EL8000 Mach 3 Hot Sheet

Balboa Instruments
System PN 53857-01

System Model # EL8-EL8000M3-YCAH
Software Version # 26
EPN # 2009

Base PCBA - PN 53858-01
PCB EL8000 – PN 22041 Rev A

Base Panels
ML900 – PN 52654

Balboa Instruments Incorporated

Template used: 40575-v26_D.pdf 06/21/2006
53857_01-97_A.pdf 09/08/2006

Basic System Features and Functions

Power Requirements

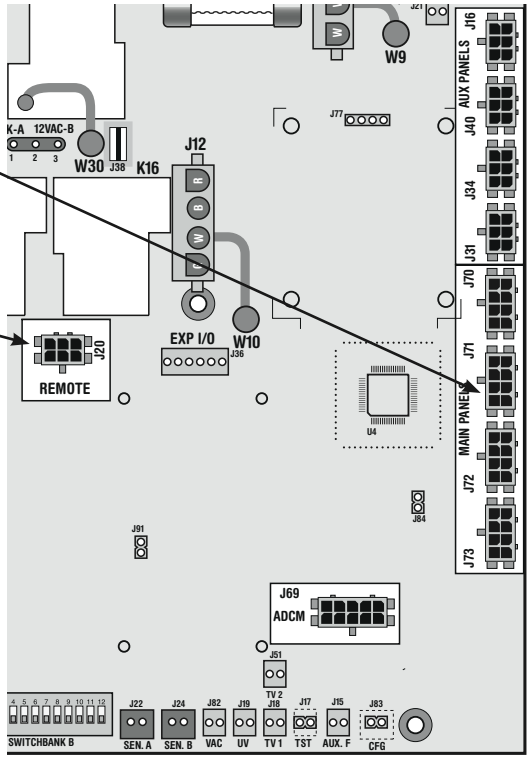
- 240VAC, 60Hz, 48A, Class A, GFCI-protected service (Circuit Breaker rating = 60A max.)
- 4 wires (hot, hot, neutral, ground)

System Outputs (As Configured)

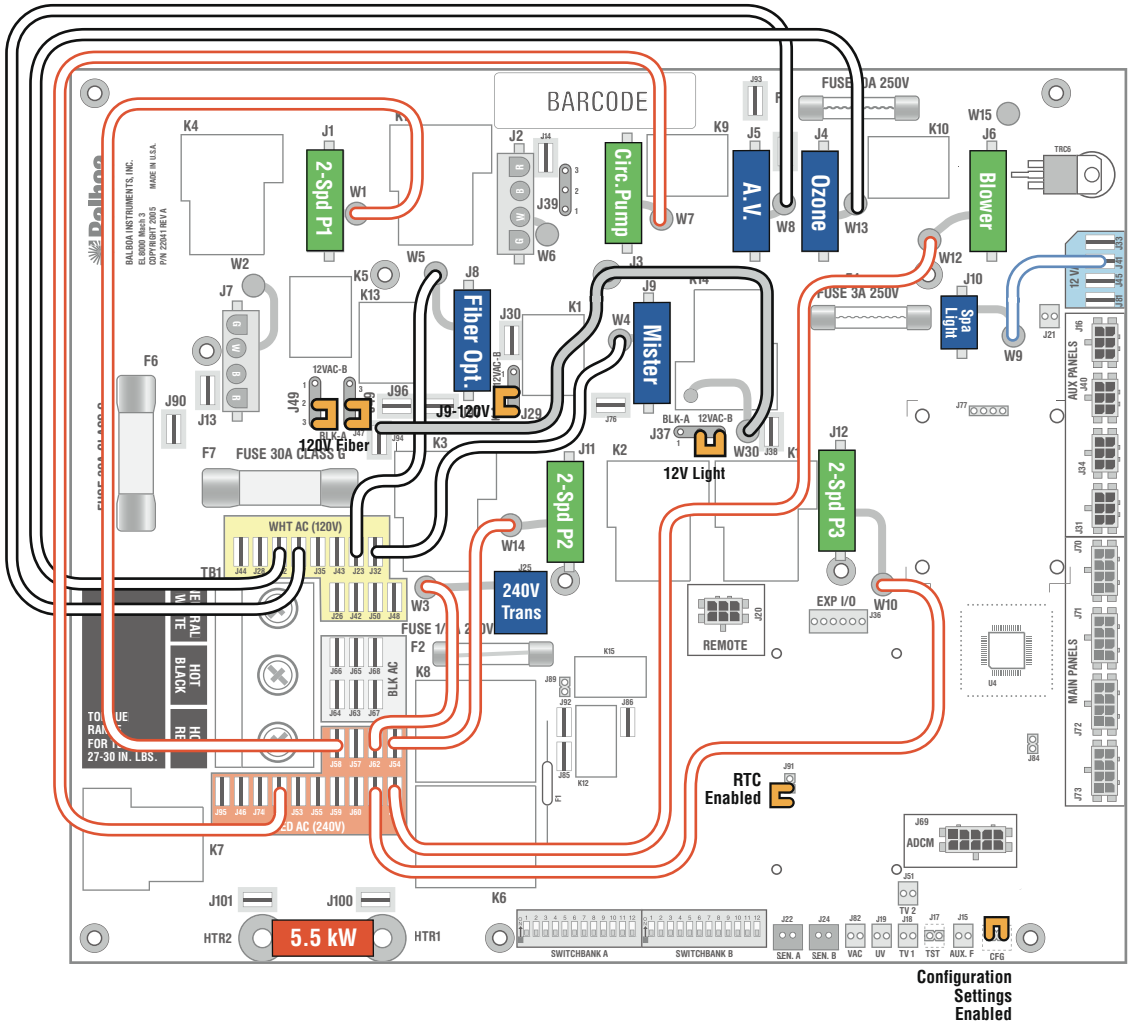
- 240V Pump 1, 2-Speed
- 240V Pump 2, 2-Speed
- 240V Pump 3, 2-Speed
- 240V Blower
- 240V Circ Pump
- 120V Ozone
- 120V Mister
- 120V Fiber Optic w/ Wheel
- 12V Spa Light
- 120V Audio\Visual (Stereo)
- 240V 5.5kW Heater

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



Wiring Configuration



Wiring Color Key

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

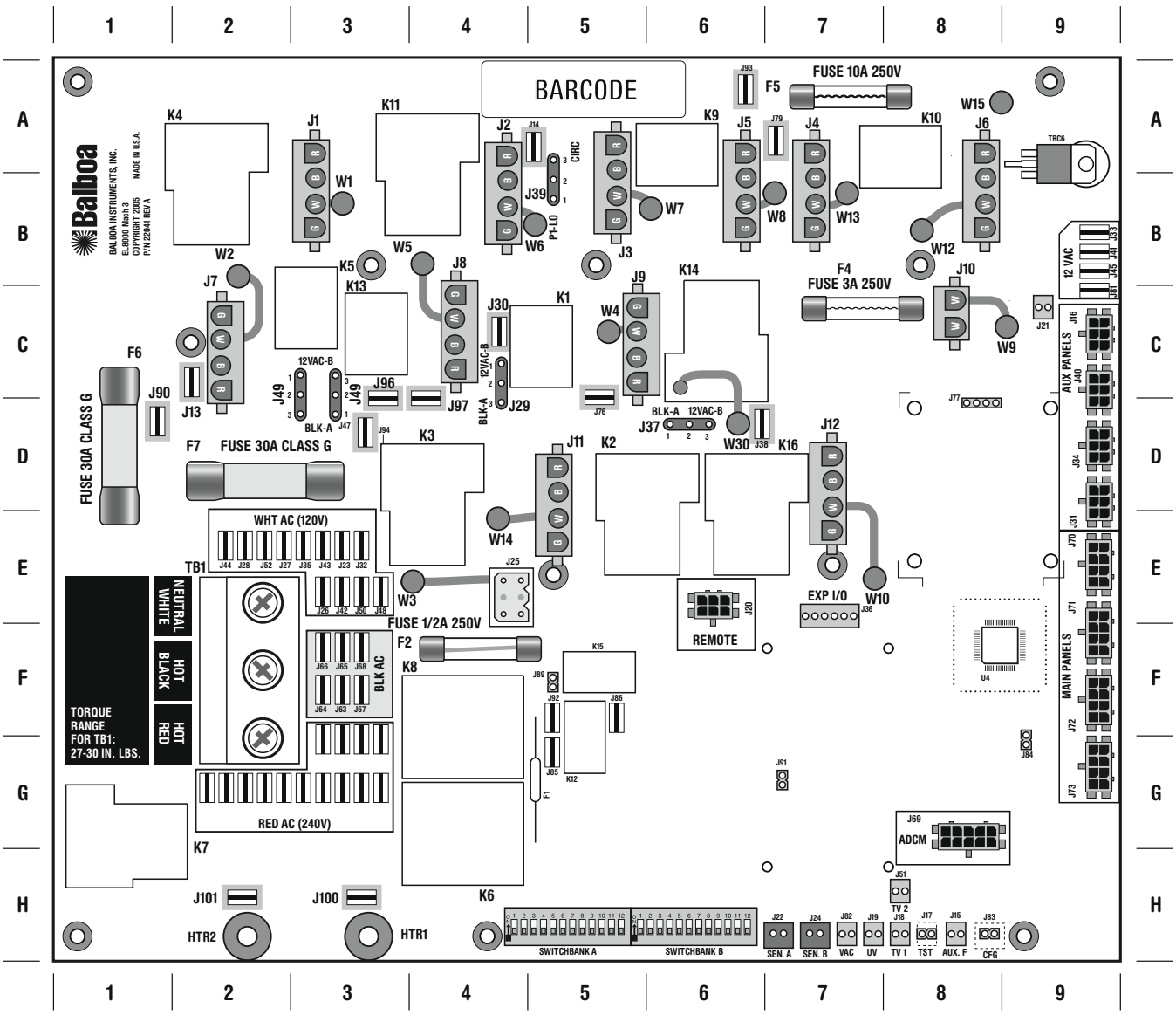
Connector Key

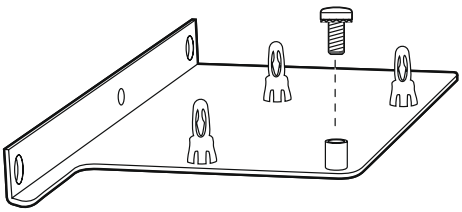
- Typically Line voltage
- Typically Line voltage for 2-speed pumps
- Neutral (Common)
- Ground

Note flat sides in connector

PCB Revision	History
A	Production Release

Configuration Options

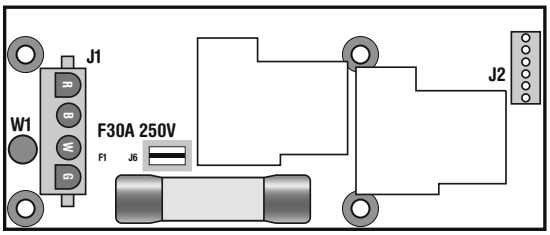




X-Mount M **PN 53914**

Used for mounting any Expander Board in a metal enclosure.
Bracket attaches to heater mounting straps

Expander Options



X-P632 **PN 53680**
Used for an additional 2-speed Pump output.
Relay control J2 plugs into the EXP I/O connector J36 on the Main PCBA (Quadrant 7-E, near W10).

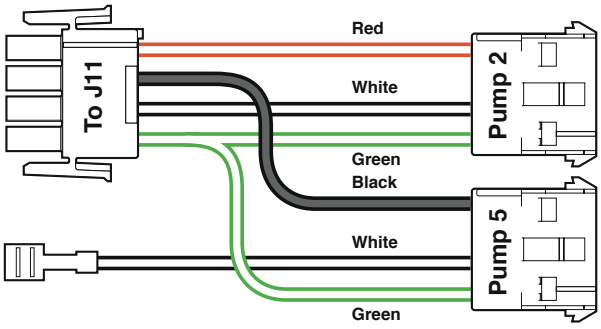
Expander boards that REPLACE the Blower function:
Relay control for these options is connected to J21 on the Main PCBA (Quadrant 9-C, near W9). Do not use the Blower Connector J6 if one of these is used.

X-P **PN 53544**
Used for an on-off Device without a fuse

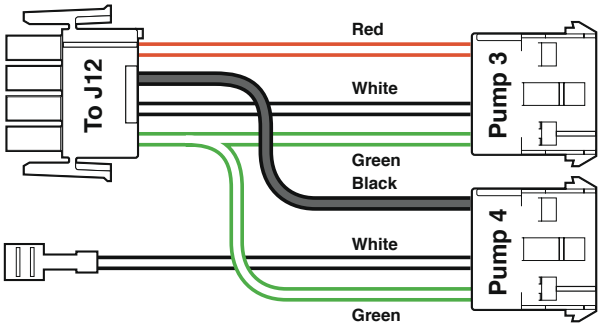
X-B **PN 53310**
Used for an on-off Device with 10A fuse

X-P231 **PN 53681**
Used for an on-off Device with 30A fuse

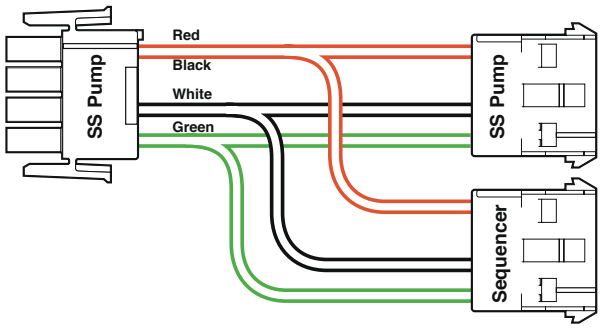
Output Features				Quadrant
J1	+	W1	– 2-Speed Pump 1	3-B
J2	+	W6	– Output tied to Pump 1 Low (J39 - P1-Lo)	4-B
			– OR output tied to Circ Pump (J39 - Circ)	
J3	+	W7	– Circ Pump	5-B
J4	+	W13	– Ozone (Separate Relay 120V or 240V)	7-B
J5	+	W8	– A.V.	6-B
J6	+	W12	– 3-speed blower	8-B
J10	+	W9	– Spa Light (12V or 120V/240V) (Check J37 setting)	8-C
J7	+	W2	– Misc (120V or 240V) (Check J47 setting)	2-C
J8	+	W5	– Fiber Optic (12V or 120V/240V) (Check J47 + J49 setting)	4-C
J9	+	W4	– Mister (12V or 120V/240V) (Check J29 setting)	5-C
J11	+	W14	– 2-Speed Pump 2	5-D
J12	+	W10	– 2-Speed Pump 3 (W30 to J94)	7-D
		W3	– Sets Transformer Voltage (120V or 240V) (Setting must match transformer installed in system.)	4-E



PS-25 **PN 25094**
Used to split the output from the Pump 2 Connector (J11) into a single-speed Pump 2 and single-speed Pump 5. White wire quick connect goes to Main PCB Red AC for 240 Pumps or to Wht AC for 120V Pumps.

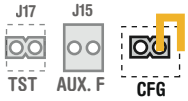


PS-34 **PN 25093**
Used to split the output from the Pump 3 Connector (J12) into a single-speed Pump 3 and single-speed Pump 4. White wire quick connect goes to Main PCB Red AC for 240 Pumps or to Wht AC for 120V Pumps.



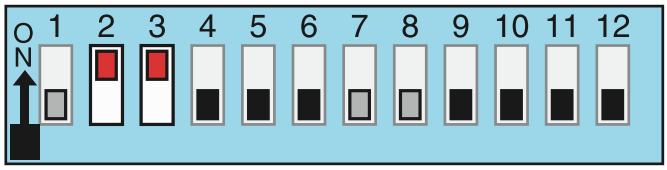
ELS-VALVE **PN 22934**
Used to split the output from a single-speed Pump to allow a Valve Sequencer to be powered by the pump's output.

DIP Switches and Jumpers



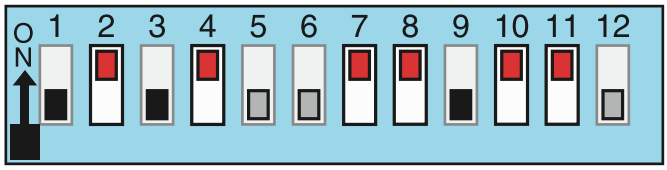
When the Logic Jumper is not installed on J83 (CFG), DIP Switch Settings are enabled. DIP Switches will then operate as shown below.

Switchbank A

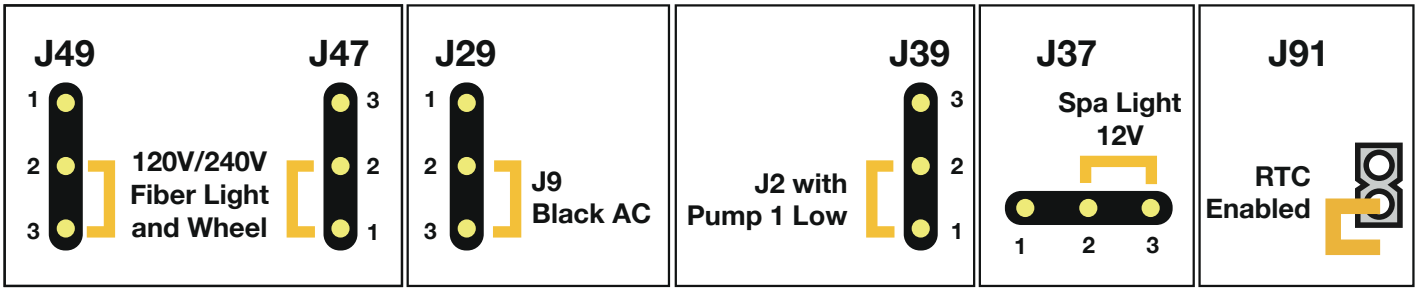


A1, Test Mode OFF
A2/A3, Four H.S. Pumps w/Heater
A4, 12 Hour Time
A7, Cleanup Cycle OFF
A8, 1Hr O_3 Disable OFF
A9/A10, No Circ Pump

Switchbank B



B1, Pump 2 2-Speed
B2/B3, Single Speed Blower (On/Off)
B4, F/O Light ON
B7, Spa Light On/Off
B8, Spa Light Button
B9, Pump 3 2-speed
B10, Pump 3 Enabled



Jumper Key

J29 . . . . . Jumper on Pin 1 and 2 will power J9-pin 1 (Mister) at 12 Volts AC.
Jumper on Pin 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 Pin 1 and 2 will power one leg of J10-pin 2 (Spa Light) at 120/240 Volts AC.
Jumper on Pin 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 Pin 1 and 2 will power J2 pin 2 with Pump 1 Low.
Jumper on Pin 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 Pin 1 and 2 will power J8 pin 2 (Fiber Optic Light) and J7 at 120/240 Volts AC.
Jumper on Pin 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 Pin 2 and 3 will power J8 pin 1 (Fiber Optic Wheel) at 120/240 Volts AC.
Jumper on Pin 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 Pin 1 and 2 will disable RTC function, for use with non-time capable panels.

DIP Switch Definitions

DIP Switch Key

A1 . . . . . Test Mode (normally Off)
A2 and A3 . . . . . Control amp draw requirements

A2	A3	# of Hi-Speed Pumps/Blower Before Heat Disabled
OFF	OFF	0
ON	OFF	1
OFF	ON	2
ON	ON	Up to 4

A4* . . . . . In "ON" position, displays time in 24 hours (military\European time)
. . . . . In "OFF" position, displays 12 hour time
A5* . . . . . In "ON" position, displays temperature in Celsius
. . . . . In "OFF" position, displays temperature in Fahrenheit
* Sets default for user preferences - only applies when persistent memory is reset (A12 On) during power-up
A6 . . . . . In "ON" position, Equipment timeout 30 minutes (4 hours for Pump 1 Low)
. . . . . In "OFF" position, Equipment timeout 15 minutes (2 hours for Pump 1 Low)
A7 . . . . . In "ON" position, Cleanup Cycle – 30 minutes after spa use/timeout, Pump 1 Low & Ozone run for 1 hour
. . . . . In "OFF" position, NO Cleanup Cycle
A8 . . . . . In "ON" position, Ozone suppressed for 1 hour after pump or blower button press
. . . . . In "OFF" position, NO Ozone suppression
A9 and A10 . . . . . Circ Pump Behavior settings

A9	A10	Circ Pump Behavior
OFF	OFF	No Circ Pump
ON	OFF	24 Hr
OFF	ON	24 Hr w/3°F Shut-Off
ON	ON	Acts like Pump 1 Low (Filter Cycles, Polls)

A11 . . . . . In "ON" position ***(non-circ mode operation)*** Pump 1 is two-speed, Ozone is ON in Filter & Cleanup Cycles only ***(in any circ mode)***, Pump 1 is one-speed, Ozone is ON with Circ Pump
. . . . . In "OFF" position ***(non-circ mode operation)*** Pump 1 is two-speed, Ozone is ON with Pump 1 Low ***(in any circ mode)*** Pump 1 is two-speed, Ozone is ON with Circ Pump
A12 . . . . . Persistent Memory Reset (used when the spa is powering up)

DIP Switch Definitions

DIP Switch Key

B1 . . . . . .In “ON” position, single-speed Pump 2
. . . . . .In “OFF” position, two-speed Pump 2
B2 and B3. . . . . Blower Speeds

B2	B3	Blower Speeds
OFF	OFF	0 (No Blower)
ON	OFF	1 (on/off)
OFF	ON	2
ON	ON	3

B4 and B8 . . . . . .Fiber Optic and Color wheel control; Spa Light Enable
Note: The Light button on an ML900 panel is a SpaLight button.
The Light button on most other panels is an EitherLight button.

	B8 OFF	B8 ON
B4 OFF	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)	
B4 ON	No separately-controlled spa 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

B5 . . . . . Pump 4 enable when On. Jets 4 replaces Blower on Aux panel
B6 . . . . . .In “ON” position, Alternate Panel layout
(ML900 scrunching enabled; ML550 and ML700 Jets 3 replaces Blower)
. . . . . .In “OFF” position, Normal Panel layout
B7 . . . . . .In “ON” position, Spa Light operation is On/Off
. . . . . .In “OFF” position, Spa Light operation is dimmable
B9 . . . . . .In “ON” position, single-speed Pump 3
. . . . . .In “OFF” position, two-speed Pump 3
B10 . . . . . .In “ON” position, Pump 3 enabled (Jets 3 replaces Light button on Aux panel)
. . . . . .In “OFF” position, Pump 3 disabled
B11 . . . . . .In “ON” position, Mister enabled
. . . . . .In “OFF” position, Mister disabled
B12 . . . . . .In “ON” position, Mister or Option replaces Blower button on Aux panels
. . . . . .In “OFF” position, no button replacement on Aux panels

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.

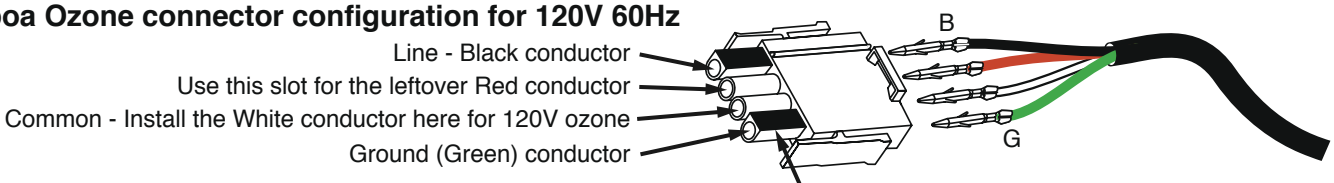
The voltage to the ozone connector can be changed in the field if required. W13 just needs to be set for the required voltage.

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.

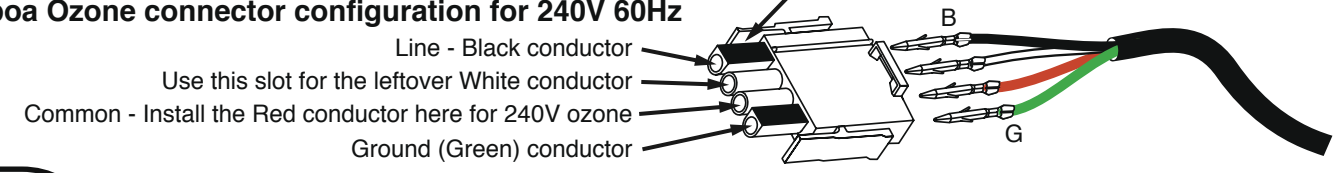
Note: A special tool is required to remove the pins from the connector body once they are snapped in place. Check with your Balboa Account Manager for information on purchasing a pin-removal tool.

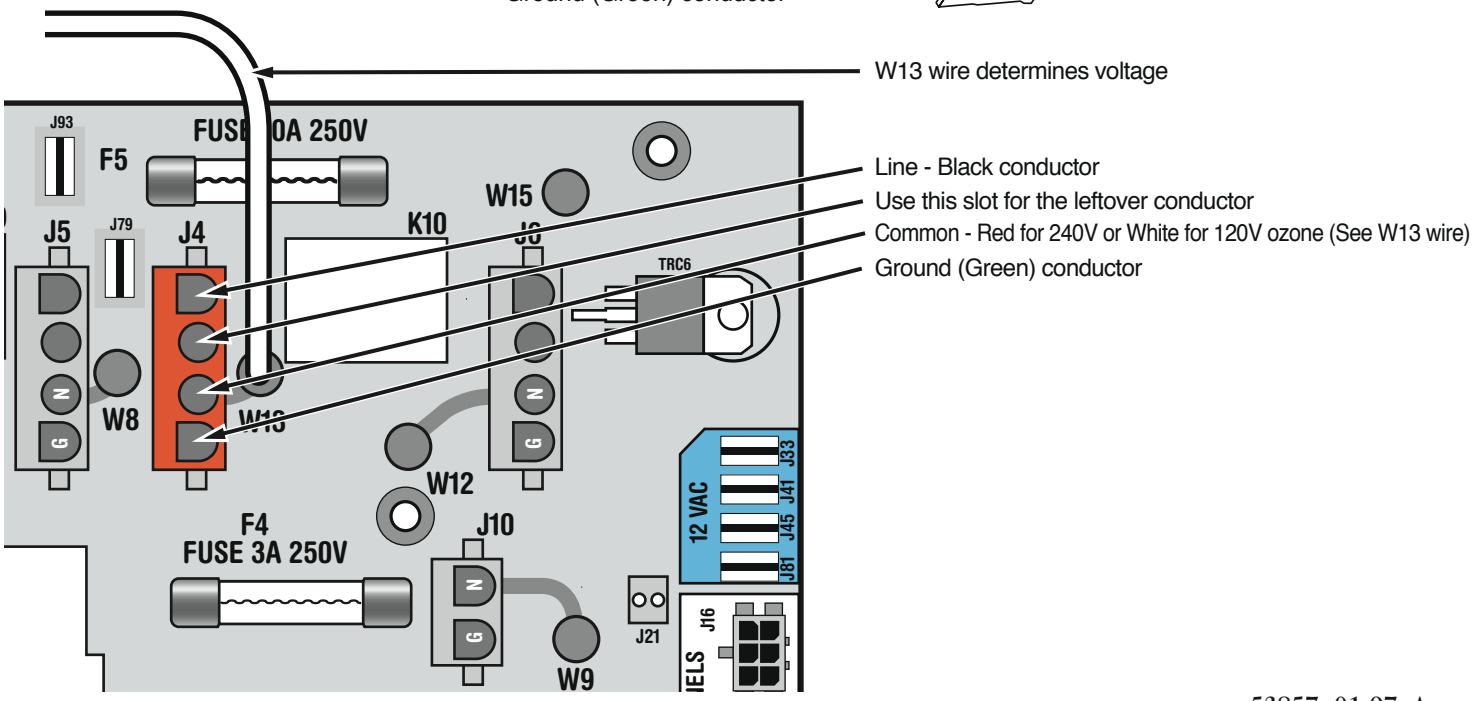
Balboa Ozone connector configuration for 120V 60Hz



Flat sides of sockets as shown

Balboa Ozone connector configuration for 240V 60Hz





Panel Configurations

ML900
PN 52654 with Overlay PN 40026
- Connects to Main Panel terminal J70, J71, J72, or J73
- RTC jumper (J91) on Main PCBA must be OFF (1 pin only)