

Hydrotech[®]

2510AIO SXT

Chemical Free Iron Filter Operation Manual

Specifications

Item #	Model #	Replacement Bed Item #	Media Cu. Ft.	Pipe Size Inches	Flow Rates USGPM			Shipping Weight (Lbs)	Capacity Iron (ppm)	Mineral Tank Size (inches)	Installation Space (inches)
					Service	Peak	Backwash				
2510AIO Filter with Standard Chem-Free Media											
7440	2510AIOSXT-0847CF-0.75	#95431	0.75	3/4"	2	4	3.5	110	22,500	8 x 47	10 x 10 x 57
7441	2510AIOSXT-0948CF-1.0	#95550	1.0	3/4"	3	6	4	145	30,000	9 x 48	11 x 11 x 58
7442	2510AIOSXT-1054CF-1.5	#95551	1.5	3/4"	4	10	5	250	45,000	10 x 54	12 x 12 x 64
7443	2510AIOSXT-1252CF-2.0	#95427	2.0	3/4"	5	15	7	365	60,000	12 x 52	14 x 14 x 62
2510AIO Filter with nextSand Media											
7444	2510AIOSXT-0847CFNS-0.75	#95632	0.75	3/4"	2	4	5	110	22,500	8 x 47	10 x 10 x 57
7445	2510AIOSXT-0948CFNS-1.0	#95633	1.0	3/4"	3	6	7	145	30,000	9 x 48	11 x 11 x 58
7446	2510AIOSXT-1054CFNS-1.5	#95644	1.5	3/4"	4	10	8	250	45,000	10 x 54	12 x 12 x 64
7447	2510AIOSXT-1252CFNS-2.0	#95645	2.0	3/4"	5	15	12	365	60,000	12 x 52	14 x 14 x 62
2510AIO Filter with Birm Media											
7448	2510AIOSXT-0847CFB-0.75	#95435	0.75	3/4"	2	4	3.5	110	22,500	8 x 47	10 x 10 x 57
7449	2510AIOSXT-0948CFB-1.0	#95449	1.0	3/4"	3	6	4	145	30,000	9 x 48	11 x 11 x 58
7450	2510AIOSXT-1054CFB-1.5	#95450	1.5	3/4"	4	10	5	250	45,000	10 x 54	12 x 12 x 64
7451	2510AIOSXT-1252CFB-2.0	#95437	2.0	3/4"	5	15	7	365	60,000	12 x 52	14 x 14 x 62

NOTE: The standard 2510AIO filter units listed above come with the bypass and check valve installed at inlet of the valve. The standard unit does not come with the flow meter. The standard 2510AIO filter comes with a special media that removes iron, manganese and hydrogen sulfide from water by increasing the pH of water and traps precipitated iron.

NOTE: Optional media bed of Birm or nextSand available.

Additional Notes:

Maximum Water Temperature = 110°F (43°C)

Maximum Operating Pressure = 80 PSIG (551 kPa)

Electrical: 24 VAC/60Hz (120V to 24V approved transformer)

- The pressure drop for the stated peak flow rates will not exceed 15 psig through these devices.
- Do not use where water is microbiologically unsafe
- The manufacturer reserves the right to make product improvements which may deviate from the specifications and descriptions stated therein, without obligation to change previously manufactured products or to note the change.

Section 1: General Information

Read this manual carefully and follow the installation steps in order.

This iron filter is intended to be an effective and economical way to remove iron from water without the use of messy and dangerous chemicals or expensive pumps or an external venturi. The valve uses a patented construction to create an air bubble at the upper portion of the tank to oxidize any ferrous iron prior to being filtered by the media.

The 2510AIO Valve requires annual maintenance. Please contact your dealer for maintenance kits (Part #92359).

How does the Chemical Free 2510AIO Iron Filter work?

This filter works by adding oxygen to the incoming water by passing it through a bubble of compressed air. The water is then passed through a special filter bed.

The special media not only increases the pH of the water to enhance iron removal but also acts as a physical barrier to trap iron precipitate.

As more water passes through this iron filter, the oxygen in the unit is used up, and the media gets loaded with iron. The regeneration process then begins in order to replenish the supply of oxygen, and to backwash the precipitated iron trapped in the media bed.

The iron removal efficiency will be more effective with high pH water.

Optional Media Beds:

- Birm - Removes iron and manganese from water. Recommended for high pH water.
- nextSand - Traps precipitated iron from the water. Recommended for high pH water.

2510AIO Standard Chemfree Filter

This special media not only increases the pH of the water to enhance iron, manganese and hydrogen sulfide removal but also acts as a physical barrier to trap iron precipitate.

The filter will automatically adjust the pH to neutral or higher on acid water without an acid neutralizer. The ability to raise pH greatly enhances the filter's ability to remove iron efficiently.

Replenishment of this media that raises pH will be required periodically, depending on how low the raw water pH is the amount of manganese (Mn) present in the water and usage rate.

2510AIO Birm Filter

This media acts as a catalyst for the removal of iron and manganese from the water but require pre-oxidation. The water is pre-oxidized from the air bubble on the top of the tank and this media removes the iron and manganese from the water. This is not recommended to remove hydrogen sulfide from the water and requires high pH water.

The media is not sacrificial hence no replenishment is required.

2510AIO nextSand Filter

The water is hydrocharged from the air bubble on the top of the tank and precipitate iron from the water. This media will effectively remove the precipitated iron from the water to the size of 3-5 micron. Require high pH water and not recommended for very high (>30ppm) of hydrogen sulfide.

Regeneration Sequence

The regeneration cycle goes through 4 steps.

1. Backwash (minimum 30 psi inlet pressure required): During the backwash cycle, water flows upwards through the bed, expanding the media and carrying any precipitated iron trapped within it to the drain
2. Air Draw: The unit is replenished with a new bubble of air. During this step water will run to the drain. There is a delay at the start of the cycle while the pressure of the air within the tank reaches atmospheric pressure. During this time no air is drawn into the tank. Once the pressure has equalized you can usually hear the sound of air being drawn in to the unit. The air draw time can be adjusted as per requirement.
3. Rapid Rinse (minimum 30 psi inlet pressure required): During the rapid rinse cycle, the media bed will be re-settled for the next service period and any small loose particles of iron or media will be flushed to the drain.
4. The unit then returns to the in-Service position. While this happens water continues to enter the tank, compressing the air into a bubble in the top of the tank. The actual size of the bubble will vary depending on the onsite conditions, but is roughly 10 inches from the top of the tank.

A backwashing type filter containing special media that causes the iron in the “hydrocharged” water to precipitate throughout the filter bed (rather than on the surface as in chemical oxidizing filters). This process produces an iron removal capacity of up to 30,000 ppm. The media requires no chemical regenerant for oxygen enrichment.

The clean, filtered water then flows into your household water line. Depending on water use and the concentration of iron in your water, periodic backwashing is required to flush the entrapped iron from the system. The filter control can be programmed to backwash once any number of days as required (instructions for calculating backwash frequency and setting the controls are on Page 11).

NOTE: Replenishment of the standard Chem-Free media that raises pH will be required periodically, depending on how low the raw water pH is, the amount of manganese (Mn) present in the water and the water usage rate.

In normal operation, the Time of Day display will alternate being viewed with the Days Remaining display. This display will be in gallons, liters or cubic meters. As treated water is used, the Days Remaining display will count down from a maximum value to zero or (---). Once this occurs, a regeneration cycle will be initiated at the Set Regeneration Time. Water flow through the valve is indicated by the Flow Indicator that will flash in direct relationship to flow rate.

Example 2 Days Remaining
for Regeneration



0 Days Remaining
for Regeneration



Control Operation During Regeneration

In regeneration, the control will display a special regeneration display. In this display, the control will show the current regeneration step number the valve is advancing to or has reached and the time remaining in that step. The step number displayed will flash until the valve has completed driving into this regeneration step position. Once all regeneration steps have been completed, the valve will return to Service and resume normal operation.

Example Less than 6 minutes
remaining in Regen
Step Rapid Rinse



Pushing the Extra Cycle Button during a regeneration cycle will immediately advance the valve to the next cycle step position and resume normal step timing.

Control Operation During Programming

The control will only enter the Program Mode with the valve in Service. While in the Program Mode, the control will continue to operate normally, monitoring water usage and keeping all displays up to date. Control programming is stored in memory permanently, eliminating the need for battery back-up power.

Meter Immediate Control

A meter immediate control measures water usage and regenerates the system as soon as the calculated system capacity is depleted. The control calculates the system capacity by dividing the unit capacity (typically expressed in grains/unit volume) by the feed water hardness and subtracting the reserve. Meter Immediate systems generally do not use a reserve volume. However, in twin tank systems with soft-water regeneration, the reserve capacity should be set to the volume of water used during regeneration to prevent hard water break-through. A Meter Immediate control will also start a regeneration cycle at the programmed regeneration time if a number of days equal to the regeneration day override pass before water usage depletes the calculated system capacity.

Meter Delayed Control

A Meter Delayed Control measures water usage and regenerates the system at the programmed regeneration time after the calculated system capacity is depleted. As with Meter Immediate systems, the control calculates the system capacity by dividing the unit capacity by the feed water hardness and subtracting the reserve. The reserve should be set to insure that the system delivers treated water between the time the system capacity is depleted and the actual regeneration time. A Meter Delayed control will also start a regeneration cycle at the programmed regeneration time if a number of days equal to the regeneration day override pass before water usage depletes the calculated system capacity.

Time Clock Delayed Control

A Time Clock Delayed Control regenerates the system on a timed interval. The control will initiate a regeneration cycle at the programmed regeneration time when the number of days since the last regeneration equals the regeneration day override value.

Day of the Week Control

This control regenerates the system on a weekly schedule. The schedule is defined in Master Programming by setting each day to either "off" or "on." The control will initiate a regeneration cycle on days that have been set to "on" at the specified regeneration time.

Control Operation During a Power Failure

The SXT includes integral power backup. In the event of power failure, the control shifts into a power-saving mode. The control stops monitoring water usage, and the display and motor shut down, but it continues to keep track of the time and day for a minimum of 48 hours.

The system configuration settings are stored in a non-volatile memory and are stored indefinitely with or without line power. The Time of Day flashes when there has been a power failure. Press any button to stop the Time of Day from flashing.

If power fails while the unit is in regeneration, the control will save the current valve position before it shuts down. When power is restored, the control will resume the regeneration cycle from the point where power failed. Note that if power fails during a regeneration cycle, the valve will remain in its current position until power is restored. The valve system should include all required safety components to prevent overflows resulting from a power failure during regeneration.

The control will not start a new regeneration cycle without line power. If the valve misses a scheduled regeneration due to a power failure, it will queue a regeneration. Once power is restored, the control will initiate a regeneration cycle the next time that the Time of Day equals the programmed regeneration time. Typically, this means that the valve will regenerate one day after it was originally scheduled. If the treated water output is important and power interruptions are expected, the system should be setup with a sufficient reserve capacity to compensate for regeneration delays.

Water Pressure

Your chemical free iron filter system is designed to operate under normal water pressures from 20 psi to 50 psi.

Backwashing and Automatic Bypass

Your filter is factory set to backwash at 1:00 a.m. during a period of little or no water use. The backwash cycle lasts approximately 15 minutes, after which filtered water service is restored. While backwashing is taking place raw water automatically bypasses the filter if required. If possible, avoid using water during backwashing to prevent iron-laden water entering your household plumbing system.

New Sounds

You will notice new sounds, such as the hum of the timer, as your filter operates. During backwashing, it will not be uncommon to hear water running to the drain.

Section 2: Before Installation

Inspection and Handling Your Chemical Free Iron Filter

Inspect the equipment for any shipping damage. If damaged, notify the transportation company and request a damage inspection. Damage to cartons should also be noted.

Handle the filter unit with care. Damage can result if it is dropped or set on sharp, uneven projection on the floor. Do not turn the filter unit upside down. NOTE: If a severe loss in water pressure is observed when the filter unit is initially placed in service, the filter tank may have been laid on its side during transit. If this occurs, backwash the filter to "reclassify" the media.

Iron (Fe)

Iron concentrations as low as 0.3 ppm will cause staining. The iron concentration, together with the flow rate demand and the consumption rate of the water, determines the basic size of the filter system. The higher these factors are, the larger the required system. The filter system is capable of filtering out the three main types of iron found in water supplies: soluble iron (also known as "clear water" or ferrous iron), precipitated iron (also known as "red water" or ferric iron) and bacterial iron (also known as iron bacteria). There is no apparent upper limit of iron concentration for the filter but special care must be taken when selecting a filter model if your water has a combination of high iron, very low pH and/or manganese.

Manganese (Mn)

The presence of manganese can be bothersome, even for a chemical free iron filter. As little as 0.05 ppm of manganese can produce a brownish or black stain. The ability of the filter to remove manganese depends on its concentration and the pH of the water.

Manganese tends to "coat" the filter media, rendering it incapable of increasing the pH and, therefore, ineffective in removing either the iron or the manganese. Manganese, however, will precipitate in the filter bed when the pH is increased.

pH

The pH of water measures its acidity or its alkalinity. Water with a pH of less than 7.0 is acidic, above 7.0 is alkaline, and 7.0 is neutral. The lower the pH value is below 7.0, the greater the acidity and the higher the pH value is above 7.0, the more alkaline. Acidic water (pH less than 7.0) is corrosive to pipes, appliances, etc. A pH of 7.0 or higher facilitates iron removal - which is why the filter is designed to increase the pH when it is less than 7.0.

The pH increasing component of the media is "sacrificial". That is, it slowly dissolves during the process of increasing pH. The rate at which this occurs is proportional to the pH increase and the water consumption rate (i.e. the greater the pH increase and the water consumption, the greater the sacrificial rate). Thus, when the pH is increased to 8.2 or more as is necessary when manganese is present, the sacrificial rate is even greater. Under the most severe conditions, the Mn component of the media may have to be replenished two to four times per year. On the other hand, if the raw water pH is 7.0 or above and no manganese is present, the sacrificial rate is very slight.

Tannins (Humic Acid)

Tannins (also known as humic acid), which are present in some supplies, are the result of decaying vegetable matter. If the tannin concentration is above approximately 0.5 ppm, it will form a sticky coating on the media, thus rendering it incapable of filtering the iron. A chemical free iron filter is not recommended for this situation. If the tannin concentration is less than 0.5 ppm, a chemical free iron filter may be installed.

Hydrogen Sulfide (H₂S)

Hydrogen sulfide (often referred to as "sulfur"), is easily detectable by its objectionable "rotten egg" odor. Sulfur corrodes iron, brass, copper and silver. A chemical free iron filter is not recommended when hydrogen sulfide is the only water problem, although it is capable of removing sulfur concentrations of up to 2 to 3 ppm. Whenever hydrogen sulfide is present, backwashing must be performed at more frequent intervals.

Locate Water Conditioning Equipment Correctly

Select the location of your filter tank with care. Various conditions which contribute to proper location are as follows:

1. Locate as close as possible to the water supply source.
2. Locate as close as possible to a floor or laundry tub drain.
3. Locate in correct relationship to other water conditioning equipment (see Fig. 1, Page 4).
4. Filters and softeners should be located in the supply line before the water heater. Temperature above 120°F damage filters
5. Do not install a filter or softener in a location where freezing temperatures occur. Freezing may cause permanent damage to this type of equipment and will void the factory warranty.
6. Allow sufficient space around the unit for easy servicing.

Facts to Remember When Planning Your Installation

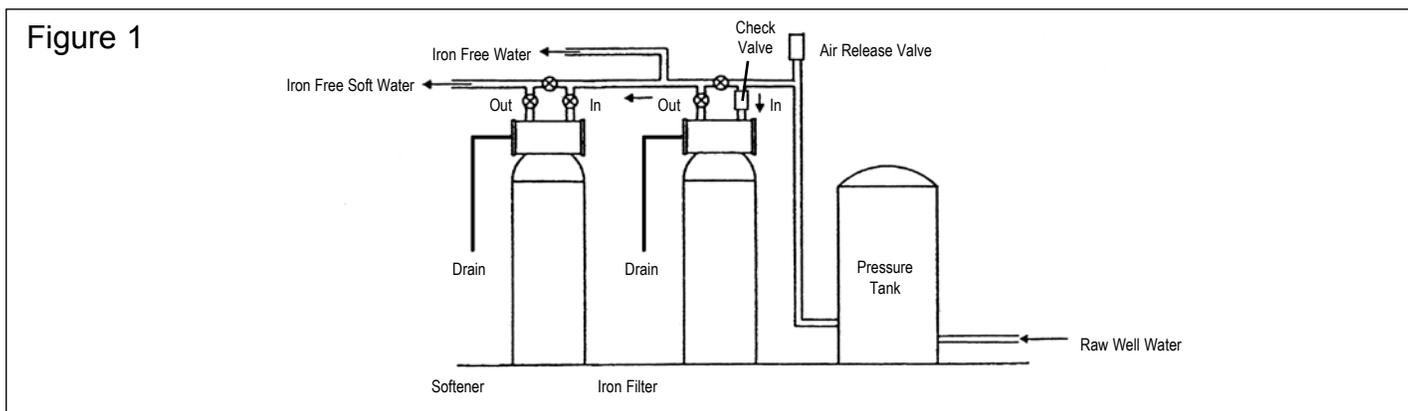
1. All installation procedures must conform to local and state plumbing codes.
 2. If lawn sprinkling, a swimming pool, geothermal heating/cooling or water for other devices/activities is to be treated by the filter, a larger model filter must be selected to accommodate the higher flow rate demands of these items. The pumping rate of the well pump must be sufficient to accommodate these items plus the backwash requirement of the filter. Consult your dealer for alternative instructions if the pumping rate is insufficient.
 3. Remember that the filter inlet is attached to the pipe that supplies water (i.e. runs to the pump) and the outlet is the line that runs toward the water heater.
 4. Before commencing installation, it is advisable to study the existing piping system and determine the size, number and type of fittings required. Typical system schematics shown in these instructions (Fig. 1, 2, or 3, Page 5), will be of assistance
- NOTE: if the plumbing system is used as the ground leg of the electric supply, continuity should be maintained by installing ground straps around any non-conductive plastic piping used in installation.

IMPORTANT: PLEASE SECURE THE DRAIN LINE PIPE DURING REGENERATION. THE AIR IN THE TANK WILL ESCAPE THROUGH THE DRAIN LINE OF THE CONTROL VALVE.

Section 3: Installation

Proper installation sequence of water conditioning equipment is very important. Refer to the diagrams following for your particular water supply.

NOTE: Install the supplied check valve before the inlet of the valve.



NOTE: Before starting installation, read Section 5, Plumbing System Clean-Up, for instructions on some procedures that may need to be performed first.

Installation Instructions

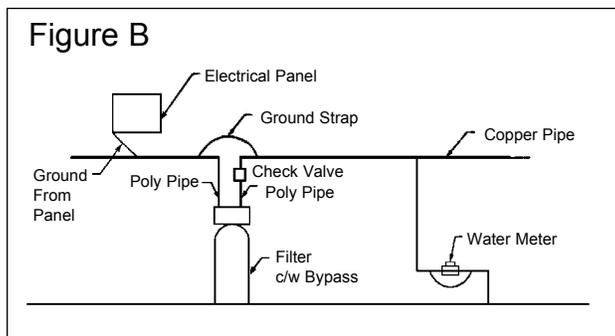
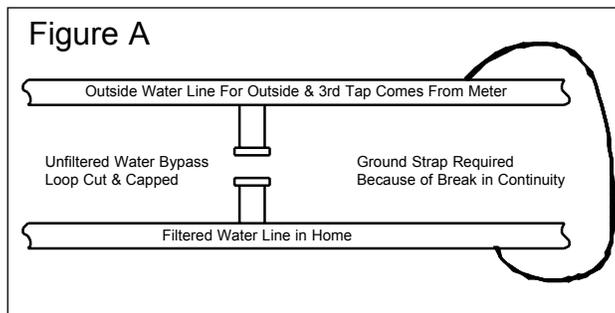
All government codes and regulations governing the installation of these devices must be observed.

CAUTION: If the ground from the electrical panel or breaker box to the water meter or underground copper pipe is tied to the copper water lines and these lines are cut during installation of the Noryl bypass valve and/or poly pipe, an approved grounding strap must be used between the two lines that have been cut in order to maintain continuity. The length of the grounding strap will depend upon the number of units being installed and/or the amount of copper pipe being replaced with poly. See Figure A & B.

In all cases where metal pipe was originally used and is later interrupted by poly pipe or the Noryl bypass valve as in Figure B or by physical separation as in Figure A, an approved ground clamp with no less than #6 copper conductor must be used for continuity, to maintain proper metallic pipe bonding.

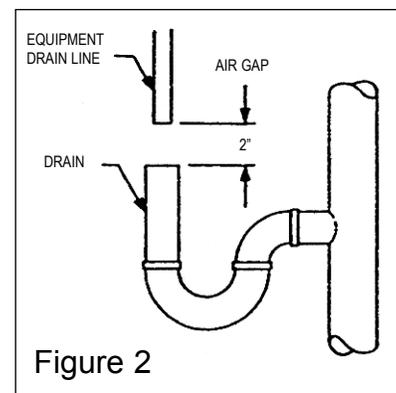
Check your local electrical code for the correct clamp and cable size.

1. Determine the best location for your water softener, bearing in mind the location of your water supply lines, drain line and 120 volt AC electrical outlet. Subjecting the softener to freezing or temperatures above 110°F (43°C) will void the warranty.
2. Shut off all water at main supply. On a private well system turn off power to pump and drain pressure tank. Make certain pressure is relieved from complete system by opening nearest faucet to drain system. Shut off fuel supply to water heater.



Media Installation (When Necessary)

- Remove the valve from the mineral tank.
 - Temporarily plug the open end of the riser tube to ensure that no resin or gravel falls down into the distribution.
 - Fill mineral tank one quarter full of water to protect distribution during gravel installation.
 - Slowly and carefully add the gravel support bed and the softener media leveling each layer as it is placed into the tank.
 - Unplug the riser tube, carefully position the valve over it and turn the valve into the threads in the fiberglass tank, tightening securely into tank. Note: Ensure that the internal O-ring in the valve fits securely over the riser tube. Silicone grease (#13691) or other food grade lubricant may be applied to the O-ring to ease installation of the riser tube. DO NOT use petroleum based lubricants as they will cause swelling of O-rings and seals.
 - The filter is now charged with filter resin.
 - It is recommended that the filter tank now be completely filled with water (SLOWLY) to soak the resin before startup. This will allow the media to absorb water as well as help displace any trapped air. This will reduce the chance of backwashing resin out during startup.
3. Install check valve before the inlet of the valve.
 4. Cut main supply line as required to fit plumbing to control valve.
 5. Solder or solvent weld plumbing. Do not apply heat to any fitting connected to control valve as damage may result to internal parts. Check to be certain water supply pipe is connected to control valve inlet fitting, and pipe connected to control valve outlet fitting is in direction of house service (see Figure 2).
 6. Remove the retaining clip and pull out drain line flow control assembly from valve body. Unscrew drain line fitting elbow from drain line flow control. Apply pipe dope or teflon tape to threads. Reassemble to valve body, making certain drain line flow control assembly is fully inserted into valve body before installing the clip. Attach 1/2 inch ID drain line to drain elbow.
 7. Position drain hose over drain and secure firmly. To prevent back-siphoning of sewer water, provide an air gap to code or equivalent. (Figure 2) Do not raise drain hose more than 10 ft. above floor.
 8. During initial backwashings, a small amount of fine white media may be observed in the drain water. This is normal. Now supply power to timer and allow the unit to finish the cycle on its own. For next-Sand media, please follow the start-up instructions on the next page.
 9. Set time-of-day and backwash frequency (see Section 6, Programming Backwash Controls).



NOTE: After start-up, this unit may take several days to completely remove the iron. This is normal because of the nature of the media.

next-Sand Start-Up Instructions

Water-only backwash

1. Check that the correct backwash (BW) flowrate has been determined based on the water temperature. (See table below)
2. Allow the tank to slowly fill with water from the bottom. This is most easily accomplished by setting the control valve to the backwash position and partially opening the inlet valve until water flows from the drain line.
3. Allow the media to soak for at least 30 minutes.
4. Fully open the inlet valve and set the control valve in the backwash position.
5. Depending on how critical the application is, allow the filter to backwash for 20 to 30 minutes. Continue the backwash until the water is clear and free of particles. This is backwash #1.
6. Allow the filter to settle for 10 to 15 minutes. Do not allow the control valve to enter the fast rinse cycle.
7. Depending on how critical the application is, allow the filter to backwash again for 15 to 20 minutes. This is backwash #2.
8. Allow the filter to fast rinse (downflow) for 5 to 8 minutes.
9. The filter is now ready for service.

Backwash Rate

Tank Diameter	8"	10"	12"	14"	16"	Reference
gpm@80°F	8	12	18	24	24	23 gpm/ft ²
gpm@70°F	7	11	16	21	21	20 gpm/ft ²
gpm@60°F	6	9	13	18	18	17 gpm/ft ²
gpm@50°F	5	8	12	16	16	15 gpm/ft ²
gpm@40°F	4	7	10	13	13	13 gpm/ft ²

Section 4: Operating Instructions

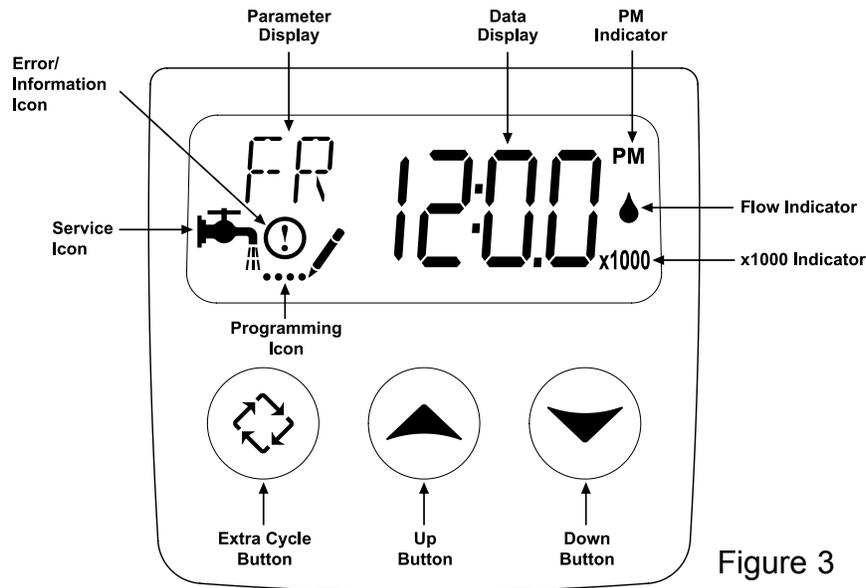


Figure 3

The valve has been pre-programmed with factory settings as follows:

Regeneration Cycle Step Programming

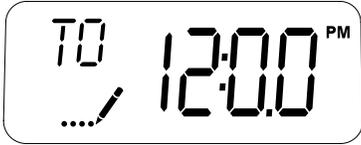
1. Backwash 14 minutes
2. Air Draw..... 40 minutes
3. Rapid Rinse 4 minutes

Whenever the valve is in Service the current time of day can be set, the control programmed, or an extra regeneration initiated at any time.

Set Time of Day

1. Press and hold either the Up or Down buttons until the programming icon replaces the service icon and the parameter display reads TD.
2. Adjust the displayed time with the Up and Down buttons.
3. When the desired time is set, press the Extra Cycle button to resume normal operation. The unit will also return to normal operation after 5 seconds if no buttons are pressed.

Queueing a Regeneration



1. Press the Extra Cycle button. The service icon will flash to indicate that a regeneration is queued.
2. To cancel a queued regeneration, press the Extra Cycle button.

Regenerating Immediately

Press and hold the Extra Cycle button for five seconds.

Installation Tip: The 2510AIO SXT Filter should not be allowed to regenerate at the same time as any other water treatment units. If adjustment is required, consult programming chart to adjust default regeneration time. Default setting is 11:00 pm.)

User Programming Mode Options		
Abbreviation	Parameter	Description
DO	Day Override	The timer's day override setting THIS IS AN OPTION ONLY. PLEASE DO NOT ADJUST BEFORE CONSULTING AN AUTHORIZED DEALER.
RT	Regeneration Time	The time of day that the system will regenerate (meter delayed, timeclock, and day-of-week systems)
H	Feed Water Iron Content	The iron content in ppm of the inlet water - used to calculate system capacity for metered systems
RC	Reserve Capacity	The fixed reserve capacity
CD	Current Day	The current day of week

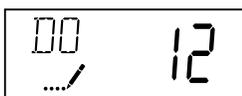
NOTES:

Some items may not be shown depending on timer configuration.

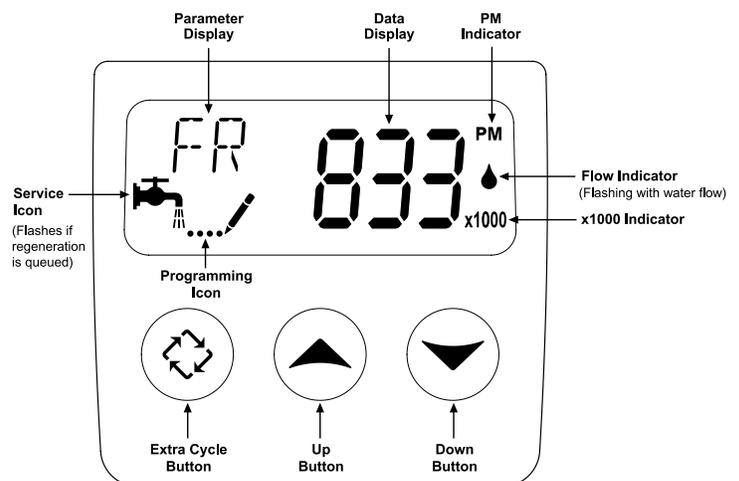
The timer will discard any changes and exit User Mode if any button is not pressed for sixty seconds.

User Programming Mode Steps

1. Press the Up and Down buttons for five seconds while in service, and the time of day is NOT set to 12:01 PM.
2. Use this display to adjust the Day Override. This option setting is identified by "DO" in the upper left hand corner of the screen.



THIS IS AN OPTION ONLY. PLEASE DO NOT ADJUST BEFORE CONSULTING AN AUTHORIZED DEALER.



3. Press the Extra Cycle button. Use this display to adjust the Regeneration Time. This option setting is identified by "RT" in the upper left hand corner of the screen.



4. Press the Extra Cycle button. Use this display to adjust the Feed Water Iron Concentration in ppm. This option setting is identified by "H" in the upper left hand corner of the screen.



5. Press the Extra Cycle button. Use this display to adjust the Fixed Reserve Capacity. This option setting is identified by "RC" in the upper left-hand corner of the screen.



# of People	RC
1	75
2	150
3	225

6. Press the Extra Cycle button to end User Programming Mode.

Error Codes

Note: Error codes appear on the In Service display

Error Code	Probable Cause	Recover and Resetting
[Err 0]	Drive motor is stalled	Unplug the unit from the power source
[Err 1]	Drive motor is running continuously	When power is restored to the unit, the Err _ display code clears. If the condition causing the error has not been resolved the Err _ code reappears in the four digit display. Do not attempt to troubleshoot this problem any further.
[Err 2]	There have been more than 99 days since the last Regeneration. If the Day of the Week mode of regeneration is selected and days since last regeneration exceeds 7 days. [7 - - 5]: There have been more than 7 days since the last regeneration. All individual settings (d1, d2, d3, d4, d5, d6, d7) are set to 0.	Regeneration must occur for the unit to recover, the display to clear and the valve to function normally. [7 - - 5]: To recover from [Err2], the user must initiate a regeneration or set at least one individual day to 1.
[Err 3]	Control board memory failure.	Perform a Master Reset. If the error returns, do not attempt to troubleshoot this problem any further.

Error Display Example



NOTE: Unit will flash when an error exists.

To determine the frequency of regeneration, use this procedure:

Setting the Frequency of Automatic Regeneration (SXT Models) Only With the Meter Control Valve

Please enter the ppm of compensated iron per gallon of water to be removed. See Step #4 of "User Programming." The SXT valve will automatically calculate the number of gallons of water to be treated by the iron filter between regenerations.

How to calculate gallons of water between regenerations:

ppm of capacity between regenerations (see Specifications - Page 1)

÷ ppm of iron in the water sample
= number of gallons supplied between regenerations
- reserve capacity (number of people x 5 gallons)

Example - Using FAIO-1.0

30,000	ppm between regenerations
÷ 2	÷ 2 to ensure adequate reserve capacity

15,000	
÷ 4	ppm of iron - 4 is the minimum setting of compensated iron [To be entered by the user]

3,750	gallons between regenerations [See step #5 of "User Programming"]
- 375	gallons reserve capacity (5 people x 75 gallons)

3,375	GALLONS - BETWEEN REGENERATIONS [Calculated by valve]

How to calculate number of days between regenerations:

Total amount of iron to be removed between regenerations -

÷ ppm of iron to be removed per day
= NUMBER OF DAYS BETWEEN REGENERATIONS

Example:

5	people in the household
x 75	gallons of filtered water per person

375	gallons of filtered per day
x 4	ppm of compensated iron - 4 is the minimum setting of compensated iron

1,500	PPM OF IRON TO BE REMOVED PER DAY

Using FAIO-1.0

30,000	ppm between regenerations
÷ 2	÷ 2 to ensure adequate reserve capacity

15,000	
÷ 1,500	ppm to be removed per day

10*	DAYS BETWEEN REGENERATIONS

*Maximum number of days between regenerations is 12.

Section 5: Plumbing System Clean-Up

The following procedures are guidelines only but have proven successful in most instances. Under no circumstances should any procedure outlined below be followed if contrary to the appliance manufacturer's instructions. Should there be any questions concerning the advisability of performing a procedure, it is strongly recommended the manufacturer's authorized service outlet be consulted prior to performing the procedure.

The plumbing system and water using appliances that have been exposed, even for a short time, to iron-fouled water need to be cleaned of the precipitated iron that has collected in them or iron bleed (staining) will continue to be a problem.

Depending on the amount of iron in the water and the length of time the water system has been exposed to iron fouling, select from the following procedures those that apply to the type of system and appliances that need to be cleaned to assure iron-free water at the point of use.

Softener

It isn't uncommon that a softener was installed in an effort to remove ferrous ("clear water") iron from the water supply. Typically, a softener will remove some ferrous iron until the resin bed becomes fouled to the extent that it will lose both hardness removal capacity and the limited capacity for iron removal. This is the condition to expect a softener to be in when planning a system clean-up.

Prior to closing the main supply valve or turning power off to private well system and preparatory to installing the filter system, do the following:

1. Disconnect brine draw line from the brine cabinet and place the loose end into a five gallon plastic pail filled with a solution of warm water and 4 oz. of resin mineral cleaner.
2. Manually advance control timer to brine draw position (refer to instructions provided with your softener). Allow all the warm mineral cleaner solution to be drawn into mineral bed. Then immediately:
3. Close main water supply valve or turn power off to pump and proceed with filter installation. During time required to install filter system, iron-fouled softener resin will be chemically cleaned.
4. After filter installation is completed and final adjustments are made with the water turned on and brine draw tube reconnected, manually reposition timer on softener to backwash position. Allow timer to perform an automatic regeneration cycle. During backwash of softener, all iron cleaned from the resin will be washed down the drain. It is advisable, after chemically cleaning softener, to regenerate system twice to fully restore capacity lost due to iron fouling.

Water Heater

If the water heater has been exposed to both iron and hardness for a long period of time, replacement of the heater tank may be the only solution to prevent continued staining originating from this source.

After completing the installation of the chemical free iron filter system, clean the water heater by following these instructions:

1. Shut off energy supply to water heater and close heater inlet water valve.
2. Drain hot water tank completely. Open inlet water valve allowing heater tank to be refilled with iron-free water. Continue flushing until water runs clear to drain.
3. If, after approximately 30 minutes flushing, water does NOT clear, terminate flushing operation. Refill hot water heater with water and pour approximately 1/2 gallon of household bleach into top of heater tank. Allow bleach solution to stand in tank for 20 to 30 minutes. Flush tank again until water is clear at drain. Turn energy supply on.

NOTE: If water does not clear in approximately 10 minutes, water heater should probably be replaced.

Dishwasher

Consult owner's handbook and follow manufacturer's instructions.

Toilet Flush Tanks

Prior to commencing installation of the filter system, pour 4 to 6 ounces of resin mineral cleaner Pro-Rust Out or inhibited muriatic acid into flush tanks and bowls and let stand. When installation is completed, flush toilets several times with iron-free water. If iron deposits or stains remain, repeat procedure until clear.

Section 6: Backwashing Instructions

To Calculate Backwash Frequency - Normal Applications

Backwash frequency for households with average water use can be determined using the following guides. The guide cannot be used if the filtered water supplies a swimming pool, geothermal pump, outside spigots or other high water demand devices or activities. If your application includes any of the foregoing refer to the paragraph on "Special Applications" below.

People in Family	Iron Content (ppm)									
	2	4	6	8	10	12	14	16	18	20
1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	2	2	2	2	2
3	1	1	1	2	2	2	3	3	3	3
4	1	1	2	2	2	3	3	4	4	4
5	1	1	2	2	3	3	4	4	4	4
6	1	2	2	3	3	4	6	6	6	6

1. Locate the box intersected by the number of people in your family and the parts per million (ppm) of iron in your water (if your ppm is between two numbers on the guide, use the higher number.)
2. The number in the box represents how many times your filter has to backwash in a twelve day schedule.

Example: You have four in the family and 8 ppm of iron. Refer to the guide and locate the box intersected by four in the family and 8 ppm of iron. The figure supplied is 2. This means your filter control should be programmed to backwash twice in twelve days - that is every sixth day. If the figure had been 3 it would mean 3 backwashes in twelve days or every fourth day.

To Calculate Backwash Frequency - Special Applications

To ensure adequate reserve capacity and prevent loss of water pressure between backwashes the figure of 15,000 (not the full 30,000 ppm capacity) is used to calculate backwash frequency. Determine your backwash frequency as follows:

1. Estimate daily iron removal requirements using the following calculation:
 No. of people in family
 x 75 gallons of water per person
 + No. of gallons of water for special use
 = No. of gallons of water required per day
 x Iron concentration (ppm)
 = Daily iron removal requirements (ppm)
2. Establish backwash frequency using daily iron removal to complete the following calculation:
 15,000 iron removal capacity (ppm)
 ÷ Daily iron removal requirements (ppm)
 = No. of backwashes required in 12 day schedule

Example: You have four in the family, 8 ppm of iron and a swimming pool requiring 46 gallons of water per day.

4	People in the family
<u>x 75</u>	Gallons of water per person
300	Gallons of water for family
<u>+ 46</u>	Gallons of water for the pool
346	Gallons of water required per day
<u>x 8</u>	Iron concentration
2,768	Daily iron removal requirements (ppm)
15,000	Iron removal capacity (ppm)
<u>÷ 2,768</u>	Daily iron removal requirements (ppm)
5.4	Backwash frequency (days)

The calculation indicates the need to backwash every 5.4 days. The control can only be programmed to backwash at intervals of two, three, four, six and twelve days. The control would be programmed to the closest more frequent setting i.e. every four days.

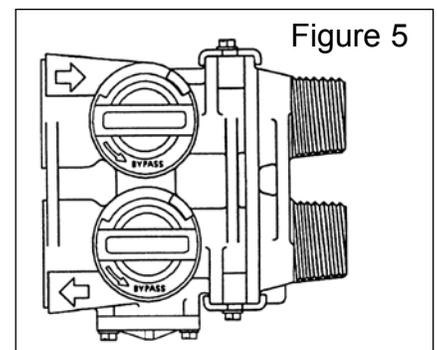
Manual Bypass (Figure 5)

In the case of emergency, such as an overflowing brine tank, you can isolate your water softener from the water supply using the bypass valve located at the back of the control.

In normal operation the bypass is open with the on/off knobs in line with the inlet and outlet pipes. To isolate the softener, simply rotate the knobs clockwise (as indicated by the word BYPASS and arrow) until they lock.

You can use your water related fixtures and appliances as the water supply is bypassing the softener. However, the water you use will be hard.

To resume soft water service, open bypass valve by rotating the knobs counterclockwise.



Section 7: Maintenance & Troubleshooting

The 2510AIO SXT Iron Filter requires annual maintenance. Please contact your dealer for maintenance kits (Part #92359).

PROBLEM	CAUSE	CORRECTION
1. Unit goes does not go through air draw sequence	A. Electrical service to unit is interrupted B. Power failure C. Timer is defective	A. i) Check supply is operating (Check fuse, plug, etc.) ii) Check that supply cut off when light is switched off or similar B. Reset time of day C. Check that dial showing days moves from day today. If it doesn't, replace timer
2. Unit doesn't draw air in refill cycle	A. Line to drain is kinked B. Water pressure to unit is too low C. Drain flow control is blocked D. Injectors or screen is plugged E. Internal leak in control	A. Straighten B. i) Check pressure. It must be above 20psi at all times. ii) If below, increase pressure C. Check and clean if necessary D. Check and clean or replace as needed E. Check piston and seals and spacers. Replace if needed.
3. Water flows to drain continuously	A. Timer motor stopped or jammed B. Foreign material jammed inside control C. Internal leak	A. Replace if necessary B. Remove piston and check C. Inspect piston and seals and spacers. Replace if necessary.
4. Water is clear when drawn, turns red upon standing (stain producing)	A. Insufficient air drawn by valve B. Bypass open or leaking C. Filter bed backwashed at improper levels D. Presence of manganese or tannins	A. Check valve at air draw time B. Close bypass valve and/or repair as necessary C. Refer to backwash frequency chart in operation manual to ensure unit is set correctly. Do not increase the backwash frequency unless required to based in the chart, since the media needs to be somewhat iron-fouled for best performance (in more severe iron-fouling cases, filter bed may need chemical cleaning - contact dealer). D. Recheck water analysis
5. Water is red when drawn from tap	A. Filter bed overloaded with precipitated iron due to insufficient backwash flow rate. B. Filter bed backwashed at improper intervals	A. i) Check for obstructions or kink in drain line ii) Check for improper drain line flow controller (see specs). Upon correction of this problem, if manually backwashing does not clear bed of iron, filter bed may need chemical cleaning. B. Refer to backwash frequency chart in operation manual to ensure unit is set correctly. Do not increase the backwash frequency unless required to based on the chart, since the media needs to be somewhat iron fouled for best performance (in more severe iron-fouling cases, filter bed may need chemical cleaning - contact dealer).
6. Excessive pressure loss through filter	A. Filter bed overloaded with precipitated iron B. Control in/outlet valve(s) not fully open C. Sand, silt or mud collecting in filter media D. Filter bed not properly "classified" E. "Cementing" or "channelling" of filter media	A. Refer to Section 2 B. Open valves C. Check well for these conditions D. Manually backwash to reclassify. E. Prod (stir) filter bed to break up hardened layer, backwash frequency to prevent recurrence.
7. "Milky" or "bubbly" water (appears to contain small bubbles)	A. Excess gases in water (carbon dioxide, hydrogen sulfide, methane)	A. May require cleaning or installation or air-relief control (contact dealer).

GUARANTEE

HYDROTECH guarantees that your new water conditioner is built of quality material and workmanship. When properly installed and maintained, it will give years of trouble-free service.

ONE YEAR VALVE GUARANTEE

The 2510AIO valve has a 1 year (12 month) warranty from the date of manufacture or from the date of installation if confirmed by verified installation invoice. The pistons, injectors, seals and spacers require maintenance as part of a yearly service schedule, are wear components and excluded from warranty coverage. Failure to comply with the installation, operation or maintenance instructions voids any and all warranties.

TEN YEAR GUARANTEE ON MINERAL TANKS

HYDROTECH will provide a replacement mineral tank to any original equipment purchaser in possession of a tank that fails within 120 months, provided that the water conditioner is at all times operated in accordance with specifications and not subject to freezing or exposure to direct sunlight.

GENERAL PROVISIONS

HYDROTECH assumes no responsibility for consequential damage as a result of escaped water from the water filter; labor or expense incurred as a result of a defect or for failure to meet the terms of these guarantees because of circumstances beyond its control.