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Matrixx Greensand Plus Iron Filtration System

081-MXF-GS-XXX



MATRIX[™]

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Unpacking and Inspection

Be sure to check the entire unit for any shipping damage or lost parts. Also note damage to the shipping cartons. Contact US Water Systems at 1-800-608-8792 to report any shipping damage within **24 hours of delivery**. Claims made after 24 hours may not be honored. Small parts, needed to install the unit, will be in a parts bag. To avoid loss of the small parts, keep them in the parts bag until you are ready to use them.

Safety Guide

- Check and comply with your provincial / state and local codes. You must follow these guidelines
- Use care when handling the system. Do not turn upside down, drop, drag, or set on sharp protrusions
- The water treatment system works on 120 volt-60 Hz electrical power only. Be sure to use only the included transformers.
- Transformer must be plugged into an indoor 120 volt, grounded outlet only.
- Be sure to keep chlorine and other chemicals out of the reach of children.
- Keep the lid for the chlorine solution tank in place.
- **DO NOT** inhale air from the solution tank.

Before Starting Installation

Proper Installation

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

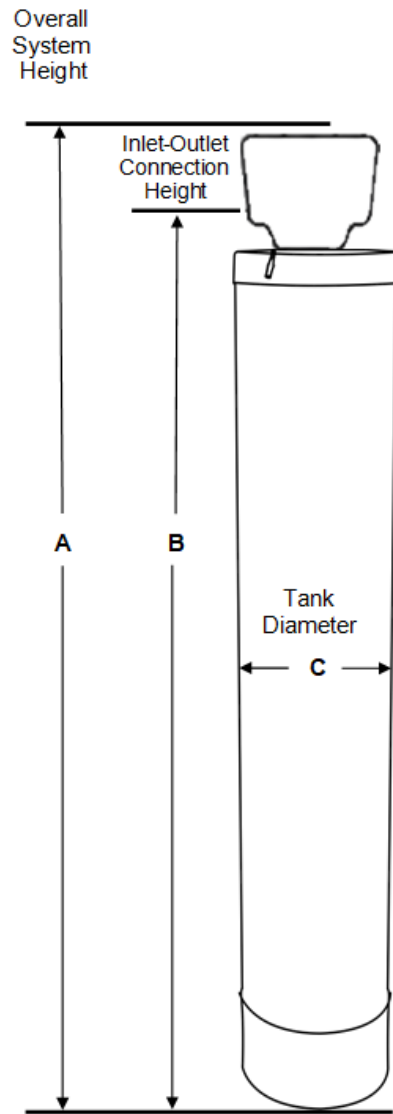
- **Do not** Install or store where it will be exposed to temperatures below freezing or exposed to any type of weather. Water freezing in the system will break it. Do not attempt to treat water over 100°F.
- **Do not** install in direct sunlight. Excessive sun or heat may cause distortion or other damage to non-metallic parts.
- Properly ground to conform with all governing codes and ordinances.
- Use only *lead-free solder and flux* for all sweat-solder connections as required by state and federal codes.
- Maximum allowable inlet water pressure is 100 psi. If daytime pressure is over 80 psi, night time pressure may exceed the maximum. Use a pressure reducing valve (PRV) to reduce the pressure.
- **Warning:** Discard all unused parts and packaging material after installation. Small parts remaining after the installation could be a choke hazard.
- Periodic control testing for the contaminant being treated is recommended to ensure system performance.

Tools, Pipe, Fittings, and Other Materials

- Channel Locks
- Screwdriver
- Teflon Tape
- Razor Knife
- Two adjustable wrenches
- Additional tools may be required if modification to home plumbing is required.
- To maintain full valve flow, be sure the plumbing size matches the size of the valve. The outlet pipe should be the same size or larger than the water supply pipe.
- Use copper, brass, or PEX pipe and fittings. Some codes may also allow PVC Plastic pipe.
- **ALWAYS** install the included bypass valve or install a 3 shut-off valve hard piped bypass. Bypass valves allow the water to be turned off to the system but can still provide water to the house for water use during repairs or service.
- 5/8" OD, 1/2" ID drain line is needed for the valve drain.
- 1" Pipe drains are required for the retention tank.

System Dimensions

Model	Tank Size	A	B	C
MXF-GS-150	10" x 54"	61.00"	55.25"	10"
MXF-GS-200	12" x 52"	59.00"	53.25"	12"
MXF-GS-250	13" x 54"	61.00"	55.25"	13"
MXF-GS-300	14" x 65"	71.00"	66.25"	14"



Backwashing Filter Introduction

The Matrixx Greensand Plus Iron Filter system is designed to remove iron and manganese from the water using chlorine as an oxidizer. Once a residual chlorine is produced following the system, the iron is removed. Chlorine is injected in the feed water line to oxidize the iron then the water goes in to a high speed retention / reaction tank to complete the reaction. After retention is completed and the chlorine concentration reaches equilibrium, the water then goes through the Greensand Plus filter. This filter acts as the substrate to catch the precipitated / oxidized iron. The Greensand Plus filter is periodically backwashed to flush out the iron that has been collected. There is a drain on the bottom of the retention tank that allows any iron sludge that may have accumulated in the tank to be flushed periodically.

PROPORTIONAL INJECTION SYSTEM

This proportional injection system consists of a holding tank for the chlorine, a chemical injection pump that mounts to the top of the tank, and a water meter that sends a signal to the chemical pump when water is used. The flow meter will be the first thing plumbed in the system followed by a tee for the chemical injection. From there, water is conveyed to the retention tank.

CHLORINE RETENTION TANK

The water comes into contact with the chlorine and mixes thoroughly in the chlorine retention tank. Roughly twenty minutes (20) of contact time is required for effective oxidation of iron. This can now be done in a third of the time with half the space requirement when using our new style of retention tank.

BACKWASHING MATRIXx GREENSAND PLUS FILTER

The Matrixx Greensand Plus Iron Filter with electronic computer control removes the precipitated iron to deliver iron free water.

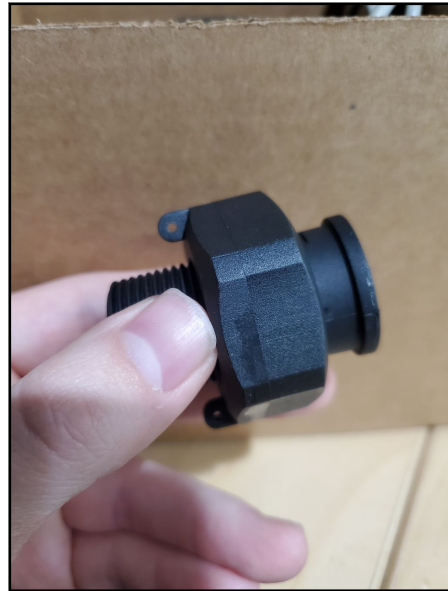
Greensand Plus Backwash Frequency	
Contaminant Level	Days Between Backwashes
1 - 3 PPM	3 Days
3 - 6 PPM	2 Days
> 6 PPM	1 Day

Where to Install the System

- Place the system as close as possible to the pressure tank (well system) or water meter (city water).
- Place the system as close as possible to a floor drain or other acceptable drain point (laundry tub, sump, standpipe, etc)
- Connect the unit to the water system **BEFORE** the water heater (10' or more). **DO NOT RUN HOT WATER THROUGH THE SYSTEM.** Temperature of water passing through the system must be less than 100°F.
- Do not install the system in a place where it could freeze. **Damage caused by freezing is not covered by the warranty.**
- Put the system in a place where water damage is least likely to occur if a leak develops. **The manufacturer will not repair or pay for water damage.**
- A 120 volt electric outlet is needed within 6 ft of the system. The transformer has an attached 6 foot power cable. **Be sure the electrical outlet and transformer are in an inside location so they are protected from wet weather.**
- If installing in an outside location, you must take the steps necessary to ensure the system, installation plumbing, wiring, etc are protected from the elements and contamination sources.
- **Keep the system out of direct sunlight.** The sun's heat may soften and distort plastic parts.

Water Meter Installation Instructions

1. Install the water meter. There is a flow direction arrow on the meter. Be sure the inlet plumbing is attached to the meter correctly.
2. Slide the nut over the connection nipple, apply Teflon tape and install it in the inlet plumbing. Do not over tighten the plastic nipple or damage could occur.



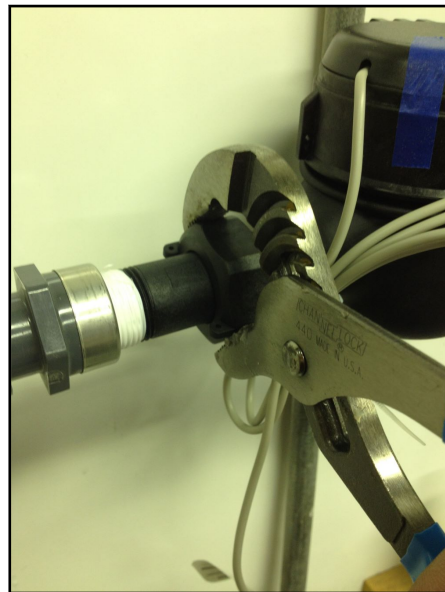
3. Install the rubber washer gasket in the connecting nut and install the water meter with the flow arrow pointing away from the inlet fitting. Tighten the nut hand tight. An adjustable wrench can be used to tighten the nut an additional 1/4 to 1/2 turn. The rubber washer gasket will seal the connection so the nut should not be over tightened.



- Slide the nut over the outlet nipple and install the outlet nipple in the outlet plumbing. Use Teflon tape to seal the connection and tighten with an adjustable wrench. Do not over tighten the nipple in the outlet plumbing connection or damage could occur.



- Install the rubber washer gasket in the nut and tighten the outlet plumbing to the water meter outlet connection. Tighten it hand tight then turn it an additional 1/4 to 1/2 turn with an adjustable wrench. Do not over tighten or damage could occur.



Chemical Solution Tank (With Pump) Installation Instructions

1. Install the chemical pump mounting bracket on the solution tank. Center the bracket on the back side of the tank. Install two #10 x 3/4" screws in the outer holes. Tighten all screws.



2. Install the chemical injection pump on the bracket that was installed on the tank using the screws taped to the bracket.



3. Drill a 1/4" hole in the top of the solution tank and install the tubing into the tank.



4. Install the weighted suction screen on the tubing that was inserted in the tank. Push the tubing down in the tank until the weighted suction screen is around 1" from the bottom of the tank.



5. Install the other end of the tank suction tube to the chemical injection pump inlet. The inlet is identified by an arrow pointing toward the pump. Be sure the sleeve is installed on the tubing properly. The beveled side of the sleeve should be facing the pump. Tighten the nut hand tight while holding the pump fitting. Do not use tools. Hand tightening will be sufficient.



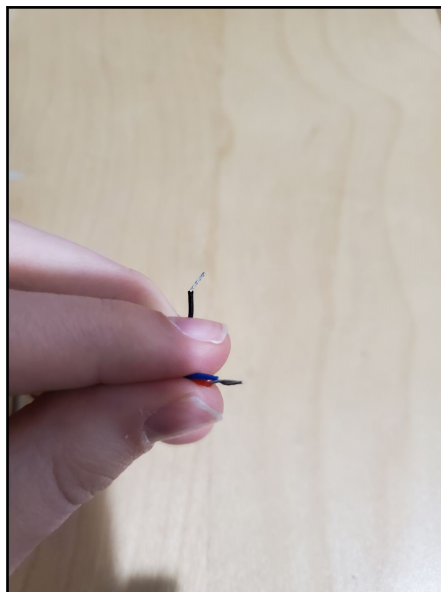
6. Install a piece of tubing on the outlet of the pump. Be sure to orient the sleeve properly and hand tighten the nut. The outlet is identified by an arrow that is pointing away from the pump.



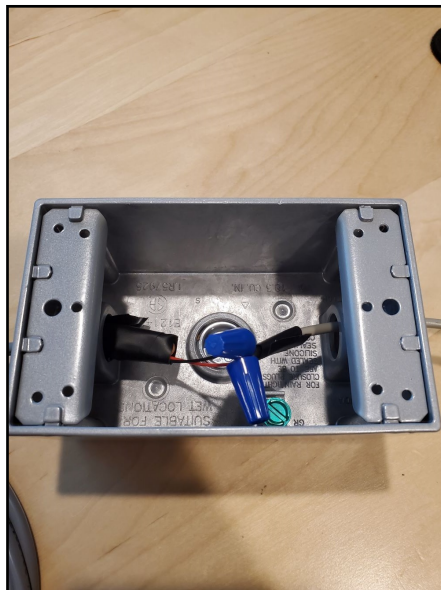
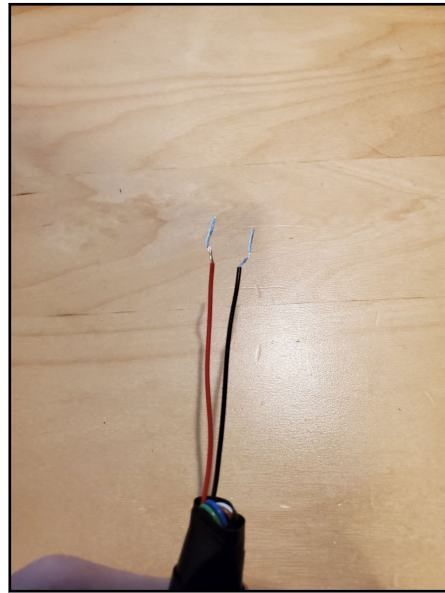
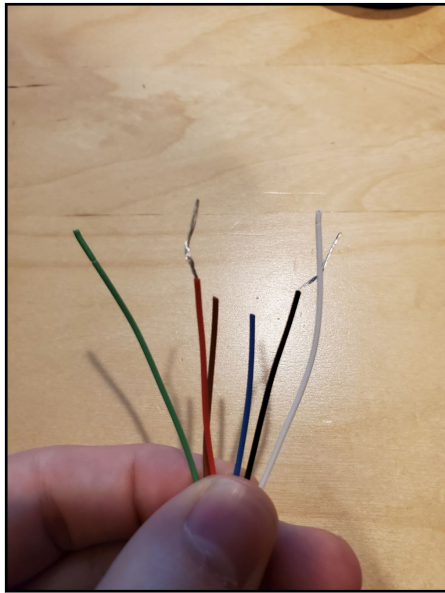
7. The other end of the outlet tube from the chemical pump will be installed in the injection check valve (installed next). Be sure to orient the sleeve properly and hand tighten.

Chemical Pump Wiring Installation Instructions

1. The wire coming from the previously installed water meter should have three wires: red, black, and blue. The red and blue wires each transfer half the rated pulse of the meter. Tape these two together and twist the wires together into one.



2. The wire coming from the chemical injection pump will have several colors. Fold back all wires but the red and black wire. Make sure the wires that are folded back are not touching each other or anything else. Tape the wires back. Now connect the black wires together with a wire nut or butt splice connector. Connect the red wire from the pump and the single red/blue wire from the meter using the same method. There is no voltage on these wires. An enclosure is recommended to house the wiring.



Retention Tank Installation

1. Remove the retention tank from the packaging. Install the drain fitting and valve on the bottom. Be sure to use Teflon tape when installing the valve. Install the nut, O-ring and retaining clip on the supplied gray elbow fitting. Grease the O-ring with food grade silicone grease. If that is not available, vegetable oil may be used. DO NOT use petroleum based lubricants. Install the elbow in the bottom of the tank and tighten the nut hand tight. There is no need to tighten it with tools. This fitting will move in the nut. This is normal. Once water pressure applied, the fitting will be secure.
2. Install the inlet from the water meter next. The 1" supplied tee must be installed prior to the inlet of the retention tank. Once this is installed, install the 1" x 1/2" reducing bushing into the offset port of the tee. Be sure to use Teflon tape when installing reducing bushing.
3. Once the tee is installed in the retention tank inlet piping, install the injection check valve for the chemical pump.
4. Now install the chemical pump outlet tubing to the check valve on the inlet piping of the retention tank.



5. Install the outlet plumbing from the retention tank to the inlet on the Matrixx Green-sand Plus Iron Filter.

Preparation

Filter Tank Preparation

Water Pressure: A minimum of 30 pounds of water pressure is required for the regeneration valve to operate effectively.

Electrical Facilities: An uninterrupted alternating current (AC) supply is required. *Note: Other voltages are available. Please make sure your voltage supply is compatible with your unit before installation.*

Existing Plumbing: Condition of existing plumbing should be free from lime and iron buildup. Piping that is built up heavily with lime and/or iron should be replaced.

Location of Tank and Drain: The media tank should be located close to a drain to prevent air breaks and back flow.

Caution: Water pressure is not to exceed 80 psi, water temperature is not to exceed 110°F (43°C), and the unit cannot be subjected to freezing conditions.

Media Installation

1. Remove the tank from the carton.
2. Verify the riser tube is centered in the bottom of the tank. There is an indentation in the bottom of the tank that will allow the distributor tube to be centered. A flashlight may be needed to verify the tube is in the center of the tank.



3. Install the clear, plastic cap that is provided in the install kit onto the distributor tube.

4. Use the funnel provided to pour the media into the tank. The order the media is poured in is important. Begin by pouring the Quartz Gravel into the bottom of the tank. Pour it evenly around the hole to ensure it is well distributed in the tank and pour slow enough to keep from plugging the hole. Then proceed to pour the Greensand Plus. A helper may be needed to hold the funnel during the filling process.
NOTE: It is recommended that a dust mask and safety goggles be worn to prevent possible injury.
5. When the media is installed, move the tank side to side to settle the media. Remove the funnel and cap from the distributor tube.



6. Lubricate the distributor O-ring and the outer tank O-ring.



7. Install the upper basket on the bottom of the valve by lining up the tabs then turning the basket clockwise to lock it in place. Place the upper basket over the distributor tube and push the valve onto the tank. Thread the valve on the tank by turning it clockwise. Be sure not to cross thread the valve on the tank.



8. Tighten the valve hand tight then snug it further by tapping it with the palm of the hand. **DO NOT** use tools to tighten the valve or damage could occur.



Installation Instructions

1. If your hot water tank is electric, turn off the power to it to avoid damage to the element in the tank.
2. If you have a private well, turn the power off to the pump and then shut off the main water shut off valve. If you have municipal water, simply shut off the main valve. Go to a faucet or spigot (preferably on the lowest floor of the house) and turn on the cold water until all pressure is relieved and the flow of water stops.
3. Locate the backwashing tank close to a drain where the system will be installed. The surface should be clean and level.

NOTE: Any solder joints being soldered near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the control valve and joints being soldered when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.

The system is equipped with male pipe threaded ports on the control valve bypass. The bypass is marked with arrows to show proper flow direction. The arrow pointing toward the valve indicates the inlet. The arrow pointing away from the valve is the outlet.



4. Insert the provided plumbing fittings into the bypass. 3/4" and 1" male pipe thread fittings are supplied so ensure you pick the correct one for your plumbing. Tighten the retaining nuts hand tight, ensuring that the fittings are not cross threaded.



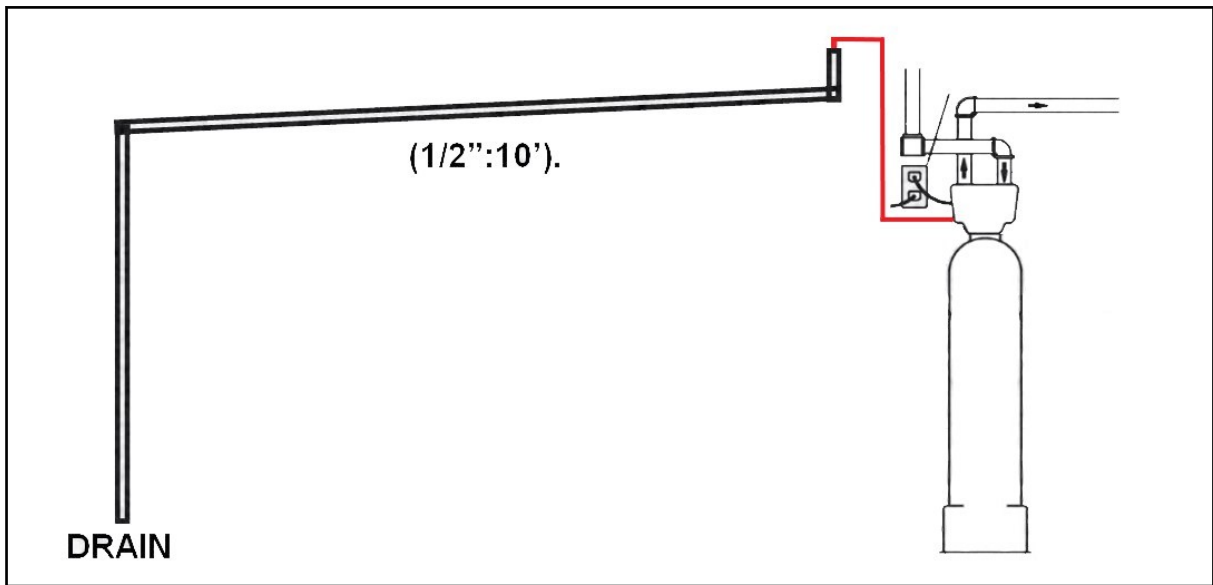
5. Be sure to use Teflon tape or other pipe sealant on the plumbing fitting threads and install them on the bypass accordingly. Use an adjustable wrench to ensure they are tight.



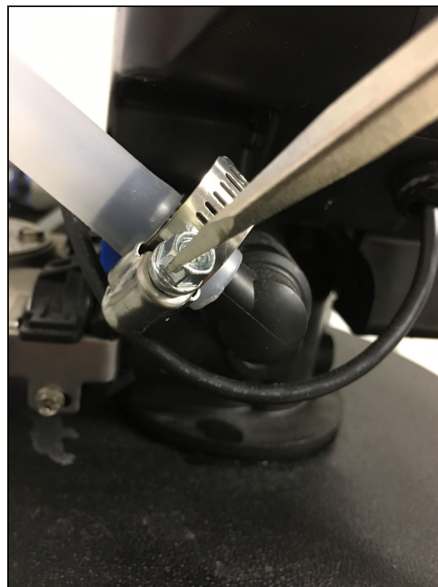
NOTE: All piping should be secured to prevent stress on the bypass valve and connectors.

NOTE: Connections above are made using a stainless steel flex connector with a rubber gasket and do not require Teflon tape.

6. Connect the drain hose to the valve and secure it with a hose clamp. Run the drain hose to the nearest laundry tub, floor drain or approved air gap fitting. The drain can be ran overhead or down along the floor. Drain tubing should be a minimum of 1/2" ID. When running the drain overhead, it is important that the tubing has no dips or kinks. If the drain is ran overhead and must run linearly to the available drain, it is recommended that a hard pipe is used of larger diameter than the drain line. This linear pipe should have a physical "drop" toward the drain (1/2" : 10'). The goal is to have a gravity drain without much back pressure when traveling long distances.



NOTE: A direct connection into a waste drain is not recommended. A physical air gap of at least 1.5" should be used to avoid bacteria and wastewater traveling back through the drain line into the system.



NOTE: Be sure to secure the drain line. The system will drain with force and it should be secured to prevent a leak. Hose clamps should be used to secure the drain line at the connection points.

Chemical Injection Pump Start-up Instructions

Proceed to mix the chlorine solution needed for the storage tank. Mix the chlorine in a 5 gallon bucket. Mix one bottle of granular chlorine to 5 gallons of warm water. Then pour the bucket in the holding tank. Make up 10 gallons of solution then trend the usage over the first month. The goal is to only make about 3 months worth of chlorine solution to ensure that it is always fresh and concentrated.

1. Plug the chemical pump power cord into a continuously energized 110v outlet. The chemical pump should be set when the unit is shipped. It should be set to "20 SECONDS" and the percentage should be set on 50%.



2. If changes need to be made, the pump must be unlocked. If the pump is locked, push and hold the mode and the percentage "%" buttons at the same time and hold them for 3-5 seconds. The pump locked sentence will disappear. If "STANDBY" is on the screen, push and hold the "MODE" and "STBY" buttons and "STANDBY" will disappear.
3. To change the "mode" to "20 SECONDS", hold the mode button while using the up or down arrows to change the setting.
4. To change the percentage, press and hold the "%" button while using the up or down arrows to change the percentage to the desired rate. The pump is now programmed.
5. Once the pump is programmed, pour the chlorine mixture in the chemical tank. Now push and hold the "PRIME" button as well as the "MODE" button until the pump pulls the solution from the container up to the pump and on to the injector. The level can be seen in the tubing as the pump becomes primed. Once it is primed, the pump is ready to use, The pump will operate during the startup process. If the pump is not working, see below.

NOTE: If the pump is showing "STANDBY", hold the "MODE" button and push the "STBY" button to take the pump out of the standby mode. The display will not show "STANDBY" if it is in normal operation. **BE SURE** to check that the pump is not in the "STANDBY" mode. If the pump is left in "STANDBY", it will not operate during regeneration as intended. If the pump is "LOCKED", it will need to be unlocked to make changes. If the valve is "LOCKED", press and hold the "MODE" and "%" buttons at the same time for 3-5 seconds to unlock.

System Regeneration

Normal Operation

Home Display - The home display will alternate between the time of day and gallons left until the next regeneration. The meter will count down to zero (0000) and then regenerate at the scheduled time set.

Starting a Regeneration Cycle

1. To Start **Delayed Extra Cycle**
 - If Days Remaining Until Next Regeneration does not read '0000', press and hold the Set/Change button for 3 seconds until the display reads '0000'
 - Regeneration cycle will initiate at the next designated regeneration time.
2. To start **Immediate Extra Cycle**, first complete above step.
 - With Gallons Remaining Until Next Regeneration at '0000', press and hold the **Set/Change** button.
 - After 3 seconds, the regeneration cycle will begin.
3. To **Fast Cycle** thru regeneration, first complete above 2 steps.
 - Press and hold the Set/Change button for 3 seconds to advance to the next cycle step. Fast Cycle is not necessary unless desired to manually step through each cycle step. (Repeat until valve returns to home display)

Filter Cycles		Default (Min)
Step 1	Backwash	10
Step 2	Rest	2
Step 3	Rinse	10

Programming Using Onboard Buttons

1. To enter the Main Menu, press the **Menu/Enter** button. (Time of Day will flash)
2. To set the **Time of Day**, press the **Set/Change** button. (First digit will flash)
 - To change digit value, press the Set/Change button.
 - To accept the digit value, press the Menu/Enter button.
 - Next digit will flash to begin setting.
 - Once the last digit display is accepted, all digits will flash.
3. To set **A.M. or P.M.**, press the **Menu/Enter** button.
 - To change digit value, press the Set/Change button.
 - To accept the digit value, press the Menu/Enter button.
 - Once A.M. or P.M. is accepted, the next menu item will flash.
4. To set the number of days between backwash cycles (A), press the **Set/Change** button. Repeat instructions from Step 2
 - Maximum value is 29
 - If value is set to 0, automatic backwash will never occur
 - Default setting is 7 days for filters
5. To Exit Main Menu, press the **Menu/Enter** button.

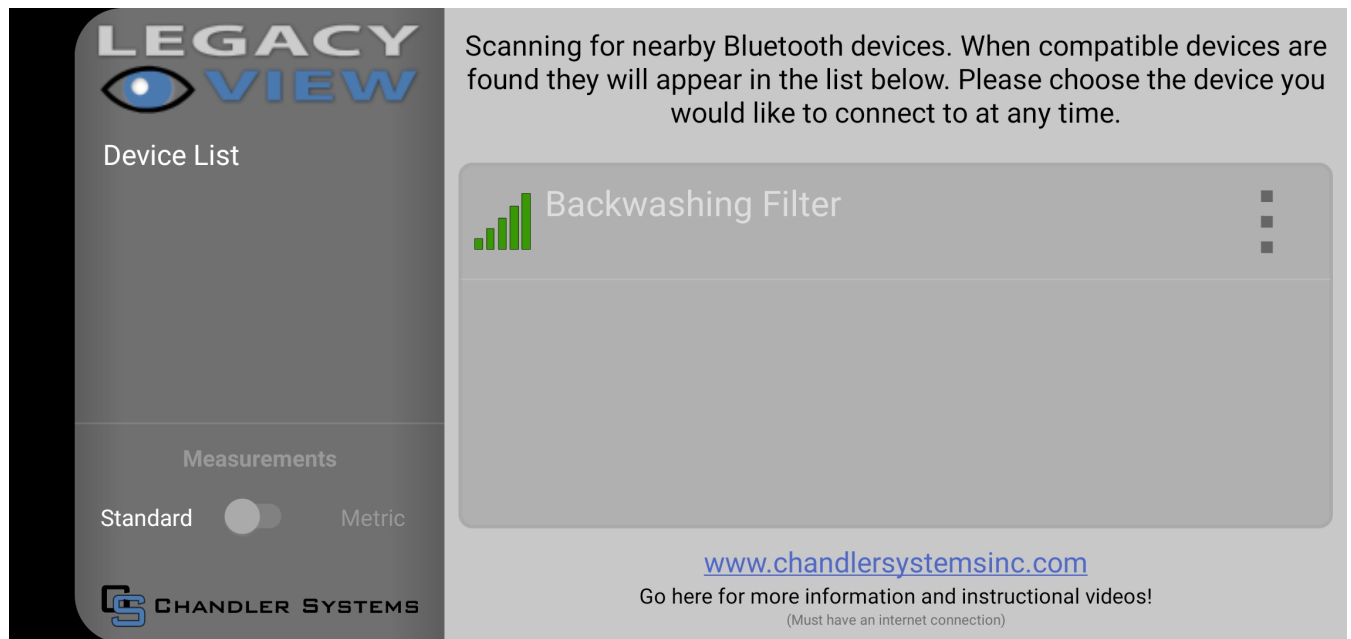
NOTE: If no buttons are pressed for 60 seconds, the Main Menu will be exited automatically.

Programming Using Legacy View App

The Legacy View app allows the user to control every aspect of the water system from the convenience of a smart phone. The Legacy View app will allow the user to monitor usage history, change cycle times, start a regeneration and advance through a regeneration.

To use the Legacy View Bluetooth App:

1. Go to the App store on the phone to be used and search for "Legacy View".
2. Download the free Legacy View app.
3. Open the app to begin programming.
4. Once the app is open, it will begin scanning for control valves in the Bluetooth vicinity.



5. Once the app connects to the control valve or valves, they will appear on the screen. Each valve can be renamed by tapping on the three vertical dots on the valve listed on the screen. Choose "Label Device" and a lettered keyboard will appear. The user can name the valve using the keyboard then save it by pushing "OK".
6. Choose the valve to be programmed by tapping on the name. A "Dashboard" will show up for the control valve.

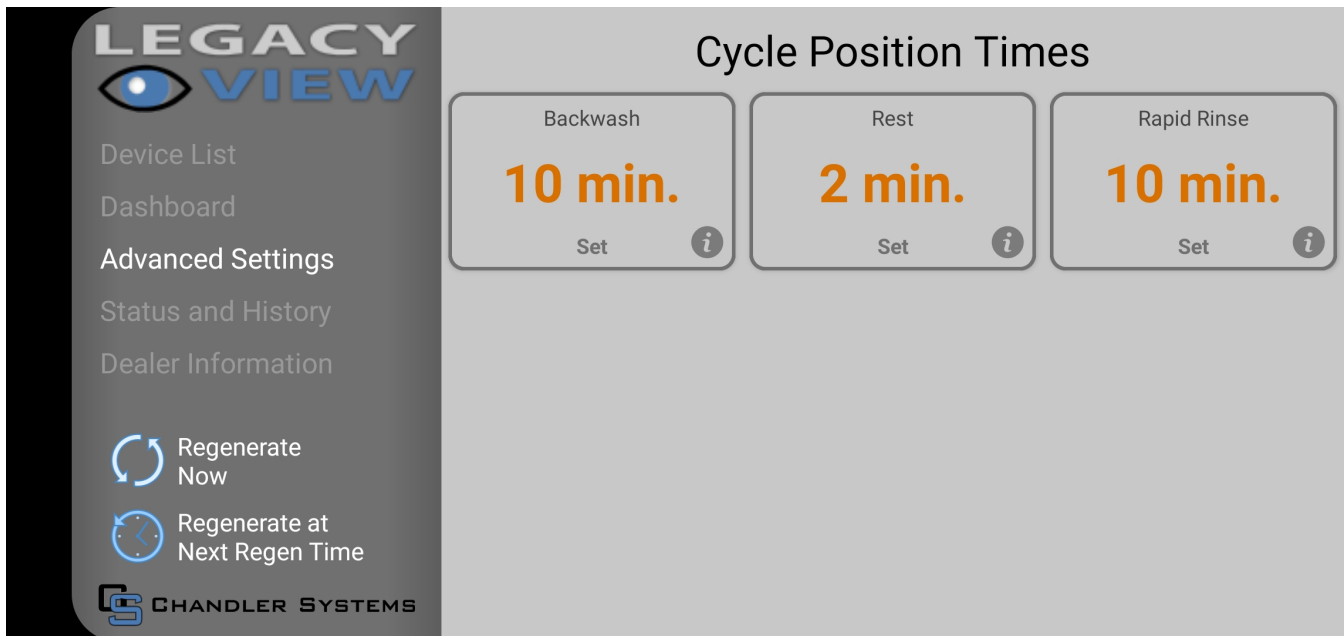
Dashboard



Parameters that can be changed are indicated with orange font. To change a parameter, tap on the orange font then use the keyboard that appears to change the value.

1. **Time of Day:** Tap on the "Time of Day" box. A box will appear that allows you to set the unit to the time that matches the device being used to program the unit. Press "OK" and the time will change to the current time of the device.
2. **Backwash Frequency:** Tap on the "Filter Backwash Frequency" box and input the desired days between backwashing. Most applications will set this to 3 days. If iron is extreme, it may need to be set to 1 or 2. Please call US Water at 1-800-608-8972 for help with setting the frequency, if necessary.
3. **Regeneration Time:** Tap on the "Regeneration Time" box. Input the desired regeneration time for normal operation. This is typically two hours after everyone in the house is asleep or the business is closed for the day.

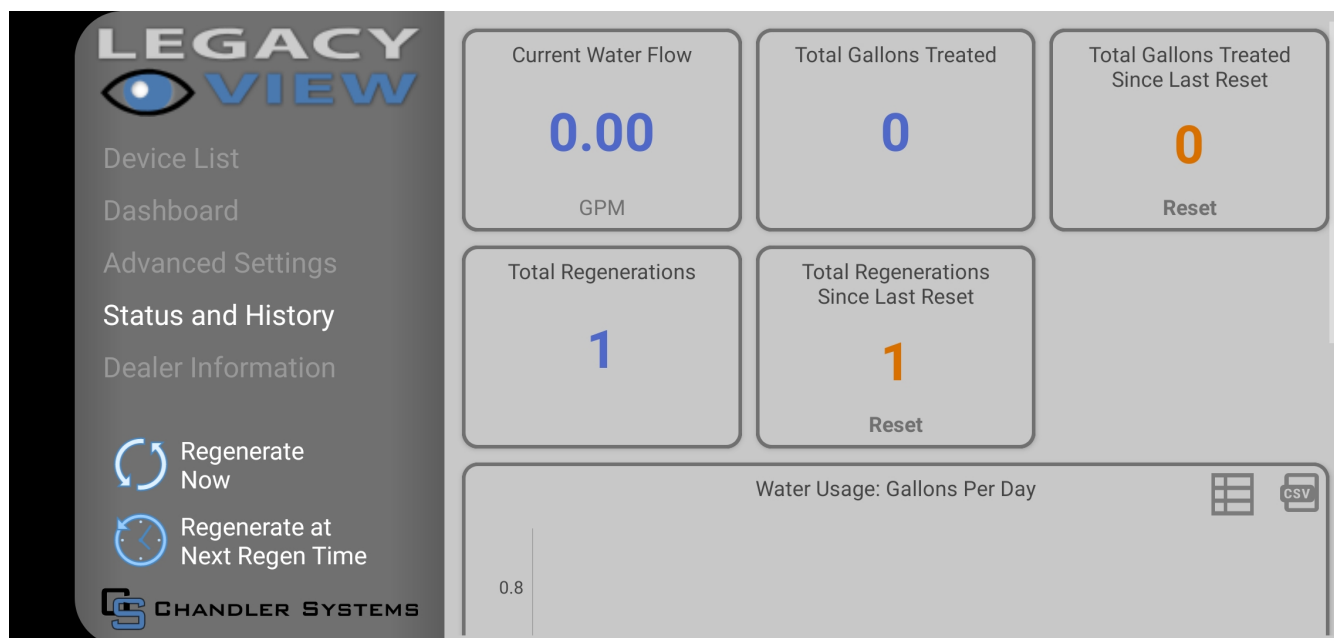
Advanced Settings



Parameters that can be changed are indicated with orange font. To change a parameter, tap on the orange font then use the keyboard that appears to change the value.

1. **Backwash:** This should be set to "10" min and should not be changed.
2. **Rest:** This should be set to "2" min and should not be changed.
3. **Rapid Rinse:** This should be set to "10" min and should not be changed.

Status and History



The Status and History screen shows current conditions of the system as well as flow rate and usage history. There are two parameters that can be reset.

1. **Total Regenerations:** This parameter shows how many times the system has regenerated since it was put in service or since the last time the value was reset.
2. **Total Water Treated:** This parameter shows the total amount of water that has been treated since the system was put in service or since the last time the value was reset.

Regenerating Using the Legacy View App

There are two options for regenerating the system. Tap on the desired option and press "OK".

1. **Regenerate Now:** Regenerate Now will queue an immediate regeneration and will start instantly.
2. **Regenerate at Next Regen Time:** Regenerate at Next Regen Time will queue the system to regenerate at the specified regeneration time chosen in the programming.

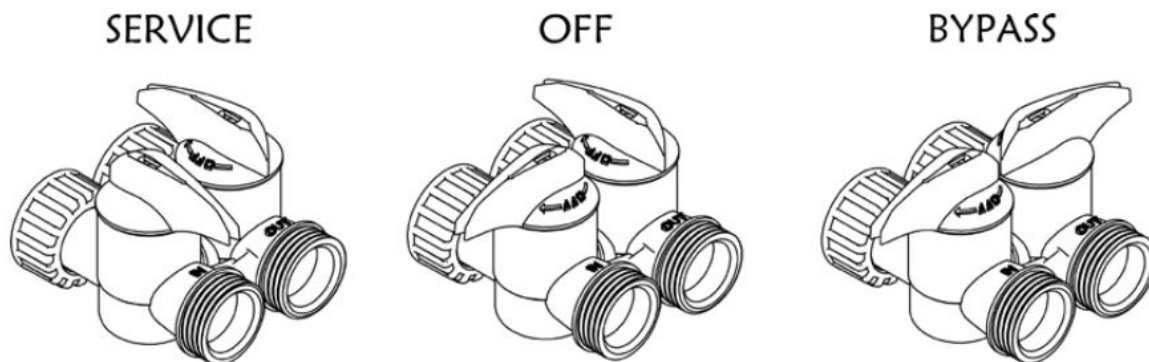
Automatic Bypass During Regeneration

The regeneration cycle can last 25 to 30 minutes, after which treated water service will be restored. During regeneration, untreated water is automatically bypassed for use in the household. This is why automatic regeneration is set for sometime during the night and manual regenerations should be performed when little or no water will be used in the household.

Manual Bypass

In the case of emergency, you can isolate your water system from the water supply using the bypass valve located at the back of the control. In normal operation, the bypass is open with the handles in line with the inlet and outlet pipes.

To isolate the system, simply rotate the handles clockwise (as indicated by the word OFF and arrow pointer on the handles) until they stop. Water can be used at related fixtures and appliances as the water supply is bypassing the system. The water used, however, will be untreated. To resume treated water service, open the bypass valve by rotating the handles counter clockwise.



About The System

You may notice new sounds as your water system operates. The backwash cycle lasts up to 25 minutes. During this time, you may hear water running intermittently to the drain.

System Start Up

1. With the bypass handles in the bypass position, turn on the main water supply and initiate an immediate regeneration. This will advance the valve to the backwash position.
2. Once the valve has stopped moving and is in the backwash position, slowly open the bypass handles about 1/8th turn. Water should slowly enter the tank.
NOTE: If there is a loud knocking sound, simply turn the bypass handle back slightly as the system is filling too quickly.
3. During the backwash cycle, slowly open the bypass valve until there is water coming out of the drain hose. Then open the bypass valve fully.
4. Allow the system to backwash and push all the air out through the drain.
5. The valve will automatically move to the rest cycle when the backwash cycle is complete. Skip this cycle by pressing and holding the "Set/Change" button on the control valve or by pressing "Go to Next Regen Step" on the Legacy View App.
6. This will move the valve to Rapid Rinse. Allow the unit to rinse for the entire cycle. The water in the drain should be running clear by the end of the Rapid Rinse Cycle.
7. The valve will then advance to Service.
8. Once the system has returned to the Service position, the system is installed and ready for chlorine adjustment.

Chlorine Injection Setting

To set the chlorine injection rate, open a faucet directly after the system and take a sample. The injection pump should be adjusted so there is about 1 PPM of residual chlorine after the system.

1. Run water for 20 - 25 minutes.
2. Take a sample after the system and test the chlorine level. The chlorine level should be 1 ppm of residual chlorine.
3. Adjust the pump in increments of 10% until the sample reads 1 ppm of residual chlorine, waiting 20 minutes between taking samples. To adjust the pump setting, the pump must be unlocked. If the pump is locked, push and hold the mode and the percentage "%" buttons at the same time and hold them for 3-5 seconds. The pump locked sentence will disappear. If "STANDBY" is on the screen, push and hold the "MODE" and "STBY" buttons and "STANDBY" will disappear.
4. To change the percentage, press and hold the "%" button while using the up or down arrows to change the percentage to the desired rate.
5. Continue the same process until the 1 ppm of chlorine is maintained. Once 1 ppm of chlorine stays consistent, the chlorine injection system is adjusted properly.

1 ppm of residual chlorine is an indicator that there is a small amount of residual chlorine in the treated water and the contaminant is being oxidized. Once this setting is determined, the system will operate automatically.

Over the first 1 -3 months, it is important to monitor the chlorine level in the storage / solution tank and start to gain usage data that will help you determine the chlorine usage. This will help you determine the chlorine usage and allow you to plan / order replenishment chlorine accordingly. This setting should be periodically checked and adjusted due to changes in the aquifer (well) and loss of chlorine concentration by degradation. After 6 - 8 months, the chlorine can lose concentration so only replenish the tank to a level that can be used in 6 - 8 months. This ensures the chlorine concentration strength is consistent.

Features

Battery Back-Up (Uses a standard 9-volt alkaline battery.)

- During power failures, the battery will maintain the time of day as long as the battery has power. The display is turned off to conserve battery power during this time. To confirm that the battery is working, press either button and the display will turn on for five (5) seconds.
- If power failure occurs while the system is regenerating, the control valve will motor to a shut off position to prevent constant flow to drain. Depending upon the system pressure and other factors, it is possible to observe a reduced flow to drain during this step. After power is restored, the control valve will return and finish the cycle where it left off prior to the power interruption.
- When used without battery back-up, during a power failure, the unit stops at its current point in the regeneration position and then restarts at that point when the power is restored. The time will be offset by the increment of time the unit was without power so it is necessary to reset the time of day on the unit. No other system will be affected.

WARNING: DO NOT INSTALL THE BATTERY BACKUP UNTIL THE SYSTEM HAS BEEN PROGRAMMED AND START UP IS COMPLETE!

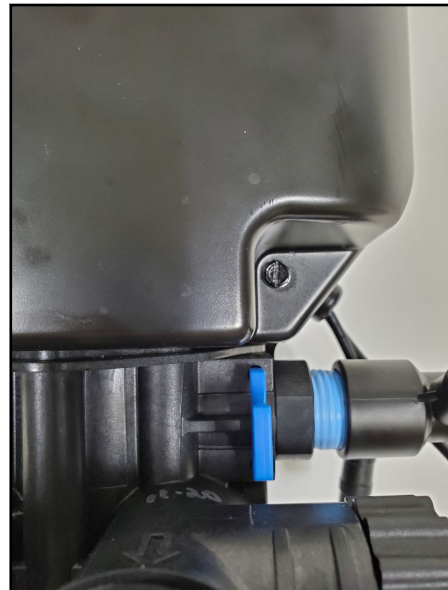
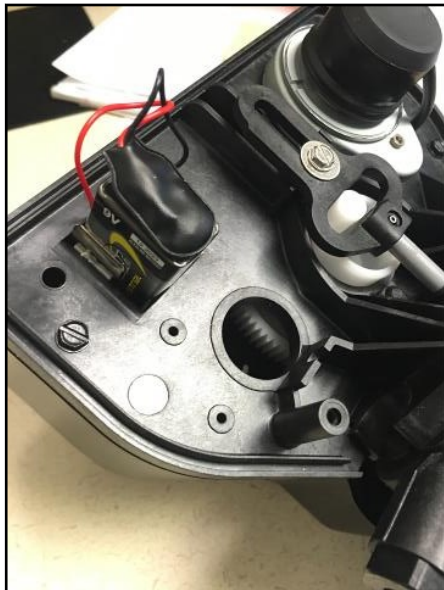
1. Remove the two screws on the back of the valve.



2. Pull out the 9V battery connector, remove the battery cover, and attach the battery to the connector.



3. Push the battery back in the holder on the valve and replace the cover and screws.



What to Expect

The Matrixx Greensand Plus Iron Filter will produce iron free water immediately after installation. Depending on the raw water quality, there may be contaminants built up in the water heater, plumbing system and other devices. Over the first few weeks, as water is used, there could be traces of this build up that are being removed by the newly installed system. This typically clears up after a couple weeks.

Depending on the contaminants being removed, there may be iron bacteria or sulfur reducing bacteria in the plumbing system prior to the treatment system install. This bacteria can potentially survive after the installation. This is usually indicated by a sulfur smell that will appear after a few weeks of initial usage. If this is the case, the well and entire plumbing system will need to be chlorinated to remove any existing bacteria. If the bacteria is not removed, it will begin to "grow" backwards toward the treatment system and the sulfur smell will not go away. If this does occur, it is easily eradicated with a chlorination well "shock" procedure. Ask a US Water Systems representative about our well sanitizing kits.

The chlorine sample reading may indicate an overfeeding of the chemical a few weeks after installation. This occurs because, after installation, the water will become cleaner and the initial dosage of chlorine may need to be adjusted to compensate for the lower contaminant level once the build up is removed.

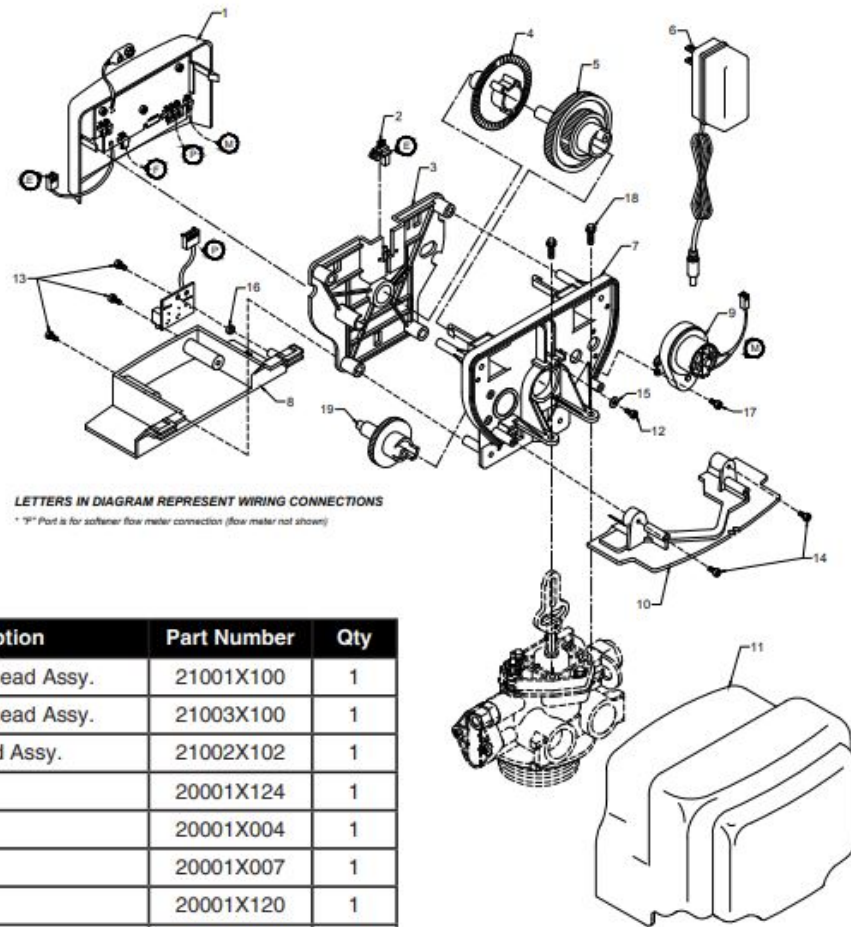
Routine Maintenance

- **Pressure Tank** - If the plumbing system uses a bladder pressure tank, it will be in the system prior to the Greensand system. This tank should be drained periodically to remove any build up of contaminants. Typically once a quarter is sufficient but that frequency may need to be increased on systems with high contaminant levels.
- **Injection Pump** - The internal pump tube and injection duck bill check valve may need to be replaced periodically. They typically last 1 - 5 years depending on the usage. There is a spare tube shipped with the system and instructional videos explaining how to change the tube at www.uswatersystems.com. Replacement duck bill check valves can be purchased at www.uswatersystems.com as well.
- **Solution Tank** - Periodically stir the solution tank and be sure the chlorine concentration is mixed and concentrated.
- **Retention Tank** - Periodically drain the retention tank to remove the accumulated solids and sludge.
- **Greensand Plus Filter** - The Greensand Plus filter is virtually maintenance free. However, if there is a power outage, the clock and other settings need to be checked to ensure the filter will backwash properly at the proper time of day. It is crucial that the Greensand Plus filter backwashes at a time when there is no water being used in the house. Periodically check the drain flow.

Maintenance Schedule

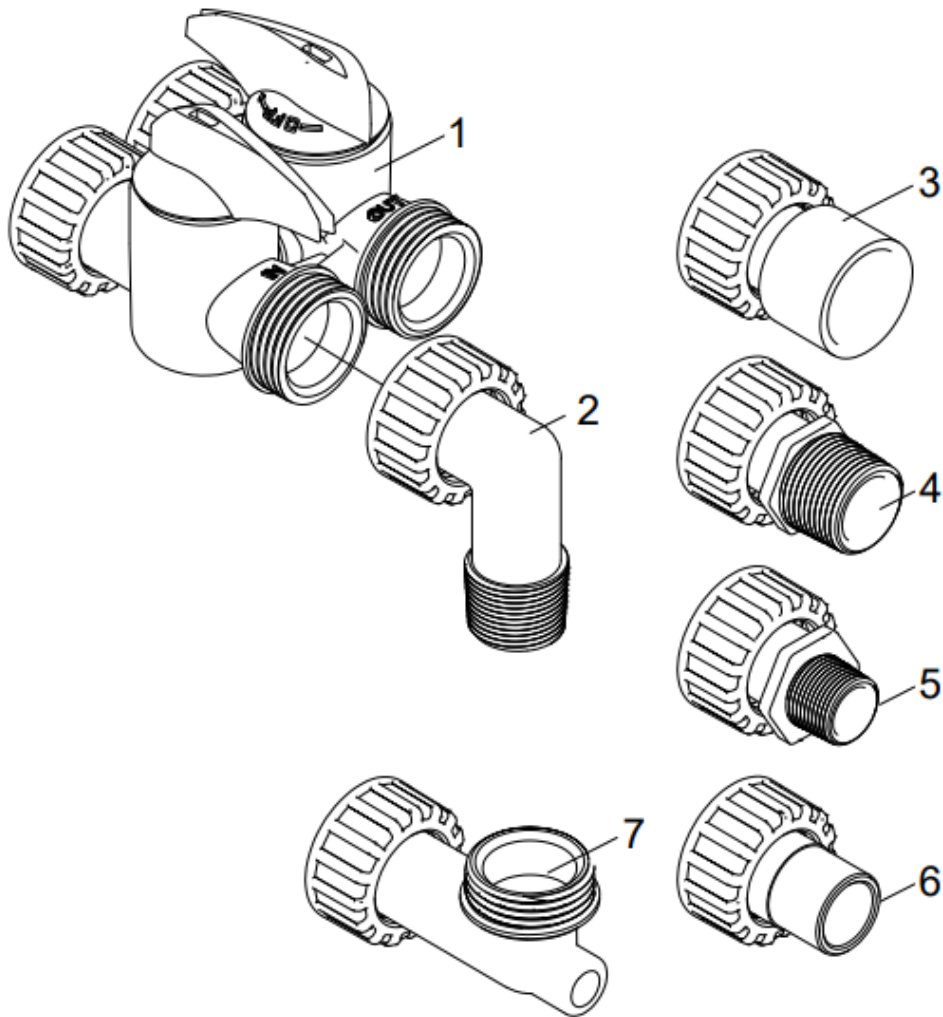
Component	Action	Frequency	Replacement Part
Existing Well Pressure Tank	Drain tank until the water runs clear	1 - 6 Months	N/A
Injection Pump Tube	Inspect pump tube and replace as needed	1 - 5 Years	411-EC30F-2
Injection Pump Duck Bill Check Valve	Replace injection check valve as needed	1 - 5 Years	411-UCDBINJ
Chlorine Solution Tank	Periodically check the solution level and refill as needed	Varies by water usage	710-C20832G
Control Valve	Check the clock and settings periodically or after a power outage	Monthly	N/A

Power Head Exploded View / Parts List



Ref	Description	Part Number	Qty
0	Timered Power Head Assy.	21001X100	1
0	Metered Power Head Assy.	21003X100	1
1	Filter Circuit Board Assy.	21002X102	1
2	Encoder	20001X124	1
3	Front Plate	20001X004	1
4	Encoder Wheel	20001X007	1
5	Main Gear	20001X120	1
6	Power Supply	20001X125	1
7	Back Plate	20001X005	1
8	Lower Front Base For Cover	20111X002	1
9	Motor		1
10	Lower Back Base for Cover	20111X003	1
11	Valve Cover	20111X000	1
12	Piston Screw	20001X007	1
13	Screw	SC10	3
14	Screw	SC9	3
15	Piston Washer	20001X002	1
16	Washer Circuit Board	20111X014	1
17	Screw Motor	SC2	1
21	Valve Hex Screw	20001X001	2

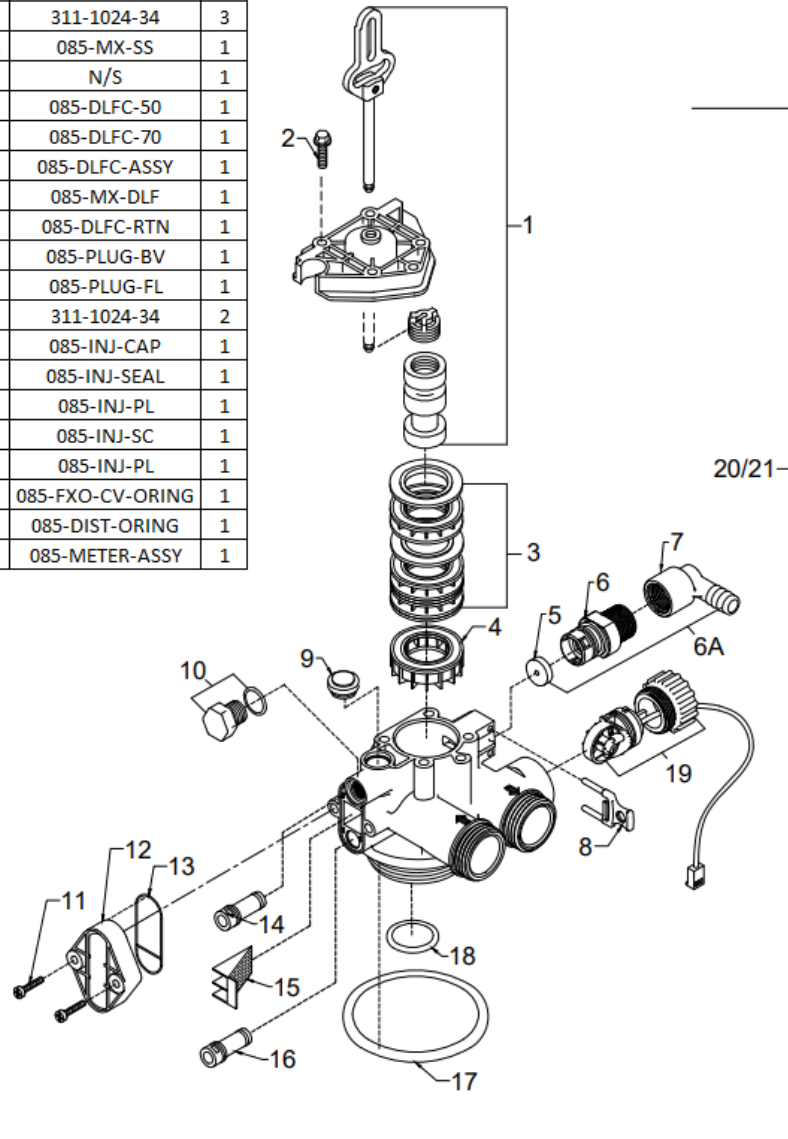
Bypass Exploded View / Parts List



REF	Description	Part No.
1	D15 Bypass	085-PBP
2	1" NPT Elbow Set	085-PBP-ELL-100
3	1" Female Straight Slip Set	085-PBP-SJ-100
4	1" NPT Straight Set	085-PBP-100
5	3/4" NPT Straight Set	085-PBP-075
6	3/4" Female Straight Slip Set	085-PBP-SJ-075
7a	Elbow, Vertical Adapter (Blank)	085-PBPA-BL
7b	Elbow, Vertical Adapter (1/4" NPT Tapped)	085-PBPA-025

Valve Body Exploded View / Parts List

REF	Description	Part No.	QTY
1	Piston Assembly	085-MX-SFP	1
2	10-24 X 3/4" Screw SST	311-1024-34	3
3	Seal and Spacer Kit Incl (5) #3 & (4) #4	085-MX-SS	1
4	End Spacer	N/S	1
5	Flow Control Button 5.0 GPM	085-DLFC-50	1
	Flow Control Button 7.0 GPM	085-DLFC-70	1
6	DLFC Assy.	085-DLFC-ASSY	1
7	90 Degree Hose Barb Elbow	085-MX-DLF	1
8	Drain Retainer	085-DLFC-RTN	1
9	Brine Valve Plug w/ O-Ring	085-PLUG-BV	1
10	Filter Plug Assy w/ O-Ring	085-PLUG-FL	1
11	10-24 X 3/4" Screw SST	311-1024-34	2
12	Injector Cap	085-INJ-CAP	1
13	Injector Seal	085-INJ-SEAL	1
14	Injector Plug & O-Ring Assy	085-INJ-PL	1
15	Injector Screen	085-INJ-SC	1
16	Injector Plug & O-Ring Assy	085-INJ-PL	1
17	Valve O-Ring	085-FXO-CV-ORING	1
18	Dist O-Ring	085-DIST-ORING	1
19	Meter Assembly	085-METER-ASSY	1



Warranty

MATRIX GREENSAND PLUS LIMITED WARRANTY

US Water Systems, Inc. (“US Water Systems”) warrants that your new water treatment system is built of quality material and workmanship. When properly installed and maintained, it will give years of trouble-free service. TO PLACE THIS EQUIPMENT UNDER WARRANTY, THE WARRANTY REGISTRATION MUST BE COMPLETED AND RETURNED BY THE ORIGINAL OWNER TO US WATER SYSTEMS, INC. WITHIN 30 DAYS OF INSTALLATION.

Coverage - This limited warranty covers the Matrixx Greensand Plus (the “System” hereafter) delivered to the original owner when the appliance is purchased for personal, family, or household use. It is intended to cover defects occurring in workmanship or materials or both. US Water Systems warrants that upon receipt from the owner of any Media Tank or Main Control Valve incorporated into the System found to be defective in material or workmanship, US Water Systems will repair or replace the defective item, at no charge for that item, under the procedures and limitations outlined below.

Ten Year System Parts Warranty - US Water Systems will replace any valve, electronics or miscellaneous part of the System, to any original purchaser of the System in possession of the System, which fails within ten (10) years from date of purchase, as indicated by the serial number, provided the failure is due to a defect in material or workmanship. THE DURATION OF THE

IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY AS THEY APPLY TO THE PARTS OF THE SYSTEM COVERED BY THIS PARAGRAPH OF THE LIMITED WARRANTY ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH IN THIS PARAGRAPH.

Lifetime Warranty on Greensand Plus Tank - US Water Systems will replace the Greensand Plus tank of the System, to any original purchaser of the System in possession of the System, which fails if the System was at all times operated in accordance with specifications set forth in the System’s handbook and not subject to freezing and other general limitations about the System. THE DURATION OF THE IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY AS THEY APPLY TO THE PARTS OF THE SYSTEM COVERED BY THIS PARAGRAPH OF THE LIMITED WARRANTY ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH IN THIS PARAGRAPH.

Five Year Warranty on Chlorine Tank / Retention Tank - US Water Systems will replace the Chlorine Solution Tank or Retention Tank of the System, to any original purchaser of the System in possession of the System, which fails if the System was at all times operated in accordance with specifications set forth in the System’s handbook and not subject to freezing and other general limitations about the System. THE DURATION OF THE IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY AS THEY APPLY TO THE PARTS OF THE SYSTEM COVERED BY THIS

PARAGRAPH OF THE LIMITED WARRANTY ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH IN THIS PARAGRAPH.

One Year Stenner Parts Warranty - US Water Systems will replace the Stenner Injection Components of the System, to any original purchaser of the System in possession of the System, which fails if the System was at all times operated in accordance with specifications set forth in the System's handbook and not subject to freezing and other general limitations about the System. THE DURATION OF THE IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY AS THEY APPLY TO THE PARTS OF THE SYSTEM COVERED BY THIS PARAGRAPH OF THE LIMITED WARRANTY ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH IN THIS PARAGRAPH.

General Provisions - US Water Systems assumes no responsibility for subsequent or consequential damage, labor or expense incurred as a result of a defect or for failure to meet the terms of this limited warranty because of circumstances beyond its control. Installation workmanship failure is not covered under this limited warranty. Damage caused by environmental conditions such as, fire, freezing, accidents, unreasonable use, abuse, neglect, lightning strikes, humidity or heat is not covered under this limited warranty. It is the responsibility of the customer to pay any and all shipping charges for the return or replacement of any part covered under this limited warranty. In the event the water supply being processed through the System contains sand, bacterial iron, algae, sulfur, tannins, organic matter, high levels of chlorine or chloramine, methane, or other unusual substan-

ces, then unless the owner's manual or appliance specifications for the System provides that the System is capable of handling these substances, other special treatment of the water supply must be used to remove these substances before they enter the System. Otherwise, US Water Systems shall have no obligations under this limited warranty. This limited warranty does not cover damage to a part or parts of the System resulting from improper installation. All plumbing and electrical connections should be made in accordance with all local codes and the installation instructions provided with the System. The limited warranty does not cover damage resulting from use with inadequate or defective plumbing; inadequate or defective water supply or high or low pressure; inadequate or defective house wiring; improper voltage, electrical service, or electrical connections; or violation of applicable building, plumbing, or electrical codes, laws, ordinances, or regulations.

US Water Systems does not authorize any person to assume for us any other obligation on the sale of this water system. No responsibility is assumed for delays or failure to meet this limited warranty 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 (800-608-8792). THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ANY IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY ARE LIMITED TO THE TERMS OF THIS LIMITED WARRANTY, AND THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE HEREIN. US WATER

SYSTEMS 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 limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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