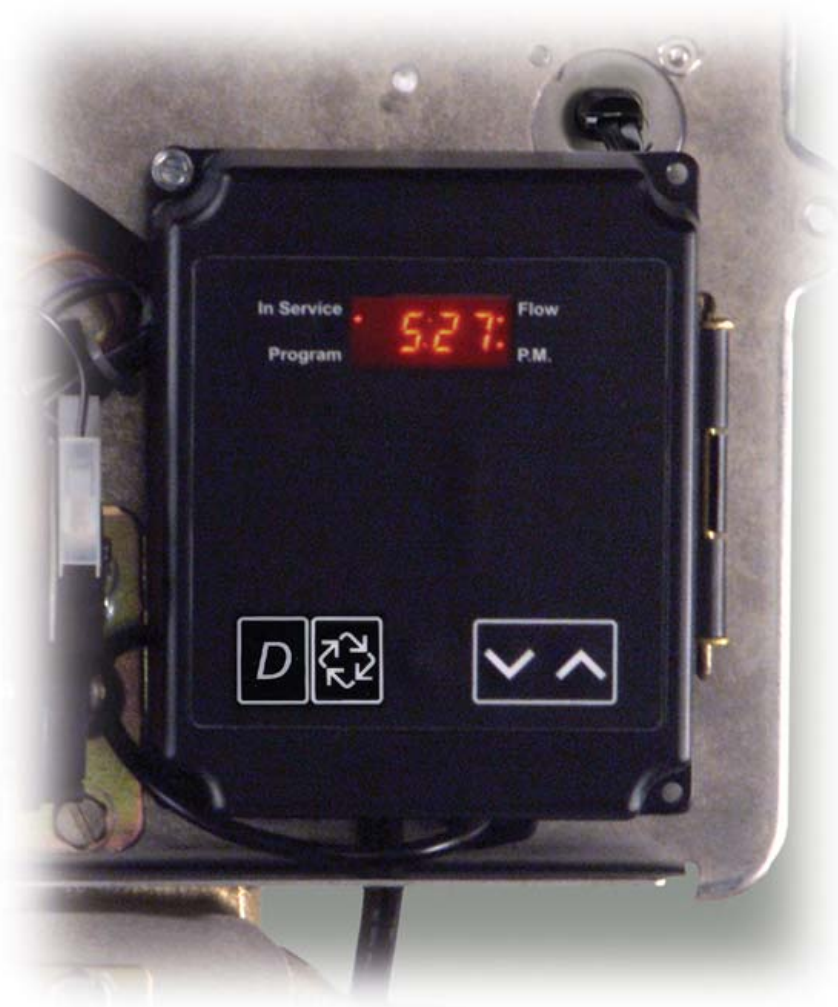


3200NT

Multivalve Electronic Controller
with Diagnostics

Programming instructions



System Programming Flow Chart



Entering System Programming

With the time of day set to 12:01pm, simultaneously press & hold both buttons for 5 seconds.

Valve model

Select the appropriate valve in the display
Example: 2900 control valve

[2 9 0 0]



Regenerant flow

Select the appropriate code.
Example: Downflow regeneration

[d F]



System type

Select the code that matches your system structure

Examples: System #4 Timeclock	[4 t c]
System #4 Meter immediate	[4 F I]
System #4 Meter delayed	[4 F d]
System #5 Meter immediate	[5 F I]
System #6 Meter immediate	[6 F I]
System #7 Meter immediate	[7 F I]
System #9 Meter immediate	[9 F I]



Valve position

Select the code that identifies the unit position.

Examples: First control valve	[L E A d]
Second, third or fourth control valve	[L A g]

NOTE: This display is only viewed with system #5, #6, #7 & #9



Remote signal start

Select the code that identifies what you want to do

Examples: Cancel setting	[r S o F]
Requires a 3 minute start signal	[r S - 3]

NOTE: If used, subsequent System Capacity, System Safety Factor, Hardness, Flow Meter size & Chemical Pump Output settings are disabled.



Display format

Select the code that identifies the units of measurement.

Example: Metric (m ³)	[U - - 4]
------------------------------------	-------------



System capacity

Enter the code to represent the calculated ion exchange capacity.

Example: 30 kg. CaCO ₃	[C t 3 . 0]
-----------------------------------	---------------

Note: Ct indicates capacity multiplied by ten. The value you enter is kg. divided by 10 so 95 kg. CaCO₃ capacity would be entered as

[C t 9 . 5]



System Programming Flow Chart - Cont'd.



Capacity safety factor

A pointless function that allows downgrading of system calculations.

Example: Cancel setting (recommended) [**c F - 0**]

If you want to use it then a 10% reduction is defined by [**c F 1 0**]



Feed water hardness

Enter the untreated water hardness in mg/l CaCO₃ divided by 10

Example: 320mg/l CaCO₃ [**H - 3 2**]



Regeneration time

For time initiated or delayed meter initiation, set the time required.

Example: 2:15 AM [**2 : 1 5**]

Remember that the previously established [U - - 4] setting defines 24 hour clock

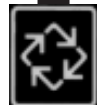


Regeneration day override

Use this function to force regeneration sequences, regardless of system meter count function.

Example: Cancel setting [**A O F F**]

Forcing regeneration 7 days since the last regeneration [**A - - 7**]



Regeneration day cycle step #1 setting

Enter the time required for the first regeneration stage - BACKWASH

Example: 10 minutes backwash time required [**1 - 1 0**]



Regeneration day cycle step #2 setting

Enter the time required for the second regeneration stage - BRINE DRAW/SLOW RINSE

Example: 50 minutes brine draw & slow rinse time required [**2 - 5 0**]



Regeneration day cycle step #3 setting

Enter the time required for the third regeneration stage - RAPID RINSE

Example: 10 minutes rapid rinse time required [**3 - 1 0**]



Regeneration day cycle step #4 setting

Enter the time required for the forth regeneration stage - BRINE REFILL

Example: 12 minutes brine refill time required [**4 - 1 2**]



Regeneration day cycle step #5 setting

This step is not used in conventional systems.

Example: Cancel the setting [**5 O F F**]



System Programming Flow Chart - Cont'd.



Timed auxiliary relay output setting - Window #1 start

The start point referenced to the beginning of the regeneration cycle.

Example: Cancel the setting

[A r o f]

At the end of backwash

[S - 1 0]



Timed auxiliary relay output setting - Window #1 end

The end point referenced to the beginning of the regeneration cycle.

Example: At the end of brine draw/slow rinse

[E - 6 0]

NOTE: The maximum timer setting is the total of all regeneration cycle step times. The minimum End time is 1 minute after the Start time.



Timed auxiliary relay output setting - Window #2

The start point referenced to the throughput of water to service.

Example: Cancel the setting

[c O o F]

After 5m³

[u - - 5]

Signal duration of 65 seconds

[t - 6 5]



Flow meter size

Enter the code appropriate to the connected meter.

Example: Non Fleck meter

[F F - -]

Fleck 1in meter

[F F 1 . 0]

Fleck 1-1/4in meter

[F F 1 . 2]

Fleck 1-1/2in meter

[F F 1 . 5]

Fleck 2in meter

[F F 2 . 0]

Fleck 3in meter

[F F 3 . 0]



Non Fleck meter

This is a sub setting if a non Fleck meter was set in the previous stage.

Example: 36.3 pulses per litre water flow

[F 3 6 . 3]

NOTE: The above setting is not shown on System #4 or System #6 & #7 Lag valve settings



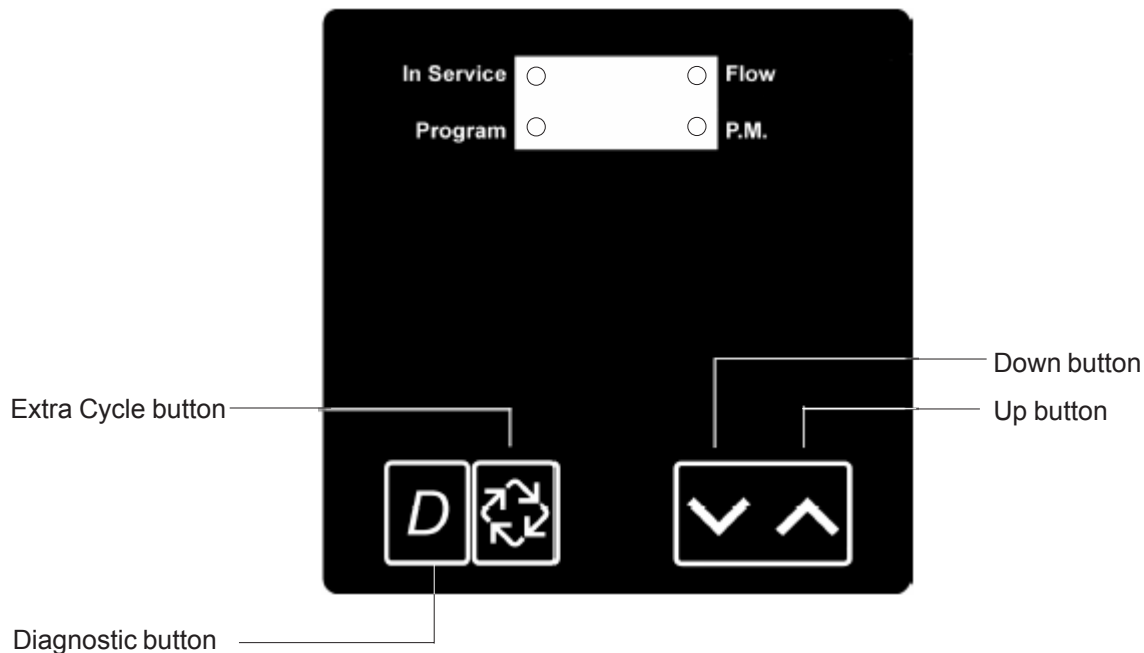
Line frequency

This will normally default to LF50 when [U - - 4] is selected but if not then adjust it.

Example: 50Hz line frequency

[L F 5 0]

Master programming is now finished



When the Master Programming Mode is entered, all available option setting displays may be viewed and set as needed. Depending on current option settings, some displays may not be viewed or set.

Entering Master Programming Mode

Set the **Time Of Day** display to 12:01 P.M. Press and hold the **Set Up** and **Set Down** buttons together until the Programme indicator turns on (about 5 seconds). Depending on current option settings, some displays cannot be viewed or set.

Exiting Master Programming Mode

Press the **Extra Cycle** button once per display until all are viewed. The Programme Mode is exited and normal operation resumes.

Resetting Permanent Programming Memory

Press and hold the **Set Up** and **Set Down** buttons for 25 seconds or until the **Time Of Day** display resets to 12:00PM. All option settings reset to default values. Control programming must be reset as necessary.

1. Valve Model (No Display Code)

This programme step selects valve models: **2750, 2850, 2900, 3150, and 3900**

- Use **Set Up** or **Set Down** buttons to adjust this value.
- Press the **Extra Cycle** button.

2. Regeneration configuration (No Display Code)

This programme step is used to set the Regeneration Type. Availability is dependent on valve model chosen.

For conventional Downflow operation

Setting: [dF]

3. System Type

Use this programme step to set the appropriate System Type code. Possible settings are:

System Type 4 Time Clock Delayed

Setting: [4tc]

The control regenerates on the days set in Regeneration Day Override, at the Regeneration Time set in Regeneration Time.

System Type 4 Meter Immediate

Setting: [4FI]

The control regenerates immediately when the available volume of treated water reaches zero (0).

System Type 4 Meter Delayed

Setting: [4Fd]

The control regenerates on the day the available volume of treated water is less than the reserve volume. Regeneration starts at the Regeneration Time.

System Type 5 Meter Immediate (Interlock)

Setting: [5 FI]

This is a 2 to 4 unit system, each unit having a meter, and all in service. Only one unit is allowed in regeneration at a time. A unit regenerates immediately when the available volume of treated water drops to zero (0) and no other unit is in regeneration.

System Type 6 Meter Immediate. (Series)

Setting: [6 FI]

This is a 2 to 4 unit system, all in service, with one meter for the entire system, connected to the designated LEAD unit. When the programmed volume of treated water drops to zero (0), it requests the first unit to go into regeneration. Then, when the first unit has finished regenerating, the second follows, and so on through the series.

System Type 7 Meter Immediate. (Alternating)

Setting: [7 FI]

This is a 2 unit system, with only one unit connected to a meter in the common soft water line and only one unit in service. When the volume of treated water drops to zero (0) in the unit in service, it requests regeneration. This causes the unit in standby to move to service. Then the unit requesting regeneration moves to standby and begins regeneration.

System Type 9 Meter Immediate. (Alternating)

Setting: [9 FI]

This is a 3 or 4 unit system, each unit having a meter, one unit in standby and all other units in service. Only one unit is allowed in regeneration at a time. When the volume of treated water drops to zero (0) in the unit in service, it requests regeneration. This causes the unit in standby to move to service. Then the unit requesting regeneration moves to standby and begins regeneration.

— Use **Set Up** or **Set Down** buttons to adjust this code.

— Press the **Extra Cycle** button.

4. Valve Position (No Display Code)

This programme step is for two or more control valves in a system. Enter **Lead** on the first control valve in a system and for the remaining valves enter **Lag**. For systems that use 1 meter, the flow meter cable must be connected to the lead control valve. This program step is skipped for System Types 4tc, 4FI and 4Fd.

First Control Valve

Setting: [LEAd]

Second, Third, Fourth Control Valve

Setting: [LAg]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

NOTE: When programming multitank systems, programme the LAg units first and then the LEAd unit. This avoids lower drive operation caused by system type changes and errors.

5. Remote Signal Start (Display Code rS)

The control system is monitored other than a meter (typically a hardness sensor). Regeneration begins immediately after a contact closure is received for the number of minutes programmed. The amount of time is required for a contact closure to be presented before the signal is considered to be valid.

Range = 1 – 99 minutes

Cancel Setting

Setting: [rSoF]

3 Minute Signal Time To Start Regeneration

Setting: [rS-3]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

Master Programming Guide

6. US / Metric Display Format (Display Code U)

This programme step sets the desired display format. The letter **U** in the first digit of the display identifies this programme step. The possible settings are:

US Display: US gallons of water, 12 hour timekeeping, and grains of hardness

Setting: [**U - 1**]

Metric Display: m³ of water, 24 hour timekeeping, Kg. CaCO₃ capacity and mg/l CaCO₃ hardness ⇨

Setting: [**U - 4**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

7. System Capacity (Display Code C)

This programme step sets the capacity of the system in kilograms of CaCO₃. The letter **C** in the first digit of the display identifies this programme step. System Capacity calculates the amount of treated water (m³) that can be treated by the unit before a regeneration cycle is required. Note: The 't' after the 'C' indicates x 10

Range = Ct1.0 – Ct99 kg. CaCO₃ ÷ 10

Example: 45.0 kg CaCO₃ system capacity

Setting: [**Ct 4.5**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

8. Capacity Safety Factor (Display Code cF)

This programme step adjusts system capacity. The setting is a percentage by which the unit's capacity is reduced.

Range = 0 – 50%.

Example: Reduce system capacity by 10%

Setting: [**cF10**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

9. Feed Water Hardness (Display Code H)

This programme step sets the feed water hardness. The letter **H** in the first digit of the display identifies this program step. The system automatically calculates treated water capacity based on the feed water hardness entered in this programme step and the system capacity entered in programme step #3.

Range = 2 – 1990 mg/l CaCO₃ ÷ 10

Example: 440 mg/l CaCO₃

Setting: [**H - 44**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

10. Regeneration Time (No Display Code)

This programme step sets time of day for the regeneration to occur. A non-flashing colon between two sets of numbers identifies the Regeneration Time display.

Range = Anytime

2 o'clock A.M. regeneration time Setting: [**2:00**] (P.M. Indicator Off)

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

11. Regeneration Day Override (Display Code A)

This programme step sets the maximum amount of time (in days) the unit can be in service without a regeneration. The letter **A** in the first digit of the display identifies this program step. For System Type Time Clock Delayed [**4tc**] the system regenerates at the time set previously, after the number of days programmed in this step. For any Meter System Types, the system regenerates after the number of days programmed in this step at the same time of day that the previous regeneration occurred unless the meter initiates a regeneration cycle earlier.

Range = 1 – 99 (Time Clock Delayed [**4tc**])

Range = OFF, 1 – 99 (All Meter Regeneration Types)

Example: Override every 14 days

Setting: [**A -14**]

Option turned off

Setting: [**AOFF**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

12. Regeneration Cycle Step Programming (Display Code 1 – 5)

This programme step programs the Regeneration Cycle step times. Up to 5 Regeneration Cycle steps can be programmed. The Regeneration Cycle Step being programmed is shown in the first digit of the display. Each display sets the duration time in minutes of that specific step in the regeneration cycle. For regeneration programmes with less than 5 regeneration cycle steps, the time for the step # after the last active step must be set to OFF. To skip a regeneration cycle step and go to the next cycle, the setting should be at 0. If regeneration cycle step setting is OFF, the remaining cycle steps do not appear for setting.

Range = OFF, 0 – 99 minutes

Regeneration Cycle Step #1 (10 minutes)

Setting: **[1- 10]**

Regeneration Cycle Step #5 (Cancel)

Setting: **[5OFF]**

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

13. Auxiliary Relay Output (Display Codes AroF, cPoF)

The next two displays viewed are part of a series of settings used to programme the optional relay output. The first setting turns the output on / off during Regeneration only. The second setting turns the output on during Service only, when a set volume of water used has accumulated. This second is not viewed on non-metered systems. When more than one of these settings is used, the relay must be wired to the auxiliary brine cam switch output to operate two separate pieces of equipment at one time.

NOTE: When auxiliary outputs are in the OFF (default) setting, use the Set Up or Set Down buttons to set the first setting. Then press the Extra Cycle button to advance the second setting.

14. Timed Auxiliary Relay Output - Window #1 (Display Codes S-Start Time, E-End Time)

This option setting consists of two displays. The first display sets the turn-on time of the output, referenced to the start of the first Regeneration Cycle. The second display sets the output turn-off time, referenced again to the start of first Regeneration Cycle. An OFF setting cancels this setting. A set on-time with a set off-time of S turns the output off at the start of Service. All settings are in minutes and output timing is synchronized with regeneration cycle timing.

Range = Total time of Regeneration

Examples:

Cancel Setting

[AroF]

Turn on at Start of Regeneration

[S- - 0]

Shut off at End of Regeneration**

[E- 92]

Turn on after 10 minutes in Regeneration

[S- 10]

Shut off after 20 minutes in Regeneration

[E- 20]

****NOTE: The end of Regeneration is the total of all Regeneration Cycle steps times.**

Timed Auxiliary Relay Output - Window #2 (Display Codes u-Volume, t-Seconds)

Normally used for chemical pump dosing control, this option setting consists of two displays. The first display sets the volume of water flow at which the output turns on. The second display defines the duration (in seconds) of the output.

Range = 1 – 999 m³

Range = 1 – 999 seconds

Cancel Setting

[cPoF]

Activate output after every 200 m³

[u200]

Turn on for 60 seconds after every 200 m³

[t- 60]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

Note: If window #1 & #2 are both to be used, the output signal should be routed via the auxiliary microswitch fitted to the valve which changes contacts between the service and regeneration positions.

15. Fleck Flow Meter Size (Display Code FF)

This programme step sets the size of the Fleck flow meter. The letters FF in the first two digits of the display identifies this programme step. The last two digits of the display indicate the meter's size. If [**FF--**] generic is chosen, the next step is **Generic Flow Meter Size**. If any other selection is chosen, the next step is **Line Frequency**.

Range = 1in – 3in Fleck Meter

2" Fleck Meter

Setting: [**FF2.0**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

16. Generic Flow Meter Size (Display Code F)

This programme step sets the proper number of pulses generated by the flow meter for each litre of water flow.

Range = 0.1 – 99.9 pulses per litre

Example: 32.4 pulses per litre

Setting: [**F32.4**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

17. Line Frequency (Display Code LF)

This programme step sets the frequency of the power supply. When the line frequency is set, all timekeeping functions remain accurate. The letters **LF** in the first digit of the display identify this program step. The possible settings are:

60Hz Line Frequency

Setting: [**LF60**]

50Hz Line Frequency

⇒ Setting: [**LF50**]

— Use **Set Up** or **Set Down** buttons to adjust this value.

— Press the **Extra Cycle** button.

Exiting the Master Programming Mode

Press the **Extra Cycle** button once more to exit Master Programme Mode. After leaving Master Programming mode the abbreviation **CALc** appears on the display indicating that volume is being calculated (initial communication is taking place if the System Type is 7 or 9).

NOTE: The length of time CALc displays is dependent on the calculated volume and could be a minute or more.

Time of Day

Finish the control programming by setting the time of day. With the controller in Normal Operating Mode (not in Master Programming Mode or User Programming Mode), set the time by pressing **Set Up** or **Set Down** buttons.

NOTE: Do NOT press the Extra Cycle button after setting the time or a regeneration cycle will be initiated.

The chart below indicates which menu setting options are accessible for programming vs. the system or valve position within the system. *Note: The Valve Model & Regenerant Flow settings are common to all programming.*

Parameter	4tc	4Fi	4Fd	5Fi	6 & 7	6 & 7	9Fi
Valve position (Lead or Lag)				Lead/Lag	Lead	Lag	Lead/Lag
Remote start (Set to rSoF)		X		X	X		X
Display format (u - - x)	X	X	X	X	X	X	X
System capacity (C x x x)		X	X	X	X	X	X
Capacity safety factor (c F x x)		X	X	X	X	X	X
Feedwater hardness (H - x x)		X	X	X	X		X
Regeneration time (x x : x x)	X	X	X	X	X	X	X
Regeneration day override (A x x x)	X	X	X	X	X	X	X
Regeneration step times (1 - xx, 2 - xx) etc.	X	X	X	X	X	X	X
Auxiliary relay (A r o f)	X	X	X	X	X	X	X
Chemical pump output (c P O F)		X	X	X	X		X
Flow meter size (F F x x)		X	X	X	X		X
Line frequency (L F x x)	X	X	X	X	X	X	X

Diagnostic Mode Flow Chart

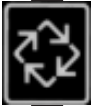


Push and release the Diagnostic Display button

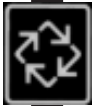
Flow Rate
Example: 22.5m³ per hour [r 2 2 . 5]
102m³ per hour [r 1 0 2]



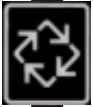
Peak Flow Rate
Example: 15.3m³ per hour [P 1 5 . 3]



Totalizer
Example: 1673 m³ [1 6 7 3]
25597 m³ [t 2 5 5]
163059 6m³ [L 1 . 6]



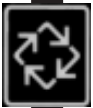
Hours between last two regenerations
Example: 93 hours [| | 9 3]



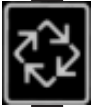
Hours since last regeneration
Example: 67 hours [= 6 7]



Adjustable volume remaining
Example: 52m³ [t 5 2]

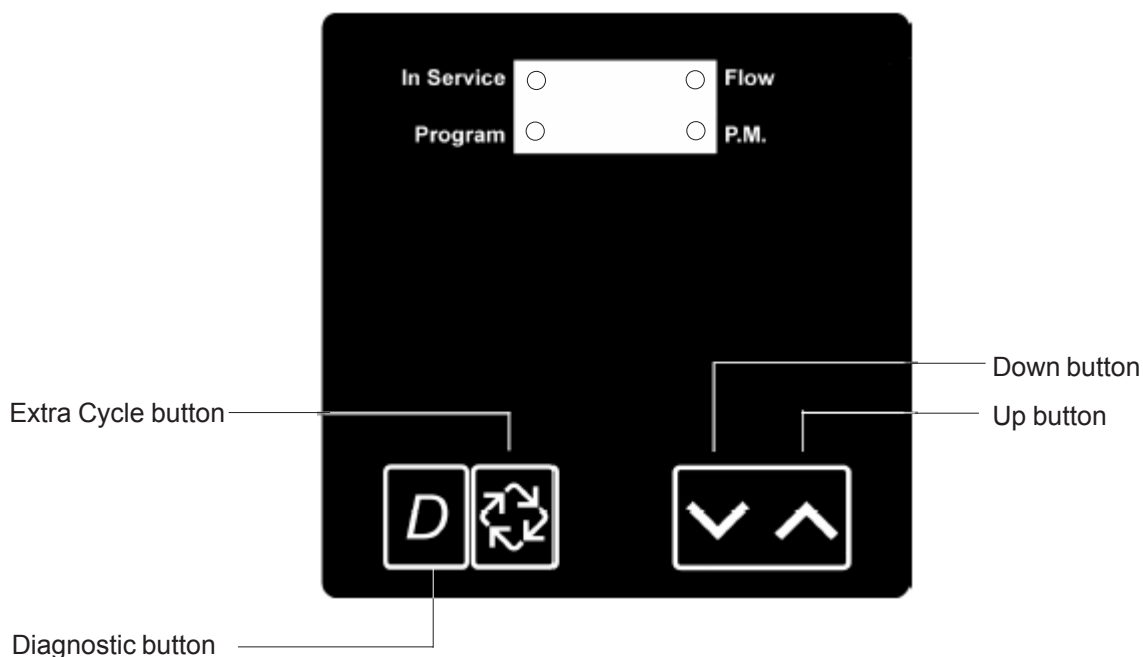


Valve position
Example: First control valve [L E A d]
Second, third or forth control valve [L A g]



Software Version
Example: SP3.0 [S P 3 . 0]

Diagnostic Mode is now finished



When the Diagnostics Mode is entered, all available displays may be viewed as needed. Depending on current option settings, some displays may not be viewed.

Overview of Diagnostic Mode

The current diagnostic will be displayed until the Extra Cycle key is pressed. There is no time limit on each display. The timer will display local information, not system information. In the event of a regeneration occurring while displaying diagnostics, then regeneration step and remaining time will be displayed. When the regeneration has been completed, the display will return to diagnostic display.

Entering & Exiting Diagnostic Mode

Push and release the 'D' button to enter. Press the **Extra Cycle** button once per display until all are viewed. The Programme Mode is exited and normal operation resumes.

1. Flow Rate (Display Code r)

The Flow rate for this particular timer will be calculated and displayed. Flow rates will be calculated over the time between pulses up to 20 seconds. Times between pulses longer than 20 seconds will be ignored. If the display is flashing, then flow rate has exceeded the range and will not calculate. The display updates once per second.

Display example [r 1 0 0]

Ranges = 0.0 - 99.9 m³/h and 100 - 113 m³/h

Depress the **Extra Cycle** button

2. Peak Flow Rate (Display Code P)

The Peak Flow rate since the last regeneration will be captured. Reset to zero by holding the UP and DOWN keys for 5 seconds during Peak Flow display.

Display example: [P 1 0 0]

Ranges = 0.0 - 99.9 m³/h and 100 - 113 m³/h

Depress the **Extra Cycle** button

3. Totaliser (Display Code t = x 1000, L = x 1,000,000)

The total volume of treated water that passes through the meter will be counted to a maximum limit of 99,999,999 m³. Reset to zero by pressing the UP and DOWN keys for 5 seconds during Totaliser display.

Display examples:

Ranges	= No display code	0 to 9999	=	0 - 9,999
	= Display code (t)	t - 10 to t999	=	10,000 - 999,999
	= Display code (L)	L-1.0 to L99.9	=	1,000,000 - 99,999,999

Depress the **Extra Cycle** button

4. Hours Between Last TWO Regenerations (Display Code II)

The hours between the last two regenerations will be saved and displayed.

Display example: [II 93]

Range = 0 to 999 Hours

Depress the **Extra Cycle** button

5. Hours Since Last Regeneration (Display Code ≡)

The hours between the last two regenerations will be saved and displayed.

Display example: [≡ 93]

Range = 0 to 999 Hours

Depress the **Extra Cycle** button

6. Volume Remaining

The volume remaining is displayed and can be adjusted manually either UP or DOWN. If the displayed value remains at ZERO for more than 10 seconds a regeneration will be initiated.

Ranges	= No display code	0 to 9999	=	0 - 9,999
	= Display code (t)	t - 10 to t999	=	10,000 - 999,999
	= Display code (L)	L-1.0 to L2.9	=	1,000,000 - 2,900,000

Depress the **Extra Cycle** button

7. Valve Position (No Display Code)

This diagnostic display is for 2 or more control valves in a system. It confirms the programmed status of the particular timer.

Display examples: First control valve [LEAd]
Subsequent control valves [LAg]

Depress the **Extra Cycle** button

7. Software Version (Display Code SP)

The electronic timer's software programme version will be displayed.

Display example: [SP3.0]

Depress the **Extra Cycle** to exit