

## Greenwave Plus Salt-Free Water Conditioner



Green  Wave  
Plus

## Owners Manual

### *Models:*

*385--GWP-1000-UV, 385-GWP-1500-UV, 385-GWP-2000-UV*

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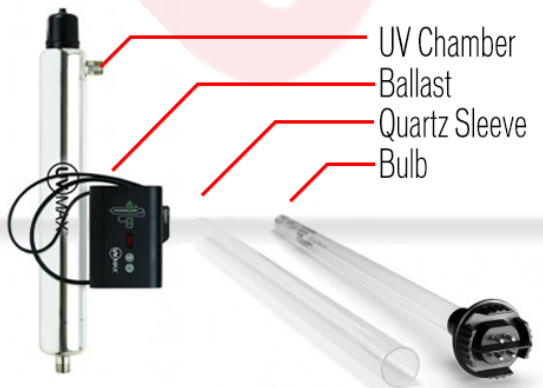
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Indianapolis, IN 46234

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# Unpacking / Inspection

Be sure to check the entire system for any shipping damage or parts loss. Also note damage to the shipping cartons. Contact US Water Systems at **1-800-608-8792** or visit [www.uswatersystems.com/returns](http://www.uswatersystems.com/returns) to report any shipping damage within 24 hours of delivery. Claims made after 24 hours may not be honored.



Visit us online at [www.USWaterSystems.com](http://www.USWaterSystems.com)

Give us a call at: 1-800-608-8792

## Introduction



The GreenWave system provides protection from scale formation throughout the home. The GreenWave system can be installed at the point-of-entry to treat your entire home, both hot and cold water, or it can be located directly before a water heater or other device (e.g. sauna, etc) that requires protection from hard water.

GreenWave reduces or eliminates scale formation on internal and external plumbing surfaces as well as reducing spotting and streaking normally associated with hard water.

GreenWave prevents scale by transforming the normal dissolved hardness minerals into undissolved crystal micro-particles. 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 build-up of scale in pipes, water heaters and on fixtures and glass is greatly reduced.

GreenWave is not a water softener – Low or phosphate-free cleaning products are recommended to achieve optimum results. Modern surfactant or detergent based, liquid soaps are preferred over old-fashioned caustic solid soaps. Unlike softened water, GreenWave treated water maintains the beneficial essential mineral content of your water and is safe to drink.

### GreenWave Benefits

- Chemical Free Scale Prevention. Cost savings and environmental benefits
- Virtually Maintenance Free. No salt bags or other chemicals to buy, transport and store
- Beneficial minerals retained for more healthful drinking water
- Improves the efficiency of water-using appliances
- Simple installation – no electrical and drain hookup
- Safe for landscaping and lawn watering. No need for costly plumbing bypasses
- Compatible with all on-site and community wastewater treatment systems
- Not subject to water softener restrictions and "bans"



## Proper Installation

*This water conditioning system must be properly installed and located in accordance with the Installation Instructions before it is used or the warranty will be void.*

**Do not** install or store where it will be exposed to temperatures below freezing or exposed to any type of weather. Water freezing in the system will break it. Do not attempt to treat water over 100°F.



32° - 100° F

**Do not** install in direct sunlight. Excessive sun or heat may cause distortion or other damage to non-metallic parts.



No Direct Sunlight

Iron levels must be less than 0.3 mg/L

**Fe**

Less than 0.3 mg/L

Manganese levels must be less than 0.05 mg/L

**Mn**

Less than 0.05 mg/L

Copper levels must be less than 1.3 mg/L

**Cu**

Less than 1.3 mg/L

**WARNING:** Discard all unused parts and packaging material after installation. Small parts remaining after the installation could be a choke hazard.



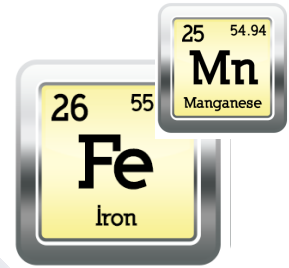
Discard All  
Unused Material



## An Important Note about *Iron, Manganese & Copper*

### Iron and Manganese

Just as with conventional water softening media, GreenWave 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, 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 should be less than 1.3 mg/L.



### Copper

Copper usually originates from new copper plumbing upstream of the GreenWave system. If this condition exists, we recommend waiting 3-4 weeks before placing the system in operation. This will allow the copper surfaces to be fully flushed and develop a natural protective surface. To further minimize any problem with excess copper the installers should be advised to avoid applying excess flux on the inner surfaces of the pipe and to use a low-corrosivity water soluble flux listed under the ASTM 8813 standard. Once the plumbing connections are complete, place the GreenWave system in bypass prior to following the startup procedure and flush the plumbing for at least 10 minutes.



## Cautions!

- Do not let the system freeze. Damage to the tank and pre-filter 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 UP-Flow, 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.

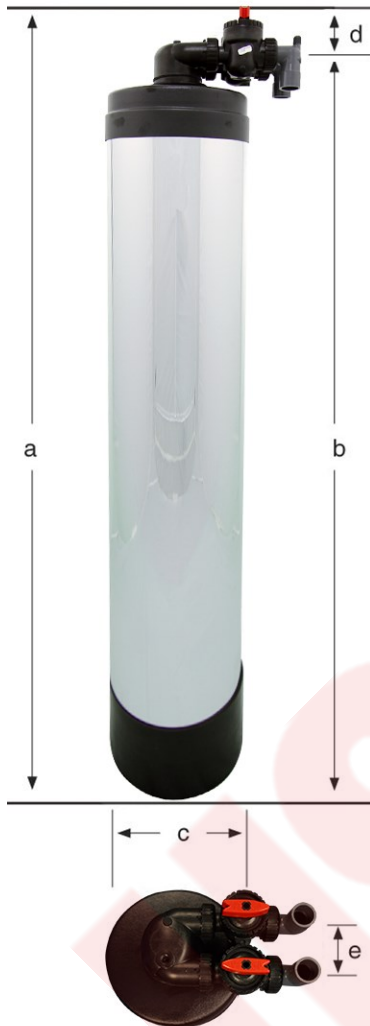
## Notes to the Installer

The GreenWave 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 UP-flow 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 GreenWave system operates in the UP-Flow mode, the tank connections are opposite of what you're used to.
- Please see the "important note about iron, manganese and copper" above.
- Please see the note about "Using GreenWave with other water treatment equipment" on page 9.

## Equipment Specifications

GreenWave 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.



### Specifications

Inlet/Outlet Connection	3/4" - 1" PVC
Temperature	40° - 110°F
pH	6.5 - 8.5
Ferrous Iron, Max*	0.3 mg/L
Manganese, Max*	0.05 mg/L
Copper, Max*	1.3 mg/L
Water Pressure	15 min, 100 max (PSI)

\*See note about iron, manganese and copper on page 5.

### Mechanical Specifications

	1000	1500	2000
Max Service Flow (gpm)	10	15	20
Dry Weight (lbs)	22	29	35
Service Weight (lbs)	80	129	168

### Dimensions (nominal - inches)

	1000	1500	2000
A	52.5	58.5	56.5
B	50	56	54
C	9	10	12
D	2.5	2.5	2.5
E	3.0	3.0	3.0

### Using GreenWave with other water treatment equipment.

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

1. Do not install any filters after GreenWave or before any devices for which scale prevention is required. POU filters, e.g. carbon or RO are exempt from this requirement.
2. Do not apply phosphate or any other anti-scalant either before or after GreenWave.

## UV Light Equipment Specifications

This point-of-use system allows for simple installation and operation due to its high output lamp and compact reactor. The reactor is an axial flow design with superior hydraulics, compact design and 1" NPT connections. The controller is a simple plug in device connecting to the lamp with a safety cap.

### Water Quality Guidelines

Iron	< 0.3 ppm (0.3 mg/L)
Hardness	< 7 gpg (120 mg/L)
Turbidity	< 1 NTU
Manganese	< 0.05 ppm (0.05 mg/L)
Tannins	< 0.1 ppm (0.1 mg/L)
UV Transmittance	> 85%

The UV light system uses ultraviolet light to kill bacteria and other organics in the water source. The light from the UV bulb passes through the water and destroys the organic contaminants. The UV bulb utilizes a quartz sleeve on the outer portion to isolate the water from the UV bulb element.

### WARNING!

**If this quartz sleeve becomes coated or stained it will reduce the light that can pass through the water in the chamber, thus inhibiting the bacteria removal by the UV light. It is crucial that the iron, manganese and any tannins in the water are removed prior to the UV to ensure the light is penetrating the quartz sleeve and its' full intensity.**

## UV Light Equipment Specifications

### Operation

The US Water Systems UV comes with a feature laden controller that incorporates both the lamp driver (ballast) and control features in one water-tight case. **CAUTION:** Prior to performing any maintenance on your UV system, you must always disconnect the power.



### USWATER 5.0 & USWATER 6.0 Controller

This controller features a power factor corrected, constant current lamp driver with a universal power input. A full color LCD screen provides the user with a detailed description of the system's performance in addition to providing any applicable fault messages and system diagnostics. The controllers used in both the USWATER5.0 and USWATER6.0 are identical. The difference is that the USWATER 6.0 series of products includes a UV intensity monitor. All USWATER 5.0 and USWATER 6.0 controllers include an "infinite expandability port" located on the right side of the controller. Simply plug in an optional UV sensor module into the expandability port of a USWATER 5.0 controller and the system will now monitor the UV intensity of the system!



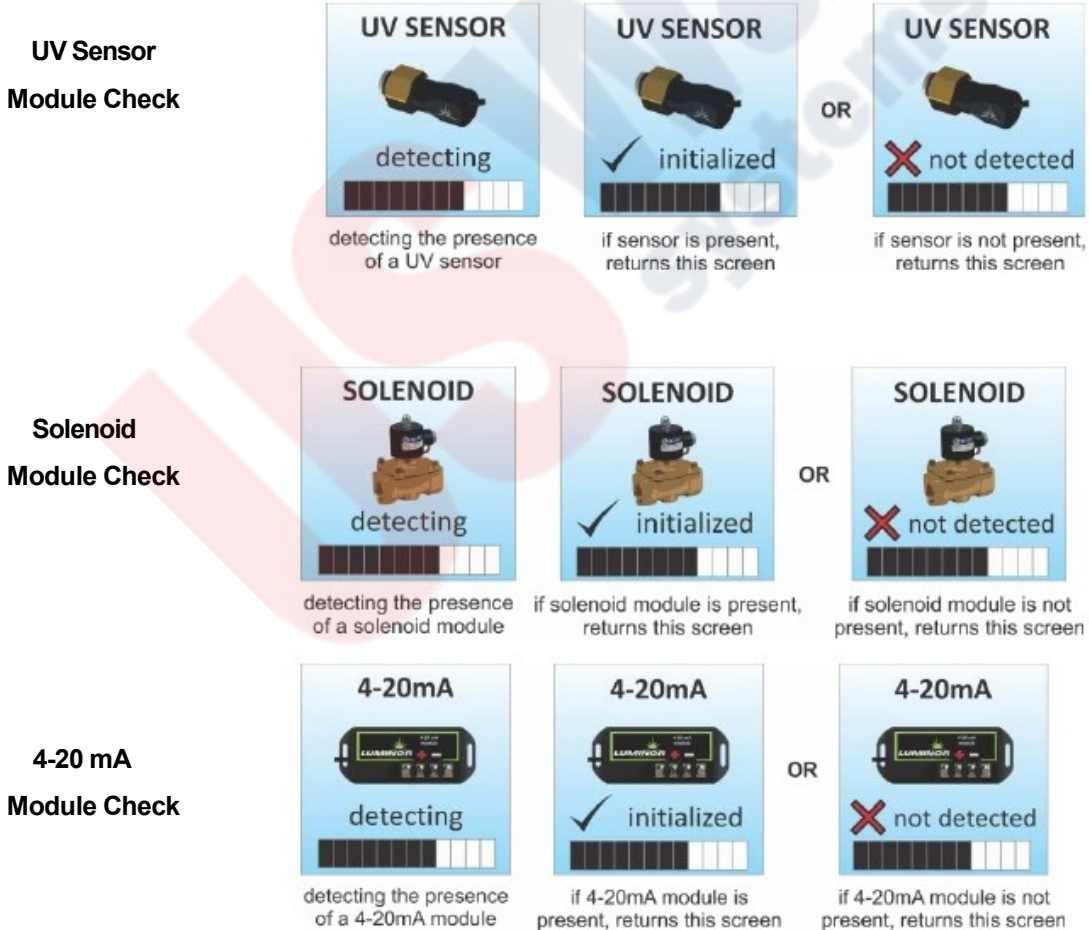
# UV Light Equipment Specifications

## USWATER 5.0 & USWATER 6.0 Power-up Sequence

Upon start up, the 5.0 & 6.0 controller will run through a diagnostic start-up and the sequence will be displayed as follows on the color LCD:

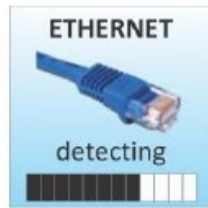


Next, the controller checks for the installation of any optional modules that may be installed on the system. It first checks to see if a module is installed and then either initializes the module to function with the controller or returns a "not detected" screen and moves on to the next module. The screens will appear as follows:

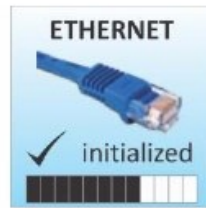


# UV Light Equipment Specifications

## Ethernet Module Check



detecting the presence of a ethernet module



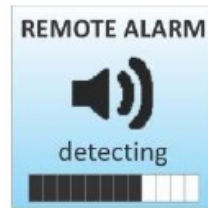
if ethernet module is present, returns this screen

OR



if ethernet module is not present, returns this screen

## Remote Alarm Module Check



detecting the presence of a remote alarm module



if remote alarm module is present, returns this screen

OR



if remote alarm module is not present, returns this screen

Once the controller has finished checking for the installation of all available modules a single screen is displayed showing which specific modules are installed and activated on this particular system. **Please Note:** If the corresponding module icon is not displayed on this screen, then that module is not installed on this system. If you believe this module is installed correctly, recheck the applicable connections to ensure a solid connection point and then restart the controller. The controller then continues to optimize the lamp efficiency by waiting 60 seconds to allow the lamp to reach its optimum output. Finally, a final "start-up complete" screen is displayed. These screens will appear as follows:



## USWATER 5.0 Operational Screens

On USWATER5.0 systems (without the UV monitor), the default screen shows the **US Water Systems Home Screen**. At any point during operation the user is able to scroll through the **US Water Systems Home Screen**, **Lamp life remaining** and **QR Code/Contact Info** screens by simply pressing the button located on the front of the controller.

# UV Light Equipment Specifications



button



Home Screen



press button once



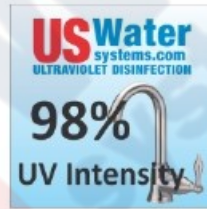
press button twice

## USWATER 6.0 Operational Screens

On systems that have the UV module installed (and on all USWATER6.0 systems), the default screen shows the % **UV Intensity**. At any point during operation the user is able to scroll through the % **UV Intensity**, **Lamp life remaining** and **QR Code** screens by simply pressing the button located on the front of the controller.



button



Home Screen



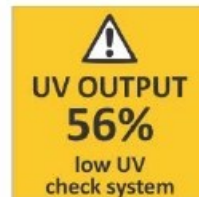
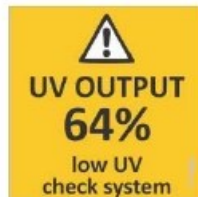
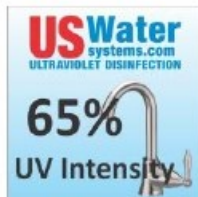
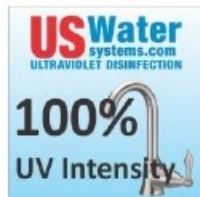
press button once



press button twice

## USWATER 6.0 % UV Intensity

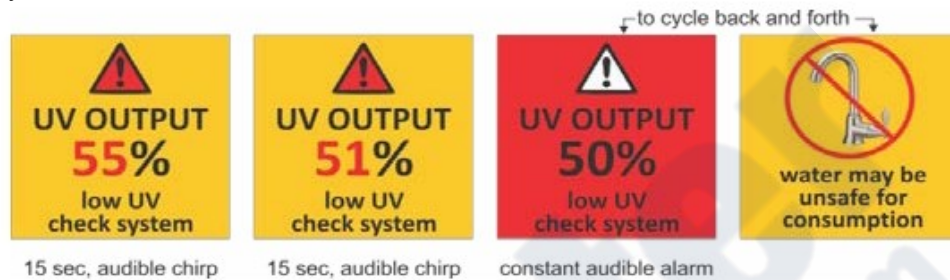
If your system is equipped with a UV sensor the % UV Output screens will indicate the level of UV intensity that is being detected within the reactor by the sensor. This will always be visible on the Home Screen of the controller. Things that can affect the % UV Output are poor water quality, scaling of the quartz sleeve and/or sensor, lamp failure, expired lamp life and sensor failure. The following screens show the % UV Output dropping on a monitored system.





## UV Light Equipment Specifications

Once the UV output drops below 56%, the numbers and warning sign switch to red and a 15 second intermittent audible chirp is given off by the ballast. When the output drops below 51%, the display switches to a solid red and a constant audible signal is provided. The screens alternate between this solid red screen and another screen indicating "water may be unsafe for consumption". At this point, the controller also provides a signal to de-activate the solenoid valve, shutting off the flow of water if a solenoid valve is installed on the system.



### USWATER5.0 & USWATER6.0 Lamp Countdown Sequence

The USWATER5.0 & USWATER6.0 counts down the number of days until a lamp change is required. The operation is as follows:



Once the lamp has seven days remaining until a lamp change is required, the screen changes to a yellow caution screen. At this point, an audible chirp is given off by the ballast to draw your attention to the pending lamp change condition. When the controller passes the zero day threshold, the screen changes to solid red and cycles between a red "lamp expired" screen and a "water may be unsafe for consumption" screen. The same intermittent audible chirp is heard throughout this lamp expired sequence.



At any point during this sequence, the audible chirp can be deferred by holding the controller button down for a period of five seconds. The screen shown below will appear for five seconds indicating that the audible deferral has been activated and then the system switches back to the current lamp change or lamp expired screen. This audible deferral will last for seven days after which then the alarm will sound once again. This audible deferral feature can be activated as many times as you wish. **PLEASE NOTE:** During the condition of lamp expiration and audible deferral, the water may be unsafe for consumption and should not be consumed without another form of disinfection.

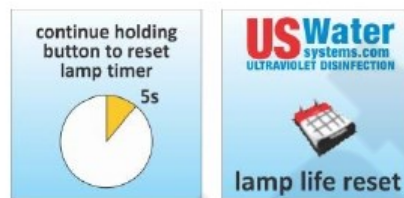


## UV Light Equipment Specifications

### USWATER5.0 & USWATER6.0 Lamp Countdown Reset Sequence

After changing the lamp on the USWATER5.0 & USWATER.0 systems, the controller must be reset in order for the system to begin its countdown function on the newly installed lamp. To perform this reset, you must firmly depress the button on the front of the controller and then manually plug the power cord back into the wall outlet initiating power to the unit. Keep holding down the button for five seconds until you hear an audible chirp indicating the controller has reset the internal timer.

Release the switch and the lamp countdown feature has now been reset. The following two screens will be displayed during this process.

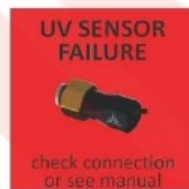


### USWATER5.0 & USWATER6.0 Failure Modes

The US Water Systems controller continuously monitors your UV system and if there is a problem with the system the controller will provide both a visual and audible signal indicating the specific fault that may be adversely affecting the operation of your system. The fault conditions are listed in a priority sequence as follows:



**LAMP FAILURE:** If at any time during the operation of the system, the UV lamp fails to be illuminated, the controller will return both an audible and visual signal indicating lamp failure. In addition, a constant audible buzzer will sound during lamp failure.

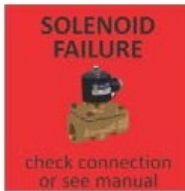


**UV SENSOR FAILURE:** Assuming the system has a UV Sensor installed, if at any time during the operation of the system, a UV sensor fails, the controller will return both an audible and visual signal indicating sensor failure. For sensor failure, the controller will cycle between "sensor failure" and "water may be unsafe for consumption" screens as an added precaution. In addition, a constant audible buzzer will sound during sensor failure.





## UV Light Equipment Specifications



**SOLENOID MODULE FAILURE:** Assuming the system has an optional Solenoid Module installed, if at any time during the operation of the system, a solenoid valve fails to operate, the controller will return both an audible and visual signal indicating solenoid failure. In addition, an intermittent (15 sec) audible buzzer will sound during solenoid failure.



**4-20 mA MODULE FAILURE:** Assuming the system has an optional 4-20 mA Module installed, if at any time during the operation of the system, a 4-20 mA module fails, the controller will return both an audible and visual signal indicating a 4-20 mA failure. In addition, an intermittent (15 sec) audible buzzer will sound during a 4-20 mA failure.



**REMOTE ALARM MODULE FAILURE:** Assuming the system has an optional Remote Alarm Module installed, if at any time during the operation of the system, a remote alarm module fails, the controller will return both an audible and visual signal indicating remote alarm failure. In addition, an intermittent (15 sec) audible buzzer will sound during remote alarm failure.



**ETHERNET MODULE FAILURE:** Assuming the system has an optional Ethernet Alarm Module installed, if at any time during the operation of the system, an Ethernet module fails, the controller will return both an audible and visual signal indicating Ethernet failure. In addition, an intermittent (15 sec) audible buzzer will sound during Ethernet failure.

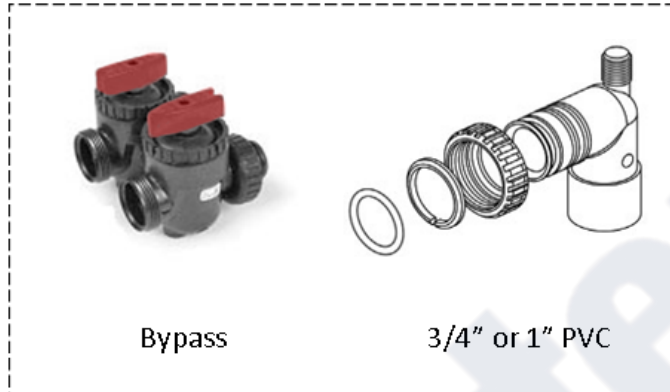
### USWATER 5.0 & USWATER 6.0 QR Codes

A **QR code** (abbreviated from Quick Response code) is a type of matrix barcode (or two-dimensional code) first designed for the automotive industry. US Water Systems uses the QR code to store a link to a specific page on our website. Users with a camera phone equipped with the correct reader application can scan the image of the QR code and over a wireless network connect to a US Water Systems web page in the phone's browser. US Water Systems' QR webpage has information on how to purchase replacement components as well as a helpful video directory on system servicing (i.e. How to change a UV lamp or quartz sleeve). To access the QR code on the USWATER5.0 or USWATER6.0 controller simply press the control button twice and the QR code screen will appear as follows:



# System Overview

## Typical Connection Fittings



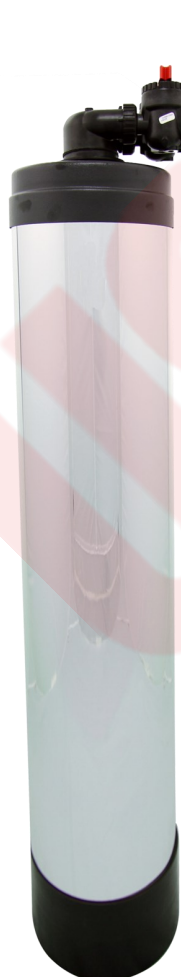
Bypass

3/4" or 1" PVC

### Filter Housing



### GreenWave Carbon



### GreenWave NAC



### Tank Heads

### Media Tanks

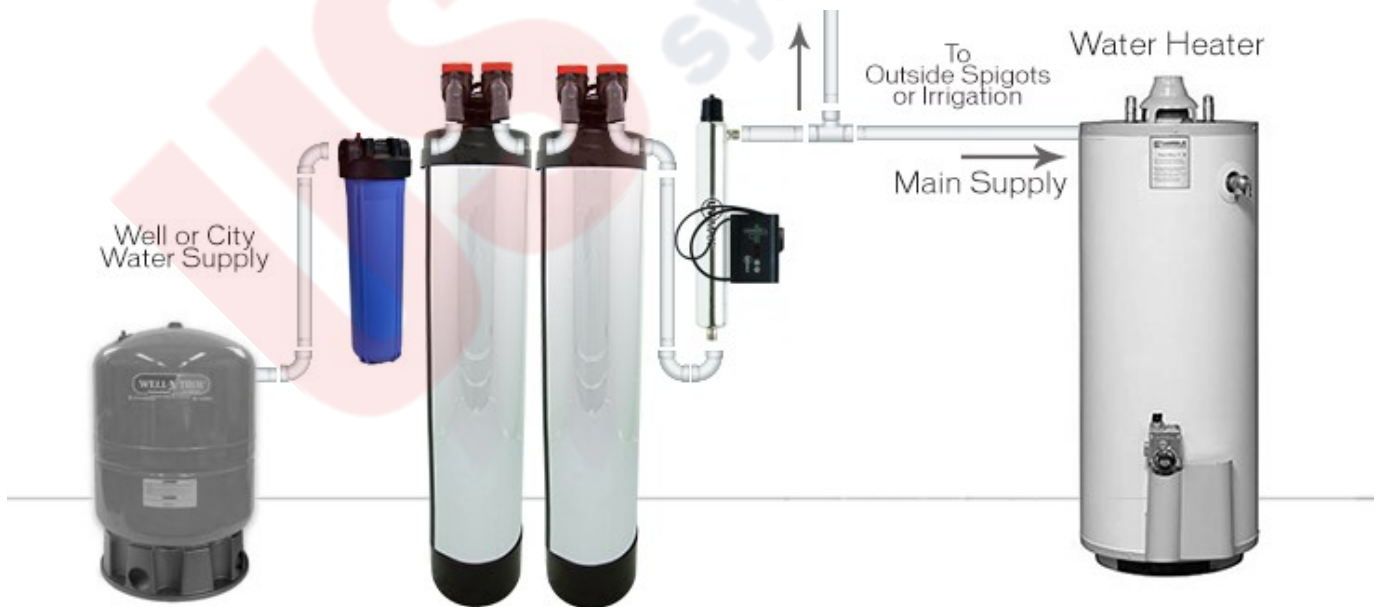
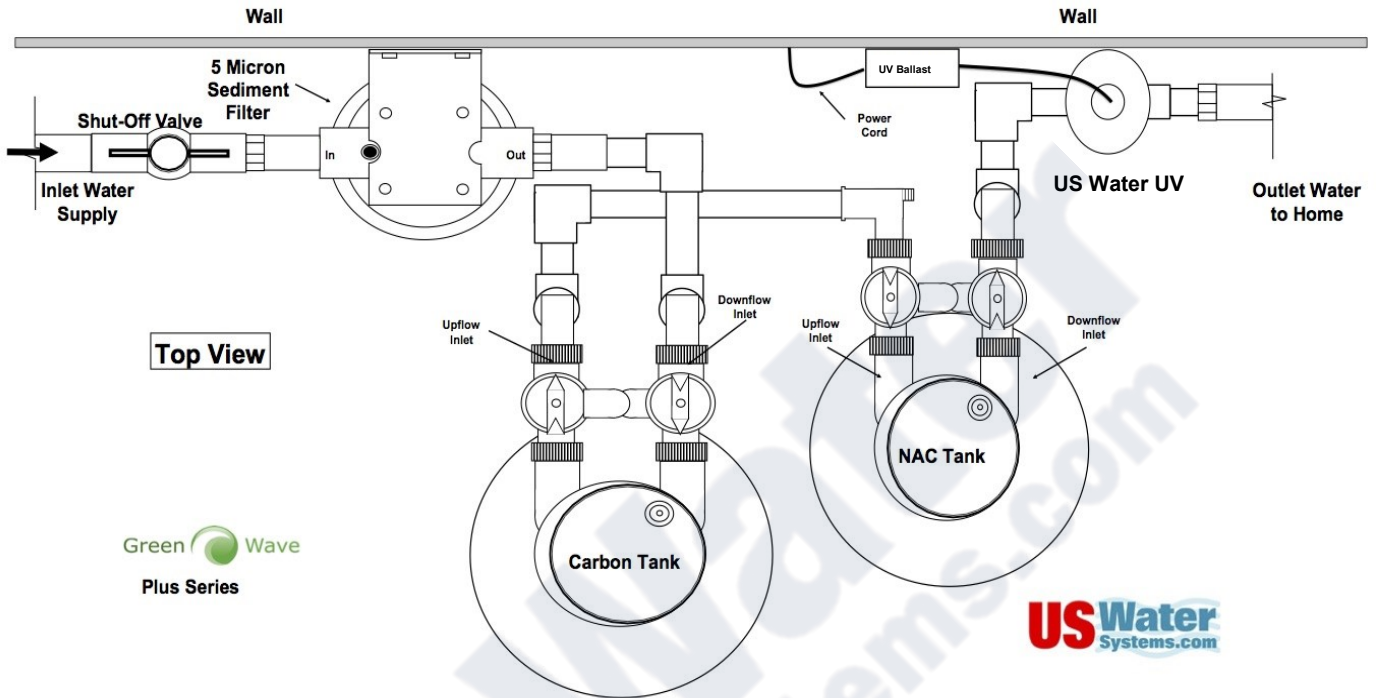
The Carbon Tank will be about 75-90% full of carbon.

The NAC Tank will have just a few inches of media in the bottom of the tank.

### US Water UV



# System Overview (Configuration)



## Filter Housing Installation

1. Install the 5 Micron sediment filter first. This filter should be installed at the point of entry of the home. The sediment filter is marked "IN" and "OUT" on the top of the housing.



2. Mount the housing to the bracket using the supplied screws. Be sure the filter is mounted so the inlet is on the correct side for the application flow direction.





## Filter Housing Installation

3. Now mount the filter housing to the wall using the appropriate fasteners for your wall material. It is preferred that this is mounted on a secured board or wall stud as it will be heavy when full of water.



4. The water source of the application should be plumbed to the "IN" port on the filter housing. The outlet plumbing from the sediment filter housing will be connected to the GreenWave Carbon Tank to the "DOWNFLOW" inlet.





## Sediment Filter Installation

1. Now install the filter in the filter housing by removing the sump from the housing.
2. There is a notch in the bottom of the sump that will center the filter in the housing. Unwrap the filter (5 Micron) and install it in the sump.

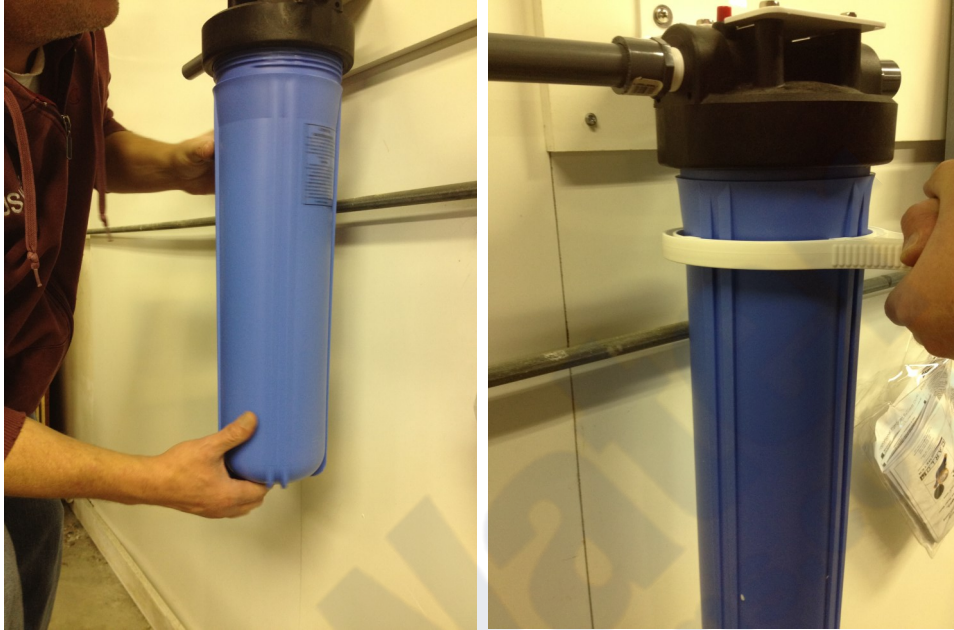


3. Coat the O-ring and threads on the sump with food grade silicone grease and install the O-ring in the filter sump.



## Sediment Filter Installation

4. Now install the sump in the filter cap and turn it clockwise to tighten the filter. Once it is hand tight, use the supplied wrench to tighten it an additional 1/4-1/2 turn.



5. Once the filter is installed the red button on the top of the filter can be used bleed the air out of the chamber when the water is turned on to the system (this step will be discussed during the startup procedure).



## Carbon Tank Installation



1. Make sure that the distributor tube (shipped inside the tank) is centered in the indent in the bottom of the tank (use a flashlight if necessary). (Figure A).
2. The distributor tube should be even with the top of the tank. There is an o-ring inside the tank head that seals around the distributor.

3. Cover the distributor tube opening with a cap or piece of tape. Duct tape works exceptionally well for this.

**NOTE: IT IS IMPERATIVE THAT NO MEDIA (carbon) BE ALLOWED INSIDE THE DISTRIBUTOR TUBE. CARBON SHOULD NOT BE ALLOWED TO ENTER THE DISTRIBUTOR UNDER NO CIRCUMSTANCES.**



4. Add the gravel & carbon.
5. Place the included funnel inside the tank opening securely. It is easiest to do this if there are two people (one to hold the funnel and one to pour the media), but one person can do it, especially if you secure the funnel to the tank with duct tape, so as not to spill the media.
6. A mask or a cloth should be worn over the nose and mouth as the carbon fines can cause irritation to the nose if breathed in. However, the carbon is in no way toxic.
7. Pour all included gravel in the tank first followed by the all the carbon.

**The tank should now be filled approximately 70-80%. US Water does not send extra media.**

8. Be sure to remove the tape and wipe the top of the tank and distributor tube with a clean cloth.
9. Fill the tank with water until it is approx. 4" from the top. Be sure to let the carbon soak for a minimum of 2 hrs.
10. Lubricate the o-rings on the head with food grade silicone lubricant\*. (part #995-1014081, not included) Make sure that the upper basket (Figure B) is securely attached to the tank head. [\* If food grade silicone is not available, use corn or vegetable oil.]
11. Install the head back on the tank and tighten hand tight. Do not use tools to tighten the head or damage may occur.

**\*\*\*\*NEVER USE A PETROLEUM BASED LUBRICANT OR VASOLINE\*\*\*\***

**Figure A**



**Figure B**



**Bypass Valve**



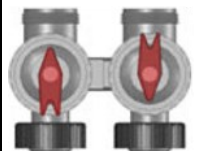
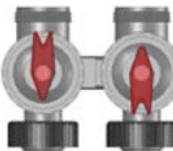
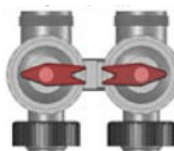


## Greenwave Tank Installation



1. Place the GreenWave tanks in the desired location on a flat level surface. The NAC tank is pre-filled with media. The carbon tank was previously filled with media and water on page 13.
2. Make sure that both tank heads are tightened securely by hand tightening—Do Not Use a Wrench. Hand-tight is recommended.
3. Connect the outlet of the filter housing to the DOWNFLOW inlet on the GreenWave carbon tank.
4. Connect the outlet of the GreenWave carbon tank (marked upflow inlet) to the UPFLOW inlet of the GreenWave NAC tank, but **keep the NAC tank bypassed**. **NOTE: With the GreenWave, the NAC tank operates in the UPFLOW mode which is opposite of most water softeners and opposite of the GreenWave Carbon tank. Therefore, the inlet is labeled *upflow inlet* and the outlet is labeled *downflow inlet*.**
5. **Keep both GreenWave tanks in the bypass position until startup.**
6. Proceed to the US Water UV installation.

### Bypass Valve Modification

Service Position down-flow tank	As shipped, the bypass is set-up for down-flow use. The arrow shape of the handles points in the wrong direction for UP-flow use. To convert it to UP-flow use, pull up on the red handles until they come off. Rotate the handle 180° and put it back on the valve stem.	Service Position UP-flow tank	Bypass Position UP-flow tank
			

## US Water UV Light Installation



Figure 3. Recommended Installation



## US Water UV Light Installation

### Installation

**Step 1:** The UV disinfection system should always be the last piece of treatment before the water branches off to the hot and cold water lines if the intent is for Point of Entry (POE) (see figure 2). If the intent for the UV system is for Point of Use (POU) the system should be the final step before the faucet.

**Step 2:** US Water Systems strongly recommends that a 5 micron filter be installed **before** the UV system for a final polishing step before the water is disinfected.

**Step 3:** The reactor can be installed either horizontally or vertically using the clamps provided, however vertical installation is the preferred method with the inlet at the bottom (lamp connection at the top) as it allows any air that may be in the lines to be easily purged from the system.

**Step 4:** If the water supply flow rate is unknown, it is recommended that you use a flow restrictor so that the rated flow of your particular US Water Systems system is not exceeded and the UV dose is not compromised. The flow restrictor should be installed on the outlet port of the reactor.

**Step 5:** It is strongly recommended to have a licensed plumber connect the UV reactor to the water supply and may be a requirement depending on where you are located. If you are attempting this yourself, ensure you have all the necessary tools and fittings to accomplish this task.

**Step 6:** Although there are many methods of installation, this manual will provide a recommended procedure using copper plumbing and standard soldering methods. US Water Systems recommends the use of unions, a by-pass assembly and shut-off valves as this will allow you to isolate and remove the UV reactor if necessary (this method is a recommended method only however it allows for the maximum convenience but it requires extra components and more time for installation. Please refer to Figure 3 for the recommended installation.

**Step 7:** Before you cut into the cold water line, measure and cut all piping as per the recommended layout. Once all the components are ready, start by installing the female adapters onto the ports of the reactor. To ensure a proper seal, the use of Teflon™ tape is recommended on all threaded connections.

**Step 8:** Next solder all the assembly together, including ball valves and unions and finally connect the by-pass assembly to the cold water feed line (water in and water out).

## US Water UV Light Installation

**Step 9:** You can now gently remove the quartz sleeve from its packaging being VERY careful not to touch the length with your hands. The use of cotton gloves (not included) is recommended for this procedure as oils from our hands can leave residue on the sleeve and lamp which can ultimately block the UV light from getting to the water. In the package, you will find a lubricated o-ring. Place the o-ring over the open-end of the sleeve as shown in Figure 4.



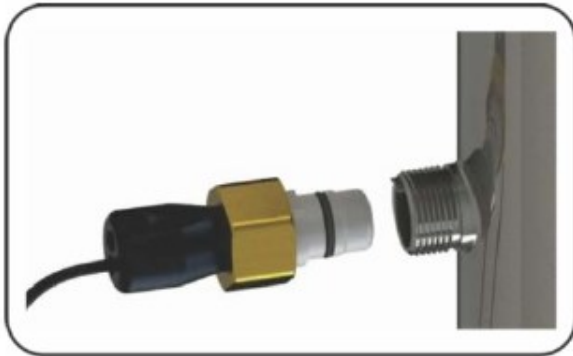
**Figure 4. Quartz Sleeve Installation**

**Step 10:** Carefully slide the sleeve into the reactor until you can feel it hit the opposite end of the reactor. Slightly push the sleeve in to feel it lock into the spring inside the reactor. Ensure that the o-ring is butted up against the reactor. Assemble the provided gland nut onto the threaded end of the reactor and tighten. The gland nut has a positive stop to avoid over-tightening, hand tighten ONLY. Install the provided stainless steel compression spring inside the quartz sleeve. This spring simply sits in the bottom of the quartz sleeve and works with the lamp and lamp connector to create the proper lamp alignment.  
**PLEASE NOTE:** DO NOT install a UV lamp inside the quartz sleeve without the sleeve spring in place.

**Step 11: (Applies only if you have a UV sensor ¼ USWATER6.0)** The UV sensor for the system is packaged in a separate plastic bag. Carefully remove the sensor from its packaging and insert the sensor into the UV sensor port (remove the protective cap on the UV reactor first). The sensor can only go in one way. Ensure that the flat portion of the UV sensor matches up with the half metal lip on the sensor port (flat portion should face the lamp connection end) (see Figure 5.). Ensure that the sensor is fully seated in the sensor port and then tighten (turning clockwise) the sensor nut.

**PLEASE NOTE:** DO NOT over tighten the nut as this could damage the Teflon sensor body. Plug the male connector into the IEP port located on the right side of the controller, Figure 6, (make sure the controller is not plugged in as the sensor MUST be attached before power is applied to the controller.)

## US Water UV Light Installation



**Figure 5. UV Sensor Installation**



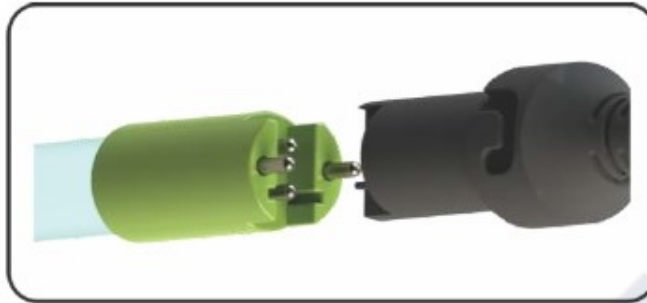
**Figure 6. IEP Connection**

**Step 12:** The reactor is now ready for water flow. When all plumbing connections have been completed you should check for any possible leaks. Slowly turn on the water supply and check for leaks. Make sure the by-pass valves are functioning properly and that the water is flowing through the reactor. The most common leak is from the o-ring not making a proper seal on the reactor. If this is the case turn the water off, drain the reactor, remove the o-ring, dry it and reapply silicon grease. Replace o-ring ensuring that it is properly sealed against the reactor and check again for leaks.

**Step 13:** The controller can now be mounted on the wall. The controller should always be above or beside the reactor to ensure that no moisture can deposit on any of the connections (see Figure 2.). Always mount the controller vertically. For safety purposes the controller should be connected to a ground fault circuit interrupter (GFCI) (also known as a ground fault interrupter (GFI)).

**Step 14:** You can now remove the UV lamp from its packaging being careful not to touch the lamp quartz with your hands. Again, the use of cotton gloves is recommended to avoid deposited oils on the lamp glass. Always hold the lamp by the ceramic ends. With the lamp outside of the reactor, affix the UV lamp to the lamp connector as shown in Figure 7.

## US Water UV Light Installation



**Figure 7. UV Lamp Connection**

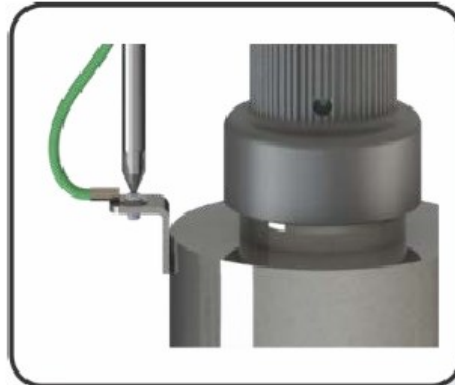
**Step 15:** Carefully insert the UV lamp into the reactor sliding it inside the quartz sleeve located inside the reactor (do not drop the lamp into the reactor). Affix the lamp connector into the gland nut by inserting the connector into the nut and turning the connector approximately  $\frac{1}{4}$  turn to lock the connector to the gland nut.



**Figure 8. Quick Disconnect Connector**

**Step 16:** Affix the captive ground screw to the ground lug on the UV reactor to ensure proper grounding continuity.

## US Water UV Light Installation



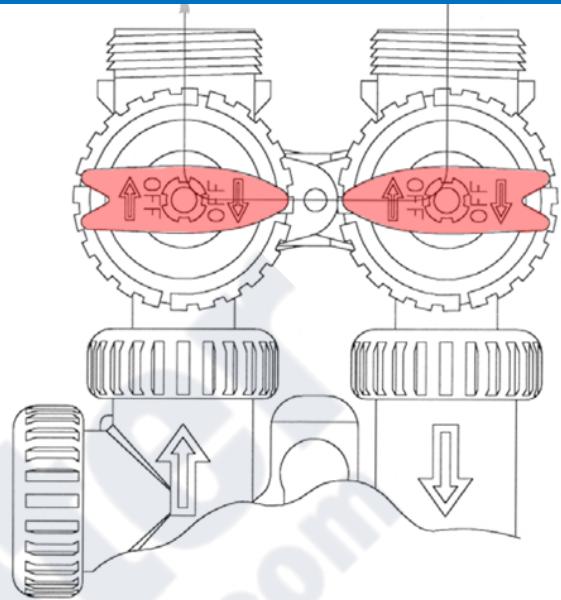
**Figure 9. Ground Screw Connection**

**Step 17:** Your system is now ready to be plugged into the appropriate GFCI protected outlet. The unit will be plugged in during the startup procedure. **DO NOT** plug in at this time.



## Start Up

1. Make Sure that the NAC Tank is on “bypass” - shown at the right.
2. Slowly open the supply valve (user supplied) to the GreenWave Carbon Tank or slowly open the Carbon Tank Bypass valves. Allow the tank to fill with water until all the air is purged. Then, flush the carbon tank for 15-20 minutes or until water runs clear. If you see any carbon (other than the “black tinted color”), immediately bypass the system. If pieces of carbon are coming out of the carbon tank there could be an internal problem. Small fines or tinted water is normal.
3. Open a faucet (preferably the tub or laundry sink faucet) downstream from the GreenWave system to relieve any trapped air and flush until clear.
4. Check for leaks. Repair as needed.
5. The Carbon System is now ready for service.
6. Next, slowly open the bypass valves on the NAC tank and with the faucet open, again allow the air to slowly purge.
7. Run the water for several minutes or until clear and free of air.
8. Check the UV light and pre-filter for leaks and repair as needed.
9. If there are no leaks, plug the UV light controller in a continuously energized 110v outlet (GFI protected if possible).
10. The system is now operational. Be sure to check for leaks one final time.



## Engineering Specifications

### Engineering Specifications & Sizing Guide

MODEL	Max Chlorine	Flow Rate	Carbon Tank	NAC Tank
GWP -1000	2 PPM	10 GPM	10" x 54"	9" x 48"
GWP -1500	3 PPM	15 GPM	12" x 52"	10" x 54"
GWP -2000	4 PPM	20 GPM	13" x 54"	12" x 52"

## A Note to the Homeowner

Your GreenWave system will improve the properties of water throughout your home. Here are some things to expect and some recommendations for maximizing the benefits and your enjoyment of your GreenWave system.

**Sinks and fixtures - should have little or no spotting.** If water is allowed to evaporate, small spots may be left behind. This spotting should not require any more than a wet cloth or sponge to remove. No harsh chemical should be required as with typical hard water spotting.



**Dishwasher-Spotting on dishes and on the surface of the dishwasher should be greatly reduced or eliminated.**

Dishwashing detergents low in phosphates are highly recommended as they are better for the environment and phosphates can cause spotting. In very hard water areas, the use of a rinse aid may be advised.

**Shower doors and tiles should have little or no spotting.** When water evaporates off a surface, small spots may be left behind. These spots should be easy to remove with a damp cloth or sponge.

**In the bath** you may notice that soaps and shampoos lather more than with untreated water. Soaps and shampoos will also rinse off much easier and faster than they would with traditional soft water. We recommend the use of modern soaps for the best results.



### Things to watch for:

During the first 30-90 days:

- Faucet aerators and drains may plug occasionally as old scale is removed from your plumbing system and water heater.
- You may also see milky water while the descaling is taking place. This is simply an increase in the calcium in the water because GreenWave is removing old scale deposits from your pipes.

### Good practices:

If your dishwasher is severely coated with scale at the time of installation, we recommend that you use a product like Lemishine, or Jet-Dry Dishwasher cleaner.. After this initial cleaning, your GreenWave Plus system should keep it clean. We also recommend that you drain your water heater tank. This should be done 30 to 60 days after GreenWave is installed, and again in one year. This is a good practice that can dramatically increase the life of your water heating appliance. Please follow the manufacturers instructions.

## LIMITED WARRANTY

US Water Systems, Inc. warrants the GreenWave system as follows:

- The Tank is warranted to be free of defects in materials and workmanship for a lifetime from the date of original purchase to the original owner.
- The Head is warranted to be free of defects in materials and workmanship for ten years from date of original purchase to the original owner.
- The GreenWave media (NAC) is warranted for performance for a pro-rated period of five years from the date of the original purchase to the original owner. [1-2 yrs. 100% 3-5yrs 50%]

## Conditions

1. The GreenWave system must be properly installed in accordance with the instructions provided by US Water Systems.
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 not to exceed 100 PSI and temperatures not to exceed 100 degrees F.
5. Water supply must not exceed 4-PPM chlorine. For water supply exceeding 4 PPM chlorine, pretreatment is required. (Please contact US WATER.)
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 US Water Systems, Inc. or any authorized representative before final commitment of warranty adjustment is made.
8. US Water Systems, Inc. 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 GreenWave media will be limited to furnishing a replacement for the media within the warranty period 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 or any other operation outside of the limits shown under Specifications, is not covered by this warranty.

US Water Systems, Inc. shall not be liable for freight, handling or labor charges, subsequent or consequential damages.



**US Water**  
systems.com



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Give us a call at: 1-800-608-8792





## Limited Lifetime Warranty

For the lifetime of the original purchaser, at the original residential place of installation of this *GreenWave Plus* Water Conditioning System, *US WATER SYSTEMS, INC.* warrants the following:

### LIFETIME COVERAGE

#### Media Tank

Free of all costs to you except transportation and labor charges, we warrant that we will replace or repair the fiberglass media tank, if for any reason it is found to be defective, because of faulty materials or workmanship.

### TEN YEAR COVERAGE

#### Head Assembly

We warrant that for ten (10) years from the date of purchase, we will replace the head assembly at no charge to you except for transportation and standard labor charges.

### FIVE YEAR COVERAGE

#### Filter Housing(s) All Other Parts

We warrant that for five (5) years from the date of purchase, we will replace the filter housing(s) and all other parts at no charge to you except for transportation and standard labor charges.

### FIVE YEAR COVERAGE

#### NAC Media

We warrant that for five (5) years from the date of purchase, we will replace the NAC Media at no charge to you except for transportation and standard labor charges during years 1-2 and at fifty percent (50%) of the list price in years 3-5.

### THREE YEAR COVERAGE

#### Carbon Media

We warrant that for three (3) years from the date of purchase, we will replace the carbon Media at no charge to you except for transportation and standard labor charges.

### GENERAL PROVISIONS

This warranty does not apply to any commercial or industrial installations or to any part of the water conditioner which has been subjected to misuse, neglect, alteration or accident; or to any damage caused by fire, flood, freezing, Acts of God, or any other casualty, or if the original serial numbers have been removed. Fouling or damage to the media caused by iron, sulfur, bacterial iron, silt, sand, tannins, organics, bacteria, hot water or chlorine voids the warranty on media.

These warranties are in lieu of all other warranties expressed or implied, and we do not authorize any person to assume for us any other obligation on the sale of this water conditioner. No responsibility is assumed for delays or failure to meet these warranties caused by strike, government regulations or other circumstances beyond the control of *US WATER SYSTEMS, INC.*

TO OBTAIN WARRANTY SERVICE, CALL OR WRITE: *US WATER SYSTEMS, INC. 1209 COUNTRY CLUB ROAD INDIANAPOLIS, IN 46234 (800) 608-USWA.*

ANY IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY ARE LIMITED TO THE TERMS OF THIS EXPRESSED WARRANTY AND THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE HEREIN. *US WATER* SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

THIS WARRANTY MAY BE TRANSFERRED TO A SUBSEQUENT OWNER WITH WRITTEN APPROVAL OF *US WATER* AND PAYMENT OF STANDARD TRANSFER FEE.