



Installation, Operation & Maintenance Guide

Clack WS TT Duplex Water Softener Systems

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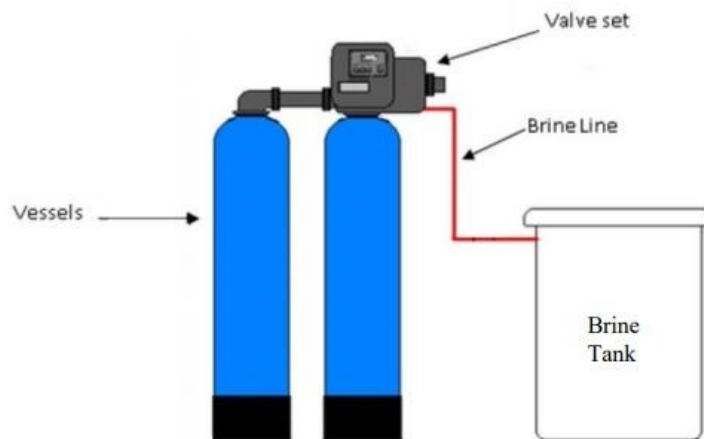
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Thank you for purchasing this system. We are sure that it will provide you with trouble free service for many years to come. Please use the following pages to assist you with the assembly and installation of your new system.

1. Unpacking

PLEASE USE THE ACCOMPANYING PACKING DOCUMENTS TO CHECK 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.



2. Installation

Please observe the local regulation concerning the installation of your system. 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 are needs to be level, frost free, have access to electricity and an open drain. Check the water quality is within any parameters specified for the chosen model. 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 degrees C and 45 degrees C.

2.2 Fitting The Distribution Systems

Fit the bottom distribution systems into the vessel – the bottom screens should be pre glued to the riser tubes (fig A.1) (smaller system). Alternatively if the system uses bottom laterals these need to be assembled inside the vessels (fig A.2). Move the vessel 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 does not damage to bottom distribution system. If you have been supplied gravel with your kits this should be added first so it covers the bottom distribution systems. Add the media supplied but make sure there is approximately 30% free space left above the media so when then system is backwashed the media can expand into the space and allow any sediment or contaminants to 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 valve outer and inner O-rings (fig A.4 & 5).



Fig A.4



Fig A.5

If tops screen have been supplied these should be attached next.

Slide the valves into the riser tubes and then gently push it down onto the vessel treads. Screw the valve on until you start to squeeze the main O-ring and then finally give the valve a tighten by tapping the rear side of the valve 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), and valve (fig A.8)



Fig A.7



Fig A.8

Connections may vary depending on the valves used, please note to use the poly insert provided with your specific valves.

2.6 Duplex Hydraulic Connections.

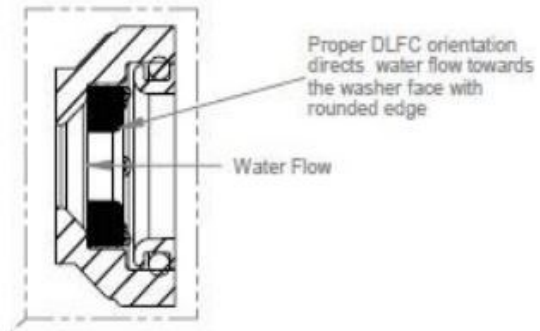
Semi rigid connections are supplied for the use in the vessels up to and including 14" and flexible hoses to make connections on larger vessels are supplied.

2.7 DLFC (drain line flow control) - normally pre-fitted

This is one of the most important components to check has been installed : this will control the back wash flow rate and will ensure that the system will continue to function correctly. The DLFC will either be fitted inside the drain line elbow, the 1" adaptor on in an external housing. The larger external DLFC may have more than one flow controls fitted to gain the required flow rate. See below pictures of the drain line housing.



3/4" Elbow



1" External Straight



Insert

2.8 Injector – normally pre-fitted

The injector is another important item in the functioning of the system. Please check that it is fitted in the DN position and that the UP position has been plugged. The injector colour will vary depending on the size of the system, this should be listed on the items listed.



2.9 Electrical connections

To connect the power cables you need to firstly remove the covers and then remove the drive bracket assemblies by pressing up on the drive brackets release tabs and pulling towards you, the drive bracket including software can now be lifted away to reveal the back plate (fig A.9)



Fig A.9

The power cable should be threaded through the back plate and strain relief as shown in Fig A.9a



Fig A.9a

You can now re install the drive bracket into its original position.

Please make sure that this has been replaced correctly as this can cause problems at a later date.

If fitting additional cables used for a micro switch remove the knock out on the back plate Fig A.10 then remove the tabs at the bottom of the strain relief on the back side of the back plate Fig A.11 thread the cables and attach the cover.



fig A.10

Fig A.12 and fit the cover Fig A.13




Fig A.11



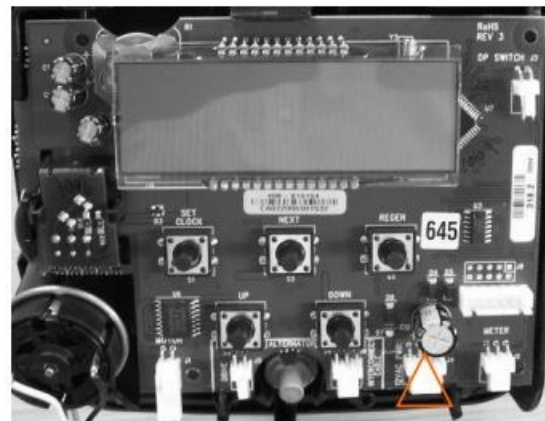
Fig A.12



Fig A.13

Connect the power here  marked 12V DC

When all of the connections have all been made the power can be turned on and programming can take place.



Quick start

2.10 Programming the Valve

The valve is pre programmed with the exception of the time of day and the incoming hardness figure.

All adjustments should be made using the up and down arrows when the setting you wish to adjust is displayed on the screen.

Set Time of Day

Press SET Clock.

Adjust the hours and press NEXT to adjust the minutes, press NEXT to return to the normal TIME display.

Hardness setting

Press NEXT and UP simultaneously for 3 seconds and release.

Hardness with 340 should appear on the screen

Softner: Adjust the necessary to your incoming supply hardness in ppm CaCO₃. This can be obtained by using a purchased hardness test kit or by contacting your water supplier.

Press NEXT repeatedly until the display returns to the time of day.

2.11 Programming the Valves in case of memory loss.

Should the programming have been lost in transit the following instruction in conjunction with the relevant setting sheet will allow you to reset them.

When the power has been connected the valve will display the software number and initialise itself and the display TIME; you can then start the program valve.

Selections are made using the UP and DOWN buttons until the required setting is displayed; after each setting press NEXT to continue.

Set Time of Day

Press SET CLOCK

Step 1. Cycle Sequence

Press NEXT and DOWN simultaneously for 3 second and release.

The screen will display SOFTENING flashing!

Press NEXT and DOWN simultaneously for 3 seconds.

The screen should display 1.0 | adjust if necessary

Press NEXT after each setting and set each setting accordingly until the display returns to TIME.



Step 2: System Set Up

Press NEXT and DOWN simultaneously for 3 seconds and release.

The screen will display SOFTENING flashing. Press NEXT.

The screen should display CYCLE 1, adjust as necessary (see settings sheet that corresponds to your system) Press NEXT and set each setting accordingly until the display returns to TIME.

Step 3: Display settings

Press NEXT and UP simultaneously for 3 seconds and release.

Hardness with 340 should appear on the screen. Adjust the necessary (see quick start section)

Press NEXT and set each setting accordingly.

The Valve is supplied pre programmed!

(Excluding settings that need to be done on site)

The settings are listed in case there is a need to re=program the valve.

If you have any concerns or worries following the setting procedure please contact us
and we will help you through the set up procedures.

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3.2 Softener

Clack WSTT Valve Set up as a Softener

Software version 332.2

Please apply the settings in the following sequence

Selections are made using the UP & DOWN buttons until the required setting is displayed,

After each setting press NEXT to continue.

Capacities calculated at 50g CaCO₃ hardness removal per litre of resin.

Vessel Size	817	835	1035	1044	1054	1248	1354	1465	1465	1665	1865	2160
Media Volume (litres)	8	20	30	40	50	60	75	100	125	150	200	250

Step 1, Cycle Sequence,

Press NEXT and DOWN simultaneously for 3 seconds and release.

Screen will display SOFTENING flashing

Press NEXT and DOWN simultaneously for 3 seconds, the screen should display 1.0Γ, below, adjust to tubine setting

Set Rinse	Off	or (see note 9)
DP Setting	Off	or (see note 2 for options)
Hardness	PPM	
Set 1	Backwash	
Set 2	Brine Draw dn	
Set 3	Rinse	
Set 4	Fill (Salt required)	
Set 5	End	

Step 2. System Setup,

Press NEXT and DOWN simultaneously for 3 seconds and release.

SET with SOFTENING flashing should appear on screen.

Cycle 1 Backwash	5	5	5	5	5	5	5	5	5	5	5	5
Cycle 2 Brine dn		54	68	60	70	62	64	86	86	71	84	61
Cycle 3 Rinse	6	6	6	6	6	6	6	6	6	6	6	6
Cycle 4 Fill Kg	1.2	3	4.5	6	7.5	9	11.2	15	18.7	22.5	30	37.5
Cycle 5												
Capacity Kg	0.4	1	1.5	2	2.5	3	3.7	5	6.2	7.5	10	12.5
Set Regen			Auto									or (see not 3 for options)
Set Time Regen								On 0				
Set rLY 1			Off									or (see note 5 for options)
Set rLY 2			Off									or (see note 6 for options)
Set Salt			Off									or (see note 7 for use)

Step 3, Display Settings.

Press NEXT & UP simultaneously for three seconds and release.

HARDNESS with 340 flashing should appear on screen,

Hardness	Set on site (if Regen is set to AUTO)
Hardness 2	0 (not used)
Regen Day	14
Set Time Regen Hrs	Default 2:
Set Time Regen Min	Default :00

Step 4, Set time of day,

Press SET CLOCK

Set hours using the up and down buttons.

Set minutes using the up and down buttons,

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4. Commissioning the System

4.1 Introduction.

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

4.2 Regeneration.

When the system is fully functional the regeneration will happen when capacity or period has expired. However running a manual regeneration during commissioning is the best way of removing air from the system, bedding in the resin and flushing the system through.

Make sure the water inlet and outlet is closed. Press and hold the regeneration button for 3 seconds. The piston will move to the back wash position. Slowly half open the water inlet to the system, and then slowly open the outlet to allow the air to be purged from the first vessel. Skip through the rest of the regeneration cycles by pressing the Regeneration button to move through each stage then start the process again to purge the second vessel. Once the air has been purged 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, rinse and fill before stopping in the service position.

For new systems or after a media change it may be 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 this will start flashing Regen Today in the bottom left corner of the screen and the system will regenerate at the pre-set regeneration time. If you wish to cancel this just press the regeneration button again and the display will disappear.

To initiate an immediate regeneration press and hold the regeneration button until the valve motor starts to run.

If during the regeneration cycle you need to skip through the cycle this can be done in the following way. To skip to the next stage quickly press the regeneration button and this will take you to the next stage of the regeneration, this can be repeated to get to the end of the regeneration cycle.

4.3 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 controllers are set automatically regenerate on capacity. This display on the control can show either of the following: Time, current flow in litres per minute, remaining capacity, this can be changed by pressing the NEXT button.

5. Routine Maintenance

Your system is designed to run with minimum of maintenance and does not normally require much adjustment.

Weekly

Check the salt level (this may need to be done more regularly dependant on consumption) The salt level should always be above the water level.

Check there is no sign of damage or leaks.

Check the quality of the treated water.

Monthly

Check the quality of the incoming water to see if it has changes significantly.

Yearly

Check for leaks or damage.

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6. Troubleshooting

On the following pages you will find a guide as to the most common problems that may arise: please consult this section before contacting your supplier as most of the problems are easily cured using the troubleshooting information.

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

Problem	Possible Cause	Solution
1. No Display on PC Board	a. No power at electric outlet	a. Repair outlet or use working outlet
	b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection	b. Plug Power Adapter into outlet or connect power cord end to PC Board connection
	c. Improper power supply	c. Verify proper voltage is being delivered to PC Board
	d. Defective Power Adapter	d. Replace Power Adapter
	e. Defective PC Board	e. Replace PC Board
2. PC Board does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch	a. Use uninterrupted outlet
	b. Tripped breaker switch and/or tripped GFI	b. Reset breaker switch and/ or GFI switch
	c. Power outage	c. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	d. Defective PC Board	d. Replace PC Board
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Meter wire not installed securely into three pin connector	d. Verify meter cable wires are installed securely into three pin connector labeled METER
	e. Defective meter	e. Replace meter
	f. Defective PC Board	f. Replace PC Board
4. Control valve regenerates at wrong time of day	a. Power outage	a. Reset time of day. If PC Board has battery back up 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 set incorrectly	c. Reset regeneration time
	d. Control valve set at "on 0" (immediate regeneration)	d. Check programming setting and reset to NORMAL (for a delayed regen time)
	e. Control valve set at "NORMAL + on 0" (delayed and/ or immediate)	e. Check programming setting and reset to NORMAL (for a delayed regen time)
5. Time of day flashes on and off	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
6. Control valve does not regenerate automatically when the correct button(s) is depressed and held. For TC valves the buttons are ▲&▼. For all other valves the button is REGEN	a. Broken drive gear or drive cap assembly	a. Replace drive gear or drive cap assembly
	b. Broken Piston Rod	b. Replace piston rod
	c. Defective PC Board	c. Defective 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 ▲&▼. For all other valves the button is REGEN	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Incorrect programming	d. Check for programming error
	e. Meter wire not installed securely into three pin connector	e. Verify meter cable wires are installed securely into three pin connector labeled METER
	f. Defective meter	f. Replace meter
	g. Defective PC Board	g. Replace PC Board

6. Troubleshootingcontd

Problem	Possible Cause	Solution
8. Hard or untreated water is being delivered	a. Bypass valve is open or faulty	a. Fully close bypass valve or replace
	b. Media is exhausted due to high water usage	b. Check program settings or diagnostics for abnormal water usage
	c. Meter not registering	c. Remove meter and check for rotation or foreign material
	d. Water quality fluctuation	d. Test water and adjust program values accordingly
	e. No regenerant or low level of regenerant in regenerant tank	e. Add proper regenerant to tank
	f. Control fails to draw in regenerant	f. Refer to Trouble Shooting Guide number 12
	g. Insufficient regenerant level in regenerant tank	g. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	h. Damaged seal/stack assembly	h. Replace seal/stack assembly
	i. Control valve body type and piston type mix matched	i. Verify proper control valve body type and piston type match
	j. Fouled media bed	j. Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting	a. Check refill setting
	b. Improper program settings	b. Check program setting to make sure they are specific to the water quality and application needs
	c. Control valve regenerates frequently	c. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	b. Incorrect injector size	b. Replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	a. Improper program settings	a. Check refill setting
	b. Plugged injector	b. Remove injector and clean or replace
	c. Drive cap assembly not tightened in properly	c. Re-tighten the drive cap assembly
	d. Damaged seal/ stack assembly	d. Replace seal/ stack
	e. Restricted or kinked drain line	e. Check drain line for restrictions or debris and or un-kink drain line
	f. Plugged backwash flow controller	f. Remove backwash flow controller and clean or replace
	g. Missing refill flow controller	g. Replace refill flow controller
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and or height
	f. Low water pressure	f. Check incoming water pressure – water pressure must remain at minimum of 25 psi

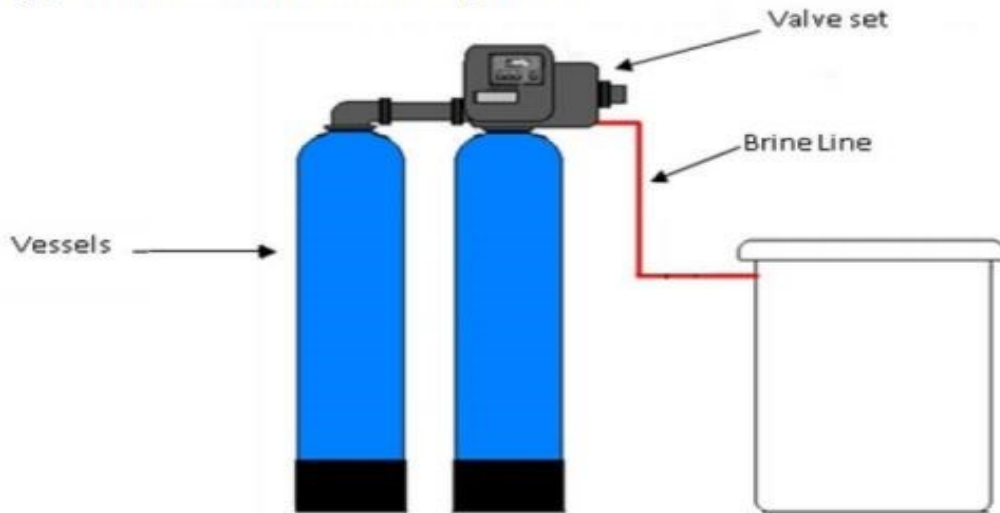
6. Troubleshooting...contd...

Problem	Possible Cause	Solution
13. Water running to drain	a. Power outage during regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened in properly	d. Re-tighten the drive cap assembly
14. E1, Err – 1001, Err – 101 = Control unable to sense motor movement	a. Motor not inserted full to engage pinion, motor wires broken or disconnected	a. Disconnect power, make sure motor is fully engaged, check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC Board labeled MOTOR. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. PC Board not properly snapped into drive bracket	b. Properly snap PC Board into drive bracket and then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Missing reduction gears	c. Replace missing gears
15. E2, Err – 1002, Err – 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	a. Foreign material is lodged in control valve	a. Open up control valve and pull out piston assembly and seal/ stack assembly for inspection. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Main drive gear too tight	c. Loosen main drive gear. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Improper voltage being delivered to PC Board	d. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

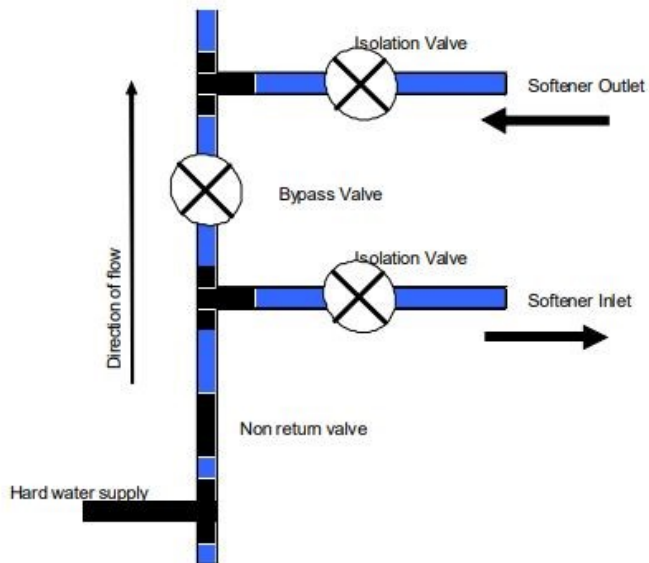
6. Troubleshootingcontd

Problem	Possible Cause	Solution
16. E3, Err – 1003, Err – 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for 3 s seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
17. E4, Err – 1004, Err – 104 = Control valve motor ran too long and timed out trying to reach home position	a. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	a. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
18. Err -1006, Err – 106, Err - 116 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too long and unable to find the proper park position Motorized Alternating Valve = MAV Separate Source = SEPS No Hard Water Bypass = NHBP Auxiliary MAV = AUX MAV	a. Control valve programmed for ALT A or b, nHbP, SEPS, or AUX MAV with out having a MAV or NHBP valve attached to operate that function	a. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect. Then re-program valve to proper setting
	b. MAV/ NHBP motor wire not connected to PC Board	b. Connect MAV/ NHBP motor to PC Board two pin connection labeled DRIVE. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. MAV/ NHBP motor not fully engaged with reduction gears	c. Properly insert motor into casing, do not force into casing Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	d. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
19. Err – 1007, Err – 107, Err - 117 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too short (stalled) while looking for proper park position Motorized Alternating Valve = MAV Separate Source = SEPS No Hard Water Bypass = NHBP Auxiliary MAV = AUX MAV	a. Foreign material is lodged in MAV/ NHBP valve	a. Open up MAV/ NHBP valve and check piston and seal/ stack assembly for foreign material. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, drive gear interface, and check MAV/ NHBP black drive pinion on motor for being jammed into motor body. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

Typical Installation Layout.



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



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