

SINGLE 42 - 63" WATER SOFTENER & NHWB OPTION

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Freecall 1800 656 771
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INSTALLATION RECORD

S-42-WS, S-48-WS, S-63-WS with optional No Hard Water Bypass (NHWB)

Please complete the following as a record for Warranty & Service purposes.

SOFTENER MODEL:

SERIAL NO.:

PURCHASED FROM:

PURCHASE DATE:

DATE INSTALLED:

INSTALLED BY:

COMPANY:

CONTACT:

HARDNESS SETTING:

VOLUME OF WATER BETWEEN REGENERATION SETTING (M³):

This product is to be installed by suitably qualified personnel only. Please review this manual thoroughly before installing your water softener. For correct installation, follow the recommended steps and guidelines. If at any stage of installation, you are unsure of how to proceed, please call our technical team on AU 1800 656 771 for NZ 0800 721 447 for further information.

ABOUT

COMPONENTS OF THE WATER SOFTENER

Please familiarise yourself with the components of your Water Softener

Pressure Vessel (Media Tank)

Wave Cyber pressure vessels have a one-piece HDPE liner with a FRP filament winding outer shell.

The pressure vessel houses both the resin media and the distributor system.

Resin Media

Lewatit high quality food grade monodisperse cation (softener) resin.

The uniform bead size delivers optimum performance in capacity, flow rate and salt consumption per regeneration with higher chlorine resistance for longer operational life.

Water Softener Salt

Premium-grade kiln dried water softener salt.

This salt is specifically manufactured for water softeners giving a clean, maximum salt per kg weight and consistent grain size for efficient brining.

Underbed Gravel

Graded and washed gravel is the support media for the softener resin.

It also helps to distribute an even water flow through the media tank during service and regeneration/backwash.

Control Valve

Clack Automatic 5 Cycle, this controls the cycles of the softener operation.

The valve is microprocessor controlled and monitors water usage. The valve automatically initiates the regeneration of the media based on volume throughput prior to running out of soft water.

Brine Tank

Clack blow-moulded high density polyethylene tanks are chemical resistant with UV inhibitors.

The brine tank houses the brine well, brine valve/pick-up tube, kiln dried water softener salt and the brine solution.



How does your Water Softener work?

WATER HARDNESS

The principal hardness minerals, calcium and magnesium, accumulate as a white scale. This can be found in plumbing fixtures and fittings, jugs, heat exchangers, boilers, steam equipment and on shower screens and glassware. Removing the scale delivers better use of energy, lowers running and maintenance costs, reduces cleaning products while providing improved laundry, dishwashing and protection for water-contact appliances.

FUNCTION OF A WATER SOFTENER

The softener exchanges harmful hardness ions for harmless sodium ions, leaving soft water. A special softener resin is the exchange media and the softener salt is the regenerant. When the resin becomes laden with hardness ions the softener regenerates using a brine solution (sodium chloride + water).

During regeneration the high concentration of sodium ions introduced will dislodge and replaces the hardness ions while flushing the harmful hardness and chloride ions to drain.

When the process is complete the softener is regenerated and ready to supply soft water again. Twin-tank softeners comprise a large capacity brine tank, and a tall resin tank for increased exchange capacity with a large void space for efficient backwash and brining. All functions are fully automatic with only a periodic top-up of water softener salt required.

NOTE: At NO time during service or regeneration is the brine solution in contact with the treated/non-treated water to service.

WHAT CONTROLS THE REGENERATION?

The microprocessor demand control valve controls the regeneration. The hardness level and resin capacity of the softener are programmed into the control which then calculates the amount of soft water the softener can supply before a regeneration is required. The valve includes an in-built water meter that, with the control, monitors actual water flow and usage.

The control automatically initiates a regeneration at a pre-set time when the calculated soft water volume is reached. The microprocessor monitors high and low usage patterns and automatically adjusts the capacity to ensure the water remains soft until the next regeneration. The control features a safe 24-volt DC power from the wall-mounted transformer supplied.

WHAT ARE THE STAGES OF THE BACKWASH CYCLE?

1st Stage - Service Position

In this position the softener delivers soft water for usage.

Note: The softener is in this position prior to commencing the backwash cycle.

2nd Stage - Backwash Position

The water flow is reversed to lift and wash the resin bed clean of entrapped sediment and particulate matter prior to brining.

3th Stage - Brine Position

The softener valve draws in brine solution from the brine tank to regenerate the softener resin.

4th Stage - Fast Rinse Position

The softener fast-rinses the resin bed to remove residual brine solution.

5th Stage - Brine Refill Position

The softener valve refills the brine/salt tank with sufficient water to make brine for the next regeneration.

The regeneration cycle is now complete.

Note: All the functions of your softener are fully automatic.

General Specifications

Minimum operating pressure	210 kPa (30psi)
Maximum operating pressure	700 kPa (100psi)
Maximum & maximum operating temperature	5°C to 43°C
Inlet & outlet connections	80mm BSPF
Valve drain fitting	80mm BSPF
Mains power requirement	240 Volt, 10 amp
Control valve power	24 Volt DC supplied by wall mount transformer
Transformer output current	800mA

MODEL	CONTINUOUS SERVICE FLOW RATE	PEAK SERVICE FLOW RATE	BACKWASH FLOW RATE
S-42-WS & NHWB	583 lpm	875 lpm	224 lpm
S-48-WS & NHWB	733 lpm	1100 lpm	292 lpm
S-63-WS & NHWB	1167 lpm	1300 lpm	504 lpm

INSTALLATION & OPERATING WARNINGS



CAUTION!

The softener is NOT designed to remove microbiologically unsafe contaminants from the water supply. If the water is for potable and/or food process use it should be disinfected prior to use.

The exchange process partially increases the sodium level in the softened water. If you are sodium intolerant or on a sodium-free diet please contact Southland Filtration for further information.



IMPORTANT! FAILURE TO COMPLY COULD VOID WARRANTY

1. All plumbing must conform to Australian Standards guidelines and Local Council regulations.
2. For softeners subjected to permanent hydrostatic pressure an integral non-testable backflow prevention device should be fitted in the inlet line. This should be in accordance with AS3500.1 and complying with AS 2845.1 Clauses 3.6.3, 3.6.4, 7.3.1 and 7.3.3.
3. For softeners subject to hydrostatic pressure greater than 700 kPa a suitable pressure control device should be fitted in the supply line.
4. Where the hot water system is a mains-pressure storage type, a cold water relief valve of suitable rating should be fitted (if not already installed), between the non-return valve and the cold water inlet of the hot water system.
5. For installations subject to excessive or prolonged water hammer, a water hammer arrestor should be fitted
6. Waste connections should comply with minimum air gap requirements as per AS3500.1, Table 4.5.



IMPORTANT! FOR TANK FILLING OR OPEN-DISCHARGE APPLICATIONS ONLY

The automatic control valve must have a positive back pressure during the regeneration or backwash cycle to ensure effective operation and prevent untreated water going to service. If using the softener/filter to fill a storage tank (or any other open-discharge application) a 'No Hard Water Bypass Valve' must be used. (Refer Fig. A)

Note: Softener/Filter Models with 'NHWB' suffix include bypass option.

Fig. A No Hard Water Bypass valve(NHWB)



Fig. B Typical NHWB Plumbing

If there is any step or parts you are not sure of during installation please do not hesitate to contact Southland Filtration for clarification to avoid incorrect installation.

INSTALLATION & OPERATING CHECKLIST

Note: These softeners are a side-mounted valve system. All functions and performances are the same as a top-mount system with the exception of the control valve mounting position. (Refer Fig. C).

Step One: Locate the Softener

1. It is advisable to locate the softener in a protected environment. If the unit is to be installed outside, or in the open, a protective shelter or shed is recommended.
2. The distance between the softener and a drain or waste outlet should be less than 6 metres
3. The brine tank should be located on the same level and as close as possible to the softener for easy access to facilitate salt refilling and servicing.
4. Hot water can severely damage the softener. If installing near a hot water service ensure a minimum of 2 metres of piping between the outlet of the softener and inlet of the heater to help avoid heat transfer. Ensure a non-return valve on the inlet of the hot water system is present and functional.
5. Do NOT install softener where it or its connections (including drain and overflow lines) will ever be subjected to ambient temperatures under 1°C or over 49°C.
6. Do NOT install softener near chemicals or chemical fumes.
7. The softener will require a standard 3-pin, 240-volt 10-amp grounded power outlet.
8. If the softener is to be installed outside or where the sunlight hits the POD (LCD display) it is recommended to cover, move or mount the POD out of the direct sunlight to protect the LCD display and electronics. (Refer Fig. D).
9. An approved inlet isolation valve (not supplied) is recommended to be installed on the inlet line.

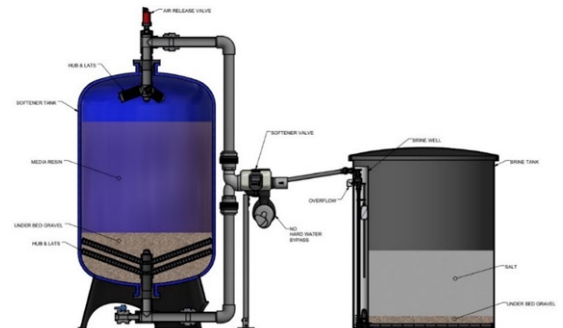


Fig. C

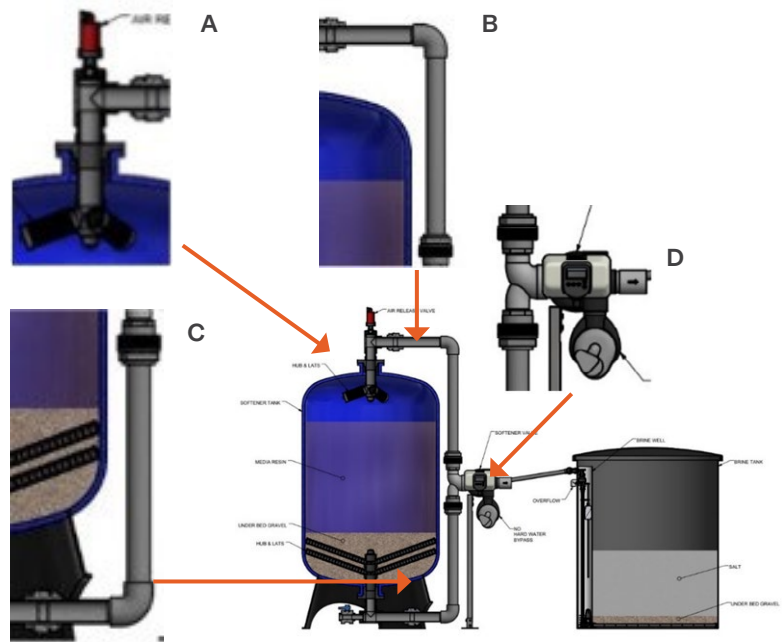


Fig. D

Note: For shipping purposes the softener is transported in Kit form which will require some onsite plumbing and component assembly.

The kit includes:

- A. Top Mount Hub & Lat assy./Flange and Air Release.
- B. Top Side Mount Plumbing assy.
- C. Bottom Side Mount Plumbing assy.
- D. Side Mount Valve Plumbing assy.



Step Two: Softener Assembly & Media Loading

- Note:** All PVC plumbing connections will be marked A – A, B – B, C – C etc. for identification and reconnection.
- Position the softener media tank (pressure vessel) in the selected location allowing room for the brine tank.
- Connect the bottom side mount plumbing assembly (C) to the outlet at the bottom of the media tank (pressure vessel). (Refer Fig. E).
- Reposition the tank so that the pipework is exiting on the right hand side and square to the tank.
- Connect the valve side mount adaptor (Fig. F) to the bottom pipe assembly (C) making sure it's right side up. The adaptor is marked 'Top of Tank' & Bottom of Tank. (Refer Fig. F & D)

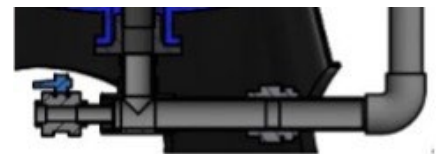
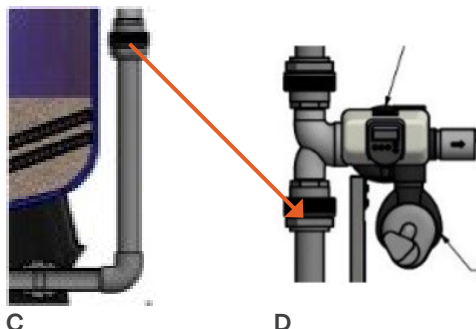


Fig. E



Fig. F



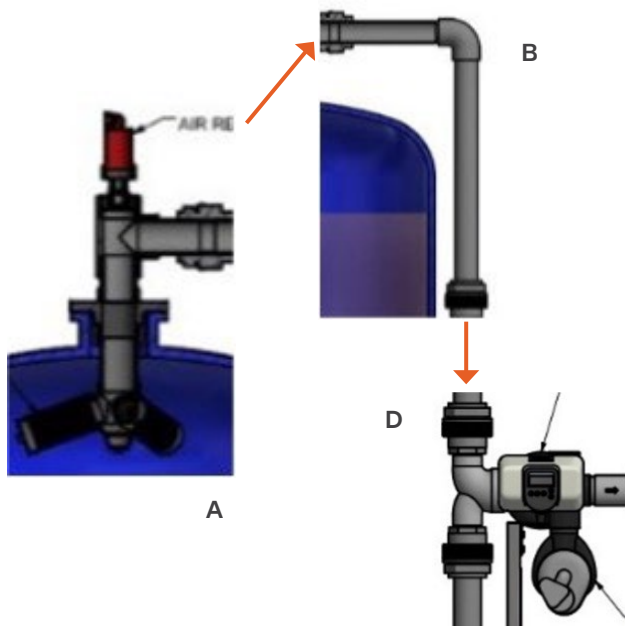
C

D

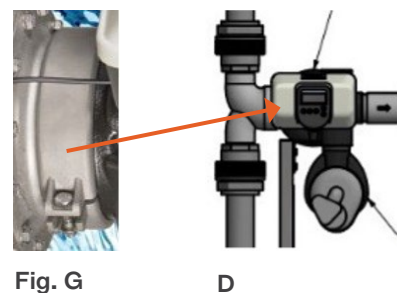
6. Install the hub & lat plumbing assembly into the top of the media tank and line up the bolt holes so that the pipe will line up with the side mount adaptor. Fix with only 3 bolts as it will be removed to install the media. (Refer A).

Note: The three lateral screens are not fitted at this stage. →

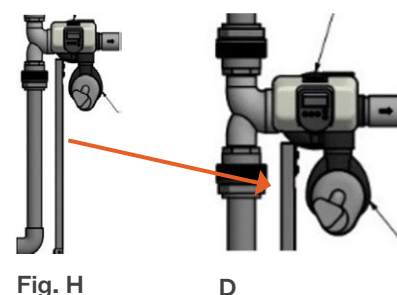
7. Connect the top side mount plumbing assembly (B) to the valve side mount adaptor and the hub & lat assy. (Refer A & D).



8. Attach the control valve to the valve side mount adaptor and secure with the 'C' clamp (Fig. G) by tightening the bolts. (Refer G & D)



9. Attach the side mount support bracket (Fig. H) to the valve. (Refer H & D).



Step Three: Water Line Connection

1. Check that all tank plumbing is correct and ensure the inlet, outlet and drain connections are lined up for the final plumbing.
Note: Once you start loading the media you will not be able to reposition the media tank.
2. Inlet and outlet pipework should be 80mm minimum. Isolation valves (not supplied) should be installed in the incoming and outgoing lines (NOT the Drain line). A full bypass line with isolation valves is recommended to ensure ongoing water supply during servicing and maintenance. (Refer Fig. I)

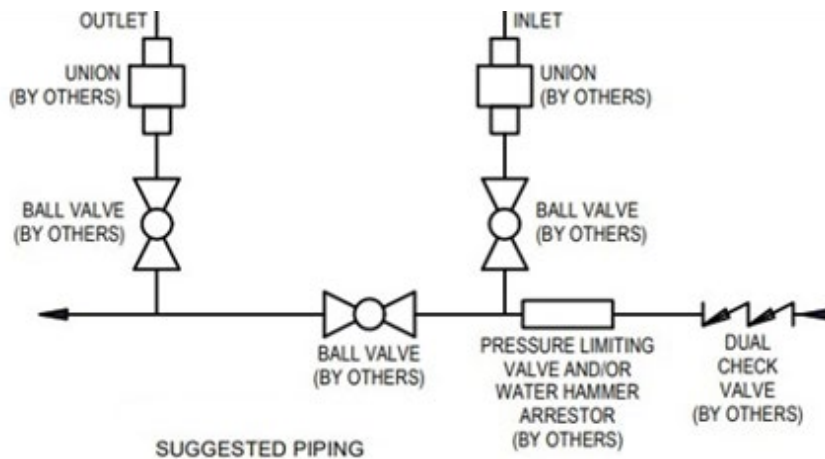


Fig I. Typical manual bypass plumbing setup.

3. Plumb the incoming hard water (Raw Feed) line to the inlet on the top of the valve and the treated water (service) line to the outlet on the bottom of the valve. Flow direction arrows are on the valve connections to show the correct flow. (Refer Fig. J.)

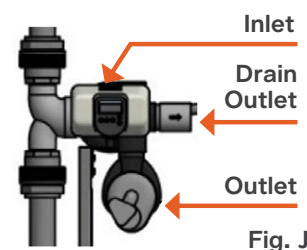


Fig. J

4. The valve outlet will be either the water meter (Fig. K) facing down or horizontal if the valve is fitted with a NHWB. (Refer Fig. L)

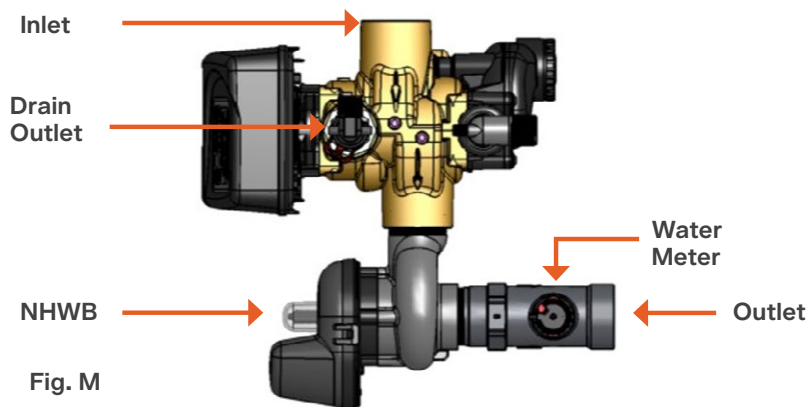


Fig. K



Fig. L

This is a side view of the valve with the NHWB and the water meter Fitted. (Fig. M)



5. 5. If ideally located, the softener will be above, and not more than 6 metres from the drain. The drain line must be a minimum pipe size of 80mm PVC pipe. Note: It is recommended to have a piece of clear PVC pipe (approximately 500mm) incorporated in the drain line to observe the clarity of the wastewater going to drain.
6. 6. Connect the drain line to the outlet of the DLFC (Fig. N) which is fitted in the drain outlet. (Refer Fig. M)
7. 7. If the drain line, drain, sewer line or trap is higher than the control valve drain outlet contact Southland Filtration for connection suitability and/or advice.
8. **DO NOT** plumb the drain line direct into a drain, sewer line or trap. Always allow an air gap between the drain line and the wastewater (Fig. O) to prevent the possibility of a vacuum in the pressure vessel or sewage being back-siphoned into the pressure vessel.

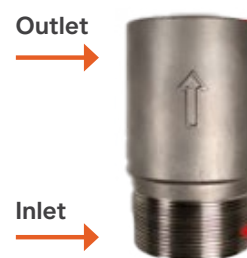
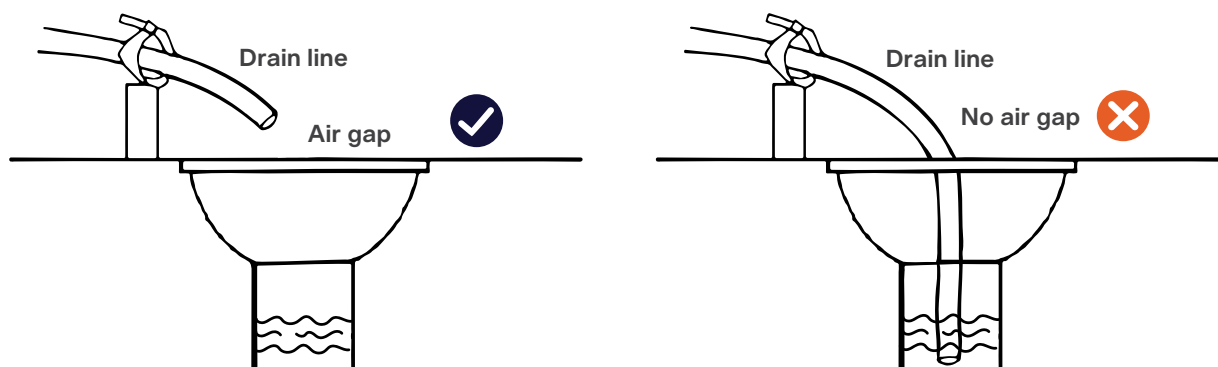


Fig. O



Step Four: Media Loading

1. When all the plumbing is completed and secure remove the top hub & lat plumbing assembly to access the media tank (pressure vessel) for media loading. (Refer Fig. O)
2. Fill the media tank (pressure vessel) approximately 1/3rd with water to prevent damage to the bottom hub & lateral (distributor assembly) in the bottom of the tank when pouring in the gravel.

Note: Use a suitable funnel for pouring the media into the tank.

3. Refer to the table below for the amount of media required for your model. Check you have the correct quantities before commencing. Load the underbed gravel first, followed by the softener resin.

Sequence is: # 5 Gravel, then # 6 Gravel then the Resin media.

Note: You will have 200kg of # 4 Gravel, this is for the brine tank which will be installed at a later stage. (DO NOT get this mixed up with the other gravel)



Fig. P



Pressure Vessel
(Media Tank)

Funnel

Table 1

MODEL	UNDERBED GRAVEL #5	UNDERBED GRAVEL #6	RESIN LITRES
S-42-WS + NHWB	400kg	100kg	875L
S-48-WS + NHWB	480kg	140kg	1100L
S-48-WS + NHWB	1000kg	240kg	1750L

4. When all the media is loaded clean any media from the flange and the top of the media tank.
Note: To prevent any accidents and/or injury, clean up any spilt media on the ground around the media tank – this can be very slippery!
5. Find the hub and lateral components to assemble for completion and reinstallation of the hub & lat plumbing assembly. (Refer Fig. P).
6. Screw the PVC pipe into the hub hand tight. (This may already be installed.)

7. While holding the hub and pipe in the media tank with one hand, screw in a lateral with the other hand, hand tight.

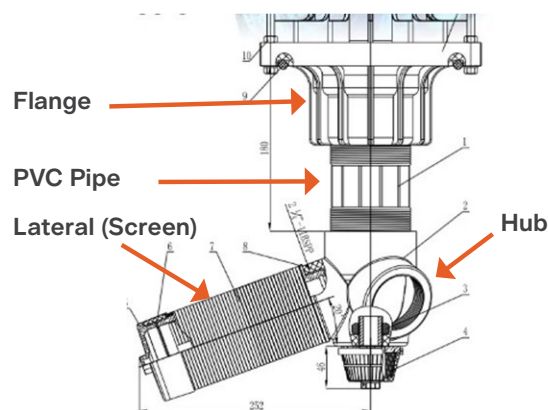


Fig. Q

8. Repeat step 7 for the other two screens
9. Using a strap/rope hold up the hub & lat to the top of the media tank so you can hold the pipe firmly to screw on the flange assembly hand tight.
10. When the hub & lat is fully assembled bolt securely into position using all bolts supplied.
Refer to Fig. R for tightening sequence.
11. Reconnect the PVC barrel union on the top side mount plumbing assembly.
12. Do a final check on all unions and connections.

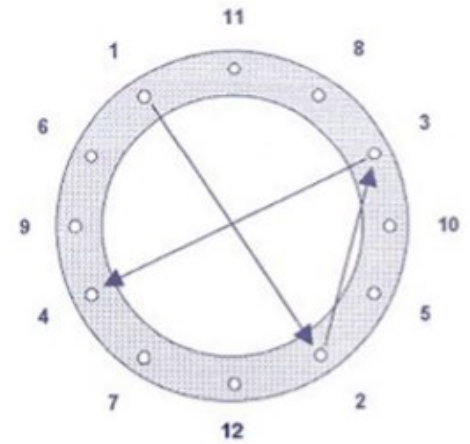


Fig. R

Please use the star tightening sequence as shown above when tightening the bolts on the flange adapter.

Step Five: Brine Line Connection

1. As most sites vary in space and equipment positioning, the brine draw plumbing is NOT preassembled. We do supply a length of PVC pipe and fittings so it can be plumbed onsite.
2. Position the brine tank as close as practical to the softener media tank. (Within 1 metre is preferred)
3. The brine valve connection on the control valve is 25mm PVC solvent weld which the pipe and fittings supplied are compatible. Make sure you use a primer to clean the pipe and fittings prior to assembly. (Refer Fig. S).

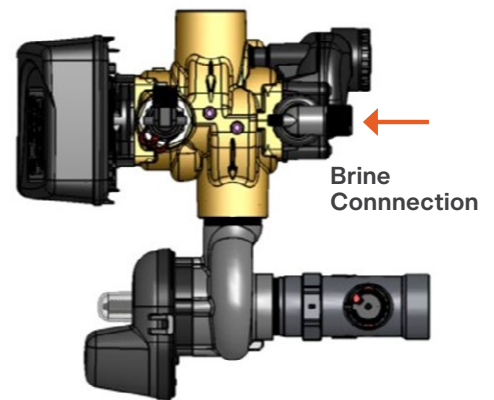


Fig. S

4. The brine valve connection is the same as the connection on the control valve. (Refer Fig. T).
5. 90° and 45° bends have been supplied, use the 45° bends where possible. Also a barrel union is supplied so that the pipe can be installed more easily and disassembled for maintenance.

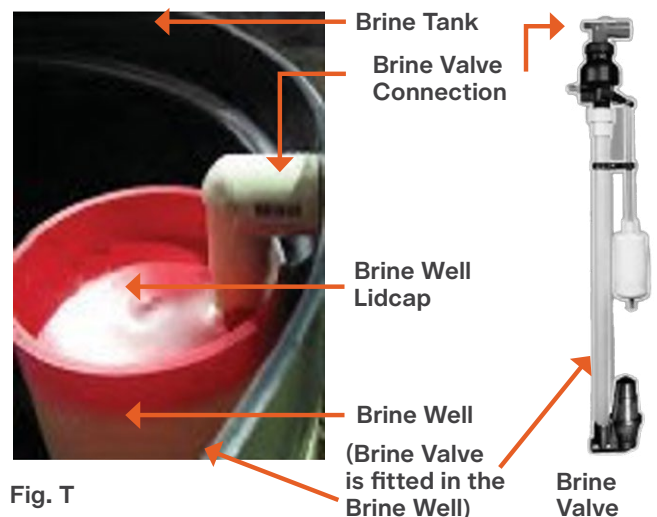


Fig. T

6. **DO NOT** plumb the drain line direct into a drain, sewer line or trap. Always allow an air gap between the drain line and the wastewater (Fig. L) to prevent the possibility of a vacuum in the pressure vessel or sewage being back-siphoned into the pressure vessel.

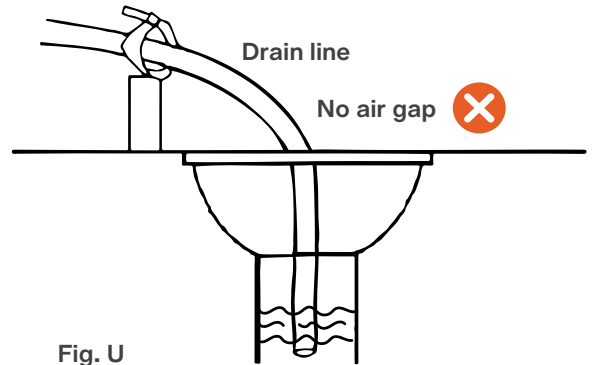


Fig. U

7. Connect a 25mm (1") hose onto the overflow elbow on the side of the brine tank (Fig. V). The hose should run to drain. Allow an air gap between the hose end and the drain as per (Refer Fig U). **NOTE:** Do not join the overflow tube into the drain line.
8. When the brine tank is in position and connected load the #4 Gravel supplied (200kg) into the brine tank. **NOTE:** Ensure no gravel gets into any in the brine well and level.



Fig. V

Control Board Connections

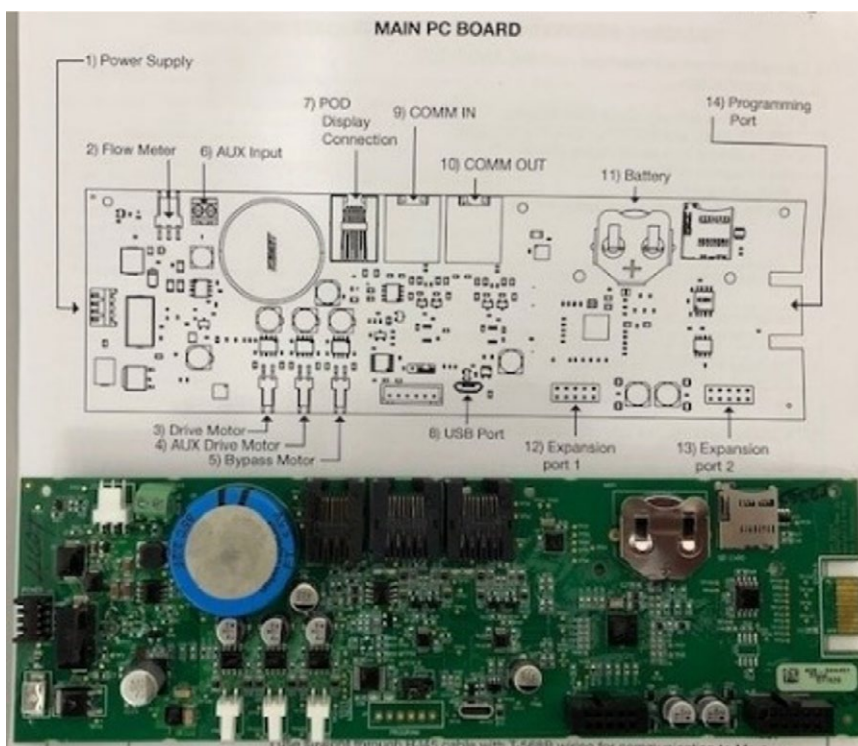


Fig. W

Button Function and Programming Key Sequence

●
STANDBY

Standby LED

- Signals that a unit is not in service, or regen
- Flashes to alert status conditions
 - 1 per second indicates flow had been detected while the unit was offline

●
ON LINE

Online LED

- Signals that a unit is currently in service

●
REGEN

Regen LED

- Signals that a unit is currently in regen



Set clock from User Screens

Exit and save from setup or program screens

Move to the next display

Change variable being displayed

Toggles scheduled regen time on/off. Holding for >3 sec. starts Immediate regen (Immediate regen is the only option if set to Immediately regenerate upon 0 gallons). Moves back one display while in program mode.

Reset

Holding for >3 sec. initiates a reset. The software version is shown and the piston returns to the "home" position, re-synchronizing the valve.

System Start-up

The final steps before putting the softener into service:

- Set the actual time of day into the control valve.
- Regenerate the softener.

4. Time of day should only need to be set after power outages lasting more than 8 hours, if the battery has been depleted and a power outage occurs, or when daylight savings time begins or ends. If a power outage lasting more than 8 hours occurs, the time of day will flash on and off which indicates the time of day should be reset. If a power outage lasts less than 8 hours and the time of day flashes on and off, the time of day should be reset and the battery replaced. (Refer Fig. N)

Step Seven: Initial Start Up

1. Make sure the inlet isolation valve is closed.
2. Close the outlet valve on the bypass or outlet isolation valve if NO bypass is installed.
3. Press and hold the REGEN button for three seconds until the drive motor starts. (Refer Fig. M)
4. When the drive stops the valve will be in backwash, next turn the power OFF.
5. Open the inlet water supply valve very slowly to allow water to fill the media tank to expel the trapped air. CAUTION: If water flows too rapidly, there could be a loss of media out of the drain.
6. When the water is flowing steadily to drain without the presence of air, fully open the inlet valve and turn the power back ON.
7. Press the REGEN button once to forward the valve to Brine Draw position. When the drive stops wait 1 minute and press the REGEN button again.
8. When the drive stops it will be in the Fast Rinse position. Wait 1 minute and press the REGEN button again.
9. When the drive stops it will be in the 2nd Backwash position. Wait 1 minute and press the REGEN button again.
10. When the drive stops it will be in the 2nd Fast Rinse position. Wait 1 minute and press the REGEN button again.
11. When the drive stops it will be in the Brine Refill position. Check that there is water being put into the brine tank. NOTE: Depending on the brine tank you may need to look in the brine well.
12. Allow the softener to automatically complete the cycle and return to Service.
13. Put the bypass valve into the service position and/or open the outlet isolation valve.
14. The Water Softener is now in service and ready to supply softened (treated) water.

Immediate Regeneration Feature

1. An immediate regeneration can be initiated at any time by pressing and holding the REGEN button for 3 seconds.
2. A regeneration can be set to regenerate at the pre-programmed time by pressing the REGEN button once and letting go. (Refer Fig. X)



Fig. X

Regeneration
Button

Step Eight: Load Salt

Check that the softener has put water into the brine tank at the end of the regeneration.

Pour softener salt into the brine tank (Fig. P). A minimum of 10 bags of salt is required.

NOTE: Do NOT fill salt above the top of the brine well.

Load salt to recommended level of approximately 300mm above the brine (water) height. **NOTE:** The level will change as you add the salt.

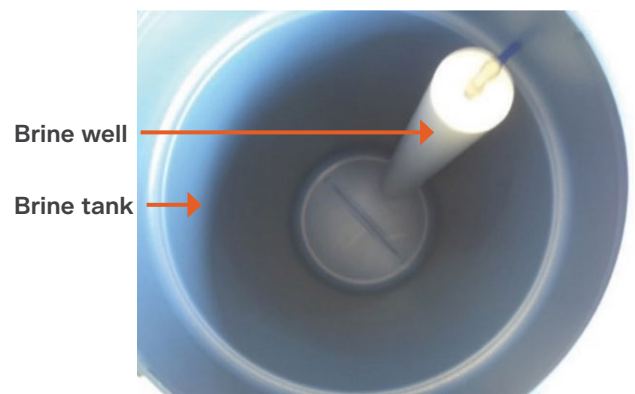


Fig. Y

INSTALLATION IS NOW COMPLETE

Owner Operator Screen Displays

TYPICAL USER SCREENS



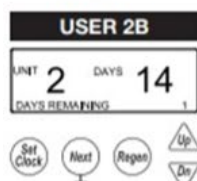
USER 1 - Capacity Remaining

- Displays the units current capacity remaining
- This screen does not display on units with volumetric capacity turned off
- Can be manually decremented by holding the down arrow



USER 2 - Days Remaining, Single Unit

- Displays a single units days until a regeneration, based on the day override setting
- This screen does not display on units with day override turned off
- On systems the LEAD unit displays the days remaining on the lead unit
- Days can be manually reduced by holding the down arrow



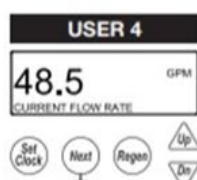
USER 2B - Days Remaining, System

- The LEAD in a system displays the days until a regeneration, based on the day override settings.
- The displays also indicates which unit the day over ride is currently pertaining to
 - Series regen systems do not display a unit as they will regenerate all units sequentially



USER 3 - Time

- Displays the current date and time of day



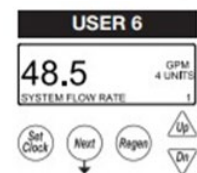
USER 4 - Flow Rate, Unit

- Displays that units current flow rate



USER 5 - Volume Totalizer, Unit

- Displays the total volume since install / reset
- Re-settable to zero, while in this screen, by holding the "Set Clock" & "Regen" buttons



USER 6 - Flow Rate, System

- Displays the current combined flow rate of all the units in the system
- This screen does not display on single tank units, or systems with volumetric capacity turned off



USER 7 - Volume Totalizer, System

- Displays the total volume of the system since install / reset
- Re-settable to zero, while in this screen, by holding the "Set Clock" & "Regen" buttons
- This screen does not display on single tank units

TO USER 1

MAINTENANCE

Hardness test

A hardness test is supplied with your softener. It is a simple colour change test to determine if the softener is delivery soft or hard water.

PROCEDURE

1. Open the nearest tap after the softener.
2. Allow water to run for at least 30 seconds.
3. Half fill the plastic tube with water.
4. Add one YES/NO tablet to the sample water and shake until the tablet has fully dissolved.



Hardness Test Kit

RESULTS

If the water sample turns GREEN, the water is soft and the softener is functioning correctly

If the water sample turns RED, the water is HARD. Regenerate the softener and re-test the water. If it is HARD refer to the Softener Troubleshooting Guide following.

FAQs and Troubleshooting

TC control valves do not have meters so shaded areas are not applicable for TC control valves

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Timer does not display time of day.	a. Power Adapter unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective Power Adapter	c. Replace Power Adapter
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day. If battery is present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	c. Defective PC board.	c. Replace PC board
3. Display does not indicate water is flowing. Refer to user instructions for how the display indicates water is flowing.	a. Bypass valve in bypass position	a. Put bypass valve in service position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Meter not installed	f. Install meter
	g. PC board incorrectly programmed	g. Refer to programming instructions
4. Control valve regenerates at wrong time of day	a. Power outages	a. Reset time of day. If battery is present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration incorrect	c. Reset regeneration time
	d. Control valve set at "on 0" (immediate regeneration)	d. Check control valve set-up procedure regeneration time option
	e. Control valve set at NORMAL + on 0 (delay + immediate regeneration)	e. Check control valve set-up procedure regeneration time option

PROBLEM	POSSIBLE CAUSE	SOLUTION
5. Control valve stalled in regeneration	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective Power Adapter	c. Replace Power Adapter
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerant piston	g. Replace main or regenerant piston
6. Control valve does not regenerate automatically when the correct button(s) is depressed and held. For TC valves the buttons are UP and DOWN. For all other valves the button is REGEN.	a. Power Adapter unplugged	a. Connect Power Adapter
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap assembly	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
7. Control valve does not regenerate automatically but does when the correct button(s) is depressed and held. For TC valves the buttons are UP and DOWN. For all other valves the button is REGEN.	a. Bypass valve in bypass position	a. Put bypass valve in normal operation position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign matter
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Set-up error	f. Check control valve set-up procedure
8. Time of day flashes 'On and Off'	a. Power outage	a. Reset time of day. If battery is present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.

PROBLEM	POSSIBLE CAUSE	SOLUTION
9. Error Codes 101, 1001 or E1 – Unable to recognise start of regeneration 102, 1002 or E2 – Unexpected stall 103, 1003 or E3 – Motor ran to long, timed out trying to reach next cycle position 104, 1004 or E3 – Motor ran to long, timed out trying to reach home position If other error codes display contact the factory	a. Control valve has just been serviced	a. Unplug power source jack from the printed circuit board (black wire) and plug back in or press button sequence to reset valves: TC valves (three buttons) press and hold SET and DOWN buttons for 3 seconds. (Cover button may have other names like “SET HOUR “, “CLOCK” or “SET CLOCK” but the circuit board is labeled with SET.) All other valves press and hold NEXT and REGEN buttons for 3 seconds.
	b. Foreign matter is lodged in control valve	b. Check piston and spacer stack assembly for foreign matter
	c. High drive forces on piston	c. Replace piston(s) and spacer stack assembly
	d. Control valve piston not in home position	d. Unplug power source jack from the printed circuit board (black wire) and plug back in or press button sequence to reset valves: TC valves (three buttons) press and hold SET and DOWN buttons for 3 seconds. (Cover button may have other names like “SET HOUR “, “CLOCK” or “SET CLOCK” but the circuit board is labeled with SET.) All other valves press and hold NEXT and REGEN buttons for 3 seconds.
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary
	f. Drive gear label dirty or damaged, missing or broken gear	f. Replace or clean drive gear
	g. Drive bracket incorrectly aligned to back plate	g. Reseat drive bracket properly
	h. PC board is damaged or defective	h. Replace PC board
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped on to drive bracket

PROBLEM	POSSIBLE CAUSE	SOLUTION
10. Error Codes for MAV and NHWB	a. Foreign matter is lodged in MAV/ NHWB	a. Check MAV/NHNB piston and spacer stack assembly for foreign matter
106 or 1006 – MAV/NHNB unable to find proper park position, motor ran too long.	b. High drive forces on MAV/ NHNB piston	b. Replace MAV/NHNB piston and spacer stack assembly
107 or 1007 – MAV/NHNB motor ran too short (stalled) while looking for proper park position	c. MAV/NHNB motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	c. Check MAV/NHNB motor and wiring. Check interconnect wiring to both PC boards. Replace motor or wiring if necessary.
	d. MAV/NHNB drive gear damaged, missing or broken gear	d. Replace MAV/NHNB drive cap.
If other error codes display contact the factory	e. MAV/NHNB main gear cover assembly incorrectly aligned to drive assembly.	e. Reseat MAV/NHNB main gear cover assembly properly
	f. PC board is damaged or defective	f. Replace PC board

**Talk to
an expert**

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