Hydrotech

2510 Valve
Chemical Free Iron Filter

Water Filter
Operation Manual

Read all instructions carefully before operation.

#51796 1/09
US

Performance and Specifications

Calendar Clock "A" Beds 2510 Models	Calendar Clock "AM" Beds 2510 Models	Filter Media Volume cu. ft.	Iron Removal Capacity ppm	Service Flow Rate USGPM	Peak Flow Rate[1] USGPM	Backwash Flow Rate USGPM	Mineral Tank Size[2] inches	Installation Space w x d x h (inches)	Shipping Weight Lbs.
2510CC-847CFA-75	2510CC-847FAM-75	0.75	22,500	2	4	4	8 x 47	10 x 10 x 57	100
2510CC-1047CFA-100	2510CC-1047FAM-100	1.00	30,000	3	6	5	10 x 47	12 x 12 x 57	145
2510CC-1252CFA-150	2510CC-1252FAM-150	1.50	60,000	4	10	7	12 x 52	14 x 14 x 62	250
2510CC-1450CFA-200	2510CC-1450FAM-200	2.00	90,000	5	15	10	14 x 50	16 x 16 x 60	365

ADDITIONAL INFORMATION: Operating Temperature Range = 34° to 110°F (1° to 43°C). Operating Pressure Range = 20 to 120 psi (1.37 to 8.27 bar). The manufacturer reserves the right to make product improvements which may deviate from the specifications and descriptions shown above, without obligation to change previously manufactured products or to note the change.
CAUTION: These products are not intended to be used to treat water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
NOTES: [1] The Service Flow Rate given will not exceed a pressure drop of 15psi. Peak flow rates are intended for intermittent use only (10 minutes or less). [2] Dimensions of cylindrical tanks shown are diameter (or width) x height.

Section 1: General Information

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

How Your Chemical Free Iron Filter Works

The chemical free iron filter consists of two major components which are:

1. A hydro-charger, located between the well head and the pressure tank, adds a small amount of air to the iron-laden water whenever the well pump runs. Refer to Figs. 1, 2 or 3 for its location.
2. A backwashing type filter containing a special media that causes the iron in the "Hydro-Charged" 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.

Your filter automatically adjusts the pH to neutral or higher on acid water without an acid neutralizer. The ability to raise pH when it is below neutral (7 or less) greatly enhances the filter's ability to remove iron efficiently.

The clean, filtered water then flows into your household water line. Depending on water use and the concentration or 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 every two, three, four, six or twelve days as required (instructions for calculating the backwash frequency and setting the controls are in Section 5).

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

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 visible 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 dropped or if set on sharp, uneven projections 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 (see Sec. 3, Step 11).

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 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. To accomplish this a special “M” type media can be provided that contains additional quantities of the pH raising component (“MpH adder”). The use of “M” type media is for applications where the manganese is not more than 1.5 ppm, and the pH is 6.0 or higher (when the pH is below 5.0, the media should contain even greater amounts of MpH — consult your dealer).

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 it is alkaline, and a pH of 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 this occurs is proportional to the pH increase and the water consumption rate (i.e., the greater the pH increase and 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 MpH component of the media may have been 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 water 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 under this situation. If the tannin concentration is less than 0.5 ppm, a chemical free iron filter may be installed.

HYDROGEN SULFIDE (H_2S)

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 sulphide is the only water problem although it is capable of removing sulfur in concentrations of up to 2 or 3 ppm. Whenever hydrogen sulfide is present, backwashing must be performed at more frequent intervals, and the pumping system MUST include a standard air-to-water pressure tank with an air relief valve.

Section 2: Continued

CHECK YOUR WATER PRESSURE AND PUMPING RATE

Two water system conditions must be checked carefully to avoid unsatisfactory operation or equipment damage:

1. Minimum water pressure required at the filter tank inlet is 20 psi. If pressure is over 50 PSI, a pressure reducing valve must be installed in the water supply line ahead of the hydro-charger (Fig. 1, 2 or 3).
2. The pumping rate of your well pump must be at least 5 gallons per minute (gpm) for satisfactory operation of the hydro-charger. In addition, the pumping rate must equal the required backwash flow rate of your model (see below for backwash flow rates). To measure the pumping rate of your pump, follow these instructions:
   a) Make certain no water is being drawn. Open spigot nearest pressure tank. When pump starts, close spigot and measure time (in seconds) to refill pressure tank (when pump shuts off). This figure represents cycle time.
   b) With the pressure tank full, draw water into a container of known volume, and measure the number of gallons drawn until the pump starts again. This is draw-down. Divide this figure by cycle time and multiply the result by 60 to arrive at the pumping rate in gallons per minute (gpm). To aid in your calculation, insert the date in the following formula:

   DRAW-DOWN _____ ÷ CYCLE TIME _____ x 60 = PUMPING RATE _____
   (gals) (secs.) (gpm)

   EXAMPLE: CYCLE TIME is 53 secs.; DRAW-DOWN is 6 gals.; then, PUMPING RATE equals:
   6 gals. ÷ 53 secs. x 60 = 6.8 gpm

   See chart on page two for minimum flow rates.

   NOTE: If your pumping rate is inadequate, do not install your filter until problem is corrected.

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 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, 2 or 3).
4. Filters and softeners should be located in the supply line before the water heater. Temperatures above 120°F damage filters and softeners, and will void the factory warranty.
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.
7. If your water source is a community water supply, a public water supply, or you wish to bypass water used for a geothermal heat pump, lawn sprinkling, out-bindings or other high demand applications, refer to Figs. 2 or 3 for additional equipment required. Also, refer to the NOTE following Step 11 or Sec. 3, Installation.

THE IMPORTANCE OF YOUR PRESSURE TANK

The pressure tank found on private well systems becomes an integral part of the filter system by providing necessary mixing and “contact time” to the “Hydro-Charged” water. While the iron filter will perform better on a standard water to air pressure tank, it will perform satisfactorily on a captive air (bladder) type pressure tank. The bladder type requires more careful adjustment of the Hydro-Charger and the careful location of the air relief valve.

If cycle time on pumping system is less than 30 seconds and under severe operating conditions (low pH, high iron, manganese, and small concentrations of sulfur), a standard air-to-water type pressure tank with an air-relief valve must be used (if a bladder type tank is already in place — do not remove it — install the air-to-water pressure tank between the Hydro-Charger and the bladder type tank).

NOTE: If your pressure tank (or any part of the water system) is not functioning properly, corrective action must be taken before installation of your iron filter.

FACTS TO REMEMBER WHEN PLANNING YOUR INSTALLATION

1. All installation procedures must conform to local and state plumbing codes.
2. All water must pass through the hydro-charger, pressure tank and the filter, or refer to the special instructions for a split-stream installation (System may malfunction if this instruction is ignored.)
3. If lawn sprinkling, a swimming pool, geothermal heating/cooling or water for other devices/activities are 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 backwashing requirement of the filter. Consult your dealer for alternative instructions if the pumping rate is insufficient.
4. 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.
5. Before commencing the installation it is advisable to study the existing piping system and to determine the size, number and type of fittings required. Typical system schematics shown in these instructions (Figs. 1, 2 or 3) 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.

Section 3: Installation

PROPER INSTALLATION SEQUENCE OF WATER CONDITIONING EQUIPMENT IS VERY IMPORTANT. REFER TO THE DIAGRAM FOLLOWING FOR YOUR PARTICULAR WATER SUPPLY.

FIG 1: STANDARD INSTALLATION

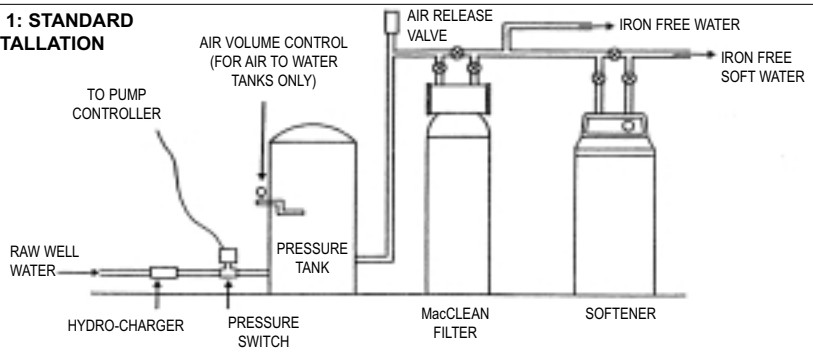


FIG 2: SPLIT-STREAM INSTALLATION

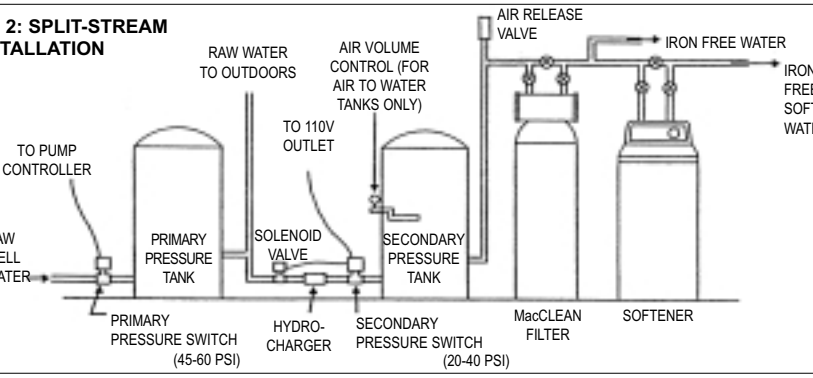
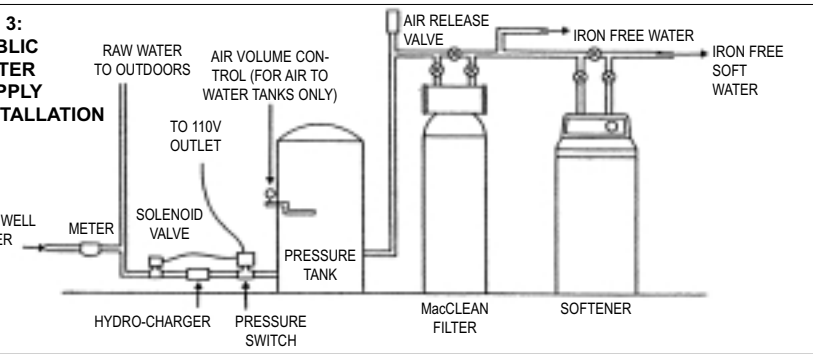


FIG 3: PUBLIC WATER SUPPLY INSTALLATION



Installation

NOTE: Before starting installation, read Sec. 4, Plumbing System Cleanup, for instructions on some procedures that may need to be performed first.

1. 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 or filtration 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-ring seals.
- The softener or filter is now charged with softening resin.
- It is recommended that the softener or filter tank now be completely filled with water (SLOWLY) to soak the resin or filtration media 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 or filter media out of the tank during the initial backwash on startup.

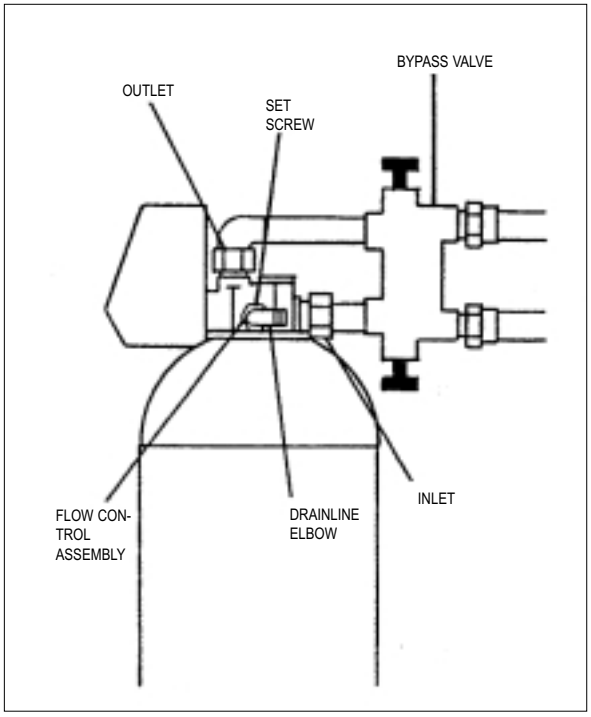


FIGURE 4

2. Cut main supply line as required to fit hydro-charger in plumbing between well pump and pressure tank (hydro-charger may be installed in a vertical or horizontal position). Allow a minimum of 6 in. straight run of pipe on each side of hydro-charger, excluding fittings. Polybutylene pipe is recommended between the hydro-charger and pressure tank to reduce build-up and easier dismantling for service. Be certain direction of flow arrow on hydro-charger points toward pressure tank, and pressure control switch is located on pressure tank side of the hydro-charger as in Figs. 1, 2 or 3 (rapid cycling of pump may occur if pressure switch is located on well side. If check valves are used they should be installed before the Hydro-Charger - not between the Hydro-Charger and pressure tank).

   NOTE: It is advisable to install the hydro-charger with unions at both ends to facilitate removal and inspection. If heat is applied near Hydro-Charger, remove rubber check valve to prevent damaging it. On badly scaled older pumping systems, it may be advantageous to install an optional “WYE”-strainer ahead of Hydro-Charger to prevent plugging Hydro-Charger nozzle with scale.

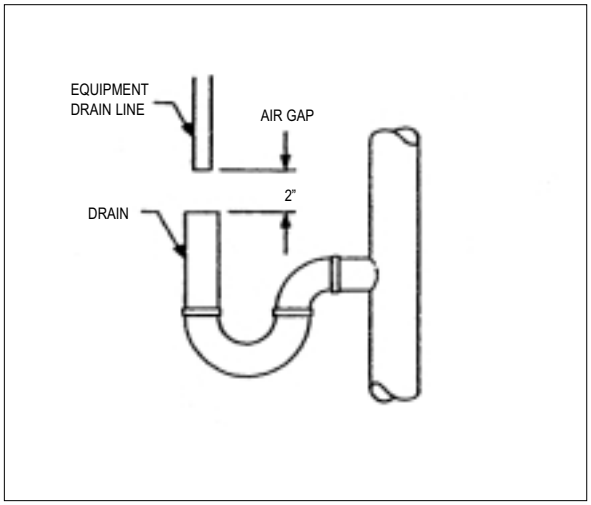


FIGURE 5

3. Cut main supply line as required to fit plumbing to control valve and attach the single lever bypass valve (Fig. 4).
4. Solder or solvent weld plumbing. Do not apply heat to any fitting connected to control valve as damage may result in 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 Fig. 5). NOTE: If the installation to be split-streamed prior to the filter tank (Fig. 2), or is a public water supply type installation (Fig. 3), refer to special instructions following Step 11.

5. Loosen set screw 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 tightening set-screw. Attach 1/2 in. ID drain line to drain elbow. Caution: Set-screw requires only finger pressure to hold plastic flow control in place. Over-tightening set-screw may crack fitting.
6. Position drain hose over drain and secure firmly. To prevent back-siphoning of sewer water, provide an air gap to code or equivalent (Fig 5). Do not raise drain hose more than 10 ft. above floor.
7. Turn on power to well pump. Be sure that the filter control is on the backwash position then disconnect power supply. Fill the unit with water slowly by cracking open main supply valve. After all air is out of the unit and only water is running to the drain, fully open the main supply valve. Let the unit backwash for a period of 10 minutes or until running clear and free of fines then reconnect to power supply. Let the unit finish off its cycle automatically.

   NOTE: During the initial backwashings, a small amount of fine white media may be observed in drain water. This is normal.
8. Set Hydro-Charger by following these steps:
   A. Open nearest faucet until pump starts, then close faucet.
   B. Place a finger over suction port (See Figure 7). A slight suction should be detected for a minimum of 20 seconds or for approximately one-third of pumping cycle whichever is greater.
   C. If suction duration is too short, increase by turning water flow adjusting screw (Figure 7) clockwise. To decrease duration, turn counterclockwise.
   D. Repeat Steps A through C until proper setting is obtained. NOTE: When the duration of the suction is too long, cold water may have a “milky” appearance caused by excess air in system. Correct this condition by reducing the duration of suction. This condition is one commonly associated with bladder-type pressure tanks. In extreme cases excess air prevents the system from performing satisfactorily, consequently it is essential to install an air relief valve (such as a Braukman) in the proper location.

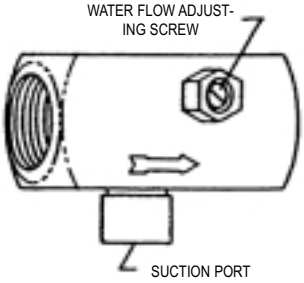


FIGURE 7

9 Make certain bypass is closed and inlet and outlet valves are fully opened. Check for leaks.
10. Set time-of-day and backwash frequency (see Sec.5: Programming Backwash Controls).

Braukman Air Vent Installation

The Braukman Air Vent must be installed at the highest point of the plumbing, between the pressure tank and filter (see Figure 8). Please note that the Braukman Air Vent (A) is mounted on a four to six inch pipe extension (B) at the elbow (C) of the highest point. This enables the vent to better collect the excess air created by the hydro-charger.

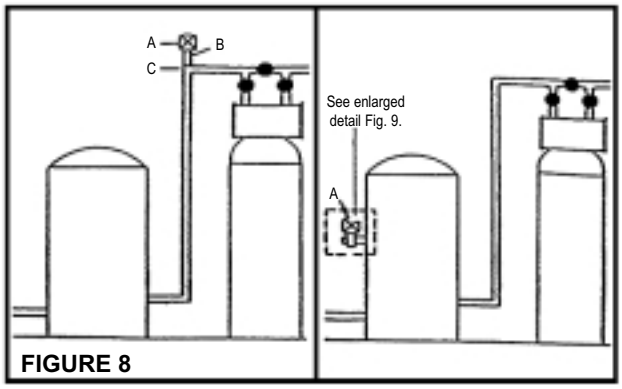


FIGURE 8

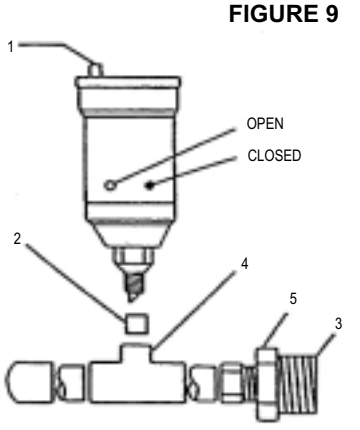


FIGURE 9

To use the Braukman Air Vent on an air to water pressure tank, install it as shown in the detailed drawing (Figure 9).

1. Air Release Cap must be loose or removed to allow air to escape from vent.
2. Vent Bushing 1/2” x 1/8”
3. To opening on side of air to water tank approximately 1/2 way
4. 3/4” x 3/4” x 1/2” copper tee
5. 3/4” adapter with bushing to tank

Special Instructions for Split-Stream and Public Water Supply Type Installations:

For a split-stream type installation, a secondary pressure tank must be installed as in Fig. 2. On a public water supply type installation, a pressure tank must be installed as in Fig. 3. It is recommended in both applications to use a standard air-to-water type pressure tank with an air-relief valve, of a capacity that would normally be installed of the water system were a standard private well type. Also note that in both applications a normally-closed solenoid valve is required. Follow the standard installation instructions above with the following additions and modifications.

1. Install pressure tank (secondary pressure tank in Fig. 2) as indicated by appropriate diagram.
2. Install normally-closed solenoid valve after water meter and after a line split for untreated water (if there is one).
3. On both types of installation, install the hydro-charger between pressure tank (secondary pressure tank on split-stream type installations) and normally-closed solenoid valve.
4. Install a pressure switch after the hydro-charger and wire it to the solenoid valve (secondary pressure switch on split-stream). Set high pressure on pressure switch (which controls opening and closing of solenoid valve) to 3 psi lower than low pressure on primary pressure switch. Example: if primary pressure switch is set at 40/60 psi, set secondary pressure switch high at 37 to 38 psi.

   For public water supply type installations, contact your local water department or plant operator and ask what the normal low system pressure is. Set high pressure on pressure switch 2 to 3 psi lower than this figure.

   NOTE: Failure to set the pressure switch as described above will not allow proper closing of the solenoid valve during periods of low system pressure.

Section 4: 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 system and appliances that need to be cleaned to assure iron-free water at the points of use.

SOFTENER

It isn't uncommon that the softener was installed in an effort to remove ferrous ("clean 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 the softener to be in when planning a system clean-up.

Prior to closing main supply valve or turning power off to a 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 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 the 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 practical 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 filled 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 probably should be replaced.

DISHWASHER

Consult owners 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 Iron 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 5: Backwashing Instructions

To Calculate Backwash Frequency - Normal Applications

Backwash frequency, for households with average water use, can be determined using the following guide. 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 an of the forgoing refer to the paragraph on Special Applications.

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	6	6
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 requirements 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.

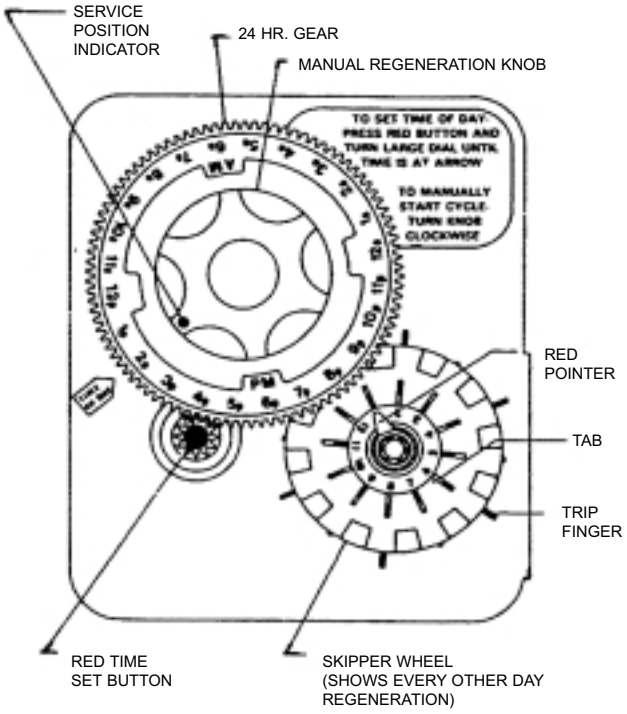
4	People in the family
X 75	Gallons of water per person
300	Gallons of water for family
+ 46	Gallons of water for the pool
346	Gallons of water required per day
X 8	Iron concentration (PPM)
2,768	Daily iron removal requirements
15,000	Iron removal capacity (PPM)
÷ 2,768	Daily iron removal requirements (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.

Programming Backwash Controls

Setting The 24-Hour Timer

Press and hold the red button in, to disengage the drive gear. Turn the large dial until the actual time of day is opposite the time of day pointer. Release the red button to re-engage the drive gear.



Setting The Backwash Frequency

The filter control features a skipper wheel with twelve numbered tabs and trip fingers. Each represents one day of a twelve day schedule. By adjusting the skipper wheel tabs the control can be programmed to backwash every second, third, fourth, sixth or every twelfth day, according to your requirements.

The control is shipped with all the skipper wheel tabs pushed outward. You must push the tabs in toward the center of the wheel (retracting the trip fingers) for each day that backwashing is **not** required.

Rotate the skipper wheel until number "1" is at the pointer, leave this tab **out.** Moving clockwise round the skipper wheel adjust the remaining tabs using the following table as a guide.

No. of back-washes required in 12 days	Skipper Wheel Tab Settings											
	1	2	3	4	5	6	7	8	9	10	11	12
1	Out	In	In	In	In	In	In	In	In	In	In	In
2	Out	In	In	In	In	In	Out	In	In	In	In	In
3	Out	In	In	In	Out	In	In	In	Out	In	In	In
4	Out	In	In	Out	In	In	Out	In	In	Out	In	In
6	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In

MANUAL REGENERATION

Turn the manual regeneration knob clockwise. The slight movement of the manual regeneration now engages the program wheel and starts the regeneration program. The back center knob will make one revolution approximately three hours and stop in the position shown in the drawing. Actual backwash time is 14 minutes. In any event, iron-free water may be drawn after rinse water stops flowing from the filter's drain line.

Section 6: Trouble Shooting

PROBLEM	CAUSE	CORRECTION
1. Water is clear when drawn, turns red upon standing (stain producing)	A. Insufficient air drawn by Hydro-Charger.	A. Check Hydro-Charger adjustment. If unable to adjust for long enough draw, check pumping rate.
	B. Bypass open or leaking.	B. Close bypass valve and/or repair as necessary.
	C. Filter bed overloaded with precipitated iron due to insufficient backwash.	C. Upon correction of problem (increase backwash frequency if problem determined to be insufficient frequency), manually backwash until backwash water starts to clear (in more severe iron-fouling cases, filter bed may need chemical cleaning - contact dealer).
	D. Presence of manganese or tannins.	D. Recheck water analysis.
	E. Flow rate exercise for model.	E. Reread Sec. 2. Facts to Remember When Planning Your Installation
	F. Check-valve located between Hydro-Charger and pressure tank, disrupting water flow.	F. Relocate check-valve.
	G. Pumping cycle too short. pH of treated water too low (should be 7.0 or higher; with manganese, pH must be 8.2).	G. Lengthen pump cycle time. Replenish MpH component in media (contact dealer).

PROBLEM	CAUSE	CORRECTION
2. Water is RED when drawn from tap	A. Filter bed overloaded with precipitated iron due to insufficient backwash flow rate.	A. (a) Recheck well pumping rate and repair or replace as required. (b) Check for obstructions or kink in drain line, or (c) 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 - contact dealer.
	B. Filter bed overloaded with precipitated iron due to insufficient backwash.	B. Upon correction of problem (increase backwash frequency if problem determined to be insufficient frequency), manually backwash until backwash water starts to clear (in more severe iron-fouling cases, filter bed may need chemical cleaning - contact dealer).
	C. Solenoid valve malfunction or inadequate supply system pressure/flow rate.	C. Replace solenoid valve (check page 4 for proper pressure/flow rates).
3. Excessive pressure loss through filter	A. Filter bed overloaded with precipitated iron. B. Control inlet/outlet valve(s) not fully open. C. Sand, silt or mud collecting in filter bed. D. Filter bed not properly "classified". E. "cementing" or "channeling" of filter media	A. Refer to Section 2 above. B. Open valves. C. Check well for these conditions. D. Manually backwash to reclassify. E. Prod (stir) filter bed to break up hardened layer, increase backwash frequency to prevent reoccurences.
4. "Milky" or "Bubbly" water (appears to contain small bubbles).	A. Excess Hydro-Charger air-draw. B. Excess gasses in water (carbon dioxide, hydrogen sulfide, methane).	A. Check adjustment for duration of draw in excess of one-third pumping cycle (see Sec. 3, Step 8). B. May require cleaning or installation of 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.

FIVE YEAR COMPLETE PARTS GUARANTEE

HYDROTECH will replace any part which fails within 60 months from date of manufacture, provided the failure is due to a defect in material or workmanship. The only exception shall be when proof of purchase or installation is provided and then the warranty period shall be from the date thereof.

TEN YEAR GUARANTEE ON MINERAL AND BRINE TANKS

HYDROTECH will provide a replacement mineral or brine 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.

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