

# Operation Manual



## Water Softener System

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**Section 1.1****WARNINGS AND CAUTIONS****WARNINGS**

- Read this manual in its entirety before operating the water Softener System.
- Misuse, improper operation, and/or improper monitoring of this equipment could result in serious injury, death, or other serious reactions to the end users of the equipment.

**CAUTIONS**

- When used as a medical device, Federal law restricts this device to sale by or on the authority of a physician. Per CFR 801.109 (b)(1).
- It is the responsibility of the governing body of the facility to ensure that all applicable regulations regarding the installation and operation of this system are observed.
- Only authorized personnel can install, perform service, or perform maintenance to the Ultrafiltration for High Purity Distribution System.
- To be used only for pre-treatment of water prior to reverse osmosis (RO).

**Section 1.2****THEORY OF OPERATION**

Water Softening consists of a single water softener or twin water softeners that are paralleled (double capacity) to meet system flow demands, reduction ratios, and user criteria.

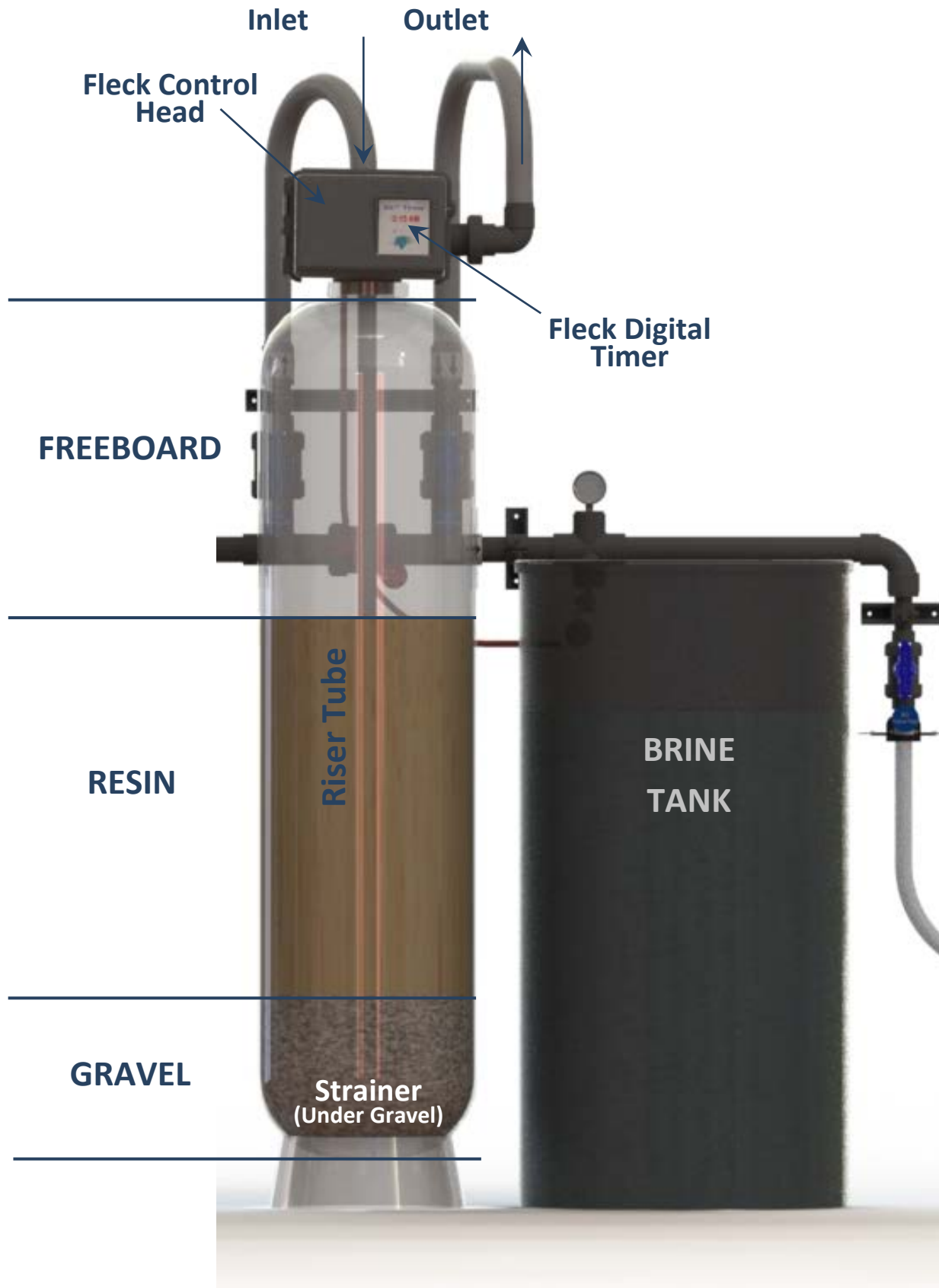
The water softeners are commercial/industrial grade, automatic, and custom sized to meet demand. The standard water softeners are commercial / industrial grade, automatic, and custom sized to meet demand. The standard water softener consists of a tank made from high quality industrial grade fiberglass reinforced plastic.

Each Water Softener has an electronic time clock control for regenerating a commercial size water softener. The controller can be set to regenerate daily at a pre-set time of day, or to skip a day or several days, giving the user maximum flexibility. The controller has a lockout feature to prevent backwashing while the Reverse Osmosis Machine is operating. A visual indicator is provided to show the user when the filter is not in the "service" position.

The resin is a premium grade, strong acid cation for high flow rate condensate demineralizing made from food-grade materials that meet FDA CFR 173.25 specifications. The Water Softener is regenerated with salt brine that is made from premium grade salt pellets made for water softening. Use only high quality salt pellets. Do not use rock salt or solar salt.

Section 1.3

SYSTEM ILLUSTRATION



**Section 2.1****SPECIFICATIONS****ELECTRICAL AND WATER REQUIREMENTS:**

Water Requirements: Tempered water.

Electrical Requirements: 120 VAC from uninterruptable, ground fault protected.

Drain Requirements: Must facilitate at least 25 gpm.

**SPECIFICATIONS:**

<u>MODEL</u>	<u>K-A-MT-5B32-104</u>	<u>K-A-MT-5C13-205</u>	<u>K-A-MT-5E14-306</u>	<u>K-A-MT-5F15-408</u>	<u>K-A-MT-5F15-410</u>	<u>K-A-MT-5H16-512</u>
Tank Size *	16" x 65"	18" x 65"	21" x 62"	24" x 72"	24" x 72"	30" x 72"
Service Flow	32 gpm	32 gpm	32 gpm	32 gpm	32 gpm	32 gpm
Drain Flow	7 gpm	9 gpm	12 gpm	15 gpm	15 gpm	25 gpm
Pressure Drop ( $\Delta$ )	< 11 psi	< 15 psi	< 15 psi	< 15 psi	< 15 psi	< 15 psi
Media cu/ft.	4	5	6	8	10	12
Grains Capacity	120,000	150,000	180,000	240,000	300,000	360,000
Control Head	Fleck 2750	Fleck 2850				
Control Timer	Fleck SXT Digital					
Port Inlet	1"	1 1/2"				
Port Outlet	1"	1 1/2"				
Drain	1"					
Media Material	Strong Acid Cation Resin					
Media Amount	4 cu.ft.	5 cu.ft.	6 cu.ft.	8 cu.ft.	10 cu.ft.	12 cu.ft.
Gravel Size	1/4" x 1/8"					
Gravel Amount	50 lbs	75 lbs	100 lbs	150 lbs	150 lbs	200 lbs

\* Other sized tanks are available as well as custom tanks and applications.

**Section 3.1****INSTALLATION**

1. The softener must be placed before the carbon filters (unless an organic scavenger is installed in which the softener will go after the carbon filters). Identify the location where the unit will be placed and verify that it is in a well-lit, with level, smooth floor, easy access location with access to a 120 VAC electrical outlet.
2. The unit will be connected by 1 ½" PVC hose into the pretreatment water supply manifold. It needs to have a bypass valve and inlet and outlet valve ready to connect to the multi-media filter.
3. You will need a drain for the regeneration cycles. If possible, the drain should be no farther than 20 feet from the filter. You will need to purchase this flexible 1" or ¾" diameter (7/8" or 5/8" inside diameter) plastic tubing from SWT. The tubing can be vinyl, polyethylene, polybutylene, etc. The drain line will be under pressure when the regeneration cycle is working, therefore make sure the drain line is secured. The drain line will need to dump into a drain that is a minimum diameter of 1 ½" and ideally be below the top of the head of your filter. All local building codes should be adhered to. Never connect the drain line directly into a drain. Allow an air gap between the drain tubing and waste line to prevent the possibility of reverse siphoning. A (DAG) Drain Air Gap Assembly can be used.
4. Put the distributor tube (riser) into the media tank, the screen intake/strainer will be at the bottom and the open end of the tube will be at the top. The screen/strainer should be resting on the bottom and centered.
5. Use masking tape or scotch tape to tape over the open end of the riser tube. This is to keep any media from falling into the tube while pouring the media into the tank.
6. Place a funnel into the tank and pour the entire contents of each box or bag in the following order to fill the tank from bottom to top:
  - a. Gravel
  - b. Resin
7. While filling the bottom of the tank with gravel be careful to keep the distributor/riser centered as best you can. Once the filling of the tank is completed, remove the tape from the distributor/riser. Do NOT pull upwards on the tube!

**Section 3.1****INSTALLATION**

8. The control valve (head) must be screwed in to the top of the tank. As you start to screw the control valve into the tank make sure the hole in the center of the control valve fits over the distributor/riser tube. NO pipe dope should be used on the threads. The control valve should be hand tightened, snugly, clockwise. Try not to over tighten the control valve, over tighteneing can make future removal difficult. The control valve contrains an O-ring in a grooved slot, and serves as the primary tank-to-valve seal. After the control valve is threaded into the tank, rotate the tank to align the control head facing forward.
9. Located between the inlet and outlet water connection on the by-pass valve, you will find a male 1" or 3/4 inch threaded (NPT) nipple. This is the connection for your drain line. Be sure it is connected as per the instructions in step 3 (above). You can connect flexible tubing to a 90° hose barb fitting. If you decide to use this connection method, wrap the threaded nipple with Teflon tape prior to connecting the 90° fitting. It's advisable to use a metal hose clamp to secure the tubing onto the barb fitting.
10. Make sure the main water supply is off. Depress the Red Pointer Knob and turn the knob counter- clockwise into the backwash position. With the water supply off, place the bypass valve into the service position. (For digital fleck heads please refer to the manual that is supplied) Open the water supply valve very slowly to approximately the 1/4 open position. In this position, you should hear air escaping slowly from the drain line.

**CAUTION:** If opened too rapidly or too far, some filter media may be lost and plugging of the valve is possible.

11. Check for leaks and re-tape or re-tighten any loose or leaking fittings.
12. When water begins to flow steadily from the drain, signifying the air has been purged from the tank, open the main water supply valve all the way. You will notice that the water running in the drain line is slightly cloudy or discolored. This is normal, and you are now backwashing a small amount of "fine" material contained in the filter media from the bed. After the water in the drain line is running clear to the drain (this can sometimes take up to 1 hour), initiate a manual backwash by turning the red pointer knob to the indicated position or per the instruction for a digital head, and allow the unit to run through a complete cycle.



**Section 3.1****INSTALLATION**

13. Now refer to the manual that was supplied with you specific model and set the time and regeneration cycle frequency as directed. It is good practice to be present at your first full cycle of regeneration to make any adjustments needed to assure a complete regeneration and back wash of the whole filtering system.
14. If a reverse osmosis system is to be installed downstream, make sure that the by-pass valve on the water softener is in by-pass during filter installation. This will guarantee that this equipment is not contaminated with an excessive amount of resin media. You can take the equipment out of by-pass when water from filter is running clear.
15. Conduct a hardness test to ensure there is no faulty connections with the riser tube or strainer. If the hardness level is  $>2$  gpg then the softener needs to be taken offline and rechecked/repared until a good reading is obtained.

**Section 4.1****OPERATION**

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1. The operations of the water softener system is completely automatic. Once the system has been setup, little operator action is necessary.

**Setting Timer**

See Control Head Manual for details.

**Control Head**

See Control Head Manual for details.

Section 5.1

ROUTINE MAINTENANCE

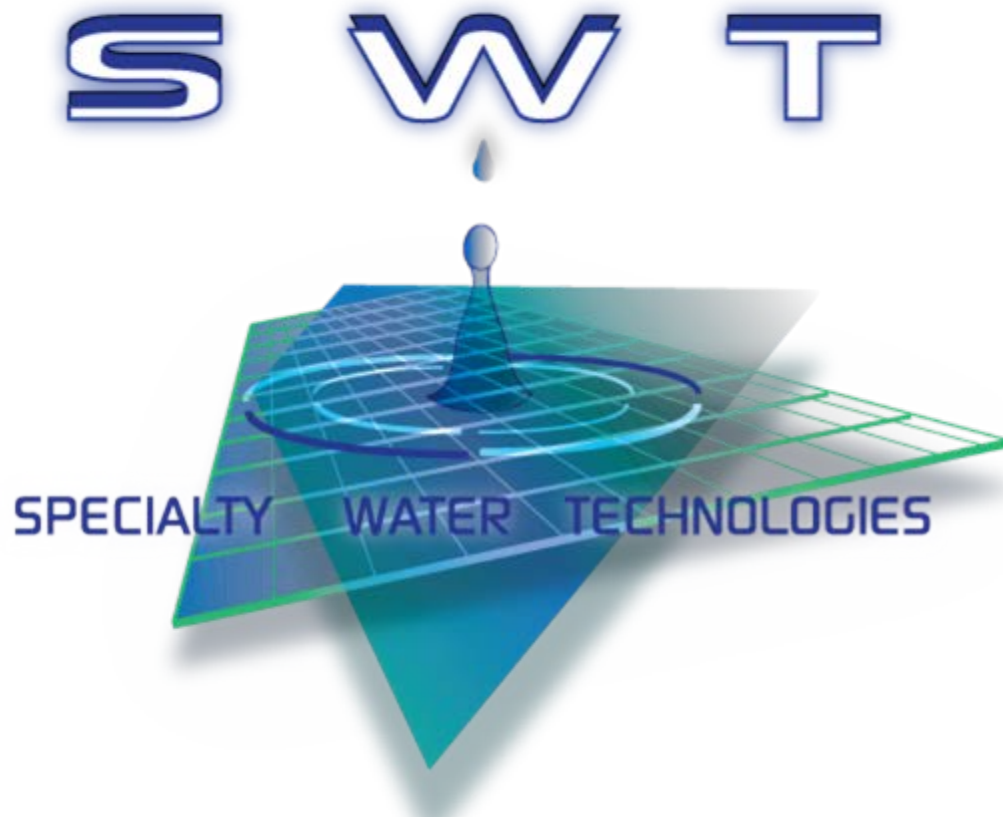
TROUBLESHOOTING GUIDE

Problem	Possible Causes	Possible Solutions
The filter backwashes at unscheduled times.	<ul style="list-style-type: none"> <li>• Problem with automatic control valve or time clock</li> </ul>	<ul style="list-style-type: none"> <li>• Check the time of day on the controller and adjust if necessary.</li> </ul>
Filter has a pressure drop greater than 15 psi.	<ul style="list-style-type: none"> <li>• Pretreatment component needs to be backwashed or regenerated more often</li> <li>• Media exhausted</li> </ul>	<ul style="list-style-type: none"> <li>• Using the manufacturer’s instructions set the controller to backwash more often.</li> <li>• If this fails to correct the problem, the tank must be emptied, cleaned, and re-bedded.</li> </ul> <p>NOTE: When re-bedding, always install a new distributor.</p>
Softener resin exhaustion occurs before the regeneration cycle is scheduled to take place.	<ul style="list-style-type: none"> <li>• Softener media exhausted</li> </ul>	<ul style="list-style-type: none"> <li>• Check brine tank salt level, adding salt if needed.</li> <li>• Perform a manual regeneration</li> <li>• Set the controller to regenerate more often if needed.</li> <li>• Re-bed if necessary</li> </ul>

**Section 5.1****ROUTINE MAINTENANCE**

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1. Daily monitoring checking the pressures along with the Delta Pressure (pressure drop) across the softener while the RO is running.
2. Daily monitoring of the hardness to ensure it is less than 2 gpg after 2 verified regeneration cycles.
3. The salt in the brine tank should be filled periodically so it does not fall below 50%.



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