

installation information

JOB N	IO:				
MODE	EL NO:				
DESIC	GN HARI	DNESS:		mg/l as	s CaCO ₃
CAPA	CITY PE	R UNIT:		kg. Ca	CO ₃
RESIN	N VESSE	EL SIZE:	DIA. x		HIGH
BRINE	E TANK S	SIZE:	DIA. x		HIGH
SALT	SETTIN	G PER REGENERATION:			Kg. NaCl
RESIN		ИЕ:			LITRES
2900S	E CONT	ROL VALVE SPECIFICATIONS & SET	TINGS:		
1)	*Туре	of Timer: SE electronic	Time initiation Immediate me Delayed mete	only eter initiation r initiation	*Delete as required
2)	*Туре	of meter: 2in Hall effect		*Delete as required	
3)	Meter	setting		m ³	
4)	Regen	eration programme settings:			
	a)	Backwash		min.	
	b)	Brine & Slow Rinse		min.	
	c)	Rapid Rinse		min.	
	d)	Brine tank refill:		min.	
5)	Drain l	ine Flow Control		lpm.	
6)	Brine r	efill rate:		US gpm/lpm	
7)	Ejecto	size:			
8)	Electri	cal: 24 volt 50 Hz 35VA		FOR SEF	RVICE CONTACT:

general installation check list

WATER PRESSURE: A minimum water pressure of 1,8 bar is required for the regeneration valve to operate effectively. The maximum water pressure must not exceed 8,6 bar.

ELECTRICAL FACILITIES: A continuous 24 volt, 50 Hz. current supply is required. Make certain the current supply is always live and cannot be turned off with another switch.

EXISTING PLUMBING: Existing plumbing should be free from hardness scale and iron buildup. Piping that is built up heavily with hardness scale and/or iron should be replaced. If piping is clogged with iron, a separate iron filter unit should be installed ahead of the water softener.

LOCATION OF SOFTENER AND DRAIN: The softener should be located close to a drain.

BYPASS VALVES: Always provide for the installation of a bypass valve system.

CAUTION: Water pressure is not to exceed 8,0 bar. Water temperature is not to exceed 43°C. The unit must not be subjected to freezing conditions.

Physical Installation

1). Place the softener resin vessel in position, making sure the vessel is level and on a firm base.

2). All plumbing should be in accordance with local water bylaws. The minimum pipe size for the drain line should not be less than 22mm (3/4") N.B.

3). The distributor tube should be cut **5mm BELOW** the top of the vessel. *Note: Top of vessel includes any vessel adaptor if used.*

4). Lubricate the distributor O-Ring seal and vessel O-Ring seal with silicone lubricant (Dow Corning 7® compound).

5). Fit the control valve on the resin vessel.

6). Make sure that the floor beneath the salt storage tank is both clean and level.

7). Place water in the salt tank to a depth of approximately 25mm. Salt may be placed in the tank at this time. (Use only granular or pellet/tablet type salt if a combined saturator/measuring tank system is installed).

8). Place the installation in the bypass position. Turn on the main water supply. Open a cold soft water outlet nearby and let it run for a few minutes or until such time as the pipework system is flushed free from foreign material that may have resulted from the installation.

9). Place the installation in the service position and let the water flow slowly into the resin vessel(s). Air should be expelled via the open soft water outlet and this should be closed when the water runs free of air entrapment.

10). Electrical: All electrical connections must be made according to the appropriate codes. Connect the system to a suitable transformer if required.

SPECIAL METER INSTALLATION NOTE:

It is important that the EM style meter is installed in the horizontal plane

Control Start-Up Procedures

1. Set Time of Day

Whenever the valve is in Service the current time of day can be adjusted, the control programmed or an extra regeneration initiated



Push either the UP or DOWN set button once to adjust the Time of DAY display by one digit. Push and HOLD either the UP or DOWN set button to adjust the Time of Day display by multiple digits

2. Enter Control Programming Mode



1. Push and HOLD both the UP or DOWN set button to enter Programming Mode.

2. Push the Extra Cycle Button once per display until all have been viewed and this mode is and normal operation is resumed.

exited

Control Start-Up Procedures

3. Set Control Programming

Depending on current control programming, option setting displays that are not required to be set will not be viewed.



1. The first option setting display that apears in the Programme Mode is Treated Water Capacity. using the Set UP or DOWN button, set the display to the capacity of the system in LITRES. For example:

2130 litres treated water capacity



2. Push the Extra Cycle button. The second option setting display that appears is Regeneration Time. using the set UP or DOWN buttons, adjust the display to the time of day when you want a regeneration cycle to start. For example:

2:00 AM regeneration start

3. Push the Extra Cycle button. The third option setting that appears is the Regeneration Day Override. using the set UP or DOWN button, adjust the maximum number of days before a regeneration MUST occur (*4 days is the recommended setting*). For example:

Regenerate at least every 4 days



4. Control programming is now complete. Push the Extra Cycle button again to exit the programming mode and return to normal service.

Control Start-Up Procedures

4. Start an Immediate Regeneration

When starting an extra regeneration cycle you will have one or two options, depending on how your control is set up:



1. Press and Release to Extra Cycle button:

- With *Immediate Regeneration* controls the control will go into regeneration immediately.
- With **Delayed Regeneration** controls the service arrow will begin to flash immediately and a regeneration will occur at the preset regeneration time.
- 2. Press and HOLD for the Extra Cycle button for 5 seconds:
- With *Delayed Regeneration* controls this will force an immediate regeneration.

5. Regeneration Cycle Displays

The following series of displays appear when the control enters a regeneration cycle. (*times indicated are examples only*):

Valve driving to (C) 1 Fin Then (C) 1 6	Less than 9 min. remains in regen step #1
Valve driving to C Z Then P Z 5 B	Less than 59 min. remains in regen step #2
Valve driving to (C) 3 Then (C) 3 8	Less than 9 min. remains in regen step #3
Valve driving to C 4 F Then P 4 - 1 1	Less than 12 min. remains in regen step #4
Regen complete. () Valve driving to P P P B:B B Service position	Valve has returned to service

Control Start-Up Procedures

6. Fast Cycling the Valve through a Regeneration



A. Initiate a regeneration - see step 4. Once the valve reaches Regen step #1 let water flow to drain for approx.
5 minutes.

Next, manually step the valve through a regeneration cycle, check valve function in each step:

- B. Push the Extra Cycle button once to advance the valve to Regen. step # 2
- C. Push the Extra Cycle button once to advance the valve to Regen. step # 3
- D. Push the *Extra Cycle* button once to advance the valve to Regen. step # 4
- E. Push the Extra Cycle button a last time to advance the valve back to SERVICE

7. Final Set-Up

With proper valve operation verified:

- A. Add water to the salt container until the top of the air check is covered. Manually step the valve into the **BRINE DRAW** position (step #2) and allow the valve to draw water out of the salt container until the water level reduces no further. The water level should be at the midpoint of the screen section of the screen intake area,
- B. Manually step the valve to the **BRINE REFILL** position and then allow the valve to return to the **SERVICE** position automatically.
- C. With the valve in the **SERVICE** position, place salt into the salt container to the recommended level. Use the type of salt recommended by your supplier.

Set-Up is now completed and the control can be left to run automatically.

Control Operation

Time Initiation Valves

In normal operation the Time of Day display will be viewed at all times. The control will operate normally until the number of days since the last regeneration reaches the Day Override setting. At this point a regeneration will be initiated at the Preset regeneration time.

Volume Initiated Valves

In normal operation the Time of day display will alternate with a Volume Remaining display. This volume displaed will be in LITRES. As treated water is produced, the Volume remaining display will count down towards zero (displayed as [----]. On reaching zero, a regeneration will be initiated either immediately or delayed until the pre-set regeneration time, depending on how the control is configured. Water flow through the valve is indicated by the Flow Dot flashing in direct relationship to the flow rate.

Immediate Regeneration set-up with Day Override programmed.

If the the valve reaches the Day Override value before the zero volume point is reached then the valve will regenerate at the same time as the previous regeneration. On completion of the regeneration cycle the system capacity will be reset to the pre-set maximum system capacity.

Delayed Regeneration set-up with Day Override programmed.

If the the valve reaches the Day Override value before the zero volume point is reached then the valve will set to regenerate at the pre-set regeneration time. On completion of the regeneration cycle the system capacity will be reset to the pre-set maximum system capacity.

Control Operation during regeneration.

During regeneration the control will display the system status. The display window will indicate the regeneration step that the valve is advancing to, or has reached, and the time remaining in that step. The step number displayed will flash until the valve has completed driving to its next step position. Once all regeneration steps have been completed the valve will return automatically to the SERVICE position and resume normal operation. NOTE: Pushing the Extra Cycle button during a regeneration cycle will immediately advance the valve to the next cycle step position. Avoid doing this unless you understand the consequences of your actions.

Control Operation during programming.

The control will only enter the Programming Mode with the valve in the SERVICE position. While in the Programme Mode the control will continue to operate normally, monitoring water flow and maintaining time etc. NOTE: Control programming is stored in permanent memory so battery backup is not required.

Control Operation during power failure.

During a power failure all displays and programming will be retained. Water will continue to flow but the volume will not be monitored. When power is restored the control will resume copeation from the point when power was lost. An indication of power loss is an innacurate Time of Day display.

Timer setting

To determine the appropriate frequency of regeneration:

The following data is for general guidance only. Many factors influence water consumption and water softener capacity. Your water softener supplier/installer should be consulted for expert guidance.

- a). Establish the total likely 24 hour water consumption in cubic meters (m³).
- b). *Determine the hardness of the incoming water supply in mole/m³ (mg/l as CaCO₃).
- c). *Determine the quantity of resin contained in your pressure vessel in cubic meters (m³).
- d). *Determine the optimum regeneration level for your requirements in kg NaCl /m³ resin * see page 1 for original setting data

From the following table, determine the approximate softening capacity of your installation:

kg NaCl /m³ resin	Softening capacity kg. CaCO ₃ / m ³ resin
100	48
130	55
160	60

Softening capacity (m³) = $\frac{\text{resin capacity (kg. CaCO}_3 / m^3) \text{ x resin volume (m³) x 1000}}{\text{water hardness (mg/l CaCO}_3)}$

Regeneration frequency =

softening capacity (m³) rounded down to a whole number 24 hour consumption (m³)

MODEL 2910SE *flow diagrams*

1 SERVICE POSITION



Hard water enters the unit at the valve inlet and flows down through the resin in the resin vessel. Softened water enters the centre tube through the bottom screen, then flows up through the centre tube, around the piston and exits from the valve outlet.

2 BACKWASH POSITION

Hard water enters the unit at the valve inlet, flows through the coupling to the regeneration valve inlet. It then flows through the regen valve piston, down the centre tube, through the bottom screen and up through the resin, around the piston and exits via the valve drain port.

3 BRINE POSITION



Hard water enters the unit at the valve inlet, flows up into the injector housing and down through the injector nozzle and throat, drawing brine from the brine tank. Brine flows down through the resin exits via the bottom screen, up through the centre tube and exits via the valve drain port.

Page 10

MODEL 2910SE *flow diagrams*

4 SLOW RINSE POSITION



Hard water enters the unit at the valve inlet, flows up into the injector housing and down through the injector nozzle and throat, around the piston and down through the resin. It enters the bottom screen, up through the centre tube and exits via the valve drain port.



Hard water enters the unit at the valve inlet, flows directly from the inlet down through the resin, into the bottom screen and up through the centre tube, around the piston and exits via the valve drain port.

6 BRINE TANK FILL POSITION



Hard water enters the unit at the valve inlet, flows up through the injector housing, through the brine valve and into the brine tank.

upper control drive assembly



Page 12

lower control drive assembly



Item	Qty	Part No.	Description
1	1	14831	Connecting link pin
2	1	18357	Drive motor assy 24vac- 50Hz
3	1	18709-50	Backplate
4	2	21361	Screw - M8x16
5	1	26218	Cover assembly
6	1	40943	Wire harness
7	1	18692	Sealing washer
8	1	18391	Watertight connector
9	1	18693	Conduit sleeve



control valve assembly



Item	Qty	Part No.	Description
1	1	28416	Upper piston assy D/flow
2	1	28415	Upper seal & spacer kit
3	1	19925	Injector body gasket
4	1	11893	Injector cover
5	2	24874	Screw
6	1	24173-xx	Injector assy - specify 3C / 4C / 5C
or	1	28422-xx	Injector assy - specify 6C / 7C
7	1	28411-N	Valve body w/O-Rings
8	1	13575-01	O-Ring
9	1	13577-01	O-Ring
10	1	24205	Lower seal & spacer kit
11	1	28413	Lower piston assy - NBP
		28419-N-xx	Complete assembly - specify size

piston assemblies / seal & spacer kits



Item	Qty	Part No.	Description
1	1	10909	Connecting link pin
2	1	14451	Piston
3	1	24518	End plug assembly
4	1	40078-01	O-Ring
5	1	41424	Piston rod
		28416	Upper piston assy - d/flow



Item	Qty	Part No.	Description
1	7	10545	Seal ring
2	6	11451	Spacer
3	1	10757	End spacer
		28415	Upper seal & spacer kit





	Item	Qty	Part No.	Description	
	1	1	14752	Piston NBP	
	2	1	14758	Piston rod	
	3	1	14813	Connecting pin	
	4	1	14818	Piston rod clip	
	5	1	28430	End plug assy	
	6	1	14922	O-Ring	
Î			24813	Piston assy NBP	

ltem	Qty	Part No.	Description
1	4	11720	Seal
2	2	10369	Spacer
3	1	14753	Spacer
		24205	Lower seal & spacer kit

'C' series injector assembly



Item	Qty	Part No.	Description
1	2	23477	Screw
2	1	11893	Inector cover
3	1	10229	Injector cover gasket
4	1	14801-xx	Injector nozzle - specify size
5	1	17777	Injector body
6	1	14802-xx	Injector throat - specify size
7	1	23304	Injector body gasket
8	1	15413	Male elbow
9	1	15414	Nut & sleeve assy
10	1	13777-01	O-Ring
11	1	24173-xx	Injector assy complete - specify size
12	1	16460-03	Brine tube
13	1	28422-xx	Injector assy complete - specify size
14	1	10228	Injector cap
15	1	17777-03	Injector body

Page 16

1710 brine valve assembly

	ltem	Qtv	Part No.	Description
	1	1	12050	Retaining ring clip
	2	1	12550-01	Quad ring
*	3	4	14202-01	Screw
	4	1	14785-01	Flow control retainer
	5	1	14795	Brine valve piston
	6	1	14798	Brine valve spacer
	7	2	14811	O-Ring
Complete assy	8	1	15310	Brine valve spring
28423-2 or 28423-4	9	3	15415	Insert 1/2in
(excludes item 10)	10	1	17906	Stem guide
	11	1	17908	Brine valve sleeve
	12	1	28410	Label
	13	2	41056	Nut assembly
	14	1	41201	Brine valve bottom
	15	1	41202	Brine valve top
	16	1	41203	Brine valve stem
	17	1	41547	O-Ring
	18	1	12087	Flow washer - 2.0 USgpm
	or	1	12091	Flow washer - 4.0 USgpm

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Item	Qty	Part No.	Description
1	1	15413-N	Elbow - 3/8in x 1/2in tube
2	2	16123-N	Compression nut
3	2	16124	Plastic sleeve
4	1	15416	PVC tube
5	1	23804	Reducer coupling
6	1	18979	900 series air check assy
7	2	15415	Insert sleeve

2in plastic meter assembly assembly



Item	Qty	Part No.	Description
1	4	12473	Screw
2	1	18330	Meter cover assembly
3	1	15374	Impeller
4	1	15432	Impeller shaft
5	1	15532	Impeller shaft seat
6	2	17988	Plastic meter nut
7	1	14680	Flow straightener
8	1	17987-101	End connector - machined
9	2	40666	Seal
10	1	17689	Meter body
11	1	17987-100	End connector
12	1	13847	O-Ring
	1	60625-10	Meter assy complete

Page 18

MODEL 2910SE SE timer assembly - Sub assembly p/n 27173



ltem	Qty	Part No.	Description
1	1	27793	Display front panel - DF
2	1	19471-02	Front panel cover
3	1	40376	Rubber button assy
4	1	40283	Circuit board
5	1	19889	Circuit board housing
6	1	27167	Wire harness - Power
7	1	27808	Harness assy - Flow meter
8	1	27168	Timer mounting plate
9	1	17904	Bushing
10	1	21363	Screw
11	4	13296	Screw
12	1	27172	Stand-off
13	4	11384	Screw
14	1	17749	Relay
15	1	14265	Spring clip
16	1	13881	Hing bracket
17	1	27169	Connector lead

MODEL 2910SE ejector performance data

Please carefully note: The indicated ejector data is for guidance only on the relative performance between sizes. Many factors influence actual performance, particularly the Ejector Draw Rate. As a result, the Brine Draw & Slow Rinse phase of the regeneration cycle should be established as part of the on site commissioning procedure.





wiring diagram for valve drive & timers

Electrical supply connections: 24vac 50 Hz. 60 Va Negative to TERMINAL 1 Positive to TERMINAL 6



valve dimensions



Cut riser 5mm below the top of the tank or tank adaptor face. Chamfer the tube end and apply a light smear of silicon grease to ease tube entry.

320

84

5mm below

166