EL2P3SP2 Tech Sheet

Balboa Water Group
System PN 56150

System Model # E2P-EL2P3SP2-YCAH

Software Version # 36

EPN # 3560

Base PCBA – PN 56151
PCB EL2000 – PN 22896 Rev B
HEX File – 10011436_EL2P3SP2.hex
Configuration Signature – FD7B708D

Base Panels

ML700 – PN 55693
ML900 – PN 52654-01

Template used: 40573-v36_A.pdf 11/18/2008
59150_97_A.pdf 02/25/2011

System Revision History

System PN	EPN	Date	Requested By	Changes Made
56150	3560	02-25-11	BWG	Initial Configuration Generic EL2000 w/3 2-spd Pumps

Basic System Features and Functions

Power Requirements

- 240VAC, 60Hz, 48A, Class A GFCI-protected service (Circuit Breaker rating = 60A max.)
- 4 wires [hot, hot, neutral, ground]

System Outputs

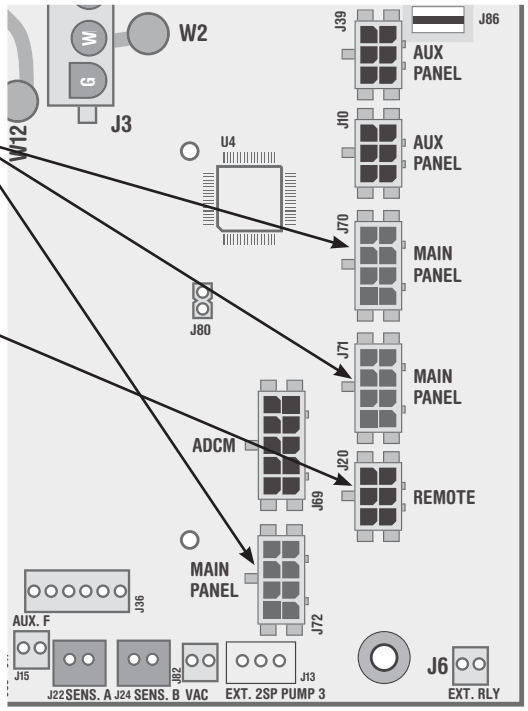
Setup 1 (As Manufactured)

- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 2-Speed
  (Optional settings available. See Pump 3 Table on Pg. 6)
- 240V Circ Pump
  (Optional; see Circ Pump Table on Pg. 6)
- 240V Ozone
- 12V Spa Light
- 120V AV (Stereo)
- 240V 5.5kW Heater *

* Heater wattage is rated at 240V. When running 120V to heater, output is approximately 25%.

Additional Options

- Full Feature Dolphin Remote
  and Spa-only Dolphin Remote
- Spa Monitor
  Connects to Main Panel terminal J70 or J71 or J72
- IR or RF Dolphin Receiver Module
  Connects to Remote terminal J20
- Ozone Generator
  Connects to terminal J9
- MoodEFX Lighting
  Connects to Spa Light terminal J12
- FiberEFX Lighting
  Connects to Spa Light terminal J12
- Stereo System
  Connects to A.V. terminal J4



Persistent Memory and Powering Up

Any time you change DIP Switches or Software Configuration Settings that affect parameters the user can change (any filter settings, set temperature default, Celsius vs Fahrenheit, 12-hour vs 24-hour time, reminders suppression, etc), you must reset Persistent Memory for your DIP Switch or Software Configuration Settings changes to take effect. You should also reset Persistent Memory after loading a new file into a board (using the ESM, purchased seperately).

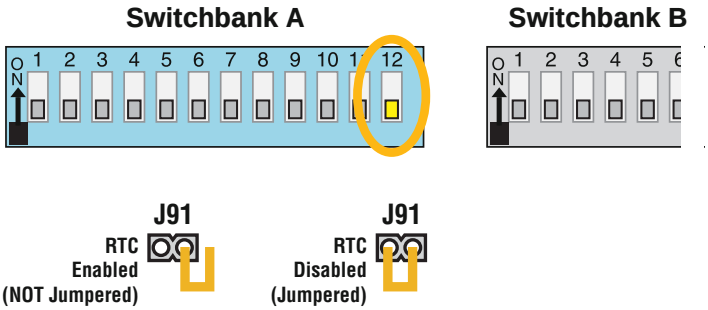
To reset Persistent Memory:

- Power down.
- Set A12 ON (See illustration below).
- Power up.
- Wait until "Pr" or "PRIMING MODE" is displayed on your panel. Note: If "CFE" appears see section below.
- Set A12 OFF. (This can be done safely with power on if you use a nonconductive tool such as a pencil to push the switch back to the OFF position. Otherwise, power down before setting A12 OFF)
- Power up again (if you powered down in the previous step).
- For all other power ups, leave A12 OFF.

About Persistent Memory and Time of Day Retention:

This system uses memory that doesn't require a battery to store a variety of settings. What we refer to as Persistent Memory stores all the User Preferences, as well as all the filter settings, the set temperature, and the heat mode.

Persistent Memory is not used for Time of Day. Time of Day needs to be "kept running" (not just stored) while the power is off, so a separate Real Time Clock feature (on all models except the EL1000, EL1500 v34 and GL1500 v34) keeps track of Time of Day while the unit is off. Time of Day Retention, and Time of Day Retention alone, is controlled by the J91 jumper. J91 must be set according to main system panel used.



CFE message on power up:

If "CFE" appears before (and instead of) "Pr" or "PRIMING MODE", you have not configured DIP Switches and/or Software Configuration Settings in a valid manner. This must be corrected before you can reset Persistent Memory.
The switch numbers, jumpers, or configuration settings displayed after "CFE" are ones with which the system has found a configuration problem. For example:

- "CFE A5 b2" would mean that the combination of how you've set A5 and how you've set B2 is not supported on this system.
- "CFE J99" would mean that there is a problem with jumper J99
- "CFE P3.1 bL.1" would mean that the combination of how you've set pump 3 for 1-speed and blower for 1-speed is not supported on this system.
- "CFE P3._ bL._" would mean that the combination of how you've set DIP switches which have been assigned to pump 3 and blower is not supported on this system.

Power Up Display Sequence

Upon power up, you should see the following on the display:

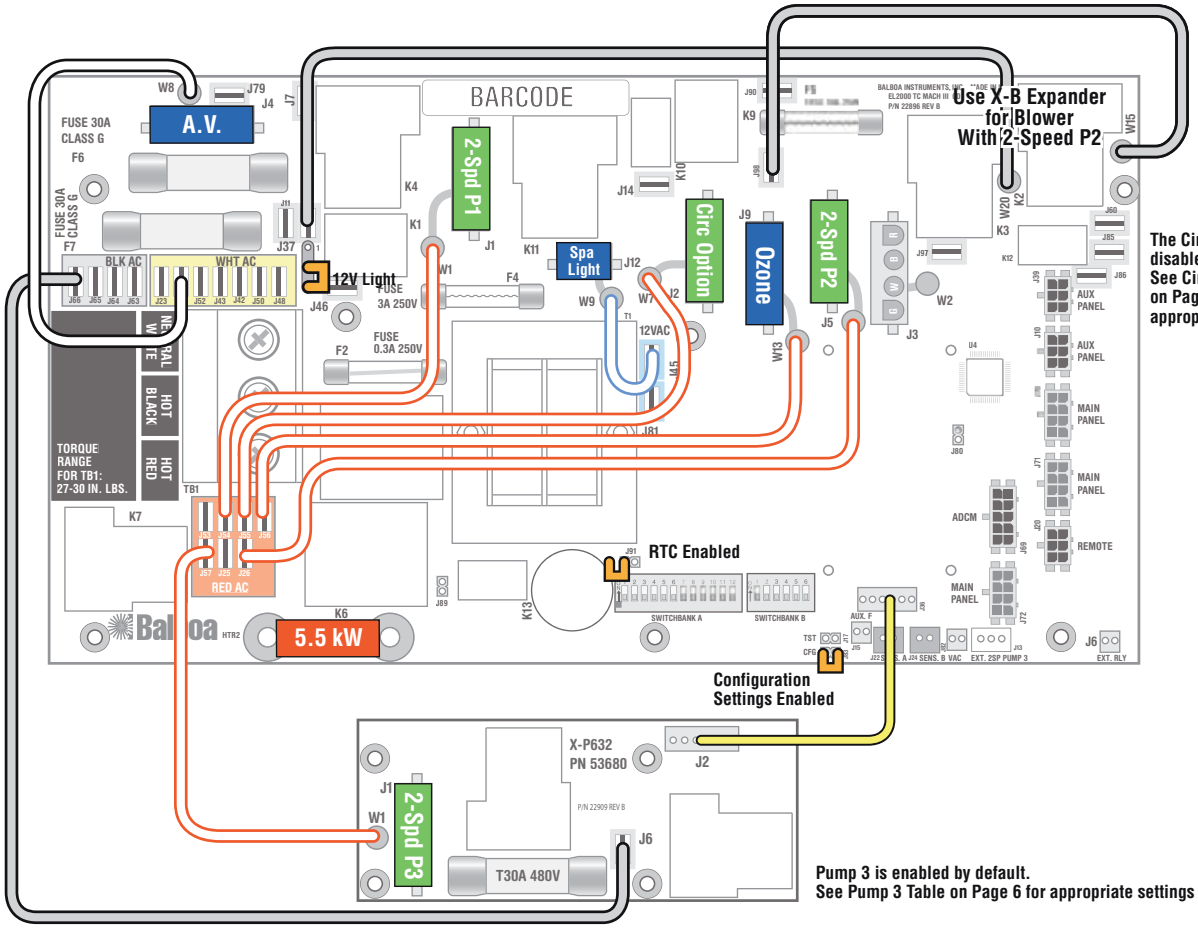
- Three numbers in a row, which are the SSID (the System Software ID). The third display of these numbers is the Software Version, which should match the version of your system. For example, if these three numbers are 100 134 26, that is a Mach 3 EL8000 at version 26.
- If there is a Configuration Error, the CFE message (see above) will appear at this point (and none of the messages below will display). Otherwise what comes next is:
- An indication of either the input voltage detected (EL1000, 1500, 2000), or the heater wattage range supported (EL8000/GL1500/GL2000/GL8000).
  Heater wattage display: "1-3" means the system supports a heater from 1 kW to 3 kW. "3-6" means the system supports a heater from 3 kW to 6 kW. "3-3" means the system supports a 3 kW heater only. (These ranges may be modified slightly in the case of special heaters, which the next bullet covers.)
  Input voltage display: A system showing "240" supports 3 kW to 6 kW heaters. A system showing "120" supports the very same heaters, although at 120V those heaters will function at only 1/4 of their 240V rated wattage. (The system shows only either "240" or "120" as a general indication of input voltage; it does not show the actual input voltage.)
- If your system is using a special type of heater, a display such as "H6" may appear next. If your system is using the generic Balboa heater, no heater type display will appear.
- "Pr" or "PRIMING MODE" will appear to signal the start of Priming Mode.

At this point, the power up sequence is complete. Refer to the User Guide for the ML Series panel on your system for information about how the spa operates from this point on.

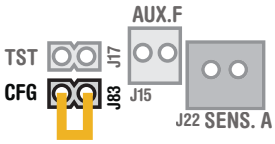
Wiring Configuration and DIP Settings

Setup 1 (As Manufactured)

- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 2-Speed (See Pump 3 Table on Pg 6)
- 240V Circ Pump – Circ is Disabled by default (See Circ Table on Pg 6)
- 240V Ozone
- 12V Spa Light
- 120V AV (Stereo)
- 240V 5.5kW Heater
- ML700 Main Panel



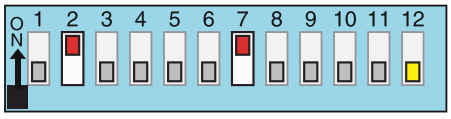
WARNING: Main Power to system should be turned OFF BEFORE adjusting DIP switches.
WARNING: Persistent Memory (A12) must be RESET to allow new DIP switch settings to take effect. (See Persistent Memory page)



When the Logic Jumper is installed on J83 (CFG), Configuration Settings are enabled. DIP Switches will then operate as shown below.

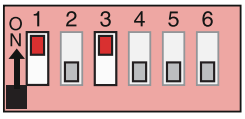
SSID #
100
114
36

Switchbank A

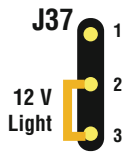


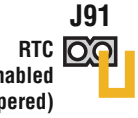
A1, Test Mode OFF
A2, + 1 Pump w/Heat
A3,
A4,
A5, 12-Hour Clock
A6, Degrees F
A7, ML 700 w/Jets 3
A8, See Circ Table
A9, See Circ Table
A10, No Edit
A11, Special Amp Rule OFF
A12, Memory ON

Switchbank B



B1, See Pump 3 Table
B2, See Pump 3 Table
B3, See Pump 3 Table
B4, Ozone with Heater Pump
B5, No Ozone Supression
B6, Not Assigned

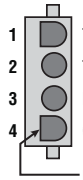




Wiring Color Key

- 120 Volt Connections
- 240 Volt Connections
- Black AC Jumpers
- 12 Volt Connections
- Relay Control Wires

Board Connector Key



1 Typically Line voltage
2 Typically Line voltage for 2-speed pumps
3 Neutral (Common)
4 Ground

Note flat sides in connector

DIP Switches and Jumpers Definitions

WARNING:
- Setting DIP switches incorrectly may cause abnormal system behavior and/or damage to system components.
- Refer to Switchbank illustration on Wiring Configuration page for correct settings for this system.
- Contact Balboa if you require additional configuration pages added to this tech sheet.

DIP Switchbank A Key

A1 . . . . . Test Mode (normally Off)
A2 . . . . . In "ON" position, add one high-speed pump (or blower) with Heater
A3 . . . . . In "ON" position, add two high-speed pumps (or 1 HS Pump and Blower) with Heater
A4 . . . . . In "ON" position, add four high-speed pumps (or 3 HS Pumps and Blower) with Heater
A10 . . . . . When switched ON when spa is on, system will enter the Edit Menu for Configuration Settings. **Do not start spa with A10 turned on or CFE* error will occur**
A11 . . . . . In "ON" position, enables Special Amperage Rule, see "SA" in Software Configuration section for functionality with your system
. . . . . In "OFF" position, disables Special Amperage Rule
A12 . . . . . Persistent memory reset (used when spa is powering up) See "Persistent Memory and Powering Up" page

A2, A3, and A4 work in combination to determine the number of high-speed devices and blowers that can run before the heat is disabled. i.e. A2 and A3 in the ON position and A4 in the OFF position will allow the heater to operate with up to 3 high-speed pumps (or two HS Pumps and Blower) running at the same time. Heat is disabled when the fourth high-speed pump or blower is turned on.

Note: A2/A3/A4 all off = No heat with any high-speed pump or blower.

*CFE errors are illegal configurations such as a pump and a blower set to run on the same output. The configuration must be corrected before the spa will operate.

Assignable DIP Switch Key

A5 . . . . . In "ON" position, displays time of day in 24-hour mode
. . . . . In "OFF" position, displays time of day in 12-hour mode
A6 . . . . . In "ON" position, displays temperature in Celsius
. . . . . In "OFF" position, displays temperature in Fahrenheit
A7 . . . . . In "ON" position, ML700 Panel with Jets 3
. . . . . In "OFF" position, ML900 Panel
A8 . . . . . See Circ Pump Behavior Table
A9 . . . . . See Circ Pump Behavior Table
B1 . . . . . See Pump 3 Table
B2 . . . . . See Pump 3 Table
B3 . . . . . See Pump 3 Table
B4 . . . . . In "ON" position, Ozone runs in Filter Cycles and Cleanup Cycles only
. . . . . In "OFF" position, Ozone runs with Heater Pump (Pump 1 Low or Circ)
B5 In "ON" position, Ozone is suppressed for 1 hour when a panel button is pressed
. . . . . In "OFF" position, Ozone suppression is disabled
B6 . . . . . Not Assigned

A8	A9	Circ Pump Behavior
OFF	OFF	No Circ Pump
OFF	ON	24 Hr
ON	OFF	24 Hr w/3°F Shut-Off
ON	ON	Acts like Pump 1 Low (Filter Cycles, Polls)

B1	B2	B3	Pump 3 Behavior
OFF	OFF	OFF	No Pump 3
OFF	OFF	ON	N/A
ON	OFF	OFF	ON/OFF on X-P632
ON	OFF	ON	2-Spd Pump 3 on X-P632 board

Jumpers

J37 Jumper on Pins 1 and 2 will power one leg of J9 (Spa Light) at 120 Volts AC
Jumper on Pins 2 and 3 will power one leg of J9 (Spa Light) at 12 Volts AC
Note: W9 controls voltage on the other leg of J9 and must be set for the same voltage

J91 Jumper on 1 Pin only enables Real Time Clock function; use with time capable panels
Jumper on Pins 1 and 2 disables RTC function; use with non-time capable panels

Software Configuration Settings

(n) = OEM Setting (Green circle)

Fd	Program Filter Cycles by Duration	(n) Y _ **n** = Start and stop times; for time capable panels. **Y** = Duration; for non-time capable panels **_** = 1 DIP Switch
F 1	Pump 1 in Filter (w/Circ Pump)	(n) Y (This feature is used in Circ Mode only.) Allows Pump 1 Low to operate in Filter Cycles to add extra filtration. **n** = Normal; **Y** = Pump 1 with Circ
24	24-Hour Time*	n Y (_) **n** = 12-hour (am/pm); **Y** = 24-hour (military\European); **_** = 1 DIP Switch *Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.
tc	Celsius**	n Y (_) **n** = Fahrenheit; **Y** = Celsius; **_** = 1 DIP Switch **Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up
to	Timeouts	1 (F) 2 3 4 5 6 **1-6** = 10, 20, 30, 40, 50, 60 minutes; **F** = 15 minutes
1t	Pump 1 Low Timeout	d 1 (2) 3 4 _ **d** = Use "Timeouts" value above; **1-4** = number of hours; **_** = 3 DIP Switch
Lt	Light Timeout	d 1 2 3 (4) **d** = Use "Timeouts" value above; **1-4** = number of hours
Sc	Scrunch Panel	n Y (_) **n** = Normal panel layout; **Y** = Alternate panel layout (ML900 scrunching enabled - ML550/700 Jets 3 replaces Blower; **_** = 1 DIP Switch
ct	Circ Type (behavior)	n A 3 P (_) **n** = Non circ or circ pump not plumbed with heater; **A** = 24-hour; **3** = 24-hour with 3°F shutoff outside filter; **P** = Acts like Pump 1 Low (filter cycles, polls, etc.); **_** = 2 DIP Switch

Software Configuration Settings Continued

Pump Speeds

P 1	Pump 1 Speeds	1 (2) _ **1** = 1 speed; **2** = 2 speed; _ = 1 DIP Switch
P2	Pump 2 Speeds	0 1 (2) _ **0** = Disabled; **1** = On/Off; **2** = 2 speed; _ = 2 DIP Switch
P3	Pump 3 Speeds	0 1 E H L (_) **0** = Disabled; **1** = On/Off on board; **E** = External X-P or X-P231 board; **H** = On/Off on pin 1 of X-P632 board; **L** = 2 speed on X-P632 board; _ = 3 DIP Switch
P4	Pump 4 Speeds	(0) 1 H L _ **0** = Disabled; **1** = On/Off on X-P or X-P231 board; **H** = On/Off on pin 1 of X-P632 board; **L** = 2 speed on X-P632 board; _ = 3 DIP Switch
P5	Pump 5 Speeds	(0) L _ **0** = Disabled; **L** = On/Off on pin 2 of X-P632 board; _ = 2 DIP Switch
bL	Blower Speeds	(0) 1 2 3 _ Note: Options 2 and 3 require X-TB board. **0** = Disabled; **1** = On/Off; **2** = 2 speeds; **3** = 3 speeds; _ = 2 DIP Switch
Fo	Fiber Optics / Light 2	(n) Y o _ **n** = Disabled; **Y** = Light and Wheel Enabled * (See note below); **o** = On/Off only Light 2 Enabled on Alarm Relay; _ = 2 DIP Switch * When Fo is set to **Y** and ct is set to **n**, then Fiber uses J2 connector on main PCBA. * When Fo is set to **Y** and ct is not set to **n**, then Fiber requires X-FOW Kit to be installed.
15	Mister 1	(n) Y _ **n** = Disabled; **Y** = On/Off on X-P or X-P231 board; _ = 1 DIP Switch
12	Mister 2	(n) Y _ **n** = Mister Disabled; **Y** = Mister Enabled on pin 1 of X-P632 board; _ = 1 DIP Switch
13	Mister 3	(n) Y _ **n** = Mister Disabled; **Y** = Mister Enabled on pin 2 of X-P632 board; _ = 1 DIP Switch
14	Mister 3	(n) Y _ **n** = Mister Disabled; **Y** = Mister Enabled on J3; _ = 1 DIP Switch

Software Configuration Settings Continued

Options

o2	Option 2*	(n) Y P _ **n =** Disabled; **Y/P =** Enabled on "alarm" relay; **_** = 2 DIP Switch
03	Option 3*	(n) Y P _ **n =** Disabled; **Y/P =** Enabled on pin 1 of X-P632 board; **_** = 2 DIP Switch
04	Option 4*	(n) Y P _ **n =** Disabled; **Y/P =** Enabled on pin 2 of X-P632 board; **_** = 2 DIP Switch *Note: Options 2-4: Y = On/Off w/ no timeout (toggle) mode; P = Pulse (momentary) mode
cc	Cleanup Cycles**	(0) 1 2 3 4 **0 =** Disabled; **1-4 =** Number of hours **Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.
cU	Cleanup Cycles as User Preference	(n) Y **n =** Only in Configuration Settings; **Y =** Over-rideable by User via User Preferences

Ozone

o3	Ozone Operation	A F (_) **A=** Operates with Heater Pump (Pump 1 Low or Circ Pump); **F =** Operates in Filter and Cleanup Cycles only; **_** = 1 DIP Switch
o5	Ozone Suppression	n Y (_) **n =** No Suppress; **Y =** 1-hour suppress on button press; **_** = 1 DIP Switch
oI	Ozone Icon	n (Y) **n =** O_3 Icon on Panels Disabled; **Y =** O_3 Icon on Panels Enabled
SP	Stir Pump Group*	(A) 2 3 4 _ **A =** All Pumps; **2 =** Pumps 2 and up; **3 =** Pumps 3 and up; **4 =** Pumps 4 and up; **_** = 2 DIP Switches *Determines what group of pumps the Stir Button turns on (at high-speed).
Sd	Stir Duration**	1 F 2 3 4 5 6 (E) **1 =** 10 minutes; **F =** 15 minutes; **2 =** 20 minutes; **3 =** 30 minutes; **4 =** 40 minutes; **5 =** 50 minutes; **6 =** 60 minutes; **E =** 5 minutes; **Determines the timeout for the Stir Button.

Software Configuration Settings Continued

Auxiliary Buttons

A1	Aux Button 1 (Bank A)	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
A2	Aux Button 2 (Bank A)	1 (2) 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
A3	Aux Button 3 (Bank A)	1 2 (3) 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
A4	Aux Button 4 (Bank A)	1 2 3 4 5 6 b g F (E) o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b** = Blower; **g** = Spa Light; **F** = Fiber-Optic / Light 2; **E** = EitherLight; **o** = Option 1; **t** = Mister 1; **d** = Mister 2/Cool; **P** = Mister 3/Elec Heat; **n** = Ext Heat; **A** = Sound Mode Select; **U** = Button Disabled; **r** = Air Valve; **O** = Option 2; **H** = Option 3; **9** = Invert; **L** = Option 4; **8** = Stir; **7** = Option 5

b1	Aux Button 1 (Bank B)	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
b2	Aux Button 2 (Bank B)	1 (2) 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
b3	Aux Button 3 (Bank B)	1 2 3 4 5 6 (b) g F E o t d P n A U r O H 9 L 8 7
b4	Aux Button 4 (Bank B)	1 2 3 4 5 6 b g F (E) o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b** = Blower; **g** = Spa Light; **F** = Fiber-Optic / Light 2; **E** = EitherLight; **o** = Option 1; **t** = Mister 1; **d** = Mister 2/Cool; **P** = Mister 3/Elec Heat; **n** = Ext Heat; **A** = Sound Mode Select; **U** = Button Disabled; **r** = Air Valve; **O** = Option 2; **H** = Option 3; **9** = Invert; **L** = Option 4; **8** = Stir; **7** = Option 5

AU	Aux Button Bank Select	(A) b _

A = Bank A; **b** = Bank B; **_** = 1 DIP Switch

Reminders

Sr	Suppress all Reminders	n (Y) _

n = Display Reminders; **Y** = Suppress all Reminders; **_** = 1 DIP Switch

rP	Check pH Reminder Period	0 (1) 2 3 4 5 6 7 8 9 t
rS	Check Sanitizer Reminder Period	0 (1) 2 3 4 5 6 7 8 9 t
rF	Clean Filter Reminder Period	0 1 2 (3) 4 5 6 7 8 9 t
r9	Test GFCI Reminder Period	0 1 2 (3) 4 5 6 7 8 9 t
rd	Drain Water Reminder Period	0 1 2 3 4 5 (6) 7 8 9 t
rA	Change Mineral Cartridge	(0) 1 2 3 4 5 6 7 8 9 t
rC	Clean Cover Reminder Period	0 1 2 3 4 5 6 7 (8) 9 t
ro	Treat Wood Reminder Period	0 1 2 3 4 5 6 7 (8) 9 t
rt	Change Filter Reminder Period	0 1 2 3 4 5 6 7 8 (9) t

0 = Off; **1** = 7 days; **2** = 14 days; **3** = 30 days; **4** = 45 days; **5** = 60 days; **6** = 90 days; **7** = 120 days; **8** = 180 days; **9** = 365 days; **t** = 21 days

Software Configuration Settings Continued

Temperature Settings

LS	Lowest Set Temperature*	(8) 7 6 **8** = 80˚F/26.0˚C; **7** = 70˚F/21.0˚C; **6** = 60˚F/15.5˚C *Setting LS at 7 and Fr at 5 will cause a CFE error. Setting LS at 6 and Fr at 4, 5, or 9 will cause a CFE error.
St	Default Set Temperature**	5 6 7 8 9 (0) 1 2 3 4 E F n **5** = 95˚F/35.0˚C; **6** = 96˚F/35.5˚C; **7** = 97˚F/36.0˚C; **8** = 98˚F/36.5˚C; **9** = 99˚F/37.0˚C; **0** = 100˚F/38.0˚C; **1** = 101˚F/38.5˚C; **2** = 102˚F/39.0˚C; **3** = 103˚F/39.5˚C; **4** = 104˚F/40.0˚C; **E** = 80˚F/26.5˚C; **F** = 85˚F/29.5˚C **n** = 90˚F/32.0˚C **Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.
Ut	Uppermost Set Temperature	5 6 7 8 9 0 1 2 3 (4) E F n **5** = 95˚F/35.0˚C; **6** = 96˚F/35.5˚C; **7** = 97˚F/36.0˚C; **8** = 98˚F/36.5˚C; **9** = 99˚F/37.0˚C; **0** = 100˚F/38.0˚C; **1** = 101˚F/38.5˚C; **2** = 102˚F/39.0˚C; **3** = 103˚F/39.5˚C; **4** = 104˚F/40.0˚C; **E** = 80˚F/26.5˚C; **F** = 85˚F/29.5˚C **n** = 90˚F/32.0˚C
Fr	Freeze Temperature Threshold	3 (4) 9 5 **3** = 39˚F/3.9˚C; **4** = 44˚F/6.7˚C; **9** = 49˚F/9.4˚C; **5** = 54˚F/12.2˚C;
tL	Set Temperature Lock	(t) S **t** = Temp Lock Only; **S** = Temp + Settings Lock

Software Configuration Settings Continued

Filter Cycles

Lc	Light Cycle Programming	(n) Y **n** = Disabled; **Y** = Enabled

1r	Filter 1 Start Hour (Set 1)*	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r
1d	Filter 1 Duration (Set 1)*	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r
2r	Filter 2 Start Hour (Set 1)*	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r
2d	Filter 2 Duration (Set 1)*	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r

- = Standard Defaults; **0** = 0 (12 am, 24); **1-9** = 1-9; **A** = 10; **b** = 11; **C** = 12; **d** = 13 (1 pm); **E** = 14 (2 pm); **F** = 15 (3 pm); **g** = 16 (4 pm); **H** = 17 (5 pm); **J** = 18 (6 pm); **L** = 19 (7 pm); **n** = 20 (8 pm); **o** = 21 (9 pm); **P** = 22 (10 pm); **r** = 23 (11 pm)

These settings allow customization of the filter defaults. If any of these four settings is **"-"**, the standard filter defaults are used.

1d and **2d** cannot both be set to **0**.

When **Fd.n** is selected, **1d** and **2d** are Filter 1 and Filter 2 Duration specifically.

When **Fd.y** is selected:
If **1d** is set to **0**, **2d** is the duration; otherwise **1d** is the duration.
If **1d** is set to **0**, only the Night cycle runs.
If **2d** is set to **0**, only the Day cycle runs.
If neither **1d** nor **2d** is set to **0**, both the Day and Night cycles run.

*Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.

3r	Filter 1 Start Hour (Set 2)**	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r
3d	Filter 1 Duration (Set 2)**	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r
4r	Filter 2 Start Hour (Set 2)**	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r
4d	Filter 2 Duration (Set 2)**	(-) 0 1 2 3 4 5 6 7 8 9 A b C d E F g H J L n o P r

- = Standard Defaults; **0** = 0 (12 am, 24); **1-9** = 1-9; **A** = 10; **b** = 11; **C** = 12; **d** = 13 (1 pm); **E** = 14 (2 pm); **F** = 15 (3 pm); **g** = 16 (4 pm); **H** = 17 (5 pm); **J** = 18 (6 pm); **L** = 19 (7 pm); **n** = 20 (8 pm); **o** = 21 (9 pm); **P** = 22 (10 pm); **r** = 23 (11 pm)

These settings allow customization of the filter defaults. If any of these four settings is **"-"**, the standard filter defaults are used.

3d and **4d** cannot both be set to **0**.

When **Fd.n** is selected, **3d** and **4d** are Filter 1 and Filter 2 Duration specifically.

When **Fd.y** is selected:
If **3d** is set to **0**, **4d** is the duration; otherwise **3d** is the duration.
If **3d** is set to **0**, only the Night cycle runs.
If **4d** is set to **0**, only the Day cycle runs.
If neither **3d** nor **4d** is set to **0**, both the Day and Night cycles run.

**Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.

FS	Filter Default Start Time Set***	(1) 2 _ **1** = Set 1; **2** = Set 2; **_** = 1 DIP Switch

***Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.

FP	Filter Default Duration Set*	(1) 2 _ **1** = Set 1; **2** = Set 2; **_** = 1 DIP Switch

*Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up.

Software Configuration Settings Continued

Purge Duration

PP	Pump Purge Duration	3 (1) 2 5 t **3** = 30 seconds; **1 - 5** = 1 - 5 minutes; **t** = 10 minutes
bP	Blower Purge Duration	5 1 2 (3) 4 6 t F **5** = 5 seconds; **1** = 10 seconds; **2** = 20 seconds; **3** = 30 seconds; **4** = 45 seconds; **6** = 60 seconds (1 minute); **t** = 2 minutes; **F** = 5 minutes
tP	Mister Purge Duration	(5) 1 2 3 4 6 t F **5** = 5 seconds; **1** = 10 seconds; **2** = 20 seconds; **3** = 30 seconds; **4** = 45 seconds; **6** = 60 seconds (1 minute); **t** = 2 minutes; **F** = 5 minutes
Ar	Air Valve	(n) Y **n =** Disabled; **Y =** Enabled on "alarm" relay

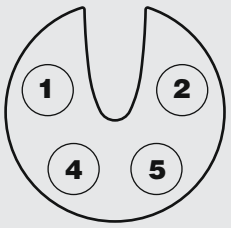
Software Configuration Settings Continued

Remote Buttons Set A

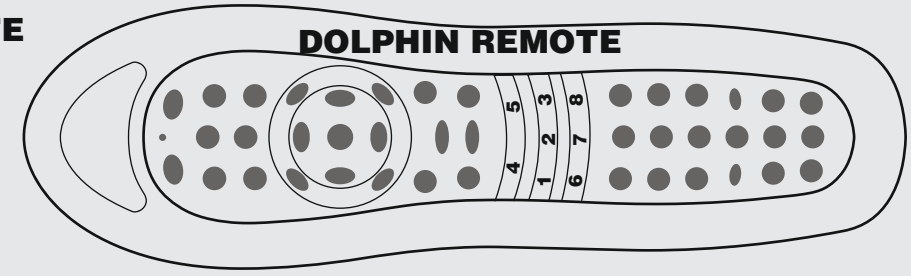
n1	Remote Button 1 (Set A)	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
n2	Remote Button 2 (Set A)	1 (2) 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
n3	Remote Button 3 (Set A)	1 2 (3) 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
n4	Remote Button 4 (Set A)	1 2 3 4 5 6 (b) g F E o t d P n A U r O H 9 L 8 7
n5	Remote Button 5 (Set A)	1 2 3 4 5 6 b (g) F E o t d P n A U r O H 9 L 8 7
n6	Remote Button 6 (Set A)	1 2 3 4 5 6 b g (F) E o t d P n A U r O H 9 L 8 7
n7	Remote Button 7 (Set A)	1 2 3 4 5 6 b g F E (o) t d P n A U r O H 9 L 8 7
n8	Remote Button 8 (Set A)	1 2 3 4 5 6 b g F E o (t) d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b =** Blower; **g =** Spa Light; **F =** Fiber-Optic / Light 2; **E =** EitherLight; **o =** Option 1; **t =** Mister 1; **d =** Mister 2/Cool; **P =** Mister 3/Elec Heat; **n =** Ext Heat; **A =** Sound Mode Select; **U =** Button Disabled; **r =** Air Valve; **O =** Option 2; **H =** Option 3; **9 =** Invert; **L =** Option 4; **8 =** Stir; **7 =** Option 5

ROUND REMOTE



DOLPHIN REMOTE

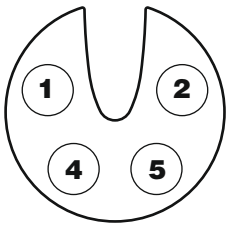


Remote Buttons Set B

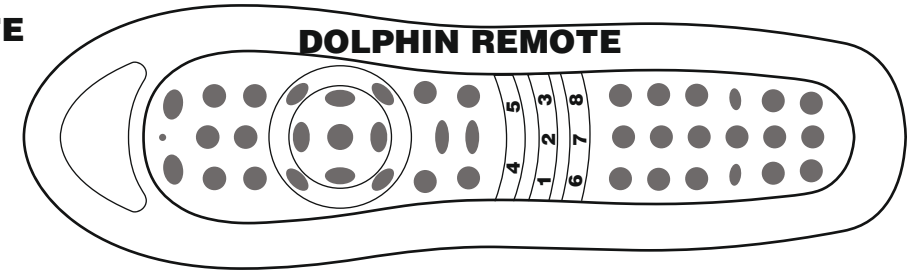
H1	Remote Button 1 (Set B)	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
H2	Remote Button 2 (Set B)	1 (2) 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
H3	Remote Button 3 (Set B)	1 2 (3) 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
H4	Remote Button 4 (Set B)	1 2 3 4 5 6 (b) g F E o t d P n A U r O H 9 L 8 7
H5	Remote Button 5 (Set B)	1 2 3 4 5 6 b (g) F E o t d P n A U r O H 9 L 8 7
H6	Remote Button 6 (Set B)	1 2 3 4 5 6 b g (F) E o t d P n A U r O H 9 L 8 7
H7	Remote Button 7 (Set B)	1 2 3 4 5 6 b g F E (o) t d P n A U r O H 9 L 8 7
H8	Remote Button 8 (Set B)	1 2 3 4 5 6 b g F E o (t) d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b =** Blower; **g =** Spa Light; **F =** Fiber-Optic / Light 2; **E =** EitherLight; **o =** Option 1; **t =** Mister 1; **d =** Mister 2/Cool; **P =** Mister 3/Elec Heat; **n =** Ext Heat; **A =** Sound Mode Select; **U =** Button Disabled; **r =** Air Valve; **O =** Option 2; **H =** Option 3; **9 =** Invert; **L =** Option 4; **8 =** Stir; **7 =** Option 5

ROUND REMOTE



DOLPHIN REMOTE



dO	Remote Button Set Select	(A) b _

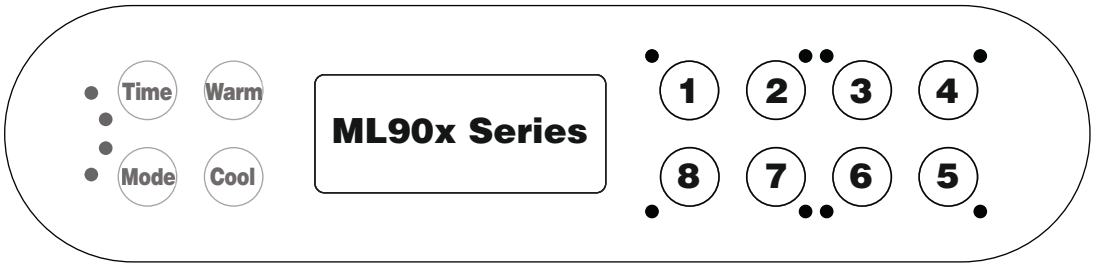
A = Bank A; **b =** Bank B; **_ =** 1 DIP Switch

Software Configuration Settings Continued

ML90x Series Buttons

81	ML90x Custom Button 1	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
82	ML90x Custom Button 2	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
83	ML90x Custom Button 3	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
84	ML90x Custom Button 4	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
85	ML90x Custom Button 5	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
86	ML90x Custom Button 6	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
87	ML90x Custom Button 7	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
88	ML90x Custom Button 8	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b =** Blower; **g =** Spa Light; **F =** Fiber-Optic / Light 2; **E =** EitherLight; **o =** Option 1; **t =** Mister 1; **d =** Mister 2/Cool; **P =** Mister 3/Elec Heat; **n =** Ext Heat; **A =** Sound Mode Select; **U =** Button Disabled; **r =** Air Valve; **O =** Option 2; **H =** Option 3; **9 =** Invert; **L =** Option 4; **8 =** Stir; **7 =** Option 5



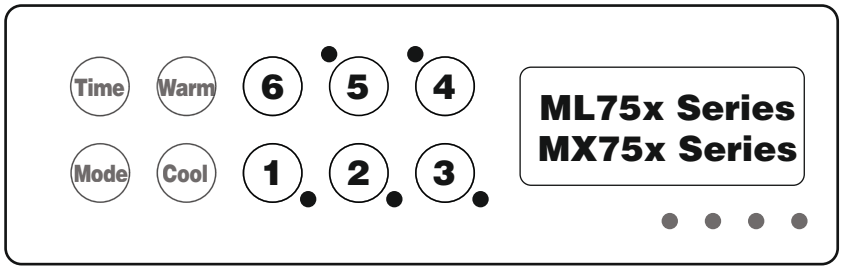
8C	ML90x Custom Buttons Enable	(n) Y _

n = Disabled; **Y =** Enabled; **_** = 1 DIP Switch

ML75x/MX75x Series Buttons

61	ML75x/MX75x Custom Button 1	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
62	ML75x/MX75x Custom Button 2	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
63	ML75x/MX75x Custom Button 3	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
64	ML75x/MX75x Custom Button 4	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
65	ML75x/MX75x Custom Button 5	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
66	ML75x/MX75x Custom Button 6	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b =** Blower; **g =** Spa Light; **F =** Fiber-Optic / Light 2; **E =** EitherLight; **o =** Option 1; **t =** Mister 1; **d =** Mister 2/Cool; **P =** Mister 3/Elec Heat; **n =** Ext Heat; **A =** Sound Mode Select; **U =** Button Disabled; **r =** Air Valve; **O =** Option 2; **H =** Option 3; **9 =** Invert; **L =** Option 4; **8 =** Stir; **7 =** Option 5



6C	ML750/MX750 Custom Buttons Enable	(n) Y _

n = Disabled; **Y =** Enabled; **_** = 1 DIP Switch

Software Configuration Settings Continued

ML70x Series Buttons

41	ML70x Custom Button 1	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
42	ML70x Custom Button 2	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
43	ML70x Custom Button 3	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
44	ML70x Custom Button 4	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b** = Blower; **g** = Spa Light; **F** = Fiber-Optic / Light 2; **E** = EitherLight; **o** = Option 1; **t** = Mister 1; **d** = Mister 2/Cool; **P** = Mister 3/Elec Heat; **n** = Ext Heat; **A** = Sound Mode Select; **U** = Button Disabled; **r** = Air Valve; **O** = Option 2; **H** = Option 3; **9** = Invert; **L** = Option 4; **8** = Stir; **7** = Option 5

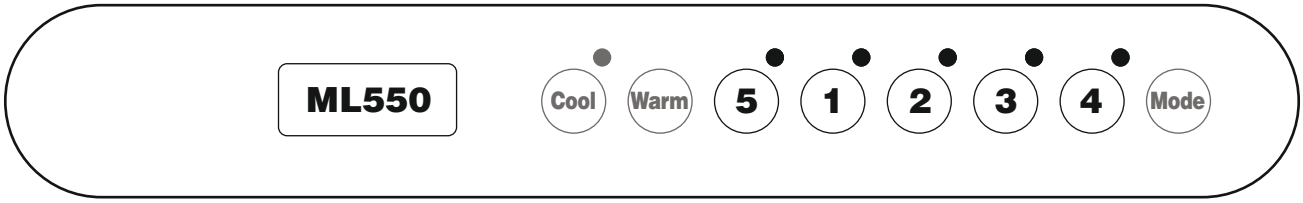
4C	ML70x Custom Buttons Enable	(n) Y _

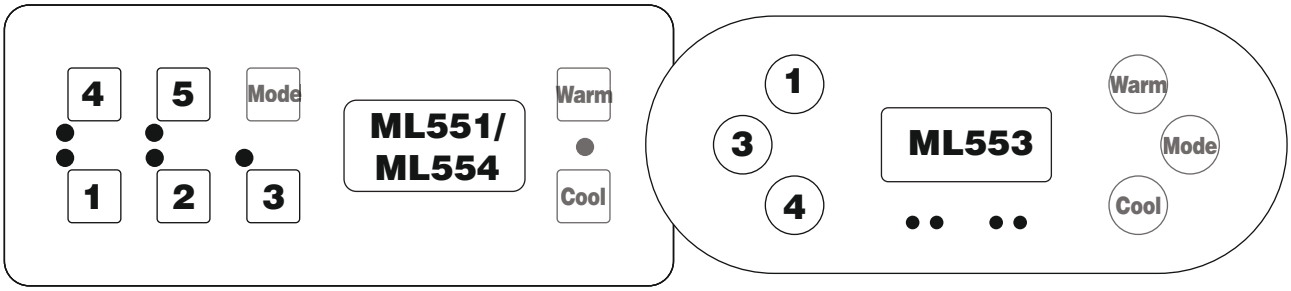
n = Disabled; **Y** = Enabled; _ = 1 DIP Switch

ML55x Series Buttons

51	ML55x Custom Button 1	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
52	ML55x Custom Button 2	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
53	ML55x Custom Button 3	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
54	ML55x Custom Button 4	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7
55	ML55x Custom Button 5	(1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b** = Blower; **g** = Spa Light; **F** = Fiber-Optic / Light 2; **E** = EitherLight; **o** = Option 1; **t** = Mister 1; **d** = Mister 2/Cool; **P** = Mister 3/Elec Heat; **n** = Ext Heat; **A** = Sound Mode Select; **U** = Button Disabled; **r** = Air Valve; **O** = Option 2; **H** = Option 3; **9** = Invert; **L** = Option 4; **8** = Stir; **7** = Option 5





5C	ML55x Custom Buttons Enable	(n) Y _

n = Disabled; **Y** = Enabled; _ = 1 DIP Switch

Software Configuration Settings Continued

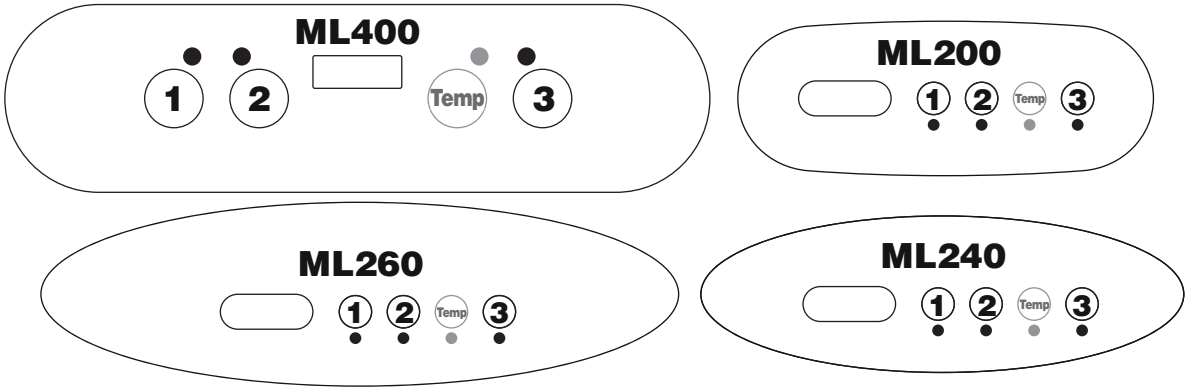
ML40x/ML2xx Series Buttons

31 ML40x/ML2xx Custom Button 1 (1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

32 ML40x/ML2xx Custom Button 2 (1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

33 ML40x/ML2xx Custom Button 3 (1) 2 3 4 5 6 b g F E o t d P n A U r O H 9 L 8 7

1-6 = Assigns Pump Number (Pump 1, Pump 2, etc); **b** = Blower; **g** = Spa Light; **F** = Fiber-Optic / Light 2; **E** = EitherLight; **o** = Option 1; **t** = Mister 1; **d** = Mister 2/Cool; **P** = Mister 3/Elec Heat; **n** = Ext Heat; **A** = Sound Mode Select; **U** = Button Disabled (DO NOT USE); **r** = Air Valve; **O** = Option 2; **H** = Option 3; **9** = Invert; **L** = Option 4; **8** = Stir ; **7** = Option 5



3C ML40x/ML2xx Custom Buttons Enable (n) Y _

n = Disabled; **Y** = Enabled; **_** = 1 DIP Switch

5A Special Amperage Rule* (1) 2 3 4 5 6

1 = Blower off when 2nd high-speed pump on; **2** = Max 1 high-speed pump **3** = Max 2 high-speed pumps; **4** = Max 2 high-speed pumps + Blower off when 2nd high-speed pump on; **5** = Max 3 high-speed pumps; **6** = Max 4 high-speed pumps

*Note: DIP A11 must be ON to use Special Amperage Rule.

HC Heat Cool Feature (n) Y _

n = Disabled; **Y** = Enabled; **_** = 1 DIP Switch

dr DR Mode (n) Y

n = Disabled; **Y** = Enabled

dE Demo Mode (n) Y

n = Disabled; **Y** = Enabled

9c Graphic Clock (n) Y

n = Disabled; **Y** = Enabled (Panel must be able to support this feature)

So Sound Mode Select Enable** (n) Y _ (Requires correct version of sound hardware)

n = No; **Y** = User Preference; **_** = 1 DIP Switch

**Enables panel/aux/remote button access, if properly configured and User Preference access.

Example: To select Sound Modes (see "So" below) by pressing Aux Button 1, configure setting "A1" to code assignment "A"

So Sound Mode Select (A) b c n (Values dependent on sound hardware used)

A = Sound choice 1; **b** = Sound choice 2; **c** = Sound choice 3; **n** = No sounds

9F GFCI Test Enable (n) 1 2 3 4 5 6 7

n = Disabled; **1** = Auto after 1 day; **2** = Auto after 2 days; **3** = Auto after 3 days; **4** = Auto after 4 days; **5** = Auto after 5 days; **6** = Auto after 6 days; **7** = Auto after 7 days

Ozone Connections

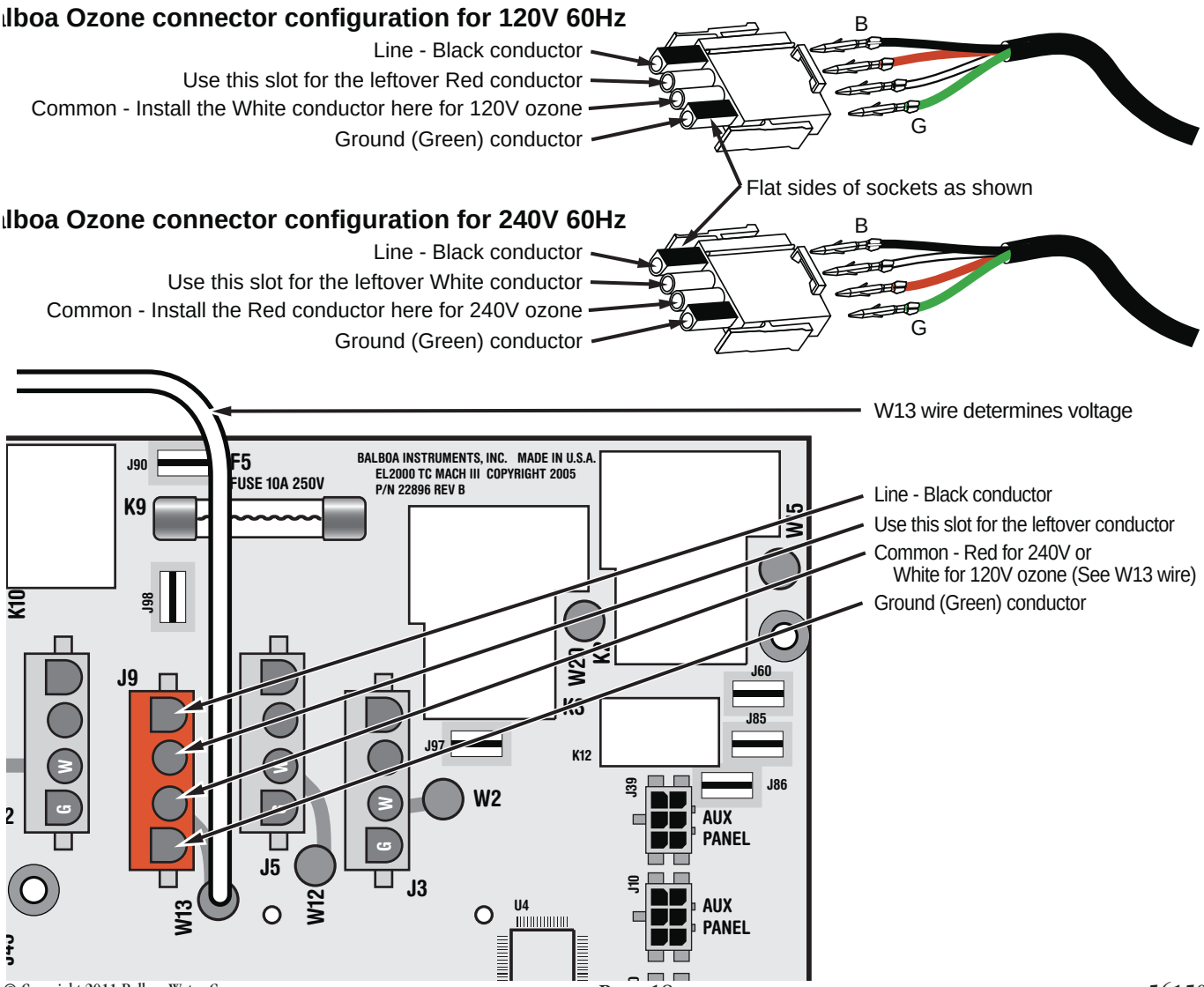
Ozone Connector Voltage: The EL circuit board is factory configured to deliver a preset voltage (120V or 240V) to the on-board ozone connector (J9). See the ratings table on the wiring diagram attached to the cover of the enclosure for the configured voltage. For 240V output W13 connects to Red AC and for 120V output W13 connects to White AC.

The voltage to the ozone connector can be changed in the field if required. W13 just needs to be set for the required voltage.

Balboa Ozone Generator: If the board is set up to operate a 120V ozone generator, the connector on the ozone generator is likely to be configured correctly, but should be compared to the illustration below.

If a 240V ozone generator is required, be sure the red wire in the ozone cord is positioned in the connector next to the green ground wire as described below.

Note: A special tool is required to remove the pins from the connector body once they are snapped in place. Check with your Balboa Account Manager for information on purchasing a pin-removal tool.



Panel Configurations

TIME CAPABLE

Note: RTC jumper (J91) on Main PCBA must be OFF (1 pin only)

ML700
PN 55693 with Overlay PN 12016
- Connects to Main Panel terminal J70, J71, or J72
- A7 must be ON

ML900
PN 52654-01 with Overlay PN 40026
- Connects to Main Panel terminal J70, J71, or J72
- A7 must be OFF
- Blower, Option and Fiber buttons are inactive