

Installation, Operation and Maintenance Manual

AquaSolve™

The eco-friendly solution for hard water.

Models M8414TM-COM (50 gpm), M8416TM-COM (75 gpm)
Chemical-Free, Salt-Free, No Power Source Required

⚠ WARNING



Read this Manual BEFORE using this equipment.
Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.
Keep this Manual for future reference.

Introduction

The PVI AquaSolve™ Scale Control System provides protection from scale formation on internal plumbing surfaces. The AquaSolve™ system can be installed at the point of entry to treat your entire system, both hot and cold water, or it can be located directly before a water heater or other device (e.g. steamer, etc) that requires protection from hard water.

AquaSolve™ prevents scale by transforming the normal dissolved hardness minerals into undissolved crystal microparticles. These crystals stay suspended in the water and have a greatly reduced ability to react and attach to surfaces like dissolved hardness does. Therefore the problem of internal buildup of scale in pipes, water heaters and on fixtures and glass is greatly reduced.

AquaSolve™ is not a water softener – Water treatment chemistry (e.g. antiscalants, sequestrants, etc..) will most likely have to be changed to be compatible with AquaSolve™ treated water. Laundry and warewashing chemistry will likewise require adjustments.

AquaSolve™ Benefits

- Chemical free scale prevention. Cost savings and environmental benefits.
- Virtually maintenance free - no control valve.
- Uses environmentally friendly "green" technology by using no salt or other chemicals to constantly add, no electricity, and no wastewater.
- Improves the efficiency of water-using appliances.
- Simple installation – no electrical and drain hookup.
- Safe for landscaping and lawn watering. No need for costly bypass plumbing.
- Compatible with all on-site and community wastewater treatment systems.
- Not subject to water softener restrictions and "bans".
- AquaSolve™ treated water has no added sodium, is safe to drink and is well suited for use in food and beverage preparation.



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System is tested and certified by WQA against NSF/ANSI Standards 61 for material safety only and 372 for Lead Free.



PVI®

A WATTS Brand

NOTICE

Important notice about iron, manganese and copper in the water supply

Iron and Manganese

Just as with conventional water softening media, AquaSolve™ needs to be protected from excess levels of certain metals that can easily coat the active surface, reducing its effectiveness over time. Public water supplies rarely, if ever, present a problem, but if the water supply is from a private well, confirm that the levels of iron (Fe) and manganese (Mn) are less than 0.3 mg/L and 0.05 mg/L respectively.

Copper

Pursuant to the EPA drinking water standards, the copper concentration permitted is up to 1.3 ppm. Typically originating from new copper plumbing, high levels of copper can foul AquaSolve™ media. For applications with copper concentration greater than 1.3 ppm, please consult PVI Technical Service. To further minimize any problem with excess copper, avoid applying excessive flux on the inner surfaces of the pipe and use a low-corrosivity water soluble flux listed under the ASTM B813 standard.

CAUTION

- Do not let the system freeze. Damage to the tank may result.
- System must be operated in a vertical position. Do not lay it down during operation. The system may be placed in any position for shipping and installation but must be operated in the vertical position.
- Place the system on a smooth, level surface. Because the system operates in an upflow, fluidized bed mode, having a level surface is more important than with a softener or media filter.
- A bypass valve should be installed on every system to facilitate installation and service.
- Observe all local plumbing and building codes when installing the system.

NOTICE RE: Installation

The AquaSolve™ system differs from a conventional softener or media filter in a number of key respects.

- The system is light and only partially filled with media. This is normal. The upflow operation of the system requires a lot of freeboard to allow the bed to fully fluidize.
- The system has no underbed so you can tip the system over without any fear of upsetting the media. This makes transportation and installation much easier than conventional systems.
- Because the AquaSolve™ system operates in the Upflow mode, special attention needs to be taken to properly plumb system. On top of the head, "Inlet" and "Outlet" are embossed above the each port.
- Please see Important note about iron, manganese and copper above.
- Please see the note about "Using AquaSolve™ with other water treatment equipment" on this page.
- Not for use on closed loop systems.

WARNING

Installation Precautions

- Do **NOT** install system on line pressure above 100psi.
- Do **NOT** install the system backwards with the feed water line connected to the outlet.
- Do **NOT** install system in direct sunlight or where system is exposed to harsh chemicals or may be subjected to being struck by moving equipment, carts, mops or any other item that may cause damage.
- Do **NOT** install the unit behind equipment where it may be difficult to access the system for media replacement.
- Do **NOT** install the AquaSolve™ system near any source of heat. Also, do not install the system near any device or break out area that would be adversely effected by water.
- **IF** water hammer is evident, install water hammer arrestors before the AquaSolve™ unit.
- Always back-up valves and fittings with a wrench when installing a fitting to avoid turning the valve.

Position the AquaSolve™ unit in a suitable location.

WARNING

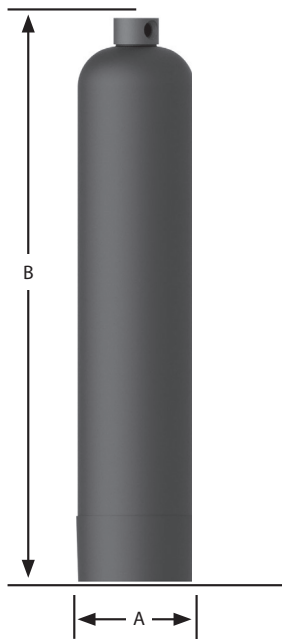
Using AquaSolve™ with other water treatment equipment.

Due to the unique properties of AquaSolve™, there are some unique requirements for using AquaSolve™ in conjunction with filtration or other forms of water treatment.

1. AquaSolve™ must be the last stage in the treatment chain. Do not install any filters after AquaSolve™ or before any devices for which scale prevention is required. POU filters, e.g. carbon or RO are exempt from this requirement.
2. The addition of soaps, chemicals, or cleaners, before or after AquaSolve™ treatment, may reverse its anti-scale treatment effects and/or create water with a heavy residue or spotting potential. Any adverse conditions caused by the addition of soaps, chemicals, or cleaners are the sole responsibility of the end user.

Equipment Specifications

ScaleNet[®] systems are complete, self-contained, loaded with media, and ready to use. A simple inlet and outlet connection is all that is required for installation. Please review operating pressures, temperatures and water chemistry limitations to ensure compatibility.



Feed Water Chemistry Requirements

pH	6.5 to 8.5
Hardness (maximum)	75 grains (1282 ppm CaCO ₃)
Water Pressure	15psi to 100psi (103 kPa to 6.9 bar)
Temperature	40°F to 100°F (5°C to 38°C)
Chlorine	< 2ppm
Iron (maximum)*	0.3 mg/l
Manganese (maximum)*	0.05 mg/l
Copper (maximum)*	1.3 ppm =
Oil & H ₂ S	Must be removed prior to ScaleNet [®]
Silica (maximum)	20 ppm ==

NOTICE

== ScaleNet[®] media does not reduce silica scaling. Silica can act as a binder that makes water spots and scale residue outside the plumbing system difficult to remove. This 20 ppm limitation is for aesthetic purposes.

NOTICE

Water known to have heavy loads of dirt and debris may require pre-filtration prior to ScaleNet[®].

* See notes about iron, manganese and copper on page 2.

Systems using ScaleNet[®] technology prevent hard water scale formation inside the plumbing system at influent hardness levels of 75 grains per gallon of calcium carbonate and less. Due to variances in water chemistry, certain aesthetic conditions external of the plumbing system may not be attained.

ScaleNet[®] is designed for the treatment of potable water that meets the requirements of the current USEPA Safe Drinking Water Act.

Mechanical Specifications

Inlet/Outlet Connection 2" FNPT (for both systems)		
MODEL	M8414TM-COM	M8416TM-COM
Dry Weight (lbs / kgs)	66 / 30	75 / 34
Service Weight (lbs / kgs)	400 / 181	480 / 218
Inlet/Outlet Connection	2" FNPT	2" FNPT

Replacement Media

PVI Part Number	Replacement Frequency
M8414TM-COM-RM	Media should be replaced every 3 years
M8416TM-COM-RM	Media should be replaced every 3 years

Dimensions (nominal - inches)

MODEL	M8414TM-COM	M8416TM-COM
A	14	16
B**	73.1	73.1

Maximum Service Flow (gpm) vs. Water Temperature

Continuous Duty Systems:

System	40°F	45°F	50°F	55°F	60°F	65°F	70°F
M8414TM-COM	40	44	48	50	50	50	50
M8416TM-COM	45	51	56	59	63	69	75

Intermittent Duty Systems:

M8414TM-COM	50 GPM at all temperatures
M8416TM-COM	75 GPM at all temperatures

Intermittent duty is defined as less than 2 hours of Maximum Flow per 24 hour period. Higher Flow rates can be achieved by combining systems in an array.

Models	Maximum Flow Rate***	
	gpm	lpm
M8414TM-COM	50	189
M8416TM-COM	75	284

*** Exceeding maximum flow can reduce effectiveness and void warranty.

Pressure drop at peak flow rate is less than 10 psi.

Pressure drop reading taken with inlet and outlet gauges installed at a common elevation and 80 degree feed water.

Installation

Tighten the Tank Head

NOTICE

Check the head on top of the tank. It is common for it to loosen during shipment. Tighten the head with a strap wrench as needed.

NOTICE

It is very important to use **flexible connections** on the inlet and outlet plumbing in the horizontal orientation as shown in the images on this page. The tanks expand and contract with water pressure fluctuations. Flexible connectors will prevent plumbing and tank leaks. The EDP code for the suggested PVI 2" Flexible Connectors is C515285 (Two are included for installation).

Anytime AquaSolve™ systems are installed above the ground floor of a building it is recommended that a **vacuum breaker** also be installed to protect against tank collapse in the event the plumbing system is drained. If a vacuum breaker is not used then the system should be placed in bypass anytime the plumbing system is drained. PVI part number for suggested relief valve is 123328. The vacuum breaker should be installed on the outlet of the system.

- We recommend the installation of a dual-union ball-valve on the inlet and outlet to isolate the tank for servicing.
- A full bypass should be installed so that the full service flow can be routed around the system as needed for servicing.
- The AquaSolve™ system operates in the Up-Flow mode which is opposite of a conventional softener. Special attention needs to be taken to properly plumb system. On top of the head, "Inlet" and "Outlet" are embossed above the each port.

Install Piping

Connect the inlet and outlet plumbing according to your preferences and any applicable local codes. Include sample/drain ports with hose-bibb connections on the inlet and outlet piping to facilitate startup and service.

WARNING

Support the Piping

The full weight of the piping and valves must be supported by uni-strut, pipe hangers or other means. The tank connections cannot support the weight of the piping. This photo from a multi-tank system installation shows properly supported piping.

Start-Up

Connect a hose to the hose bibb on the outlet of the tank. Run the hose to a drain and open the hose bibb.

Slowly/partially open the supply water ball valve. Allow the tank to slowly fill with water. When a steady stream of water appears at the drain, close the supply valve and hose bibb.

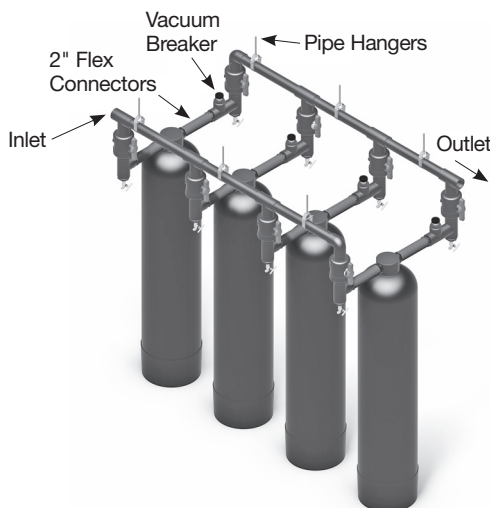
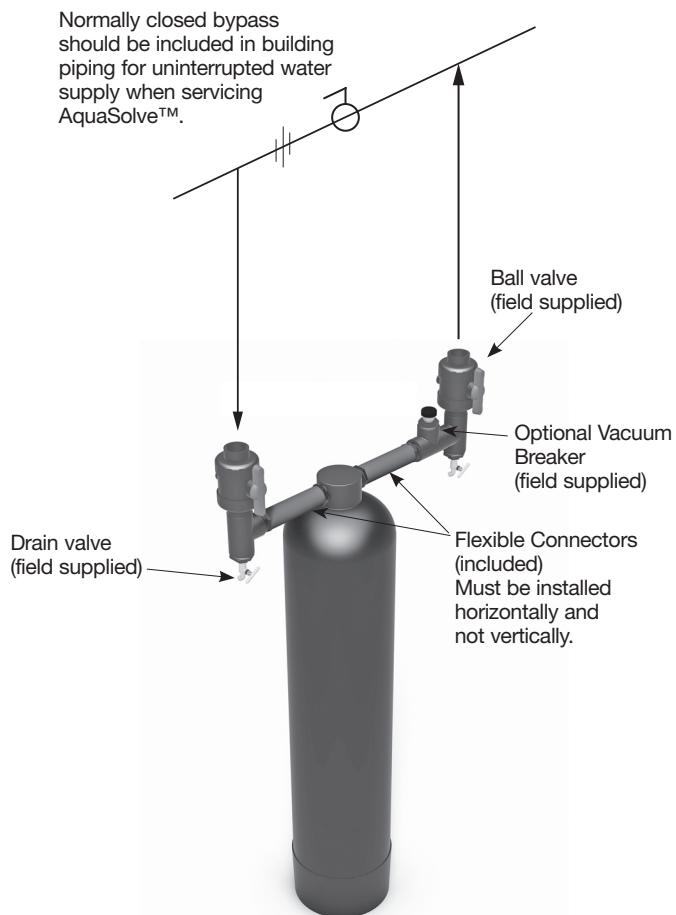
Open the inlet and outlet valves on the system. Transfer the bypass valves from Bypass to the Service position. Open a nearby faucet downstream from the AquaSolve™ system to relieve any air.

Check for leaks. Repair as needed.

Fill in install date and rebed due date on product label located on front of each tank as reminder to replace AquaSolve every 3 years.

The system is now ready for service.

Typical Installation for Single and Multi-bank Systems



Replacing the Media

NOTICE

Your AquaSolve™ media should be replaced every (3) years.

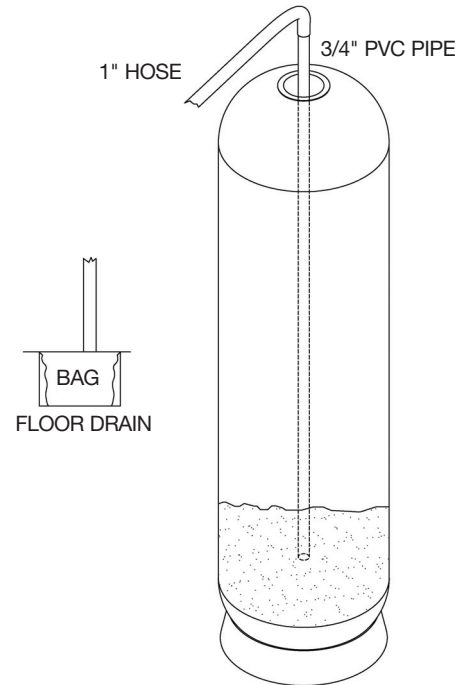
1. Shut off the primary feed supply going to the AquaSolve™ tank.
2. Open up a downstream spigot or faucet to release pressure in the tank and in the distribution lines before and after the system.
3. Shut the isolation valves immediately before and after the tank.
4. Disconnect the unions on the inlet and outlet of the tank, and then disconnect flex connectors from head.
5. Using a step ladder and strap wrench, remove the threaded head assembly connection (turning counter-clockwise) and remove the complete upper assembly including grey-colored PVC strainer. Rinse these parts in a nearby sink or bucket of water. Do not drain the tank.
6. Remove the distributor tube with the bottom strainer. Rinse these parts in a nearby sink or bucket of water.
7. Get a 6ft length of 3/4" sch. 40 PCV and a length of 1" poly-vinyl hose. The length of hose depends on the distance to the nearest floor drain. (Both of these can be acquired at Home Depot or Lowes.)
8. Insert one end of the pipe inside the hose and put the other end of the pipe into the top of the tank and down into the media. Put the other end of the hose inside a rice bag and put the rice bag on the floor drain.
9. Get a garden hose and put it on the open end of the poly hose to fill the hose and pipe with water. Air will bubble out of the tank. Once all the air is out of the hose and pipe, you can start a siphon to remove the media. Put the garden hose in the top of the tank and turn it on to keep the tank full of water. Push the pipe up and down in the media to get it all out. The rice bag will catch the media and allow the water to go down the drain.
10. Try not to be too aggressive when extracting the media. You need to take it out in small bites. If you let the whole pipe/hose fill with media it will plug up. You need to let slugs of water flush out the pipe as you go.
11. When all the old media is removed turn off the garden hose and continue to siphon until the tank is about half full with water.
12. Using the step ladder again, reinstall the distributor tube with bottom strainer that was removed in step #6. Center the distributor tube in the bottom of the tank. Keeping any and all media from entering the distributor tube, carefully pour-in a new bag(s) of media that specifically meets the replacement requirement of the tank. For example, an OF1665-75TM system requires (x1) OF1665RM Replacement Media.
13. Inspect the threaded connection on the top of the tank to ensure no loose beads of media are stuck to the internal threads. If visible, wipe away the beads with a damp cloth.
14. Re-attach the head assembly onto the distributor tube and thread the head assembly back onto the tank. Hand-tighten until the final turn when a strap wrench can help tighten the connection.
15. Reconnect the flex connectors and union connections.
16. Open the feed water inlet (slowly) to fill the tank.
17. Purge the air at a downstream faucet close to the system.
18. Once the tank is full, wait 4 hours for media to "hydrate".
19. Put the tank in service.

Alternative Method for Replacing Media

Follow steps 1 – 6 then,

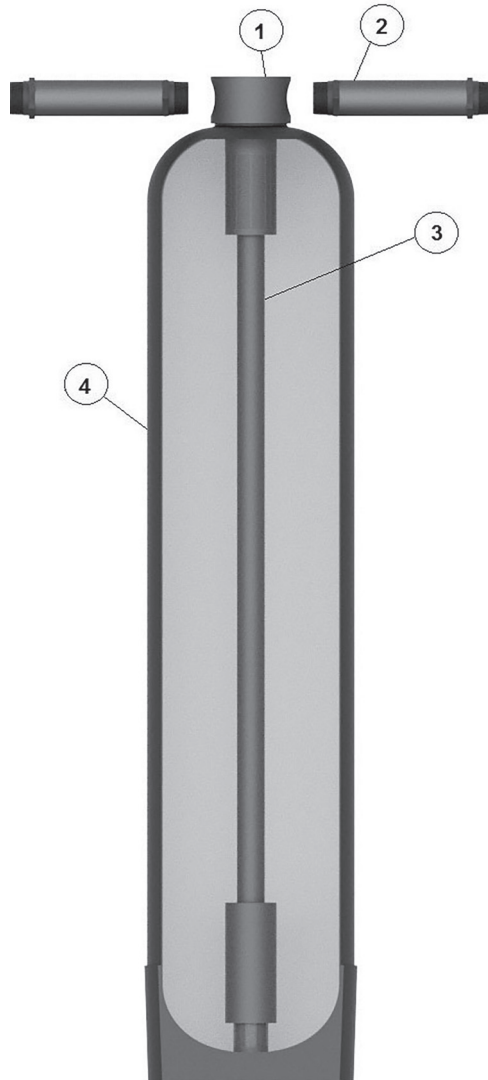
- Remove center distributor tube and lower basket and siphon all water from tank
- Lay tank down on its side and tip upside down while using hose to flush media out
- When all the old media is removed, stand tank back up and install in original position. Fill the tank so that it is about half full with water.

Then continue with steps 12 – 19.



Parts List

Item	QTY.	PVI PART NUMBER	DESCRIPTION
1	1	144064	TANK HEAD & UPPER BASKET ASSEMBLY
2	2	144065	FLEX HOSE 2" x 12"
3	1	144066	RISER & BOTTOM DISTRIBUTOR ASSEMBLY
4	1	Contact Factory	PRESSURE VESSEL, MEDIA TANK



Limited Warranty

PVI warrants its AquaSolve™ tank systems as follows:

- The AquaSolve™ tank system is warranted to be free of defects in materials and workmanship for 5 years from the date of original shipment.
- The AquaSolve™ media is warranted for performance for a period of 2 years from the date of the original installation when installed and operated in accordance with the instructions in the corresponding Installation and Operation Manual.

Conditions

1. The AquaSolve™ system must be installed in applications with municipally supplied water adhering to EPA guidelines with the exception of oil and grease, copper, phosphate, silica and chlorine. See copper warnings on page 2 and condition number 5 below.
2. Any component failure must not result from abuse, fire, freezing or other acts of nature, violence, or improper installation.
3. Equipment must be installed and operated in compliance with the local plumbing codes and on an approved water supply.
4. Equipment is limited to use at water pressures and temperatures that do not exceed our published specifications.
5. Water supply must not exceed 2.0 PPM chlorine. For water supply exceeding 2.0 PPM chlorine, pretreatment is required. (Please contact your water treatment specialist.)
6. Information, including model number, serial number, and date of installation, must be provided for any claims pertaining to equipment in warranty.
7. Defective parts are subject to inspection by either PVI or any authorized representative before final commitment of warranty adjustment is made.
8. PVI reserves the right to make changes or substitutions in parts or equipment with material of equal quality or value and of then current production.

Limitations

Our obligation under this warranty with respect to the tank or valve is limited to furnishing a replacement for, or at our option, repairing any part or parts to our satisfaction that prove defective within the warranty period stated above. Such replacement parts will be delivered to the owner F.O.B. nearest factory, at no cost, excluding freight and local labor charges, if any.

Our obligation under this warranty with respect to the AquaSolve™ media will be limited to furnishing a replacement for the media within two years from date of original installation. Such replacement media will be delivered to the owner F.O.B. nearest factory, at no cost, excluding freight and local labor charges, if any. Damage to the media due to chlorine, other oxidizers or fouling caused by local water conditions or any other operation outside of the limits shown under Specifications, is not covered by this warranty.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY PVI WITH RESPECT TO THE PRODUCT. PVI MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. PVI HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described under this warranty shall constitute the sole and exclusive remedy for breach of warranty, and PVI shall not be responsible for any incidental, special or consequential damages, including without limitation, freight, handling, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which PVI has no control. This warranty shall be invalidated by any abuse, misuse, misapplication or improper installation of the product.

Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This warranty gives you specific legal rights, and you may have other rights that vary from state to state. You should consult applicable state laws to determine your rights. SO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE APPLICABLE WARRANTY PERIODS STATED ABOVE.



WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

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