Royal Water Softener

Product Manual

ULTRA SOFT

WATER SOFTENER SPECIALISTS

Identifying Your Softener

The Royal water softener is available with a number of different valve configurations, which will vary depending on your choice of softener. To identify which softener you have purchased please consult the product page and look for the 'specification' tab where all relevant valve information is displayed.

In some cases you will also find a label on the control valve which will list serial number, ID code and configuration code. This is read in order of vessel size, valve type and controller type (e.g. 0919-255-760 which indicates a 9" x 19" vessel with 255-760 valve and controller).

Valve Connections

255 Valve	Inlet ¾"	Outlet ¾"	Drain ½" Barbed	Overflow ½" Barbed
268 Valve	Inlet 1"	Outlet 1"	Drain ¾" Barbed	Overflow ½" Barbed

General Information

Power Requirement	240V (12V, 50Hz, 3 AMP Plug In Transformer Supplied)
Inlet Water Pressure	Min 20 PSI, Max 120 PSI
Working Temperature	Max 40° C (Protect From Frost)

Planning Your Installation

Please observe the regulations concerning the installation of your water softener. For guidance check out the water regulations advisory service web site (www.wras.co.uk). Check that you only have one rising main, that you have allowed space for access to the unit for possible future maintenance and salt replenishment. Check the water pressure; locate the rising main (stop cock), a drain facility and a power supply.

Unless you are replacing an existing water softener, this installation will require you to carry out plumbing work and may require an electrical outlet to be fitted near the softener. You should only attempt this if you have the necessary skills.

The softener may or may not be supplied with connection hoses, drain hoses or bypass valve sets. These are available to order separately if required from https://ultra-soft.co.uk/product/water-softener-installation-kits/

Positioning The Softener

Where possible the softener should be placed close to the rising main. Take care to allow hard water take off points for a drinking water facility and /or an outside tap.

The distance between the drain and the softener should be as short as possible. Ensure that both the drain and overflow will not freeze or reach a temperature above 40°C. If putting the softener within a cupboard ensure that the base is adequately supported. If the softener is being installed within your loft etc it is recommended to house the softener within a tank capable of storing at least 100 litres with an overflow fitted. The overflow on the tank should be below the softener overflow and be a minimum of ¾" in size.

Single Check Valve

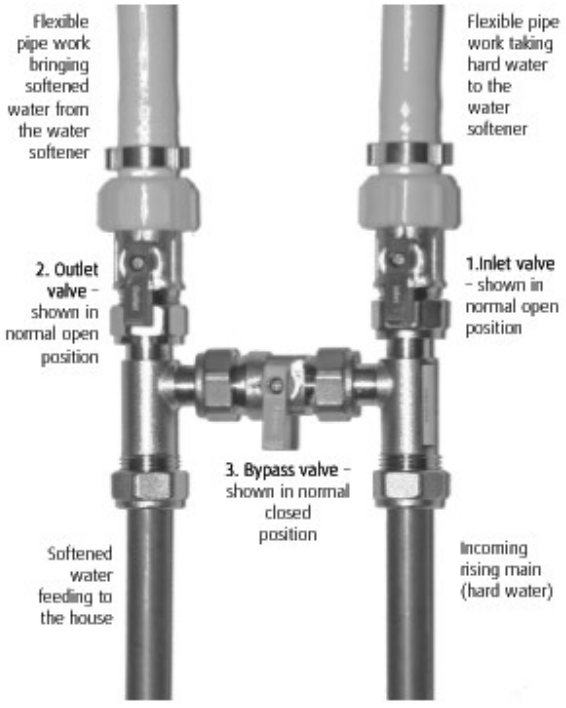
A suitable check valve should be fitted. This is usually inside the installation kit that can be ordered separately at https://ultra-soft.co.uk/product/water-softener-installation-kits/

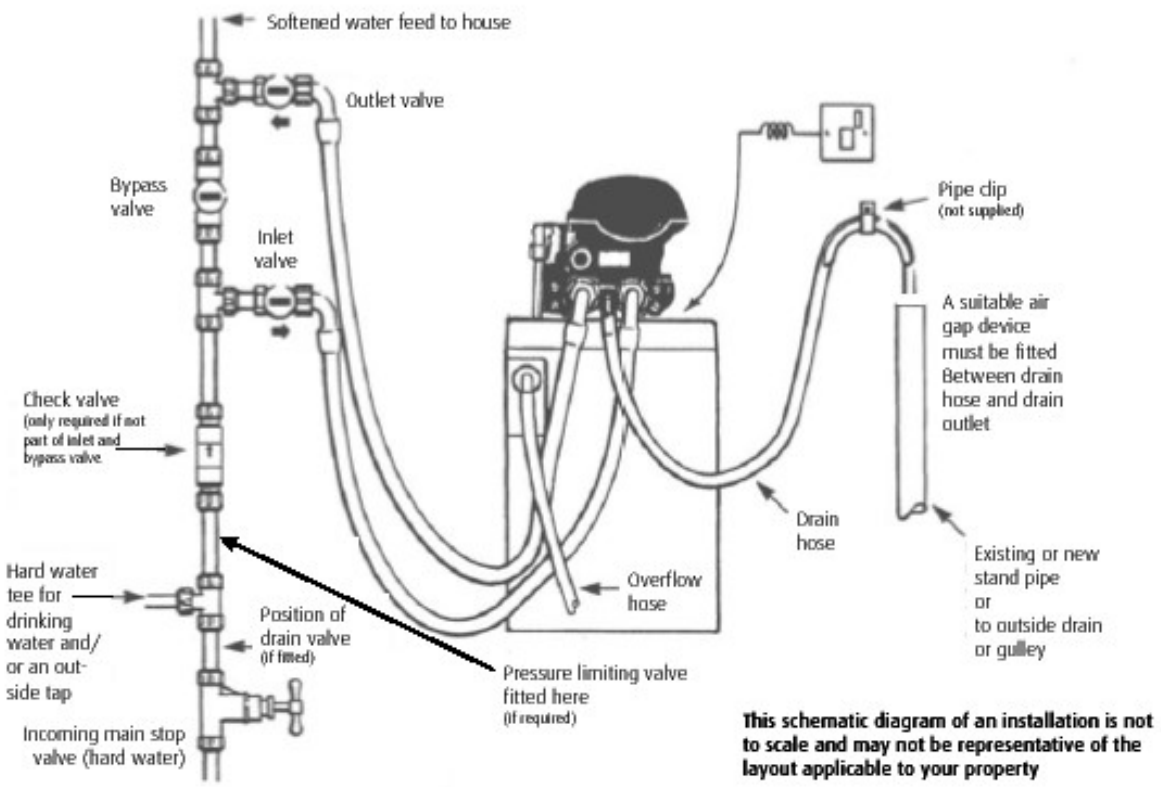
Before you start the installation make sure that you have all the necessary fittings. The purchase of one of our standard installation kits will normally ensure that you have everything that you need for a typical installation.

Water Pressure Test

It is important that a pressure test is carried out. High and low water pressure can result in either damage to or failure of the softener.

Although the water softener is tested to a pressure of 8 bar (120psi), we recommend the fitting of a pressure limiter should your pressure exceed 5 bar (70 psi). The minimum working pressure is 1.4 bar (20 psi).





Starting The Installation

Before starting the installation of the valves ensure that the stop cock is in the closed position. Once the valves have been fitted, set the valves as follows:

Softener Inlet and Outlet valve CLOSED

Bypass valve OPEN

You can now safely return the stop cock to the open position. Using the hoses provided (if installation kit ordered) connect the straight end of the hose having first inserted the washer provided to the softener inlet and outlet valves.

Connect the angled end of the hose to the softener. The inlets and outlets and drain are marked on the softener. Normally the softener tails are in a configuration of three with the centre being the waste outlet.

Waste Pipe Installation

Connect the waste pipe to the waste outlet on the softener and run the waste hose to either an up stand or outside drain, a minimum air gap of 20mm must exist at the end of the drain line. Softened water will have no adverse effect on a septic tank. Should you need to extend the drain hose this can be done by connecting to a 15mm copper tube for a maximum run of 8 meters with a minimum daytime pressure of 40 psi. Ensure that the drain hose is not kinked or obstructed in any way as this will lead to an overflow of the softener.

The drain pipe can run uphill to a max of 1 meter with a min water pressure of 40 psi

Overflow Connection

The overflow connection is the white ½" hose spigot on the rear or side of the cabinet. The overflow must be run downhill through an outside wall without kinks or restrictions. It is recommended the overflow hose be visible when it exits the outside wall.

Electrical Connection

Connect the transformer provided to a continuous electrical supply with the power off. Plug the flying lead from the transformer into the electrical connection on the controller (see programming instructions). Ensure the flying lead cannot get caught on the camshaft or any moving parts on the softener valve.

Preparing The Softener To Go Into Service

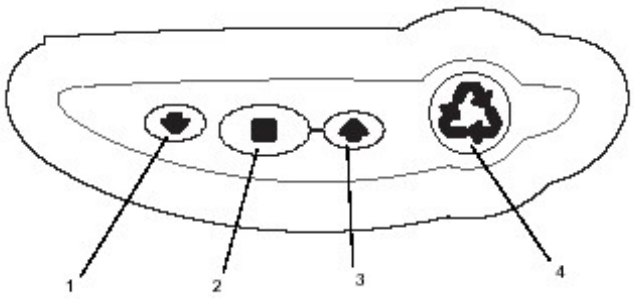
Now that all the connections have been completed, put approximately 5 litres of water into the brine tank. You may also at this point put a quantity of salt into the tank. Do not allow the salt level in the brine tank to exceed the height of the overflow. The amount of salt used will depend on the type and model of softener you have, you should never let the brine tank become completely empty of salt and it is advisable to check the salt levels on a regular basis until a usage pattern has been established, normally the salt level should be above the water line.

Putting The Softener Into Service

You should now complete any programming instructions that may apply to your particular softener. During the commissioning process and initial regeneration you can confirm that the unit has no leaks from the installed valves and that waste water runs freely. This regeneration will also assist in cleaning any potential air locks that may be present within the system. The regeneration will also reset any internal meter or timer devises that dictate the frequency of the regeneration cycle.

Quick Set Up Guide

Your softener 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, Day of Week and the Water Hardness where applicable. Please use this guide to help with initial programming – before starting please ensure the softener is connected correctly to the water, waste and power supply.



Button Descriptions

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 type (255 or 268). The valve type will be printed on the side of the valve or can be found on our website. On occasions the display may flash between the time and regeneration symbols, press the set button to clear this. During the set up process the display may revert to normal mode (after 25 seconds).

By repeatedly pressing the up or down arrow button you can scroll to the part of the set up programme you require. If you receive an ERR3 message allow the cam shaft to turn for a few moments and this code should disappear. If the cam does not move check that the cam shaft is fitted correctly and that the optical sensor is 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.

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Salt Setting

The system should have been pre-programmed to the required setting but may need altering or resetting, the default amount is 110 grams/Ltr. To reset this press the set button to start the display flashing and adjust the setting using the up and down arrows to the correct setting. On the 740 and 760 controllers you have options of S, L or H.

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.

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 (760 And 762 Controllers Only)

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. Not adjustable on the 740 or 760 controllers.

Normal Valve Operation

During normal valve operation the 740 and 742 will display the time of day, the 760 will alternate between the time of day and volume of water remaining in cubic meters before regeneration. The 762 will display the current water flow and remaining capacity before regeneration.

Commissioning The Softener

Open the outlet from the softener, press and hold the regeneration button (4) until the cam starts to rotate, when the cam stops moving open the inlet to the softener slowly until it is about a quarter open. Water will start flowing into the softener and start purging the air from the system, you will hear the air coming out and eventually water will begin to run steadily from the drain line; you can now fully open the inlet valve to the softener. Advance the regeneration cycle to the (refill) position C8; do this by pressing the set button and up arrow together at the same time and letting go, this advances the cycle to the next position, repeat this until you reach C8. Now allow the valve to continue on it's own to the end of the cycle, this will purge air from the regenerant line and put the correct amount of water into the salt chamber for its first regeneration.

Finally turn on a tap close to the softener and run the water, you may find there is some colouration in the water; this will clear after a short while and is normal. Your softener is now supplying soft water to your home, please bear in mind it may take some time to reach all of the outlets in your home. It is advised to instigate a delayed regeneration for the first night (as outlined below).

Initiating A Manual Regeneration

There are two different types of manual regeneration - either immediate or delayed.

Immediate Regeneration

To perform an immediate regeneration you need to press and hold the regeneration button for around five seconds until the cam starts to move and the egg timer shows on the screen.

Delayed Regeneration

Quickly press and let go of the regeneration button once. The regeneration symbol will appear and flash on the display. A single regeneration will start at the default or pre set regeneration time, if you wish to cancel this delayed regeneration quickly press the regeneration button again an the symbol will disappear from the display.

Resetting The Valve Programming

Occasionally it may be necessary to reset the valve to factory defaults. The programmed valve type can be checked by pressing and holding the SET and DOWN buttons simultaneously for 5 seconds. H0 and a volume is displayed e.g. H0 100, the valve has been set as a softener. If in doubt please get in touch with a member of our team.

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

The valve type will now be shown e.g. 255, 268. Choose the correct valve (255 or 268) and press the SET button. Three dashes will now show on screen, this is the volume and should be set accordingly using the up and down arrows set the amount applicable to your system.

Troubleshooting

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

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 be 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 adaptor for either 50 or 60 Hz power.
ERR 3 is displayed	Controller does not know the position of the cam shaft. Cam shaft 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 which indicates the motor is running.
	Cam shaft is not turning during ERR 3 display.	Check that the 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 the motor gear is engaged with the cam gear. If everything is connected replace in order of wire harness, motor, optical sensor, controller.

	If the camshaft is turning for more than five minutes to find home position.	Verify that the optical sensor is in place and connected to the harness. Verify that the camshaft is connected correctly. Verify no debris 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.
Regenerant tank overflow	A. Drain line restricted B. Uncontrolled refill flow rate C. Air leak in regenerant line D. Drain control clogged with resin or other debris E. Sinking air check ball (255 only) F. Incorrect drain control fitted G. Regenerant valve disc 1 being held open H. Valve disc 2 not closed during regenerant draw causing a refill	A. Check drain line is not blocked or kinked B. Remove refill flow control to clean ball and seat C. Check all connections in regenerant line for leaks D. Clean drain control E. Replace air check ball F. Too small a drain control with a larger injector may reduce draw rates G. Remove obstruction H. Remove obstruction
Water flow from drain or regenerant line when in service	A. Flapper valve return sprint weak B. Debris stopping flapper valve from closing	A. Replace valve spring B. Remove debris
Hard water after regeneration	A. Incorrect or failed regeneration B. Leaking external bypass valve C. O-Ring around riser damaged D. Capacity too low due to incorrect setting	A. Repeat regeneration after checking settings B. Replace bypass C. Replace O-Ring D. Check settings and adjust if required
Will not draw regenerant or intermittent or irregular draw	A. Low water pressure B. Drain line restricted C. Injector plugged D. Injector defective E. Flapper 2 or 3 not fully closed F. Air check permanently closed	A. Fit a pump B. Check drain line is not blocked or kinked C. Clean injector and screens D. Replace injector E. Remove debris, check flapper for closing or replace F. Put control into refill C8 and replace or repair air check valve if needed

System will not regenerate automatically	A. Power not connected B. Defective motor C. Fouled or defective turbine D. Defective turbine cable E. Turbine cable not positioned correctly	A. Connect power B. Replace motor C. Clean or replace turbine D. Replace turbine cable E. Push sensor into housing fully until clicks into place
System regenerated at wrong time	Check settings are correct	Correct settings
No conditioned water after regeneration	A. No salt in brine tank or level too low B. Injector plugged C. Air check closes prematurely	A. Add salt to regenerant tank, level should always be above water level B. Clean injector and screen C. Check connections for air leaks and check air check ball (255) floats
Backwashes at excessively low or high rate	A. Incorrect drain controller used B. Debris effecting valve operation	A. Replace with correct size B. Remove drain controller and clean volume to correct setting
Valve will not draw brine	A. Low water pressure B. Drain line restricted C. Injector plugged D. Injector defective E. Air check closes prematurely	A. Fit a pump B. Check drain line is not blocked or kinked C. Clean injector and screen D. Replace injector E. Put control into brine draw C2 to check, repair or replace if needed
Uses more or less salt than the setting	Foreign matter in valve causing incorrect flow rates	Remove brine control and clean out any debris. Put system through a regeneration cycle to flush valve
No water flow display on metered valves	A. Bypass valve in bypass B. Meter probe not connected C. Restricted turbine rotation due to debris	A. Open bypass B. Connect correctly C. Remove turbine and clean, turbine should rotate freely. If not replace turbine
Run out of conditioned water between regenerations	A. Improper regeneration B. Incorrect regeneration setting C. Incorrect hardness or capacity settings D. Water hardness has increased E. Restricted turbine rotation F. No or not enough salt in cabinet	A. Repeat regeneration after checking the correct regenerant dosage is set B. Set correct salt setting C. Set to correct values D. Set hardness to correct value E. Remove turbine and clean F. Salt level should be above the water level