Installation / Operation Manual

Nitrate / Sulfate Water Treatment System

(2510 Control Valve)

For Model Numbers :

☐ **MN15-25**

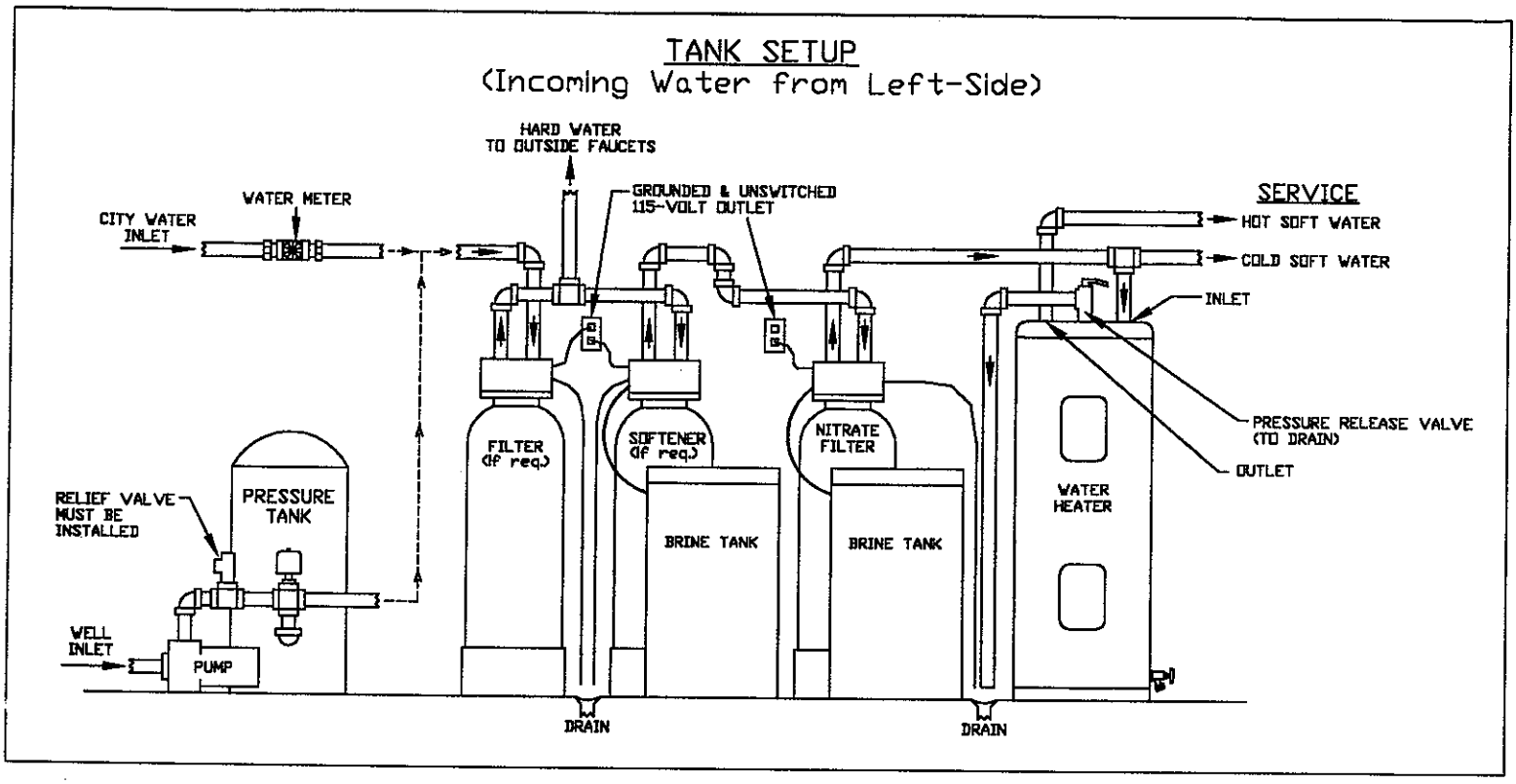
☐ **MN25-25**

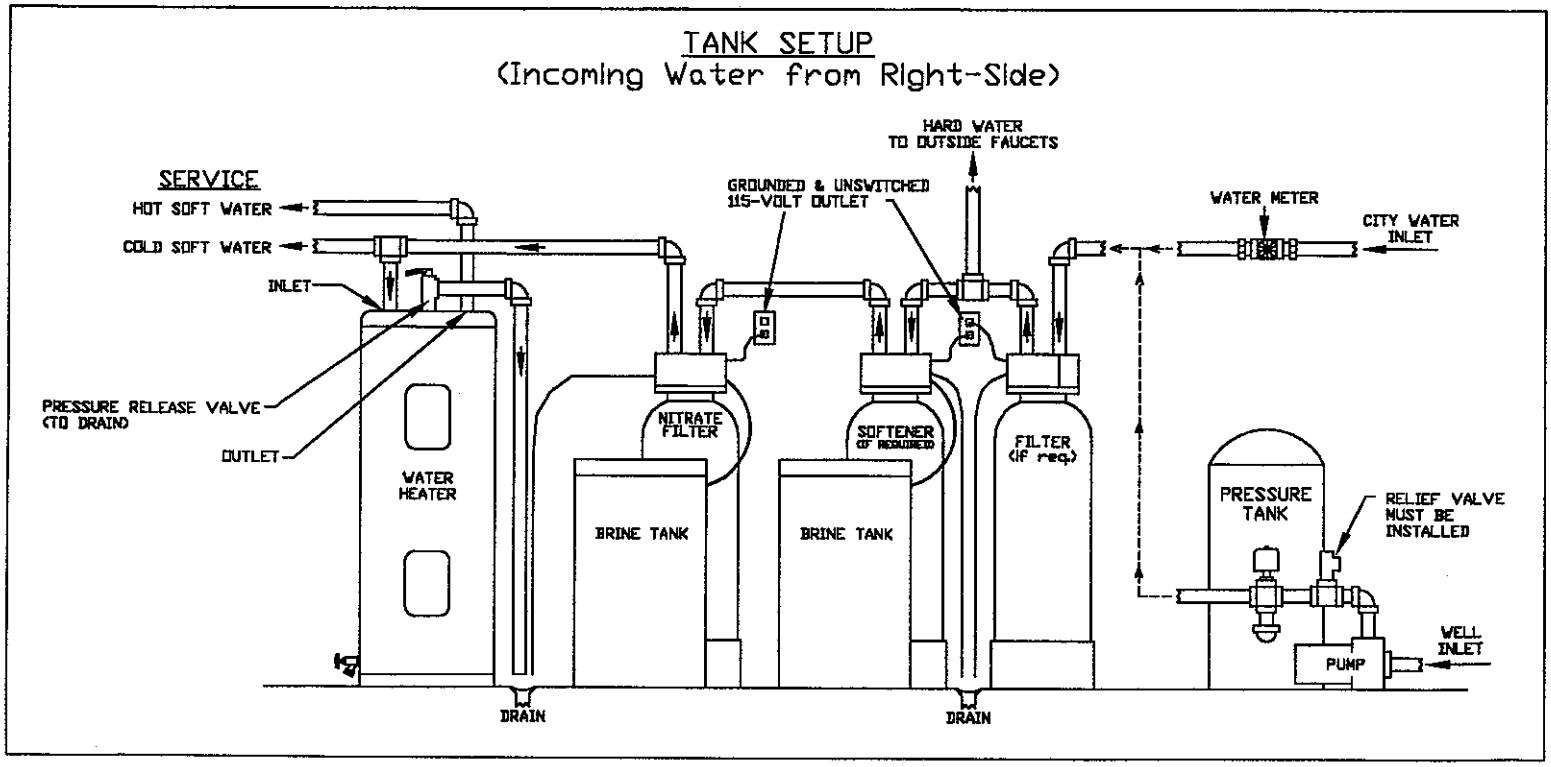
CSI Inc.
220 Ohio Street
Ashland, OH 44805
(419) 281-5767

General Specifications	MN15-25	MN25-25
Grains Capacity / Regeneration	15,000	25,000
Maximum Raw Water Nitrate (mg/l)	100	100
Maximum Clear Iron / Manganese (ppm)	0	0
Salt Used / Regeneration (pounds)	18.0	30.0
Exchange Resin (cu. ft.)	1.5	2.5
Mineral Tank (Polyglass)	10 x 54	13 x 54
Brine Tank (Polyethylene with Grid & Safety)	18 x 33	18 x 33
Service Flow Rate (gpm)*	5.0	8.0
Backwash Flow Rate (gpm)	1.2	2.0
Space Required (D x W x H inches)	18 x 28 x 62	18 x 30 x 56
Approximate Shipping Weight (pounds)	133	225

**** The pressure drop does not exceed 15.0 psi at Service Flow Rate.***

Typical Installation





Installation Requirements

- A level floor position ahead of piping into water heater.
- Unit must be installed at least 10' ahead of the inlet to a water heater to prevent damage due to back-up of hot water.
- DO NOT install the unit in an area of direct sunlight or where freezing temperatures may occur! (See Installation Diagrams for proper placement and plumbing connections.)

Nitrate Filter Location / Other Requirements

- Locate the unit near an unswitched, 120 volt / 60 Hz grounded electrical outlet.
- Check for distance and proper drain installation (e.g. floor drain, washing machine standpipe).
- Determine type and size of piping required for softener connection (e.g. cooper galvanized, PVC plastic).

Note : Where the drain line is elevated above the control valve or exceeds 20 feet in length to reach the drain, use 3/4" I.D. drain tubing instead of 1/2" I.D. Drain line tubing is not included.

Caution : *If sweat soldering copper pipe, (remember to always use lead free solder and flux) cover yoke and bypass valve with wet rags to prevent heat damage to connections and control valve! If using PVC or plastic pipe, primers and solvent cements specifically recommended for use with potable water are required.*

Note : All plumbing lines not requiring *treated* water should be connected "upstream" of the nitrate filter. (See Installation Diagrams.)

Installation Procedure

- Water Supply Connections and Bypass Valve -

To allow for filter servicing, swimming pool filling or lawn sprinkling, a manual bypass valve has been installed at the factory. The bypass allows hard water to be manually routed around the filter.

1. Position filter at desired location for installation. (See Installation Diagrams.)
2. ***For MN25-25 Units Only*** - The filling material is shipped separately from the mineral tank. Remove the valve by unscrewing from center hole. Leave distributor tube in while filling. Use a cork or tape to place over top of distributor tube to prevent mineral from entering tube while filling. Place funnel in hole. Pour several gallons of water in the tank. First pour in the "D" gravel and then the filling material. Remove funnel and cork or tape from distributor tube. Clean tank threads and fill the mineral tank completely with water. Replace the valve, being careful to position the distributor tube into the distributor tube pilot hole.
3. Turn OFF main water supply and OPEN nearest faucet to relieve pressure.
4. Loosen clips one each side of valve body. Lubricate o-ring on adapters and firmly press bypass assembly (packed separately) onto valve body. Align clips and tighten. **Note :** It is normal to have ***play*** in the bypass assembly after installation.
5. Cut main line and install appropriate elbows and extensions. Inlet and outlet connections on the control valve are 3/4" FNPT.

Note : An optional 1" FNPT yoke is available.

Caution : *Raised arrows located on the sides of control valve body and bypass valve indicate proper direction of water flow. Install inlet and outlet piping in direction of arrows.*

6. Rotate inlet and outlet knobs on bypass valve to the bypass position (position of bypass knobs are at right angles to inlet / outlet piping).
7. Turn the main supply line on to restore water service to the home.
8. OPEN nearest faucet to evacuate air and repressurize plumbing lines.
9. Check for leaks!

- Drain Line Connection -

1. Pull out clip and remove drain line assembly located on the left side of control valve. Remove drain line hose barb and wrap threads with Teflon tape. Reinstall drain line hose barb. **CAUTION :** Hand tighten only!! Replace drain line assembly and reinstall clip.

2. Install 1/2" I.D. drain line tubing (not included) from hose barb to an open drain. A 4" gap between the end of the drain line and the open drain is required to prevent waste water back flow. Keep the drain line as short as possible. An overhead drain line can be used if necessary but should discharge below the control valve. A syphon trap (taped loop) at the outlet of the drain line is advisable to keep the drain line full assure correct flow during regeneration. Elbows or other fitting must be kept at a bare minimum.

Note : Where the drain line is elevated above the control valve or exceeds 20' in length, 3/4" I.D. drain line tubing should be used.

- Brine Line and Overflow Connection -

1. Position brine tank on a smooth, level surface near the softener resin tank. If necessary, the brine tank can be placed at a higher level than the resin tank, but ***never at a lower level***.
2. Install one end of 3/8" O.D. by 1/4" I.D. brine line tubing (included with unit) to compression fitting located on right side of control valve, behind backplate.
3. Remove brine tank cover.
4. Remove cap from brine well.
5. Insert opposite end of brine line through outer hole in brine tank.
6. Connect brine line to compression fitting on safety brine valve located inside the wall.
7. Install 1/2" I.D. drain line tubing (not included) to the overflow fitting on brine tank located just below the brine line.
8. Run the opposite end of brine tank drain line to a suitable drain.

Note : The brine tank drain line is gravity flow and must discharge below the overflow fitting.

Caution : *Do not **TEE** to the main drain line from control valve.*

Notice : The brine overflow is provided as a back-up in the event the safety float shut-off should fail, allowing the brine tank to overfill. This drain connection would then carry the excess water to the drain and prevent flooding of the floor. Therefore, no liability will or can be assumed by the manufacturer of the filter should this occur.

- Electrical Connection -

1. Remove control valve face cover.
2. The control valve ***must be in the SERVICE position!*** If needed, rotate manual regeneration knob on time clockwise until white dot aligns with raised time of day arrow. (See Figure 1.)
3. Plug the cord from the control valve into a standard 115 volt / 60 Hz receptacle.

Note : Do not plug into an outlet controlled by a wall switch or pull chain that can be inadvertently turned off.

4. For your protection, this unit is equipped with a 3-prong plug and should be plugged into a grounded receptacle. If the receptacle is designed only to accept 2-prong plugs, obtain a 3-prong adapter and secure the ground wire to the receptacle plate mounting screw.
   Warning : Do not remove grounding plug! An improperly grounded unit could cause injury from electric shock.

- Pressuring The System -

1. The control valve ***must be in the SERVICE position!*** If needed, rotate manual regeneration knob on timer clockwise until white dot aligns with raised time of day arrow. (See Figure 1.)
   Warning : NEVER turn the regeneration knob counter clockwise as this will cause damage to the control valve!
2. Slowly rotate inlet knob of the bypass valve to the SERVICE position. Slowly rotate outlet knob to the SERVICE position. (Position of bypass knobs are parallel to inlet / outlet.)
3. Open the nearest faucet to evacuate air from plumbing lines.
4. Check for leaks!

- Control Valve Operation -

Each control valve position can be manually selected by rotating the **manual regeneration knob** clockwise until first microswitch located on rear of timer door is aligned with each cycle position on the program wheel. (See Figure 2.)

Note : To expose the program wheel, grasp the upper left corner of the timer ***face*** and pull outward. ***Make certain meter cable is disconnected from meter module before opening timer face.***

Warning : When selecting cycle positions you ***must wait*** until position of the piston has stopped before advancing the timer further.

1. Manually index **manual regeneration knob** to **BACKWASH** position and allow water to run to drain 3 to 4 minutes. (See Figure 2.)
2. Manually index **manual regeneration knob** to **BRINE REFILL** position and allow the brine tank to fill just over the salt grid plate. (See Figure 2.)
3. Manually index **manual regeneration knob** to **BRINE & RINSE** position and allow the control valve to draw water from brine tank until it stops. (See Figure 2.)
4. Manually index **manual regeneration knob** to **SERVICE** position. (See Figure 2.)
5. Manually index **manual regeneration knob** to **BRINE TANK REFILL** position and allow the control valve to automatically fill the brine tank. (See Figure 2.)
   Note : Control valve will advance to service position automatically.
6. Snap timer door closed.
7. Push meter cable firmly into meter module.

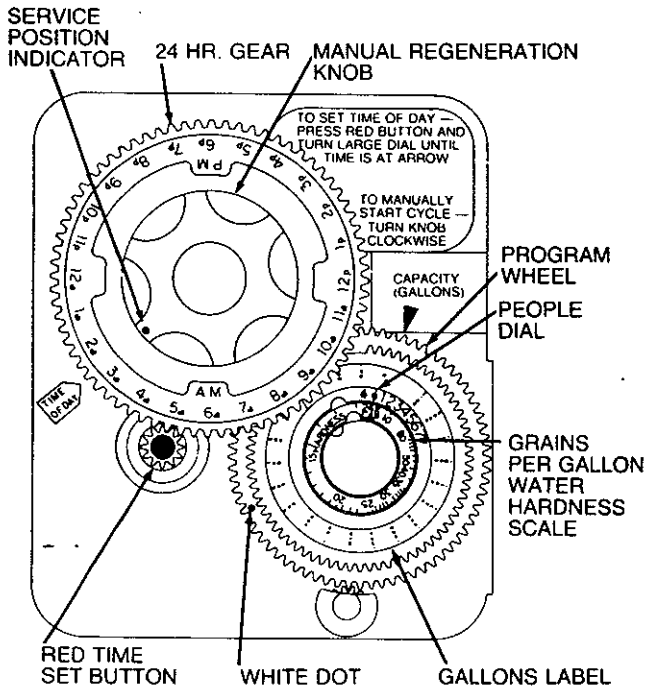


Figure 1

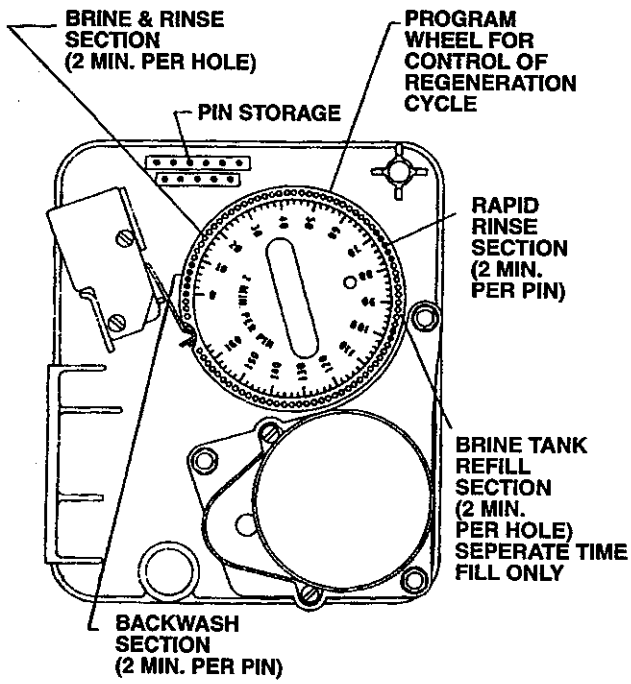


Figure 2

How To Calculate Regeneration Frequency

Note : The quantity of both nitrate and sulfate must be known for proper regeneration calculation.

$$\frac{NO_3 \text{ (Nitrate)}}{NO_3 \text{ (Nitrate)} - SO_4 \text{ (Sulfate}} = \text{Ratio}$$

Step 1 Nitrate = 50 mg/l
Sulfate = 75 mg/l
Salt Setting = 12 lbs. / cu. ft.

$$\frac{50}{50 + 75} = \frac{50}{125} = .40 \text{ Ratio}$$

Step 2

Fig. 3 OPERATING CAPACITY VS. $\frac{NO_3^-}{NO_3^- + SO_4^=}$ RATIO

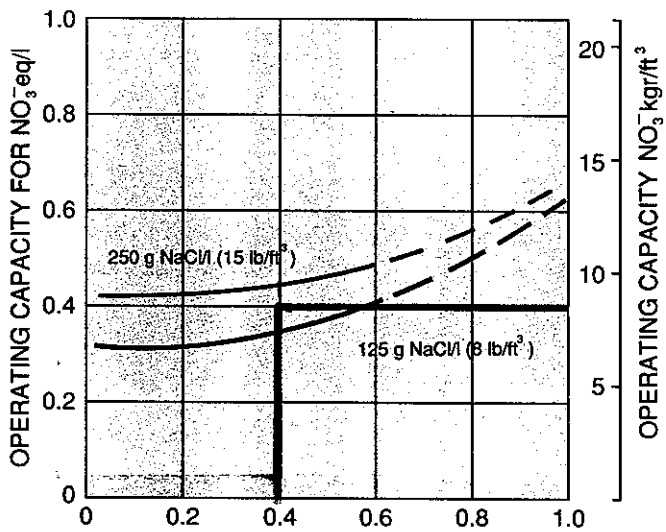


Figure 3

Step 3 Operating Capacity = 9,500 grains / cu. ft. media (Refer to Figure 3.)
MN25-25 = 2.5 cu. ft. x 9,500 grains
= 23,750 grains capacity

Step 4 50 mg/l (nitrate) ÷ 17.1 = 2.92 grains

Step 5 23,750 grain capacity ÷ 2.892 grains (NO_3) = 8,133 gallons between regeneration

In this example, the meter program wheel would be set for the maximum setting of 2,125 gallons. A one (1) day reserve should be calculated and subtracted from the total gallons between regeneration.

(# people in family x 75 gallons per day = one day reserve)

This will provide adequate capacity in the event the meter zeros out before 2:00 a.m.

Step 8 Locate the program wheel just to the lower right of the manual regeneration knob. (See Figure 1.)

Step 9 Rotate program wheel until the white dot located on the outermost gear is aligned with the capacity (gallons) arrow on the timer. (See Figure 1.)

Step 10 Place you thumb firmly on the white dot to prevent rotation of the outer gear while setting the program wheel.

Step 11 Lift out the "center" dial and rotate it so that the capacity arrow is aligned to the gallons of water that will be used between each regeneration as shown on the gallons label located outside the "center" dial. (See Figure 1.)

- Setting The Time Of Day -

1. Depress the red button on lower left side of valve timer door. (See Figure 1.)
2. Rotate the 24 hour gear on the manual regeneration knob until the time of day aligns with time of day arrow. (Note a.m. and p.m.)
3. Check that red button has engaged in the 24 hour gear.
4. The starting time of regeneration is factory pre-set to occur at 2:00 a.m.

Note : If a different regeneration time is desired, adjust time plate per instructions on page 5 of the 2510 Service Manual.

Start Up

- Disinfection -

The materials used in the construction of the nitrate filter will not support the growth of bacteria. However, the conditions existing during shipment, storage and installation are unknown and thus dictates the disinfecting of filter after installation, before it is used to treat potable water. With this in mind, your newly installed water filter should be disinfected using the recommended procedure described in this section. Ordinary chlorine laundry bleach is an excellent disinfecting agent for this purpose. The proper dosage for your particular filter model is listed below.

Unit Capacity	Cubic Feet of Resin	Chlorine Dosage
MN15-25	1.5	1.8 ounces
MN25-25	2.5	3.0 ounces

1. Measure the proper amount of chlorine bleach as shown above.
2. Pour the chlorine directly into brine well located inside brine tank.
3. Replace brine well cap.

- Filling The Brine Tank With Salt -

To expect a high level of performance and reliability, a salt manufactured specifically for water softeners must be used. Salt of this grade is virtually free of dirt and other particulates that would eventually cause the filter to malfunction. A pellet type salt is recommended although any high quality water softener salt (such as solar salt) will suffice. The salt level will decrease after each regeneration cycle. Consequently, the salt compartment will need to be checked and replenished periodically.

1. Fill the brine tank or salt compartment with water softener salt as described above. This will be approximately 250 lbs. of salt.

Warning : Do not fill salt above level of the brine well.

2. Replace brine tank lid.
3. Start manual regeneration by rotating manual regeneration knob one (1) or two (2) "clicks".
4. Replace control valve cover.

Operation, Care and Cleaning

When the inlet / outlet knobs on the bypass valve are in the **SERVICE** position (position of bypass knobs are parallel to the inlet / outlet piping), water is directed through the nitrate filter. Water may be bypassed by turning the inlet / outlet knobs to the bypass position (position of bypass knobs are at right angles to inlet / outlet piping). Water to the home will bypass the filter and be ***untreated***.

You should manually bypass the filter if :

1. The outside lines do not bypass the nitrate filter and water is to used for lawn sprinkling or other similar uses.
2. Servicing the nitrate filter.
3. A water leak from the nitrate filter is evident.
4. ***Shock treating*** water well and piping with chlorine or other disinfectant.

- General Care and Cleaning -

1. Do not place heavy or sharp objects on nitrate filer.
2. Use only mild soap and warm water to clean exterior of the unit. Never use harsh, abrasive cleaners.
3. Protect the nitrate filter and drain line from freezing.
4. Reset the time of day on the control valve after any interruption of the electrical power occurs in order to keep the unit on the proper regeneration schedule. Also, reset time for daylight saving time periods.
5. Inspect and clean the brine tank when sediment appears in the bottom of the salt compartment.
6. Always keep the brine tank supplied with good quality salt, a type designed for use in water softeners.

- Final Check -

1. Be certain the bypass valve is in the **SERVICE** position.
2. Make sure the electric cord is connected to an uninterrupted 115 volt outlet.
3. Check that the time of day is set.
4. Double check regeneration schedule.
5. Make final check for leaks!
6. Fill out and mail warranty card.
7. Leave this manual with the unit.

How To Set The Regeneration Cycle Program :

The regeneration cycle program on your water conditioner has been factory preset, however, portions of the cycle or program may be lengthened or shortened in time to suit local conditions.

To expose cycle program wheel, grasp timer in upper left hand corner and pull, releasing snap retainer and swinging timer to the right.

To change the regeneration cycle program, the program wheel must be removed. Grasp program wheel and squeeze protruding lugs towards center, lift program wheel off timer. (Switch arms may require movement to facilitate removal.)

How To Change The Length Of The Backwash Time :

The program wheel as shown in the drawing is in the service position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time your unit will backwash.

For example : If there are six pins in this section, the time of backwash will be 12 minutes (2 minutes per pin). To change the length of backwash time, add or remove pins as required. The number of pins times two equals the backwash time in minutes. (Note : DO not add pins before "0" minutes designation.)

How To Change The Length Of Brine & Rinse Time :

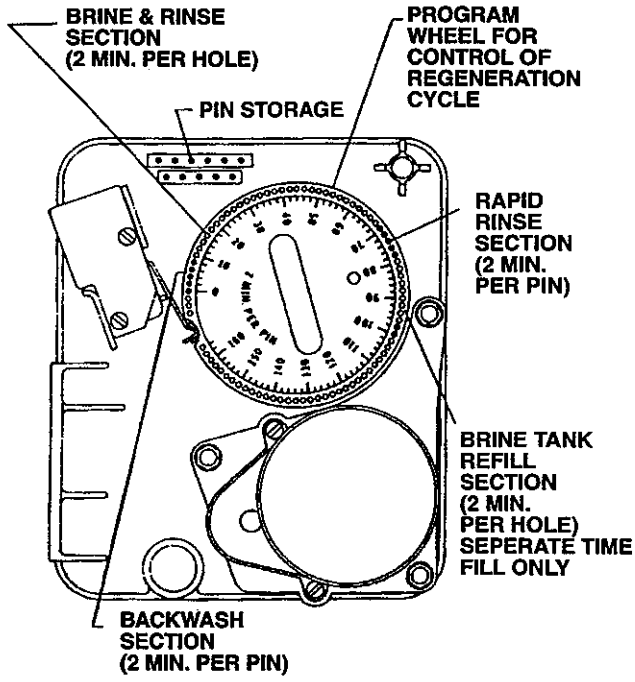
The group of holes between the last pin in the backwash section and the second group to give more or fewer holes in the length of time that your unit will brine and rinse. (2 minutes per hole.)

To change the length of brine and rinse time, move the rapid rinse group of pines to give more or fewer holes int he brine and rinse section. Number of holes times two equals brine and rinse time in minutes.

How To Change The Length Of Rapid Rinse :

The second group of pins on the program wheel determines the length of time that your water conditioner will rapid rinse. (2 minutes per pin.)

To change the length of rapid rinse time, add or remove pins at the higher numbered end of this section as required. The number of pins times two equals the rapid rinse time in minutes.



How To Change The Length Of Brine Tank Refill Time :

The second group of holes on the program wheel determines the length of time that your water conditioner will refill the brine tank. (2 minutes per hole.)

To change the length of refill time, move the two pins at the end of the second group of holes as required.

The regeneration cycle is complete when the outer microswitch is tripped by the two pin set at end of the brine tank refill section. The program wheel, however, will continue to rotate until the inner microswitch drops into the notch on the program wheel.

Return timer to closed position engaging snap retainer in back plate. Make certain all electrical wires are located above snap retainer post.