3200NXT

Service Manual

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

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 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 1
- Do not pl] ce the unit in tibect sunlight. ȥ l] cĦ units will ab ¡ c
- Do not striĤe the valve or an) of the componÂnts0
- ŧaurant) of thfs product extends Do " anufacturing tefects. (fsa co0tition watem !
- A preﺶlter shCeld re esed on installations Ān wffc– fbeÃ solf
- In come a plfcations local municipalities ®be ` t wates with ʆ –
-

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

Programming Mode:

Feed Water Hardness:	_____ Grains per Gallon or Degrees
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 / Stager**
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 $CaCO_3$/L
System Size:	1 Valve / 2 Valves / 3 Valves / 4 Valves
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 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 stored during a power failure, and will be restored upon power re-application. 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

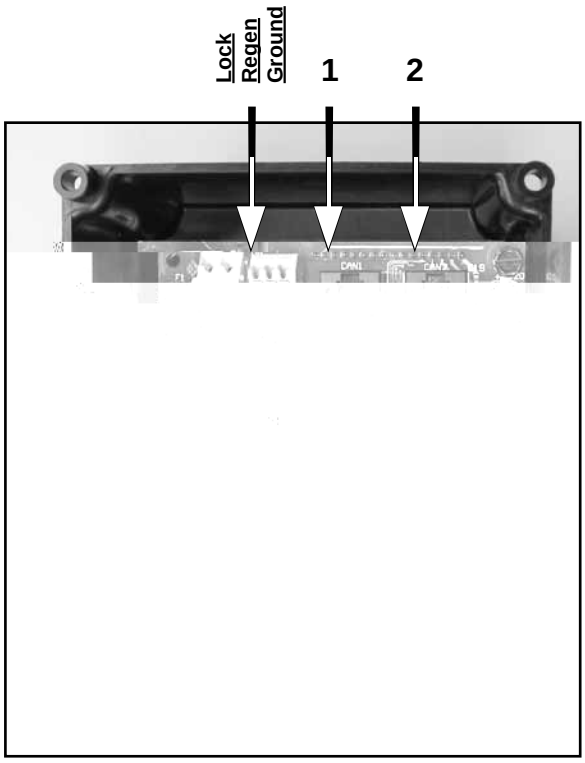
If the Day Override option is turned on and the valve reaches the set Regeneration Day Override value, the

Timer Display - Screen Examples

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 lenth 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.



3200NXT Circuit Board

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

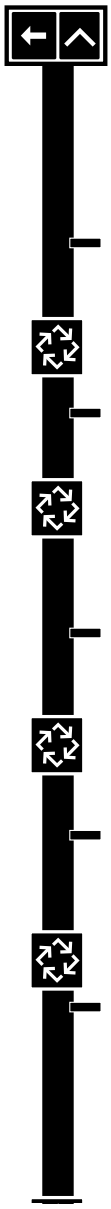
Two-Unit System: One network/communication cable
Three-Unit System: Two network/communication cables
Four-Unit Systems: Three network/communication cables

Master Programming Mode Flow Chart

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.



SYSTEM TYPE: 4
SINGLE UNIT

Example:
System Type 4, Single Unit

Options: System 4 (single unit)
System 5 (2-4 units)
System 6 (2-4 units)
System 7 (2 units)
System 9 (2-4 units)

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

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.

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

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)
Remote Signal Start Immediate (All System Types)

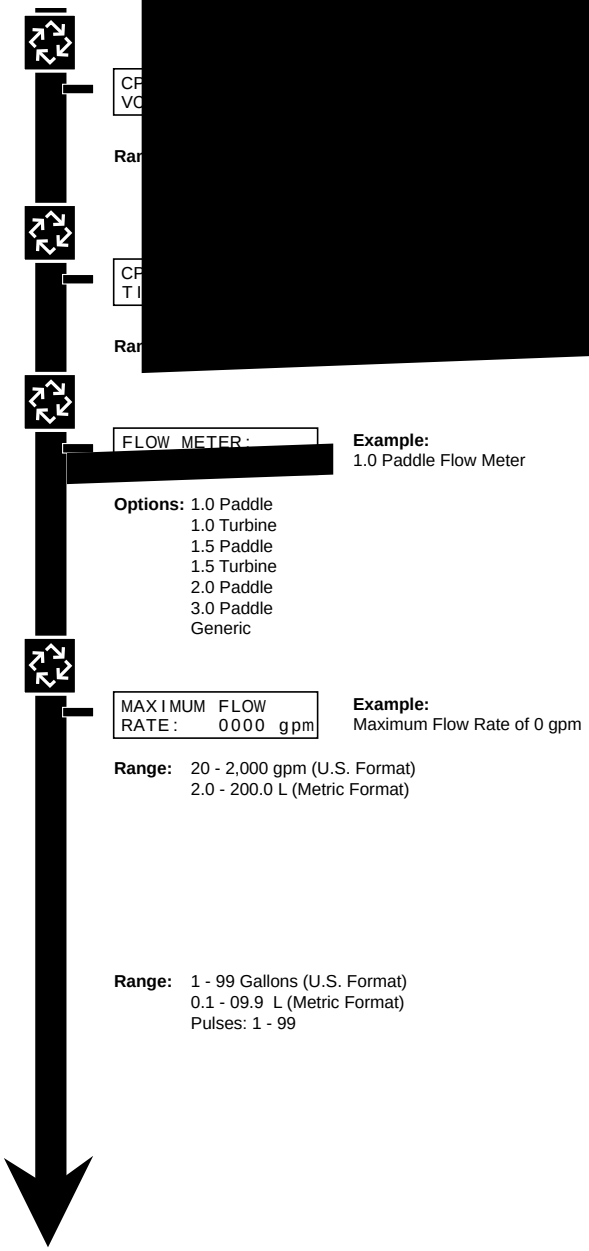
VALVE TYPE:
2750

Example:
2750 **(Default)**

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

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

Master Programming M



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

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 fow meter totalizer volume.

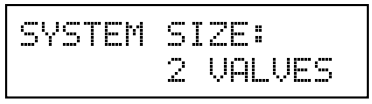
Master Reset: Hold the Extra Cycle button while powering up the unit. This resets all of the

x h ! M

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.



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.

6. Valve Type

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

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

7. Regenerant Flow

This program step selects the regenerant fow type (Downfow, Upfow, or Upfow Fill First)

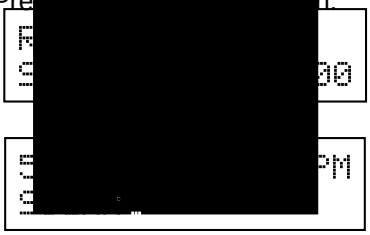
1. Use Up or Down buttons to adjust this value.
2. Press the Extra Cycle button.

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

8. Rem

This pro emote signal start. Hours, minutes, and seconds can be changed. When Remote Signal S screen will display. The options are either Off or set to the desired time.

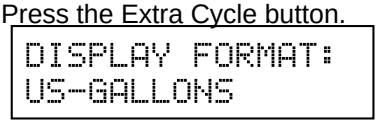
1. Use adjust this value.
2. Pre n.



9. 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.



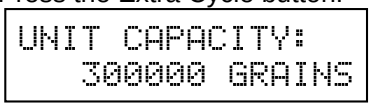
10. Unit Capacity

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 $CaCO_3$ 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 $CaCO_3$ (Default = 300.0 grams $CaCO_3$)

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.



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

11. 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.

33111

14. 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.

15. 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.

16. 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.

17. 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.

18. 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.

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

t to Valve Type)

k fow meter.

value.

of the generic fow meter.

t you want to modify.

t this value.

n/liter for generic fow meters.

t you want to modify.

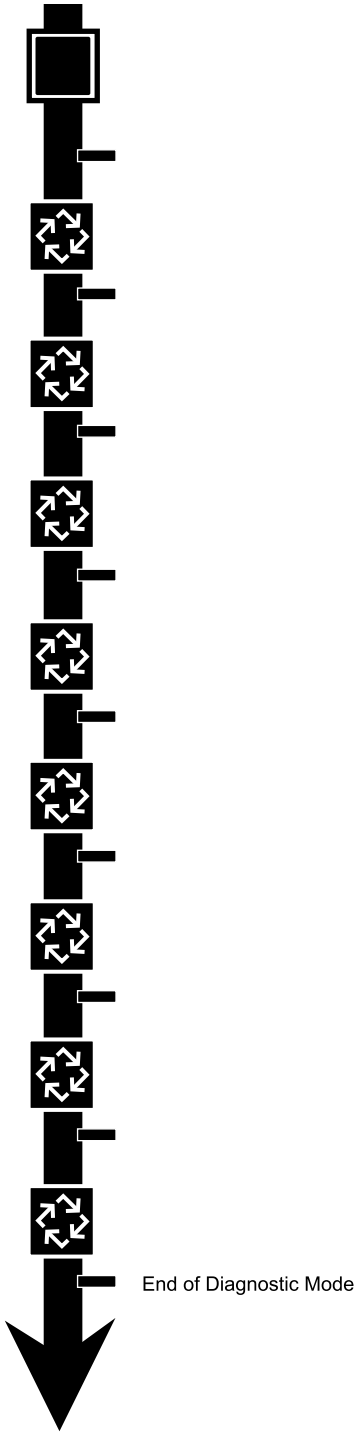
t this value.

Mode

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

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.



Hours Between Last Two Regenerations

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

1. Depress the Extra Cycle button.

Hours Since Last Regeneration

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

1. Depress the Extra Cycle button.

Volume Remaining (This Tank Only)

Volume remaining in the current tank will be adjustable when displayed in this mode. Regeneration will occur if set to zero.

NOTE: Volume Remaining will not display for System Type 6.

The maximum ranges are the same as the maximum volume calculated on the main screen.

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

Volume Remaining (System)

Volume remaining in the system cannot be edited when displayed in this mode, except for the Lead unit. It can only be viewed on the Lag unit.

1. Depress the Extra Cycle button

Valve Address

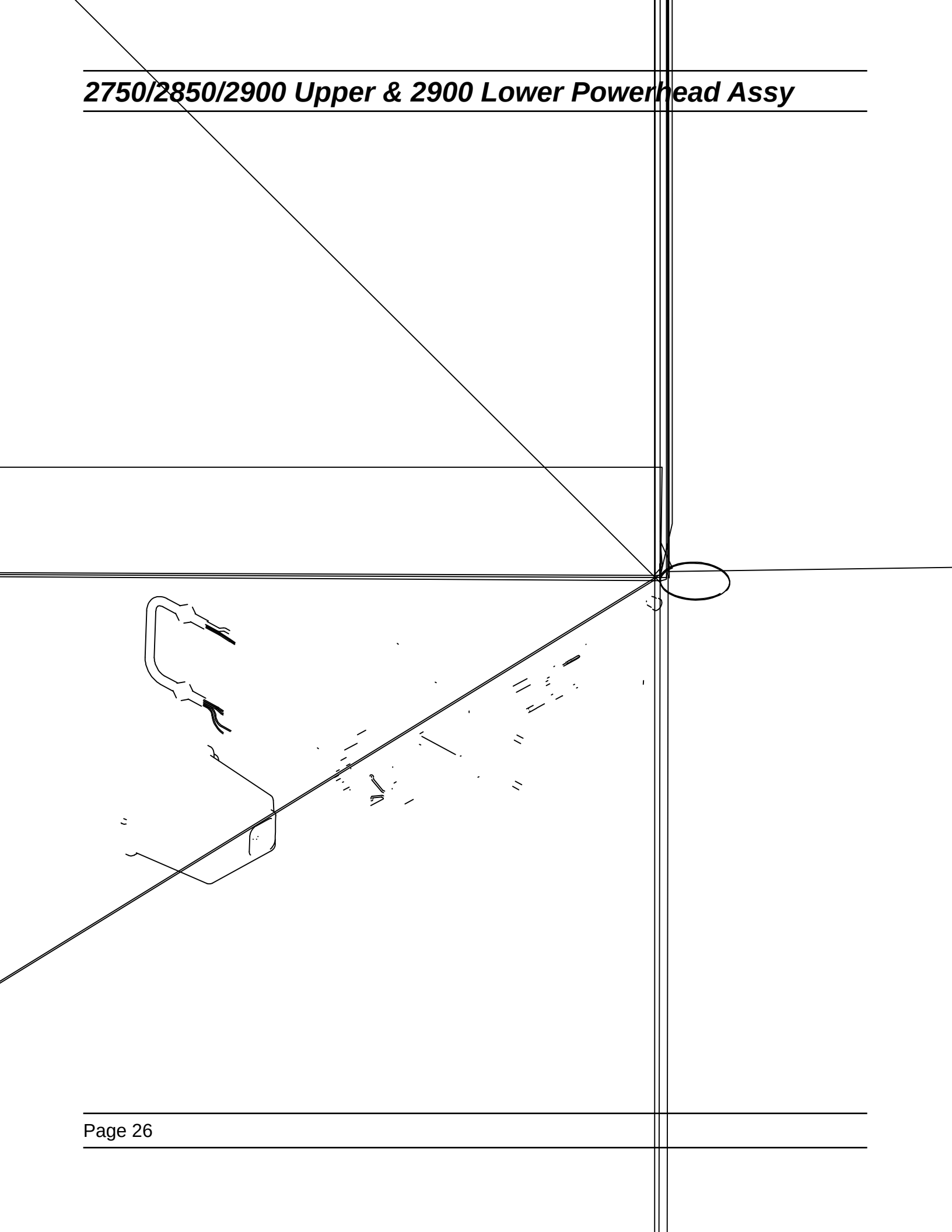
This diagnostic display is for 2 control valves or more in a system (a single valve will not display).

1. Depress the Extra Cycle button.

Software Version

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

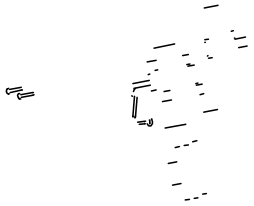
1. Depress the Extra Cycle button to exit.



2750/2850/2900 Upper & 2900 Lower Powerhead Assy

Item No.	Quantity	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	41544	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	41034	transformer, US, 120V, 24V, 108VA
		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, fat cord, heyco #30-1
22	1	19121	meter cable assy, 3200NT
		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
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, 18-8

3150/3900 Upper & 3900 Lower Drive Powerhead Assy

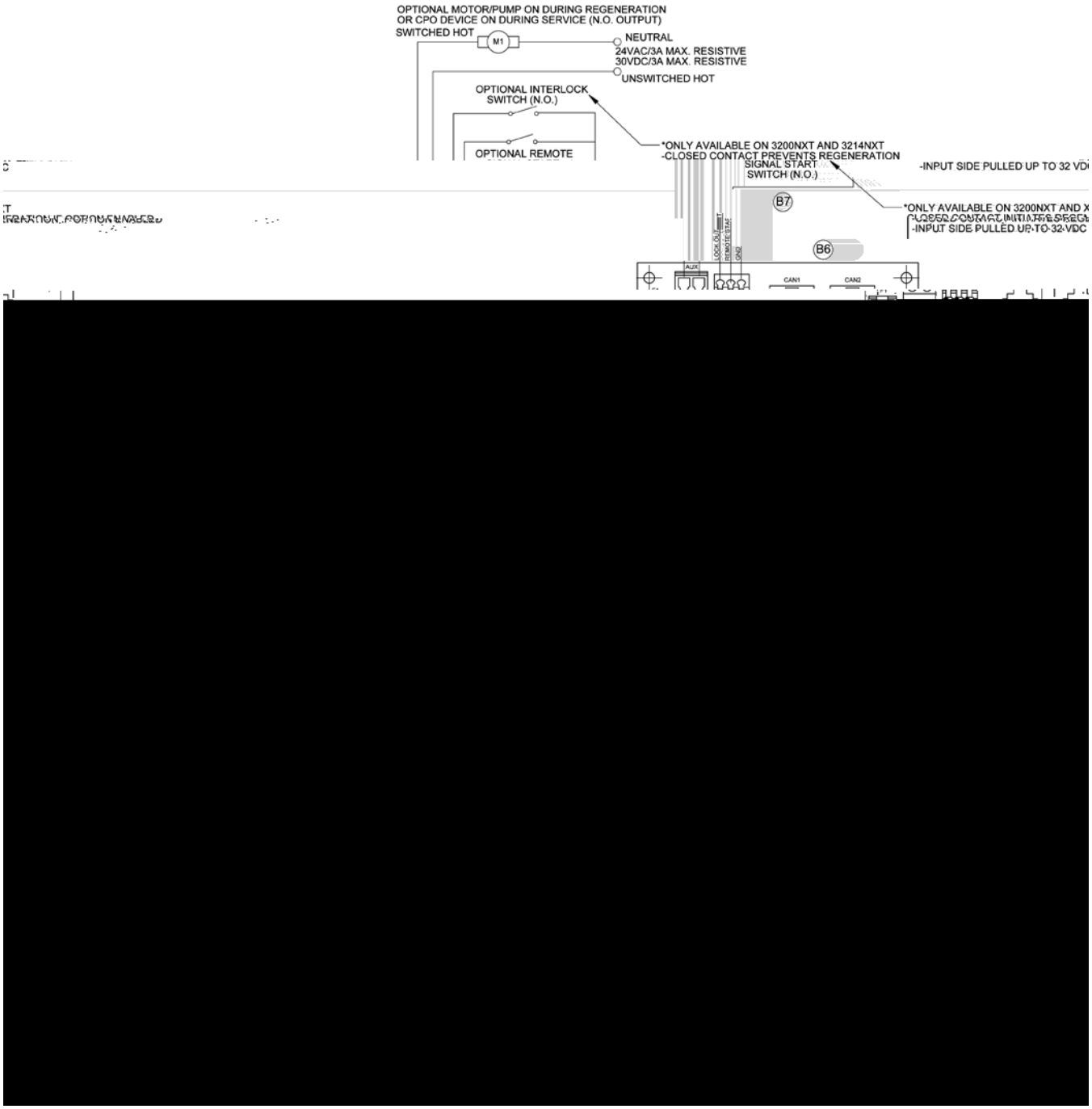


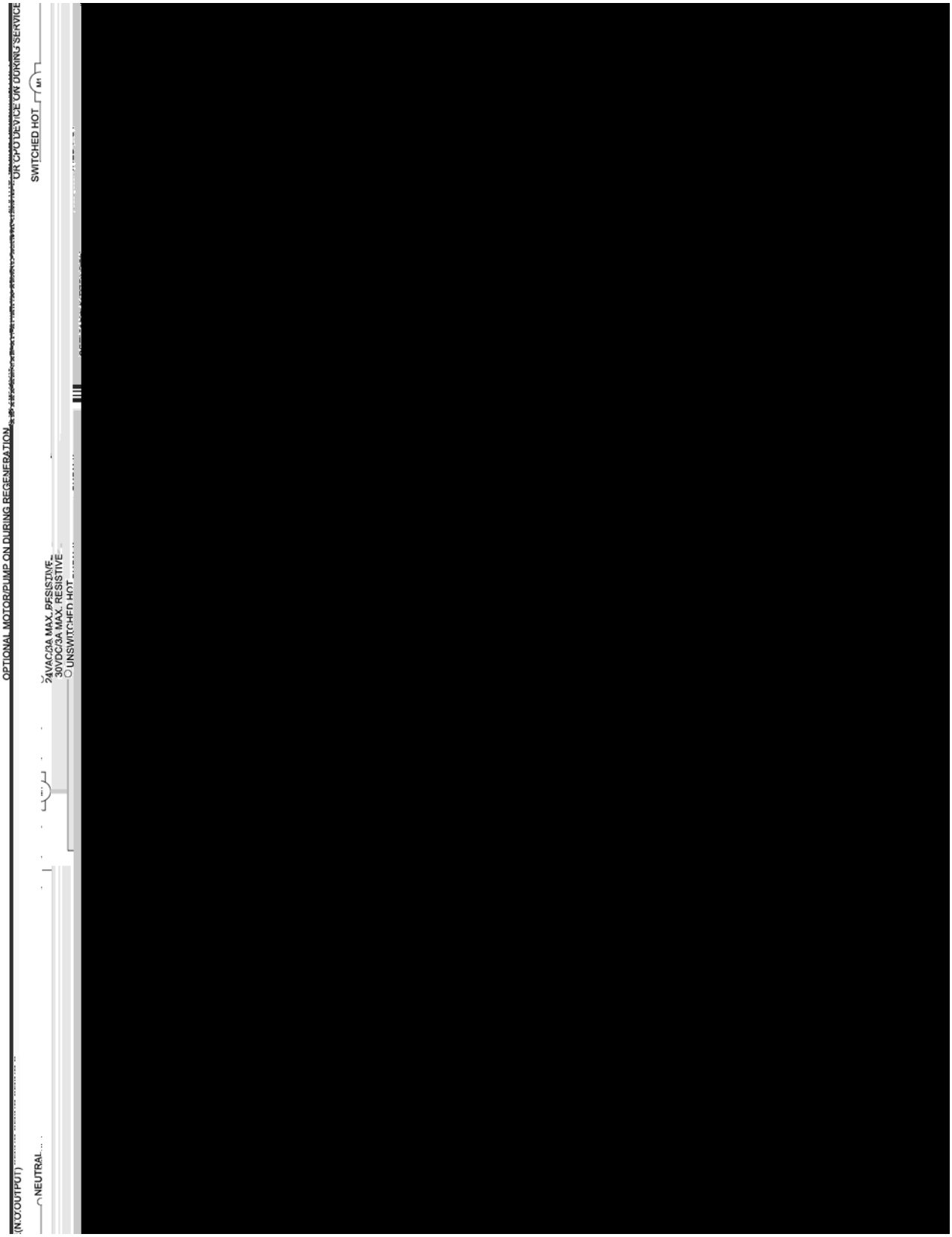
3150/3900 Upper & 3900 Lower Drive Powerhead Assy

Item No.	Quantity	Part No.	Description
1	1	19304-04	backplate, 3150/3900
2	1	15120	bracket, motor mtg, 3150/3900
3	1	40391	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	41034	transformer, US, 120V, 24V, 108VA
		41049	transformer, euro, 230V/24V 108VA
		41050	transformer, aust, 230V/24V, 108VA
36	1	19121	meter c Î א ҍ8VA

..................1 41034.....................transformer, aust, [illegible] 230V/24V, 108VA [illegible] meter c Î א ҍ8VA
.... 141034
[illegible] .724 04 [illegible] 1 .218 0 [illegible] 057005500440051005600 [illegible] ....40............... [illegible] 1 .218 0 [illegible] 050004800570048005500030046 [illegible]

2750/2850/3150 Input & Output Wiring




OPTIONAL MOTOR/PUMP ON DURING REGENERATION
(N.O. OUTPUT)
NEUTRAL
SWITCHED HOT
OR O.K. TO DEVICE ON DURING SERVICE
2A VAC/3A MAX. RESISTIVE
30VDC/3A MAX. RESISTIVE
UNSWITCHED HOT

Detected Errors

NOTE: It can take up to 30 seconds for an error to be detected and displayed. All errors on each timer in the system must be displayed before the errors can be corrected.

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 fow 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 frst.

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.	B. Co [illegible]

[illegible]

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

Example Error Screens

```
DETECTED ERROR=
E2    RESET UNIT
```

Detected Error
1. Go through Master Programming to program the unit.

```
DETECTED ERROR=
NO MESSAGE #1
```

No Message #1
1. Make sure all communication cables are connected.
2. If “No Message #1” ensure it is the lead unit.
3. Ensure #1 is confgured for the correct system type.

```
DETECTED ERROR=
NO MESSAGE #3
```

No Message #3
1. Make sure all communication cables are connected.
2. If “No Message #3” ensure it is unit #3.
3. Ensure #3 is confgured for the correct system type.

```
DETECTED ERROR=
PROGRAM MISMATCH
```

Program Mismatch
1. Ensure the units on the network are not confgured the same as #1/the Lead unit.

```
DETECTED ERROR=
EXCEED UNIT SIZE
```

Exceed Unit Size
1. There are more units on the system than the Lead is programmed for.

```
DETECTED ERROR=
MATCHING ADDRESS
```

Matching Address
1. The unit is programmed the same # as another unit.
   NOTE: The rest of the system will still function without this unit.

Notes