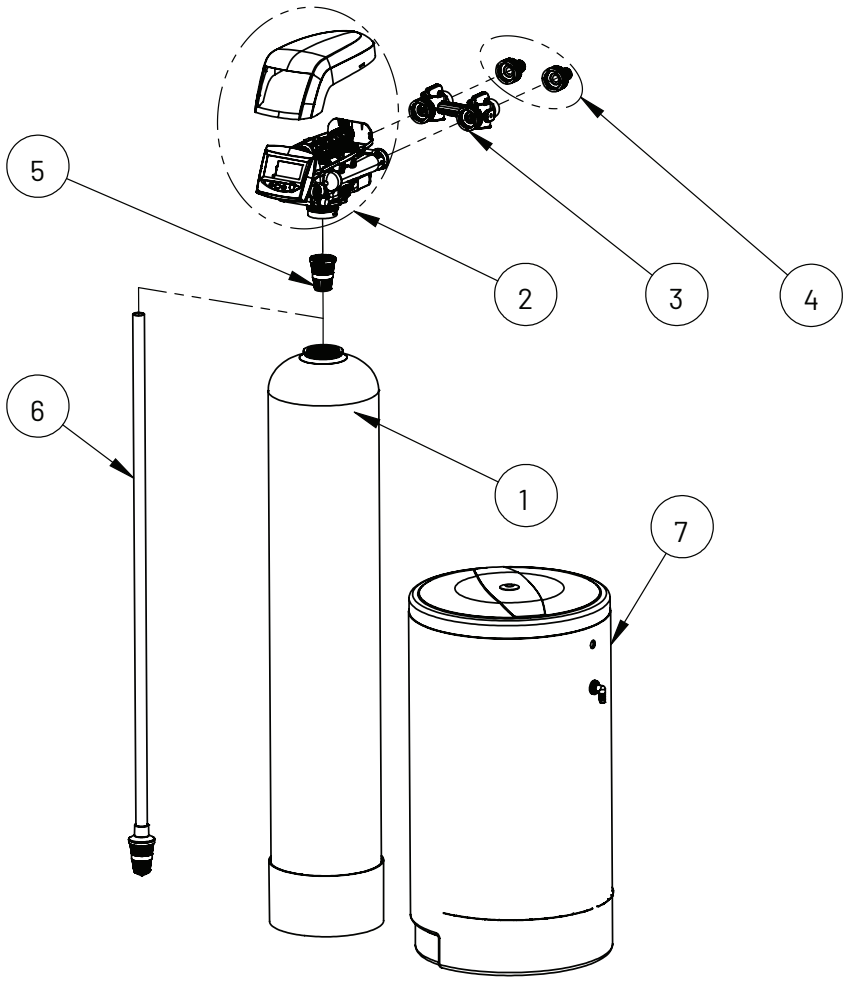
BYPASS VALVE EXPLODED VIEW



BYPASS VALVE ASSEMBLY PART NUMBER 1040930

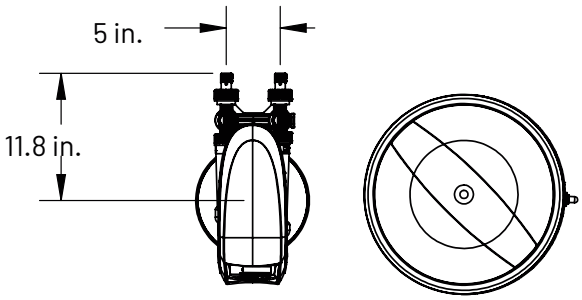
BYPASS PARTS SHOWN IN THE ABOVE DRAWING ARE NOT SOLD STAND-ALONE.

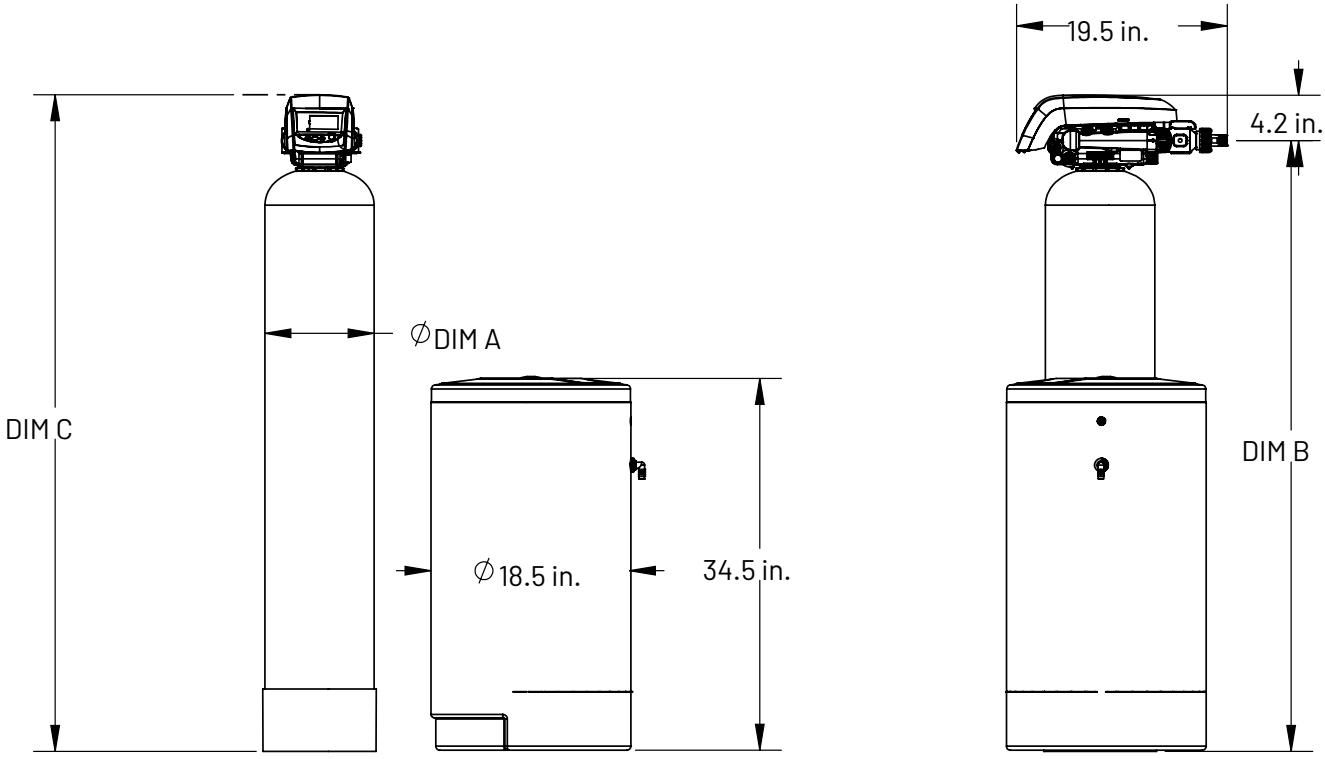
SYSTEM EXPLODED VIEW AND PARTS LIST



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	38256	10 X 44 TANK BLACK W/BASE, 1.0	1
	38257	10 X 54 TANK BLACK W/BASE, 1.5	1
	38258	12 X 48 TANK BLACK W/BASE, 2.0	1
2	4000620	268 AUTOTROL VALVE WITH COVER, 1.0,1.5	1
	4000621	268 AUTOTROL VALVE WITH COVER, 2.0	1
3	1040930	BYPASS ASSEMBLY	1
4	1001769	3/4" MALE NPT FITTING CONNECTORS	1
	1001603	1" MALE NPT FITTING CONNECTORS	1
5	4000562	UPPER BASKET	1
6	4000988	DISTRIBUTOR ASSEMBLY, 1.0	1
	4001980	DISTRIBUTOR ASSEMBLY, 1.5	1
	4000987	DISTRIBUTOR ASSEMBLY, 2.0	1
7	38571	BRINE TANK BLACK 18 X 33	1
8 (not shown)	39516	10 X 44 TANK SLEEVE, 1.0	1
	39517	10 X 54 TANK SLEEVE, 1.5	1
	39518	12 X 48 TANK SLEEVE, 2.0	1

TANK SIZE	DIM A	DIM B	DIM C
10x44	10.2 in.	47.4 in.	51.6 in.
10x54	10.2 in.	57.4 in.	61.6 in.
12x48	12.2 in.	51.4 in.	55.6 in.





TROUBLESHOOTING

700 Series Controller Troubleshooting

Problem	Cause	Correction
ERR 1 is displayed	Controller power has been connected and the control is not sure of the state of the operation.	Press the UP arrow and the control should reset.
ERR 2 is displayed	Controller power does not match 50 or 60 Hz.	Disconnect and reconnect the power. If problem persists, obtain the appropriate controller or AC adapter for either 50 or 60 Hz power.
ERR 3 is displayed	Controller does not know the position of the camshaft. Camshaft should be rotating to find Home position.	Wait for two minutes for the controller to return to Home position. The hourglass should be flashing on the display indicating the motor is running.
	Camshaft is not turning during ERR 3 display.	Check that motor is connected.
		Verify that motor wire harness is connected to motor and controller module.
		Verify that optical sensor is connected and in place.
		Verify that motor gear has engaged cam gear.
		If everything is connected, try replacing in this order: —Wire harness, Motor and Optical Sensor Assembly —Controller
	If camshaft is turning for more than five minutes to find Home position:	Verify that optical sensor is in place and connected to wire.
		Verify that camshaft is connected appropriately.
		Verify that no dirt or rubbish is clogging any of the cam slots.
		If motor continues to rotate indefinitely, replace the following components in this order: —Wire harness, Motor and Optical Sensor Assembly —Controller
Four dashes displayed: — — : — —	Power failure occurred	Press SET to reset the time display.

TROUBLESHOOTING *CONTINUED*

System Troubleshooting

Problem	Cause	Correction
Brine tank overflow.	Uncontrolled brine refill flow rate.	Remove brine control to clean ball and seat.
	Air leak in brine line to air check.	Check all connections in brine line for leaks. Refer to instructions.
	Drain control clogged with resin or other debris.	Clean drain control.
Flowing or dripping water at drain or brine line after regeneration.	Valve stem return spring weak.	Replace spring. (Contact dealer.)
	Debris is preventing valve disc from closing.	Remove debris.
Hard water leakage after regeneration.	Improper regeneration.	Repeat regeneration after making certain correct regenerant dosage was set.
	Leaking of external bypass valve.	Replace bypass valve. (Contact dealer.)
	O-ring around riser pipe damaged.	Replace o-ring. (Contact dealer.)
	Incorrect capacity.	Verify appropriate regenerant amount and system capacity. (Contact dealer.)
Control will not draw brine.	Low water pressure.	Make correct setting according to instructions.
	Restricted drain line.	Remove restriction.
	Injector plugged.	Clean injector and screen.
	Injector defective.	Replace injector and cap. (Contact dealer.)
	Valve disc 2 and/or 3 not closed.	Remove foreign matter from disc and check disc for closing by pushing in on stem. Replace if needed. (Contact dealer.)
	Air check valve prematurely closed.	Put control momentarily into brine refill, C8. Replace or repair air check if needed. (Contact dealer.)
Control will not regenerate automatically.	AC adapter or motor not connected.	Connect power.
	Defective motor.	Replace motor. (Contact dealer.)
Control regenerates at wrong time of day.	Controller set incorrectly.	Correct time setting according to instructions.
Valve will not draw brine.	Low water pressure.	Set pump to maintain 20 psi at softener.
	Restricted drain line.	Change drain to remove restriction.
	Injector plugged.	Clean injector and screen.
	Injector defective.	Replace injector. (Contact dealer.)
	Air check valve closes prematurely on 255 valve or brine pickup tube.	Put control momentarily into brine/slow rinse, C2. Replace or repair air check if needed. (Contact dealer.)
System using more or less salt than regenerant setting.	Foreign matter in valve causing incorrect flow rates.	Remove brine control and flush out foreign matter. Advance control to brine/slow rinse, C2 to clean valve (after so doing position control to "fast rinse, C7" to remove regenerant from tank).
Intermittent or irregular regenerant draw.	Low water pressure.	Set pump to maintain 20 psi at conditioner.
	Defective injector.	Replace injector. (Contact dealer.)
No conditioned water after regeneration.	No regenerant in regenerant tank.	Add regenerant to regenerant tank.
	Injector plugged.	Clean injector and screen.
	Air check valve closes prematurely.	Put control momentarily into brine/slow rinse, C2. Replace or repair air check if needed. (Contact dealer.)
Backwashes or purges at excessively low or high rate.	Incorrect drain controller used.	Replace with correct size controller. (Contact dealer.)
	Foreign matter affecting valve operation.	Remove drain controller and clean ball and seat.
No water flow display when water is flowing on 760 controller.	Bypass valve in bypass.	Shift bypass valve to not-in-bypass position.
	Meter probe disconnected or not fully connected to meter housing.	Fully insert probe into meter housing.
	Restricted meter turbine rotation due to foreign material in meter.	Remove meter housing, free up turbine and flush with clean water. Turbine should spin freely. If not, replace meter. (Contact dealer.)

TROUBLESHOOTING *CONTINUED*

Problem	Cause	Correction
Run out of conditioned water between regenerations.	Improper regeneration.	Repeat regeneration, making certain that correct regenerant dosage is used.
	Incorrect regenerant setting.	Set P6 to proper level. See salt setting chart.
	Incorrect hardness or capacity settings.	Set to correct values. See Programming section.
	Water hardness has increased.	Set hardness to new value. See Programming section.
	Restricted meter turbine rotation due to foreign material in meter.	Remove meter housing, free up turbine and flush with clean water. Turbine should spin freely; if not, replace meter. (Contact dealer.)
Regenerant tank overflow.	Regenerant valve disc 1 being held open by foreign matter.	Manually operate valve stem to flush away obstruction.
	Valve disc 2 not closed during regenerant draw causing brine refill.	Flush out foreign matter holding disc open by manually operating valve stem.
	Air leak in regenerant line to air check.	Check all connections in regenerant line for leaks. Refer to instructions.
	Improper drain control for injector.	Too small of a drain control with a larger injector will reduce draw rates.
	Drain control clogged with resin or other debris.	Clean drain control.

PERFORMANCE DATA SHEET

Pentair Whole House Water Softening System

Model	*Pentair Water Softening System 1.0*	*Pentair Water Softening System 1.5*	*Pentair Water Softening System 2.0*
Rated Service Flow (gpm)	11	11	14.5
Pressure Drop at Rated Service Flow Rate (psi)	11	15	15
Rated Capacity (grains @ lb of salt)	17,113 @ 3.3 lbs of salt 24,575 @ 9.0 lbs of salt 31,280 @ 15.0 lbs of salt	27,076 @ 4.95 lbs of salt 38,883 @ 13.5 lbs of salt 49,491 @ 15.0 lbs of salt	36,102 @ 6.6 lbs of salt 51,844 @ 18.0 lbs of salt 65,988 @ 30.0 lbs of salt
Rated Efficiency (grains/lb Salt @ lb of salt)	5,185 @ 3.3 lb of salt	5,470 @ 4.95 lb of salt	5,470 @ 6.6 lb of salt
Ion Exchange Resin (cu ft)	1.0	1.5	2.0
Tank Size	10 x 44	10 x 54	12 x 48
Drain Flow Rate (gpm)	2.5	2.5	3.5

Operating Pressure: 20 -125 psi (138 kPa - 862 kPa), Operating Temperature: 34 - 100° F (1.1° C - 38° C) Acceptable Salt Type: Sodium Chloride – Pellet or solar salt water softeners

All Systems tested at 35psi +/- 5 psi, pH of 7.5 +/- 0.5, Capacity Testing Flow Rate = 50% of the rated service flow rate for the various size systems.

These water softener systems have been tested by WQA and conform to NSF/ANSI 44 for specific performance claims as verified and substantiated by test data. The rated salt efficiencies above were also determined in accordance with NSF/ANSI 44 and are only valid at the salt dosage referenced above. An efficiency rated water softener is a demand initiated regeneration (DIR) softener which also complies with specific performance specifications intended to minimize the amount of regenerant brine and water used in its operation. Efficiency rated water softeners shall have a rated salt efficiency of not less that 3350 grains of total hardness exchanged per pound of salt (based on NaCl equivalency) (477 grams of total hardness exchanged per kilogram of salt), and shall not deliver more salt than its listed rating. The rated efficiency of the water softener, the salt dosage at that efficiency, the capacity at that salt dosage and that of the efficiency is only valid at the stated salt dosage. Efficiency is measured by a laboratory test described in NSF/ANSI 44. The test represents the maximum possible efficiency the system can achieve. Operational efficiency is the actual efficiency achieved after the system has been installed. It is typically less than the efficiency due to individual application factors including water hardness, water usage, and other contaminants that reduce the water softener's capacity. These systems 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. Refer to the system Installation and Service Manuals for set-up and programming instructions. Contact your local dealer for parts and service. See your owner's manual for warrant information.

Tested and Certified by WQA against NSF/ANSI Std. 44 & 372 for "lead free" compliance & CSA B483.1.

Notes

For information on Pentair Product Warranties visit: pentair.com/assets/residential-filtration-warranty

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