PENTAIR

FLECK NXT TIMER
SERVICE MANUAL

TABLE OF CONTENTS

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 controller 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 controller 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.
- Correct and constant voltage must be supplied to the controller 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 mg $CaCO_3$/L

Regeneration Time: Delayed _____AM/PM or Immediate

Regeneration Day Override: Off or Every_____ Days

Master Programming:

System Type:

4 - Single Unit
5 - Parallel Unit
6 - Parallel Series Regen
7 - Twin Alternating
9 - Alternating
14 - Demand Recall

Valve Type: 2750 2850 2900s 3150 3900

System Size: 1 Valve 2 Valves 3 Valves 4 Valves

Valve Address: #1 #2 #3 #4

Regenerant Flow: Downflow or Upflow
Brine Draw First or Brine Fill First

Display Format: US Gallons or Liters

Unit Capacity: _____ Grains or grams $CaCO_3$

Capacity Safety Factor: Zero or _____%

Trip Points (Gallons or M^3):_____ Point 1 _____ Point 2 _____ Point 3

Trip Delays: _____ Delay 1 _____ Delay 2 _____ 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

Setting the Time of Day

NOTE: Set Time of Day on the Lead Unit (#1) and the rest of the units in the system will update the Time of Day within 10 seconds.

1. Press and hold the Up or Down button for 2 seconds.
2. Press the Shift button to select the digit you want to modify.
3. Press the Up or Down buttons to adjust the valve.
4. Press the Extra Cycle button to return to the normal display screen, or wait for a 5 second timeout.

NOTE: The "D" button (Diagnostic) can be pressed to exit without saving.

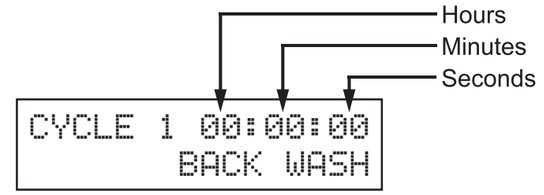
Manually Initiating a Regeneration

1. When timer is In Service or Stand By, press the Extra Cycle button for 5 seconds on the main screen.
2. The timer advances to Regeneration Cycle Step #1, and begins programmed time count down.
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.

NOTE: A manually initiated or queued regeneration can be cleared by pressing the Extra Cycle button for less than 5 seconds. A system queued regeneration can only be cleared by stepping through a manual regeneration. If regeneration occurs for any reason prior to the delayed regeneration time, the manual regeneration request shall be cleared. Pressing the Extra Cycle button while in regeneration will cause the upper drive to advance to the next step immediately.

Timer Operation During Regeneration

In the Regeneration Cycle step display, the timer shows the current regeneration cycle number the valve is in, 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 (Backwash)

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

Flow Meter Equipped Timer

As treated water is used, the Volume Remaining display counts down from the calculated system capacity to zero. When zero is reached 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

All program settings are stored in permanent memory. Current valve position, cycle step time elapsed, and time of day are all stored during a power failure, and will be restored when power is re-applied. Time is kept during a power failure, and time of day is adjusted upon power up (as long as power is restored within 12 hours).

NOTE: The time of day on the main display screen will flash for 5 minutes when there has been a power outage. The flashing of the time of day can be stopped by pressing any button on the display.

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.

⚠ WARNING: Transformer must be grounded and ground wire must be terminated to the back plate where grounding label is located before installation.

SYSTEM DEFINITIONS

System Number	System Description	# of Tanks/ Controls	Type	Operation Discussion
4	Single Unit	1	Time Clock: No Meter Immediate: One Meter Delayed: One Meter Remote Signal Start: No Meter	Single tank configuration.
5	Interlocked	2, 3, or 4	Immediate: All Meters Remote Signal Start: No Meter	All tanks in parallel supplying treated water. Each unit in the system will have its own flow meter/sensor input. The control will delay the start of Regeneration if another unit is already in Regeneration. Once that unit has completed a Regeneration cycle, and has returned to Service,the unit with longest regeneration queue time will begin Regeneration. No more than one unit will be in Regeneration at a time.
6	Series Regeneration	2, 3, or 4	Immediate: One Meter Delayed: One Meter Remote Signal Start: No Meter	All tanks in parallel supplying treated water. Only #1 control will monitor flow meter/sensor input. When a regeneration is required for the system, it will regenerate valve address #1 first, immediately followed by #2, then #3, then #4 if installed. No more than one unit will be in Regeneration at a time.
7	Twin Alternating	2	Immediate: One Meter Remote Signal Start: No Meter	One tank online supplying treated water, one tank in Standby. Only #1 control will monitor its flow meter/sensor input. Regeneration of a unit will begin after the other control has left Standby and returned to Service. When the Regeneration cycle is complete, the regenerated unit will enter Standby. Standby on each tank is controlled by the lower drive output terminals on the NXT circuit board.
9	Multiple Tank Alternating	2, 3, or 4	Immediate: All Meters Remote Signal Start: No Meter	One, two, or three tanks online supplying treated water, one tank in Standby. Meter/sensor input is required on each tank. Regeneration of a unit will begin after the other control has left Standby and returned to Service. When the Regeneration cycle is complete, the regenerated unit will enter Standby. Standby on each tank is controlled by the lower drive output terminals on the NXT circuit board.
14	Demand Recall	2, 3, or 4	Immediate: All Meters	Meter input is required on each tank. Unit #1 will begin In Service with #2, #3, and #4 (if installed) will begin in Standby. At least one unit is In Service at all times. When flow rate to the Primary Service Unit increases to a user specified rate, the next unit in sequence will move from Standby to Service. As the flow rate falls below the user specified rate subsequent tanks will return to Standby. When the Primary Service Unit regenerates, the next unit in sequence will become the new Primary Service Unit. As each units capacity is reached the controller will initiate a Regeneration of that unit. Depending on the number of units in the system, and flow rate demand the regenerated unit will then be placed either into Standby or Service. Only one unit will be in Regeneration at a time.

SYSTEM OPERATION IN SERVICE (SYSTEM 14-DEMAND RECALL)

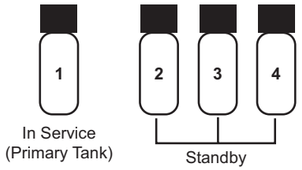
The system operates as part of a multi-valve regeneration system.

Each valve in the system will have an active flow meter input, even in Standby.

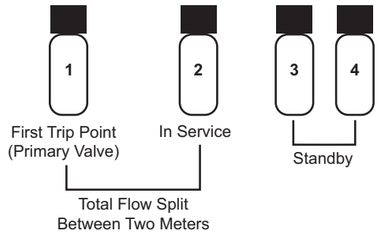
The number of valves in service depends on the flow rate.

Examples of a Four-Unit System:

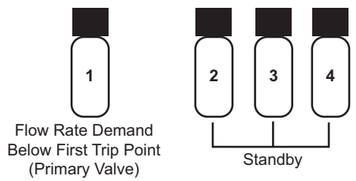
1. One Valve is in service at all times (the "primary valve").



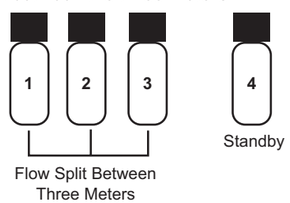
2. The total flow rate to the primary valve increased past the first trip point programmed rate. The flow stayed past the trip point delayed time. The next valve (least volume remaining) changes from Standby to In Service. This valve then splits the total flow between two meters.



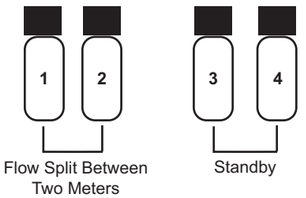
3. The flow rate demand decreased below the first trip point. The valve returns to Standby.



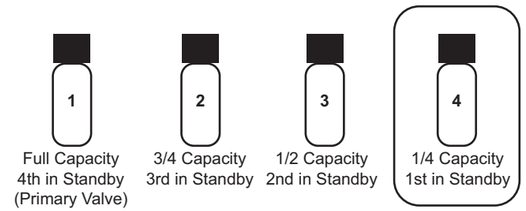
4. Total flow rate demand increased past a second trip point programmed rate. The second and third valve (least volume remaining) changes from Standby to In Service. The total flow is split between the three meters.



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

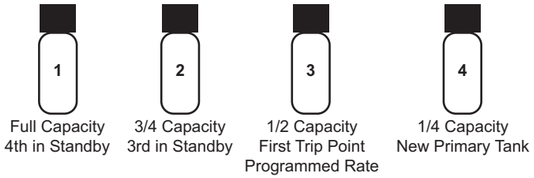


6. Valves return to stand by due to decreased total flow rate and trip points programmed. The valve with the most remaining volume will be the first to go into Standby.



7. 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.

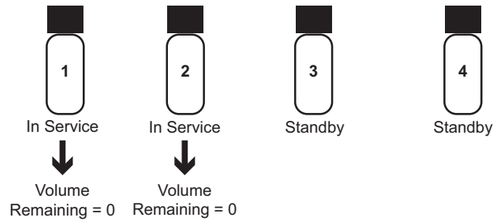
System Operation in Regeneration:



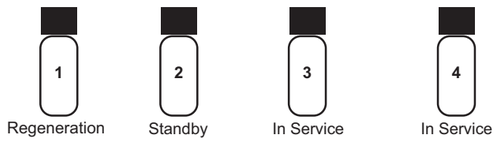
If two valves are In Service and both reach Volume Remaining = 0, the other two valves will shift from Standby to In Service. The lead valve with Volume Remaining = 0 will start regeneration. The second valve with Volume Remaining = 0 will enter Standby. If flow increases past the trip point a third valve needs to enter In Service. The valve in Standby with Volume Remaining = 0 will shift into In Service to maintain a steady flow. Operating for extended periods in this mode may degrade the water quality.

FLOW IN A FOUR-UNIT SYTEM (SYSTEM 14-DEMAND RECALL)

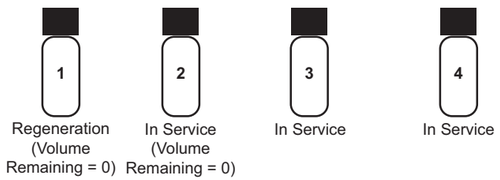
Steady Flow:



Flow Stays Steady:



Flow Increases Past the Trip Point:



TIMER DISPLAY FEATURES

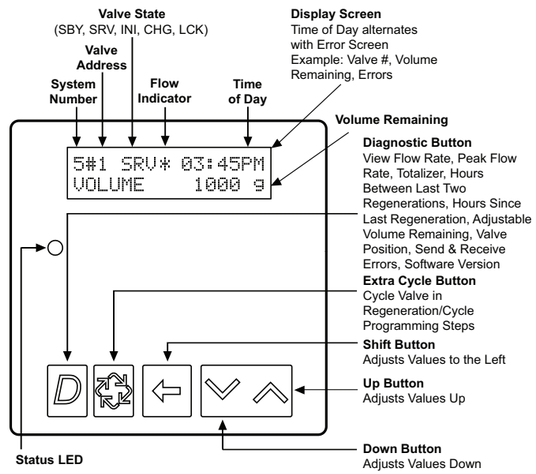


Figure 1

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 "Wiring Diagrams" section of this manual.

LED Status Lights

Blue LED - Illuminates while the unit is in service and no errors exist. 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.

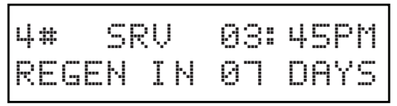
Red LED- Illuminates when there is an error.

Flow Indicator

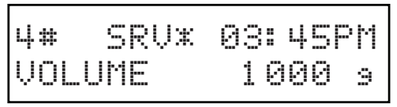
A rotating line (appearing as a rotating star shape) will display on the screen when flow is going through the meter.

TIMER DISPLAY - SCREEN EXAMPLES (SYSTEM 4 THROUGH 6)

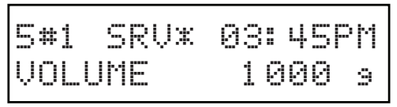
1. In Service: System 4 Time Clock



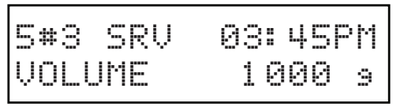
2. In Service: System 4 Flow Meter Initiated or System 4 Flow Meter Delayed



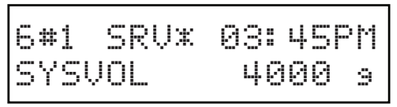
3. In Service: System 5 Flow Meter Initiated (Lead Unit)



4. In Service: System 5 Flow Meter Initiated (Lag Unit #3)

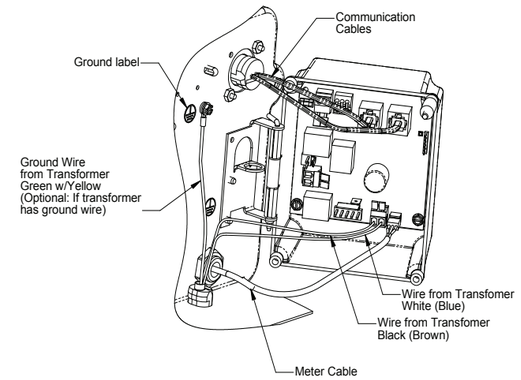


5. In Service: System 6 Flow Meter Initiated (Lead Unit)

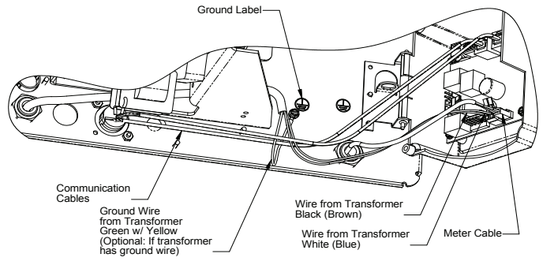


TRANSFORMER AND GROUND CONNECTIONS

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.
3. Insert white and black transformer wires into 24VAC input of control.

NETWORK/COMMUNICATION CABLES AND CONNECTIONS

Use either a CAT3 or CAT5 Network/Communication cable.

Connect the network/communication cable first before programming.

The maximum cable length between timers is 100 feet.

Connect each unit together from one communication port to the next communication port. It does not matter which one goes to the next one.

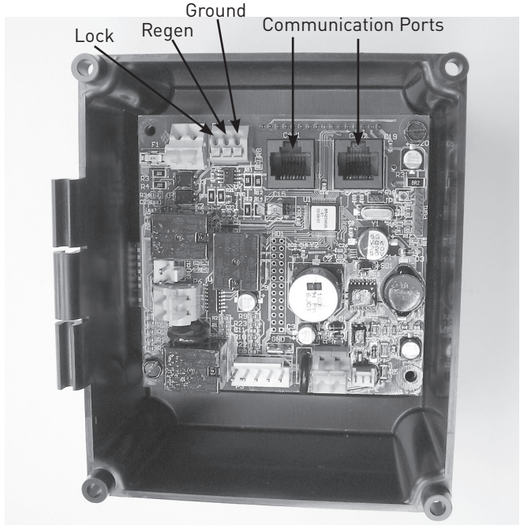


Figure 2 NXT Circuit Board

MASTER PROGRAMMING MODE FLOW CHART

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

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 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.

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 changes, 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 saved, 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.

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

SELECT LANGUAGE: ENGLISH — **Example:** English

Options: English, Espanol, Portugues, Deutsch, Francais

SYSTEM TYPE: 4 SINGLE UNIT — **Example:** System Type 4, Single Unit

Options: System 4 (single unit)
System 5 (2-4 units) Parallel Interlock
System 6 (2-4 units) Parallel Series Regeneration
System 7 (2 units) Alternating
System 9 (2-4 units) Alternating
System 14 (2-4 units) Demand Recall

VALVE ADDRESS: #2 — **Example:** Valve Address #2 (Second Control Valve) **(Default)**

Options: Valve Address #1 (First Control Valve)
Valve Address #2 (Second Control Valve) **(Default)**
Valve Address #3 (Third Control Valve)
Valve Address #4 (Fourth Control Valve)

NOTE: This screen will not display for System Type 4.

MASTER PROGRAMMING MODE FLOW CHART *continued*

SYSTEM SIZE: 2 VALVES — **Example:** 2 Valves in the System **(Default)**

Options: 2 Valves in the System **(Default)**
3 Valves in the System
4 Valves in the System

Range: 2 to 4 Valves in the System

NOTE: This screen will not display for System Type 4.

REGEN TYPE: TIME CLK DELAYED — **Example:** Time Clock Delayed **(Default)**

Options: Time Clock Delayed (System 4 Only) **(Default)**
Meter Immediate (All System Types)
Meter Delayed Fixed Reserve (Systems 4 & 6 Only)

VALVE TYPE: 2750 — **Example:** 2750 **(Default)**

Options: 2750 (Default)
2815
2850
2900
3150
3900
Stager - Notch Cam

REGENERANT FLOW: DOWNFLOW — **Example:** Downflow **(Default)**

Options: Downflow **(Default)**
Up Flow
UF Fill First

REMOTE SIGNAL START: 00:06:00 — **Example:** 00:06:00 (Hours:Minutes:Seconds)

Options: Off **(Default)**
00:00:00 (Hours:Minutes:Seconds)

Range: 1 second to 99 minutes (1 hour, 39 minutes)

NOTE: This display will not be viewed in System 4

DISPLAY FORMAT: US-GALLONS — **Example:** U.S. Gallons **(Default)**

Options: U.S. - Gallons **(Default)**
Eu Metric - 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)**
Grams (in Metric Format)

Range: 1 to 9,900,000 Grain Capacity in U.S. Format
1 to 198,000 grams CaCO3 Capacity in Metric Format

NOTE: 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)
20 to 1,999 miligrams CaCO3/L (Metric Format)

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

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.

Trip Points 1, 2, and 3 (System 14 only)

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 2 plus 1 to 999
Range: 0001 – 3997 Lpm	Metric: Value of Trip Point 1 plus 1 - 3998	Metric: Trip Point 2 plus 1 - 3999

Trip Delays 1, 2, and 3 (System 14 only)

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

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 400 lpm [400]

Range: 1 to 997 gpm (U.S. Format)
0.01 to 3997 lpm (Metric Format)

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

TRIP DELAY 1: 30 SECONDS

Example: Trip point time delay until valve goes into service [30] = Default

Range: 30 to 99 seconds

NOTE: Display will not appear unless timer is programmed as valve position #1. Use the Shift button to move one space to the left.

TRIP POINT 2: gpm

Examples: Brings 3rd valve In Service after 250 gpm [250]
Brings 3rd valve In Service after 900 lpm [900]

Range: Trip Point 1 + 1 to 998 gpm (U.S. Format)
Trip Point 1 + 1 to 3998 lpm (Metric Format)

NOTE: Display will not appear unless timer is programmed as valve position #1. System size must be 3 or 4 to appear. Use the Shift button to move one space to the left.

TRIP DELAY 2: 30 SECONDS

Example: Trip point time delay until valve goes into Service [30] = Default

Range: 30 to 99 seconds

NOTE: Display will not appear unless timer is programmed as valve position #1. System size must be 3 or 4 to appear. Use the Shift button to move one space to the left.

MASTER PROGRAMMING MODE FLOW CHART *continued*

TRIP POINT 3:
gpm

Examples: Brings 4th valve In Service after 350 gpm [350]
Brings 4th valve In Service after 1300 lpm [1300]
Range: Trip Point 2 + 1 to 999 gpm (U.S. Format)
Trip Point 2 + 1 to 3999 lpm (Metric Format)

NOTE: Display will not appear unless timer is programmed as valve position #1. System size must be 4 to appear. Use the Shift button to move one space to the left.

TRIP DELAY 3:
30 SECONDS

Example: Trip point time delay until valve goes to Service [30] = Default
Range: 30 to 99 seconds

NOTE: Display will not appear unless timer is programmed as valve position #1. System size must be 4 to appear. Use the Shift button to move one space to the left.

REGENERATION DAY OVERRIDE:OFF

Example:
Off **(Default)**
On **(Default for time clock)**

REGENERATION DAY OVERRIDE:01 DAYS

Example:
1 Day

Options: Off **(Default for meter)** 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.

Regeneration Cycle Steps

This 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
Downflow	Backwash	10 Minutes	Brine & Slow Rinse	1 Hour
UF Brine Draw	Brine & Slow Rinse	1 Hour	Backwash	10 Minutes
UF Fill First	Brine Tank Fill	12 Minutes	Brine Making	1 Hour

Regenerant Flow	Cycle 3	Time	Cycle 4	Time
Downflow	Rapid Rinse	10 Minutes	Brine Tank Fill	12 Minutes
UF Brine Draw	Rapid Rinse	10 Minutes	Brine Tank Fill	12 Minutes
UF Fill First	Brine & Slow Rinse	1 Hour	Backwash	10 Minutes

Regenerant Flow	Cycle 5	Time
Downflow	Pause	N/A
UF Brine Draw	Pause	N/A
UF Fill First	Rapid Rinse	10 Minutes

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

CHEMICAL PUMP:
DISABLED

Example:
Chemical Pump is Disabled

Options: Enabled
Disabled **(Default)**

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.

CPO AUX RELAY VOLUME: 000 g

Example:
Energize Chemical Pump Relay Every 50 Gallons
Energize Chemical Pump Relay Every 200 L

Range: 1 to 999 gallons in U.S. Format
1 to 9999 L in Metric Format

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 TIME: 00:00:00

Example:
Each Time the Chemical Pump Relay is on, Run for 30 Seconds (00:00:30)

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

FLOW METER:
1.0 PADDLE

Example:
1.0 Paddle Flow Meter

Options: 1.0 Paddle (Fleck)
1.0 Turbine (Fleck)
1.5 Paddle (Fleck)
1.5 Turbine (Fleck)
2.0 Paddle (Fleck)
3.0 Paddle (Fleck)
Generic (Non-Fleck)

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.

MAXIMUM FLOW RATE: 0000 gpm

Example:
Maximum Flow Rate of 0 gpm

Range: 20 - 2000 gpm (U.S. Format)
20 - 2000 L (Metric Format)

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

MASTER PROGRAMMING MODE FLOW CHART *continued*

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 - 255 Gallons (U.S. Format)
1 - 255L (Metric Format)
Pulses: 1 - 255

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

PROGRAMMING UNIT
PLEASE WAIT...

Example:
Master Programming Mode is Exiting

USER PROGRAMMING MODE FLOW CHART

Entering User Programming Mode

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

NOTE: User Mode is only displayed when a metered option is chosen under System Type. Depending on current option settings, some displays cannot be viewed or set.

NOTE: User Mode cannot be entered on the Lag unit for System 6.

Enter User Mode by holding the Set Up and Set Down buttons for five (5) seconds.

FEED WATER
HARDNESS: gpg

Options: US Format: [gpg]
Metric Format: [mg/l]

REGENERATION DAY
OVERRIDE: OFF

Options: US Format: [OFF] = default
Metric Format: [OFF] = default

Use the Set Up and Set Down buttons to change from OFF to days desired.

REGENERATION DAY
OVERRIDE:99 DAYS

Use the Set Up and Set Down buttons to change to days desired.

REGENERATION
TIME: 02:00AM

Options: US Format: [02:00AM] = default
Metric Format: [02:00] = default

User Mode is Exited

DIAGNOSTIC PROGRAMMING MODE FLOW CHART

Entering Diagnostic Programming 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 the current controller programming, certain displays may not be able to be viewed or set.

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 a 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.

D

CURRENT FLOW RATE: 0 GPM

Example:
Flow rate at this time.

PEAK FLOW RATE: 0 GPM

Example:
Peak flow since last regeneration.

TOTALIZER: 130 G

Example:
Gallons at the outlet since installation.

LAST TWO REGENS: 0 HOURS

Example:
Hours between the last regeneration and the one before it.

LAST REGEN 0 HOURS

Example:
Hours since last regeneration.

VOLUME REMAIN: 1000 G

Example:
Volume remaining (can be adjusted).

NOTE: If a System 6, Unit #1 of "Tank Remaining" will display "System Remaining".

VALVE ADDRESS #2

Example:
Controller unit number.

VERSION: X.XX

Example:
Installed software level of the controller in use.

End of Diagnostic Mode

NXT Multi Language
Programming Parame ters and Ranges

System Type	4 Time Clock	4 Metered Immediate	4 Metered Delayed	5 Interlock 1	5 Interlock 2	5 Interlock 3	5 Interlock 4	6 Series 1	6 Series 2	6 Series 3	6 Series 4	7 Alternating 1	7 Alternating 2	9 Alternating 1	9 Alternating 2	9 Alternating 3	9 Alternating 4	14 Demand Recall 1	14 Demand Recall 2	14 Demand Recall 3	14 Demand Recall 4	Programming Parameter Ranges: Gallons	Programming Parameter Ranges: Liters
Valve Address				1	2	3	4	1	2	3	4	1	2	1	2	3	4	1	2	3	4	1 thru 4	
Select Language	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		English, Espanol, Portugues, Deutsch, Francais	
System Size				x				x				x		x				x				1 thru 4	
Regen Type	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Time Clock, Metered Delayed, Metered Immediate	
Valve Type	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		2750, 2815, 2850, 2900, 3150, 3900, Stager	
Regenerant Flow	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Downflow, Upflow, Upflow Fill First	
Remote Signal Start	x	x	x	x	x	x	x	x				x		x	x	x	x					Off, 00:00:01 - 01:39:00	
Display Format	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		US - Gallons	EU - Metric-Liters
Unit Capacity		x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x		1 - 9900000 Grains	1 - 198000 gCaCO3
Capacity Safety Factor		x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x		0- 50%	
Feed Water Hardness		x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x		1 - 199 Grains/Gallons	1 - 1999 mgL
Trip Point 1																		x				0 - 997gpm	0 - 3997 Lpm
Trip Delay 1																		x				30 - 99 Seconds	30 - 99 Seconds
Trip Point 2																		x				Trip Point 1 + 1 - 998 gpm	Trip Point 1 + 1 - 3998 Lpm
Trip Delay 2																		x				30 - 99 Seconds	30 - 99 Seconds
Trip Point 3																		x				Trip Point 2 + 1 - 999 gpm	Trip Point 2 + 1 - 3999 Lpm
Trip Delay 3																		x				30 - 99 Seconds	30 - 99 Seconds
Regeneration Day Override	x	x	x	x	x	x	x	x				x		x	x	x	x	x	x	x		Off, 1 - 99	
Regeneration Time	x	o	o	o	o	o	o	o				o	o	o	o	o	o	o	o	o	o	12:00 a.m. - 11:59 p.m.	00:00 - 23:59 Hour
Cycle 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		00:00:00 - 04:00:00	
Cycle 2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Off, 00:00:00 - 04:00:00	
Cycle 3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Off, 00:00:00 - 04:00:00	
Cycle 4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Off, 00:00:00 - 04:00:00	
Cycle 5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Off, 00:00:00 - 04:00:00	
Auxiliary Relay	x	x	x	x	x	x	x	u	x	x	x	u	x	x	x	x	x	x	x	x	x	Enabled, Disabled	
Aux Relay Output Start	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c		00:00:01 to Total Regeneration Time - 1	
Aux Relay Output End	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c		Start Time + 1 to Total Regeneration Time	
Chemical Pump		x	x	x	x	x	x	u				u		x	x	x	x	x	x	x	x	Enabled, Disabled	
CPO Aux Relay Volume		c	c	c	c	c	c	c				c		c	c	c	c	c	c	c		1 - 999 gallons	0001 - 9999 Liters
CPO Aux Relay Time		c	c	c	c	c	c	c				c		c	c	c	c	c	c	c		00:00:01 - 02:00:00	00:00:01 - 02:00:00
Flow Meter		x	x	x	x	x	x	x				x		x	x	x	x	x	x	x		1" 1.5" Paddle or Turbine, 2" Paddle, 3" Paddle, Generic	
Generic		x	x	x	x	x	x	x				x		x	x	x	x	x	x	x			
Maximum Flow Rate		a	a	a	a	a	a	a				a		a	a	a	a	a	a	a		20 - 2000 GPM	20 - 2000 LPM
Add _ _ _ Gallons or Liters		a	a	a	a	a	a	a				a		a	a	a	a	a	a	a		1 - 255 Gallons	001 - 255 Liters
Every _ _ _ Pulses		a	a	a	a	a	a	a				a		a	a	a	a	a	a	a		1 - 255	1 - 255

Notes

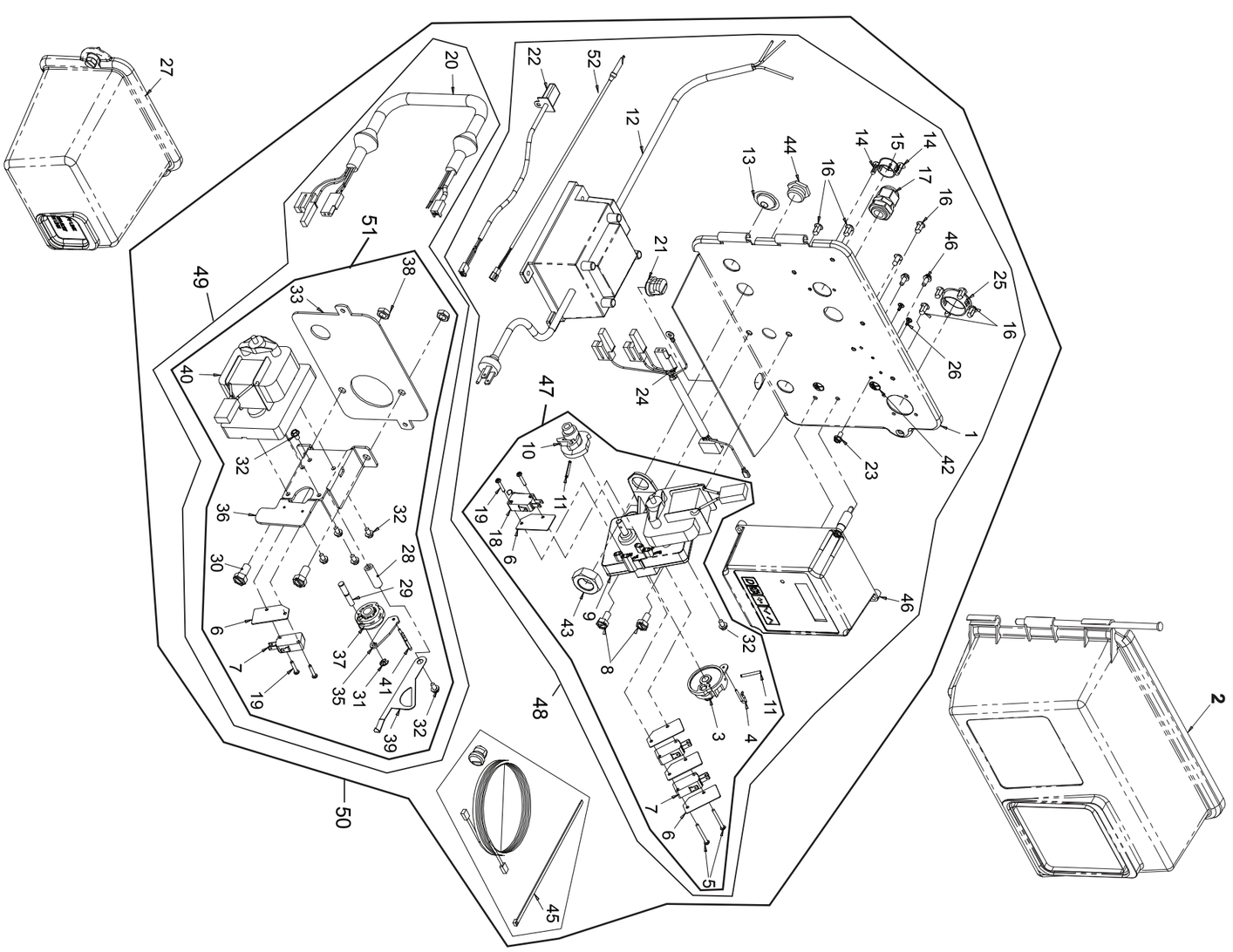
o - Regeneration Time will only be viewed if Regeneration Day Override is used.

u - If Auxiliary Relay is Enabled then Chemical Pump Relay will not be viewed or if Chemical Pump Relay is Enabled then Auxiliary Relay will not be viewed.

c - All Relay Output parameters programming will be viewed if Enabled.

a - If Generic Flow Meter is chosen, then programming parameters will be viewed.

2750/2850/2900S UPPER & 2900S LOWER POWERHEAD ASSEMBLY



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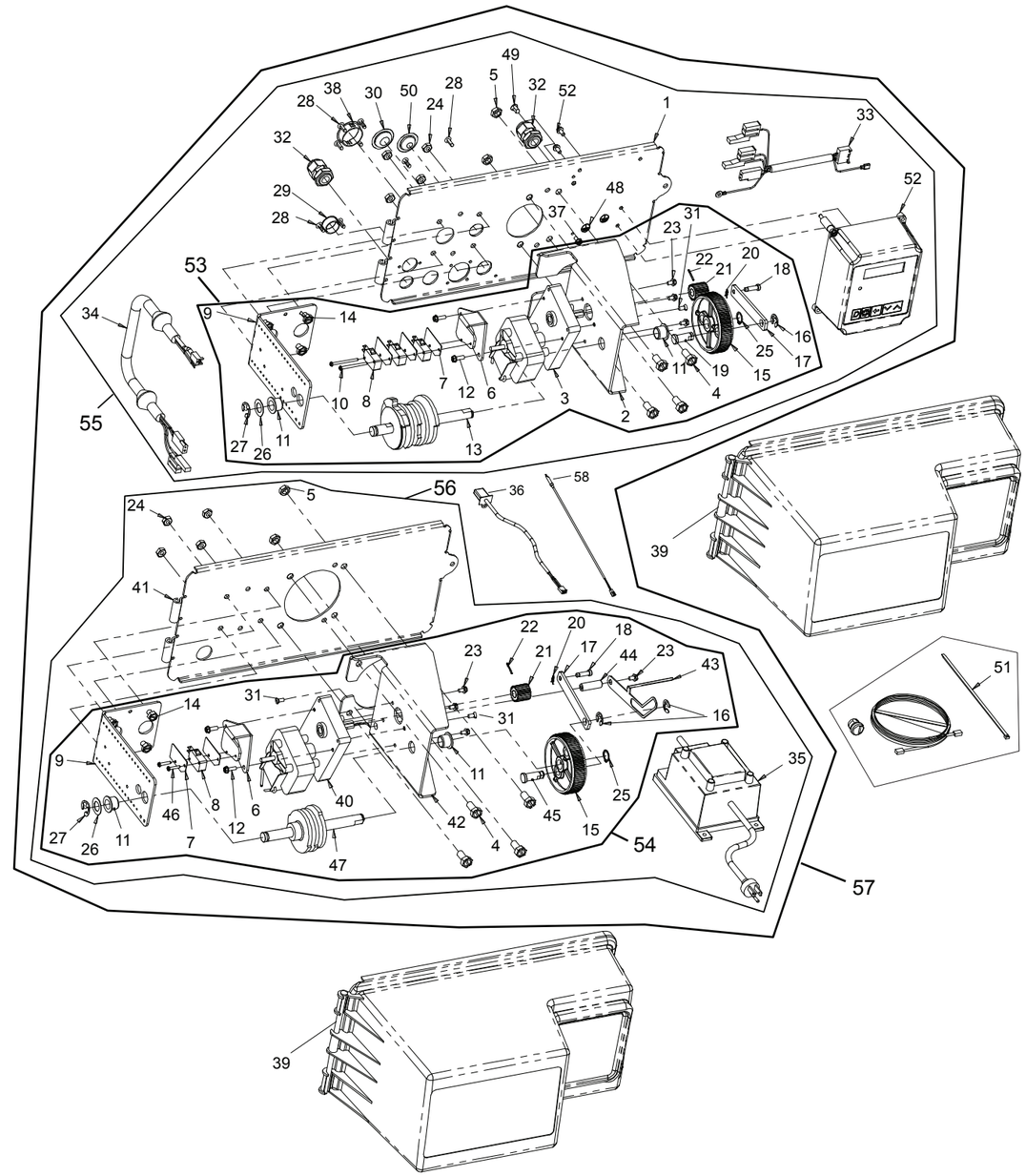
2750/2850/2900S UPPER & 2900S LOWER POWERHEAD ASSEMBLY *continued*

Item No.	QTY	Part No.	Description
1	1	18697-15	Backplate, Hinged
2	1	60219-02	Cover Assy, Environmental, Black
3	1	60160-15	Drive Cam Assy, Stf, Blue
4	1	10909	Pin, Link
5	2	14923	Screw, Pan Hd Mach, 4-40 X 1
6	5	10302	Insulator, Limit Switch
7	3	10218	Switch, Micro
8	2	10231	Screw, Slot Hex, 1/4 - 20 X 1/2
9	1	42579	Motor, Drive, 24V, 50/60 Hz
10	1	12777	Cam, Shut-Off Valve
11	2	10338	Pin, Roll, 3/32 X 7/8
12	1	42469	Transformer, Us, 120V, 24V, 40Va
		41049	Transformer, Euro, 230V/24V 108Va
		41050	Transformer, Aust, 230V/24V, 108Va
13	1	19691	Plug, .750 Dia, Recessed, Black
14	2	19800	Plug, .140 Dia, White
15	1	15806	Plug, Hole, Heyco #2693
16	9	19801	Plug, .190 Dia, White, Heyco #0307
17	1	17967	Fitting Assy, Liquid Tight, Blk
18	1	10896	Switch, Micro
19	4	11805	Screw, Rd Hd, 4-40 X 5/8 Type 1
20	1	40943	Wire Harness, Lower Drive, W/ Molded Strain Relief
21	1	13547	Strain Relief, Flat Cord, Heyco #30-1
22	1	19121	Meter Cable Assembly,
		19121-08	Meter Cable Assembly, 35 inch long with connector
		19121-09	Meter Cable Assembly, 100 inch long with connector
		19121-10	Meter Cable Assembly 304 inch long with connector
23	1	14202-01	Screw, Hex Wsh Mach, 8-32 X 5/16
24	1	40941	Wire Harness, Upper Drive
25	1	17421	Plug, 1.20 Hole, Heyco #2733
26	2	41581	Plug, Hole, .125 Dia, White
27	1	60217-02	Cover Assy, 2900, Lower, Black, Environmental
28	1	18626	Spacer, Indicator
29	1	18746	Bearing, Connecting Rod
30	2	11224	Screw, Hex Hd 5/16 - 18 X 5/8, Ss
31	1	10250	Ring, Retaining
32	7	10872	Screw, Hex Wsh, 8-32 X 17/64
33	1	18709	Backplate, Lower
34	1	11381	Pin, Roll, 2900/3900
35	1	14759	Link, Piston Rod
36	1	14769	Bracket, Motor, 2900
37	1	14775	Cam, Drive, 2900
38	2	16346	Nut, Hex, Jam, 5/16-18, 18-8-Ss
39	1	18725	Indicator, Service/Standby
40	1	42580	Motor, Drive, 24V, 50/6 0Hz, Sp
41	1	14813	Pin, Spring, Connecting Rod
42	1	41102	Label, 3200Nt, Ground
43	1	10269	Nut, Jam, 3/4 - 16
44	1	10712	Fitting, Brine Valve
45	1	61763	Kit, Can Communication Cable
46	1	42466-11	Timer Assy, Nxt, Right Hand
47		60050-23	Drive Assy, 2750, 2850, 2900S Upper, STF, 24V 50/60 Hz
		60050-26	Drive Assy, 2850S, STF, 24V 50/60 Hz
48		*	Powerhead Assy, 2750, 2850, 2900S Upper
		*	Powerhead Assy, 2850S
49		*	Powerhead Assy, Lower 2900S
50		*	Powerhead Assy, Upper and Lower 2900S
51		60055-53	Lower Drive Assy, 2900, 24/60
52	1	19791	Meter Cable Assembly,
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly 304 inch long with connector

*Call you distributor for a Part Number

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

3150/3900 UPPER & LOWER POWERHEAD ASSEMBLY



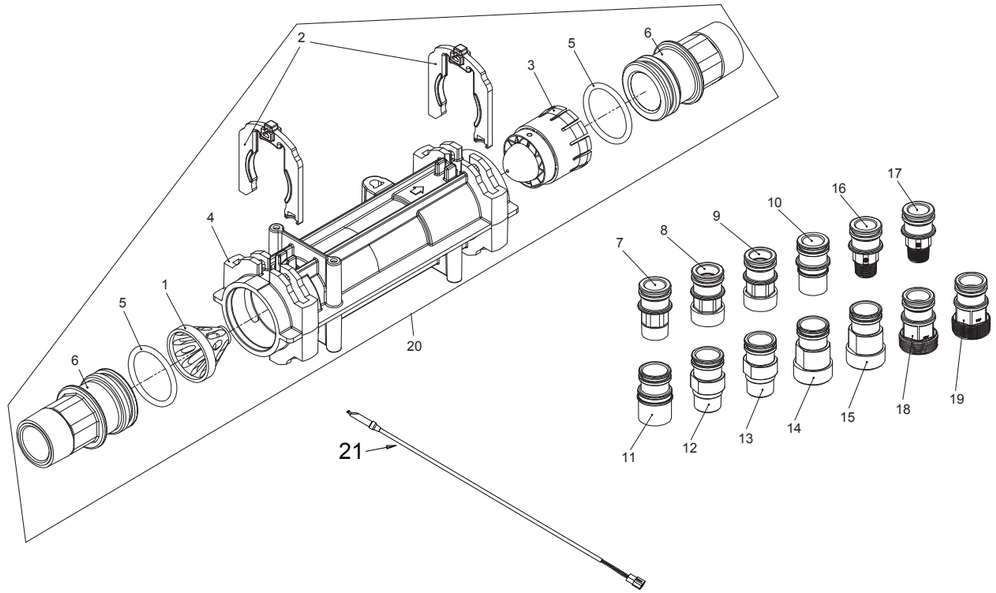
3150/3900 UPPER & LOWER POWERHEAD ASSEMBLY *continued*

Item No.	QTY	Part No.	Description
1	1	19304-04	Backplate, 3150/3900
2	1	15120	Bracket, Motor MTG, 3150/3900
3	1	42581	Motor, Drive, 24V, 50/60 Hz, SP
4	8	11224	Screw, Hex HD, 5/16 - 18 X 5/8, SS
5	4	16346	Nut, Hex, Jam, 5/16 - 18, 18-8-SS
6	2	17797	Bracket, Switch, Mounting, 3150/3900
7	5	10302	Insulator, Limit Switch
8	4	10218	Switch, Micro
9	2	16053	Bracket, Brine Side
10	2	12624	Screw, Phil Pan, 40 X 1 1/2
11	4	16052	Bushin, 3150/3900
12	4	17567	Screw, Hex, Wsh HD, 8 X 1/2
13	1	16494	Cam Assy, 3150/3900
14	8	10231	Screw, Slot Hex, 1/4 - 20 X 1/2 18-8 SS
15	2	16046	Gear, Drive
16	3	11774	Ring, Retaining
17	2	16047	Link, Drive
18	2	11709	Pin, Drive Link
19	1	16048	Bearing, Drive Link
20	2	11898	Clip, 3150/3900
21	2	16045	Pinion, Drive
22	2	11381	Pin, Roll, 2900/3900
23	7	10872	Screw, Hex Wsh, 8-32 X 17/64
24	8	11235	Nut, Hex, 1/4 - 20
25	2	16050	Ring, Retaining
26	2	16059	Washer, SS, .88, 3150/3900
27	2	16051	Ring, Retaining, Bowed
28	8	19800	Plug, .140, White
29	1	15806	Plug, Hole, Heyco, #2693
30	1	19591	Plug, .8750 Hole, Recessed, Black
31	3	11080	Screw, FLT HD Mach, 8-32 X 3/8
32	2	17967	Fitting Assy, Liquid Tight, Blk
33	1	40941	Wire Harness, Upper Drive
34	1	40943	Wire Harness, Lower Drive W/ Molded Strain Relief
35	1	42469	Transformer, US, 120V, 24V, 40VA
		41049	Transformer, Euro, 230V/24V 108VA
		41050	Transformer, Aust, 230V/24V, 108VA
36	1	19121	Meter Cable Assembly
		19121-08	Meter Cable Assembly, 35 inch long with connector
		19121-09	Meter Cable Assembly, 100 inch long with connector
		19121-10	Meter Cable Assembly, 304 inch long with connector
37	1	14202-01	Screw, Hex Wsh, 8-32 X 5/16
38	1	17421	Plug, 1.20 Hole
39	2	60240-02	Cover Assy, 3150/3900, Env, Black
40	1	42581	Motor, Drive, 115V, 50/60Hz, SP
41	1	19305	Backplate, 3900, Lower, Env
42	1	16086	Bracket, Motor Mounting
43	1	19315	Indicator, Service/Standby, 3900
44	1	18726	Spacer, Indicator
45	1	16048	Bearing, Drive Link
46	2	11805	Screw, RD HD, 4-40 X 5/8, Type 1
47	1	16495	Cam Assy, 3900, Lower
48	1	41102	Label, 3200NT, Ground
49	1	19801	Plug, .190 Dia, White
50	1	19691	Plug, .750 Dia, Recessed, Black
51	1	61763	Kit, Can Communication Cable
52	1	42466-11	Timer Assy, Nxt, Right Hand
53		60057-03	Drive Assy, 3150, 3900 Upper, 24V 50/60 Hz
54		60058-03	Lower Drive Assy, 3900, 24V 50/60 Hz
55		*	Powerhead Assy, 3150, 3900 Upper
56		*	Powerhead Assy, 3900 Lower
57		*	Powerhead Assy, 3900 Upper & Lower
58	1	19791	Meter Cable Assembly
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly, 304 inch long with connector

* Call your distributor for Part Number

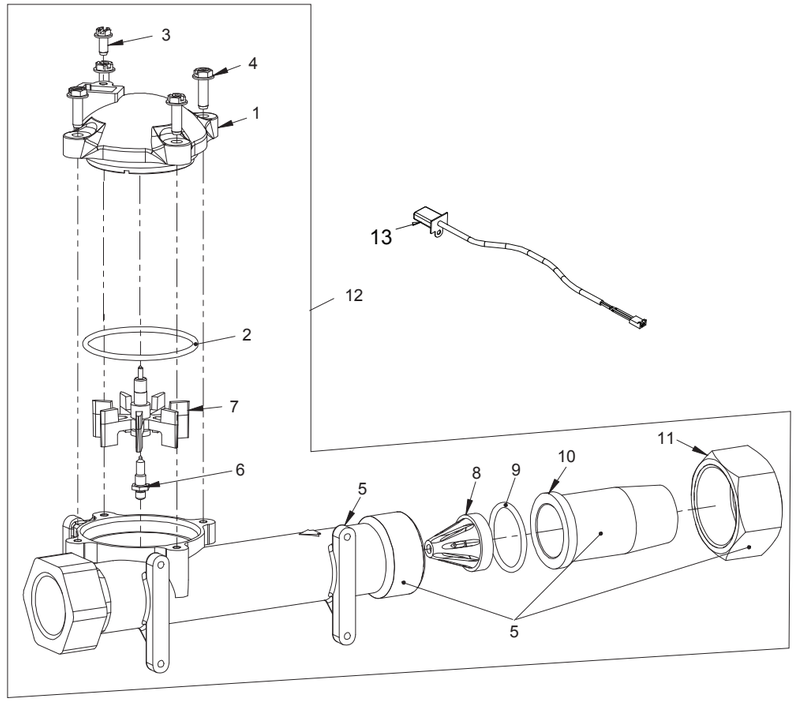
NOTE: For all other service part numbers, see the Service Manual that accompanies the control valve.

METER ASSEMBLY PLASTIC



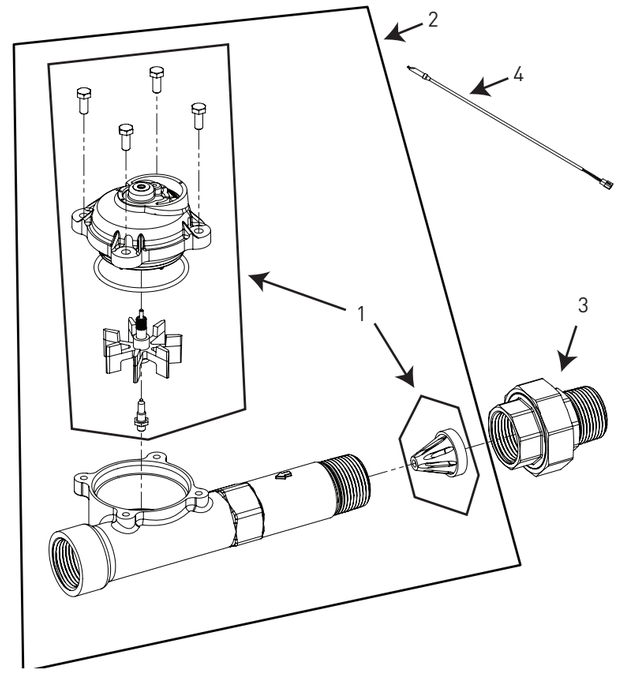
Item No.	QTY	Part No.	Description
1	1	17542	Flow Straightener, 1-1/2"
2	2	40576	Clip, H, Plastic, 7000
3	1	40577	Turbine Meter Assy, 7000
4	1	41555	Body, Inline Meter
5	2	40951	O-ring, -220
6	2	40563-01	Connector Assy, 1" NPT, Plastic, w/O-ring
7	2	40563-11	Connector Assy, 1" BSP, Plastic, w/O-ring
8	2	40565-01	Connector Assy, 1-1/4" NPT, Plastic, w/O-ring
9	2	40565-11	Connector Assy, 1-1/4" BSP, Plastic, w/O-ring
10	2	41242-01	Connector Assy, 1" & 1-1/4", Sweat, w/O-ring
11	2	41243	Connector, 1-1/4" & 1-1/2" Sweat, 7000
		41243-01	Connector Assy, 1-1/4" & 1-1/2", Sweat, w/O-ring
12	2	61561	Connector Assy, 1" NPT, Brass, w/O-ring
13	2	61561-10	Connector Assy, 1" BSP, Brass, w/O-ring
14	2	61562	Connector Assy, 1-1/2" NPT, Brass, w/O-ring
15	2	61562-10	Connector Assy, 1-1/2" BSP, Brass, w/O-ring
16	2	42414-01	Connector 3/4" NPT, Plastic, w/O-ring
17	2	42414-11	Connector, Assy, 3/4" BSP, Plastic, w/O-ring
18	3	42241-01	Connector Assy, 1-1/2" NPT, Plastic, w/O-ring
19	3	42241-11	Connector Assy, 1-1/2" BSP, Plastic, w/O-Ring
20		61560	Meter Assy, 1-1/2" INLN, ELEC, PLAS, w/o Nipples, TURB
		61560-01	Meter Assy, 1", INLN, NPT, ELEC, PLAS, PLAS Nipples, TURB
		61560-02	Meter Assy, 1", INLN, BSP, ELEC, PLAS, PLAS Nipples, TURB
		61560-03	Meter Assy, 1-1/4" INLN, NPT, ELEC, PLAS, PLAS Nipples, TURB
		61560-04	Meter Assy, 1-1/4" INLN, BSP, ELEC, PLAS, PLAS Nipples, TURB
		61560-05	Meter Assy, 1" & 1-1/4", INLN, SWT, ELEC, PLAS, SWT Nipples, TURB
		61560-06	Meter Assy, 1-1/4" & 1-1/2", INLN, SWT, ELEC, PLAS, SWT Nipples, TURB
		61560-07	Meter Assy, 1" INLN, NPT, ELEC, PLAS, BRS Nipples, TURB
		61560-08	Meter Assy, 1" INLN, BSP, ELEC, PLAS, BRS Nipples, TURB
		61560-09	Meter Assy, 1-1/2" INLN, NPT, ELEC, PLAS, BRS Nipples, TURB
		61560-10	Meter Assy, 1-1/2" INLN, BSP, ELEC, PLAS, BRS Nipples, TURB
		61560-11	Meter Assy, 3/4" INLN, NPT, ELEC, PLAS, PLAS Nipples, TURB
		61560-12	Meter Assy, 3/4" INLN, BSP, ELEC, PLAS, PLAS Nipples, TURB
		61560-13	Meter Assy, 1-1/2", INLN, NPT, ELEC, PLAS, PLAS Nipples, TURB
		61560-14	Meter Assy, 1-1/2" INLN, BSP, ELEC, PLAS, PLAS Nipples, TURB
21	1	19791	Meter Cable Assembly,
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly 304 inch long with connector

1-INCH BRASS METER ASSEMBLY



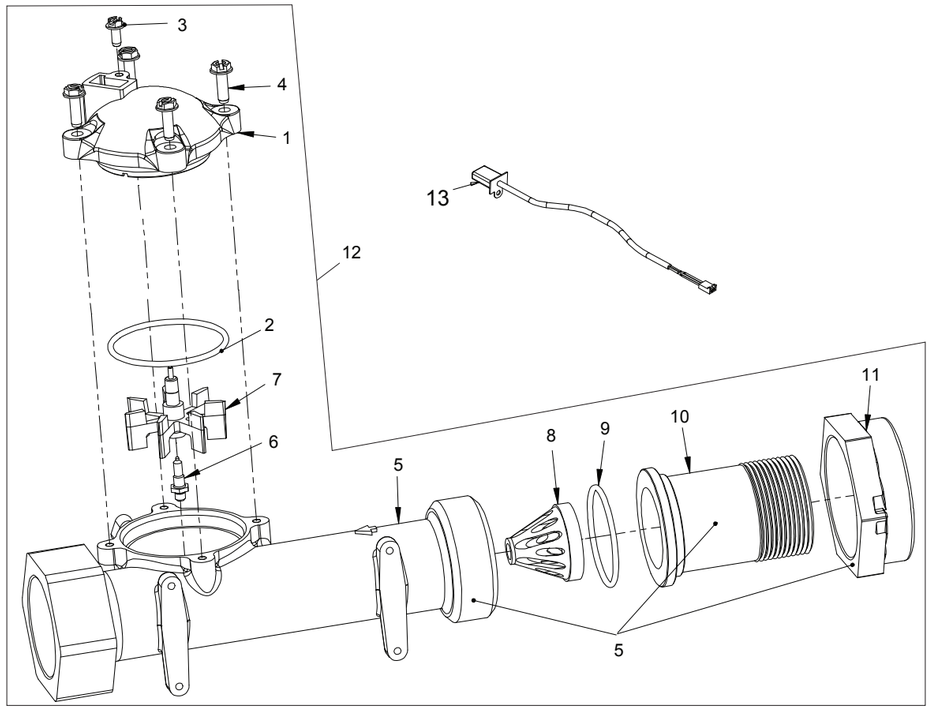
Item No.	QTY	Part No.	Description
1	1	14716	Meter Cap Assy, Elec, Plastic Paddlewheel
2	1	13847	O-ring, -137
3	1	17798	Screw, Slot Hex WSH HD
4	4	12473	Screw, Hex WSH, 10-24 x 5/8
5	1	14959-20	Body, Meter, 1", BSP, Metric, Brass
6	1	13882	Post, Meter Impeller
7	1	13509	Impeller, Meter
8	1	14960	Flow Straightener, 1"
9	1	13287	O-ring, 123
10	1	14961-10	Fitting, 1" Quick Connector, BSP
11	1	14962	Nut, Quick Connect NPT
12	1	60613	Meter Assy, 1" Inline, NPT, Electronic, Brass, PDL
		60613NP	Meter Assy, 1" Inline, NPT, Electronic, Nickel, PDL
		60613-20	Meter Assy, 1" Inline, BSP, Electronic, Brass, PDL
13	1	19121	Meter Cable Assembly,
		19121-08	Meter Cable Assembly, 35 inch long with connector
		19121-09	Meter Cable Assembly, 100 inch long with connector
		19121-10	Meter Cable Assembly 304 inch long with connector

1-INCH STAINLESS STEEL METER ASSEMBLY



Item No.	QTY	Part No.	Description
1	1	62049-01	Service Kit, 1 inch & 1-1/2 inch Meter, Standard Range
	1	62049-02	Service Kit, 1 inch & 1-1/2 inch Meter, Extended Range
2	1	61932-10	Meter Assy, 1 inch, Inline, Stainless Steel, NPT, Standard Range
	1	61932-11	Meter Assy, 1 inch, Inline, Stainless Steel, NPT, Extended Range
	1	61932-20	Meter Assy, 1 inch, Inline, Stainless Steel, BSP, Standard Range
	1	61932-21	Meter Assy, 1 inch, Inline, Stainless Steel, BSP, Extended Range
3	1	44022	Union, 1 inch, NPT (Optional on models with electronic controls)
	1	44023	Union, 1 inch, BSP (Optional on models with electronic controls)
4	1	19791	Meter Cable Assembly,
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly 304 inch long with connector

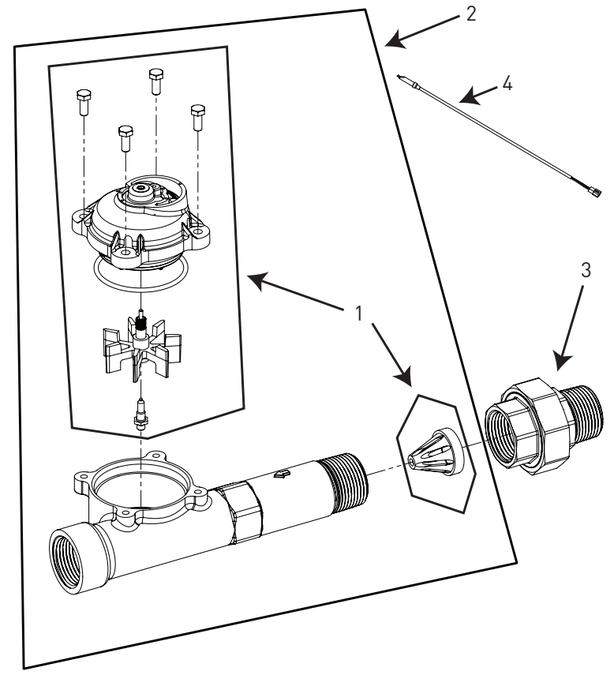
1-1/2 INCH BRASS METER ASSEMBLY



Item No.	QTY	Part No.	Description
1	1	14716	Meter Cap Assy, Elec, Plastic Paddlewheel
2	1	13847	O-ring, -137
3	1	17798	Screw, Slot Hex WSH HD
4	4	12473	Screw, Hex WSH, 10-24 x 5/8
5	1	17569-20	Body, Meter, BSP, 1-1/2" Quick Connector Brass
6	1	13882	Post, Meter Impeller
7	1	13509	Impeller, Meter
8	1	17542	Flow Straightener, 1-1/2"
9	1	12733	O-ring, -132
10	1	17544-10	Fitting, 1-1/2" Quick Connector, BSP
11	1	17543	Nut, Quick Connect 1-1/2"
12	1	60614	Meter Assy, 1-1/2" Inline, NPT, Electronic, Brass Body, PDL
		60614NP	Meter Assy, 1-1/2" INLN, NPT, ELEC, BRS BDY, NP, PDL
		60614-01	Meter Assy, 1-1/2" INLN, NPT, ELEC, BRS BDY, PDL, 1" SLV
		60614-01NP	Meter Assy, 1-1/2" INLN, NPT, ELEC, BRS BDY, NP, PDL, 1" SLV
		60614-20	Meter Assy, 1-1/2" INLN, BSP, ELEC, BRS BDY, PDL, 1" SLV
		60614-20NP	Meter Assy, 1-1/2" INLN, BSP, ELEC, BRS BDY, NP, PDL, 1" SLV

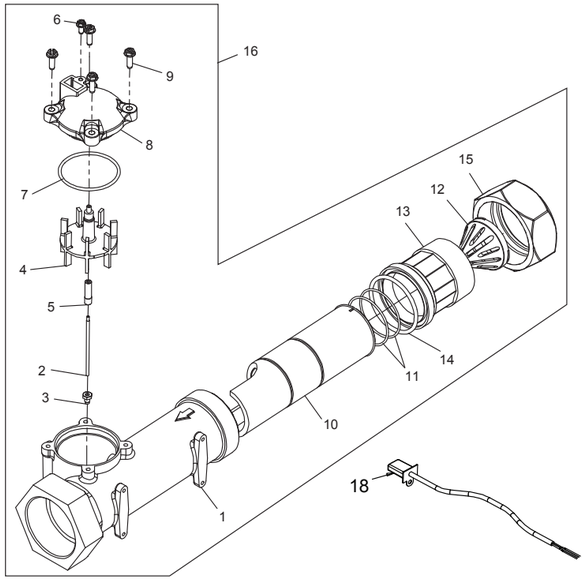
Item No.	QTY	Part No.	Description
13	1	19121	Meter Cable Assembly,
		19121-08	Meter Cable Assembly, 35 inch long with connector
		19121-09	Meter Cable Assembly, 100 inch long with connector
		19121-10	Meter Cable Assembly 304 inch long with connector

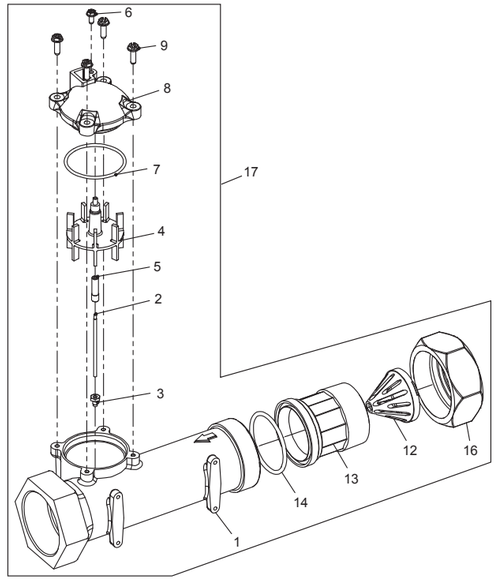
1-1/2 INCH STAINLESS STEEL METER ASSEMBLY



Item No.	QTY	Part No.	Description
1	1	62049-01	Service Kit, 1 inch & 1-1/2 inch Meter, Standard Range
	1	62049-02	Service Kit, 1 inch & 1-1/2 inch Meter, Extended Range
2	1	61933-10	Meter Assy, 1-1/2 inch, Inline, Stainless Steel, NPT, Standard Range
	1	61933-11	Meter Assy, 1-1/2 inch, Inline, Stainless Steel, NPT, Extended Range
	1	61933-20	Meter Assy, 1-1/2 inch, Inline, Stainless Steel, BSP, Standard Range
	1	61933-21	Meter Assy, 1-1/2 inch, Inline, Stainless Steel, BSP, Extended Range
3	1	44024	Union, 1-1/2 inch, NPT Optional on models with electronic controls)
	1	44025	Union, 1-1/2 inch, BSP (Optional on models with electronic controls)
4	1	19791	Meter Cable Assembly,
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly 304 inch long with connector

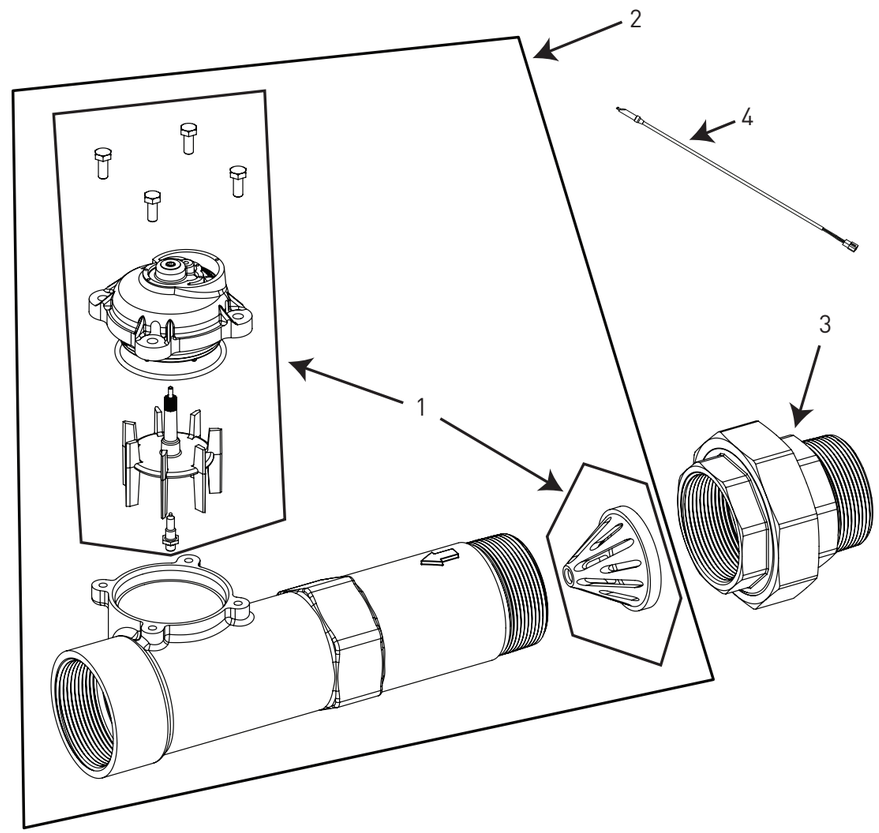
2 INCH BRASS METER ASSEMBLY





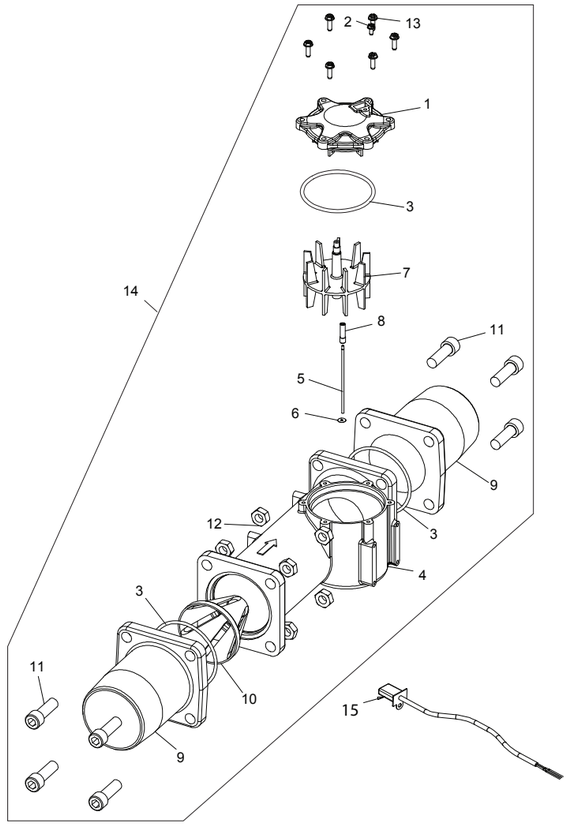
Item No.	QTY	Part No.	Description
1	1	14456	Body, Meter 2"
	1	14456-20	Body, Meter, 2", BSP,Metric
	1	14456-20NP	Body, Meter, 2", BSP,Metric, NP
2	1	15432	Shaft, Impeller, SS
3	1	15532	Seat, Impeller Shaft, Hex
4	1	15374-01	Impeller, 2" Meter
5	1	15381	Plug, Impeller 2" Meter
6	1	17798	Screw, Slot Hex WSH HD
7	1	13847	O-ring, -137
8		14716	Meter Cap Assy, ELEC, Plastic, Paddlewheel
9	4	12473	Screw, Hex WSH, 10-24 x 5/8
	4	21716	Screw, Hex Head, M5 x 16
10		61439	Meter Sleeve w/O-ring, MACHD
11	2	16080	O-ring, -032
12	1	14680	Flow Straightener
13	1	14568	Fitting, Nipple, 2"
	1	14568-10	Fitting, Nipple, 2", BSP, Brass
	1	14568-10NP	Fitting, Nipple, 2", BSP, Brass, NP
14	1	14679	O-ring, -227
15	1	14569	Nut, Quick Connect
16		60615	Meter Assy, 2" INLN, NPT, ELEC, BRS, PDL, 1.5" SLV
		60615NP	Meter Assy, 2" INLN, NPT, ELEC, NP, PDL, 1.5" SLV
		60615-20	Meter Assy, 2" INLN, BSP/MET, ELEC, BRS, PDL, 1.5" SLV
		60615-20NP	Meter Assy, 2" INLN, BSP/MET, ELEC, NP, PDL, 1.5" SLV
17		60616	Meter Assy, 2" INLN, NPT, ELEC, BRS, PDL
		60616NP	Meter Assy, 2" INLN, NPT, ELEC, NP, PDL
		60616-20	Meter Assy, 2" INLN, BSP/MET, ELEC, BRS, PDL
		60616-20NP	Meter Assy, 2" INLN, BSP/MET, ELEC, NP, PDL
18	1	19121	Meter Cable Assembly,
		19121-08	Meter Cable Assembly, 35 inch long with connector
		19121-09	Meter Cable Assembly, 100 inch long with connector
		19121-10	Meter Cable Assembly 304 inch long with connector

2 INCH STAINLESS STEEL METER ASSEMBLY



Item No.	QTY	Part No.	Description
1	1	62048-01	Service Kit, 2 inch Meter, Standard Range
	1	62048-02	Service Kit, 2 inch Meter, Extended Range
2	1	61934-10	Meter Assy, 2 inch, Inline, Stainless Steel, NPT, Standard Range
	1	61934-11	Meter Assy, 2 inch, Inline, Stainless Steel, NPT, Extended Range
	1	61934-20	Meter Assy, 2 inch, Inline, Stainless Steel, BSP, Standard Range
	1	61934-21	Meter Assy, 2 inch, Inline, Stainless Steel, BSP, Extended Range
3	1	44026	Union, 2 inch, NPT (Optional on models with electronic controls)
	1	44027	Union, 2 inch, BSP (Optional on models with electronic controls)
4	1	19791	Meter Cable Assembly,
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly 304 inch long with connector

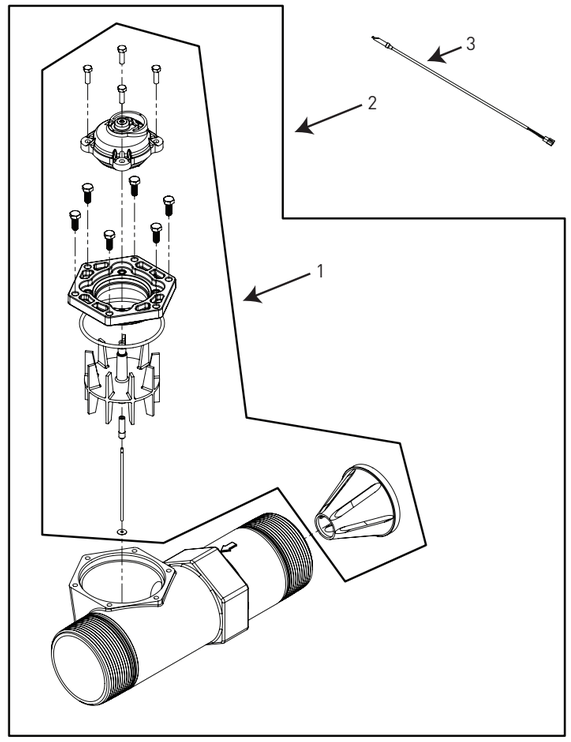
3 INCH BRASS METER ASSEMBLY



Item No.	QTY	Part No.	Description
1	1	14716-01	Meter Cap Assy, 3" ELEC, Plastic, Paddlewheel
2	1	17798	Screw, Hex Washer Head, #8-16 x 0.38
3	3	15707	O-ring, -236
4	1	16254-20	Body Meter, 3900, BSP
5	1	16279	Shaft, Impeller, SS
6	1	16574	Washer, Plain, SS
7	1	16252	Impeller, 3900
8	1	15381	Plug, Impeller, 2" Meter
9	2	16328-10	Adapter, Flange, 3" BSP
10	1	16280	Flow Straightener
11	8	40118	Screw, SCKT HD, 1/2-13 UN
12	8	16386	Nut, Hex, Jam, 1/2-13, 18-8 S.S.
13	6	12473	Screw, Hex Washer Head, #10-24 x 0.625
14		60617	Meter Assy, 3" INLN, NPT, Electronic, BRS BDY, Paddlewheel
		60617-10	Meter Assy, 3" INLN, BSP, Electronic, BRS BDY, Paddlewheel

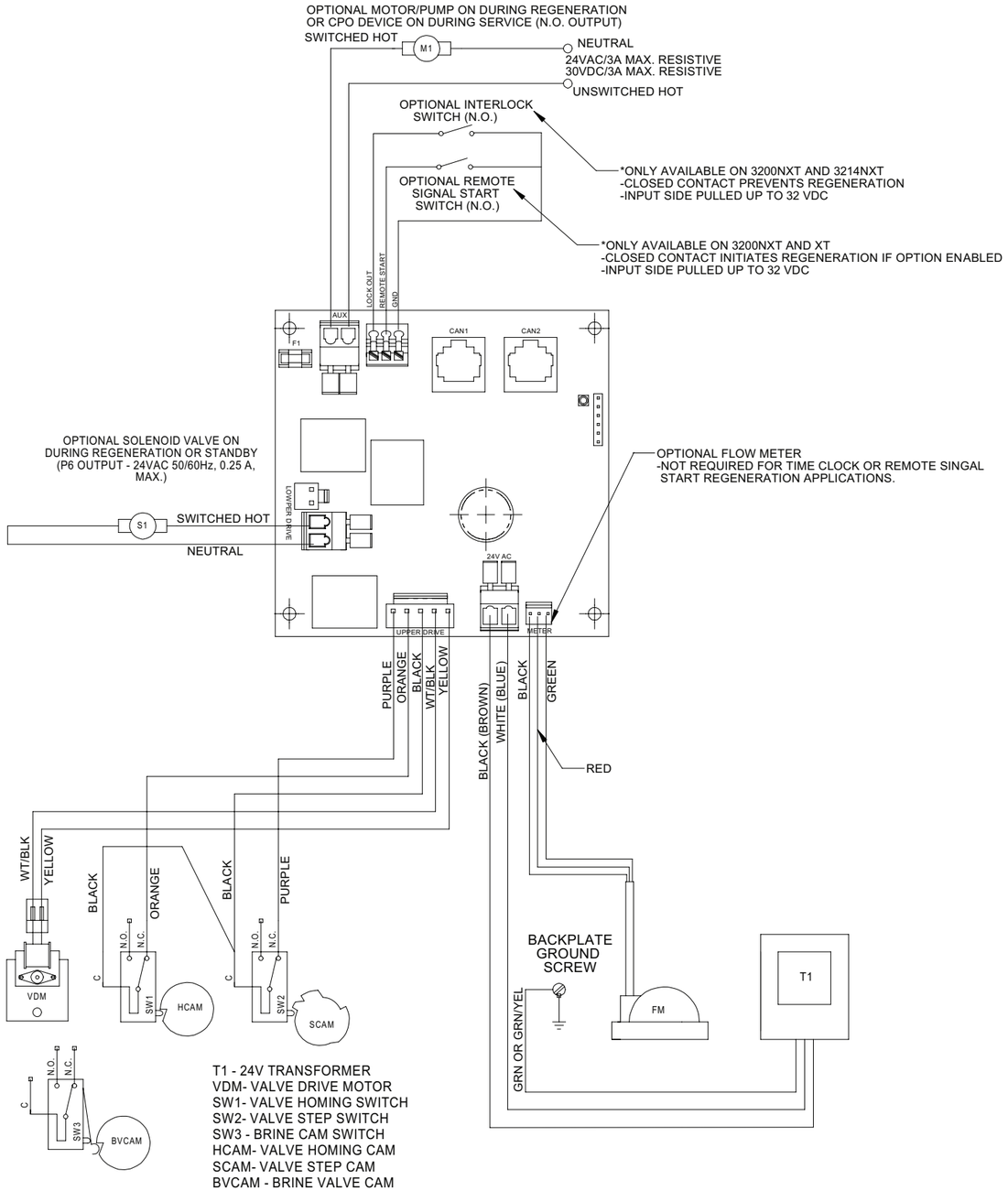
Item No.	QTY	Part No.	Description
15	1	19121	Meter Cable Assembly,
		19121-08	Meter Cable Assembly, 35 inch long with connector
		19121-09	Meter Cable Assembly, 100 inch long with connector
		19121-10	Meter Cable Assembly 304 inch long with connector

3 INCH STAINLESS STEEL METER ASSEMBLY



Item No.	QTY	Part No.	Description
1	1	62078-01	Service Kit, 3 Inch Meter, Standard Range
	1	62078-02	Service Kit, 3 Inch Meter, Extended Range
2	1	61935-10	Meter Assy, 3 Inch, Inline, Stainless Steel, NPT, Standard Range
		61935-11	Meter Assy, 3 Inch, Inline, Stainless Steel, NPT, Extended Range
		61935-20	Meter Assy, 3 Inch, Inline, Stainless Steel, BSP, Standard Range
		61935-21	Meter Assy, 3 Inch, Inline, Stainless Steel, BSP, Extended Range
3	1	19791	Meter Cable Assembly,
		19791-02	Meter Cable Assembly, 28 inch long with connector
		19791-04	Meter Cable Assembly, 100 inch long with connector
		19791-05	Meter Cable Assembly 304 inch long with connector

SINGLE PISTON WIRING DIAGRAM

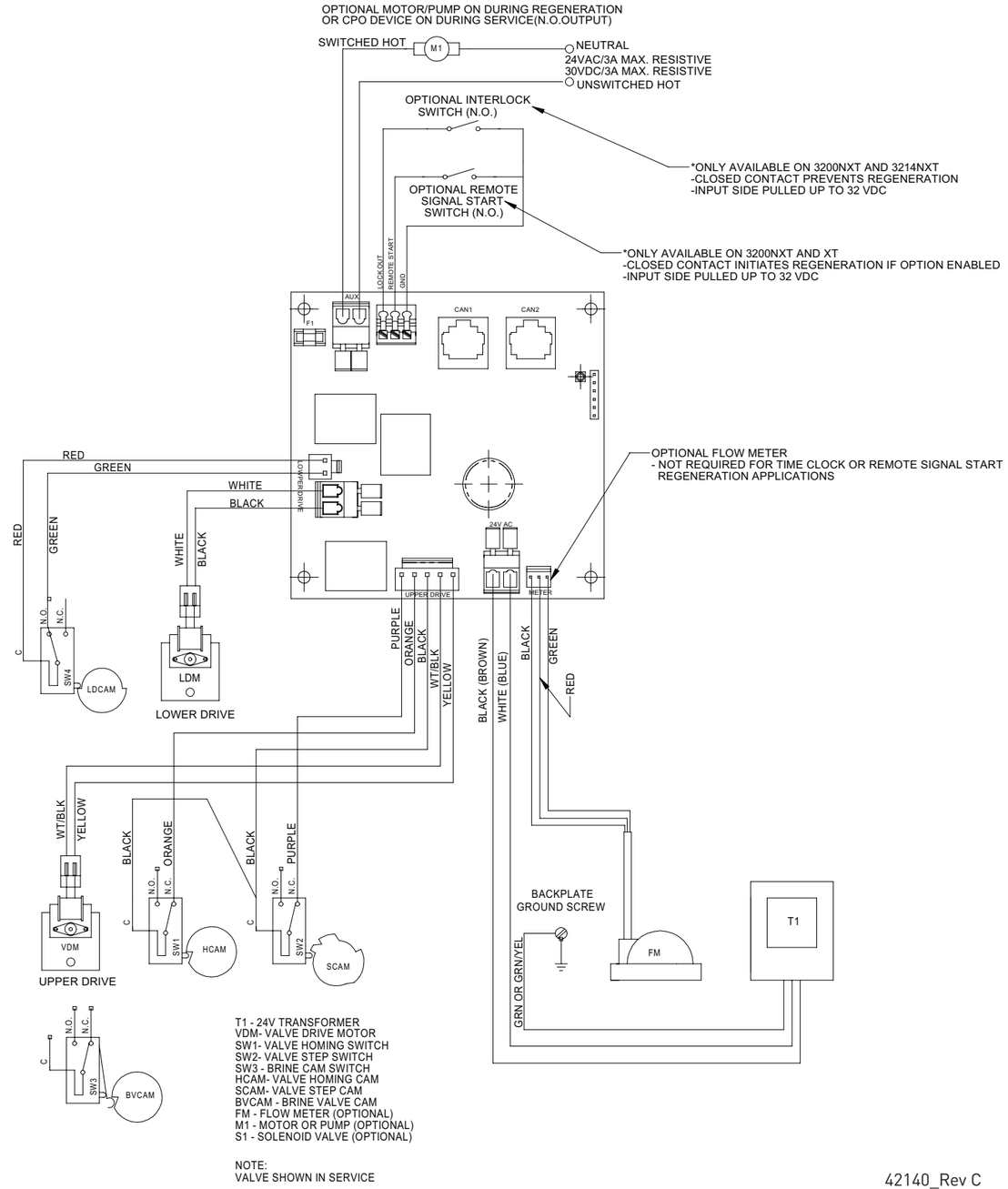


T1 - 24V TRANSFORMER
VDM- VALVE DRIVE MOTOR
SW1- VALVE HOMING SWITCH
SW2- VALVE STEP SWITCH
SW3 - BRINE CAM SWITCH
HCAM- VALVE HOMING CAM
SCAM- VALVE STEP CAM
BVCAM - BRINE VALVE CAM
FM - FLOW METER (OPTIONAL)
M1 - MOTOR OR PUMP (OPTIONAL)
S1 - SOLENOID VALVE (OPTIONAL)

NOTE:
VALVE SHOWN IN SERVICE

42140_Rev D

DUAL PISTON WIRING DIAGRAM

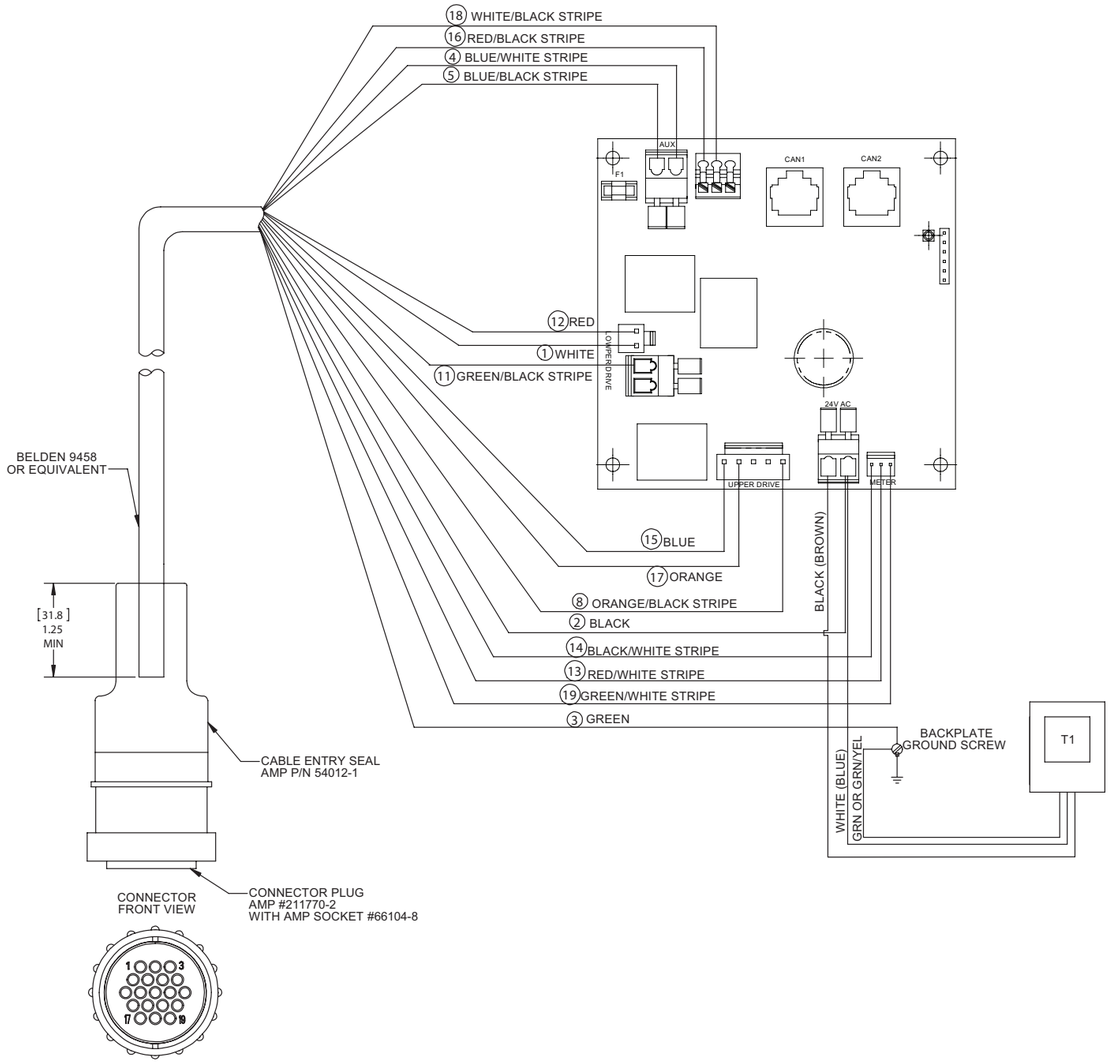


T1 - 24V TRANSFORMER
VDM- VALVE DRIVE MOTOR
SW1- VALVE HOMING SWITCH
SW2- VALVE STEP SWITCH
SW3 - BRINE CAM SWITCH
HCAM- VALVE HOMING CAM
SCAM- VALVE STEP CAM
BVCAM - BRINE VALVE CAM
FM - FLOW METER (OPTIONAL)
M1 - MOTOR OR PUMP (OPTIONAL)
S1 - SOLENOID VALVE (OPTIONAL)

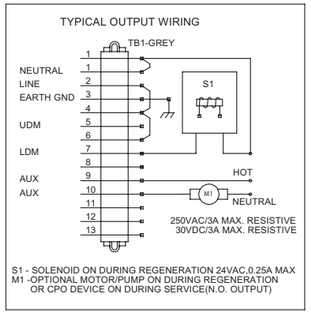
NOTE:
VALVE SHOWN IN SERVICE

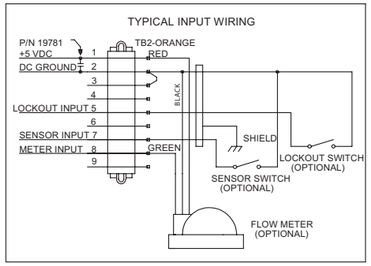
42140_Rev C

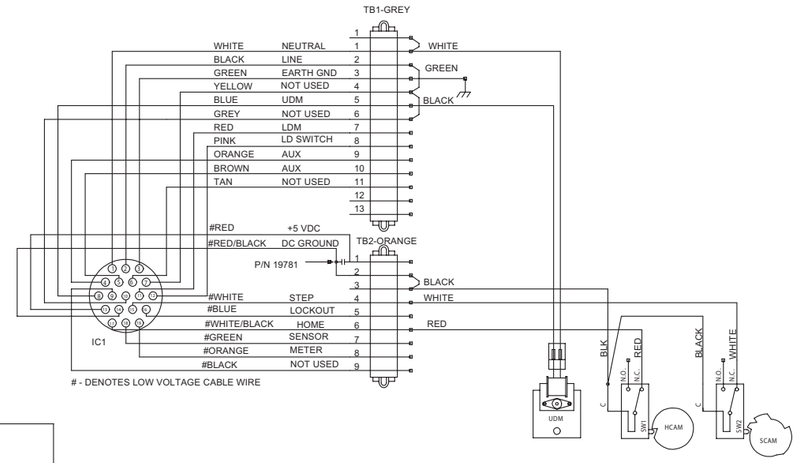
REMOTE TIMER WIRING DIAGRAM



2750/2850 REMOTE TIMER WIRING DIAGRAM



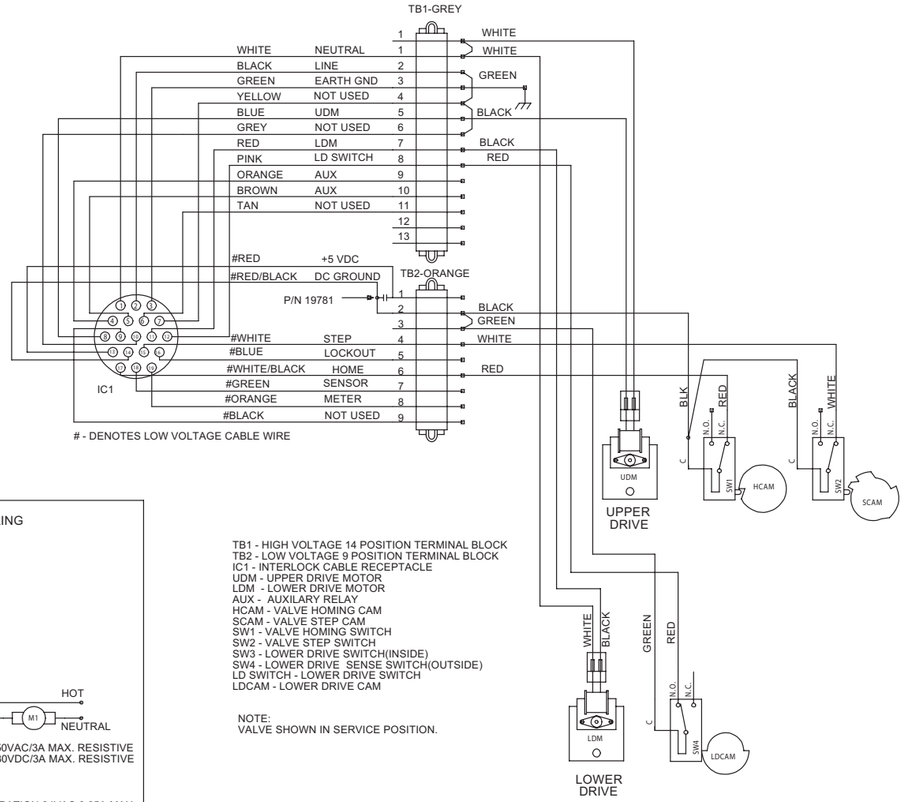




TB1 - HIGH VOLTAGE 14 POSITION TERMINAL BLOCK
TB2 - LOW VOLTAGE 9 POSITION TERMINAL BLOCK
IC1 - INTERLOCK CABLE RECEPTACLE
UDM - UPPER DRIVE MOTOR
LDM - LOWER DRIVE MOTOR
AUX - AUXILARY RELAY
HCAM - VALVE HOMING CAM
SCAM - VALVE STEP CAM
SW1 - VALVE HOMING SWITCH
SW2 - VALVE STEP SWITCH
LD SWITCH - LOWER DRIVE SWITCH

NOTE:
VALVE SHOWN IN SERVICE POSITION.

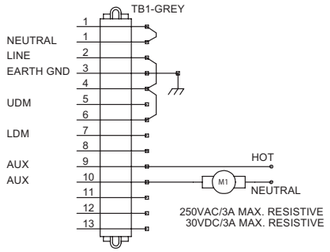
2900 REMOTE TIMER WIRING DIAGRAM



TB1 - HIGH VOLTAGE 14 POSITION TERMINAL BLOCK
TB2 - LOW VOLTAGE 9 POSITION TERMINAL BLOCK
IC1 - INTERLOCK CABLE RECEPTACLE
UDM - UPPER DRIVE MOTOR
LDM - LOWER DRIVE MOTOR
AUX - AUXILARY RELAY
HCAM - VALVE HOMING CAM
SCAM - VALVE STEP CAM
SW1 - VALVE HOMING SWITCH
SW2 - VALVE STEP SWITCH
SW3 - LOWER DRIVE SWITCH(INSIDE)
SW4 - LOWER DRIVE SENSE SWITCH(OUTSIDE)
LD SWITCH - LOWER DRIVE SWITCH
LDCAM - LOWER DRIVE CAM

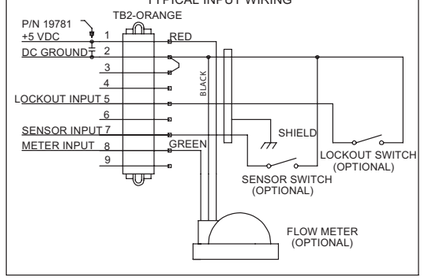
NOTE:
VALVE SHOWN IN SERVICE POSITION.

TYPICAL OUTPUT WIRING

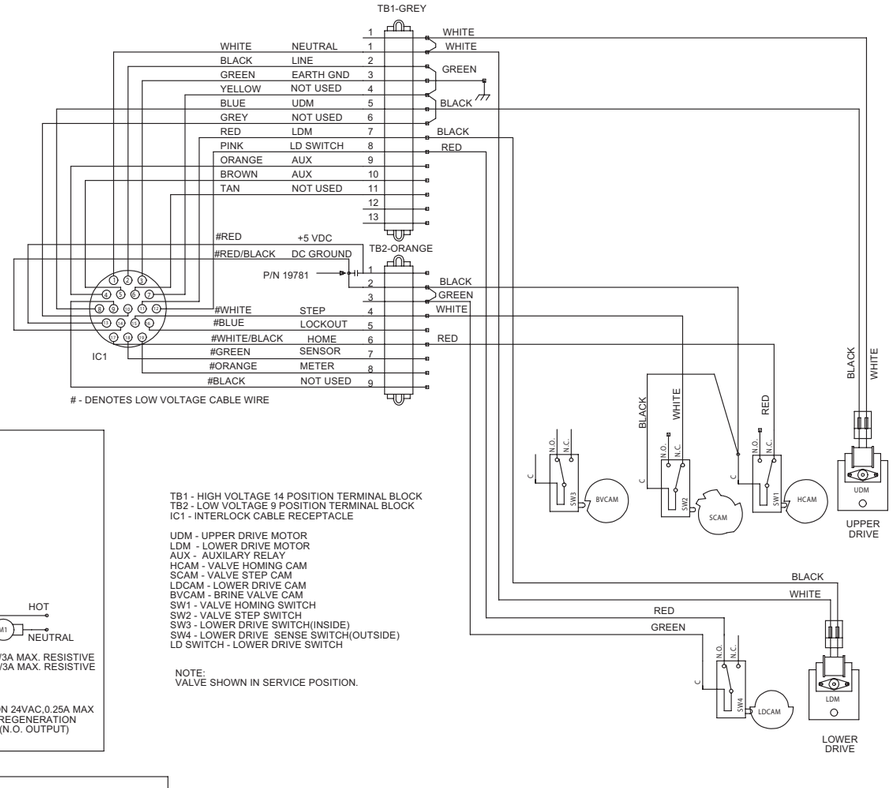


S1 - SOLENOID ON DURING REGENERATION 24VAC,0.25A MAX
M1 -OPTIONAL MOTOR/PUMP ON DURING REGENERATION
OR CPO DEVICE ON DURING SERVICE(N.O. OUTPUT)

TYPICAL INPUT WIRING



3900 REMOTE TIMER WIRING DIAGRAM

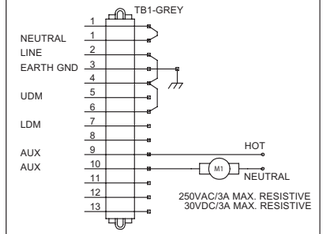


TB1 - HIGH VOLTAGE 14 POSITION TERMINAL BLOCK
TB2 - LOW VOLTAGE 9 POSITION TERMINAL BLOCK
IC1 - INTERLOCK CABLE RECEPTACLE

UDM - UPPER DRIVE MOTOR
LDM - LOWER DRIVE MOTOR
AUX - AUXILARY RELAY
HCAM - VALVE HOMING CAM
SCAM - VALVE STEP CAM
LDCAM - LOWER DRIVE CAM
BVCAM - BRINE VALVE CAM
SW1 - VALVE HOMING SWITCH
SW2 - VALVE STEP SWITCH
SW3 - LOWER DRIVE SWITCH(INSIDE)
SW4 - LOWER DRIVE SENSE SWITCH(OUTSIDE)
LD SWITCH - LOWER DRIVE SWITCH

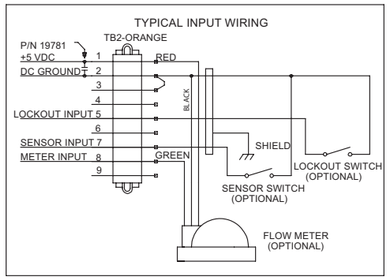
NOTE:
VALVE SHOWN IN SERVICE POSITION.

TYPICAL OUTPUT WIRING

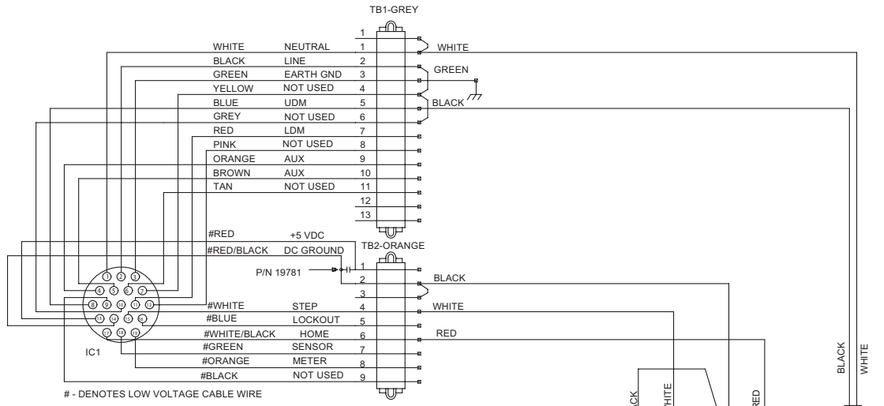


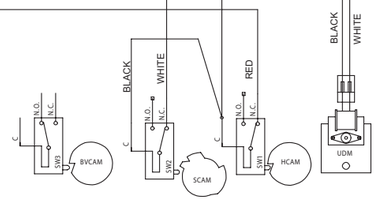
S1 - SOLENOID ON DURING REGENERATION 24VAC,0.25A MAX
M1 -OPTIONAL MOTOR/PUMP ON DURING REGENERATION
OR CPO DEVICE ON DURING SERVICE(N.O. OUTPUT)

TYPICAL INPUT WIRING



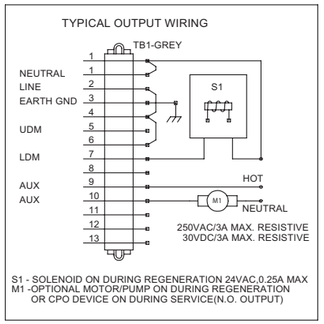
3150 REMOTE METER WIRING DIAGRAM

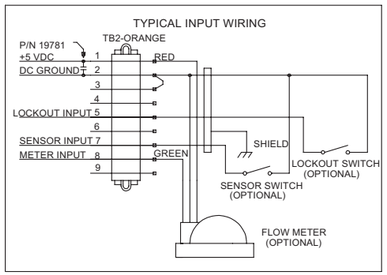




TB1 - HIGH VOLTAGE 14 POSITION TERMINAL BLOCK
TB2 - LOW VOLTAGE 9 POSITION TERMINAL BLOCK
IC1 - INTERLOCK CABLE RECEPTACLE
UDM - UPPER DRIVE MOTOR
LDM - LOWER DRIVE MOTOR
AUX - AUXILARY RELAY
HCAM - VALVE HOMING CAM
SCAM - VALVE STEP CAM
BVCAM - BRINE VALVE CAM
SW1 - VALVE HOMING SWITCH
SW2 - VALVE STEP SWITCH

NOTE:
VALVE SHOWN IN SERVICE POSITION.





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.

Message Displayed	Cause For Error	Correction
Flashing time	Power outage.	Program time by holding UP on Unit #1.
Detected Error = Matching Address	Two or more units programmed with the same valve address number.	Program each unit with unique valve address number in Master Programming.
Detected Error = Program Mismatch	Master program parameters do not match between two or more controls.	Confirm Master Programming for each unit.
Detected Error = No Message #1	No power to Control #1.	Power Control #1.
	Communication Cable to Valve Address #1 bad or missing.	Connect or replace Communication Cable.
Detected Error = No Message #2	No power to Control #2.	Power Control #2.
	Communication Cable to Valve Address #2 bad or missing.	Connect or replace Communication Cable.
Detected Error = No Message #3	No power to Control #3.	Power Control #3.
	Communication Cable to Valve Address #3 bad or missing.	Connect or replace Communication Cable.
Detected Error = No Message #4	No power to Control #4.	Power Control #4.
	Communication Cable to Valve Address #4 bad or missing.	Connect or replace Communication Cable.
Detected Error = E2 Reset Unit	This message appears after a software reset.	Reprogram control using Master Programming section.
Test Mode	Circuit Board was not programmed at factory.	Replace Circuit Board.
Black Squares on screen	Bad Circuit Board.	Replace Circuit Board.
INI on screen for more than 2 minutes	Circuit board not getting feedback from cycle switch.	Inspect Motor - should be rotating.
		Connect wire harness to cycle switch.
		Check Cycle Micro Switch.
CHG on screen for more than 2 minutes	Control programmed incorrectly as 2900 or 3900 valve type.	Reprogram unit as Stager Valve type.

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