



IMPORTANT: Fill in Pertinent Information on Page 3 for Future Reference

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IMPORTANT PLEASE READ:

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water systems only.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi, nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F (43°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the control valve to maintain proper function.

Job Specification Sheet

Please Circle and/or Fill in the Appropriate Data for Future Reference:

Programming Mode:

Feed Water Hardness: _____ Grains per Gallon or Liters
Regeneration Time: Delayed _____ AM/PM or Immediate
Regeneration Day Override: Off or Every _____ Days
Time of Day: _____

Master Programming Mode:

Valve Type:	2750	2850	2900s	3150	3900
Regenerant Flow:	Downflow	Upflow	Brine Draw First	Upflow	Brine Fill First
Valve Address:	#1	#2	#3	#4	
Display Format:	US Gallons or Liters				
Unit Capacity:	_____ Grains or grams CaCO ₃				
Capacity Safety Factor:	Zero or _____ %				
Feed Water Hardness:	_____ Grains or milligrams CaCO ₃				
System Size:	2 Valves	3 Valves	4 Valves		
Trip Points (Gallons or M ³):	_____ Trip Point 1	_____ Trip Point 2	_____ Trip Point 3		
Trip Delays:	_____ Trip Delay 1	_____ Trip Delay 2	_____ Trip Delay 3		
Regeneration Cycle Step #1:	__ : __ : __				
Regeneration Cycle Step #2:	__ : __ : __				
Regeneration Cycle Step #3:	__ : __ : __				
Regeneration Cycle Step #4:	__ : __ : __				
Regeneration Cycle Step #5:	__ : __ : __				
Timed Auxiliary Relay Output Window:	Off or Start Time __ : __ : __				
	End Time __ : __ : __				
Chemical Pump Output Auxiliary Relay:	Off or Volume (Gallons or Liters) _____				
	Time: __ : __ : __				
Fleck Flow Meter Size:	Paddle: 1" 1.5" 2" 3"				
	Turbine: 1" 1.5" _____				
Generic Flow Meter:	Maximum Flow Rate:				
	Add __ Gallons every __ Pulses				

Timer Operation

Set Time of Day

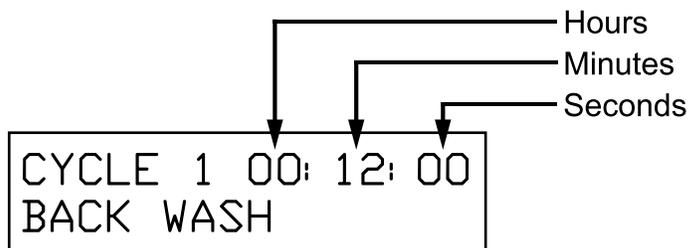
1. Hold down the Set Up or Set Down buttons for five (5) seconds.
2. Feed Water Hardness screen displays. Press the Extra Cycle button.
3. Regeneration Day Override screen displays. Press the Extra Cycle button.
4. Set Time of Day screen displays. Press the Shift button to move the cursor to the left, and the Set Up and Set Down buttons to change the value of each number.
5. Press the Extra Cycle button
6. The unit will reprogram itself with the new Time of Day.

Manually Initiating a Regeneration

1. When timer is In Service or Stand By, press the Extra Cycle button for five (5) seconds on the main screen to force a manual regeneration if another unit is not in regeneration.
2. The timer reaches Regeneration Cycle Step #1.
3. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #2 (if active).
4. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #3 (if active).
5. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #4 (if active).
6. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #5 (if active).
7. Press the Extra Cycle button once more to advance the valve back to In Service

Timer Operation During Regeneration

In the Regeneration Cycle step display, the timer shows the current regeneration cycle number the valve is on, or has reached, and the time remaining in that step. Once all regeneration steps are complete the timer returns to In Service and resumes normal operation.



Example: 12 Minutes Remaining in Cycle 1 (Back Wash)



Press the Extra Cycle button during a Regeneration Cycle to immediately advance the valve to the next cycle step position and resume normal step timing.

Flow Meter Equipped Timer

During normal operation the Time of Day screen alternates with the error screen (if errors are present).

- As treated water is used, the Volume Remaining display counts down from the calculated system capacity to zero. When this occurs a Regeneration Cycle begins if no other units are in regeneration.

Timer Operation During Programming

The timer enters the Program Mode in standby or service mode as long as it is not in regeneration. While in the Program Mode the timer continues to operate normally monitoring water usage. Timer programming is stored in memory permanently.

Timer Operation During A Power Failure

During a power failure all timer displays and programming are stored for use upon power re-application. The timer retains all values, without loss. The timer is fully inoperative and any calls for regeneration are delayed. The timer, upon power re-application, resumes normal operation from the point that it was interrupted.

NOTE: A flashing Time of Day display indicates a power outage.

Remote Lockout

The timer does not allow the unit/system to go into Regeneration until the Regeneration Lockout Input signal to the unit is cleared. This requires a contact closure to activate the unit. The recommended gauge wire is 20 with a maximum length of 500 feet. See P4 remote inputs in the wiring diagrams in the service manual.

Regeneration Day Override Feature

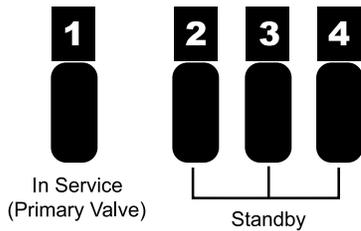
If the Day Override option is turned on and the valve reaches the set Regeneration Day Override value, the Regeneration Cycle starts if no other unit is in Regeneration. If other units are in regeneration, it is added to a regeneration queue. This occurs regardless of the remaining volume available.

	<p>WARNING Transformer must be grounded and ground wire must be terminated to the back plate where grounding label is located before installation.</p>
------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------

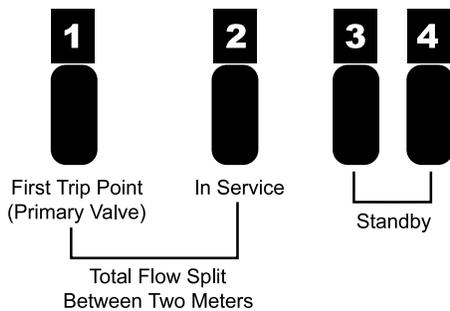
System Operation In Service

- The system operates as part of a multi-valve regeneration system.
- Each valve in the system will have an active flow meter input, even in stand by.
- The number of valves in service depends on the flow rate.

Examples of a Four-Unit System:



One valve is in service at all times (the "primary valve")

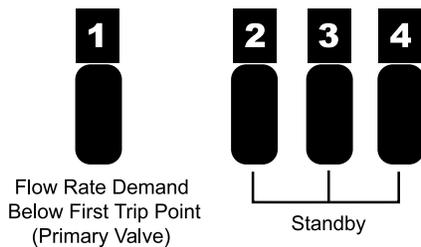


The total flow rate to the primary valve increased past the first trip point programmed rate.

The flow stayed past the trip point delayed time.

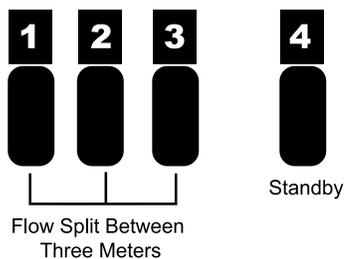
The next valve (least volume remaining) changes from stand by to in service.

This valve then splits the total flow between two meters.



The flow rate demand decreased below the first trip point.

The valve returns to stand by.

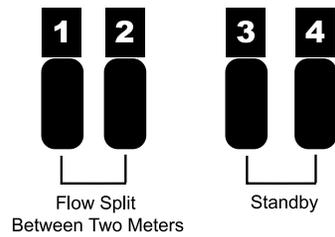


Total flow rate demand increased past a second trip point programmed rate.

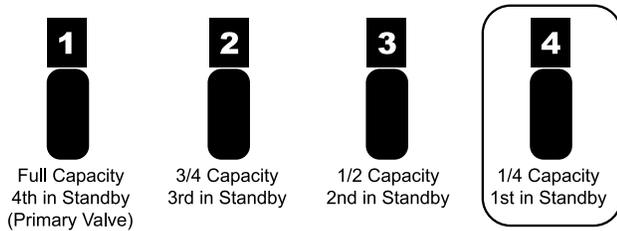
The third valve (least volume remaining) changes from stand by to in service.

The total flow is split between the three meters.

System Operation In Service



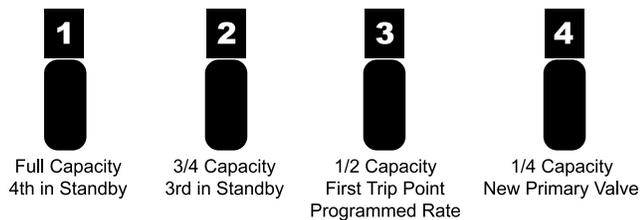
The third valves returns to stand by as demand increases past the second trip point.



Valves return to stand by due to decreased total flow rate and trip points programmed.

The valve with the most remaining volume will be the first to go into standby.

System Operation in Regeneration:



The primary valve regenerates.

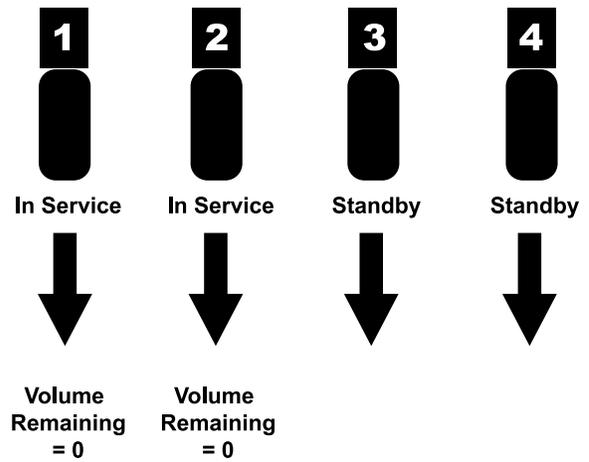
The next valve with the least remaining volume becomes the new primary valve.

The valve with the next least volume remaining will be the first trip point programmed rate.

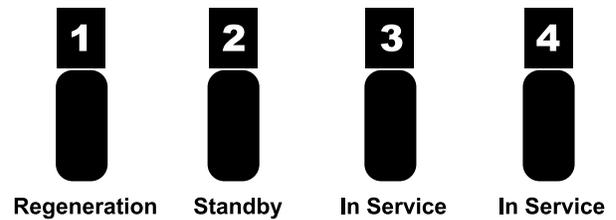
Valves continue operating in this order.

Flow in a Four-Unit System

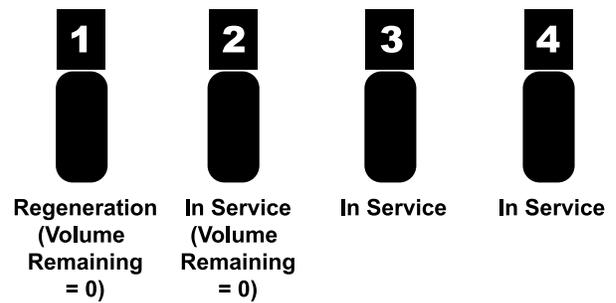
Steady Flow →

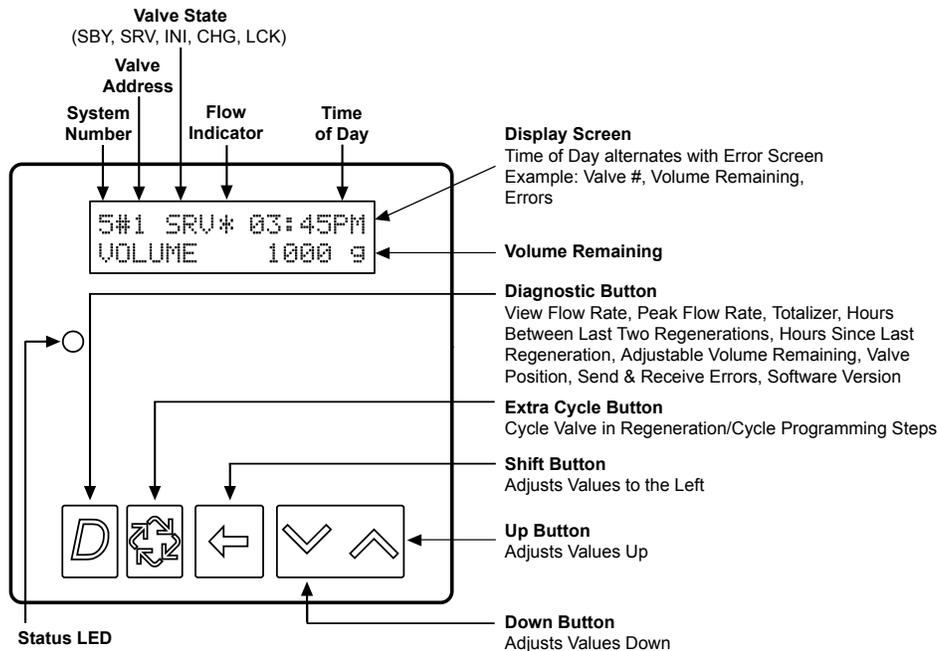


Flow Stays Steady →



Flow Increases Past the Trip Point ↑





Valve State:

CHG (Change of State)

CHG will be displayed when the lower drive changes from one state to another in dual piston valves.

INI (Initializing)

INI will display on the screen for 30 to 45 seconds when initializing after a power failure reset or programming.

RGQ (Regeneration Queued)

RGQ indicates that the reserve has been entered in a delayed system and regeneration has been queued. When in the main screen, press the Extra Cycle button to toggle service (SRV) with RGQ.

Service (SRV)

SRV will display when the unit is in service.

LCK (Lock)

Lock will be displayed when the terminal/remote input block P4 on the circuit board is switched to "lock". See the "Network/Communication Cables & Connections" section of this manual.

LED Status Lights:

Blue LED:

Illuminates while the unit is in service and no errors exist. The unit will always be in service unless a regeneration trigger has occurred (green LED light will be displayed).

A **blinking blue light** indicates the timer is in service, and queued for regeneration.

Green LED:

Illuminates when the unit is in Regeneration mode, unless an error condition exists.

A **blinking green light** indicates the timer is in standby, and not in regeneration.

Red LED:

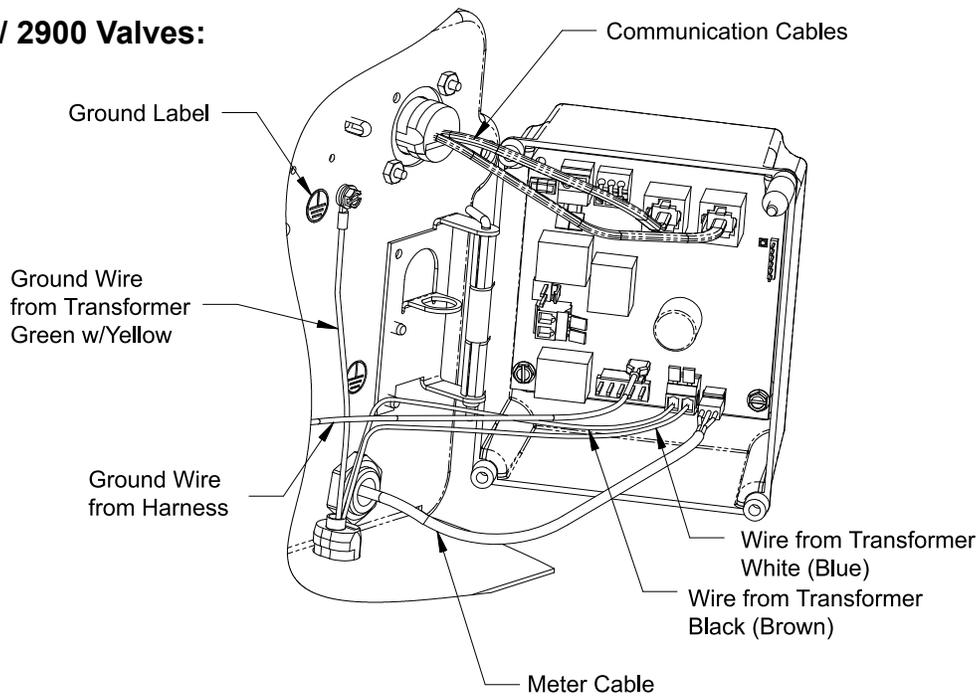
Illuminates when there is an error.

Flow Indicator:

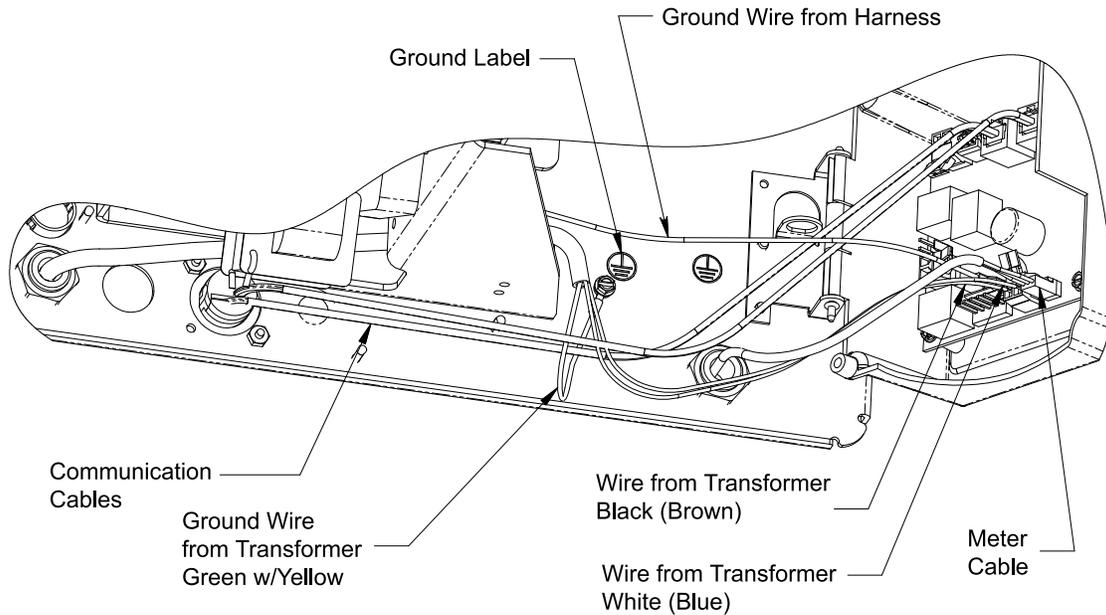
A rotating line (appearing as a rotating star shape) will display on the screen when flow is going through the meter.

Transformer & Ground Connections

2750 / 2850 / 2900 Valves:



3150 / 3900 Valves:



IMPORTANT: Earth Ground Wire Must be Installed!

Installing the Transformer:

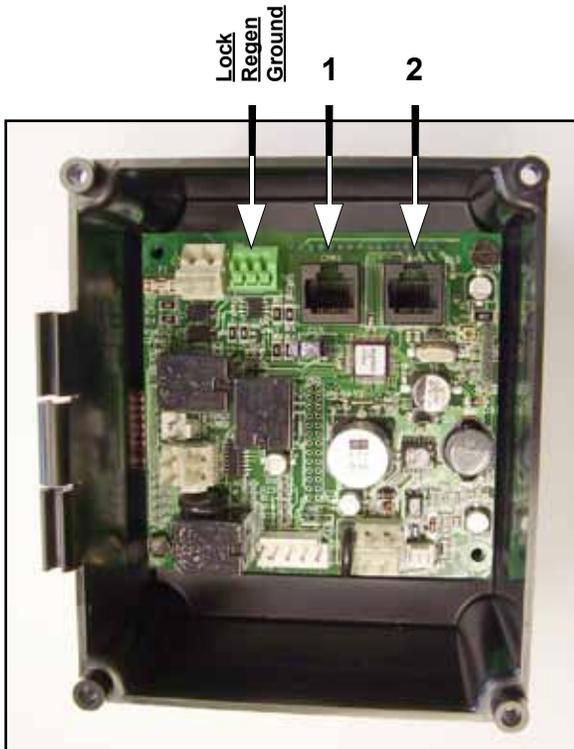
1. Locate the ground label to find the screw to attach the ground wire on the transformer.
2. Remove the screw and attach the ground wire, and re-attach the screw.

Network/Communication Cables & Connections

Use either a CAT3 or CAT5 Network/Communication cable.

1. Connect the network/communication cable first before programming.
2. The maximum cable length between timers is 100 feet.
3. Connect each unit together from one communication port to the next communication port. It does not matter which one goes to the next one (unless you are replacing an older 3214NT timer that has the Mylar® cover on the back). If replacing an old 3214NT with a new one, ensure you connect Port B on the old timer to either CAN1 or CAN2 on the new timer.

NOTE: Please see the photos below for examples of the current and old circuit boards.



**Current 3214NXT Circuit Board
(without Mylar® Overlay)**

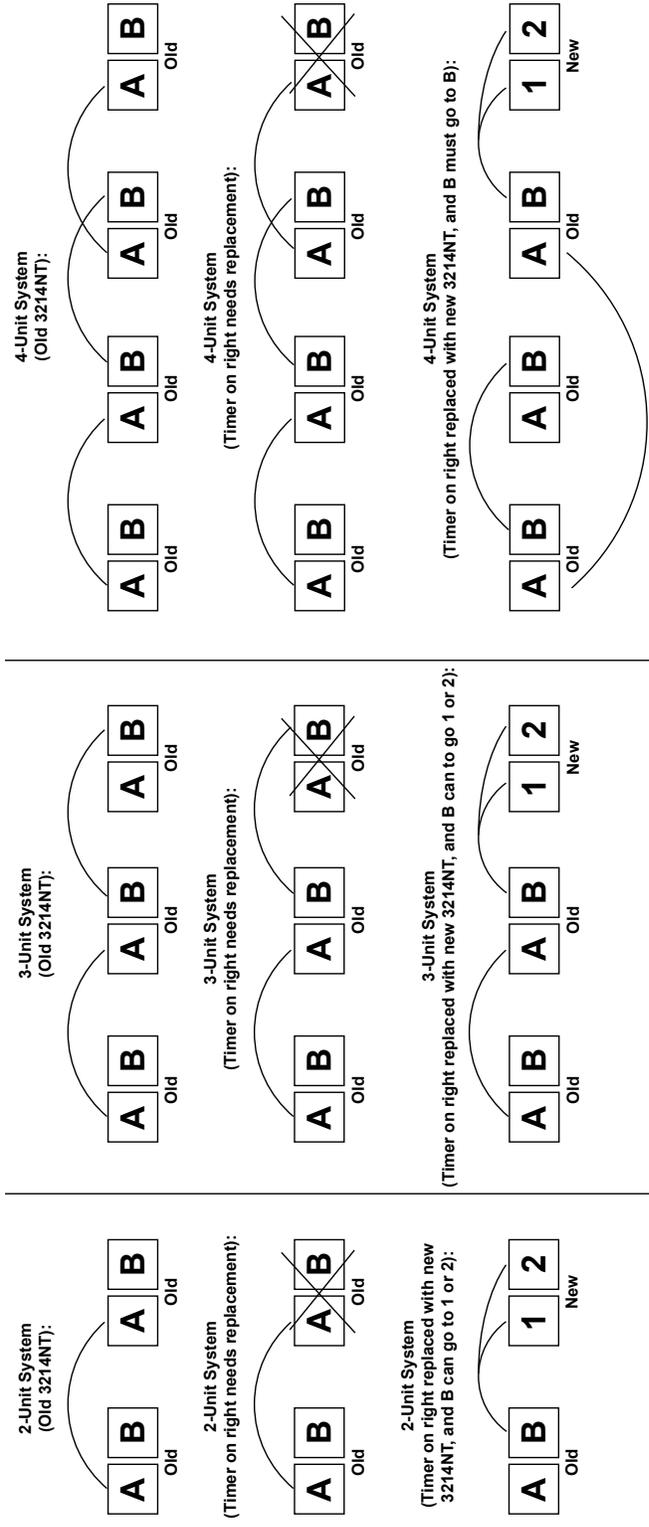
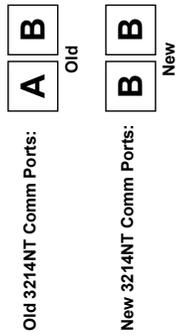


**Old 3214NT Circuit Board
(with Mylar® Overlay)**

The number of cables needed for setup is one less than the total number of valves.

- Two-Unit System = One Cable
- Three-Unit System = Two Cables
- Four-Unit Systems = Three Cables

Examples of Replacing a Timer in an Older System



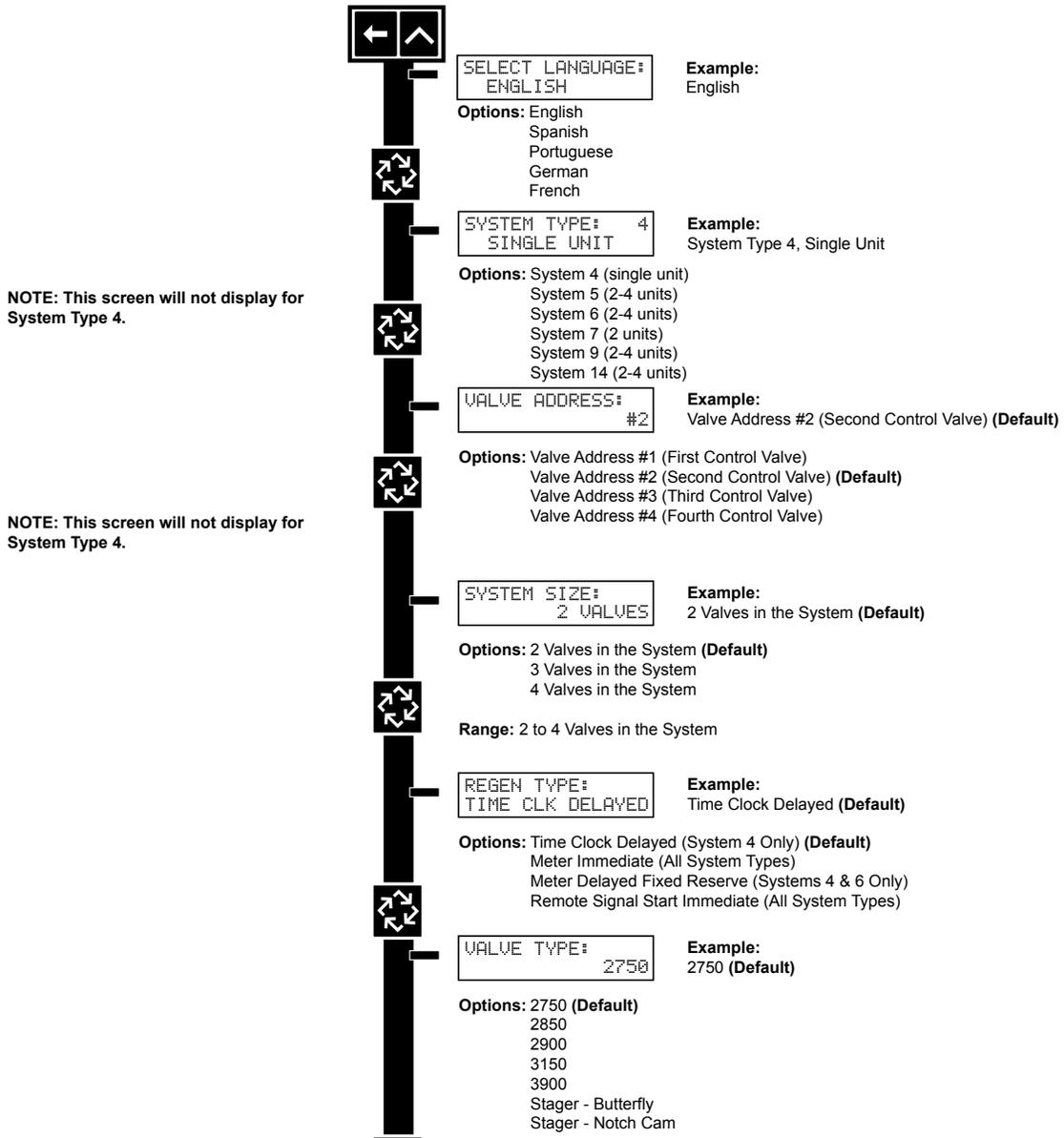
Master Programming Mode Flow Chart

NOTE: Depending on current option settings, some displays cannot be viewed or set.

Entering Master Programming Mode:

1. Press and hold the Shift and Up buttons for 5 seconds.
Press the Extra Cycle button once per display until all displays are viewed and Normal Display is resumed. Option setting displays may be changed as required by pressing either the Up or Down button. Use the Shift button to move one space to the left.
2. Depending on current valve programming, certain displays may not be viewed or set.

NOTE: If the “D” button is pressed while in master programming, no changes will be saved.



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode Flow Chart



REGENERANT FLOW:
DOWNFLOW

Example:
Downflow (Default)

Options: Downflow (Default)
UF Brine Draw
UF Fill First



DISPLAY FORMAT:
US-GALLONS

Example:
U.S. Gallons (Default)

Options: U.S. - Gallons (Default)
European Units - Liters (Metric)

NOTE: In U.S. - Gallons mode, the display will be in 12-hour time.

NOTE: In European Units - Liters (Metric) mode, the display will be in 24-hour time.



UNIT CAPACITY:
00000000 GRAINS

Example:
Grains (Default)

Options: Grains (in U.S. Format) (Default)
(in Metric Format)

Range: 9,000 to 9,900,000 Grain Capacity in U.S. Format
90.0 to 190,000 grams CaCO₃ Capacity in Metric Format

NOTE: The word "GRAINS" will change to "DEGREES" in the metric Display Format. Use the Shift button to move to the left.



CAPACITY SAFETY
FACTOR: 00%

Example:
00% (Default)

Range: 0 to 50%

NOTE: Use the Shift button to move to the left.



FEED WATER
HARDNESS: 15 GPG

Example:
15 GPG (U.S. Format) (Default)

Range: 1 to 199 Grains/Gallon (U.S. Format)
2 to 199 milligrams CaCO₃/L (Metric Format)

NOTE: Use the Shift button to move to the left.



TRIP POINT 1:
000 GPM

Examples: Default will need to be changed before next step [000] = Default
Brings 2nd valve In Service after 125 gpm [125]
Brings 2nd valve In Service after .47 m³/m [0.47]

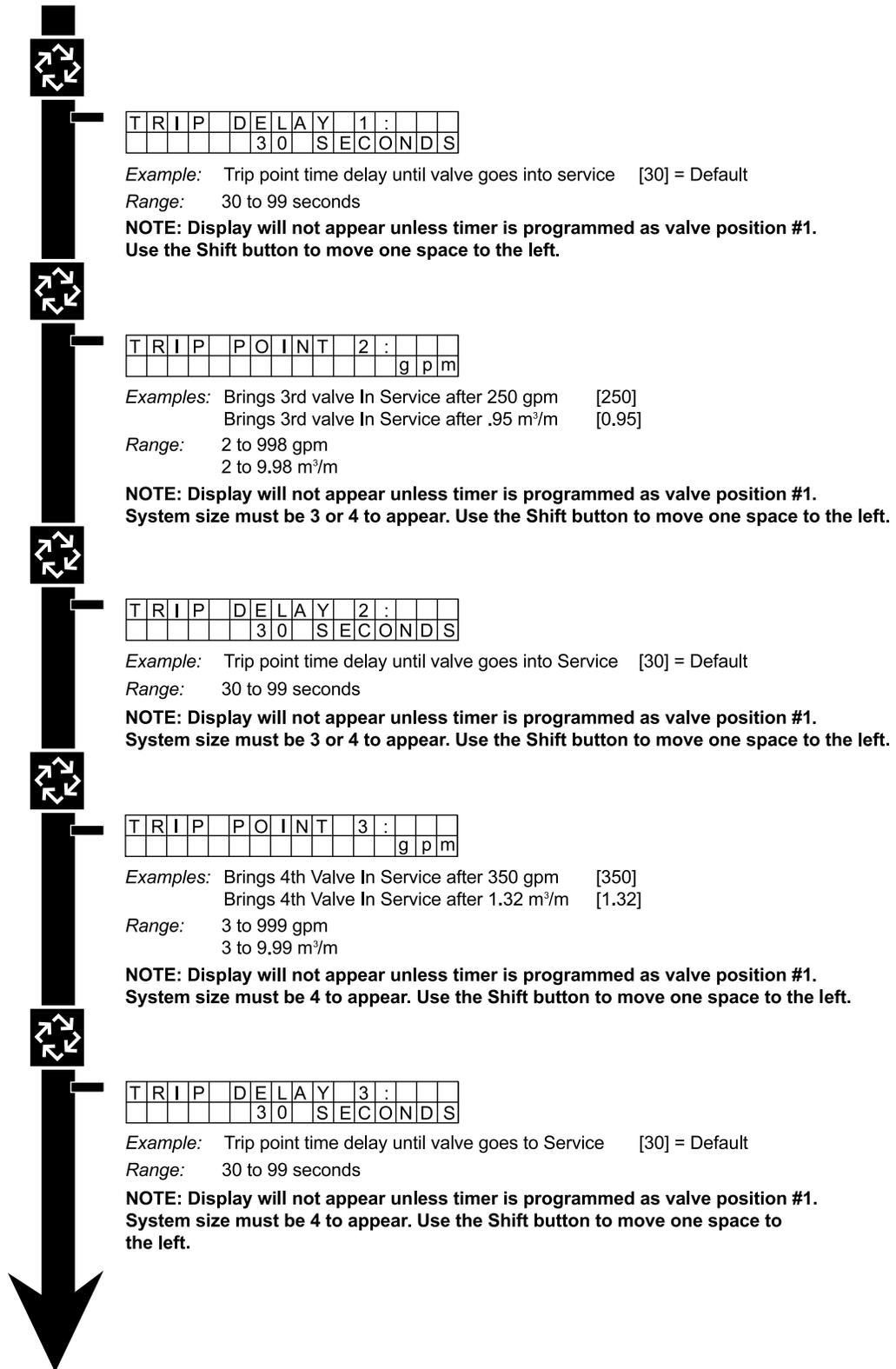
Range: 1 to 997 gpm
0.01 to 9.97 m³/m

NOTE: Display will not appear unless timer is programmed as valve position #1. Use the Shift button to change each decimal position.

NOTE: This screen will only display on the lead unit for System Types 6 & 7. For all other System Types, it will display for all units.

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode Flow Chart



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode Flow Chart



REGENERATION DAY
OVERRIDE: OFF

Example:
Off (Default)

REGENERATION DAY
OVERRIDE: 01 DAYS

Example:
1 Day

Options: Off (Default) or On

Range: 1 to 99 Days



REGENERATION
TIME: 02:00AM

Example:
2:00 A.M. (Default)

Options: A.M. (U.S. Format)
HR (Metric Format)

NOTE: Regeneration time will not appear unless
Regeneration Day Override is on.



CYCLE 1 00:00:00
BACK WASH

Example:
Cycle 1 in Back Wash Mode

Options: Regeneration Cycle Step #1
Regeneration Cycle Step #2
Regeneration Cycle Step #3
Regeneration Cycle Step #4
Regeneration Cycle Step #5

NOTE: Please refer to the "Regenerant Flow Default Cycle Steps & Times"
in the Master Programming Mode section of the manual.

NOTE: If Stager is chosen for Valve
Type, the Regeneration Cycle Step
description will not display.



AUXILIARY RELAY:
DISABLED

Example:
Auxiliary Relay is Disabled

Options: Enabled
Disabled (Default)



AUX RELAY OUTPUT
START 1 00:00:00

Example:
Auxiliary Relay Output in Start 1 at
0 hours, 0 minutes, & 0 seconds

Range: 00:00:00 to 18:00:00

NOTE: Only displayed if Auxiliary
Relay is enabled in previous screen.
Auxiliary Relay will only display if
Chemical Pump is OFF for System
Types 6 & 7.



AUX RELAY OUTPUT
END 1 00:00:00

Example:
Auxiliary Relay Output in End 1 at
0 hours, 0 minutes, & 0 seconds

Range: 00:00:00 to 18:00:00

NOTE: This screen will only display on
the lead unit for System Types 6 & 7.
For all other System Types, it will display
for all units.



CHEMICAL PUMP:
DISABLED

Example:
Chemical Pump is Disabled

Options: Enabled
Disabled (Default)



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Mode Flow Chart

NOTE: Only displayed on units that physically have a meter (Lead always has a meter). Only shown if Auxiliary Relay is disabled on System Types 6 & 7.



CPO AUX RELAY
VOLUME: 000 g

Example:
Chemical Pump Auxiliary Relay
Volume at 0 Gallons

Range: 000 to 999 gallons in U.S. Format
0.000 to 9.999 L in Metric Format



CPO AUX RELAY
TIME: 00:00:00

Example:
Chemical Pump Auxiliary Relay at 0 Hours,
0 Minutes, & 0 Seconds

Range: 00:00:00 to 02:00:00

NOTES: Default flow meter type is based on the valve type. This screen will only display on the lead unit for System Types 6 & 7. All other system types it will display for all units.



FLOW METER:
1.0 PADDLE

Example:
1.0 Paddle Flow Meter

Options: 1.0 Paddle
1.0 Turbine
1.5 Paddle
1.5 Turbine
2.0 Paddle
3.0 Paddle
Generic

NOTE: Only displayed if "Generic" is chosen for the flow meter.



MAXIMUM FLOW
RATE: 0000 gpm

Example:
Maximum Flow Rate of 0 gpm

Range: 20 - 2,000 gpm (U.S. Format)
2.0 - 200.0 L (Metric Format)

NOTE: Only displayed if "Generic" is chosen for the flow meter.



ADD 01 GALLONS
EVERY 001 PULSES

Example:
Add 1 Gallon for Each Pulse in U.S. Format

Options: Gallons (U.S. Format)
Liters (Metric Format)

Range: 1 - 99 Gallons (U.S. Format)
0.1 - 09.9 L (Metric Format)
Pulses: 1 - 99



PROGRAMMING UNIT
PLEASE WAIT...

Example:
Master Programming Mode is Exiting



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Guide

When the Master Programming Mode is entered, parameters can be set to make the timer(s) function as needed.

NOTE: Depending on current option settings, some displays cannot be viewed or set.

Entering Master Programming Mode:

1. Press and hold the Shift and Up buttons for 5 seconds.
OR
2. Set the time of day display to **12:01 PM or 12:01HR** (See the “Setting the Time of Day” section on the “Timer Operation” page). Then go to the main display screen, press the Up and Down buttons at the same time for 5 seconds.

Exiting Master Programming Mode:

1. Press the Extra Cycle button once per display until all are viewed. Master Programming Mode is exited and the normal display screen appears.
2. To exit the Master Programming Mode without saving, press the Diagnostic button.

NOTE: If no keypad activity is made for 5 minutes while in the Master Programming Mode, or if there is a power failure, no changes will be made, and the unit will go back to the main display screen.

Resets:

Soft Reset: Press and hold the Up and Down buttons for 25 seconds until 12:00PM (or 12:00HR) appears. This resets all parameters except for the flow meter totalizer volume.

Master Reset: Hold the Extra Cycle button while powering up the unit. This resets all of the parameters in the unit. Check and verify the choices selected in Master Programming Mode.

1. Choice of Language

This option selectS the language for programming and display.

1. Use Up or Down to select language.
2. Press the Extra Cycle button.



SELECT LANGUAGE
ENGLISH

2. System Type

This program type selects the system type (4, 5, 6, 7, 9, or 14).

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.



SYSTEM TYPE: 14
DEMAND RECALL

3. Valve Address

This program step selects the valve address (1, 2, 3, or 4) within the network needed for each timer for communication. The #1 is the “master” or “lead” which contains programmed parameters, that will be used by all of the timer(s) in the network to control Regeneration, in Service, or Standby of all the valve(s) in the system.

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.



VALVE ADDRESS:
2

Master Programming Guide

4. System Size

This program step is used to set up the number of valves (1, 2, 3, or 4) in the system.

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.

```
SYSTEM SIZE:  
2 VALVES
```

5. Regeneration Type

This program step is used to set up the trigger type.

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.

```
REGEN TYPE:  
TIME CLK DELAYED
```

6. Valve Type

This program step selects the valve type (2750, 2850, 2900s, 3150, 3900, Stager-Butterfly, or Stager-Notch Cam)

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.

```
VALUE TYPE:  
2750
```

7. Regenerant Flow

This program step selects the regenerant flow type (Downflow, Upflow, or Upflow Fill First)

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.

```
REGENERANT FLOW:  
DOWN FLOW
```

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

8. Display Format

This program step is used to set the desired volume display format. This option must be the same on all system units. U.S. will display volumes in gallons and is in 12 hour timekeeping. Metric will display volumes in liters and is in 24 hour timekeeping.

1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.

DISPLAY FORMAT:
US-GALLONS

9. Unit Capacity

This program selects the individual timer's total capacity of hardness that can be removed. The unit capacity is measured in grains if in U.S. mode and grams CaCO₃ in Metric mode.

U.S. Range: 9,000 to 9,900,000 Grains (Default = 300,000 Grains)

Metric Range: 90.0 to 199,000.0 grams CaCO₃ (Default = 300.0 grams CaCO₃)

1. Use the Shift button to select the digit you want to modify.
2. Use Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

UNIT CAPACITY:
300000 GRAINS

10. Trip Points 1, 2, and 3

This program step selects up to three Trip Points programmed on the master timer only (Valve Address #1).

The actual required number of Trip Points in a system is one less than the number of valves in the system.

Trip Point 1 represents the system flow rate at which a second valve will be brought In Service or Standby.

Trip Point 2 represents the system flow rate at which a third valve will be brought In Service or Standby.

Trip Point 3 represents the system flow rate at which a fourth valve will be brought In Service or Standby.

Trip Point 1	Trip Point 2	Trip Point 3
Range: 1 – 997 GPM	U.S.: Value of Trip Point 1 plus 1 to 998	U.S.: Trip Point 3 = Trip Point 2 plus 1 to 999
Range: 0.01 – 9.97 M3M	Metric: Value of Trip Point 1 plus .01 to 9.98	Metric: Trip Point 2 plus 0.01 to 9.99

- Use the Shift button to select the digit you want to modify.
- Use Set Up or Set Down buttons to adjust this value.
- Press the Extra Cycle button.

Master Programming Guide

11. Trip Delays 1, 2, and 3

This program step selects each Trip Delay time that is addressed with each Trip Point and will be programmed on the Master timer only (Valve Address #1). The Trip Delay time represents a minimum amount of time the system flow rate is required to be equal or greater than the Trip Points to bring a unit In Service. It also is the minimum amount of time the system flow rate is required to be less than the Trip Points to remove a unit from In Service to Standby.

Trip Delay 1	Trip Delay 2	Trip Delay 3
Default: 30 Seconds	Range: 30 - 99 Seconds	Range: 30 - 99 Seconds
Range: 30 - 99 Seconds		

- Use the Shift button to select the digit you want to modify.
- Use Set Up or Set Down buttons to adjust this value.
- Press the Extra Cycle button.

12. Capacity Safety Factor

This program step is used to adjust the capacity of the system. This is a percentage by which the unit's capacity is reduced.

Range: 0 – 50% (Default = 0%)

1. Use the Shift button to select the digit you want to modify.
2. Use Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

```
CAPACITY SAFETY  
FACTOR: 00%
```

13. Feed Water (Hardness)

This program step is used to set the feed water hardness. The system will automatically calculate volume remaining based on the Unit Capacity, Capacity Safety Factor and Feed Water Hardness entered.

U.S. Range: 1 – 199 gpg (Grains per Gallon)(Default = 15)

Metric Range: 2 – 199 milligrams CaCO₃/Liter (Default = 30)

1. Use the Shift button to select the digit you want to modify.
2. Use Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

```
FEED WATER  
HARDNESS:015 GPG
```

14. Regeneration Day Override

This program step sets the maximum amount of time (in days) the unit can be In Service without a Regeneration.

Default: OFF

Range: 1 - 99 Days

NOTE: If "On," the screen for regeneration time will display.

1. Use the Shift button to select the digit you want to modify.
2. Use Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

```
REGENERATION DAY  
OVERRIDE: OFF
```

```
REGENERATION DAY  
OVERRIDE:01 DAYS
```

Master Programming Guide

15. Regeneration Time

This program step sets time of day for a delayed regeneration to occur, or regeneration day override.

Default U.S.: 02:00 AM

Default Metric: 02:00 HR

1. Use the Shift button to select the digit you want to modify.
2. Use Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

```
REGENERATION
TIME:      02:00AM
```

16. Regeneration Cycle Steps

This program step programs the Regeneration Cycle step times 1 through 5. Please refer to the chart below for regenerant flow default cycle steps and times.

Regenerant Flow	Cycle 1	Time	Cycle 2	Time	Cycle 3	Time	Cycle 4	Time	Cycle 5	Time
Down Flow	Back Wash	10 Minutes	Brine & Slow Rinse	1 Hour	Rapid Rinse	10 Minutes	Brine Tank Fill	12 Minutes	Pause	N/A
UF Brine Draw	Brine & Slow Rinse	1 Hour	Backwash	10 Minutes	Rapid Rinse	10 Minutes	Brine Tank Fill	12 Minutes	Pause	N/A
UF Fill First	Brine Tank Fill	12 Minutes	Brine Making	1 Hour	Brine & Slow Rinse	1 Hour	Back Wash	10 Minutes	Rapid Rinse	10 Minutes

17. Auxiliary Relay Output

The next two displays are part of a series of settings used to program the optional relay output. The first setting turns the output on/off during Regeneration only. The second turns the output on during Service only, every time a set volume of water used has accumulated.

```
AUXILIARY RELAY:
ENABLED
```

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

Master Programming Guide

18. Timed Auxiliary Relay Output Window (Start & End Time Setting, If Auxiliary Relay is Enabled)

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.

Start Time:

Anytime During Regeneration (Except Last Minute of the Regeneration Time)

End Time:

At start time, and anytime during the regeneration cycle.

```
AUX RELAY OUTPUT
START  00:00:00
```

```
AUX RELAY OUTPUT
END    00:00:00
```

19. Chemical Pump Auxiliary Relay Output Window

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 sets the time of the output.

U.S. Range: 0 – 999 Gallons (1 – 999 Seconds)

Metric Range: 0.00 – 9.99 m3 (1 – 999 Seconds)

Activate Output After Volume Set is Reached.

Use the Shift button to move one space to the left for each number entered.

Use Up or Down buttons to adjust this value.

Press the Extra Cycle button.

```
CHEMICAL PUMP:
          ENABLED
```

```
CPO AUX RELAY
VOLUME:  000  g
```

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

20. Fleck Flow Meter Size (Default to Valve Type)

This program step sets the size of the Fleck flow meter.

- 1.0" Paddle (2750 Default)
 - 1.5" Paddle (2850/2900 Default)
 - 2.0" Paddle (3150 Default)
 - 3.0" Paddle (3900 Default)
 - 1.0" Turbine
 - 1.5" Turbine
 - Generic Flow Meter
1. Use Up or Down buttons to adjust this value.
 2. Press the Extra Cycle button.

21. Maximum Flow Rate

This program step sets maximum flow rate of the generic flow meter.

1. Press the Shift button to select the digit you want to modify.
2. Press the Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

22. Pulses per Gallon/Liter

This program step sets the pulses per gallon/liter for generic flow meters.

1. Press the Shift button to select the digit you want to modify.
2. Press the Up or Down buttons to adjust this value.
3. Press the Extra Cycle button.

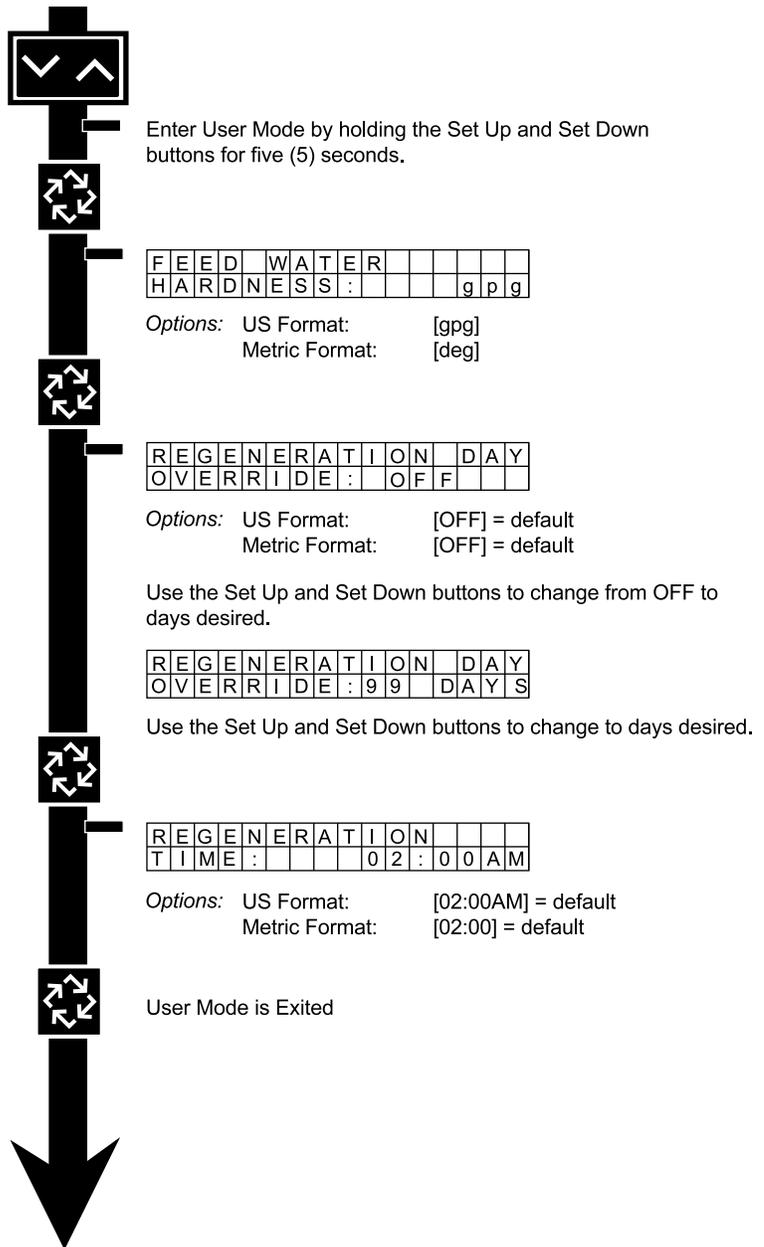
23. End of Master Programming Mode

CAUTION: Before entering Master Programming, please contact your local professional water dealer.

User Mode Programming Flow Chart

Entering User Mode:

Hold the Set Up and Set Down buttons for 5 seconds.



User Mode Programming Guide

1. Enter 3214NXT User Mode

- Press and hold the Set Up and Set Down buttons for five (5) seconds to enter Programming Mode.
- When the Program Mode is entered, the Feed Water Hardness screen displays.

2. Set Feed Water Hardness

- Press the Shift button to move the cursor to the left, and the Set Up and Set Down buttons to change the value of each number.
- Press the Extra Cycle button to proceed to the next step.

3. Set Regeneration Day Override

- The default for Regeneration Day Override is OFF.
- To turn on and set the days, press the Set Down button
- Press the Shift button to move the cursor to the left, and the Set Up and Set Down buttons to change the value of each number.
- Press the Extra Cycle button to proceed to the next step.

4. Regeneration Time

- Regeneration Time will not be an option if Regeneration Day Override is OFF.
- Press the Shift button to move the cursor to the left, and the Set Up and Set Down buttons to change the value of each number.
- Press the Extra Cycle button to proceed to the next step.

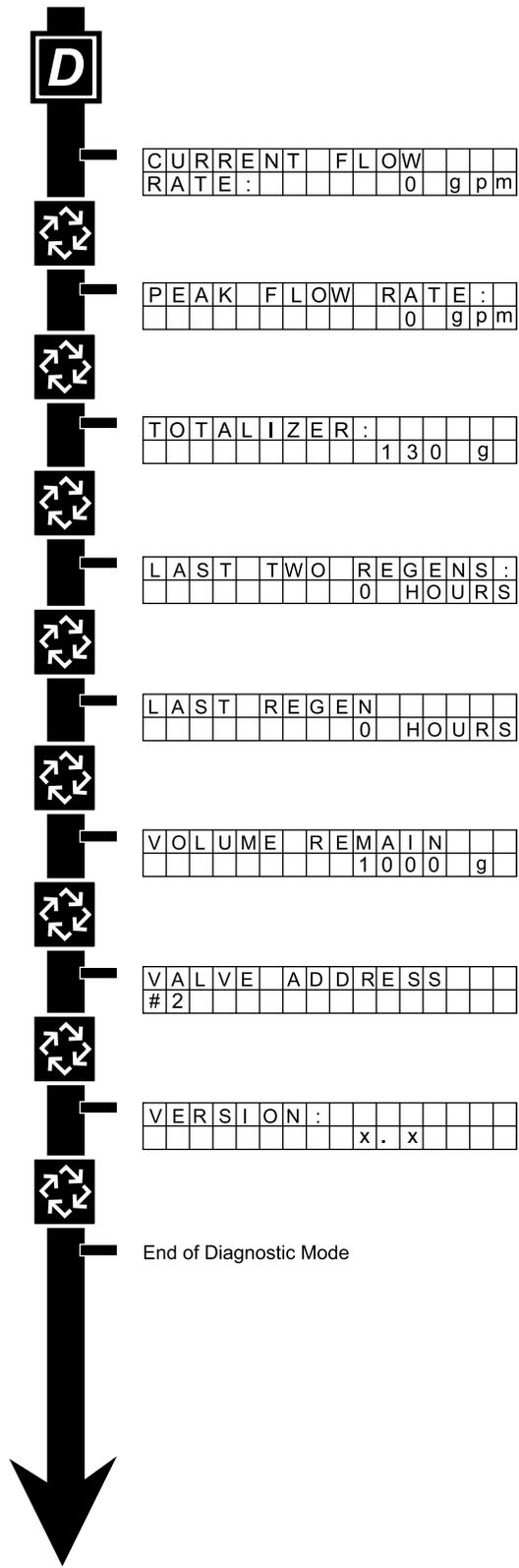
5. Set Time of Day

- Press the Shift button to move the cursor to the left, and the Set Up and Set Down buttons to change the value of each number.
- Press the Extra Cycle button to complete the User Mode and return to the main screen.

Diagnostic Mode Programming Flow Chart

Entering Diagnostic Mode:

1. Push and release the "D" button.
2. Press the Extra Cycle button once per display until all displays are viewed and Normal Display is resumed.
3. Push and release the "D" button at anytime during diagnostic mode and the timer will exit the mode.
4. Depending on current valve programming, certain displays may not be able to be viewed or set.



Diagnostic Display Guide & Programming

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

Overview Diagnostic Mode

The current diagnostic will be displayed until 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 regeneration occurring while displaying diagnostics, the regeneration step and time remaining will be displayed. When regeneration has been completed, the display will return to the main screen.

Entering and Exiting Diagnostic Mode

Push and Release the "D" button to enter. Pressing the Extra Cycle button will move to the next diagnostic to be displayed. Push the Extra Cycle button once per display until all are viewed. Pressing the Diagnostic button, while in the Diagnostic Mode, will cause the unit to leave the Diagnostic Mode and return to the normal time of day display.

1. Current Flow Rate

Flow Rate for this particular Timer will be calculated and displayed. Flow rates will be calculated every second. The display updates once per second. Flow rates are dependent upon the meter used.

1" Paddle Meter Maximum Flow Rate: 75 gpm (.28 m³/m)

1.5" Paddle Meter Maximum Flow Rate: 90 gpm (.34 m³/m)

2" Paddle Meter Maximum Flow Rate: 175 gpm (.66 m³/m)

3" Paddle Meter Maximum Flow Rate: 350 gpm (1.32 m³/m)

1" and 1.5" Turbine Meter: 75 gpm

— Depress the Extra Cycle button.

2. Peak Flow Rate

The Peak Flow Rate since the last regeneration will be captured.

Range: 0 to Maximum Number

— Depress the Extra Cycle button.

3. Totalizer

The total volume of treated water that passes through a meter will be counted.

— Reset to zero by holding the

— Set Up and Set Down arrow keys for 5 seconds during the Totalizer display.

— Depress the Extra Cycle button.

4. Hours Between Last Two Regenerations

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

— Depress the Extra Cycle button.

5. Hours Since Last Regeneration

The hours since the last regeneration will be saved and displayed.

— Depress the Extra Cycle button.

6. Volume Remaining

Volume remaining will be adjustable when displayed in this mode. Regeneration will occur if set to zero. The maximum ranges are the same as the maximum volume calculated on the main screen.

- Press the Shift button to select the digit you want to modify.
- Use Set UP or Set DOWN buttons is used to adjust this value.
- Depress the Extra Cycle button

7. Valve Address

This diagnostic display is for 2 control valves or more in a system.

First Control Valve

Second, Third, Fourth Control Valve

- Depress the Extra Cycle button.

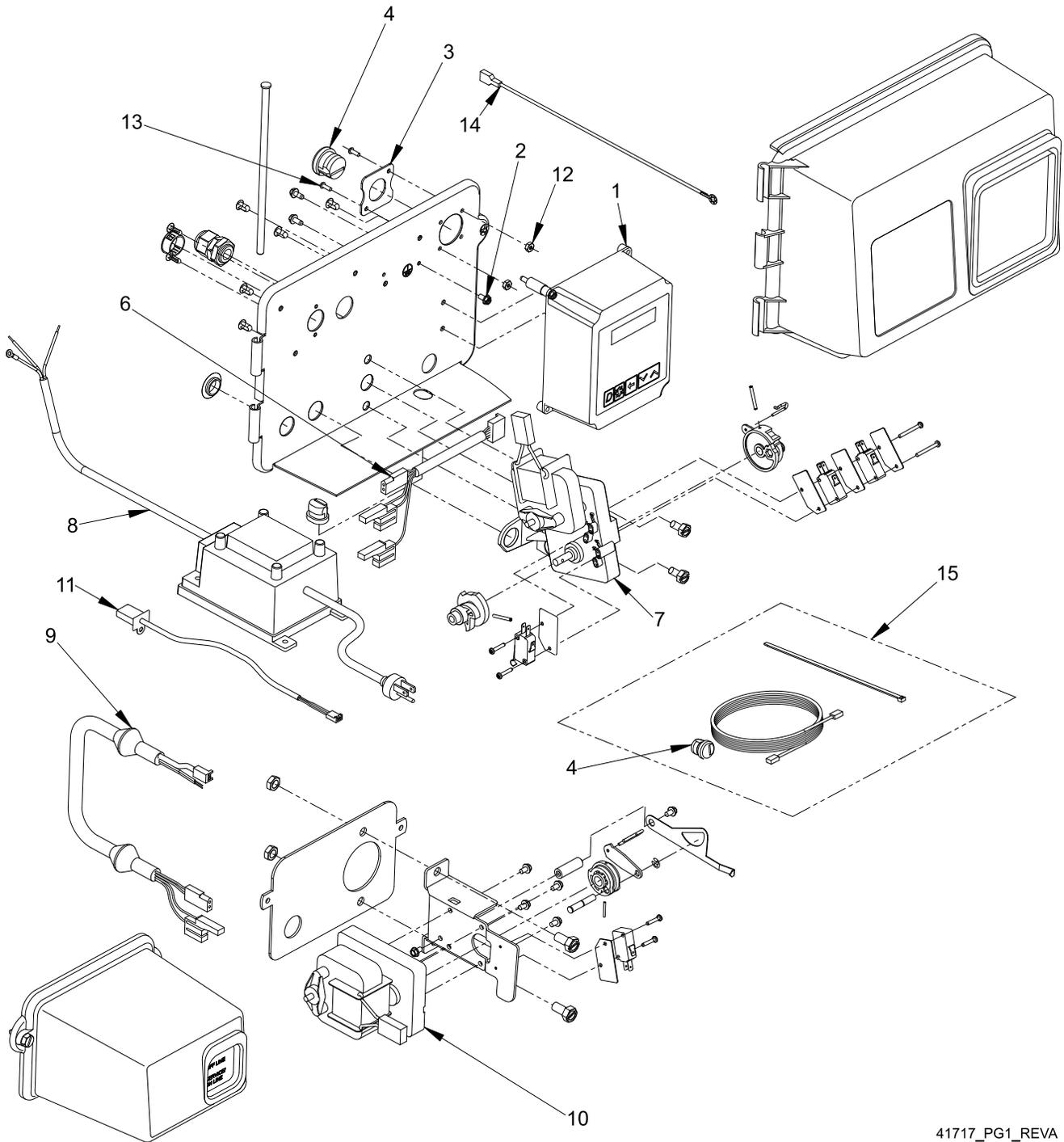
9. Software Version

The electronic timer's software program version number will be displayed.

- Depress the Extra Cycle button to exit.

NOTE: Diagnostic Mode programming will stop if the system goes into regeneration.

2750/2850/2900 Upper & 2900 Lower Powerhead Assy



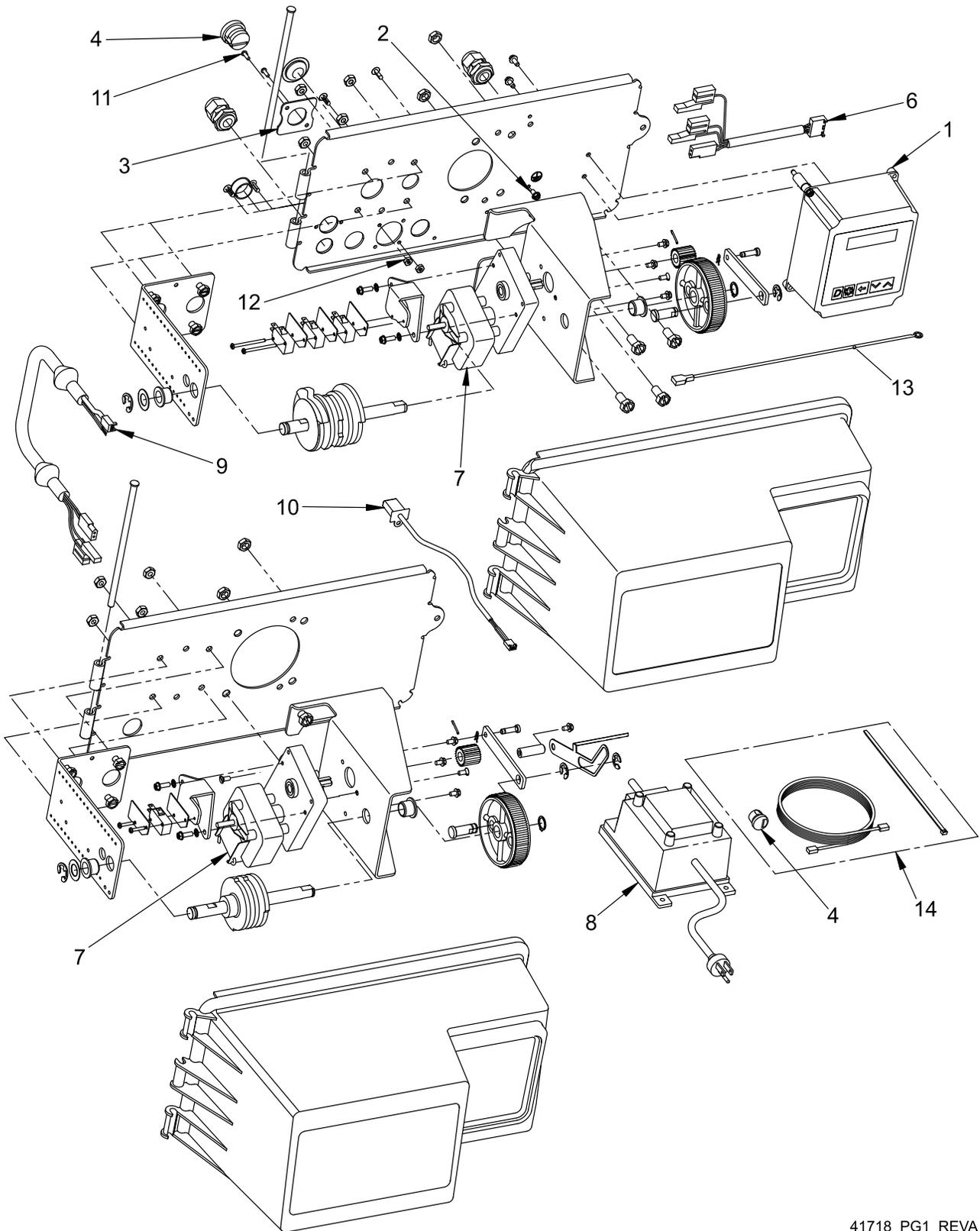
41717_PG1_REVA

2750/2850/2900 Upper & 2900 Lower Powerhead Assy

Item No.	Quantity	Part No.	Description
1.....	1.....	42466-21.....	Timer Assy, NXT14, Right Hand
2.....	1.....	14202-01.....	Screw, Hex Wsh Mach, 8-32 x 5/16
3.....	1.....	40959-01.....	Bracket, Strain Relief
4.....	1.....	41730.....	Bushing, Heyco
6.....	1.....	40941.....	Wire Harness, Upper Drive 3200NT
7.....	1.....	41544.....	Motor, Drive, 24V, 50/60 Hz
8.....	1.....	41034.....	Transformer, US, 120V/24V, 108VA 3200NT
		41049.....	Transformer, Euro, 230V/24V 108VA
		41050.....	Transformer, Aust, 230V/24V
9.....	1.....	40943.....	Wire Harness, Lower Drive w/Molded Strain Relief, 3200NT
10.....	1.....	40388.....	Motor, Drive, 50/60 Hz, Sp Fam 2
11.....	1.....	19121-08.....	Meter Cable Assy, NT, 35" w/Connector
		19121-09.....	Meter Cable Assy, NT, 99.5" w/Connector
		19121-10.....	Meter Cable Assy, NT, 303.5" w/Connector
12.....	2.....	12732.....	Nut, Hex, 5-40 Stainless Steel
13.....	2.....	10299.....	Screw, Slot Rnd, 5-40 x 3/8
14.....	1.....	40175-03.....	Ground Wire Assy, Earth 3200NTS Circuit Board
15.....	1.....	41692.....	Kit, CAN Communication Cable

NOTE: For all other service part numbers, see the Service Manual that accompanies the control valve.

3150/3900 Upper & 3900 Lower Drive Powerhead Assy



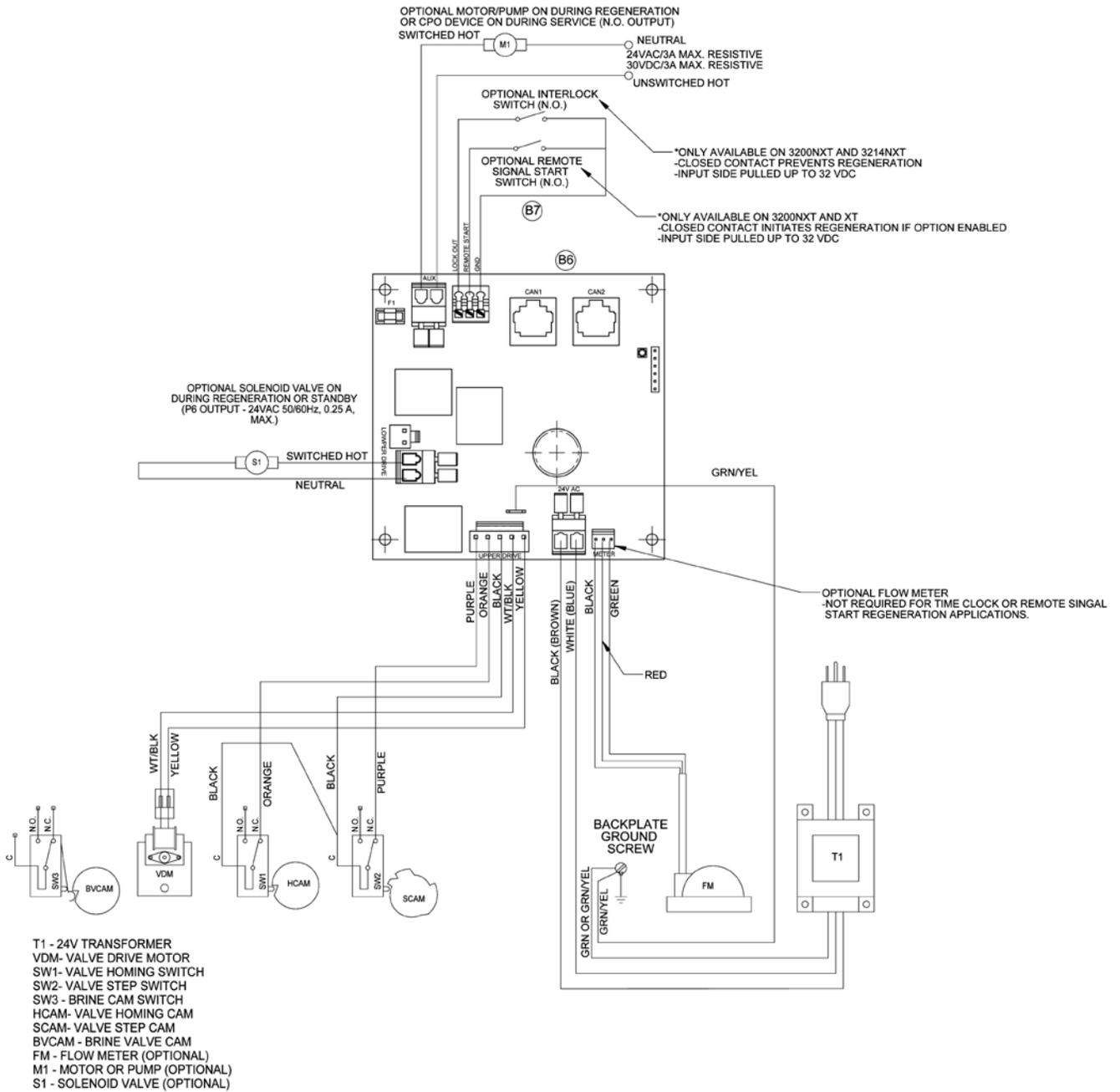
41718_PG1_REVA

3150/3900 Upper & 3900 Lower Drive Powerhead Assy

Item No.	Quantity	Part No.	Description
1.....	1.....	42466-21.....	Timer Assy, NXT14, Right Hand
2.....	1.....	14202-01.....	Screw, Hex Wsh Mach, 8-32 x 5/16
3.....	1.....	40959-01.....	Bracket, Strain Relief
4.....	1.....	41730.....	Bushing, Heyco
6.....	1.....	40941.....	Wire Harness, Upper Drive 3200NT
7.....	2.....	40391.....	Motor, Drive, 24V, 50/60 Hz, Sp Fam 3
8.....	1.....	41034.....	Transformer, US, 120V/24V, 108VA 3200NT
		41049.....	Transformer, Euro, 230V/24V 108VA
		41050.....	Transformer, Aust, 230V/24V
9.....	1.....	40943.....	Wire Harness, Lower Drive w/Molded Strain Relief, 3200NT
10.....	1.....	19121-08.....	Meter Cable Assy, NT, 35" w/Connector
		19121-09.....	Meter Cable Assy, NT, 99.5" w/Connector
		19121-10.....	Meter Cable Assy, NT, 303.5" w/Connector
11.....	2.....	10299.....	Screw, Slot Rnd, 5-40 x 3/8
12.....	2.....	12732.....	Nut, Hex, 5-40 Stainless Steel
13.....	1.....	40175-03.....	Ground Wire Assy, Earth 3200NTS Circuit Board
14.....	1.....	41692.....	Kit, CAN Communication Cable

NOTE: For all other service part numbers, see the Service Manual that accompanies the control valve.

Single Piston Wiring Diagram



NOTE:
1. TRANSFORMER FUSE - 5A 250V SLOW-BLOW P/N 41143
2. VALVE SHOWN IN SERVICE

42140_REV D

Troubleshooting

Detected Errors

If a communication error is detected, an Error Screen will alternate with the main (time of day) screen every few seconds.

- All units In Service remain in the In Service position.
- All units in Standby go to In Service.
- Any unit in Regeneration when the error occurs completes Regeneration and goes to In Service.
- No units are allowed to start a Regeneration Cycle while the error condition exists, unless they are manually forced into Regeneration.
- When an error is corrected and the error no longer displays (it may take several seconds for all of the units in a system to stop displaying the error message), the system returns to normal operation.

NOTE: During the error condition the control continues to monitor the flow meter and update the volume remaining. Once the error condition is corrected all units return to the operating status they were in prior to the error. Regeneration queue is rebuilt according to the normal system operation. Or, if more than one unit has been queued for regeneration, then the queue is rebuilt according to which one communicates first.

Cause	Correction
A. One or more units have a missing or bad communication cable.	A. Connect the communication cables and/or replace.
B. One or more units has a communication cable plugged into the wrong receptacle.	B. Connect the communication cable as shown in the wiring diagrams.
C. One or more units is not powered.	C. Power all units.

Programming Errors

During the error condition the control continues to monitor the flow meter and update the remaining capacity. Once the error condition is corrected all units return to the operating status they were in prior to the error and regeneration is queued according to the normal system operation. If reprogramming the unit in the Master Programming Mode clears the error, the volume remaining may be reset to the full unit capacity (i.e. as though it were just regenerated).

1. All units in standby go In Service.
2. Any unit in regeneration when the error occurs completes regeneration and goes to In Service.
3. No units are allowed to start a regeneration cycle while the error condition exists.

When the problem is corrected and the error no longer displays (it may take several seconds for all of the units in a system to stop displaying the error message), the system returns to normal operation.

Programming Errors Detected:

- Duplicate unit addresses or numbers
- Size of system (ex: if sized for a 4 units, and only have 2 units)
- Display format mismatches

Solution:

- Program the units correctly in the Master Programming Mode.

NOTE: If these errors are detected, numbers 1 through 3 on the previous page become true, and the main screen (time of day) will alternate with an error screen.

Troubleshooting

Cause	Correction
A. Any or all of two or more units programmed with the same unit number (Matching Address Error)	A. Program the units correctly in the Master Programming Mode
B. Flashing/blinking display	B. Power outage has occurred
C. Format Mismatch (Units have both U.S. and Metric Formats)	C. Verify all units have same Format selected (all U.S. or all Metric)
D. No messages displayed/small black squares appear in display	D. Turn the contrast button on the back of unit until text appears (see "Problems Viewing Display/Changing Contrast of Display" below)
E. Size Error (Units not correctly numbered/more than one unit has the same number assigned)	E. Check each unit and verify each as the correct number, and that only one unit has that number
F. Com Error (Communication Error)	F. Check the wiring of the system and verify it is correct and that all are connected

