Owners Manual

For Water Softener/Conditioner Systems
Krystal Pure™ : KS10 | KS15HE | KS64HE

Includes: Specifications, Installation and Service Instructions,
and Trouble Shooting Guidelines

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INTRODUCTION

Congratulations! You have purchased one of the highest-quality water softener/conditioner systems available today. Your new water softener/conditioner is very efficient in its salt and water usage. The system is completely automatic and will contribute to better and longer service of all your water-using appliances. There is very little maintenance required for a water softener/conditioner, and it can give you many years of trouble-free use. This system has been engineered with the finest-quality components and materials. You'll soon be enjoying better water quality and the personal benefits that come from soft/conditioned water use.

IMPORTANT: ONLY USE ON POTABLE WATER SUPPLIES
Special pre-treatment may be required for well water applications.
Read entire manual before attempting installation or routine service.
Obtain all materials and tools needed for installation before starting.
System and installation must be in compliance with state and local laws and regulation.

Benefits of Soft/Conditioned Water

1. Save up to 30% of the cost of hot water heating.
2. Reduce dishwashing detergent use up to 75%. See dishwasher owner's manual for proper amount of soap at "0" softness.
3. Reduce use of all soaps and cleaning products up to 75%. You may be able to use less shampoo, conditioners and skin lotions.
4. Reduce laundry soap use up to 75%. Typically, a one-quarter cup to one-half cup of standard laundry detergent is recommended.
5. Reduced cleaning time and effort. Many people report that their cleaning time is cut in half.
6. The silky-smooth feeling you may experience while rinsing the soap off your skin during a shower is your natural body oils. Soap actually rinses off much faster with soft/conditioned water, but you may not feel like the soap is rinsed off because of this slick feeling. You will find that if you shower in hard water again, it will feel sticky and unclean. Enjoy the fresh, new showering experience; and remember, you don't need as much soap now!
7. There are many other benefits of soft/conditioned water that you can now start to enjoy. Studies have indicated that savings from a softener/conditioner can easily range from $10.00 to $30.00 per month. Start to experience the benefits of soft/conditioned water now! We hope you enjoy!

Warnings

1. **Do not let unit freeze** or place unit where unit, connections, or drain lines will ever be subject to room temperatures under 40° F, or over 140° F. Warm valve to room temperature before putting into operation.
2. Hook up to cold water supply only.
3. Check existing plumbing and repair prior to install of water softener.
4. Improper installation may void warranty. Read manual completely before installation and mail in warranty card.
5. Do not lay unit down on its side, or drop, or set on sharp protrusions.
6. Avoid setting unit in direct sunlight or outside, if possible.
7. Do not use soft water on your outside faucets for watering or sprinkling.
8. Check with your evaporative cooler company to see what it recommends about soft water use in your coolers.
9. Check with your pool company to see what it recommends about soft water use in your pool.
10. Never let your water softener run out of salt. May void your warranty.
11. If sand particles are present in water supply to be softened, a pre-filter will be required.
12. If certain types of iron are present in the water supply, proper pre-treatment will be required.
13. Do not solder joints within 6" of bypass or drain line fitting.
14. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

SPECIFICATIONS AND LIMITATIONS
KS10 - KS15HE - KS64HE

Total Grain Capacity: KS10 42K grain 1.31 cu. ft. of cation exchange resin Efficiency*	25,900 @ 6.2 lbs. of salt (using white injector) 36,200 @ 12.5 lbs. of salt 41,000 @ 17.5 lbs. of salt 4140 grains/lb of salt @ 6.2 lbs. of salt
Total Grain Capacity: KS15HE 50K grain 1.56 cu. ft. of cation exchange resin Efficiency*	26,200 @ 5.2 lbs. of salt (using h injector) 38,900 @ 9.4 lbs. of salt 47,300 @ 14.1 lbs. of salt 5030 grains/lb of salt @ 5.2 lbs. of salt
Total Grain Capacity: KS64HE 64K grain 2.0 cu. ft. of cation exchange resin Efficiency*	33,800 @ 6.7 lbs. of salt (using h injector) 50,200 @ 12.0 lbs. of salt 61,200 @ 18.1 lbs. of salt 5070 grains/lb of salt @ 6.7 lbs. of salt
Maximum Water Hardness	24-60 Grains Per Gallon
Maximum Ferrous Iron ("clearwater iron" only)**	1-10 PPMS**
Minimum Ph	7
Regeneration Time	Approximately 80 – 120 Minutes
Maximum flow rate to drain during regeneration: KS10 KS15HE KS64HE	 2.2 GPM 2.7 GPM
Water Pressure	40 Min. –100 Max. PSI 85 psi day time pressure
Service Flow Rates: KS10 KS15HE KS64HE	8.8 gpm @ 15 psi pressure drop 12.8 gpm @ 15 psi pressure drop 14.3 gpm @ 15 psi pressure drop
Water Pressure Drop at 5 GPM	.6-1.0 PSIG
Temperature	Air : 40° to 140° F Water : 40° to 110°F
Source-Select, Bypass Valve Size	3/4" or 1"
Drain Line Size	1/2" (under 20' run and lower than 10' vertical at 60 PSI) 3/4" (over 20' run or over 10' high, or over 7GPM backwash rates)
Electrical Requirements***	Continuous 110 Volt, 60 Cycles/12volt/24volt***
System Dimensions: Media Tank With Valve: KS10 KS15HE KS64HE Brine Tank: KS10, KS15HE KS64HE	 9" dia. X 56" high 10" dia. X 62" high 12" dia. X 60" high 11" square X 34" high 14" square X 34" high
Salt/Potassium Storage Capacity (salt recommended: 99.99% pure pellets for maximum performance)	11" square X 34" high - 150 lbs. 14" square X 34" high - 225 lbs.
Approximate Shipping Weight (with no salt)	100-160 lbs.

* Efficiency based at stated factory set salt dosage only.

**Iron can be in several forms, pretreatment will be necessary if certain types of iron are encountered.

***Continuous means to a 110 outlet that has continuous voltage not able to be turned off be a light switch.

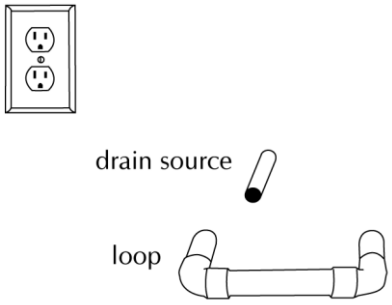
These systems are efficiency rated and conform to NSF/ANSI 44
for the specific performance claims as verified and substantiated by test data.
No reduction of specific contaminant claims

INSTALLATION INSPECTION

IS YOUR HOME PRE-PLUMBED?

Your home is pre-plumbed for a water softener/conditioner if you have a loop in the garage or laundry room. Typically, there will be 110 volt outlet within 6 feet of the loop and a 1/2" drain line stubbed out of the wall. If your home is pre-plumbed, skip now to Step 1 of Installation Procedures.

CAUTION: Before starting up system, check water softener drain line to insure that it will drain properly.

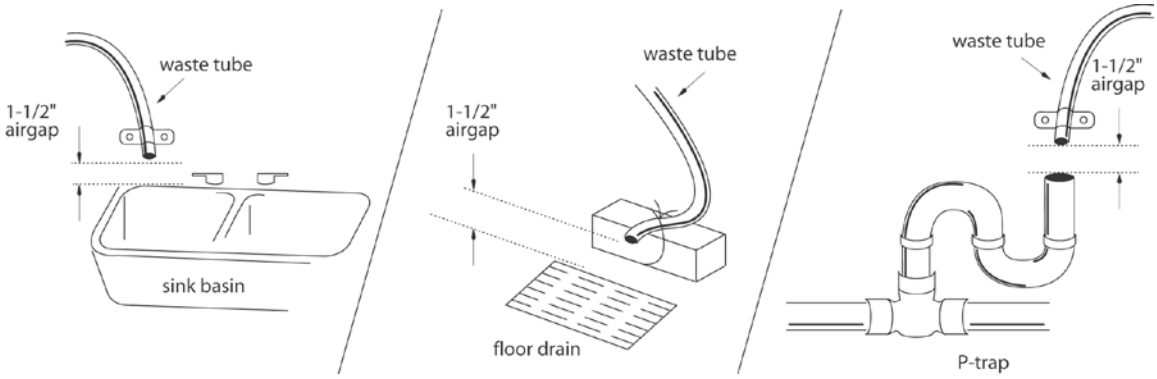


IF YOUR HOME IS NOT PRE-PLUMBED

If your home is not pre-plumbed for a water softener, then we recommend calling for professional installation. If you are attempting to install the system yourself, you must determine where to locate the water softening/conditioning system.

The best location depends on several questions:

1. How will you get the water from the water main to the water softener/conditioner?
2. Where will you run the drain line/waste tube? (see illustration on page 5)



3. Where is a 110V outlet within 6 feet of the softener?
   Optional: Run a longer wire to most any 110V outlet.
4. Do you need to run a hard-water line to your outside hose bibs, pool fillers or irrigation system?
5. Where can the water softener sit on a firm, fairly level concrete floor or slab?

Determine the location of your water softener/conditioner, taking into account the above factors, and determine what materials and tools will be needed for installation. You are now ready to move on to Step 1 of the installation procedures.

INSTALLATION PROCEDURES

WARNING: <u>Do not attempt to remove the red locking bar</u> (KS5 & KS10 only). The locking bar is for service only and should only be removed by a trained softener technician.

NOTE: The Air-Check sight glass will **<u>NOT</u>** have a **rubber ball** in it. The air-check on Krystal Pure™ softeners is located in the brine well in the brine tank.

STEP 1 – CONNECT TO WATER SUPPLY

A. Shut off the main water supply to the house. Open the hose bib to relieve pressure and drain out water. Close the hose bib. Place a bucket or the softener brine tank under the softener loop to catch the excess water that will spill out when you cut the pipe. Cut the plumbing loop off. Determine the inlet side of the loop by turning the main water on very slightly until water comes out of one of the sides of the loop. This is the inlet supply. **<u>Warning: You must connect the incoming side of the softener/conditioner to the inlet supply from the loop</u>.** Failure to connect with the proper directional flow can damage the water softener/conditioner and your household plumbing.

B. Prepare Source-Select bypass valve or yoke for piping connections.

1. KS10 Source-Select bypass valve connection:

a. Apply O-rings (3-required and included) to tank meter adapter. Lubricate with silicone (provided).
b. Slip bypass valve into position over O-rings.
c. Connect bypass valve to meter adapter using (4) nuts and bolts (provided).
d. Install drain hose barb. Use Teflon tape on threads. Hose barb can point up or down.
e. Insert tailpieces through union nuts.
f. Attach tailpieces by soldering to the inlet and outlet of the plumbing loop.
g. **Place rubber gaskets into the union nuts and thread onto the bypass valve body.** It is not necessary to use lubricant or sealant on rubber gasket or union nuts.
h. Place Source-Select valve into the bypass position by rotating the handles so they are both perpendicular to the flow path of the inlet and outlet water stream.

2. KS15HE and KS64HE (High-Flow) Source-Select bypass valve connection:

a. Install drain hose barb before attaching Source-Select bypass valve. Use Teflon tape on threads.
b. **Insert the rubber gaskets into the union nuts on the Source-Select bypass valve.**
c. Thread the bypass onto the valve control body, hand-tightening both union nuts. It is not necessary to use lubricant or sealant on rubber gasket or union nuts.
d. Insert tailpieces through union nuts.
e. Attach tailpieces by soldering to the inlet and outlet of the plumbing loop.
f. **Place rubber gaskets into the union nuts and thread onto the bypass valve body.** It is not necessary to use lubricant or sealant on rubber gasket or union nuts.
g. Place Source-Select valve into the bypass position by rotating the handles so they are both perpendicular to the flow path of the inlet and outlet water stream.

STEP 2 – CONNECT TO DRAIN

Typical drain line runs to a floor drain, washing machine drain, sanitary sewer line with a p-trap, a sink drain or a sump. **CAUTION: Check with all local plumbing codes to insure proper installation in your area. An air-gap may be required. Be sure to install proper drain line size (see specifications or step 2B for sizing).**

A. Slide a ½" I.D. tube onto hose barb located on the back of the valve control body, (you may want to secure tube with a hose clamp, (not provided)). Connect the tubing to the drain stub out provided with your pre-plumb loop. Some pre-plumbs may provide an ABS drainpipe to run drain line to. **CAUTION: Be sure drain line discharges properly into a drain to prevent flooding.**

B. If the following conditions exist, it is recommended to increase the drain line tubing from ½" to ¾" I.D.
   1. Drain line run is over 20'.
   2. Drain line vertical run is over 10 feet high with incoming water supply pressure of 60 psi. (You can increase or decrease height of run 2 feet per 10 psi. variations in either direction, i.e. 12 feet vertical run with 70 psi. or 8 feet vertical run with 50 psi.).
   3. Backwash rates exceed 5 gpm (see specifications sheet).

STEP 3 – CONNECT BRINE LINE

A. Connect the 3/8" black brine line to the valve control using the fitting provided. The connection on the KS15HE is located on the right side of the valve just at the bottom and behind the control. The connection on the KS5 and KS10 is located on the clear plastic site glass. Connect the other end of the 3/8" black line to the fitting on top of the brine float located at the top of the brine well inside the brine tank. The lid of the brine well can be removed by pulling it up. Be sure all fittings and connections are tight. See page 28.

STEP 4 – START UP THE SYSTEM

KS10 start up:

Note: The following steps will require turning the indicator knob (figure 1) to various positions. Push the indicator knob in while manually rotating the camshaft by, located behind the controller, by hand **(COUNTERCLOCKWISE)** until indicator knob points to the desired position.

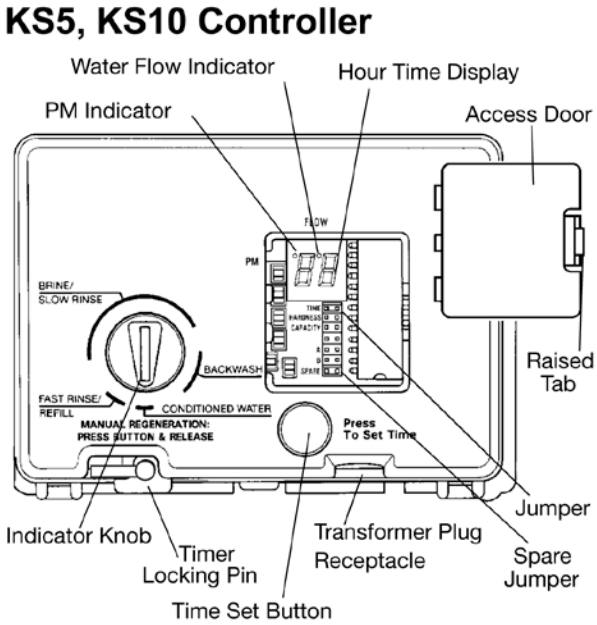


figure 1

1. Remove valve cover by releasing the plastic clip from the back and lifting the cover up and forward.
2. Rotate indicator knob to the **BACKWASH** position **(COUNTERCLOCKWISE).**
3. Fill the softener/conditioner tank with water.
   a. With house water supply off, open the Source Select bypass valve.
   b. Open water supply valve **very slowly** to approximately ¼ open position.
4. When all of the air has been purged from the tank (water begins to flow steadily from the drain), open the main water supply all the way. Allow water to run to drain until clear.
5. Turn off water supply and let the unit stand for about five minutes to allow all trapped air to escape from the tank.
6. Add the initial amount of water to the brine tank manually with a bucket or a hose. Add approximately 4 gallons of water to the brine tank.
7. Slowly turn the water supply valve completely open. Place the conditioner into operation by turning the indicator knob **COUNTERCLOCKWISE** to the **BRINE/SLOW RINSE** position.
8. With conditioner in this position, observe the water level in the brine tank for several minutes to check that the level is going down. If water level does not recede, then make sure the brine line fittings are tight and no air can leak into connections.

9. Advance the indicator knob to the **FAST RINSE/REFILL** position. Let conditioner run in this position for a minute or so.
10. Advance the indicator knob to just past the **FAST RINSE/REFILL** position but **NOT** all the way to the **CONDITIONED WATER** position. Run water from a nearby faucet until the water is clear. Proceed to **STEP 5-CONNECT ELECTRICAL**.

KS15HE and KS64HE Start up:

Note: The following steps will require turning the cycle indicator (figure 2) to various positions. Manually rotate the camshaft, located behind the controller, by hand **(COUNTERCLOCKWISE)** only until cycle indicator points to the desired position

1. Remove valve cover by depressing the two tabs on the sides of the cover and lifting the front of the cover up and off.
2. Rotate cycle indicator **(COUNTERCLOCKWISE)** to the **BACKWASH** position.
3. Fill the softener/conditioner tank with water.
   c. With house water supply off, open the Source Select bypass valve.
   d. Open water supply valve **very slowly** to approximately ¼ open position.
4. When all of the air has been purged from the tank (water begins to flow steadily from the drain), open the main water supply all the way. Allow water to run to drain until clear.
5. Turn off water supply and let the unit stand for about five minutes to allow all trapped air to escape from the tank.
6. Add the initial amount of water to the brine tank manually with a bucket or a hose. Add approximately 3 gallons of water to the brine tank.
7. Slowly turn the water supply valve completely open. Place the conditioner into operation by slowly turning the cycle indicator **COUNTER-CLOCKWISE** to the **BRINE/SLOW RINSE** position.
8. With conditioner in this position, observe the water level in the brine tank for several minutes to check that the level is going down. If water level does not recede, then make sure the brine line fittings are tight and no air can leak into the fitting connections.
9. Advance the cycle indicator to the **FAST RINSE** position. Let conditioner run in this position for a minute or so.
10. Advance the cycle indicator to the **REFILL** position. Hold this position until water starts to flow through the brine line into the brine tank.
11. Advance the cycle indicator **COUNTERCLOCKWISE** to the **REGENERATION COMPLETE** position and run water from a nearby faucet until the water is clear. Proceed to **STEP 5-CONNECT ELECTRICAL**.

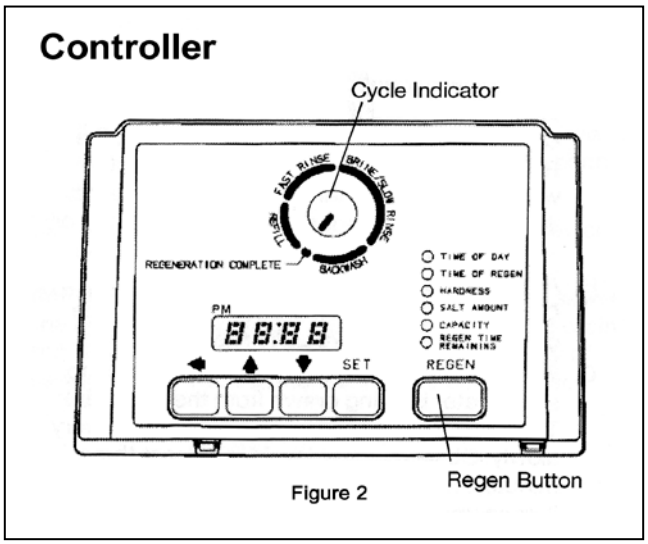


Figure 2

STEP 5 – CONNECT ELECTRICAL

1. Plug transformer into a 110 VAC outlet that is **NOT** controlled by a wall switch. Connect the plug of the transformer into the Transformer Plug Receptacle located at the bottom of the control housing (see figure 1).

STEP 6 – PROGRAM THE VALVE CONTROL

KS10 programming:

1. **Time of Day Setting**
   Open the access door to access the jumper settings. The jumper should be on the **TIME** jumper. Set the time of day to the nearest hour by pressing the black **TIME SET** button. PM hours are indicated by a light next to the letters PM on the display window.

   Note: The unit is factory-set to regenerate at 2:00a.m. If you prefer to have the unit regenerate at an earlier or later time, simply set the current time of day accordingly (e.g., to have the unit regenerate at 4:00a.m. – two hours later - set the clock two hours earlier than the actual time of day. If it is actually 2:00 p.m., set the time to 12:00 p.m.).
   Note: Make sure the Timer Locking Pin is always in the horizontal position during operation.

2. **Hardness Setting**
   Move the jumper to the pins next to the word **HARDNESS.** Press the black **TIME SET** button until the hardness of the incoming water supply is displayed. **Note:** The factory default is **18 GPG (Grains Per Gallon**). It is a good idea to set your hardness a few grains higher than your actual hardness because hardness can vary throughout the year. Check with your local water supply company or municipality to find out the hardness in your area.

3. **Capacity Setting**
   It is NOT necessary to change the capacity setting on your softener/conditioner. It is set at the factory and determined by the size of the system and the amount of salt used to regenerate the media bed.

   Note: The factory has set the conditioner for the proper **Capacity Setting** based upon the amount of Salt used to regenerate the media bed. The settings are designed for optimum efficiencies and do not need to be changed.

   Note: If Potassium is used to regenerate the conditioner. It is recommended to increase the salt dosage by 3 more pounds. Also, keep the level of potassium low in the brine tank to prevent bridging. To adjust the salt dosage, locate the salt dosage setting on the right side of the valve control, insert a small screwdriver into the white indicator knob and move pointer to proper salt setting.

   Note: Put the jumper back on the **TIME** pins. **The jumper must not be left on any pins other than the top pins next to the word TIME.**

4. **Calendar Override (Optional)**
   The factory setting is 15 days. If you would like a different calendar override or none at all, follow the steps below.
   a. Disconnect power.
   b. Place jumper on Pin A and reconnect power.
   c. Move jumper to Pin B.
   d. Press the **TIME SET** button and hold down. The numbers will scroll from 0 to 15 days. Release the button when number of days desired for the calendar override appears.
   e. Disconnect power.
   f. Place jumper back on **TIME** pins and reconnect power.

5. **Manual Regeneration/ Extra Cycle**
   In the case of power failure, the control can be **manually regenerated**. Depress the indicator knob and turn the camshaft to the proper cycle. The following cycle times should be used for proper regeneration:
   BACKWASH – 14 minutes.
   BRINE/SLOW RINSE – 52 minutes.
   FAST RINSE/ REFILL – 10 minutes.
   Return indicator knob to the **CONDITIONED WATER** position.
   For an **Extra Cycle**, simply push in the indicator knob. It will take a few minutes for regeneration to start. A normal regeneration will take approximately two hours.

KS15HE and KS64HE Programming:

1. **Time of Day Setting**
   Press the **SET** button. The display will show the Time of Day with the minutes digit blinking. The number that is flashing is the number you can change. If you want to change this number, press the up arrow button to increase the number or the down arrow button to decrease the number. To accept the number, press the left arrow button to move to the next number. Continue changing numbers until you have set the current time of day. Press the **SET** button to enter the value.

2. **Time of Regeneration Setting**
   The next value displayed is the Time of Regeneration. It is set at the factory for 2:00 a.m. If this is not acceptable, press the **SET** button and change the time setting the same way the Time of Day was set. Press the **SET** button to enter the time.

3. **Hardness Setting**
   The next setting is the amount of water hardness in the incoming water supply expressed in grains per gallon. The factory default value is set at 18. Check with your local water supplier for the actual level of hardness for your area. It is recommended to add 3 to the actual value due to varying levels of water hardness throughout the year. Press the **SET** button to change the number. Press the **SET** button again to enter the value.

4. **Salt Amount and Capacity Setting**
   It is NOT necessary to change the salt amount or capacity setting on your softener/conditioner. It is set at the factory and determined by the size of the system and the amount of salt used to regenerate the media bed. The method for changing the settings is the same as for the previous settings.

   Note: The factory has set the conditioner for the proper **Capacity Setting** based upon the amount of **Salt** used to regenerate the media bed. The settings are designed for optimum efficiencies and do not need to be changed.

   Note: If Potassium is used to regenerate the conditioner. It is recommended to increase the salt dosage by 3 more pounds. Also, keep the level of potassium low in the brine tank to prevent bridging.

5. **Manual Regeneration/ Extra Cycle**
   In the case of power failure, the control can be **manually regenerated**. Remove the cover and turn the camshaft by hand **COUNTERCLOCKWISE** to each position according to the cycle indicator. The following cycle times should be used for proper regeneration:
   BACKWASH – 4 minutes.
   BRINE/SLOW RINSE – 50 minutes.
   FAST RINSE/ REFILL – 3 minutes.
   Return cycle indicator to the **REGENERATION COMPLETE** position.
   For an **Extra Cycle**, simply push in the **REGEN** button. This button is located on the front of the control. It will take a few minutes for regeneration to start. A normal regeneration will take approximately two hours.

Factory Default Settings

The **KS5**, **KS10**, and **KS15HE** default settings are as follows:

Model	Hardness (grains/gallon)	Capacity (kilo grains)	Salt (pounds)	Calendar Override (days)
KS10	18	26	6.2	15
KS15HE	18	26.2	5.2 (using h injector)	15
KS64HE	18	43	9.0 (using h injector)	15

USE AND CARE

A. Type of System

Your water softener is a fully automatic **Demand Initiated**, metered system. This means the softener meters, or keeps track of, the water used in the home. It uses this information to determine when to perform the regeneration, or cleaning cycle. The control of the softening process automatically adjusts to your water use. For example, if you have company and your water use increases substantially, the softener will adjust to insure you don't run out of soft water. If you go away for a time and are not using any water in the home, the softener will adjust again and not perform a regeneration cycle thereby saving salt and water.

B. Type of Salt

Basically, salt is salt. However, some makes of salt contain more dirt in the bag than others. We recommend Morton™ or Diamond Crystal™ salt pellets, but any type will work. Salt is readily available at Lowes.

C. Type of Potassium

Potassium can also be used in the water softener. When Potassium is used however, the softener control valve will need to be adjusted. Add 3 lbs to the salt amount setting i.e. salt amount = 6 lbs, add 3 to salt amount for potassium, salt amount = 9 lbs. See programming section for your system for instructions on changing the salt amount. Also keep the level of potassium in the brine tank low.

D. Amount of Salt or Potassium

We recommend keeping the level of salt in the brine tank about half full for most households. Larger households can start out with more. Let the salt level drop down to the water level before adding more salt. Potassium should be kept as close to the water level as is practical to help prevent a "salt bridge". Periodically you may experience a salt bridge. A salt bridge occurs when the salt forms a crust right at the water level in the brine tank. The salt remains suspended above the water and cannot make the brine solution required for the regeneration of the softener bed. If you do experience a salt bridge, simply tap a broom handle down in the salt to break up the bridge. Wait at least 1 hour, and then manually regenerate the softener.

E. Cleaning the Brine Tank

Normally it is not necessary to clean the brine tank. In time dirt and silt can build up in the brine tank and if you choose you can clean it out. Let the salt level drop down very low. The night before you clean, manually regenerate the softener. Disconnect the brine line and dump out the old salt, **(Do not dump the old salt anywhere near living plants).** Reconnect the brine line, add about (3) gallons of water, and add the new salt.

F. Changing the Control Valve Settings

It is not necessary to change the control valve settings other than the ones described in step (6). Over the course of several months it is possible the display will not show the correct time of day due to power fluctuations. Reset the control to the correct time of day. If your feed water hardness changes, reset the control to the new hardness. Other settings are programmed at the factory for optimum efficiency and do not need to be changed.

G. Sodium and Potassium in Softened Water

The softening process does add some sodium or potassium to the conditioned water. The following chart shows approximately how much sodium or potassium is added to one quart of conditioned water based on the amount of feed water hardness.

Sodium added to water from cation exchange softening		
Initial feed water hardness	Sodium added by softening	Potassium added by softening
Grains per Gallon	Milligrams Na+/qt.	Milligrams K+/qt.
5	37	62.9
10	75	127.5
15	112	190.4
20	150	255
30	225	382.5

For comparison, (2) slices of white bread contain approximately 278 milligrams of sodium and (2) cups of milk contain approximately 226 milligrams of sodium. One large banana contains approximately 600 milligrams of potassium.

H. Bypassing the Softener

You may need to bypass the softener for service or if you do not want your household water to pass through the softener. See the diagram in step (1) for instructions on bypassing the softener. The instructions are also shown on top of the bypass valve. **Make sure you depressurize the system before performing any service or removing the softener.** See the "WARNING" in the troubleshooting section below.

I. Vacations or extended periods of non-use

It is not necessary to shut down the softener for periods of non-use equal to two-week to one-month vacations. If however, you are a temporary resident and leave for periods of four to six months, we recommend you shut the softener down. Put the softener in bypass and unplug it. When you return you will need to start the softener up. Make sure there are approximately (3) gallons of water in the brine tank, plug the softener in, and manually regenerate the softener.

J. Disinfection of the Water Softener

The materials of construction of the modern water conditioner will not support bacterial growth, nor will these materials contaminate a water supply. However, during normal use, a conditioner may become fouled with organic matter, or in some cases with bacteria from the feed water supply. This may result in an off-taste or odor in the water.

Therefore, your conditioner may need to be disinfected after installation. Some conditioners will require periodic disinfection during their normal life. Consult your installing dealer for more information on disinfecting your conditioner.

Depending upon the conditions of use, the style of conditioner, the type of ion exchanger, and the disinfectant available, a choice can be made among the following methods.

Sodium or Calcium Hypochlorite

These materials are satisfactory for use with the polystyrene resin in your water softener.

5.25% Sodium Hypochlorite

These solutions are available under trade manes such as Clorox™. If stronger solutions are used, such as those sold for commercial laundries, adjust the dosage accordingly.

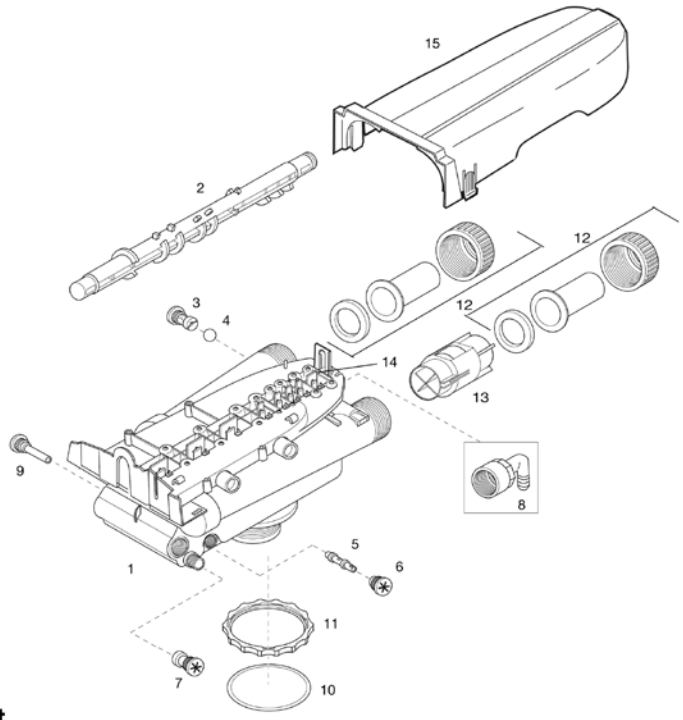
1. Dosage
   - KS10 — 1.8 fluid ounce
   - KS15HE — 2.4 fluid ounce
   - KS64HE — 3.0 fluid ounce
2. Application
   a. Manually put the water softener into regeneration.
   b. Let the softener proceed through the first cycle, about (10) minutes.
   c. Add the sodium hypochlorite solution to the brine well inside the brine tank.
   d. Let the softener proceed with the regeneration process.

Calcium Hypochlorite

Calcium hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials may be used directly without dissolving before use.

1. Dosage
   - KS10 — 3 grains (approximately 0.15 ounce)
   - KS15HE — 4 grains (approximately 0.20 ounce)
   - KS64HE — 5 grains (approximately 0.25 ounce)
2. Application
   a. Manually put the water softener into regeneration.
   b. Let the softener proceed through the first cycle, about (10) minutes.
   c. Add the sodium hypochlorite solution to the brine well inside the brine tank.
   d. Let the softener proceed with the regeneration process.

KS15HE AND KS64HE VALVE AND PARTS

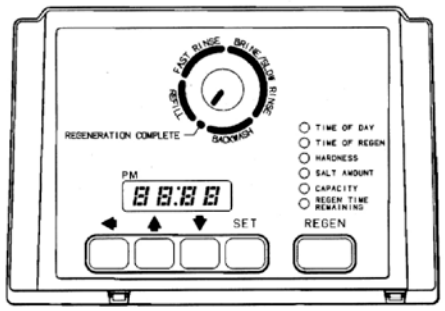


Parts List

Code	Part No.	Description	Qty.	Code	Part No.	Description	Qty.
1	1035807	Valve Assembly, w/o Flow Controls	1	11	1035622	Tank Ring	1
2	1035615	960 Standard Camshaft:	1	12		Plumbing Adapter Kits:	1
3		Drain Control Assembly:	1		1001606	3/4-inch Copper Tube Adapter Kit	
	1000209	No. 7 (1.2 gpm; 4.5 Lpm)			1001670	1-inch Copper Tube Adapter Kit	
	1000210	No. 8 (1.6 gpm; 6.1 Lpm)			1041210	1-1/4-inch Copper Tube Adapter Kit	
	1000211	No. 9 (2.0 gpm; 7.6 Lpm)			1001608	22-mm Copper Tube Adapter Kit	
	1000212	No. 10 (2.5 gpm; 9.5 Lpm)			1001613	3/4-inch CPVC Tube Adapter Kit	
	1000213	No. 12 (3.5 gpm; 13.2 Lpm)			1001614	1-inch CPVC Tube Adapter Kit	
	1000214	No. 13 (4.1 gpm; 15.5 Lpm)			1001615	25-mm CPVC Tube Adapter Kit	
	1000215	No. 14 (4.8 gpm; 18.2 Lpm)			1001769	3/4-inch NPT Plastic Pipe Adapter Kit	
4	1030502	Ball, Flow Control	1		1001603	1-inch NPT Plastic Pipe Adapter Kit	
5		Injector Assembly:	1		1001604	3/4-inch BSPT Plastic Pipe Adapter Kit	
	1032970	"A" Injector - White			1001605	1-inch BSPT Plastic Pipe Adapter Kit	
	1032971	"B" Injector - Blue			1001611	3/4-inch BSPT Brass Pipe Adapter Kit	
	1032972	"C" Injector - Red			1001610	1-inch NPT Brass Pipe Adapter Kit	
	1030272	"D" Injector - Green			1001612	1-inch BSPT Brass Pipe Adapter Kit	
6	1000269	Injector Cap Assembly:	1	13	1033444	Turbine Assembly	1
7		Brine Refill Control	1	14	1001580	Spring, Flapper Valve	
	1000222	.33 gpm		15	1030372	Cover	1
8	1002449	Drain Fitting Elbow (3/4" hose barbed)	1	*		Valve Disc Kit:	
9	1000226	Screen/Cap Assembly	1		1041174	Standard	
10	1010429	O-Ring	1		1041175	Severe Service	

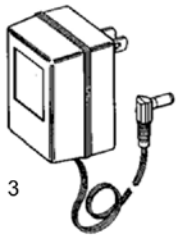
* Not Shown

KS15HE Controller



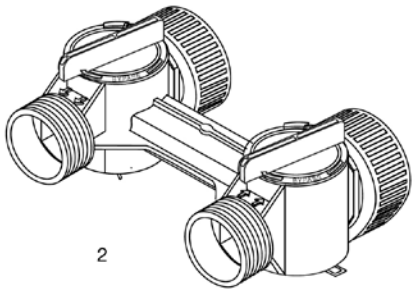
1

KS15HE Transformer



3

Source Select, Bypass Valve

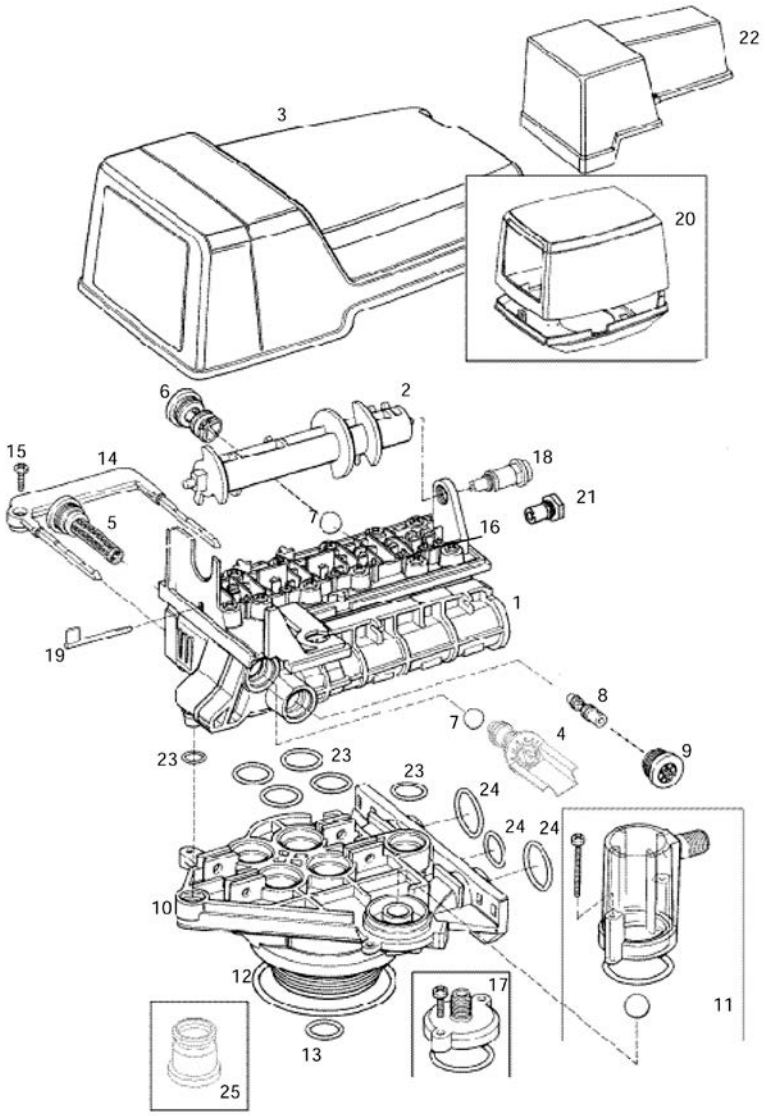


2

Code	Part No.	Description	Qty.
1		KS15HE Controller	1
2	1040930	Source Select, bypass valve	1
3	1000811	Transformer	1
*	1000907	Transformer Extension Cord 15 feet (4.6 m)	1
*	1034264	Y-Splitter (run 2 units from 1 transformer)	1
Source Select, Bypass Valve			
*	1040930	Bypass Body Assembly with Install Kit	1

* Not Shown

KS5, KS10 VALVE AND PARTS

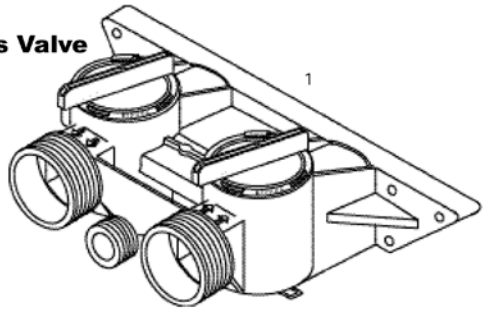


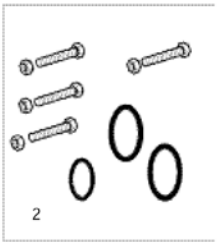
Code	Part No.	Description	Qty.
1	1000232	Valve Assembly, w/o Flow Controls	1
2	1031950	Camshaft, Standard, One-Piece	1
3	1000062	Valve Cover, Black with transparent window	1
4		Brine Refill Flow Control Assembly:	1
	1034261	1 to 10 lbs Salt	
	1034263	3 to 19 lbs Salt	
5	1000226	Screen/Cap Assembly with O-Ring	1
6		Backwash Control Assembly with O-Rings:	1
	1034162	No. 6 for 6 in Diameter Tank	
	1000209	No. 7 for 7 in Diameter Tank	
	1000210	No. 8 for 8 in Diameter Tank	
	1000211	No. 9 for 9 in Diameter Tank	
	1000212	No. 10 for 10 in Diameter Tank	
	1000213	No. 12 for 12 in Diameter Tank	
	1000214	No. 13 for 13 in Diameter Tank	
	1000215	No. 14 for 14 in Diameter Tank	
7	1030502	Ball, Flow Control	1
8		Injector Assembly with O-Rings:	1
	1032970	"A" Injector - White	
	1032971	"B" Injector - Blue	
	1032972	"C" Injector - Red	

Code	Part No.	Description	Qty.
9		Injector Cap with O-Ring:	1
	1000217	"A" Cap	
	1000218	"B" Cap	
	1000219	"C" Cap	
10	1033784	Tank Adapter Assembly	1
11	1032416	Air Check Assembly	1
12	1010429	O-Ring BN	1
13	1010428	O-Ring EP	1
14	1031402	Locking Bar: English Language	1
15	1006093	Screw, No. 8 x 9/16 inch	1
16	1001580	Spring, Valve Disc Kits:	9
17	1033066	New to Old Aircheck Adapter Kit	1
18	1000297	Extended Bearing, Camshaft	1
19	1031391	Pin, Locking, Timer, Black	1
20		Covers, High Style:	
	1041087	Beige/Tan	
	1041088	Black/White	
	1041091	Beige/Black	
21	1030501	Bearing, Camshaft for use with Cover (Code 22)	
22	1032565	Cover, L-lid	
23	1001404	O-Ring Group: Tank Adapter	
24	1040459	O-Ring Group: Piping Boss	
25	1041010	13/16-inch Riser Insert (optional)	
*	1000250	Valve Disc Replacement	

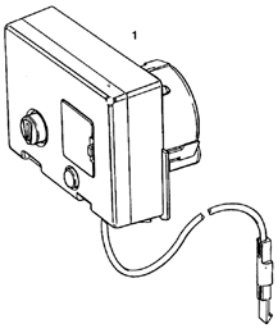
* Not shown

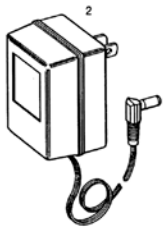
Source Select, Bypass Valve





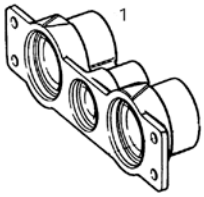
KS5,KS10 Controller

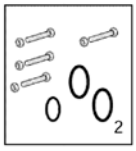




KS5, KS10 piping adapter

Note: Do not use pipe joint compound when threading pipe into the Noryl piping adapter. Use only Teflon* pipe tape. Do not overtighten pipe into Noryl piping adapter.





KS5, KS10 Controller

Code	Part No.	Description	Qty.
1		KS5, KS10 Controller	1
2		Transformer	1
	1000810	Japanese	
	1000811	North American	
	1000812	Australian	
	1000813	British	
	1000814	European	
*	1000907	Transformer Extension Cord 15 foot (4.6 m)	1

Source Select, Bypass Valve

Code	Part No.	Description	Qty.
1	1040769	Source Select, Bypass Valve	1
2	1040524	Install Kit	1
*		Tube Adapter Kits	
	1001606	3/4-inch Copper Tube Adapter Kit	
	1001670	1-inch Copper Tube Adapter Kit	
	1001608	22-mm Copper Tube Adapter Kit	
	1001609	28-mm Copper Tube Adapter Kit	
	1001613	3/4-inch CPVC Tube Adapter Kit	
	1001614	1-inch CPVC Tube Adapter Kit	
	1001615	25-mm CPVC Tube Adapter Kit	
	1001769	3/4-inch NPT Plastic Pipe Adapter Kit	
	1001603	1-inch NPT Plastic Pipe Adapter Kit	
	1001604	3/4-inch BSPT Plastic Pipe Adapter Kit	
	1001605	1-inch BSPT Plastic Pipe Adapter Kit	
	1001611	3/4-inch BSPT Brass Pipe Adapter Kit	
	1001610	1-inch NPT Brass Pipe Adapter Kit	
	1001612	1-inch BSPT Brass Pipe Adapter Kit	

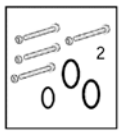
* Not Shown

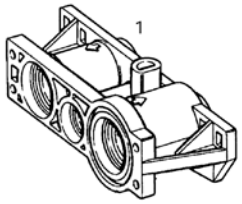
KS5, KS10 Piping adapter

Code	Part No.	Description	Qty.
1		Kit KS5, KS10 Piping adapter (Includes Hardware):	1
	1040277	3/4-inch NPT, Brass	
	1040278	1-inch NPT, Brass	
	1040281	3/4-inch BSPT, Brass	
	1040282	1-inch BSPT, Brass	
	1040279	3/4-inch NPT, Noryl	
	1040280	1-inch NPT, Noryl	
	1040283	3/4-inch BSPT, Noryl	
	1040284	1-inch BSPT, Noryl	
2	1040339	KS5, KS10 Piping adapter Install Kit	1

KS5, KS10 Adapter

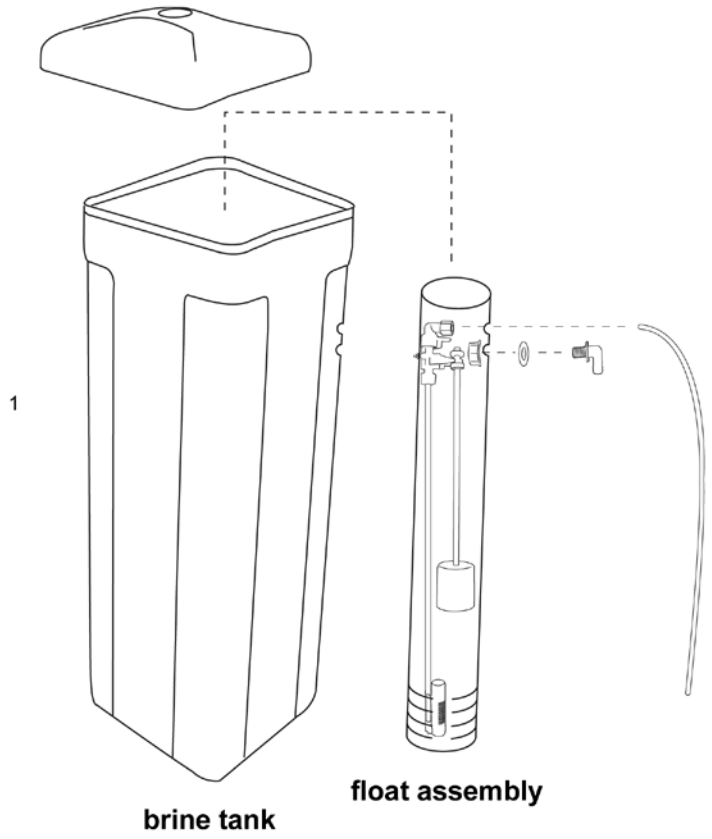
Code	Part No.	Description	Qty.
1	1032350	Kit, KS5, KS10 Adapter	1
2	1032351	KS5, KS10 Adapter Install Kit	1





*Teflon is a registered trademark of E.I. Dupont de Nemours and Company, Inc.

BRINE TANK ASSEMBLY



Code	Part No.	Description	Qty.
1	208-11112	KS5 brine tank & assembly kit (black)	1
1	208-11111	KS10, KS15HE brine tank & assembly kit (white)	1
1	208-14142	KS64HE brine tank & assembly kit	1

TROUBLESHOOTING

The technology upon which the Krystal Pure™ control valve is based is well established and proven in service over many years. However, should a problem or question arise regarding the operation of the system, the control can very easily be serviced.

WARNING: Service procedures that require the water pressure to be removed from the system are marked with an "**!**" after the possible cause. To remove water pressure from the system, put the bypass valve or three-valve bypass into the bypass position and open the backwash drain valve (the seventh valve back from the control) with a screwdriver. Restore system water pressure when the service work is completed.

Valve Troubleshooting

Problem	Possible Cause	Solution
1. Control will not draw brine.	a. Low water pressure. b. Restricted drain line. c. Injector plugged **!** d. Injector defective **!** e. Valve (2 and/or 4) not closed.	a. Set pump to maintain 30 psi at conditioner. b. Remove restriction. c. Clean injector and screen. d. Replace injector. e. Remove foreign matter from disc and check disc for closing by pushing in on stem. Replace if needed.
2. Brine tank overflow.	a. Brine valve (1) being held open. b. Uncontrolled brine refill flow rate **!** c. Valve (3 or 4) not closed during brine draw causing refill. d. Air leak in brine line.	a. Manually operate valve stem to flush away obstruction. b. Remove variable salt controller to clean. c. Flush out foreign matter by holding disc open and manually operating valve stem. d. Check all connections in brine line for leaks. Refer to instructions.
3. System using more or less salt than salt control is set for.	a. Inaccurate setting. b. Foreign matter in controller causing incorrect flow rates **!** c. Defective controller.	a. Correct setting. b. Remove variable salt controller and flush out foreign matter. Manually position control to brine draw to clean controller (after so doing, position control to "purge" to remove brine from tank). c. Replace controller.
4. Intermittent or irregular brine draw.	a. Low water pressure. b. Defective injector **!**	a. Set pump to maintain 30 psi at softener/conditioner. b. Replace both injector and injector cap.
5. No soft/conditioned water after regeneration.	a. Unit did not regenerate. b. No salt in brine tank. c. Plugged injector **!**	a. Check for power. b. Add salt. c. Clean injector. Flush with water.
6. Control backwashes at excessively low or high rate.	a. Incorrect backwash controller used. b. Foreign matter affecting controller operation!	a. Replace with correct size controller. b. Remove controller and ball. Flush with water.
7. Flowing or dripping water at drain or brine line after regeneration.	a. Drain valve (5 or 6) or brine valve (1) held open by foreign matter or particle. b. Valve stem return spring on top plate weak.	a. Manually operate valve stem to flush away obstruction. b. Replace spring.
8. Hard water leakage during service.	a. Improper regeneration b. Leaking of bypass valve **!** c. O-ring around riser tube damaged **!**	a. Repeat regeneration making certain that the correct salt dosage is set. b. Replace O-ring. c. Replace O-ring.

KS5 and KS10 - 460i Control Troubleshooting

Problem	Possible Cause	Solution
1. Clock does not display time of day.	a. Transformer cord unplugged b. No electric power at outlet. c. Defective transformer. d. Defective circuit board.	a. Connect power b. Repair outlet or use working outlet. c. Replace transformer. d. Replace timer.
2. Clock does not display correct time of day.	a. Outlet operated by switch b. Incorrect voltage or frequency (Hz). c. Power outages.	a. Use outlet not controlled by switch. b. Replace timer with one of correct voltage and frequency (Hz). c. Reset clock.
3. Time display continues to advance.	a. Defective time set switch.	a. Replace timer.
4. Time display shows something other than time of day.	a. Electrical interference. b. Defective circuit board.	a. Disconnect power to unit. Restore power and reset time of day. b. Replace timer.
5. No water flow display when water is flowing.	a. Bypass valve in bypass. b. Meter probe disconnected or not fully connected to meter housing. c. Restricted meter turbine rotation due to foreign matter in meter. d. Defective meter probe. e. Defective circuit board.	a. Shift bypass valve to not-in-bypass position. b. Fully insert probe into meter housing. c. Remove meter housing, free up turbine and flush with clean water. Do not disassemble turbine from meter housing. Turbine should spin freely. If not, replace meter **!** d. Replace timer. e. Replace timer.
6. Control regenerates at wrong time of day.	a. Power outages. b. Clock set incorrectly.	a. Reset clock to correct time of day. b. Reset clock to correct time of day.
7. Timer stalled in regeneration cycle.	a. Motor dead. b. Motor runs backward. c. No electric power at outlet. d. Broken gear. e. Defective switch. f. Air leak in brine connections. g. Binding of camshaft. h. Water pressure greater than 125 psi during regeneration. i. Defective circuit board.	a. Replace timer. b. Replace timer. c. Repair outlet or use working outlet. d. Replace timer. e. Replace timer. f. Check all junction points and make appropriate corrections. g. Remove foreign object obstruction from valve discs or camshaft. h. Install pressure regulator. i. Replace timer.
8. Continuous regeneration. Camshaft does not stop at the end of regeneration.	a. Broken switch activator on gear. b. Defective switch.	a. Replace timer. b. Replace timer.
9. Control will not regenerate automatically or when button is pressed.	a. Electric cord unplugged. b. No electric power at outlet. c. Defective motor. d. Broken gear. e. Binding in gear train.	a. Connect power. b. Repair outlet or use working outlet. c. Replace timer. d. Replace timer. e. Replace timer.

	f. Defective switch.	f. Replace timer.
10. Control will not regenerate automatically but will regenerate when button is pressed.	a. If water flow display is not operative, refer to item 5. b. Defective circuit board. c. Incorrect hardness and capacity settings.	a. Same as item 5. b. Replace timer. c. Set to correct values. See Programming section.
11. Run out of soft water between regenerations.	a. Improper regeneration. b. Fouled softener resin. c. Incorrect salt setting. d. Incorrect harness or capacity settings. e. Water hardness has increased. f. Restricted meter turbine rotation due to foreign material in meter housing. g. Excessive water usage below 1/5 gallon per minute.	a. Repeat regeneration, making certain that correct salt dosage is used. b. Use resin cleaner. See Note 1. c. Set salt control to proper level. See Salt Setting chart. d. Set to correct values. See Programming section. e. Set hardness to new value. See Programming section. f. Remove meter housing, free up turbine and flush with clean water. DO NOT DISASSEMBLE TURBINE FROM METER HOUSING. Turbine should spin freely, if not, replace meter **!** g. Repair leaky plumbing and/ or fixtures **!**

Note: 1: Use of resin cleaners in an unvented enclosure is not recommended.

KS15HE and KS64HE Performa HE Control Troubleshooting

The **KS15HE/KS64HE** continuously monitors itself and sounds an alarm if it detects something wrong. The alarm is a beep that is on for one second and then off for nine seconds. When the alarm sounds, the display shows the letters "Err" with a number from 1 to 4. The table below lists the Err numbers, a description of each error, the cause of the error, and the solutions. To silence the alarm, press any button on the control. If the error still exists, the control will go back to the alarm condition after 30 seconds.

Indication	Description	Cause	Solution
Err1	1. Electronics Failure	a. Control settings need reprogramming	a. Press any key to load default values. Refer to "Programming the valve"
Err2	2. Improper start of regeneration (limit switch closed when it should be open).	a. Valve camshaft has been manually rotated during a regeneration. b. Valve camshaft has been manually rotated out of "regeneration complete" position. c. Faulty motor. d. Faulty motor drive. e. Faulty switch.	a. Press any key to silence the alarm. (Note: Alarm automatically clears at "TIME OF REGENERATION".) b. The control will turn the motor on and drive the camshaft to the proper location. c. Replace the control. d. Replace the control. e. Replace the control.
Err3	3. Improper finish of regeneration (limit switch open when it should be closed).	a. Valve camshaft has been manually rotated our of "regeneration complete" position. b. Faulty motor. c. Faulty motor drive. d. Faulty switch.	a. The control will turn the motor on and drive the camshaft to the proper location. b. Replace the control. c. Replace the control. d. Replace the control.
Err4	4. Improper control settings (one or more settings our of the allowable range).	a. One or more settings out of the allowable range.	a. Hardness: Adjust range: 3 to 250. Capacity: Adjust range: 0.1 to 140.0. Refill control: Adjust range: 1 to 99. Brine draw value: Adjust range per Table 4.

MANUFACTURER'S WARRANTY
WATER SOFTENER/CONDITIONER
LIMITED WARRANTY

Your Water Softener / Conditioner System is warranted to the original owner from date of purchase, as indicated below.

Factory labor, (trip charge not included), to repair or replace defective component(s) is covered for:

Model KS5	1-year from date of purchase
Model KS10 & KC10	1-year from date of purchase
Model KS15HE/KS64HE & KC15	1-year from date of purchase

The resin is warranted to be free from material defects for:

Model KS5	5-years from date of purchase
Model KS10	10-years from date of purchase
	With Factory Installation 25-years
Model KS15HE/KS64HE	15-years from date of purchase
	With Factory Installation 25-years

The media tank, brine tank, and valve body are warranted to be free from material defects for:

Model KS5	10-years from date of purchase
Model KS10 & KC10	15-years from date of purchase
	With Factory Installation 25-years
Model KS15HE/KS64HE & KC15	20-years from date of purchase
	With Factory Installation 25-years

On all Models:
The valve and its components are warranted to original owner to be free from material defects for 5-years from date of purchase. All other components are warranted to original owner to be free from material defects for a period of 1-year from date of purchase. All other media beds are warranted for their service life or one year, whichever is less. Trip charge is not included.

Please read carefully the installation, maintenance, and specification manual. Divergence from these instructions or use on non-potable water supply will void your warranty.

DO NOT CONTACT THE LOCATION WHERE YOU PURCHASED YOUR EQUIPMENT. For warranty service contact the manufacturer. Send or deliver the defective component or unit to the manufacturer for inspection, freight prepaid, with a copy of sales invoice and manufacturer warranty. The parts or unit will be repaired or replaced at our option and returned to the customer, freight prepaid.

This warranty does not cover any defects or damage resulting from water pressure exceeding 85psi, misuse, misapplication, neglect, alterations, accident, improper maintenance or installation contrary to manufacturers printed instructions and specifications, casualties, fire, flood, water softener/conditioner drain line plugging, sediment/scale fouling, iron fouling, air temperatures over 140ºF, water temperatures over 110ºF, freezing, environmental factors, or acts of God.

This warranty is void if equipment is moved from original installation site or repaired by an unauthorized service agent or if not using AmeriFlow approved components. This warranty does not cover systems used outside the United States.

This warranty does not cover any consequential damages, including travel expense, telephone charges, loss of revenue, loss of time, inconvenience, loss of use of the equipment and/or its failure to function properly.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES, IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE DURATION OF THIS GUARANTEE. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. AMERIFLOW WATER SYSTEMS INC. WILL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES SUFFERED BY CUSTOMER ARISING FROM ANY DEFECT OR MALFUNCTION IN THE UNIT. SOME STATES DO NOT ALLOW THE EXCLUSION OF LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

AmeriFlow™ Water Systems Inc. 525 W. 21st St., Tempe, AZ 85282 U.S.A. · 1-602-275-4188

WARRANTY REGISTRATION

Mail form and a copy of original sales receipt to: AmeriFlow™ WATER SYSTEMS INC.
525 WEST 21 ST. STREET Tempe, AZ 85282 U.S.A., 602-275-4188.

Or Fax form and a copy of original sales receipt to: 602-244-2505.

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KEEP FOR YOUR RECORDS

Model #: _____ Serial #: _____

Date of Purchase: _____Date of Install: _____

Where Purchased: _____

Installed by: _____

Original Purchaser

First Name: _____ Last Name: _____

Address: _____ City _____

State: _____ Zip Code: _____

Country: _____ Phone #: _____

Email: _____

Date of Purchase: _____Date of Install: _____

Where Purchased: _____

Installed by: _____

Model #: _____ Serial #: _____