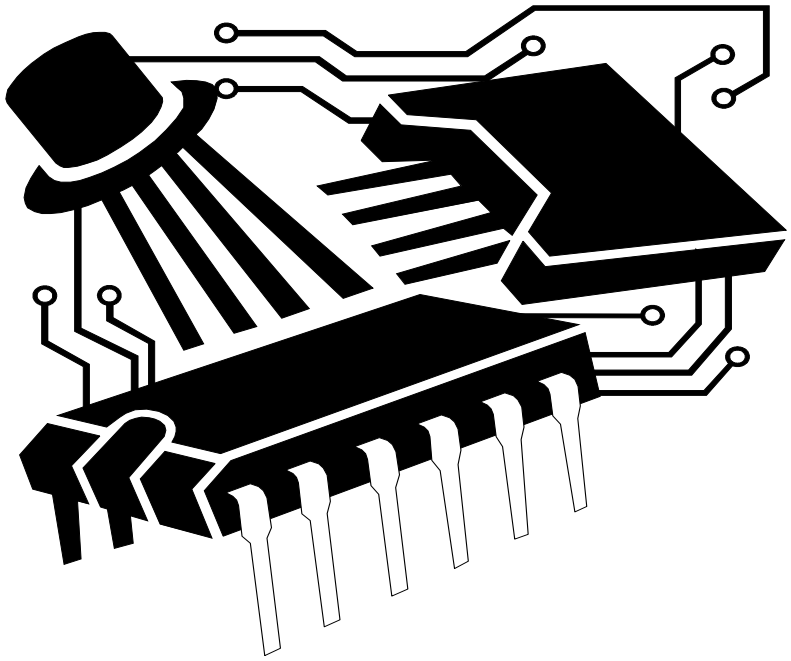
Model 9500SE-B
OEM Manual



To get into the master programming mode, which effectively tells the system what it is and what it is supposed to do, you have to get through the "security lock". This is done by setting the time of day to 12:01pm using the UP or DOWN arrows. When you have established the time at 12:01 you must then press the UP and DOWN arrow buttons simultaneously for 5 seconds. This lets you into the master programming mode.

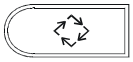
A word of caution. When using the UP or DOWN arrow buttons you will notice that the longer you keep the button depressed, the faster the digits change. This can be annoying at first because you will keep missing the setting you require. A series of quick depressions on the appropriate button is usually the best way.

MODEL 9500SE-B

master programming mode

1. Display format [*U - - ?*]

This display is used to determine the display format and is identified by the letter 'U' as the first digit in the display window. Use the UP or DOWN arrow button to set this display to [*U - - 4*] and the volume unit displays will be in cubic metres (m^3) (up to 999.9) with the time displays in 24 hour clock format. NOTE: The P.M. indicator is disabled. Regeneration timings will be in minutes with an accuracy of 0.1 minute. *See NOTE 2 at the end of this document*



2. Regeneration type [*7 - - ?*]

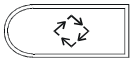
This display is used to determine the regeneration initiation format. There are three possible options but you should only set option 2 via the UP or DOWN arrow buttons:

Immediate meter [*7 - - 2*]

The control will determine that a regeneration is required when the system capacity value reaches zero. Regeneration begins immediately, regardless of the time.

3. System capacity (no display code)

This display is used to establish the volume of softened water that the system can produce between regenerations. If [*U - -2*] was set previously then the value to be set in the display should be in LITRES using the UP or DOWN arrow buttons. If [*U - - 4*] was set then the value to be set in the display should be in m^3 and it can be set to an accuracy of 1 decimal place (100 litres). *Please carefully consider the implications of the Brine Refill setting and also the deduction of regeneration water volume discussed later - pages 4 & 6.*



4. Regeneration day override [*A - - -*]

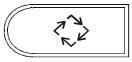
This display is used to establish the maximum number of days between regenerations. This setting is not usually appropriate for a duty/standby duplex system and it is recommended that you set this function to [A OFF]. The only exception to this might be if the system is likely to be left unused for some time in which case you can set [A - - 4 } for example. This will force a regeneration every 4 days regardless of water use.

5. Regeneration cycle step programming [1 thru 4]

This series of displays is used to establish the timings of the various regeneration steps. Up to 4 steps can be programmed and for normal softener operations, ALL steps should be programmed.

Backwash step [*1 - - ?*]

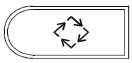
This is one of the major regeneration water consumption steps and should be carefully considered. On smaller systems where the resin vessel is very full and the system is treating clean mains water then backwash is of limited value. A setting of 2 minutes [*1 - 2.0*] will usually be sufficient to loosen the resin bed prior to brine injection. If sufficient resin bed expansion has been allowed for and the water supply contains particulate matter then a setting of 6 minutes [*1 - 6.0*] may be more appropriate. If you programme this step to 0 minutes [*1 - - 0*] then the step will be skipped.



←PRESS

Brine injection and slow rinse [*2 - - ?*]

This step needs to be considered in relation to the values you intend to establish in step 4 - Brine tank refill. The amount of water refilled into the brine tank must be fully drawn out during the first phase of this step. The first phase is completed when the brine air check device shuts off, allowing the system to enter the second phase of this step - Slow rinse. When establishing the total time to be set in this step you must add the time required to draw out the brine from the brine tank PLUS the contact time / slow rinse time. In the absence of any other information, a typical setting would be 50 minutes [*2 50.0*].



←PRESS

Rapid rinse [*3 - - ?*]

This is the other major regeneration water consumption step which also needs to be carefully considered. If the time set is to short then the brine regenerant will not be rinsed out and will be present in the water flowing to service - leading to customer complaints and possible corrosion damage. If the time set is to long then system capacity will be wasted as you will simply be putting softened water down the drain. Again, in the absence of other information, a typical setting of 10 minutes [*3 1 0.0*] should be sufficient on typical installations.

←PRESS

Brine tank refill [*4 - - ?*]

This is the key step that influences system performance, both in terms of capacity and treated water quality. Several factors have to be taken into account when determining the time to set in this step. Detailed discussion is not appropriate to this document and the following examples are for illustration purposes only.

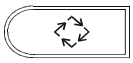
The refill flow rate is controlled by the brine line flow control (BLFC) fitted in the brine valve assembly. Assume this is sized at 2.0 USgpm which equals 7.57 l/min. For most purposes you can assume that 1 kg. NaCl (salt) is dissolved in 3 litres of water. The amount of salt used per regeneration is a function of resin volume and regeneration level. The regeneration level used should be given some thought, particularly with regard to regeneration efficiency vs. available softening capacity and appropriate residual hardness. Please refer to resin data sheets for details of these considerations. For the purposes of this example, assume 125 litres of resin and a regeneration level of 160 kg. NaCl / m^3 resin which would provide a nominal resin capacity of 64 kg $CaCO_3/m^3$ resin. If we assume 125 litres of resin then to establish the salt required per regeneration multiply 160 x 0.125 which gives you 20 kg. salt. Multiply this value by 3 and you get 60 litres of water required to dissolve this amount of salt. If we divide 60 by 7.57 we get 7.92 minutes.

In this example, using the UP or DOWN arrow buttons set the display to show [*4 - 7.9*]

NOTE: The relationship of this setting to the value set in section 3 is shown by the following formula:

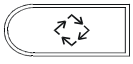
System capacity (in litres) equals:

$$\frac{\text{Resin capacity (kg } CaCO_3/m^3 \text{) x resin volume (litres) x 1000}}{\text{water hardness (mg/l as } CaCO_3 \text{)}}$$

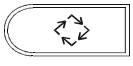


Spare cycle [*5 - - ?*]
This cycle does not apply to the 9500SE valve and MUST be programmed to show [*5 OFF*]

5. Flow meter size [*F - - ?*]
This display is used to define the water meter characteristics and MUST be set to show [*F 21.0*]. Any other value will cause false operation of the system.



6. Valve type [*o - - ?*]
This display is used to tell the control what type of system it is operating and MUST be set to show [*0 - - 2*]



7. Tank in Service [*U -- ?*]

The programmer needs to be lined up with the physical status of the valve drive and pistons. In the area of the drive motor you will see an arrow indicator on the end of the gear shaft.

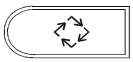
If the arrow is pointing at Tank #1 then set the programmer to [*U - - 1*].

If the arrow is pointing at Tank #2 then set the programmer to [*U - - 2*]

8. Line frequency [*L F - -*]

This display is used to tell the control the characteristics of the electrical power supply. It needs this information in order to properly determine both the time of day and the duration of the various steps. In Europe the value MUST be set to [*L F 50*] representing 50 Hz.

Exiting the programming mode is done by a final touch of the Extra Cycle button.



NOTE 1: If everything gets screwed up you can restore the permanent programme memory by pressing the UP and DOWN arrow buttons simultaneously for 25 seconds or until the time of day display shows [*1 2:0 0*]. The control will then have been reset to default values and you must then start back at the beginning to establish the required programme.

NOTE 2: This programmer device is used in conjunction with other controls and has functions that are irrelevant to the 9500SE series duplex valve. If you stray from the non optional setting described then your system will not work and you will find yourself in programming areas that fall outside the scope of these instructions.

Example - Setting the system capacity

Knowing the amount of resin in each vessel and the salt setting per regeneration (see page 4), calculate the system capacity available using the following guide:

Kg NaCl/m^3 resin	Approx. capacity Kg. $CaCO_3$/m^3 resin
100	48
130	55
160	60

Softened water output (m^3) = $\frac{\text{Resin capacity (kg. CaCO3/m3) x resin volume } (m^3) \text{ x } 1000}{\text{Water hardness (mg/l } CaCO_3)}$

DO NOT SET THIS FIGURE - GO TO NEXT STEP

Since the valve regenerates with soft water from the on-line vessel, you must subtract the water used for regeneration from the above figure. Taking each of the regeneration cycles, calculate the water used for each cycle. The following example could apply to a 16 inch vessel having a 20 lpm backwash control, #3C ejector, 2,0 USgpm refill control and a timer setup of:

Backwash	=	6 min.
Brine and Rinse	=	50 min.
Rapid Rinse	=	6 min.
Brine tank refill	=	7.9 min.

Backwash:	6 mins x 20 lpm ÷ 1000	= 0,12 m^3
Brine & rinse:	50 mins x *.** ÷ 1000	= *.** m^3
Rapid Rinse:	6 mins x 20 lpm ÷ 1000	= 0,12 m^3
Brine tank fill:	7.9 mins x 2,0 USgpm x 3.785 ÷ 1000	= 0,059 m^3
	TOTAL REGENERATION WATER (to be deducted from system capacity)	= *.** m^3

* See ejector chart slow rinse flow - page 7

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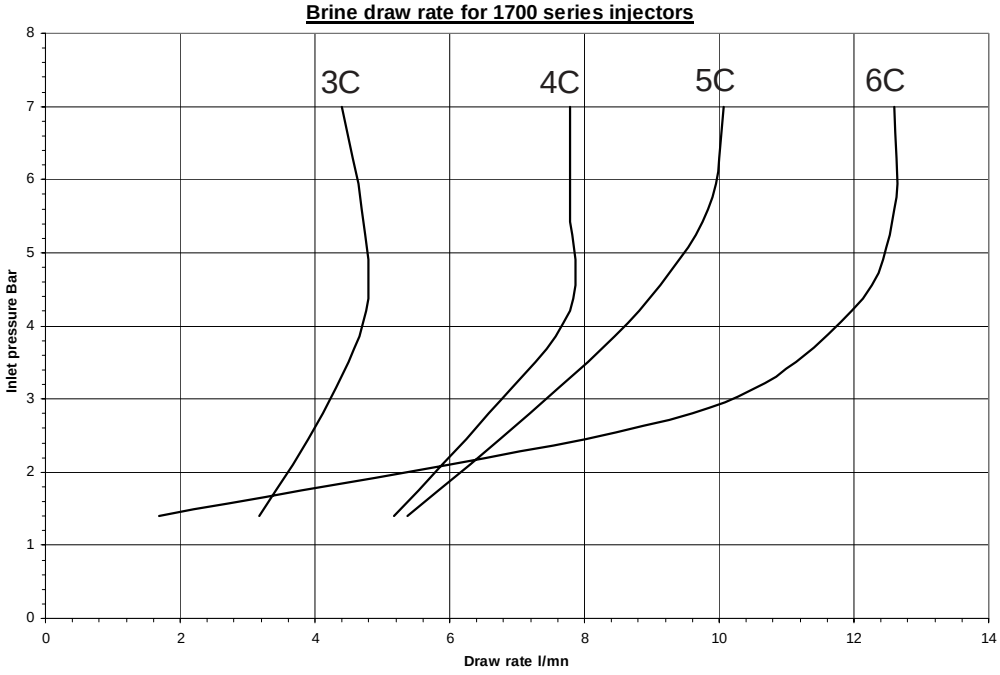
ejector performance data

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.*

Brine draw rate for 1700 series injectors



Slow rinse rate for 1700 series injectors