



Clean Water Made Easy

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5900e Nitrate Installation & Start-Up Guide

Thank you for purchasing a Clean Water System! With proper installation and a little routine maintenance your system will be providing filtered water for many years.

Please review this start-up guide entirely before beginning to install your system, and follow the steps outlined for best results.

Make sure to have a nitrate test kit on hand and test regularly for nitrate before and after the system, as nitrate levels can change over time.

Quarterly or at least annually have your water professionally tested by a certified testing lab for nitrate levels before and after your system.



Questions?

Call us toll-free: 1-888-600-5426 or 1-831-462-8500

Email us: support@cleanwaterstore.com

See more information on our website: www.cleanwaterstore.com/resources

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Packing List

Model Size: 0.75 CF Nitrate System:

Quantity	Description
1	5900e backwash control valve & bypass valve
1	Pipe connector kit (either 1" or ¾")
1	8" x 44" filter tank with distributor tube
1	Media funnel
1	¾ cubic foot box of Nitrate media (resin)
1	8 lbs. filter gravel
1	18" x 33" black brine tank

Model Size: 1 CF Nitrate System:

Quantity	Description
1	5900e backwash control valve & bypass valve
1	Pipe connector kit (either 1" or ¾")
1	9" x 48" filter tank with distributor tube
1	Media funnel
1	1 cubic foot box of Nitrate media (resin)
1	12 lbs. filter gravel
1	18" x 33" black brine tank

Model Size: 1.5 CF Nitrate System:

Quantity	Description
1	5900e backwash control valve & bypass valve
1	Pipe connector kit (either 1" or ¾")
1	10" x 54" filter tank with distributor tube
1	Media funnel
1	1 cubic foot box of Nitrate media (resin)
1	½ cubic foot box of Nitrate media (resin)
1	16 lbs. filter gravel
1	18" x 33" black brine tank

Model Size: 2 CF Nitrate System:

Quantity	Description
1	5900e backwash control valve & bypass valve
1	Pipe connector kit (either 1" or ¾")
1	12" x 52" filter tank with distributor tube
1	Media funnel
2	1 cubic foot boxes of Nitrate media (resin)
1	20 lbs. filter gravel
1	18" x 33" black brine tank

Model Size: 2.5 CF Nitrate System:

Quantity	Description
1	5900e backwash control valve & bypass valve
1	Pipe connector kit (either 1" or ¾")
1	13" x 54" filter tank with distributor tube
1	Media funnel
2	1 cubic foot boxes of Nitrate (resin)
1	½ cubic foot box of Nitrate media (resin)
1	35 lbs. filter gravel
1	18" x 33" black brine tank

Pre-Installation

1. Review your packing list and make sure you have received all the parts before beginning installation. Please ensure that all parts are included before scheduling a plumber or installer to come to the site.
2. If you are going to be turning off the water to the house and you have an electric water heater, shut off the power to the water heater before beginning installation in case water heater is accidentally drained.
3. Pick a suitable location for your filter system on a dry level spot where it won't be exposed to freezing temperatures. A minimum of 20 PSI is required. Maximum pressure is 90 PSI.
4. Get all of your plumbing parts together before beginning installation. Installation typically takes 3 to 5 hours. However after installation the Nitrate must be allowed to run through a complete backwash and rinse cycle (also called 'regeneration'). You don't have to be present for this first backwash necessarily, but it does take 90 minutes.
5. After the system is installed and running, your water may be discolored, or full of sediment/rust, particularly if this is older piping that has been exposed to iron or manganese for some time. Typically this clears up over a day or two, but can persist for weeks if the pipe is old galvanized iron pipe that is corroded.

Best Practices for Piping & Drain Installation

1. See typical installation (see Fig 2). The Nitrate is installed after the pressure tank.
2. Make sure to connect the IN pipe to the 5900e inlet and the OUT to the outlet (see Fig 3). As you face the 5900e control from the front, the water enters on the right and exits on the left. From the back (see Fig 3) the water enters on the left and exits on the right. The inlet and outlet are attached to the bypass valve which is marked with arrows as well.
3. Make sure there is a working gate or ball valve before the 5900e Nitrate and also one after as shown in the diagram (Fig 2). The pressure gauges are optional but a hose bib (a faucet that you can attach a garden hose to) is strongly recommended after the Nitrate and before the second ball valve. This makes it easy to rinse your new Nitrate on start-up and gives you a place to test the water before it enters your household plumbing.
4. If you will be using copper piping, do not sweat the copper pipe directly on to the 5900e control valve. Avoid heating up the 5900e control valve plastic with the torch.
5. You do not need unions to install your 5900e control. If you need to remove it, the 5900e has quick-release couplings that make it easy to put the Nitrate on by-pass and remove the filter system from the piping.
6. The drain line tubing (not supplied) is connected to a drain from the drain outlet using flexible ½" ID tubing. Note that the drain can run up above the 5900e control and into a drain, it does not have to drain down, as the filter backwashes under line pressure from your well pump. Most plumbing codes

require an air-gap connection, so that if your sewer or septic tank backs up, it cannot cross connect with the drain tubing.

Installation of Your System into Copper or Metal Piping Systems

If your new filter system is to be installed in a metal (conductive) plumbing system, i.e. copper or galvanized steel pipe, the plastic components of the system will interrupt the electrical continuity of the plumbing system.

As a result any stray currents from improperly grounded appliances downstream or potential galvanic activity in the plumbing system can no longer ground through the contiguous metal plumbing.

Some homes may have been built in accordance with building codes, which encouraged the grounding of electrical appliances through the plumbing system.

Consequently, the installation of a bypass consisting of the same material as the existing plumbing, or a grounded "jumper wire" bridging the equipment and reestablishing the contiguous conductive nature of the plumbing system must be installed prior to your systems use.

This is simple and easy step to take if you are installing your water treatment system into copper piping. A simple ground jumper wire with a pipe clamp can be purchased at any Home Center, or hardware store etc for a few dollars.

How Your Nitrate Filter Works

See Fig 1 on the right, in the Nitrate filter, water enters the top of the tank and flows down through the media and up the distributor tube. Nitrates are drawn to the resin beads. During backwash, the water flow is reversed and water flows down the distributor tube and up through the media, lifting and expanding the Nitrate media, and removing any trapped particles. After the backwash stage, salt brine is automatically drawn in from the brine tank which then slowly rinses through the Nitrate resin for 1 hour, allowing the Nitrates to be swapped out with harmless sodium or potassium ions. This entire automatic process, called 'regeneration' takes about 90 minutes. Typically the Nitrate filter is set to regenerate every 7 days, during the middle of the night when no water is being used.

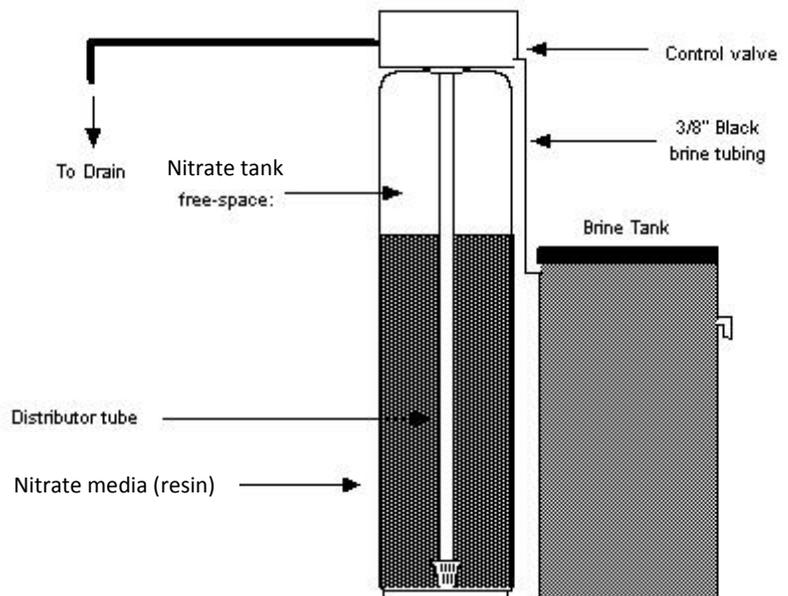


Fig 2 - Typical Nitrate 5900e piping installation with ball valve and hose bib after the filter along with pre- and post-filtration if necessary:



Fig 3: 5900e from the rear showing the inlet and outlet end-connector fittings 3/4" or 1" NPT in Noryl plastic. Brass end-connectors are also available for connecting to copper tubing.

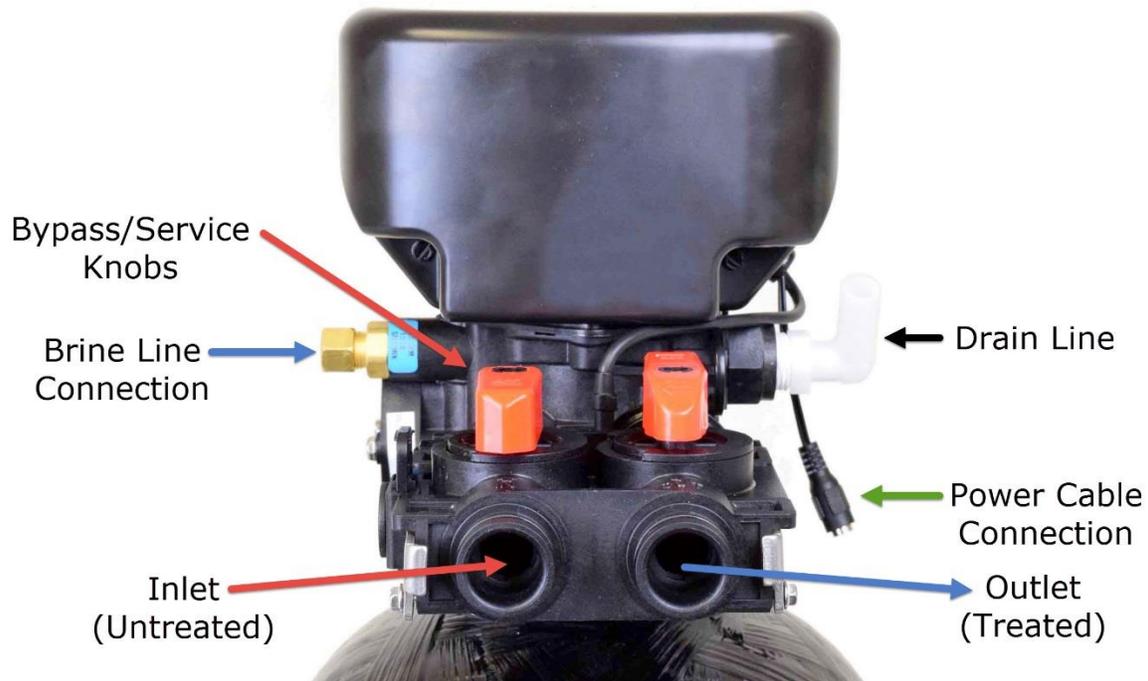


Fig 4 5900e Bypass/Service Mode Knob Positions



Installation Instructions

1. Wrap the top of distributor tube with black electrical tape or blue painter's masking tape so that no gravel or Nitrate media will go down the distributor tube when adding the media. Also, leaving a folded tab of tape that you will be able to grab onto to gently pull off the tape after filling the tank. When you are ready to screw the valve head on, apply silicone lubricant to the outside of the distribution tube, and the o-ring on the control valve where the tube goes in.



2. Add the filter gravel that came with your system. You want the gravel to cover the bottom distributor screen before adding the Nitrate media. Note: Be sure not to let any parts of the bag or other foreign materials enter the tank when you are adding media.
3. Next add the Nitrate resin using the media funnel provided. The tank will be approximately 2/3 full, however do not fill it past 2/3 full, even if there is some resin left over.
4. Remove tape from top of distributor tube. Be careful not to pull up distributor tube when removing tape.
5. Attach plastic top screen to the under-side of the 5900e control valve. It is a funnel-shaped plastic screen that snaps on to the control valve and prevents resin from being backwashed out to drain during the regeneration cycles. It may twist on clockwise or counter-clockwise.



1. Add a small amount of silicone grease to the tank threads and both o-rings on the bottom of the control valve and screw on 5900e control valve carefully. Do not use pipe-joint compound, vegetable oil, Teflon tape, or Vaseline or other petroleum greases to lubricate tank threads.

Assemble the bypass valve:

6. When you remove the bypass valve from the box, the valves are in the open position. Holding the bypass so that you are reading the In and Out (so that the words are not upside down to you when holding the bypass), note the following:

5900e Bypass and Service Mode Positions



7. The red handles are slightly arrow-shaped; the pointed end is pointing in the direction of flow when open. The Inlet valve (on the left) turns clockwise, from full open at “12:00 o’clock”, to full closed at “3:00 o’clock”. The Outlet valve turns clockwise from “6:00 o’clock” full open to “9:00 o’clock” full closed. The valves are stiff when new, so open and close them a few times. Leave them closed for now.
 - a) Choose which yoke (3/4” or 1”) you wish to attach to the back end of the bypass. Remove the barrels (picture 1) and apply a small amount of silicone lubricant to each of the O-rings (two on each barrel, four total) Push the barrels back into the bypass, and push the yoke onto the barrels. Attach the steel mounting clips on each side and screw in the two screws (picture 2)
 - b) If the valve you are attaching the bypass to has a flow sensor (see picture 3), lube the two O-rings and push the bypass assembly onto the flow sensor, and attach the steel mounting clips and screws.

8. If the valve you are attaching the bypass to does not have a flow sensor, then it has the same type of barrels that are on the opposite side of the bypass. Take out the barrels and apply silicone grease to all four o-rings and push in the barrels and attach the bypass.
9. Now install your water pipes to the 5900e bypass end connectors. Make sure inlet is installed to the 'In' pipe connector on the bypass valve and outlet is on the "Out" connector.
10. Connect some flexible tubing from the drain connection on the 5900e control valve to a suitable drain such as a septic tank or drain to a sewer. It is OK to run the drain line up and over the Nitrate, up to 4 feet above the top of the tank. If the drain line will be more than 20 feet, and especially if your system is a 2.0 or 2.5 cubic foot size, use larger diameter tubing such as $\frac{3}{4}$ " or 1". Note that it is desirable to be able to run the drain line into a bucket in order to test the backwash flow rate in the future. This is why hard piping the drain line is discouraged, however, if you do use hard PVC piping for the drain line, and you are able to remove the hard PVC drain piping and attach flexible tubing should you ever desire for testing purposes, it is OK to use rigid PVC pipe for the drain. Make sure the drain tubing is firmly clamped to the barbed fitting with a hose clamp to prevent leaks.
11. Next, connect the solution tank to the 5900e control valve with the black tubing, provided with the brine tank.

Attaching the brine line tubing to the brine tank & the 5900e brine valve

12. Insert $\frac{3}{8}$ " diameter tubing into the brine tank connection. Screw the nut with the sleeve and Ferrell attached to prevent leaking.

Fig 8 5900e Brine Line Installation



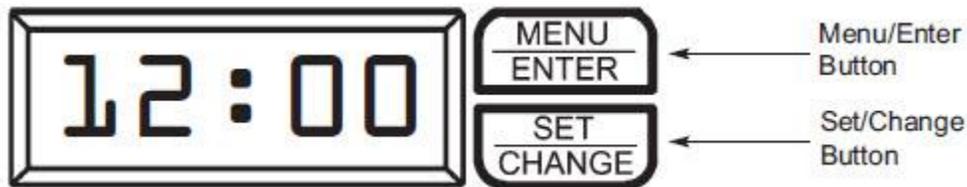
- To connect the brine tank, begin by sliding the plastic brine injector nut on to the brine tubing by putting the tubing through the non-threaded side of the nut. Next, slide the black (or clear) compression ring on to the tubing with the narrower diameter going on first. Then slide the taller, white compression ring on to the tubing with the wider diameter going on first. The two compression rings should lay flush against each other on the tubing. Slide them in to the brine injector nut and place the brine tubing into the brine valve. Finally, push the brine injector nut, which now has the compression rings inside of it, on to the threading of the brine valve and rotate the nut clockwise, screwing it on to the brine valve. Tighten it down to finger tightness. The tubing should be firmly attached and not slide out if pulled on.



- Add approximately 5 gallons of water to the brine tank, and then fill the brine tank with salt, using about 300 lbs, or 6 50-lb bags. It is OK to use any kind of water softening salt, however we find that extra coarse salt works better than pellets. You do not have to add water to the brine tank again after this first time during the start-up.
- See the over-flow barbed fitting on the side of the brine tank. You do not have to connect this to a drain. If the safety float were to malfunction, there is a small chance that the brine solution will drip out of this fitting. If this would cause a big mess where you have installed the Nitrate, hook some tubing to this and run to a bucket, floor pan or floor drain. Normally no brine will leak out of this fitting.
- Now you are ready to turn on the water to the system. Turn on the water and leave on bypass and check for leaks. Leave the ball valve after the Nitrate filter closed, so water is still off to the house, but connect a garden hose and open up the hose bib after the Nitrate and allow the water to run. This will help to clear out any foreign material that may be in the pipes from the piping installation. If you do not have a valve installed after the Nitrate and you do not have a hose bib, you will need to turn the water on inside the house to let the water run. Use a bathtub or laundry sink or other fixture that does not have an aerator screen.
- Leave the water running out of the garden hose at a slow rate. Now you can turn the bypass valve to the service position. First open the Inlet Side of the bypass valve. Second slowly open the Outlet Side of the bypass until it is in the full service position. Make sure you are turning the bypass valve knobs in the correct direction which is counter-clockwise as you face the bypass valve knobs.

18. Now turn on the garden hose to full force and let the water until it turns relatively clear. The water may have some color at first.
19. You are now ready to plug in your Nitrate 5900e control valve and start programming. Your valve does require some modifications to the programming specific to your application.
20. Next, you will need to program the system to work as a Nitrate filter. There are a few settings that must be changed before the system can be put into service. Plug in the control valve and continue on to the next page to begin the programming instructions.

Programming Your Valve



*While scrolling through numbers, it only increases the value. To decrease the value, you will have to “go all the way around” to get back to a lower value.

1. To enter main menu press the Menu/Enter button
(Time of day will flash)
2. To set time of day press the Set/Change button
(First digit will begin to flash) Example [12:00]
 - **To change digit value press the Set/Change button**
 - **To accept the digit press the Menu/Enter button**
 - (Next digit will flash)
 - (Once hours is accepted all digits will flash)
3. With all digits flashing press the Menu Button to set A.M. or P.M.
- (Once A.M./P.M. is accepted the next menu item will flash) Example [A]
4. (Metered Version) To Set the **(Hardness Setting)** Press the Set/Change Button
To accurately set your system based on the amount of Nitrates, we will need to do a little calculation first.

Nitrate level as nitrogen = (Nitrogen) = X
Nitrate level = (Nitrate) ppm x 0.81 = Y ppm as CaCO4
Sulfate: (Sulfate) ppm x 1.04 = Z ppm as CaCO4

Total sum of NO3 and Sulfates as CaCO4 = X + Y + Z = (Hardness)
(Hardness) ppm divided by 17.1 = (Hardness Setting) in grains per gallon (round to 5 grains for conservative calculation)

- To change digit value press the Set/Change button
- To accept the digit press the Menu/Enter button
- (Next digit will flash)
- Once the last digit is accepted all digits will flash

Example [H - 10]

Note: One cycle must be completed before new setting will be accepted.

5. To exit menu press the Menu/Enter button

Note: If no buttons are pressed for 60 seconds or longer the menu will automatically be exited.

Next you will need to set the Master Programming to be used as a Nitrate filter, continue on to the next page to finish the programming instructions.

Master Programming Mode

Entering Master Programming Mode

-To enter Master Programming Mode press and hold both buttons for 5 seconds.

1. Regeneration Time (r)

Press the Menu/Enter Button. The next display viewed is the option setting for Regeneration Time. It is identified by the letter 'r' in the left digit. Set the desired time of day that a regeneration may occur, if required. **We recommend setting the system to backwash at 2 AM**, or at any time that it is unlikely that any water will be used. The first digit(s) indicates the Hour and the other digit indicates A.M. or P.M.
Example: 2 A.M. regeneration time - [r 2A] (factory setting)

2. Regeneration Day Override (A)

Press Menu/Enter Button. This display is used to set the maximum amount of time (in days) the unit can be in service without a regeneration. This option setting is identified by the letter 'A' in the left digit. This option will be in the Master Programming Menu only in the Meter Mode. Regeneration will begin at the set Regeneration Time. A 0 setting will cancel this feature. The Max Value for this item is 29. **We recommend setting the system to regenerate every 18 days for a 24k size, and every 24 for all other sizes.**

Example: Override every 7 days - [A - 07] (Factory Setting)

To Adjust this Value, press the Set/Change Button.

To Accept the Digit Value, press the Menu/Enter Button.

3. Regeneration Cycle Step Programming (1)(2)(3)(4)

The next 4 displays viewed are part of a series of option settings used to program the Regeneration Cycle. Up to 4 steps can be programmed. Each display is used to set the duration time in minutes for that specific step in a regeneration cycle. A step # will turn on for the regeneration cycle step being programmed. Regeneration steps are *skipped* by setting the display to 0 as shown below:

Examples: Regeneration Cycle Step #1 - 10 minutes - [1 - 10] (Factory Setting)

Regeneration Cycle Step #2 - skipped - [2 - - 0]

Set each step according to the values below, appropriate for a Softener:

- 1 8 minutes. This is the Backwash cycle. [1 - 8]
- 2 60 minutes. This is the Brine Draw cycle. [2 - 60]
- 3 6 minutes. This is the Rapid Rinse cycle. [3 - 6]
- 4 For the Brine Refill Cycle, set the time according to the size of your system below:

24K grain softeners set to 5 min;
32K grain softeners set to 6 min;
48K grain softeners set to 9 min;
64K grain softeners set to 12 min;
80K grain softeners set to 15 min;
96K grain softeners set to 18min.

4. Set the Capacity

The display screen will have a lower case c, and three numbers: [c 027]. Set this according to the size of softener you have, i.e.:

[c 024] for a 24,000 capacity, [c 032] for a 32,000 capacity, [c 048] for 48,000 Capacity, etc.

5. Set the Safety Factor (P)

The control unit takes the input value for the capacity, and divides it by the value input for the hardness (the H setting). So, if you have a capacity of 048 (48,000 grains) and you have 10 grains of Hardness, you will have a "gallon run" between regenerations of 4,800 gallons. The flow meter starts at that value, and when that many gallons have passed through the softener, it will do an automatic regeneration, at the pre-programmed time. Since that may happen up to 23 hours before the next regeneration can happen, a safety factor can be input, as a percentage. In the above example, if you set **P** at 10, it will subtract 480 gallons, and will have a gallon run of 4320- this safeguards that you will have softened water throughout the day, when the valve has already counted down to zero gallons.

6. Bluetooth Settings

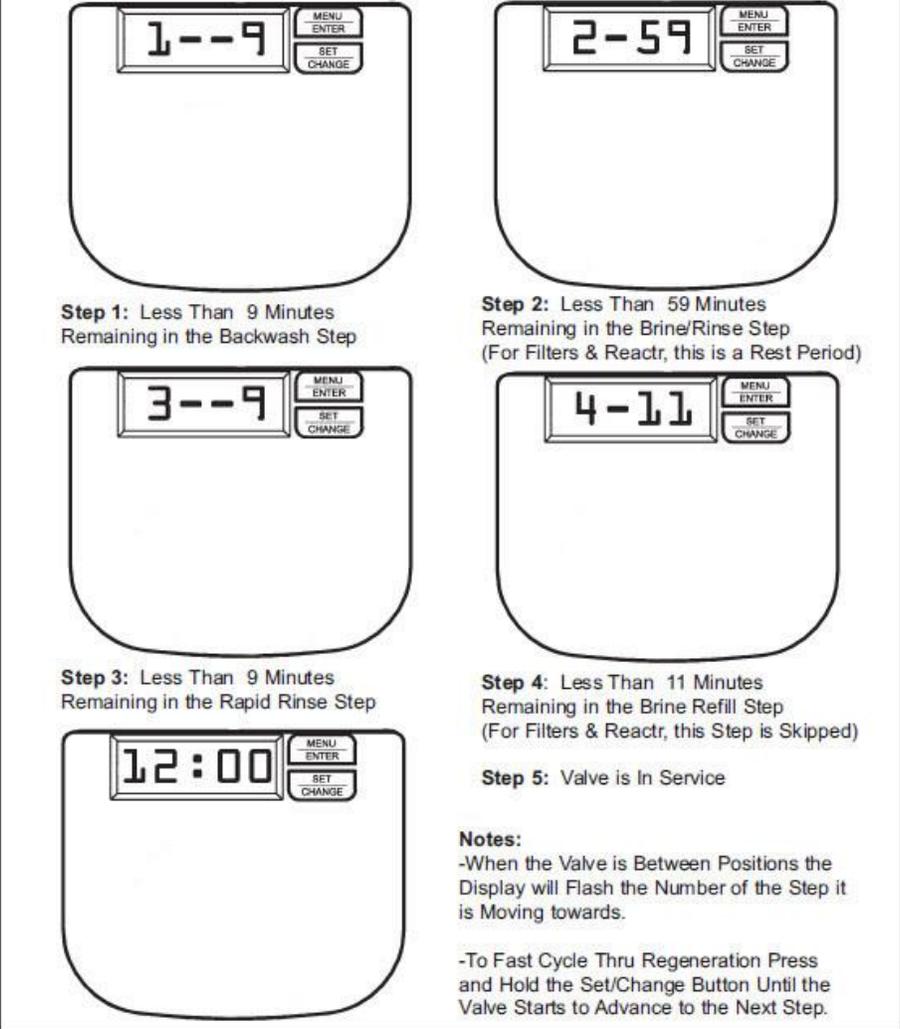
After the Capacity setting, you will see **be 1**, **btPP** and **1234** each time you hit the Menu/Enter button. These are factory/dealer settings and not used currently on your valve. After **1234** the display will return to the service screen, flashing between the clock time and the number of gallons remaining until regeneration.

Pressing and holding the Menu/Enter button will also access some options: **Flo**- this is the flow rate, if water is running, it will display the volume, in gallons per minute. **Gt r**- This the total # of gallons that has gone through the filter. **g tot**- this is the same as the previous. **rC r**- number of regeneration done. **rC**- the same. **gPdL**- shows how many gallons used each day. **Gbrl**- is the gallons used between regenerations. **PfDL**- This shows the peak, or highest flow rate that has passed through the filter in the last 24 hours.

Exiting the Master Programming Mode

Press the Menu/Enter Button until all steps have been viewed. The Program Mode will be exited and normal operation resumed. If no buttons are pressed for 60 seconds or longer in Master Programming Mode, it will be exited automatically.

Sample Regeneration Displays



Step 1: Less Than 9 Minutes Remaining in the Backwash Step

Step 2: Less Than 59 Minutes Remaining in the Brine/Rinse Step (For Filters & Reactr, this is a Rest Period)

Step 3: Less Than 9 Minutes Remaining in the Rapid Rinse Step

Step 4: Less Than 11 Minutes Remaining in the Brine Refill Step (For Filters & Reactr, this Step is Skipped)

Step 5: Valve is In Service

Notes:
-When the Valve is Between Positions the Display will Flash the Number of the Step it is Moving towards.
-To Fast Cycle Thru Regeneration Press and Hold the Set/Change Button Until the Valve Starts to Advance to the Next Step.

Initial Backwash

- 1 If days remaining is not already at 1 press and hold the Set/Change button. Now, press and hold the set change button again, until the valve begins the backwash cycle and the display reads 1 – 10. Now, proceed to step two.
- 2 Start to put the valve into the service position by turning inlet the bypass knobs counter-clockwise about a quarter inch, until you can hear water passing through the bypass into the filter. Stop and wait until you see water coming out of the drain line. It will often be mixed with air bubbles, but we will want to get all of that air out. When you do not see bubbles anymore, keep opening the valve, a little bit at a time, stopping for a minute or two each time. You want to

see a corresponding increase in flow out of the drain line as you increase the flow of water into the filter. After several minutes, you should have the valve fully open, and with no media coming out. The water may appear milky white.

- 3 If possible, verify that the backwash flow corresponds with the size of your system below. You can easily run the drain hose to a bucket and using a watch verify the flow rate in gallons per minute. An adequate backwash is critical to properly clean the Nitrate resin.

24K	1.5 GPM
32K	2 GPM
48K	2.4 GPM
64K	3 GPM
80K	4 GPM

- 4 Once the water is clear, press and hold the Set/Change button, and after 3 seconds the valve will start to advance to the “Rinse” position. Once again, allow the water to flow for about five minutes or until the water is clear.
- 5 Press and hold the Set/Change button advance to the “Service” position. Next, open the outlet on the bypass valve and then open the nearest treated water faucet to the unit and allow the water to run until it is clear. We advise using a bathtub, laundry sink, or other fixture that does not have an aerator screen as any remaining residue may get caught in the screen.

Congratulations, you are done setting up your valve!

Maintenance

Normal Operation

- Normal display alternates between time of day and days until regeneration.
- Days remaining until the next regeneration will count down from the regeneration day override value to 1 day remaining.
- Once the count reaches 1, a regeneration cycle will be initiated at the next designated regeneration time.

Battery back-up (this unit uses a standard 9-volt alkaline battery)

- Installing the battery
- To install the battery the back-cover must be removed by removing the two back-cover screws.
- Next insert the battery into the battery holding clip and snap the 9-volt battery connector onto the battery.

- Replace back-cover
- Features of battery back-up
- The battery back-up maintains the time of day during power failures.
- The battery back-up continues to count down gallons remaining during power failure (Metered Version)

Note: During power failure to conserve battery power the display is turned off. However, to confirm that the battery is working you can press either button and the display will turn on for five seconds.

- * Menus cannot be accessed during power failure
- * If a power failure occurs while the valve is in regeneration the regeneration will resume operation once the power is restored

How To Start An Extra Regeneration Cycle

1. Starting delayed extra cycle

- If days remaining is not already at 1 press and hold the Set/Change button.
- After 3 seconds the days remaining display will read 1 Example [1]
- Regeneration cycle will be initiated at the next designated regeneration time

2. Starting Immediate Extra Cycle - First, complete above delayed cycle steps

- With days remaining at 1 press and hold the Set/Change button
- After 3 seconds the regeneration cycle will begin.

3. Fast Cycling Through Regeneration

- First complete above immediate cycle steps
- Press and hold the Set/Change button
- After 3 seconds the valve will start to advance to the next step

Troubleshooting the 5900e Nitrate filter

SYMPTOM	PROBABLE CAUSE	CORRECTION
1. Softener fails to regenerate automatically.	<ul style="list-style-type: none"> A. Power supply plugged into intermittent or dead power source. B. Disconnected meter cable. C. Improper control valve programming. D. Defective power supply. E. Defective circuit board or meter. F. Defective drive motor. 	<ul style="list-style-type: none"> A. Connect to constant power source. B. Reconnect cable. C. Reset program settings. D. Replace power supply. E. Replace or Repair F. Check motor operation by activating the service button on back of motor.
2. Regeneration at wrong time.	<ul style="list-style-type: none"> A. Time of day improperly set, due to power failure. B. Regeneration time set improperly. 	<ul style="list-style-type: none"> A. Reset time of day programming and install 9 volt battery. B. Reset Regeneration time programming.
3. Loss of capacity.	<ul style="list-style-type: none"> A. Increased raw water hardness. B. Brine concentration and/or quantity. C. Resin fouling. D. Poor distribution, Channeling (uneven bed surface). E. Internal valve leak. F. Resin age. G. Resin Loss. 	<ul style="list-style-type: none"> A. Reset unit to the new capacity. B. Keep brine tank full of salt at all times. Clean it yearly. Salt may be bridged. If using a salt grid plate ensure refill water is over it. C. Call dealer, find out how to confirm it, clean the resin and prevent future fouling. D. Call dealer. Check distributors and backwash flow. E. Call dealer. Replace spacers, seals and/or piston. F. Call dealer. Check for resin oxidation caused by Chlorine. Mushy resin. G. Call dealer. Check for correct bed depth. Broken distributors. Air or gas in bed. Well gas eliminatr. Loose brine line.
4. Poor water quality.	<ul style="list-style-type: none"> A. Check items listed in #1, #2, & #3. B. Bypass valve open. C. Channeling. 	<ul style="list-style-type: none"> B. Close by-pass valve. C. Check for too slow or high service flow. Check for media fouling.
5. High salt usage.	<ul style="list-style-type: none"> A. High salt setting. B. Excessive water in brine tank. C. Constant flow through the unit. D. Improperly set hardness, Regeneration frequency or regeneration day override programming. 	<ul style="list-style-type: none"> A. Adjust brine tank refill time. B. See symptom No. 7. C. Indicates plumbing leak (ie. toilet tank). D. Reset programming

Troubleshooting Guide (Cont'd.)

SYMPTOM	PROBABLE CAUSE	CORRECTION
6. Loss of water pressure.	A. Scaling/Fouling of inlet pipe. B. Fouled resin. C. Improper backwash.	A. Clean or replace pipeline. Pretreat to prevent. B. Clean resin. Pretreat to prevent. C. Too many resin fines and/or sediment. Call dealer, reset backwash flow rate, and/or adjust time
7. Excessive water in brine tank and/or salty water to service.	A. Plugged Drain Line. B. Dirty or damaged brine valve. C. Plugged Injector. D. Low inlet pressure. E. Excessive brine refill cycle time.	A. Check flow to drain. Clean flow control. B. Clean or replace brine valve. C. Clean injector and replace screen. D. Increase pressure to allow injector to perform properly (20psig minimum). E. Reset brine refill cycle time.
8. Softener fails to use salt.	A. Check items listed in #1. B. Improper control valve programming. C. Plugged/restricted drain line. D. Injector is plugged. E. No water in brine tank. F. Water pressure is too low. G. Brine line injects air during brine draw. H. Internal control leak.	B. Check and reset programming. C. Clean drain line and/or flow control. D. Clean or replace injector and screen. E. Check for restriction in BLFC. Ensure safety float is not stuck. Check brine tank for leaks. F. Line pressure must be at least 20 psi. G. Check brine line for air leaks. H. Call dealer, Check piston, seals and spacers for scratches and dents.
9. Control cycles continuously.	A. Faulty circuit board.	A. Replace circuit board.
10. Continuous flow to drain.	A. Foreign material in control. B. Internal control leak. C. Valve jammed in backwash, brine, or rapid rinse position. D. Motor stopped or jammed.	A. Call dealer. Clean valve, rebuild unit. B. Same as above. C. Same as above D. Replace motor.

More Troubleshooting Tips

Brine Solution Not Being Sucked In During Regeneration

Most problems occur when the 5900e is not drawing in the brine. Make sure the injector is drawing in the brine:

1. Remove the brine tank tubing where it enters the 5900e control valve.
2. Initiate a backwash and skip to the Brine Cycle by following the steps below:
 - A. Starting delayed extra cycle
 - If days remaining is not already at 1 press and hold the Set/Change button.
 - After 3 seconds the days remaining display will read 1 Example [1]
 - Regeneration cycle will be initiated at the next designated regeneration time
 - B. Starting Immediate Extra Cycle - First, complete above delayed cycle steps
 - With days remaining at 1 press and hold the Set/Change button
 - After 3 seconds the regeneration cycle will begin.
 - C. Fast Cycling Through Regeneration
 - First complete above immediate cycle steps
 - Press and hold the Set/Change button
 - After 3 seconds the valve will start to advance to the next step, which is the Brine Cycle, where it is supposed to suck in the brine solution.
3. If it is sucking strongly, check the brine tank float inside the brine well and make sure there are no rubber bands around it, and that is free of obstructions. In some cases, it may need to be replaced or cleaned, if there is suction at the control valve, but no brine is being drawn in.
4. If there is NO suction at the control valve port where you removed the brine line tubing, then the injector should be cleaned.
5. If the injector has been cleaned and there is still no suction check to make sure there is obstruction in the backwash line; that the backwash line does not go up and over the Nitrate filter more than several feet (which causes pressure loss and the injector not to work correctly); finally check to make sure there is enough pressure. If possible increase your water pressure to the Nitrate filter from your well pump and see if a slightly increased pressure makes the injector work. We recommend a minimum 30 PSI but it does work better if there is 40 to 50 minimum PSI.

System Not Backwashing Adequately

The other main problem that may occur is if you do not have enough backwash flow rate to properly clean the nitrate filter. You can verify the backwash flow rate by running the drain line into a bucket and timing it when the 5900e is in Cycle 1 or backwash. A 1.0 or 1.5 cubic foot system should have 2.0 gallons per minute and a 2.5 cubic foot system should have 4.0 gallons per minute of backwash.

System Not Programmed Correctly – PROGRAM SETTINGS

In some cases, the 5900e may not be programmed correctly, try to verify the correct programming.

Brine Tank Not Filling With Enough Water

Sometimes if the brine tank is not filling adequately, it is possible that the float assembly in the tank is set too low. You would want the float to be several inches above the air check valve inside the tank. This will allow for enough water to be added to the tank before shutting the brine fill cycle. If necessary, pull the float assembly rod up to the appropriate height, and cut the rod at that height, leaving while keeping the rubber washers the adequate space to hold the float in place.

Backwash Flow Rate

One problem that may occur is if you do not have enough backwash flow rate to properly clean the Nitrate filter. If possible, verify that the backwash flow corresponds with the size of your system below. You can easily run the drain hose to a bucket and using a watch verify the flow rate in gallons per minute. An adequate backwash is critical to properly clean the Nitrate resin.

24K	1.5 GPM
32K	2 GPM
48K	2.4 GPM
64K	3 GPM
80K	4 GPM

Error Codes

There are five (5) error codes that could indicate a possible problem with the control valve:

Error 2 - Homing slot expected. Valve will start looking for home.

(Normal operation continues)

Error 3 - Encoder is not sending a signal

(Valve requires service to continue)

Error 4 - Unable to find homing slot

(Valve requires service to continue)

Error 5 - Motor overload (stalled position or shorted motor)

(Valve requires service to continue)

Error 6 – No Power to Motor (usually this means the cable has come loose)

What To Do If Your Filter Tank Does Not Sit Level On the Floor

Your black filter tank base is not glued to the bottom of your tank. Occasionally tank bases will become crooked during shipment. If you find that that your tank does not sit level on the floor, you can easily adjust it by holding the empty tank and rapping it on a concrete or solid floor once or twice in order to level it.

Service Instructions

A. Replacing The Brine Valve, Injectors, and Screen

1. Turn off water supply to conditioner:
 - a. If the conditioner installation has a “three valve” by-pass system, first open the valve in the by-pass line, then close the valves at the conditioner inlet and outlet.
 - b. If the conditioner has an integral by-pass valve, put it in the by-pass position.
 - c. If there is only a shut-off valve near the conditioner inlet, close it.
2. Relieve water pressure in the conditioner by stepping the control into the backwash position momentarily. Return the control to the service position.
3. Unplug electrical cord from outlet.
4. Disconnect brine tube and drain line connections at the injector body.
- 5A. To Replace Brine Valve.
 1. Remove the control valve back cover. Disconnect the meter signal wire from the meter.
 2. Remove screw and washer at drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily.
 3. Remove piston retaining plate screws and Pull upward on end of piston yoke until assembly is out of valve.
 4. Pull brine valve from injector body, also remove and discard O-ring at bottom of brine valve hole.
 5. Apply silicone lubricant to new O-ring and reinstall at bottom of brine valve hole.
 6. Apply silicone lubricant to O-ring on new Brine valve assembly and press into brine valve hole, shoulder on bushing should be flush with injector body.
- 5B. To Replace Injectors and Screen.
 1. Remove injector cap screws, remove cap. Gasket may be re-used if undamaged.
 2. Remove injector assembly. Apply silicone lubricant to new injector assembly o-rings and install. Be sure to push injector assembly in completely so the o-rings are seated. Replace vortex generator. Install a new screen.
 3. Apply silicone lubricant to new gasket and install around oval extension on injector cap.
 6. Insert screws thru injector cap and into mating holes in the valve body. Tighten screws.
 7. Reconnect brine tube and drain line.
 8. Return by-pass or inlet valving to normal service position. Water pressure should now be applied the conditioner, and any by-pass line shut off.
 9. Check for leaks at all seal areas. Check drain seal with the control in the backwash position.
 10. Plug electrical cord into outlet.
 11. Set time of day and cycle the control valve manually to assure proper function. Make sure control valve is returned to the service position.
 12. Make sure there is enough salt in the brine tank.
 13. Start regeneration cycle manually if water is hard.

B. To Replace Powerhead

1. Remove the control valve back cover. Remove the three screws along the outer edge of the back plate and remove the front cover. Disconnect the power supply and the circuit board signal wire from the motor and

feed them back through the control. Disconnect the optical sensor signal wire. Disconnect the meter signal wire from circuit board and feedback through the control.

2. Remove screw and washer at drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily.
3. Put new powerhead on top of the valve. Be sure the drive pin on main gear engages slot in drive yoke (wide side of drive yoke upright must face to the left away from the motor).
4. Replace powerhead mounting screws. Replace screw and washer at drive yoke.
5. Reconnect meter signal, optical sensor, power supply, and circuit board signal wires.
6. Reinstall front cover and back cover.

C. To Replace Piston Assembly

1. Follow Steps A.1 through A.3.
2. Remove control valve back cover. Disconnect the meter signal wire from the meter.
3. Remove screw and washer at drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily.
4. Remove piston retaining plate screws.
5. Pull upward on end of piston yoke until assembly is out of valve.
6. Inspect the inside of the valve to make sure that all spacers and seals are in place, and that there is no foreign matter that would interfere with the valve operation.
7. Take new piston assembly as furnished and push piston into valve by means of the end plug. Twist drive yoke carefully in a clockwise direction to properly align it with drive gear. Reinstall piston retaining plate screws.
8. Place powerhead on top of valve. Be sure drive pin on main gear engages slot in drive yoke (wide side of drive yoke upright must face to the left away from the motor).
9. Replace powerhead mounting screws. Replace screw and washer at drive yoke.
10. Reconnect brine tube and drain line.
11. Return by-pass or inlet valving to normal service position. Water pressure should now be applied to the conditioner, and any by-pass line shut off.
12. Replace the control valve back cover.
13. Follow Steps A.9 through A.13.

D. To Replace Seals and Spacers

1. Follow Steps A.1 through A.3.
2. Remove the control valve back cover. Disconnect the meter signal wire from the meter
3. Remove screw and washer at drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily. Remove piston retaining plate screws.
4. Pull upward on end of piston rod yoke until assembly is out of valve. Remove and replace seals and spacers.
5. Take piston assembly and push piston into valve by means of the end plug. Twist yoke carefully in a clockwise direction to properly align it with drive gear. Reinstall piston retaining plate screws.
6. Place powerhead on top of valve. Be sure drive pin on main gear engages slot in drive yoke (wide side of drive yoke upright must face to the left away from motor).
7. Replace powerhead mounting screws. Replace screw and washer at drive yoke.

8. Return by-pass or inlet valving to normal service position. Water pressure should now be applied to the conditioner, and any by-pass line shut off.
9. Replace the control valve back cover.
10. Follow Steps A.9 through A.13.

E. To Replace Meter

1. Follow Steps A.1 through A.3.
2. Remove two screws and clips at by-pass valve or yoke. Pull resin tank away from plumbing connections.
3. Remove signal wire from meter.
4. Remove two screws and clips at meter and pull the meter out of the control valve.
5. Apply silicone lubricant to four new O-rings and assemble to four ports on new meter.
6. Assemble meter to control valve. Note, meter portion of module must be assembled at valve outlet. Install two screws and clips.
7. Install signal wire into new meter.
8. Push resin tank back to the plumbing connections and engage meter ports with by-pass valve or yoke.
9. Attach two clips and screws at by-pass valve or yoke. Be sure clip legs are firmly engaged with lugs.
10. Return by-pass or inlet valving to normal service position. Water pressure should now be applied to the conditioner, and any by-pass line shut off.
11. Check for leaks at all seal areas.
12. Follow steps A.9 through A.13.

F. To Check Drive Motor Operation

1. Remove the control valve back cover.
2. To verify drive motor operation, push service button located on back of motor. Motor should run. Release button. After 1 minute the control should automatically advance to Rapid Rinse (cycle #3) Position. It will remain in Rapid Rinse for 5 minutes and then advance to Service Position.