



# **Duplex Commercial Softeners**

## **Installation, Operation & Maintenance Guide**

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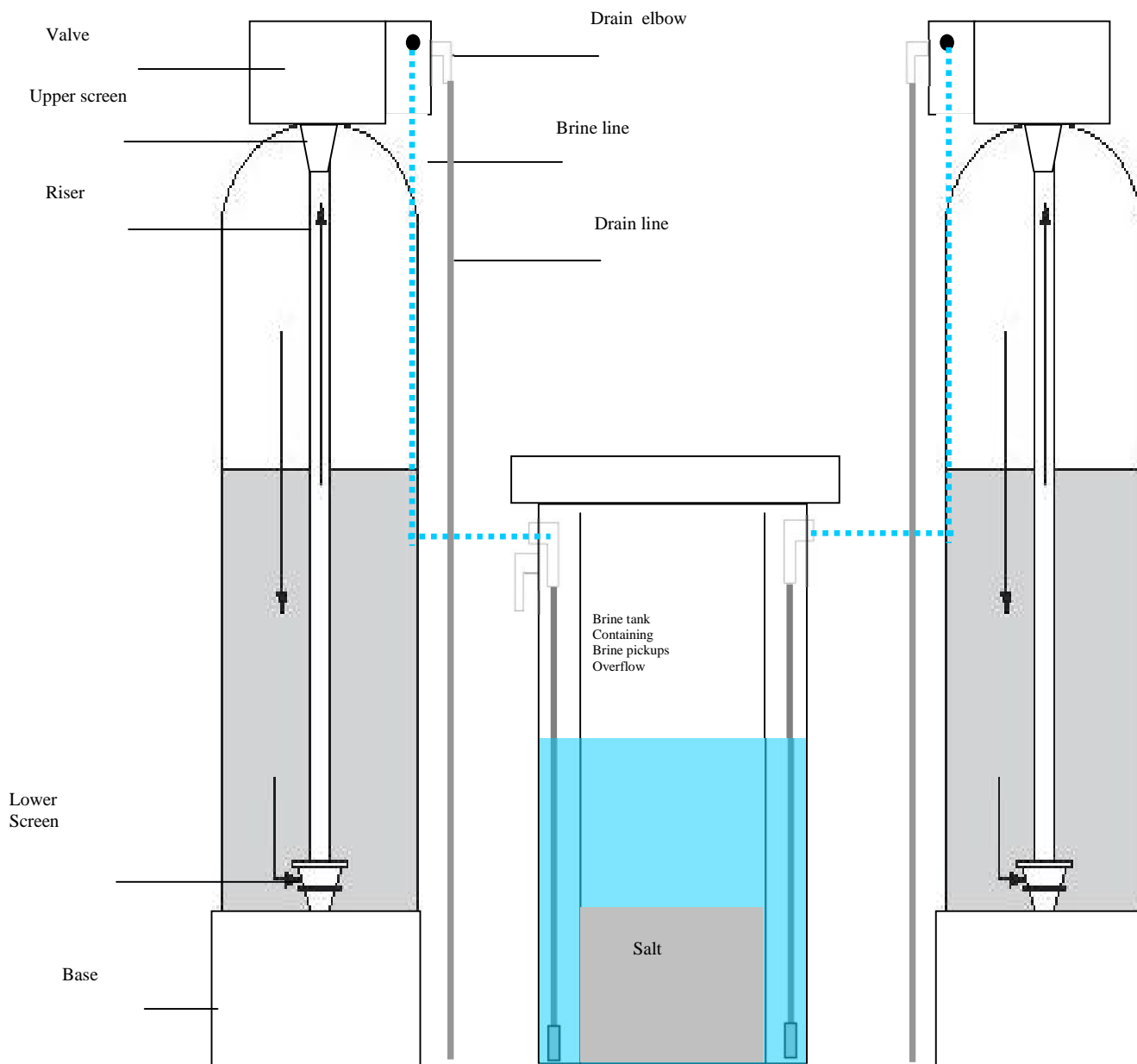
Thank you for purchasing this Softener. We are sure that it will provide you with trouble free service for many years to come. Please use the following pages to assist you with the assembly and installation of your new system.

## 1. Unpacking.

PLEASE USE THE ACCOMPANYING PACKING DOCUMENTS TO CHECK THAT ALL ITEMS ARE PRESENT AND CORRECT.

If any item is missing or damaged your carrier and supplier must be notified within 2 days of receipt if a claim is to be made.

The main parts of the system include:



## 2. Installation.

Please observe the regulations concerning the installation of your water softener. Check that you have allowed space for access to the unit for possible future maintenance. This installation may require plumbing work and will require an electrical outlet to be fitted near the system. Only attempt this if you have the necessary skills.

### 2.1 Pre-installation checks.

The area needs to be level, frost free have access to electricity and an open drain. Check the incoming water quality is within any parameters specified for that media (see technical information at the back of the manual). In addition to this check the incoming water pressure is between 2 and 8 bar (preferably approx. 4 bar) and the water temperature is between 3°C and 45°C.

### 2.2 Fitting the Bottom Distribution Systems.

Fit the bottom distribution systems into the vessels – the bottom screens should be pre glued to the riser tubes (fig A.1). If the system uses bottom laterals (typically 16” diameter and above) these need to be assembled inside the vessels (fig A.2), Move the vessels to their final positions as they will be difficult to move once the media has been added.



Fig A.1



Fig A.2

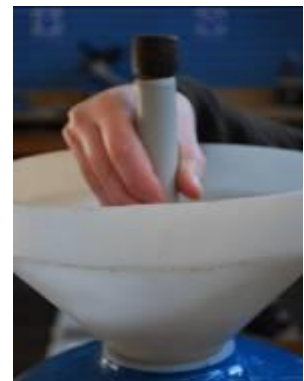


Fig A.3

### 2.3 Adding the Media.

Block the top of the riser tubes to stop media getting down the tubes (see fig A.3). Add about 1/3 by volume of water to the vessels so when the media is poured in it doesn't damage the bottom distribution systems. Add the media supplied but make sure there is free space left above the media so when the system is backwashed the media can expand into the space and any sediment or contaminants can be backwashed away (there may be media left over). Unblock the riser tubes.

### 2.4 Fitting the Valves.

Add a small amount of silicone grease to the valves outer and inner o-rings (fig A.4 & 5).



Fig A.4



Fig A.5

If top screens are supplied these should be attached next.

Slide the valves onto the riser tubes and gently push them down onto the vessel treads. Screw the valves on until you start to squeeze the main O rings and then finally give the valves a final tighten by tapping the rear side of the valves with the palm of your hand (fig A.6)



Fig A.6

## 2.5 Brine Tank Connections.

Attach the brine line tubing to the brine tank and valves using the connectors fitted to the brine tank (Fig A.7), valve (Fig A.8), or air check bottle on 255 valve. (Fig A.9)



Fig A.7



Fig A.8



Fig A.9

## 2.5 Hydraulic Connections.

Interconnecting pipe work kits with bypasses and 1" BSP connections (Fig A.10) are supplied for the 3/4" or 1" valves; these can be connected using fixed or flexible pipe work.

Duplex systems with 2" valves do not come with interconnecting pipe work kits and will need to be plumbed on site with connections to the 2" solvent weld tails provided.

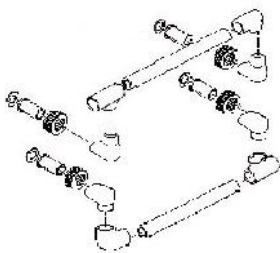


Fig A.10

## 2.6 Drain Line Flow Connections.

Check the service and backwash flow rates (see technical information at the end of the manual). If the service flow rates are exceeded then the softener will not give its full capacity of soft water. The backwash flow rate should be limited by either internal or external drain line flow controls (DLFCs). If the DLFC are external they should be listed on the packing documents and should be screwed on to the waste connections of the valves. A drain hose should then be attached which needs to terminate in an open drain (back pressure or a kinked waste hose will cause the system to malfunction). If the DLFC is internal they will be fitted inside the valves (normally used on vessels 10 inch diameter and smaller).

## 2.7 Electrical connections.



Fig A.11

All valves are low voltage valves with a 240V transformer. With the power off connect the transformer provided to 240V supply. With the power OFF plug the flying lead into the connector of the master controller (Fig A.11). If you have in line transformers this will need to be wired into a fused switch. Ensure that the cables cannot get caught on the camshafts or any of the valves moving parts.

## 2.8 Connecting the Valves together.

The valves are connected together with the interconnecting cable supplied, the loose end needs to be connected to the other valve. (Fig A.12)

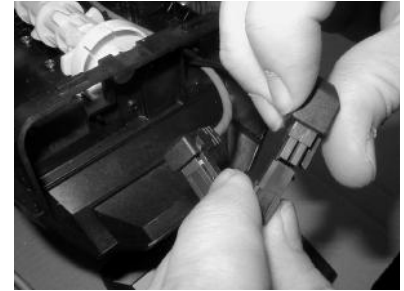


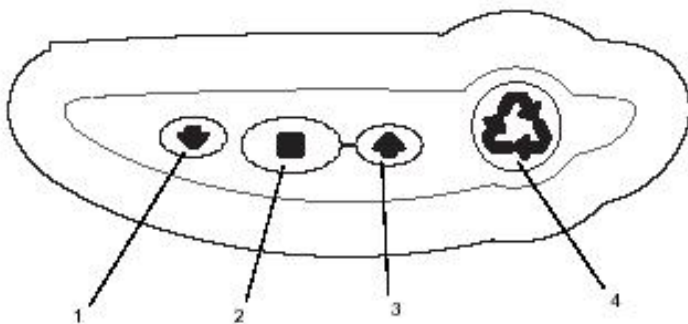
Fig A.12

## 2.9 Programming the Valve set.

This programming relates to the Autotrol 764 logix duplex valve sets.

The valve set should already have been set up with the basic settings in the factory. The only settings you should need to enter are the time of day and day of the week. All settings are set on the master controller.

When making these settings the controller may indicate ERR3 then ERR4 this is NOT a fault, allow the cams to turn and settle back to the service and standby positions and continue setting.



1. Down arrow. Used to scroll down or increment through a group of choices.
2. Set. Used to accept a setting to store in the memory.
3. Up arrow. Used to scroll up or increment up through a group of choices.
4. Regenerate. Used to command the controller to regenerate.

### Initial Power Up.

Plug the transformer into the rear of the control panel; this is located to the left top corner of the panel if viewing from the front. Once the power is connected the display may briefly show the valve number for the system (764). The valve type will be printed on the side of the valve and should also appear on the delivery documentation.



Note. During the set up process the display may revert to service mode (after 25 seconds).



By repeatedly pressing the set button you can scroll to the part of the set up programme you require.

You may receive an ERR3 / ERR4 message, if this happens allow the cam shafts to turn for a few moments and this code should disappear. If the cam does not move check that the Cam Shafts are fitted correctly and that the optical sensors are in position.



### Set Time.

Press the set button. The TIME should now be flashing, use the up and down arrows to set the correct time of day (24hrs format). Once the correct time has been selected, press the set button to confirm. The following will then be displayed.



### Set Day of the Week.

Press the set button to display the screen shown. The display will flash, use the up and down buttons to advance the arrow to underneath the correct day. Once under the correct day press the set button to confirm. The following will then be displayed.



### Time when system Regenerates.

This normally defaults to 2.00am but can easily be changed to a more suitable time if required by pressing the square set button to start the display flashing, adjusting the time using the up and down arrows then press the square set button to confirm. The following will then be displayed.



### Calendar Override Days.

The system should have this pre-programmed to a suggested number of days but this may need altering to suit your needs. This function allows the filter bed to backwash regardless of usage; this is to ensure that the filter bed remains fresh.

Press the set button to start the display flashing then alter the figure using the up and down arrows, then press the set button to confirm the setting.



### Hardness Setting

The hardness setting will need to be set on site, the setting is in ppm.

Press the set button to start the display flashing and adjust the hardness value up or down using the up and down arrows, when the correct figure is displayed press the square button to set.



### Capacity.

System capacity is displayed in kilograms of hardness removed before regeneration is necessary. This should be factory set but should it require setting you need to press the set button to start the display flashing, then adjust the figure using the up and down arrows and press the set button to confirm the figure. (see section 5.1)

## 2.10 Resetting the Valve Programming.

Occasionally it may be necessary to reset the valve to factory defaults.

The programmed valve type (softener) can be checked by pressing and holding the SET and DOWN buttons simultaneously for 5 seconds. H0 and a resin volume is displayed e.g. H0 100, the valve has been set as a softener. If in doubt contact your supplier.

To reset the valve: with H0 displayed, press and hold the SET for 5 seconds

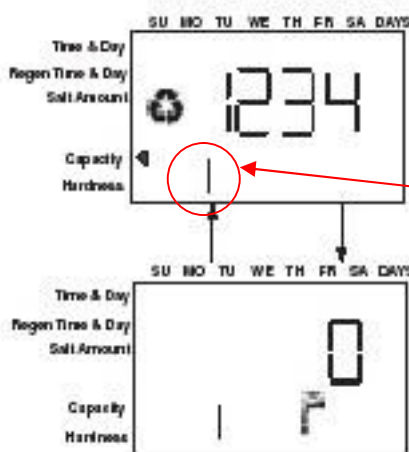
For 764 controllers valve type will now be shown e.g. 255A, 255P, 278A. Choose the correct valve (255, A or P) and press the SET button, (A = Alternating & P = Parallel). Three dashes will now show on screen, this is the resin volume per vessel and should be set accordingly using the up and down arrows set the amount of resin applicable to your system (see programming details)

It will now be necessary to reset the time, day, regeneration time and override days.

**Alternating:** One vessel in service and one in standby.

**Parallel:** Both vessels in service but only one will regenerate at a time.

## 2.11 In Service Display.



764 Electronic Multi-Tank "A" Alternating Control:

Service display – The number of the tank in service and alternating capacity remaining and flow rate with faucet icon of tank in service  
Tank in service.

764 Electronic Multi-Tank "P" Parallel Control:

Service display – Alternating three times  
Capacity remaining for tank 1 with digit "1" displayed  
Capacity remaining for tank 2 with digit "2" displayed  
System flow rate (Tank 1 + Tank 2 added with faucet icon).

## 3. Commissioning the Softener

### 3.1 Introduction.

With the system fully plumbed and the valve programmed commissioning can start.

### 3.2 Regeneration.

When the system is fully functional the regeneration will happen at the pre-set time (see programming the valve section). However, running a manual regeneration during commissioning is the best way of removing air from the system, bedding in the media and flushing the system through.

Make sure the water inlet and outlet are closed. Press and hold the regeneration button for 5 seconds. The cam will rotate to the backwash position (C1). Slowly half open the water inlet to the system, and then slowly open the outlet to allow the air to be purged from the system. Once this has been done you can fully open the inlet and outlet and allow the system to



continue through the regeneration cycle, this will allow you to check for leaks and also purge any remaining air from the system. After a backwash the system will move through a brine draw routine, some pressure equalising and further rinse cycles before stopping in the service position. This will have to be done for both vessels.

For new systems or after a media change it maybe necessary to run two regenerations to fully charge the media (check the water at the end of the backwash is running clear).

To initiate a delayed regeneration press the regeneration button once quickly to start the regen symbol flashing, this will start the backwash at the backwash pre-set time.

If during a regeneration cycle you need to skip through the cycle this can be done in the following ways. To skip to the next stage press the square set button and up arrow together for a second. To skip to the end of the cycle press and hold the square set button and up arrow until the egg timer starts flashing.

### 3.3 Service.

Water flows into the valve at the top, down through the media and then up through the 'riser' tube in the middle of the vessel. As the water travels through the media the ion exchange takes place. The valves and controllers are set to automatically regenerate when specified or required.

## 4. Routine Maintenance.

The system is designed to run with the minimum of maintenance and does not normally require much adjustment or work.

### Weekly.

Check the salt level (this may need to be checked more regularly dependant on use)  
Check there is no sign of damage or leaks,  
Check the quality of the treated water.

## 5. Technical Information.

### 5.1 Identifying your Softener

Your softener will have a identification label fixed to the outer carton and the control valve, this will look similar to the picture shown here.

The information listed can be read as follows:

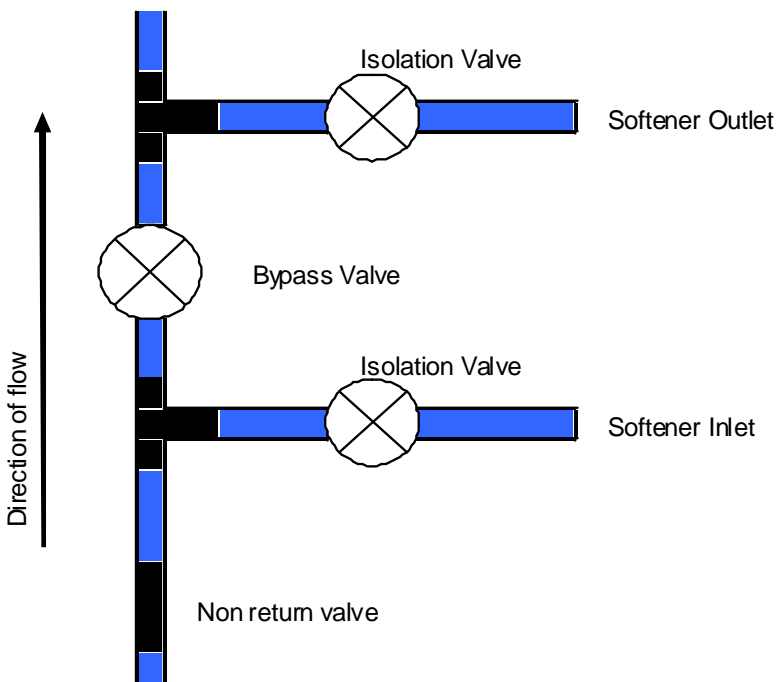
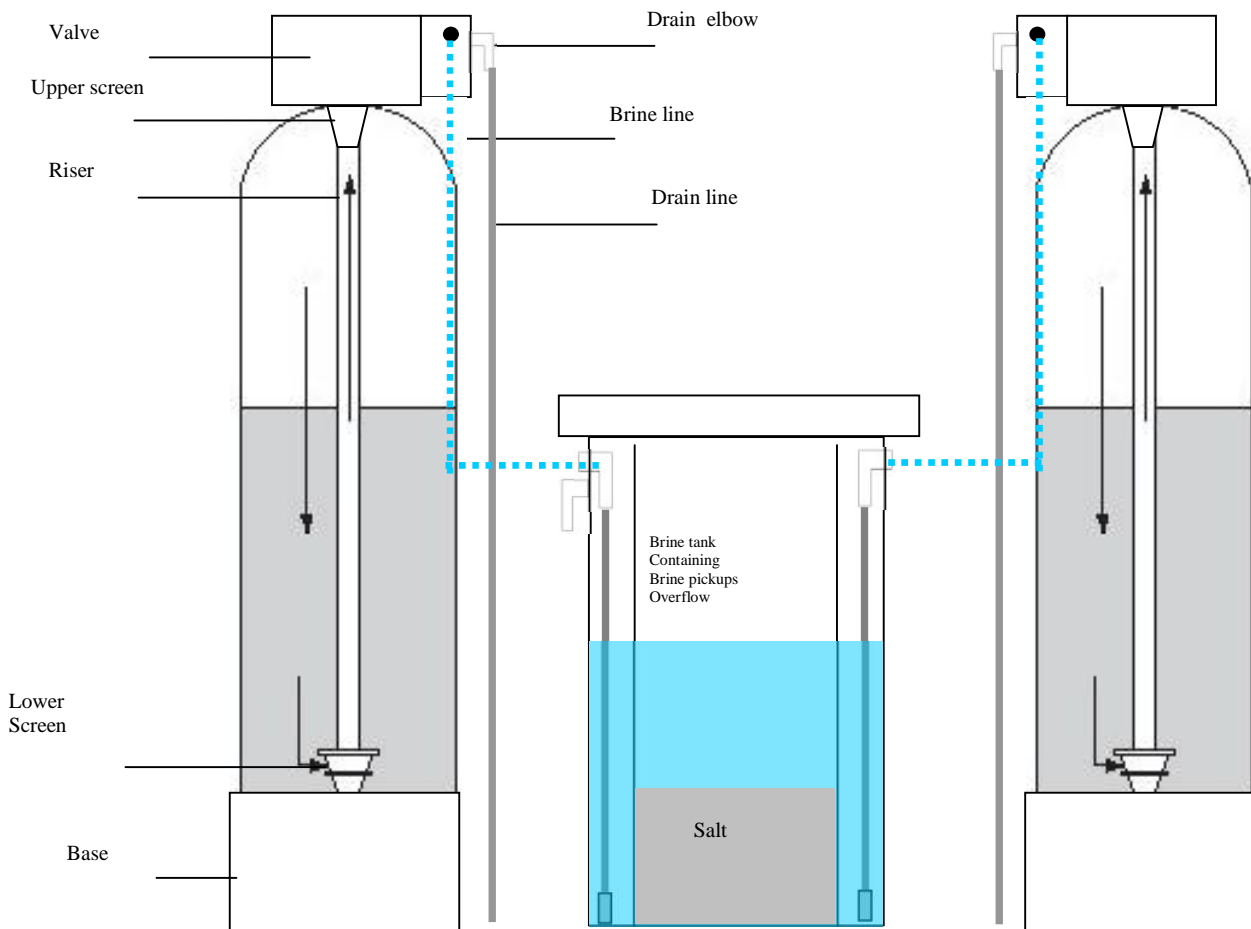
4202035013	Stock Number:	Manufacturers part number.
SNo 08090137	Serial No:	Serial No.
Mis	Id Code:	Softener type identification code.
0919-255-760	Configuration:	Vessel size, Valve type & Controller type.

Identify the settings relevant to your softener from the chart below by looking at the vessel size and controller type.

## 5.2 Programming Details and Operating Data.

Small Commercial Softeners								
Vessel Size		835	935	1035	1044	1054	1248	1354
Media Volume (each vessel)		20	25	30	40	50	60	75
Valve Type		255	255	255	255	255	255	255
<b>Parameters</b>								
Time of day (HH:MM)	P1	Set on site						
Day of week	P2	Set on site						
Time of regeneration (HH:MM)	P3	Set on site / factory default 2,00am						
Calendar override days	P4	Set on site / factory default 14 days						
Salt ammount (gms)	P6	150						
Capacity (Kg)	P7	1	1.2	1.5	2	2.5	3	3.8
Hardness (ppm)	P8	Set on site						
Refill rate (gpm x 100)	P14	33	33	33	33	33	33	33
Brine draw rate (gpm x 100)	P15	18	18	22	26	26	38	50
Larger Commercial Softeners								
Vessel Size		1354	1465	1665	1865	2160		
Media Volume (each vessel)		75	100	125	200	250		
Valve Type		278	278	278	278	278		
<b>Parameters</b>								
Time of day (HH:MM)	P1	Set on site						
Day of week	P2	Set on site						
Time of regeneration (HH:MM)	P3	Set on site / factory default 2,00am						
Calendar override days	P4	Set on site / factory default 14 days						
Salt ammount (gms)	P6	150						
Capacity (Kg)	P7	3.8	5	6.2	8.8	11.2		
Hardness (ppm)	P8	Set on site						
Refill rate (gpm x 100)	P14	130	130	130	130	130		
Brine draw rate (gpm x 100)	P15	56	56	67	84	84		
Vessel Size		1665	1865	2160	2469	3072	3672	
Media Volume (each vessel)		150	200	250	350	500	700	
Valve Type		298	298	298	298	298	298	
<b>Parameters</b>								
Time of day (HH:MM)	P1	Set on site						
Day of week	P2	Set on site						
Time of regeneration (HH:MM)	P3	Set on site / factory default 2,00am						
Calendar override days	P4	Set on site / factory default 14 days						
Salt ammount (gms)	P6	150						
Capacity (Kg)	P7	6.2	8.8	11.2	15	25	35	
Hardness (ppm)	P8	Set on site						
Refill rate (gpm x 100)	P14	80	140	140	200	300	500	
Brine draw rate (gpm x 100)	P15	50	90	90	140	200	300	

### 5.3 Typical Installation layout.



**Typical bypass setup using three isolation valves plus a non return valve.**

## 5.4 Troubleshooting.

Following you can find a guide as to the most common problems that may arise; please consult this section before contacting you supplying dealer as most problems are easily cured by following this information.

### 700 Series Controller Troubleshooting.

Problem	Possible cause	Solution
ERR 1 is displayed.	Controller power has been connected and the control is not sure of the state of operation.	Press the up arrow and the control should reset.
ERR 2 is displayed	Controller power does not match 50 or 60 Hz	Disconnect and reconnect the power. If the problem persists, obtain the appropriate controller or AC adapter for either 50 or 60 Hz power.
ERR 3 is displayed	Controller does not know the position of the camshaft. Camshaft should be rotating to find home position.	Wait for two minutes for the controller to return to home position. The hour glass should be flashing on the display indicating the motor is running.
	Camshaft is not turning during ERR 3 display.	Check that motor is connected. Verify that the motor wire harness is connected to the motor and controller module. Verify the optical sensor is connected and in place. Verify that motor gear has engaged cam gear. If everything is connected, try replacing in this order: Wire harness Motor Optical sensor Controller
	If camshaft is turning for more than five minutes to find home position.	Verify that the optical sensor is in place and connected to wire. Verify that the camshaft is connected appropriately. Verify that no dirt or rubbish is clogging any of the cam slots. If motor continues to rotate indefinitely replace the following in this order: Wire harness Motor Optical sensor Controller
Four dashes displayed	Power failure occurred	Press SET to reset time display.

## System Troubleshooting

Problem	Possible cause	Solution
1. Regenerant Tank Overflow. See also 4.	<ul style="list-style-type: none"> <li>a. Drain line restricted.</li> <li>b. Uncontrolled refill flow rate</li> <li>c. Air leak in regenerant line</li> <li>d. Drain control clogged with resin or other debris.</li> <li>e. Sinking air check ball (255 only)</li> <li>f. Incorrect drain control fitted.</li> <li>g. Regenerant valve disc 1 being held open.</li> <li>h. Valve disc 2 not closed during regenerant draw causing a refill.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check the drain line is not blocked or kinked.</li> <li>b. Remove refill flow control to clean ball and seat.</li> <li>c. Check all connections in regenerant line for leaks.</li> <li>d. Clean drain control.</li> <li>e. Replace air check ball.</li> <li>f. Too small of a drain control with a larger injector may reduce draw rates.</li> <li>g. Remove obstruction.</li> <li>h. Remove obstruction.</li> </ul>
2. Water flow from drain or regenerant line when in service.	<ul style="list-style-type: none"> <li>a. Flapper valve return spring weak.</li> <li>b. Debris stopping flapper valve from closing.</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace valve spring. (contact dealer)</li> <li>b. Remove debris.</li> </ul>
3. Hard water after regeneration.	<ul style="list-style-type: none"> <li>a. Incorrect / failed regeneration.</li> <li>b. Leaking external bypass valve.</li> <li>c. O-Ring around riser damaged.</li> <li>d. Capacity too low due to incorrect setting.</li> </ul>	<ul style="list-style-type: none"> <li>a. Repeat regeneration after checking settings.</li> <li>b. Replace bypass (contact dealer)</li> <li>c. Replace O Ring (contact dealer)</li> <li>d. Check settings and adjust if required.</li> </ul>
4. Will not draw regenerant or intermittent or irregular draw.	<ul style="list-style-type: none"> <li>a. Low water pressure</li> <li>b. Drain line restricted.</li> <li>c. Injector plugged.</li> <li>d. Injector defective.</li> <li>e. Flapper valve 2 &amp;/or 3 not fully closed.</li> <li>f. Air check prematurely closed.</li> </ul>	<ul style="list-style-type: none"> <li>a. Fit pump (contact dealer)</li> <li>b. Check the drain line is not blocked or kinked.</li> <li>c. Clean injector and screen.</li> <li>d. Replace injector.</li> <li>e. Remove debris, check flapper for closing or replace. (contact dealer)</li> <li>f. Put control into refill C8, replace or repair air check if needed. (contact dealer)</li> </ul>
5. System will not regenerate automatically.	<ul style="list-style-type: none"> <li>a. Power not connected.</li> <li>b. Defective motor</li> <li>c. Fouled or defective turbine</li> <li>d. Defective turbine cable.</li> </ul>	<ul style="list-style-type: none"> <li>a. Connect power.</li> <li>b. Replace motor. (contact dealer)</li> <li>c. Clean or replace turbine.</li> <li>d. Replace turbine cable.</li> </ul>
6. System regenerated at the wrong time.	<ul style="list-style-type: none"> <li>a. Settings incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>a. Correct settings.</li> </ul>
7. No conditioned water after regeneration.	<ul style="list-style-type: none"> <li>a. No salt in regenerant tank.</li> <li>b. Injector plugged.</li> <li>e. Air check closes prematurely.</li> </ul>	<ul style="list-style-type: none"> <li>a. Add salt to regenerant tank. (Salt must be above the water level)</li> <li>b. Clean injector and screen.</li> <li>e. Check connections for air leaks and check air check ball (255) floats. See also 1.e. &amp; 4.f.</li> </ul>
8. Backwashes at excessively low or high rate.	<ul style="list-style-type: none"> <li>a. Incorrect drain controller used.</li> <li>b. Debris affecting valve operation.</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace with correct size.</li> <li>b. Remove drain controller and clean. volume to correct setting.</li> </ul>

## System Troubleshooting

Problem	Possible cause	Solution
9. Valve will not draw brine.	<ul style="list-style-type: none"> <li>a. Low water pressure</li> <li>b. Drain line restricted.</li> <li>c. Injector plugged.</li> <li>d. Injector defective.</li> <li>e. Air check closes prematurely.</li> </ul>	<ul style="list-style-type: none"> <li>a. Fit pump (contact dealer)</li> <li>b. Check the drain line is not blocked or kinked.</li> <li>c. Clean injector and screen.</li> <li>d. Replace injector.</li> <li>e. Put control into brine draw C2 to check. Repair or replace if needed.</li> </ul>
10. Uses more or less salt than setting.	<ul style="list-style-type: none"> <li>a. Foreign matter in valve causing incorrect flow rates.</li> </ul>	<ul style="list-style-type: none"> <li>a. Remove brine control and flush out any debris. Put system through a regeneration to flush valve.</li> </ul>
11. No water flow display on metered valves.	<ul style="list-style-type: none"> <li>a. Bypass valve in bypass.</li> <li>b. Meter probe not connected to control or turbine housing.</li> <li>c. Restricted turbine rotation due to foreign matter in turbine.</li> </ul>	<ul style="list-style-type: none"> <li>a. Open bypass.</li> <li>b. Connect correctly.</li> <li>c. Remove and clean turbine, Turbine should spin freely, if not replace.</li> </ul>
12. Run out of conditioned water between regenerations.	<ul style="list-style-type: none"> <li>a. Improper regeneration.</li> <li>b. Incorrect regenerant setting.</li> <li>c. Incorrect hardness or capacity settings.</li> <li>d. Water hardness has increased.</li> <li>e. Restricted turbine rotation</li> </ul>	<ul style="list-style-type: none"> <li>a. Repeat regeneration after checking the correct regenerant dosage is set.</li> <li>b. Set correct salt setting.</li> <li>c. Set to correct values.</li> <li>d. Set hardness to new value.</li> <li>e. See 11.c</li> </ul>

### Notes:

**Notes:**

