

Clack **Water Softener** **Installation & Operating** **Guide**



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 in the installation and set up of your new Softener.

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.

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.

A single Check Valve.

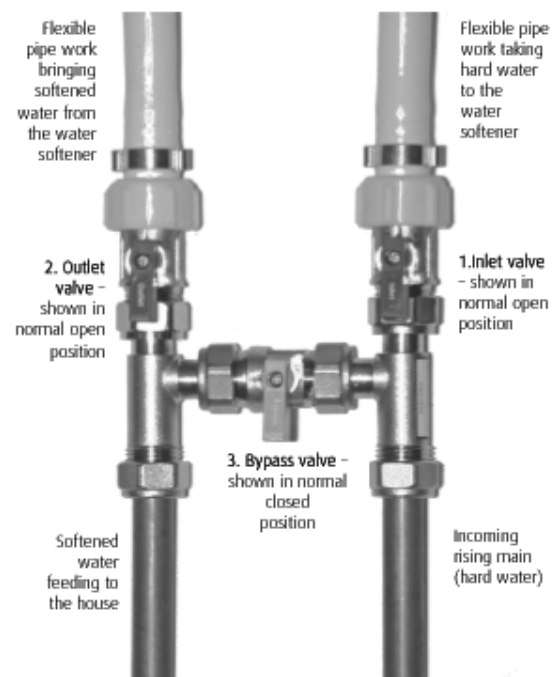
A suitable check valve should be fitted. This will usually be in the installation kit that can be ordered separately.

Check List.

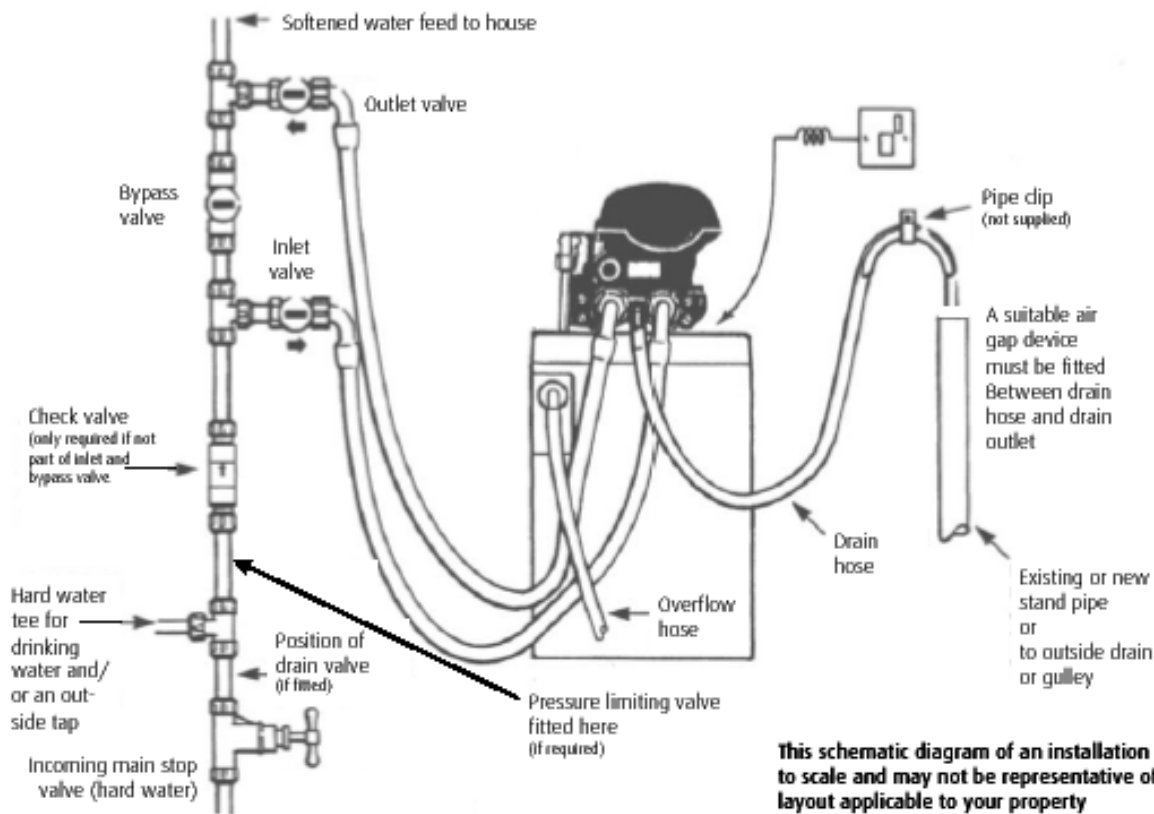
Before you start the installation make sure that you have all the necessary fittings. The purchase of one of our standard installation kits will normally ensure that you have everything that you need for a typical installation

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 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)



Before starting the installation of the valves ensure that the stop cock is in the closed position.



Connecting the Softener.

Once you have completed the installation of the valves 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 to the Softener. The Softener inlets and outlets should be indicated either with the words inlet or outlet or with an embossed directional arrow on the Softener tails. Normally the Softener tails are in a configuration of three with the centre normally being the waste outlet.

Waste Pipe Installation.

Connect the waste pipe to the waste outlet on the Softener and run the 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 maximum of 1 Meter with a minimum water pressure of 40 psi.

Overflow Connection.

The overflow connection is the white ½” hose spigot on the rear or side of the cabinet. A clip is not required for this connection. 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.

To connect the power cable you need to firstly remove the cover then remove the drive bracket assembly 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 1).

Fig 1



When the drive plate has been removed, locate the knockout on the backplate. You can use a punch or a Phillips screwdriver to do this. (fig 2)

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.**

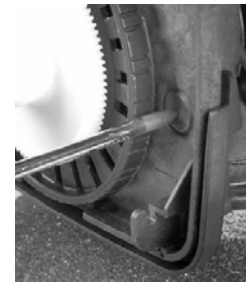


Fig 2



Fig 3



Fig 4



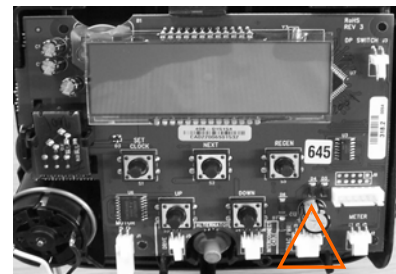
Fig 5

Remove the tabs at the bottom of the strain relief on the back side of the back plate (fig 3).

You can now connect the power cable to the valve. After connecting the cable you can weave the wires through the strain relief (fig 4) and fit the cover supplied (fig 5)

Connect power here  marked 12V DC

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



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 keep the salt level above the water level and check the salt level on a regular basis until a usage pattern has been established.

Programming.

Quick Start

Programming the Valve.

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

All adjustment should be made using the up and down arrows when the setting you wish to adjust is displayed on 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 or a previously set figure should appear on screen.

Adjust as necessary to your incoming supply hardness in ppm CaCO_3 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.

Commissioning the Softener

Introduction.

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

Regeneration.

When the softener is fully functional the regeneration will happen at the pre-set time (see programming the valve section page 7). However, running a manual regeneration during commissioning is the best way of removing air from the softener, bedding in the resin and flushing the softener through.

Make sure the water inlet and outlet are closed. Press and hold the regeneration button for 3 seconds. The piston will move to the backwash 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 softener. Once this has been done you can fully open the inlet and outlet and allow the softener to continue through the regeneration cycle, this will allow you to check for leaks and also purge any remaining air from the softener. After a backwash the softener will move through a brine draw routine, rinse and fill before stopping in the service position (this will take approximately one hour).

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 softener 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 turn.

If during a 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 it to the next stage of the regeneration, this can be repeated to get to the end of the regeneration cycle.

Service.

Water flows into the valve at the top, down through the resin and then up through the 'riser' tube in the middle of the vessel. As the water travels through the resin the ion exchange takes place. The controllers are set to automatically regenerate on capacity.

The display on the control can show either of the following; Time, current flow in litres per minute or remaining capacity, this can be changed by pressing the NEXT button.

Routine Maintenance.

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,

Programming the Valve (in case of memory loss).

Should the programming have been lost in transit the following instructions in conjunction with the setting sheet will allow you to re set it.

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

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

Step 1: Cycle Sequence.

Press **NEXT** and **DOWN** simultaneously for 3 seconds and release.

The screen will display SOFTENING flashing!

Press **NEXT** and **DOWN** simultaneously for 3 seconds.

The screen should display SET 25, adjust as necessary (see setting sheet page 8) Press **NEXT** after each setting and set each setting accordingly until the display returns to **TIME**.

Step 2: System Setup.

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 setting sheet that corresponds to your softener!) 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 screen. Adjust as necessary (see quick start section.

Press **NEXT** and set each setting accordingly. The Regen Time setting, has a factory default of 02:00 am this can be adjusted if required the display will return to the time of day after setting the regen time.

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 08100137	Serial No:	Serial No.
Swan	Id Code:	Softener type identification code.
0935-WS1CI	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.

Clack WSCI Setting Sheet.				
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 based on 50g CaCO ₃ hardness removal per litre of resin,				
Vessel Size	735	835	935	1035
Media Volume (litres)	18	25	30	35
Valves	WS1CI	WS1CI	WS1CI	WS1CI
	WS125CI	WS125CI	WS125CI	WS125CI
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 three seconds, the screen should display SET 25, adjust to turbine setting below,				
Turbine Size WS1	25	25	25	25
Turbine Size WS1,25	32	32	32	32
Set (Alternating)			Off	
SET dp			Off	
Hardness Units			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
Cycle 2 Brine dn	54	54	54	68
Cycle 3 Rinse	6	6	6	6
Cycle 4 Fill Kg	2.7	3.7	4.5	5.2
Cycle 5			End	
Set Capacity Kg	0.9	1.2	1.5	1.7
Set Regen			Auto	
Set Time Regen			NORMAL on 0	
Set Salt			(Salt Alarm Off)	
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	
Hardness 2			0 (not used)	
Regen Day			Off	
Set Time Regen			Default 2.00am	
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,				
Notes. Total Reset: Press & Hold REGEN & NEXT for three seconds.				

Trouble shooting

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

Troubleshooting

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

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

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.

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.