

# BRASSMASTER

## Water Softening Systems Operation & Maintenance Manual



# Specifications

## Feedwater

**! Do not use this system on water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. !**

Minimum inlet pressure: 20 psig

Maximum outlet pressure: 125 psig

Minimum water temperature: 34 degrees F

Maximum water temperature: 110 degrees F

## Power

Voltage: 120VAC

Frequency: 60Hz

Power consumption: 3 Watts Maximum

## Installation

Location: Indoors (Protect from direct sunlight)

Minimum ambient temperature: 34 degrees F

Maximum ambient temperature: 122 degrees F

## Salt Capacity

Cabinet models: 200lbs

Two-Tank models: 300lbs

## Maximum Flow To Drain

WB24, WBT24 (0.75 ft<sup>3</sup> resin) – rated drain flow during regeneration – 1.7 gpm

WB32, WBT32 (1.0 ft<sup>3</sup> resin) – rated drain flow during regeneration – 2.0 gpm

WBT48 (1.5 ft<sup>3</sup> resin) – rated drain flow during regeneration – 2.4 gpm

WBT60 (2.0 ft<sup>3</sup> resin) – rated drain flow during regeneration – 4.0gpm

This unit conforms to ANSI/NSF-44 for specific performance claims as verified and substantiated by test data.

# Softener Operation

As water enters the softener, it passes over a resin bed in a special tank. The resin consists of tiny beads of a plastic called styrene. These beads attract and hold sodium ions and exchange the sodium for hardness ions when encountered. Over time, the resin becomes saturated with hardness ions and no longer removes hardness materials. The softener goes into a "regeneration" to flush hardness materials to the drain and refresh the resin with sodium. Regeneration is typically programmed to take place in the middle of the night when little or no water is in use.

## Regeneration consists of four cycles:

### 1. Backwash Position

**Backwash** is a rapid upward flow of water that loosens the resin bed and flushes iron particles, dirt and sediments filtered in the bed out to the drain.

### 2. Brine Draw / Slow Rinse Position

**Brine Draw** is the process in which brine is drawn out of the brine cabinet and passed through the resin in a downward direction. This rinses the resin and large amounts of sodium ions replace the hardness ions accumulated during service.

**Slow Rinse.** After brine is completely removed from the brine cabinet into the resin tank the brine valve closes. Water replaces any remaining brine from the resin, flushing hardness ions removed from the resin to drain.

### 3. Fast Rinse Position

**Fast Rinse** is a fast flow of water down through the resin tank that follows a **Backwash**. This flushes all remaining brine from the tank and packs the resin bed for softening efficiency.

### 4. Brine Fill

Brine is water saturated with large amounts of a salt (sodium chloride). During **Brine Fill**, water flows into the salt storage area after each regeneration and dissolves salt. During the regeneration process, hardness ions on the resin beads are replaced or exchanged for sodium ions from the brine solution.

### 5. Service

When the softener is in **Service** it is flowing water through the system and removing hardness minerals from your water.

# Service

## Cleaning Iron Out of the Water Softening System

The BrassMaster Water Treatment system is designed to remove minerals like calcium and magnesium from household water. BrassMaster Water Treatment recommends periodic resin bed cleaning if your iron rating is high. Clean the bed at least every six months, or more if iron appears in the soft water between cleanings.

## Checking for a Salt Bridge

A hard crust or "Salt Bridge" can form in the lower half of the salt storage tank. This can be deceiving because the tank will appear to have plenty of salt, but underneath, salt has hardened and when the system regenerates, water cannot quite reach this level to be made into brine (water and salt).

## Breaking a Salt Bridge

Take a wooden broom handle and carefully push it down into the salt, working it up and down. If the tool strikes a hard object (be sure it's not the bottom or sides of the tank), it's probably a salt bridge. Carefully break the bridge with the broom handle. Do not pound on the walls of the tank.

**NOTE:** Salt bridges are typically caused by high humidity or using the wrong kind of salt. In humid areas it is best to fill with less salt, more often. Use only nugget, pellet or coarse solar salt with a purity of 99.5% or higher. DO NOT use rock, block, granulated, and ice cream-making salts, or salt with iron-removing additives.

## Cleaning the Injector and Screen

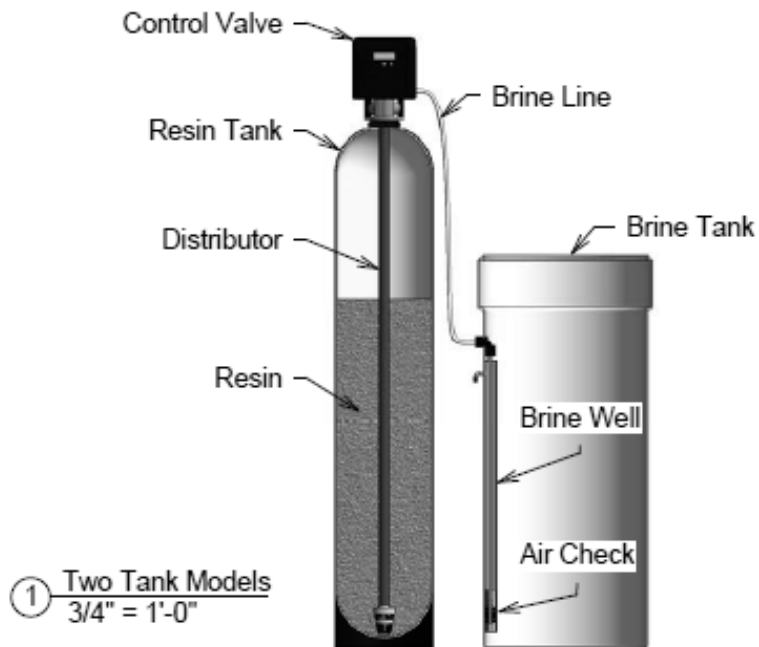
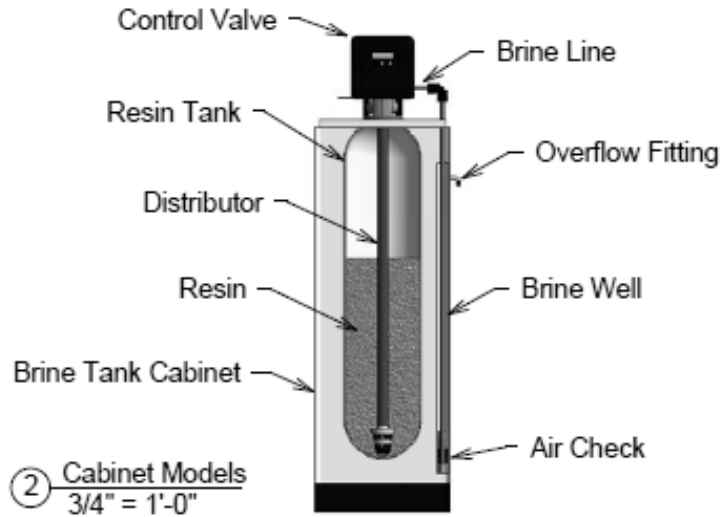
1. Turn off water supply to conditioner:
  - a) If the conditioner installation has a "three valve" by-pass system, first open the valve in the bypass line, then close the valves at the conditioner inlet and outlet.
  - b) If the conditioner has an integral by-pass valve, put it in the by-pass position.
  - c) If there is only a shut-off valve near the conditioner inlet, close it.
2. Relieve water pressure in the conditioner by stepping the control into the backwash position momentarily. Return the control to the service position.
3. Unplug electrical cord from outlet.
4. Disconnect brine tube and drain line connections at the injector body.
5. Remove the two injector body mounting screws. The injector and brine module can now be removed from the control valve. Clean and reassemble.
6. To replace brine valve:
  - a) Pull brine valve from injector body, also remove and discard O-ring at bottom of brine valve hole.
  - b) Apply silicone lubricant to new O-ring and reinstall at bottom of brine valve hole.
  - c) Apply silicone lubricant to O-ring on new valve assembly and press into brine valve hole, shoulder on bushing should be flush with injector body.
7. To replace injectors and screen:
  - a) Remove injector cap and screen, discard O-ring. Unscrew injector nozzle and throat.
  - b) Screw in new injector throat and nozzle, be sure they are sealed tightly. Install a new screen.
  - c) Apply silicone lubricant to new O-ring and install around oval extension on injector cap.
8. Apply silicone lubricant to three new O-rings and install over three bosses on injector body.
9. Insert screws with washers thru injector cap and injector. Place this assembly thru hole in timer housing and into mating holes in the valve body.
10. Tighten screws.
11. Reconnect brine tube and drain line.
12. Return by-pass or inlet valving to normal service position. Water pressure should now be applied to the conditioner, and any by-pass line shut off.
13. Check for leaks at all seal areas. Check drain seal with the control in the backwash position.
14. Plug electrical cord into outlet.
15. Set time of day and cycle the control valve manually to assure proper function. Make sure control valve is returned to the service position.
16. Make sure there is enough salt in the brine tank.
17. Start regeneration cycle manually if water is hard.

# Troubleshooting

<b>1. Softener Fails To Regenerate.</b>	A. Electrical service to unit has been interrupted.	A. Assure permanent electrical service (check fuse, plug, pull chain or switch).
	B. Timer programming bad (improper programming).	B. Check programming and reset as needed.
<b>2. Softener Delivers Hard Water.</b>	A. By-pass valve is open.	A. Close by-pass valve.
	B. No salt in brine tank.	B. Add salt to brine tank and maintain salt level above water level.
	C. Injectors or screen plugged.	C. Clean or replace injectors and screen.
	D. Insufficient water flowing into brine tank.	D. Check brine tank fill time and clean brine line flow if plugged.
	E. Hot water tank hardness.	E. Repeated flushings of the hot water tank is required.
	F. Flow meter jammed.	F. Check flow indicator light for flow. Remove obstruction from flow meter.
	G. Flow meter cable disconnected or not plugged into meter.	G. Check meter cable connection to timer and meter.
	H. Improper programming.	H. Reprogram the control to the proper regeneration type, inlet water hardness, capacity or flow meter size.
	I. Plugged brine line or air check.	I. Remove and clean any sediment from brine tank and brine valve assembly.
	J. Salt bridge has formed.	J. Refer to <i>Breaking a Salt Bridge</i> section in manual.
	K. No water in brine tank.	K. Ensure safety float is not stuck.
	L. Unit is plumbed backwards.	L. Check that the unit is plumbed correctly.
M. Water hardness has increased or is set incorrectly.	M. Retest hardness and change settings.	
N. Water pressure is too low.	N. Line pressure must be at least 20psi.	
<b>3. Unit Uses Too Much Salt.</b>	A. Improper salt setting.	A. Check salt usage and salt setting.
	B. Excessive water in brine tank.	B. See problem No. 7.
	C. Improper programming.	C. Check programming and reset as needed.
<b>4. Loss of Water Pressure.</b>	A. Iron buildup in line to water conditioner.	A. Clean line to water conditioner.
	B. Iron buildup in water conditioner.	B. Clean control and add resin cleaner to resin bed. Increase frequency of regeneration.
<b>5. Loss of Resin Through Drain Line.</b>	A. Air in water system.	A. Assure that well system has proper air eliminator control and check for dry well condition.
	B. Drain line flow control is too large.	B. Ensure drain line flow control is sized correctly.
<b>6. Iron in Conditioned Water.</b>	A. Fouled resin bed.	A. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration. Increase backwash time.
	B. Iron content exceeds recommended parameters.	B. Add iron removal filter or system.

<b>7. Excessive Water in Brine Tank.</b>	A. Plugged drain line flow control.	A. Clean flow control.
	B. Brine valve failure.	B. Clean brine valve.
	C. Improper programming.	C. Check programming and reset as needed.
<b>8. Salt Water in Service Line.</b>	A. Plugged injector system.	A. Clean injector and replace screen.
	B. Improper programming.	B. Check programming and reset as needed.
	C. Foreign material in brine valve.	C. Clean or replace brine valve.
	D. Foreign material in brine line flow control.	D. Clean brine line flow control.
	E. Low water pressure.	E. Raise water pressure.
<b>9. Softener Fails to Draw Brine.</b>	A. Drain line flow control is plugged.	A. Clean drain line flow control.
	B. Injector is plugged.	B. Clean or replace injectors.
	C. Improper programming.	C. Check programming and reset as needed.
	D. Line pressure is too low.	D. Increase line pressure (line pressure must be at least 20psi at all times.)
<b>10. Drain Flows Continuously.</b>	A. Foreign material in control.	A. Remove piston assembly and inspect bore, remove foreign material & check control in various ports.
<b>12. Loss of capacity.</b>	A. Increased raw water hardness	A. Reset unit to the new capacity.
	B. Brine concentration and/or quantity.	B. Keep brine tank full of salt at all times. Clean it yearly. Salt may be bridged. If using a salt grid plate ensure refill water is over it.
	C. Resin fouling. Future fouling.	C. Call Water Control Corp, find out how to confirm it, clean the resin and prevent.
	D. Poor distribution, channeling (uneven bed surface).	D. Call Water Control Corp. Check distributors and backwash flow.

# Water Softener System Parts List



Water Softener Parts List

11/08/2013

Please contact Water Control Corporation or your dealer for parts availability.

Part No.	Description
WFL5800/MTR	Control Valve (Metered Models)
WFL5800/TC	Control Valve (Time Clock Models)
BT1833	Brine Tank (Two-Tank models)
BC1235	Brine Tank (Cabinet Models) 15135-1
36523211	Brine Well
60002	Air Check
RT835	Resin Tank (Model WB24)
RT935	Resin Tank (Model WB32)
RT844	Resin Tank (Model WBT24)
RT940	Resin Tank (Model WBT32)
RT1054	Resin Tank (Model WBT48)
RT1248	Resin Tank (Model WBT60)
60795-00	Distributor Assembly
PE58	Drain Line
PE38	Brine Line
WRES1	Resin: R8X (See spec sheet for quantity.)