Balboa Instruments
System PN 54775

System Model # EL8-EL84P-YCAH

Software Version # 32

EPN # 2756

Base PCBA – PN 55889
PCB EL8000 – PN 22041 Rev A
HEX File – 10013432_EL84P_02.hex
Configuration Signature – 513BFF57

Base Panels
ML900 – PN 54589

Aux Panels
AX10A3 – PN 52765

Optional Base Panel
MLM990S – PN 54527-02
Requires ADCM Splitter to be installed.

Aux Panels
AX40 – PN 55487

BALB**O**A
water group

System Revision History

System PN	EPN	Date	Requested By	Changes Made
54775	2756	02.11.2008	Balboa	New system at v31
54775	2756	04.24.2008	Balboa	Update to v32
54775	2756	06.04.2008	Balboa	Pages 1 & 19: AX40 panel = PN 55487
54775	2756	09.10.2008	Balboa	New Config file - Change expander board
54775	2756	09.17.2008	Balboa	New Config file - Aux Behavior on DIP Switches

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, 1-Speed
- 240V Pump 4, 1-Speed on X-P632
- 120V Ozone
- 12V Spa Light
- 120V Fiber Optic Light and Wheel
- 120V AV (Stereo)
- Continuity-interfaced TV Lift output
- 240V 5.5kW Heater

Optional Devices (Use DIP Switches to enable)
- 240V Blower
- 240V Circ Pump

Setup 2
- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 1-Speed
- 240V Pump 4, 1-Speed on X-P632
- 120V Ozone
- 12V Spa Light
- 120V Fiber Optic Light and Wheel
- 120V AV (Stereo)
- Continuity-interfaced TV Lift output
- ADCM Splitter for MLM990S Panel
- 240V 5.5kW Heater

**Optional Devices** (Use DIP Switches to enable)
- 240V Blower
- 240V Circ Pump

* 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, J71, J72, or J73
- IR or RF Dolphin Receiver Modules
  Connects to Remote terminal J20
- Ozone Generator
  Connects to terminal J4
- MoodEFX Lighting
  Connects to Spa Light terminal J8
- FiberEFX Lighting
  Connects to Spa Light terminal J8
- Stereo System
  Connects to A.V. terminal J5

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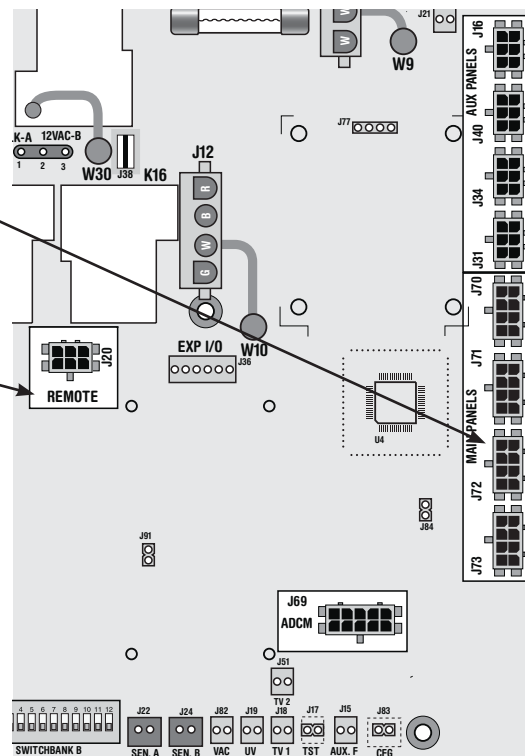
Any time you change DIP Switches or Software Configuration Settings that affect parameters the user can change (any filter settings, set temperature default, Celsius vs Fahrenheit, 12-hour vs 24-hour time, reminders suppression, etc), you must reset Persistent Memory for your DIP Switch or Software Configuration Settings changes to take effect. You should also reset Persistent Memory after loading a new file into a board (using the ESM, purchased seperately).
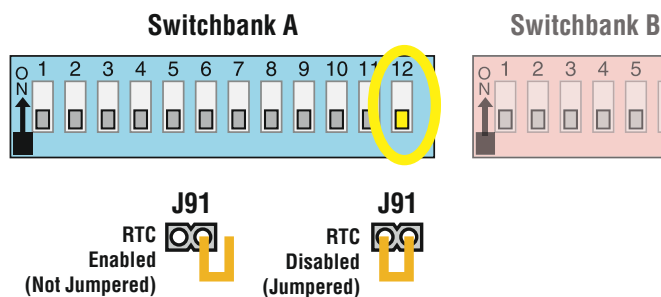
To reset Persistent Memory:
- Power down.
- Set A12 ON (See illustration below).
- Power up.
- Wait until "Pr" or "$PRIMING\ MODE$" is displayed on your panel. Note: If "CFE" appears see section below.
- Set A12 OFF. (This can be done safely with power on if you use a non-conductive tool such as a pencil 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) 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.

Switchbank A   **Switchbank B**

J91   J91
RTC   RTC
Enabled   Disabled
(Not Jumpered)   (Jumpered)

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/EL2000), or the heater wattage range supported (EL8000/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 "$H\ 6$" 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.

Setup 1 (As Manufactured)

- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 1-Speed
- 240V Pump 4, 1-Speed on X-P632
- 12V Spa Light
- 120V Fiber w/ wheel
- 120V Ozone
- 120V AV (Stereo)
- "Continuity Momentary" TV Lift
- 240V 5.5kW Heater
- 240V Circ Pump (optional)
- 240V Blower (optional)
- ML900 Main Panel
- AX10A3 Panel - Required for Blower control
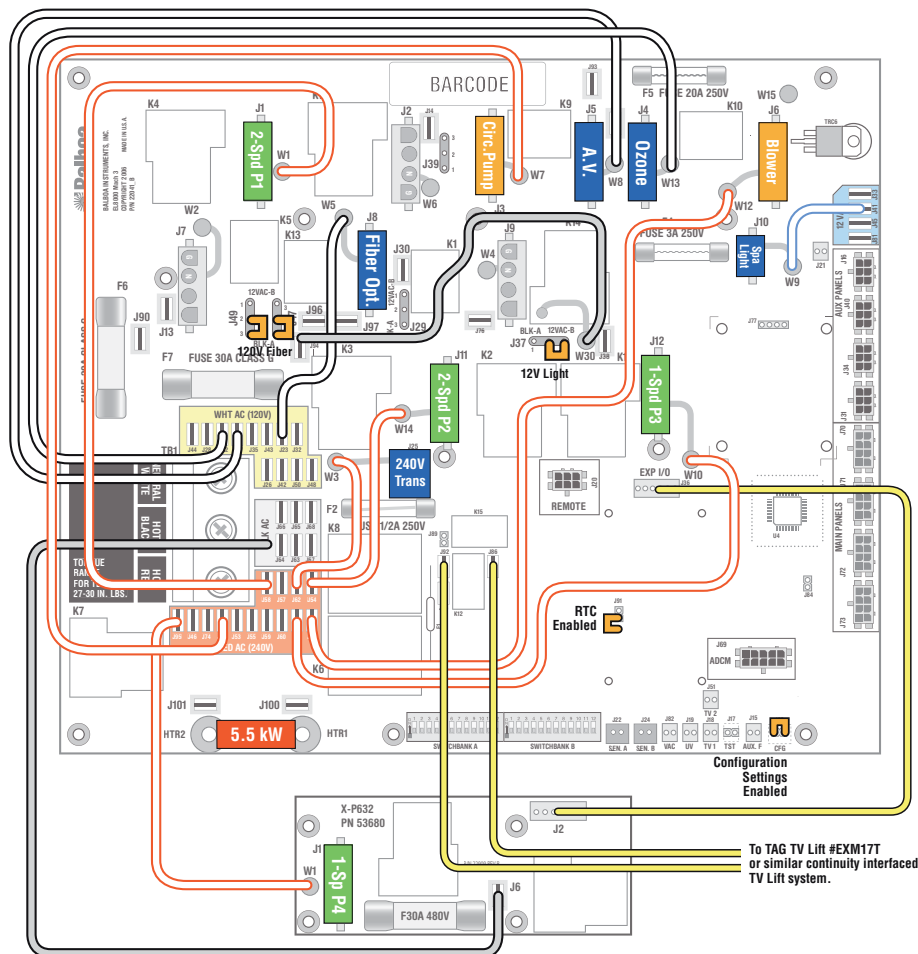
To TAG TV Lift #EXM17T or similar continuity interfaced TV Lift system.

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)

Switchbank A

ON 1 2 3 4 5 6 7 8 9 10 11 12

A1, Test Mode OFF
A2, + 1 Pump w/Heat
A3, + 2 Pumps w/Heat
A4,
A5, } See Table 1
A6, } Circ Behavior
A7, } See Table 2
A8, } Blower
A9, See Table 3
A10, No Edit
A11, Special Amp Rule OFF
A12, Memory ON

Switchbank B

ON 1 2 3 4 5 6 7 8 9 10 11 12

SSID # 100 134 32

B1, See Table 3
B2, Blower on AX10A3
B3, Not Assigned
B4, Not Assigned
B5, Not Assigned
B6, Not Assigned
B7, Not Assigned
B8, Not Assigned
B9, Not Assigned
B10, Not Assigned
B11, Not Assigned
B12, Not Assigned

Wiring Color Key

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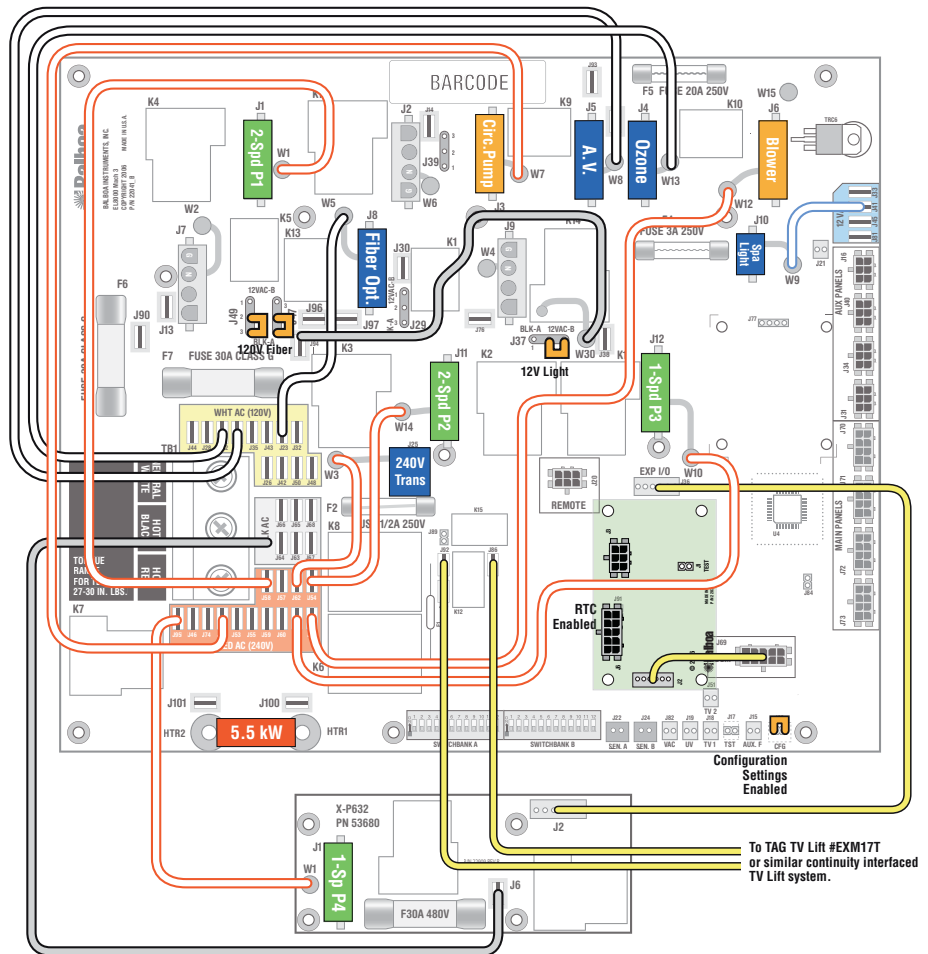- Relay Control Wires

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

J49 J47
1 2 3
120V/240V Fiber Light and Wheel

J29
1 2 3
J9 Black AC

J39 J37 Spa Light 12V
1 2 3
J2 with Pump 1 Low

RTC Enabled J91
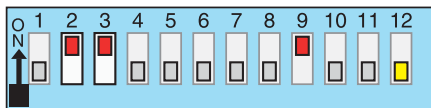
Config Settings Enabled J83

Setup 2

- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 1-Speed
- 240V Pump 4, 1-Speed on X-P632
- 12V Spa Light
- 120V Fiber w/ wheel
- 120V Ozone
- 120V A\V (Stereo)
- "Continuity Momentary" TV Lift
- 240V 5.5kW Heater
- 240V Circ Pump (optional)
- 240V Blower (optional)
- MLM990S Main Panel
- ADCM Splitter
- AX40 Panel -
  Required for Jets 3 and
  Jets 4 Buttons

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)
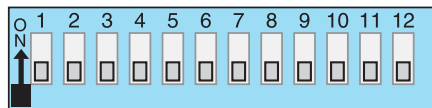
Switchbank A

| ON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

A1, Test Mode OFF
A2, + 1 Pump w/Heat
A3, + 2 Pumps w/Heat
A4,
A5, ⎫ See Table 1
A6, ⎭ Circ Behavior

A7, ⎫ See Table 2
A8, ⎭ Blower
A9, See Table 3
A10, No Edit
A11, Special Amp Rule OFF
A12, Memory ON

Switchbank B

| ON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

B1, See Table 3
B2, AX40 - J1, J2, J3, J4
B3, Not Assigned
B4, Not Assigned
B5, Not Assigned
B6, Not Assigned

B7, Not Assigned
B8, Not Assigned
B9, Not Assigned
B10, Not Assigned
B11, Not Assigned
B12, Not Assigned

SSID #
100
134
32

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

J49 **J47** 120V/240V Fiber Light and Wheel

J29 J9 Black AC

J39 J2 with Pump 1 Low

J37 Spa Light 12V 1 2 3

RTC Enabled **J91**

Config Settings Enabled **J83**
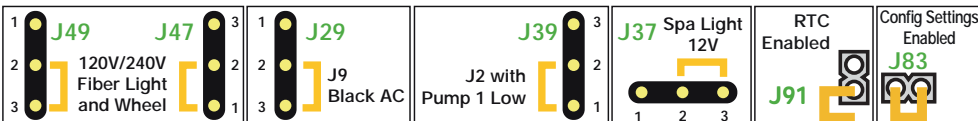
DIP Switches Definitions

> **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 and A6........See **Table 1** for Circ Pump Behavior settings
A7 and A8........See **Table 2** for Blower Behavior settings
A9 . . . . . . See **Table 3** For TV Lift Settings
B1 . . . . . . See **Table 3** For TV Lift Settings
B2 . . . . . . In "ON" position, AX40 = J1, J2, J3, J4 — AX10A3 = Blower
　　. . . . . . In "OFF" position, AX40 = J1, J2, J3, J4
B3 . . . . . . Not Assigned
B4 . . . . . . Not Assigned
B5 . . . . . . Not Assigned
B6 . . . . . . Not Assigned
B7 . . . . . . Not Assigned
B8 . . . . . . Not Assigned
B9 . . . . . . Not Assigned
B10 . . . . . . Not Assigned
B11 . . . . . . Not Assigned
B12 . . . . . . Not Assigned

Table 1		Circ Pump
A5	**A6**	**Behavior**
OFF	OFF	Non-Circ
OFF	ON	24hr Circ
ON	OFF	24hr with 3°F
ON	ON	Like P1-low

Table 2		Blower
A7	**A8**	**Behavior**
OFF	OFF	No Blower
OFF	ON	1-Spd Blower
ON	OFF	2-Spd Blower
ON	ON	3-Spd Blower

Table 3		TV Lift
A9	**B1**	**Behavior**
OFF	OFF	No TV Lift
OFF	ON	Toggle
ON	OFF	Momentary

Jumper 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.

Jumpers Key

J29 . . . . Jumper on Pins 1 and 2 will power J9-pin 1 (Mister) at 12 Volts AC.
Jumper on Pins 2 and 3 will power J9-pin 1 (Mister) at 120/240 Volts AC.
Note: W4 controls voltage on return line of J9-pin 3 and must be set for the same voltage.

J37 . . . . Jumper on Pins 1 and 2 will power one leg of J10-pin 2 (Spa Light) at 120/240 Volts AC.
Jumper on Pins 2 and 3 will power one leg of J10-pin 2 (Spa Light) at 12 Volts AC.
Note: W9 controls voltage on the return line of J10-pin 1 and must be set for the same voltage.

J39 . . . . Jumper on Pins 1 and 2 will power J2 pin 2 with Pump 1 Low.
Jumper on Pins 2 and 3 will power J2 pin 2 with the Circ Pump.
Note: W6 controls voltage on common line of J2-pin 3

J47 . . . . Jumper on Pins 1 and 2 will power J8 pin 2 (Fiber Optic Light) and J7 at 120/240 Volts AC.
Jumper on Pins 2 and 3 will power J8 pin 2 (Fiber Optic Light) at 12 Volts AC.
Note: J47 and J49 must be set for the same voltage. W5 controls voltage on return line of J8-pin 3 and must be set to the same voltage.

J49 . . . . Jumper on Pins 2 and 3 will power J8 pin 1 (Fiber Optic Wheel) at 120/240 Volts AC.
Jumper on Pins 1 and 2 will power J8 pin 1 (Fiber Optic Wheel) at 12 Volts AC.
Note: J47 and J49 must be set for the same voltage. W5 controls voltage on return line of J8-pin 3 and must be set to the same voltage.

J91 . . . . Jumper on 1 Pin only enables Real Time Clock function, for use with time capable panels.
Jumper on Pins 1 and 2 will disable RTC function, for use with non-time capable panels.

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(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

F1 — 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

PUMP SPEEDS

P1 — 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) 2 _
0 = Disabled; **1 =** On/Off; **2 =** 2 speed;   **_ =** 3 DIP Switch

P4 — Pump 4 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

P5 — Pump 5 Speeds
(0) 1 E L _
0 = Disabled; **1 =** On/Off on board; **E =** External X-P or X-P231 board
L = On/Off on pin 2 of X-P632 board; **_ =** 2 DIP Switch

PUMP SPEEDS

P6 — Pump 6 Speeds   (**0**)   1   _
0 = Disabled; **1** = On/Off;   _ = 1 DIP Switch

bL — Blower Speeds   0   1   2   3   (_)
0 = Disabled; **1** = On/Off; **2** = 2 speeds; **3** = 3 speeds; _ = 2 DIP Switch

LIGHTING CONTROL

Lb — Separate Spa Light Buttons   n   (Y)   _   See Chart Below
(This feature applies when   **n** = No Spa light button, Spa Light output is on with Fiber;
using Fiber Optic light)   **Y** = Separate Spa Light button on ML900 or Aux panel
   _ = 1 DIP Switch

Note: The Light button on an ML900 panel is a SpaLight button. The Light button on most other panels is an EitherLight button.

	Lb.n	Lb.Y
Fo.n	No separately-controlled fiber light; spa light enabled on both SpaLight and EitherLight buttons; fiber light (not wheel) comes on with spa light (at any intensity)	
Fo.Y	No separately-controlled fiber light; fiber light enabled on both FiberLight and EitherLight buttons; spa light comes on with fiber light	Spa light and fiber light each separately controlled; fiber light enabled on both FiberLight and EitherLight buttons; spa light enabled on SpaLight buttons only

L1 — Spa Light On/Off   n   (Y)   _
n = Dimmable (H, M, L) Light; **Y** = On/Off Light;   _ = 1 DIP Switch

Fo — Fiber Optics   n   (Y)   _
n = Disabled; **Y** = Light and Wheel Enabled;;   _ = 2 DIP Switch

IS — Mister   (n)   Y   _
n = Mister Disabled (Option Enabled on J9);
Y = Mister Enabled on J9 (Option Disabled);   _ = 1 DIP Switch

OPTIONS

oE — Option 1*   (n)   Y   P   _
n = Disabled; **Y/P** = Enabled on J9; _ = 2 DIP Switch

o2 — Option 2*   n   Y   P   (_)
n = Disabled; **Y/P** = Enabled on "alarm" relay; _ = 2 DIP Switch

O3 — Option 3*   (n)   Y   P   _
n = Disabled; **Y/P** = Enabled on pin 1 of X-P632 board; _ = 2 DIP Switch

O4 — Option 4*   (n)   Y   P   _
n = Disabled; **Y/P** = Enabled on pin 2 of X-P632 board; _ = 2 DIP Switch

O5 — Option 5*   (n)   Y   P   _
n = Disabled; **Y/P** = Enabled on J7; _ = 2 DIP Switch

*Note: Options 1-5: 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 (U) |

n = Disabled; **Y** = Enabled ; **U** = Controlled by UV input

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 wheel/light; **E** = EitherLight;
o = Option 1; **t** = Mister; **d** = CK Mode/Cool; **P** = CK Option/Heat; **n** = CK Intensity/TurboHt; **A** = ACD Aroma/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 wheel/light; **E** = EitherLight;
o = Option 1; **t** = Mister; **d** = CK Mode/Cool; **P** = CK Option/Heat; **n** = CK Intensity/TurboHt; **A** = ACD Aroma/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
rg	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

L5   Lowest Set Temperature*   (**8**)   7

8 = 80°F/26.0°C;   **7** = 70°F/21.0°C

*Setting LS at 7 and Fr at 5 will cause a CFE error.

5t   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.

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

Lc   Light Cycle Programming   (**n**)   Y

n = Disabled;   **Y** = Enabled

FILTER CYCLES

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.

FILTER CYCLES

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.

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
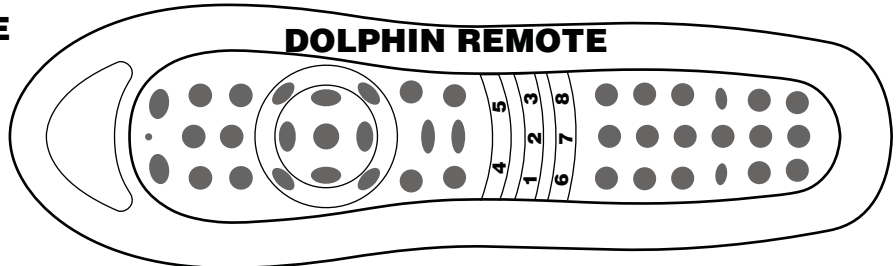
REMOTE BUTTONS

n1	Remote 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
n2	Remote 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
n3	Remote 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
n4	Remote 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
n5	Remote Button 5 (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
n6	Remote Button 6 (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
n7	Remote Button 7 (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
n8	Remote Button 8 (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 wheel/light; **E =** EitherLight;
o = Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/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
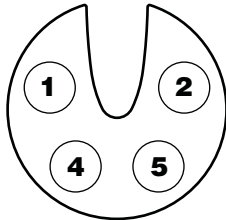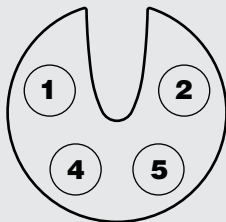
**ROUND REMOTE**   **DOLPHIN REMOTE**

H1	Remote 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
H2	Remote 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
H3	Remote 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
H4	Remote 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
H5	Remote Button 5 (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
H6	Remote Button 6 (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
H7	Remote Button 7 (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
H8	Remote Button 8 (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 wheel/light; **E =** EitherLight;
o = Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/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**
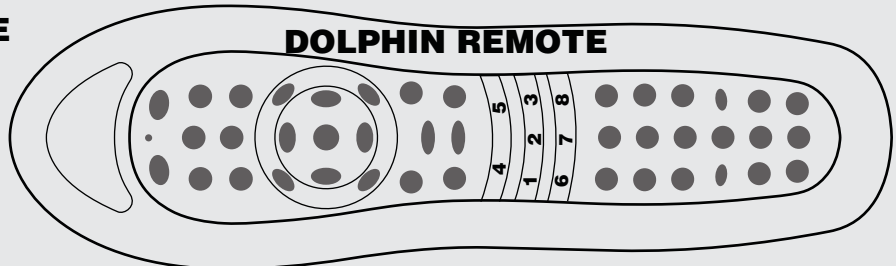
| d0 | Remote Button Bank Select | (A) b _ |

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

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 wheel/light; **E =** EitherLight;
o = Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/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

Time Warm
Mode Cool

ML90x Series
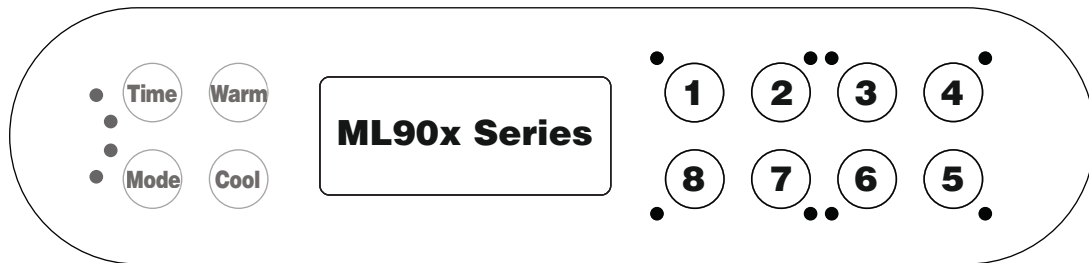
1 2 3 4
8 7 6 5

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 wheel/light; **E =** EitherLight;
o = Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/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

Time Warm 6 5 4
Mode Cool 1 2 3

ML75x Series
MX75x Series
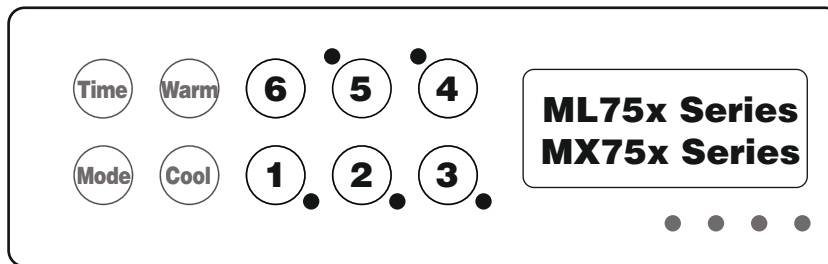
6C	ML750/MX750 Custom Buttons Enable	(n) Y _
		n = Disabled; **Y =** Enabled; **_** = 1 DIP Switch

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 wheel/light; **E =** EitherLight; **o =** Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/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
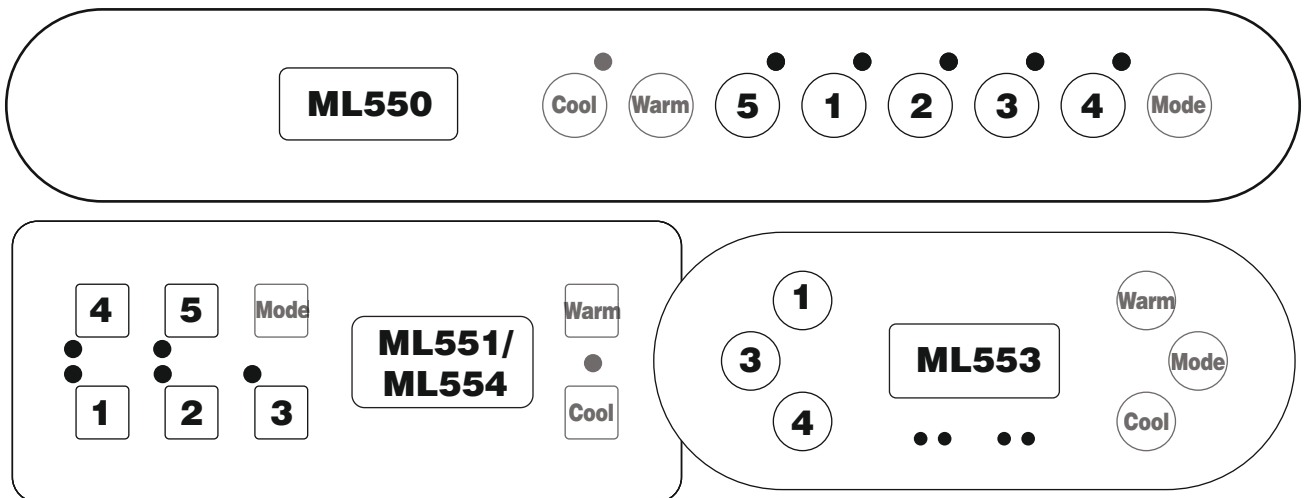
Time Warm

Mode Cool

ML70x Series

4 3
1 2

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 wheel/light; **E =** EitherLight; **o =** Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/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
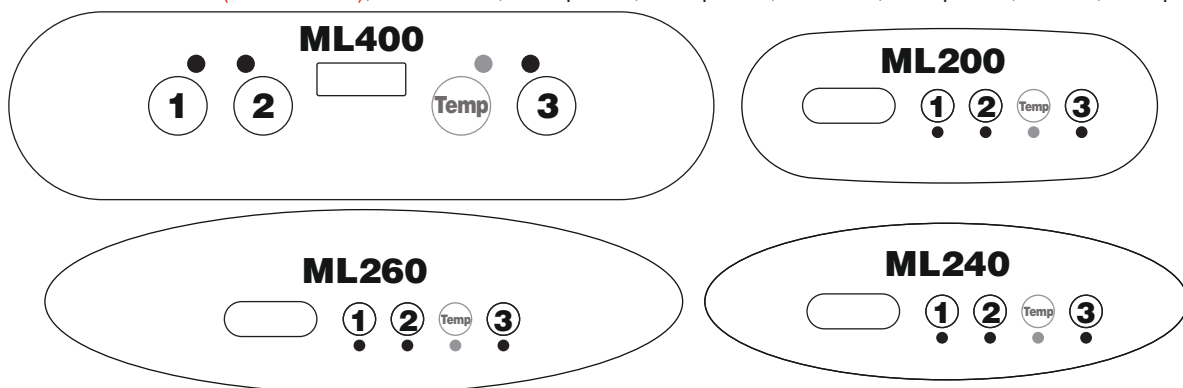
ML550   Cool Warm 5 1 2 3 4 Mode

ML551/ ML554   4 5 Mode   1 2 3   Warm Cool

ML553   1 3 4   Warm Mode Cool

5C ML55x Custom Buttons Enable   (n) Y _

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

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 wheel/light; **E =** EitherLight;
o = Option 1; **t =** Mister; **d =** CK Mode/Cool; **P =** CK Option/Heat; **n =** CK Intensity/TurboHt; **A =** ACD Aroma/Sound Mode Select;
U = Button Disabled (DO NOT USE); **r =** Air Valve; **0 =** Option 2; **H =** Option 3; **9 =** Invert; **L =** Option 4; **8 =** Stir; **7 =** Option 5

ML400

ML200

ML260

ML240

3C	ML40x/ML2xx Custom Buttons Enable	(n) Y _ **n =** Disabled; **Y =** Enabled; **_** = 1 DIP Switch
SA	Special Amperage Rule*	(1) 2 3 4 **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 *Note: DIP A11 must be ON to use Special Amperage Rule.
HC	Heat Cool Feature	(n) Y _ **n =** Disabled; **Y =** Enabled; **_** = 1 DIP Switch
co	Color Kinetics	(n) Y **n =** Disabled; **Y =** Enabled
cd	ACD	(n) Y **n =** Disabled; **Y =** Enabled
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 (J4). 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.
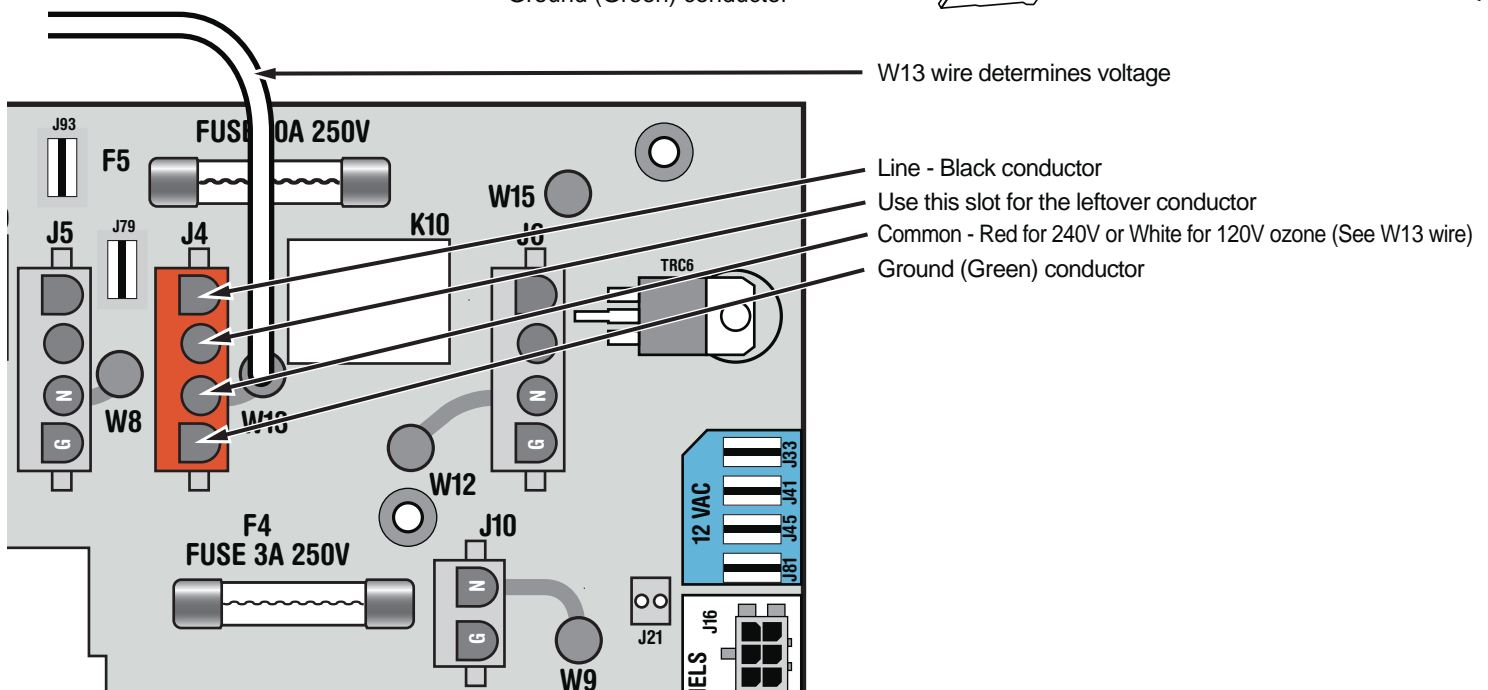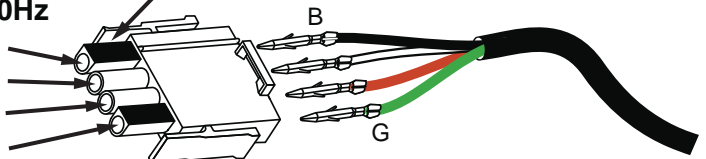
Balboa Ozone connector configuration for 120V 60Hz

Line - Black conductor
Use this slot for the leftover Red conductor
Common - Install the White conductor here for 120V ozone
Ground (Green) conductor

B

G

Flat sides of sockets as shown
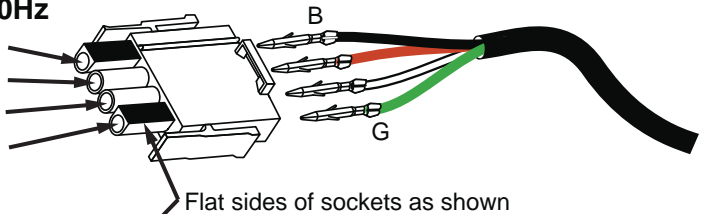
Balboa Ozone connector configuration for 240V 60Hz

Line - Black conductor
Use this slot for the leftover White conductor
Common - Install the Red conductor here for 240V ozone
Ground (Green) conductor

B

G

W13 wire determines voltage

Line - Black conductor
Use this slot for the leftover conductor
Common - Red for 240V or White for 120V ozone (See W13 wire)
Ground (Green) conductor

J93
F5
FUSE 10A 250V
W15
J5
J79
J4
K10
J6
TRC6
W8
W13
W12
J10
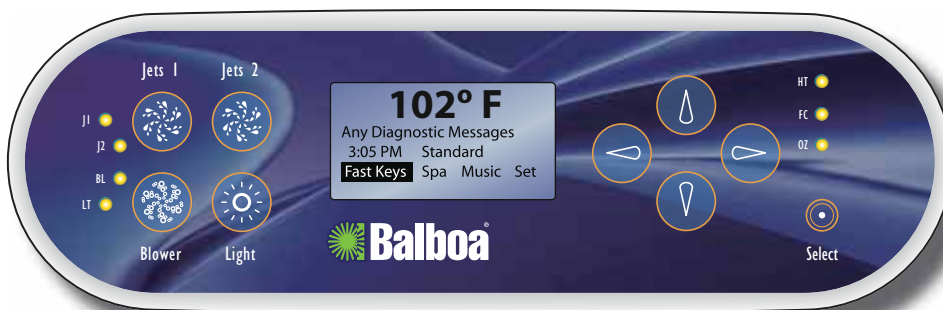F4
FUSE 3A 250V
12 VAC
J33
J41
J45
J81
J21
J16
W9

SETUPS 1

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

ML900
PN 54589 with Overlay PN 11806
• Connects to Main Panel terminal J70, J71, J72, or J73

SETUP 2

MLM990S
PN 54527-02 with Overlay PN 11810
• Connects to ADCM Splitter

AUXILIARY

AX40 (Optional on Setup 1 – REQUIRED on Setup 2)
PN 55487 with Overlay PN 11823
• Connects to Aux Panel terminal J31, J34, J40, or J16

AX10A3 (Optional on Setup 1)
PN 52765 with
Overlay PN 40107_B

• Connects to Aux Panel terminal
  J31, J34, J40, or J16

54775_97_C