

NGC Controller



Water Treatment Controls

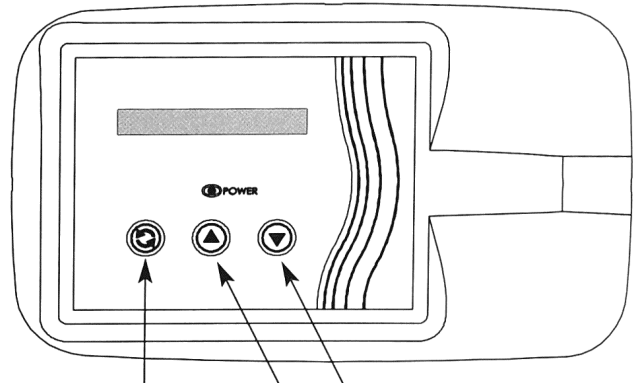
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Introduction:

The **NEW GENERATION CONTROL (NGC)** is a control designed to function with (6) different valve configurations. The control is designed with layered programming. This allows the Manufacturer's to have more control and the end user less responsibility.



Scroll button
To advance
through the
parameters

Up/Down button
to adjust the
value of the
parameter

Control Specifications:

Agency Approvals: The NGC complies with the rules of the FCC applicable to residential water softeners.

The NGC meets UL and CSA requirements for residential water softeners.

Power Requirements: The NGC receives power from an external, wall-mount or plug-in, transformer. The factory or the manufacturer supplies the transformer.

Voltage: The voltage supplied to the NGC is 24V AC.

Frequency: Line frequency is 50 Hz or 60 Hz.

Operating Range: The ambient air around a NGC must not exceed 50°C (122°F). The NGC operates down to 0°C (32°F).

Storage Range: The NGC can be stored at temperatures from -20°C (-4°F) to 70°C (158°F).

Humidity: The NGC operates properly with relative humidity from 10% to 95%, non-condensing.

Environmental Requirements:

EMC: Compliance with the following standards is evidence that the NGC is robust in the presence of electrical noise and that it does not emit excessive levels of RFI (Radio frequency interference). Electrical noise does not cause obvious problems such as micro-processor resets, or non-obvious problems such as memory corruption.

Surge Withstand: Passes a surge test per the requirements in EN 61000-4-5.

Voltage Interrupts: Passes a voltage interruption test per the requirements of EN 61000-4-11.

Radiated and Conducted Emissions: Passes radiated and conducted emission tests per the requirements of EN 55022.

Location: The water softener, with the NGC, cannot be exposed to outdoor elements, such as direct sunlight or atmospheric precipitation. The system may be installed in a covered, open-air structure such as a carport, or residential or commercial building.

Important OEM Information

Program Levels: The Installer's and Manufacturer's levels are for trained personnel only. Each level is accessed with a four, five, or six key sequence. To enter any of the program levels the NGC must display the time of day.

The End User's and Diagnostic levels require no special code to access. Follow instructions sheets located in this manual.

Power On LED: A green LED, embedded in the keypad, is ON when power is applied to the NGC and the microprocessor is operating properly.

Blinking Digits or Message: Digits, or a message, blinking at the rate of 0.5 seconds ON and 0.5 seconds OFF indicates that these digits can be changed (edited.)

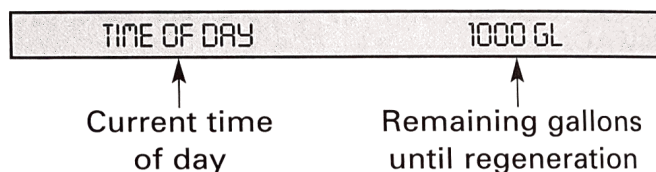
A message flashing at a rate of 1 second ON and 1 second OFF cannot be changed. It is flashing to call the user's attention to the message.

Pressing and releasing the *UP ARROW* ▲ or *DOWN ARROW* ▼ key can change blinking digits, or message. Using these two keys, the user can increase or decrease the values.

Real-Time Clock

A real-time clock maintains the time of the day when line power is applied to the NGC. *The time of day is maintained by a super capacitor for a minimum of 2 hours following loss of line power.*

Normal Service Display: The display shows the current time and the capacity remaining. (Capacity remaining is not shown if "NO METER" is selected. Refer to Programming Section.) If the time is flashing, the clock needs to be reset. After the time is set the colon flashes to indicate that the clock is operating.



Measurement Units

Both English-US and Metric units can be programmed into the control.

When the manufacturer selects English-US units, volume is displayed by "GL" (gallons), flow rate is indicated by "GPM" (gallons per minute). "GL/d" (gallons per day) indicates average volume, and time is displayed in a 12-hour AM/PM format.

When the manufacturer selects Metric units, volume is displayed by "L" (liters), flow rate is indicated by "L/m" (liters per minute), average volume is indicated by "L/d" (liters per day), and time is displayed in a 24 hour format.

Flow Input (Meters)

One of two types of flow meters may be connected to the NGC. *The Rotary valve has a built in standard meter. The Diaphragm valve uses an external standard meter.*

Standard Meter: The meter produces **108 pulses per one gallon** of flow and 29 pulses per liter of flow. The maximum pulse rate is 54 per second, corresponding to a maximum flow rate of 30 GPM.

Secondary Meter: The control can be programmed for a non-standard meter. (This is a non Hall-effect type meter.) This is called volume/pulse setting on this control (**100 gal/per pulse**).

The factory selects a "K" factor for the meter. For English-US, the "K" factor defines the number of pulses per gallon. For Metric, the "K" factor defines the number pulses per liter. The default setting is 100.

Holiday Mode

Regeneration is not allowed when the NGC is in the holiday mode. The word holiday will blink when scrolled to on the control board. After sixty seconds, the unit enters the holiday mode. The only way the unit comes out of holiday mode is a flow rate greater than 1.5 gallons per minute or if an immediate regeneration is started. Scrolling out of holiday mode is the last way to exit. After exiting, the unit will go into an immediate regeneration.

HOLIDAY	CURRENT TIME OF DAY
---------	---------------------

High-Speed Motor operation in the Regeneration Mode

High-speed motor operation is achieved while stepping the control through the regeneration cycle. *Pressing the SCROLL ⏪ button a second time while in regeneration activates the higher speed.*

Service Level

Service level starts when regeneration is completed. The control will display the time of day. At this point treated water can flow through the unit.

Capacity Remaining Counter: At the completion of regeneration, the valve returns to service. The "capacity remaining" amount is displayed.

This amount *decreases* as flow is measured by the meter. The volume amount is located in the control window along with the time of day.

TIME OF DAY	CAPACITY REMAINING
-------------	--------------------

The "capacity remaining" counter is used only if the Meter type is "STD Meter" or "Vol./Pulse".

Regeneration Level

When a regeneration in progress is aborted, the valve is cycled to the service position. If the aborted regeneration was initiated by the control (not manually initiated), the regeneration is re-started after a 60-second delay. A power outage is an example of an aborted regeneration.

Control Outputs

Drive Motor: Valve types 1 and 6 are operated with a "drive" motor (*Rotary Valve*).

Drain Motor: Valve types 2, 3, 4, and 5 are operated with a "drain" motor (*Diaphragm Valve*).

Non-Volatile Memory

NGC configuration parameters are saved in non-volatile (E²PROM) memory that has a minimum of 100,000-erase/write-cycle capability. The non-volatile memory is a storage of information that can be changed by adding or taking away. The storage of information will stay in memory in the event of a power outage.

Example: The *Hardness, Capacity or Volume* settings are the type of setting that is stored in the non-volatile memory. *In the occurrence of a power outage, the non-volatile memory will hold this information.*

When the power is restored, the time of day must be reset. The non-volatile memory is not used for the time of day. The time of day will only need to be reset if the power interruption is longer than two hours. The super capacitor will last two hours in most cases.

Corrupt Manufacturer's Mode, Installer's Mode, and Diagnostic Mode Parameters

This Corrupt mode signifies that somehow the board received an incorrect signal then rejected that signal. The board is now put on notice there was a mistake made.

If any of the parameters, except *Valve Type, Meter Type, and Duplex Type*, are corrupted, the default for the corrupted parameter is saved in non-volatile memory. In addition, a *Corrupt Memory* registers and records the error to non-volatile memory. In the diagnostic mode, the number of corruptions can be read.

Corrupt Real-Time Clock

If line power is lost for an extended period, the super cap will lose its charge. The real-time clock will stop operating. When line power returns the clock will blink, indicating that the clock needs to be set to the correct time. The clock will activate from 8:00 AM, until the clock is set to the correct time. The *Corrupt Memory* registers and records this error to *non-volatile memory*.

CORRUPT MEMORY XX

All corrupt modes will go into regeneration thirty-minutes after resetting.

Override Counter

If the *Override* parameter is set to OFF, "days to override" counter is not used to initiate regeneration.

The "days to override" counter is always used to initiate regeneration when "No Meter" is selected.

If "days to override" are programmed with a meter, the override will only initiate regeneration if the meter has not recorded enough water usage.

Regeneration


Once an immediate regeneration is requested, a complete regeneration must occur to clear the request. The same goes for a delayed regeneration. Once it starts it must finish or the board will not clear. **Manually walk the control through regeneration to clear the board. If the regeneration is aborted, the request is not cleared and another, immediate regeneration occurs. This could happen in a power outage.**

Following a power outage in the regeneration mode, the NGC is delayed for 60 seconds before restart of a new regeneration

If a **manual** regeneration is aborted there is no backup regeneration.

Requests: Any one of the following events will cause regeneration.

Immediate Regeneration

When the control is in service, the user requests an *immediate* regeneration by pushing the **SCROLL**  button three times. "REGENERATION IN 10 SEC" message will show. (Located in the end user's mode) The regeneration will occur when the second counter reaches zero.

Delayed Regeneration

While in service mode, the user requests a *delayed regeneration* by scrolling to the "REGENERATION AT 02:00" message (*located in the end user's mode*). Leave the setting in *this mode*. After the regeneration takes place, the clock will return to the time of day. Regeneration will occur when the real-time clock reaches the delayed regeneration time. (Delayed regeneration is not available if the NGC is programmed for "Immediate" regeneration.)

Exhaustion

When the "capacity remaining" counter (*counter next to the time of day*) reaches the reserve level, Regeneration starts when the real-time clock reaches the programmed regeneration time.

If the NGC is set for a delayed regeneration, the control displays:

2:00 AM REGEN

If the NGC is set for an immediate regeneration, the control displays:

02:00 REGEN

Manual Regeneration Note

When the control is turned on for the first time, or after an extended shut down, the manual regeneration may not initiate for up to one minute. When the display counts down to zero, it may repeat three or four times before regeneration is activated.

Reserve Calculation

Fixed Reserve

RSRV: 200 GL FXD

This is the gallon reserve capacity programmed by the installer.

Variable Reserve

RSRV: VARIABLE

The variable reserve gallon capacity is calculated by the NGC. It is based on the volume of water used over the previous 7 days.

Reserve = Average Daily Usage + 75 Gallons

The default variable reserve is 25% of capacity plus 75 gallons.

SERVICE REQUIRED

If this displays in the window of the control, some kind of Fault has happened on the board. This is also called a *corrupt board*. Most of the time just reprogramming will clear the window. If it does not clear then other checks must be made such as switches, board or other problems.

Programming the Manufacturer's Level

Key Buttons

⊙ SCROLL

▲ UP ARROW

▼ DOWN ARROW

Press the DOWN ARROW ▼ and hold for five seconds. The words SYSTEM CHECK will display. Now enter the code to proceed to the programming options menu below.

The code is as follows, ▼ ⊙ ▲ ▲ ⊙. The code must be entered within 10 seconds, or the control will return to the time of day display.

The following are the steps to enter the code.

Press the DOWN ARROW ▼ once.
Then press the SCROLL ⊙ button.
Now press the UP ARROW ▲ twice.
Finally press the SCROLL ⊙ button once.

Use the SCROLL ⊙ button to advance through the different settings.

Use the UP ARROW ▲ & DOWN ARROW ▼ to program the desired setting.

The following is the programming options menu.

1. Units

- **English:** (US gallons)
- **Metric:** (Liters)

2. Meter Type

- **Standard meter:** This is the standard Erie meter.
- **No meter:** When no meter is selected the installer must activate calendar override.
- **Volume /Pulse Setting:** Whenever a non-Erie meter is used, the pulse factor must be programmed in this field.

3. Capacity

- **Volume:** If selected, the installer programs the amount of water to be used.
Note: If the control is programmed for metric units, this is the only option as a capacity setting.
- **Hardness:** If selected the installer programs the capacity in grains and hardness amount.

To activate any change with either volume or hardness, advance the control through the entire regeneration cycle. The program change will then take affect.

4. Regeneration Type

- **Delayed/Immediate:** In this program, the unit will regenerate immediately if capacity reaches zero. However, the regeneration is delayed if the system still has reserve capacity.
- **Immediate:** In this program, the unit will regenerate immediately if the capacity reaches zero.
- **Delayed:** In this program, the unit will not regenerate when the capacity reaches zero. The unit will wait until the programmed regeneration time.

To return to the service mode SCROLL ⊙ down to the exit display, then press the UP ▲ or DOWN ▼ arrow. After 60 seconds if no buttons are pressed the control will return to the service mode.

Visual Instructions for the Manufacturer's Level

Accessing the manufacturer's level:

- Verify the control valve is in the service mode. The control will display the following:

TIME OF DAY GL REMAINING

- Press the *DOWN ARROW* ▼ and hold it for 5 seconds until the control displays:

SYSTEM CHECK

- Within 10 seconds, enter the manufacturer's level access code by pressing the following key sequence:

Press the *DOWN ARROW* ▼ once. Then press the *SCROLL* ⌂ button. Now press the *UP ARROW* ▲ twice. Finally press the *SCROLL* ⌂ button once.

- The control is now in the manufacture level; use the *SCROLL* ⌂ button to advance through the different settings.

The following is the programming options menu.

1. Units:

- The control will display:

UNITS: ENGLISH-US

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to program the control from "English -US" to "Metric".

Press the *SCROLL* ⌂ button to advance to the next setting.

2. Flow Meter Type:

- The control will display:

STANDARD METER

To program *no meter* or choose a *pulse factor* for a non-Erie meter continue below:

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to program the flow meter from "Std Meter" to "No Meter" or "Vol/Pulse".
- If "Vol/Pulse" is selected, Push the *UP ARROW* ▲ or *DOWN ARROW* ▼ to program the pulse factor from 1 to 1000.
- The control will display:

VOL/PULSE = # OF PULSES

Press the *SCROLL* ⌂ button to advance to the next setting.

3. Capacity (The hardness function is not programmable if "Metric" was selected in the Manufacturer's level):

- The control will display:

CAPACITY: VOLUME

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to program the capacity from a volume to a hardness setting.
- If "Volume" is selected the installer programs the amount of water to be used. *Note: If the control is programmed for metric units, this is the only option as a capacity setting.*
- If "Hardness" is selected the installer programs the capacity in grains and hardness amount.

Press the *SCROLL* ⌂ button to advance to the next setting.

4. Regeneration Type: (if "No Meter" was selected in the Manufacturer's level, delayed regeneration is the only option).

- The control will display:

REGEN: DELAYED

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to program the regeneration type to "Delayed", "Dlyd/Immd" or "Immediate".

Programming Instructions for the Installer's Level

Key Buttons

- ⊙ SCROLL
- ▲ UP ARROW
- ▼ DOWN ARROW

Press the *DOWN ARROW* ▼ and hold for 5 seconds. The words *SYSTEM CHECK* will display. Now enter the code to proceed to the programming options menu below.

The code is as follows, ▼▼⊙▼. The code must be entered within 10 seconds, or the control will return to the time of day display.

The following are the steps to enter the code.

Press the *DOWN ARROW* ▼ twice. Then press the *SCROLL* ⊙ button. Finally press the *DOWN ARROW* ▼ once more.

Use the *SCROLL* ⊙ button to advance through the different settings. Use the *UP ARROW* ▲ & *DOWN ARROW* ▼ to program the desired setting.

The following is the programming options menu.

1. **Capacity/System:** The control will display one of these pre-programmed features.

- **Capacity:** Program the volume of gallons before regeneration, This can be programmed from 100 to 999,990 gallons. *Note: Will not display when there is no meter selected from the manufacturer's mode.*
- **System:** Program the grain capacity of the system. Then *SCROLL* ⊙ to the hardness setting and enter the grains of hardness. *Note: Will not display when there is no meter selected from the manufacturer's mode.*

2. **Reset Flow:** Displays YES or NO. The *Rotary Valves* are the only valves where yes is applicable. If yes is selected the peak flow rate is set to zero and average volume per day for variable reserve is set to 25% of capacity. This setting is entered when the *SCROLL* ⊙ button is pressed.

Note: Will not display when there is no meter selected from the manufacturer's mode.

3. **Reserve or Variable Reserve:** The reserve level is pre-programmed at 200 gallons. To change the amount of reserve, press the *SCROLL* ⊙ button, then use the arrow keys to program a different amount.

Note: Will not display when there is no meter selected or immediate regeneration is selected in the manufacturer's mode.

If *variable* is selected, the variable reserve starts at 25% of capacity + 75 gallons.

Note: Will not display when there is no meter selected or immediate regeneration is selected in the manufacturer's mode.

4. **Time of Regeneration:** This is the time of the day that the unit will regenerate.

Note: Will not display if immediate regeneration was selected from the manufacturer's mode.

5. **Over Ride:** The unit can be programmed to regenerate from one to thirty days. This will override the meter and regenerate at the chosen day. If the system has no meter, this field must be activated.

6. **Backwash:** The backwash time can be programmed from 1 to 99 minutes. If the control is programmed for metric units this position will display as *CYCLE 1* (not applicable on all models).

7. **Brine and Rinse:** The brine and rinse time can be programmed from 1 to 99 minutes. If the control is programmed for metric units this position will display as *CYCLE 2* (not applicable on all models).

8. **Fill and Rinse:** The fill and rinse time can be programmed from 1 to 99 minutes. If the control is programmed for metric units this position will display as CYCLE 3 (not applicable on all models).

To return to the service mode SCROLL Ⓞ down to the EXIT display, then press the UP ▲ or DOWN ▼ arrow. After 60 seconds if no buttons are pressed the control will return to the service mode.

Manual Regeneration:

To manual regenerate the system, press the SCROLL Ⓞ button three times. Seconds will count down from 10 to 0 initiating regeneration. To cancel the regeneration, scroll past the cycle before the control counts down to zero. If the control reaches zero, the system will initiate regeneration.

To advance the system through regeneration, press the SCROLL Ⓞ button. Continue past each step in the regeneration cycle until the control displays the time of day.

Note: Allow the motor to stop at each cycle before advancing.

To activate *Delayed Regeneration*, press the SCROLL Ⓞ button four times. The control will display REGEN AT 2 00 AM. Leave the control in this program in order for this setting to activate.

Note: Will not display if control is programmed for immediate regeneration.

Visual Instructions for the Installer's Level

Capacity (Volume Setting)

Accessing the Installer's level:

Verify the control valve is in the service mode.

- The control will display for service mode:

TIME OF DAY	GL REMAINING
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- Press the **DOWN ARROW** ▼ and hold it for 5 seconds until the control displays:

SYSTEM CHECK

- Within 10 seconds, enter the Installer's level access code, by pressing in the following key sequence:
DOWN ARROW ▼
DOWN ARROW ▼
SCROLL ⌚ button
DOWN ARROW ▼
- The control is now in the Installer's Level; use the **SCROLL** ⌚ button to advance through the different settings.

The following is the programming options menu.

1. Capacity:

- The control will display:

CAPACITY:	1000 GL
-----------	---------

- Press the **UP ARROW** ▲ or **DOWN ARROW** ▼ to set the volume of softened water between regenerations in increments of 100 gallons. This can be programmed from 100 to 999,999 gallons.

Press the **SCROLL** ⌚ button to advance to the next setting.

2. **Reset Flow:** (Not available if the control is programmed for "No Meter" in the Manufacturer's level).

- The control will display:

RESET FLOW?	NO
-------------	----

Press the **UP ARROW** ▲ or **DOWN ARROW** ▼ to select Yes or No.

If yes is selected (*Rotary Valve only*) the peak flow rate is set to zero. Average volume per day is set to 25% of capacity.

Press the **SCROLL** ⌚ button to advance to the next setting.

3. Reserve capacity:

- The control will display:

RSRV:	200 GL FXD
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- To adjust the reserve press the **SCROLL** ⌚ button. Then press the **UP ARROW** ▲ or **DOWN ARROW** ▼ to set the reserve capacity in increments of 10 gallons up to 40% capacity of the bed.
- If a variable reserve is desired press the **UP ARROW** ▲ or **DOWN ARROW** ▼.

- The control will display:

RSRV:	VARIABLE
-------	----------

- The reserve capacity will be calculated automatically, based on the registered daily water consumption.
- The default setting is 25% of the capacity, + 75 gallons.

Press the **SCROLL** ⌚ button to advance to the next setting.

4. Time of Regeneration:

- The control will display:

REGEN @ 2:00

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the time of regeneration.

Press the **SCROLL** ⌂ button to advance to the next setting.

5. Days Override:

- The control will display:

OVERRIDE:	OFF
-----------	-----

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the number of days between regenerations from "OFF" to maximum 30 days.

Press the **SCROLL** ⌂ button to advance to the next setting.

The following cycle times are not applicable for all controls. The control you have may have one or more cycles.

6. Cycle 1:

The control will display:

BACKWASH:	10 MIN
-----------	--------

or

BRN/RNS:	60 MIN
----------	--------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the backwash cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

7. Cycle 2:

The control will display:

BRN/RNS:	60 MIN
----------	--------

or

FILL:	5 MIN
-------	-------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the brine/slow rinse cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

8. Cycle 3:

- The control will display:

BACKWASH:	5 MIN
-----------	-------

or

RNS/FILL:	5 MIN
-----------	-------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the fast rinse cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

9. Cycle 4:

The control will display:

FILL:	10 MIN
-------	--------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the brine refill cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

10. Exiting the Installer's Level:

- Press the **SCROLL** ⌂ button until the display shows:

EXIT

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to exit the Installer's level.

In order for these new settings to become active, it is necessary to execute a complete regeneration. Stepping through a manual regeneration will accomplish this.

Visual Instructions for the Installer's Level

System (Hardness Setting)

Accessing the Installer's level:

Make sure that the control valve is in the service mode. The control will display:

TIME OF DAY	GL REMAINING
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- Press the *DOWN ARROW* ▼ and hold it for 5 seconds until the control display shows:

SYSTEM CHECK

- Within 10 seconds, enter the Installer's level access code, by pressing in the following key sequence:
DOWN ARROW ▼
DOWN ARROW ▼
SCROLL ⌂ button
DOWN ARROW ▼.
- The control is now in the Installer's level; use the *SCROLL* ⌂ button to advance through the different settings.

The following is the programming options menu.

1. System:

- The control will display:

SYSTEM:	24000 GRN
---------	-----------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the softening capacity between regenerations in increments of 1000 Grn.

Press the *SCROLL* ⌂ button to advance to the next setting.

2. Capacity (The hardness function is not programmable if "Metric" was selected in the Manufacturer's level):

- The control will display:

WATER HARD:	28 GRN
-------------	--------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the water hardness between 0 and 99 grains.

Press the *SCROLL* ⌂ button to advance to the next setting.

3. Reset Flow: (Not available if the control is programmed for "No Meter" in the Manufacturer's level).

- The control will display:

RESET FLOW?	NO
-------------	----

- To select yes use the *UP ARROW* ▲ or *DOWN ARROW* ▼ (Rotary Valve only). The peak flow rate is set to zero. Average volume per day is set to 25% of capacity.
- The control will display:

RSRV:	VARIABLE
-------	----------

- The reserve capacity will be calculated automatically, based on the registered daily water consumption.
- The default setting is 25% of the capacity, + 75 gallons.

Press the *SCROLL* ⌂ button to advance to the next setting.

4. Time of Regeneration:

- The control will display:

REGEN @ 2:00

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the time of regeneration.

Press the *SCROLL* ⌂ button to advance to the next setting.

5. Days Override:

- The control will display:

OVERRIDE:	OFF
-----------	-----

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the number of days between regenerations from "OFF" to maximum 30 days.

Press the **SCROLL** ⌂ button to advance to the next setting.

The following cycle times are not applicable for all controls. The control you have may have one or more cycles.

6. Cycle 1:

- The control will display:

BACKWASH:	10 MIN
-----------	--------

or

BRN/RNS:	60 MIN
----------	--------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the backwash cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

7. Cycle 2:

- The control will display:

BRN/RNS:	60 MIN
----------	--------

or

FILL:	10 MIN
-------	--------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the brine/slow rinse cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

8. Cycle 3:

- The control will display:

BACKWASH:	5 MIN
-----------	-------

or

RNS/FILL:	5 MIN
-----------	-------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the fast rinse cycle from 0 to maximum 99 minutes.

Press the **SCROLL** ⌂ button to advance to the next setting.

9. Cycle 4:

- The control will display:

FILL:	10 MIN
-------	--------

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ to set the length of the brine refill cycle from 0 to maximum of 99 minutes.

Press the **SCROLL** ⌂ button, control will display:

EXIT

10. Exiting the Installer's Level:

- Press the *UP ARROW* ▲ or *DOWN ARROW* ▼ exit the Installer's Level.

In order for these new settings to become active, it is necessary to execute a complete regeneration. Stepping through regeneration manually will accomplish this.

Programming Instructions for the End User's Level

Key Buttons

⊞ SCROLL

▲ UP ARROW

▼ DOWN ARROW

Programming the Time of Day: The time of day and total gallons remaining is viewed in the display.

Pressing the *SCROLL* ⊞ button enters the Time of Day programming mode. Once pressed the time of day will start flashing. To adjust the time, press the *UP ARROW* ▲ or *DOWN ARROW* ▼.

Holiday Program: To activate the holiday program press the *SCROLL* ⊞ button twice. *HOLIDAY* will start flashing. If the control is left in this program the system will not regenerate.

The holiday program ends when a flow rate greater than 1.5 GPM is measured or when the *SCROLL* ⊞ button is pressed. In either of these cases the system regenerates immediately.

Immediate Regeneration: To manual regenerate the system, press the *SCROLL* ⊞ button three times. Seconds will count down from 10 to 0 initiating regeneration. To cancel the regeneration, scroll past the cycle before the control counts down to zero. If the control reaches zero, the system will initiate regeneration.

Delayed Regeneration: To activate, press the *SCROLL* ⊞ button four times. The control will display *REGEN AT 2:00 AM*. Leave the control in this program in order for this setting to activate.

Note: Will not display if control is programmed for immediate regeneration.

To advance the system through regeneration, press the *SCROLL* ⊞ button. Continue past each step in the regeneration cycle until the control displays the time of day.

Note: Allow the motor to stop at each cycle before advancing.

Visual Instructions for the End User's Level

1. Accessing the End-User's Level:

- Verify the control valve is in the service mode. The control will display the time of day and gallons remaining before regeneration.

TIME OF DAY GL REMAINING

- Press the **SCROLL** ⌂ button; the control will display:

SET TIME OF DAY

Press the SCROLL ⌂ button to advance to the next setting.

2. Available Programming Parameters:

- **Time of Day Setting:** the control will display:

SET TIME OF DAY

- Press the **UP ARROW** ▲ or **DOWN ARROW** ▼ to program the time of day.

Press the SCROLL ⌂ button to advance to the next setting.

- **Holiday Mode:** the control will display:

HOLIDAY TIME

When the control valve is left in this position for 60 seconds, the holiday mode is now activated. The unit will not regenerate.

- The holiday program ends when a flow rate greater than 1.5 gallons is measured with the meter or when the **SCROLL** ⌂ button is pushed. In either of these cases the unit will start an immediate regeneration.

Press the SCROLL ⌂ button to advance to the next setting.

3. Immediate Regeneration Mode:

- The control will display:

REGEN IN 10 SEC

- If the control valve is left in this position, the timer will countdown to 0, starting a regeneration.
- To avoid an immediate regeneration, push the **SCROLL** ⌂ button before the timer has reached 0.

Press the SCROLL ⌂ button to advance to the next setting.

4. Delayed Regeneration Mode: (not available in case regeneration type is programmed to "Immediate" in the Manufacturer's level):

- The control will display the programmed regeneration time:


REGEN AT (CURRENT SETTING)

- If the control valve is left in this position, the unit will regenerate at the programmed time.
- The display will remain in this mode until the regeneration is started.
- To cancel this mode, push the **SCROLL** ⌂ button.

Checking the Diagnostics

Diagnostic Mode (Viewing Only)

Press the *UP ARROW*  and hold for 5 seconds.


The diagnostics menu will display beginning with *REGEN DAYS AGO*. Use the *SCROLL*  button to advance to each diagnostic. If no button is pressed within 60 seconds, the display will return back to the time of the day.

- **Regeneration Days Ago:** Displays how many days ago the unit last regenerated.
- **In Service:** Displays how many days the control has been in service.
- **Number of Regenerations:** Displays the number of regenerations that have taken place since the control was installed.
- **Total Volume:** Displays the total volume of water used since installation.
- **Last Regeneration:** Displays the amount of water used before the last regeneration.
- **Peak Flow:** Displays the peak flow rate since the last regeneration. This function resets back to zero after every regeneration.
Note: Will not display when control is programmed for Volume/Pulse.
- **Average Daily Volume:** Displays the average daily water consumption.
- **Capacity/System:** If the control is programmed for Volume, the display will read *CAPACITY* along with the maximum volume of water to be used. When the control is programmed for hardness, the display will read *SYSTEM* along with the maximum grain capacity of the system.
- **Hardness:** Displays the amount of hardness programmed into the control (will not display when control is programmed for volume).

- **Reserve:** Displays whether the control is programmed for fixed or variable reserve.
Note: Will not display when programmed for immediate regeneration.
- **Regeneration Time:** Displays the time of day the unit will regenerate.
- **Override:** Displays the override mode by reading *OFF*, or the number of days programmed into the control.
- **Backwash:** Displays the minutes of backwash programmed into the control. If the control is programmed for metric units this position will display as *CYCLE 1*.
Note: Not applicable on all models.
- **Brine and Rinse:** Displays the minutes of brine and rinse programmed into the control. If the control is programmed for metric units this position will display as *CYCLE 2*.
- **Fill and Rinse:** Displays the minutes of fill and rinse programmed into the control. If the control is programmed for metric units this position will display as *CYCLE 3*.
Note: Not applicable on all models.
- **Units:** Displays the mode of measurement, *ENGLISH* or *METRIC*.
- **Meter:** Displays whether the control is programmed as *STANDARD METER*, *NO METER* or *VOLUME/PULSE* setting.
- **Capacity Volume/Hardness:** Displays whether the control is programmed for a *CAPACITY VOLUME* or *CAPACITY HARDNESS* setting.
- **Regeneration:** Displays the programmed regeneration type. *DELAYED*, *IMMEDIATE* or *DELAYED/IMMEDIATE*.
- **Valve Type:** Displays the type of valve the factory programmed into the control.
- **M P Resets:** Displays how many times the programs have been reset.
- **Corrupt Memory:** For factory information only.
- **4000 VTL REV:** For factory information only.

Diagnostic Mode No Meter (Viewing Only)

Press the *UP ARROW*  and hold for 5 seconds.

The Diagnostics menu will display beginning with *REGEN DAYS AGO*. Use the *SCROLL*  button to advance to each diagnostic. If no button is pressed within 60 seconds, the display will return back to the time of the day.

- **Regeneration Days Ago:** Displays how many days ago the unit last regenerated.
- **In Service:** Displays how many days the control has been service.
- **Number of Regenerations:** Displays the number of regenerations that have taken place since the control was installed.
- **Regeneration Time:** Displays the time of day the unit will regenerate.
- **Override:** Displays the override mode by reading off, or the number of days programmed into the control.
- **Backwash:** Displays the minutes of backwash programmed into the control. If the control is programmed for metric units this position will display as *CYCLE 1*.
Note: Not applicable on all models.
- **Brine and Rinse:** Displays the minutes of brine and rinse programmed into the control. If the control is programmed for metric units this position will display as *CYCLE 2*.
- **Fill and Rinse:** Displays the minutes of fill and rinse programmed into the control. If the control is programmed for metric units this position will display as *CYCLE 3*.
Note: Not applicable on all models.
- **Units:** Displays the mode of measurement, *ENGLISH* or *METRIC*.
- **No Meter:** Displays the control is programmed for *NO METER*.
- **Regeneration:** Displays the programmed regeneration type. *DELAYED*, *IMMEDIATE* or *DELAYED/IMMEDIATE*.
- **Valve Type:** Displays the type of valve the factory programmed into the control.
- **M P Resets:** Displays how many times the programs have been reset.
- **Corrupt Memory:** For factory information only.
- **4000 VTL REV:** For factory information only.