EL8000 Hot Sheet

System PN 52887_04 (Mach 2)
Balboa Instruments

System Model # EL8-EL8000-YCAH

Base PCBA PN
EL8000 – 52888-01 (PCB 21858 Rev E)

Base Panels
ML 700 – PN 52649
ML 900 – PN 52654

The ML 700 Panel may require Aux panels
for adequate functionality.

Manufacturer Settings for EL8000

INPUT

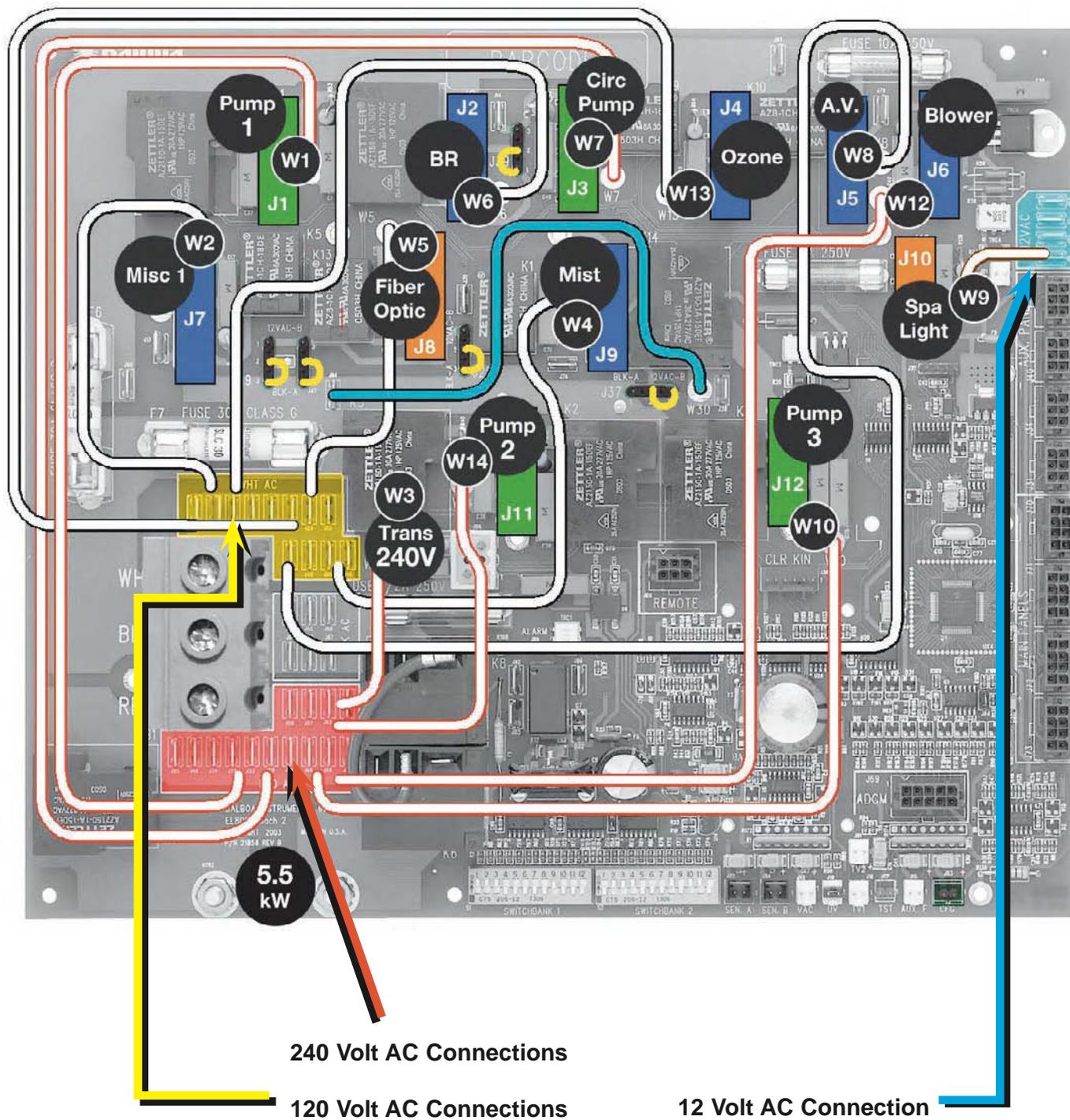- 240V; 4 wires (hot, hot, neutral, ground)

OUTPUTS

- 240V Pump 1, dual speed (high speed: 15-minute timeout; low-speed; 2-hour timeout)
- 240V Pump 2, dual speed (15-minute timeout; 5-minute for purge cycle w/filter)
- 240V Blower, single speed (15-minute timeout; low-speed; 30-second for purge cycle w/filter)
- 120V Ozone (ozone runs with pump 1 low)
- 12V Spa Light (4-hour timeout)
- 120V Fiber-Optic Light only (optional) (fiber-optic light w/wheel)
- 120V Mister
- 120V AV (stereo)
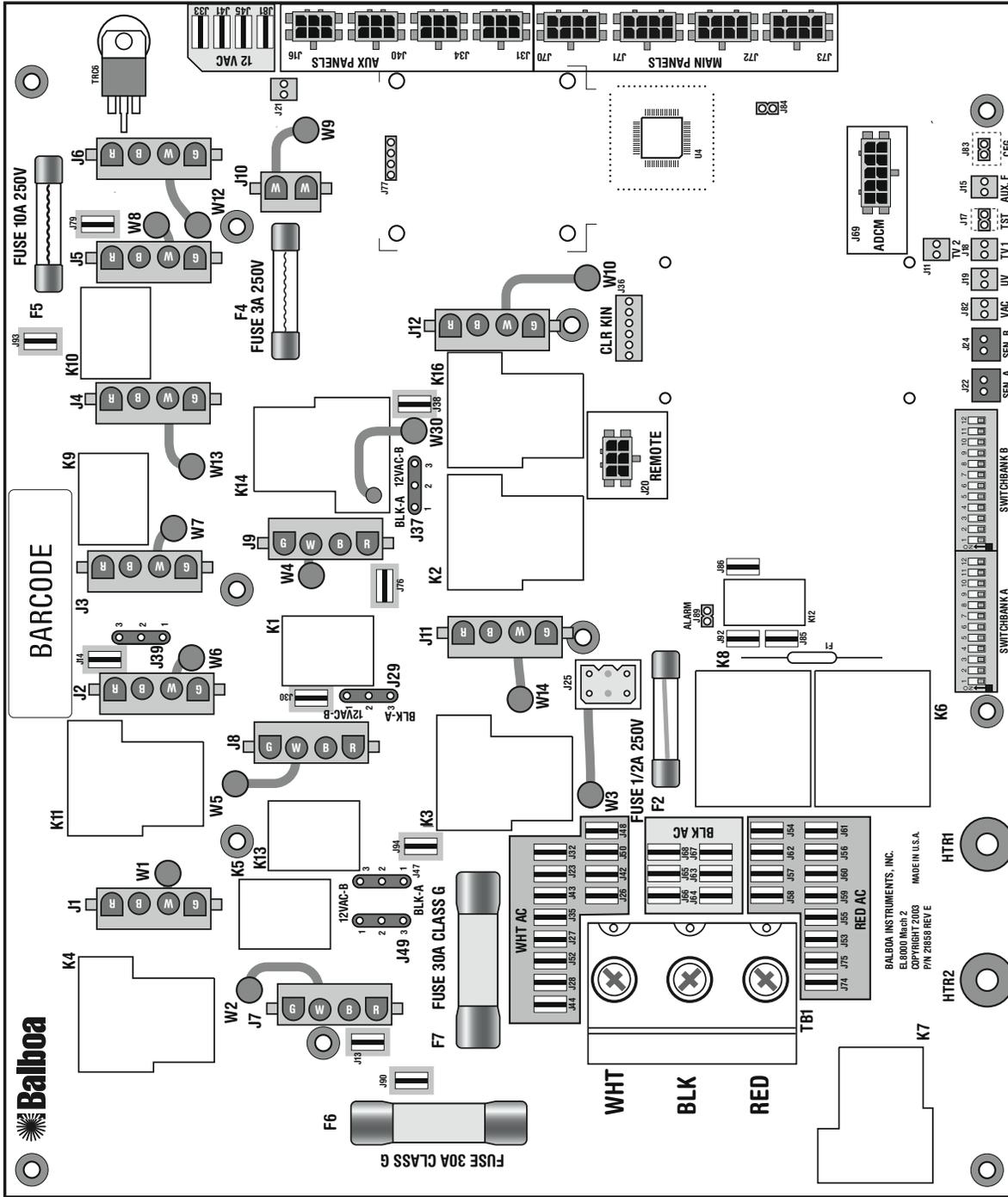- Heater: 5.5kw @ 240V
- 240V Circ Pump

FEATURES

- See ML900 panel reference card (pages 9-12 of this document)
- See ML700 panel reference card (pages 13-16 of this document)

52887_04-97_A

Circuit Board Configuration

240 Volt AC Connections

120 Volt AC Connections

12 Volt AC Connection

Circuit Board Layout

BARCODE

Balboa

J1 & W1 . . Pump 1

J2 & W6 . . BR
With J39

J3 & W7 . . Circ Pump

J4 & W13 Ozone

J5 & W8 . . A.V.

J6 & W12 Blower

J7 & W2 . . Misc 1

J8 & W5 . . Fiber Optic
With J47 & J49

J9 & W4 . . Mist
With J29

J10 & W9   Spa Light
With J37

J11 & W14 Pump 2

J12 & W10 Pump 3
With W30 to J94

BALBOA INSTRUMENTS, INC.
EL8000 Mach 2
COPYRIGHT 2003
P/N 21858 REV E   MADE IN U.S.A.
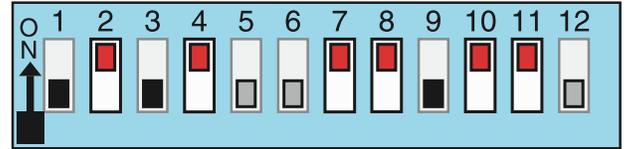
52887_04-97_A

DIP Switches and Jumpers

Switchbank A
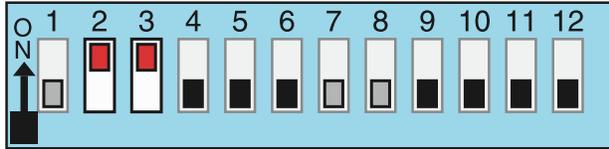
A1, Test Mode OFF
A2/A3, Four H.S. Pumps w/Heater
A4, 12 Hour Time
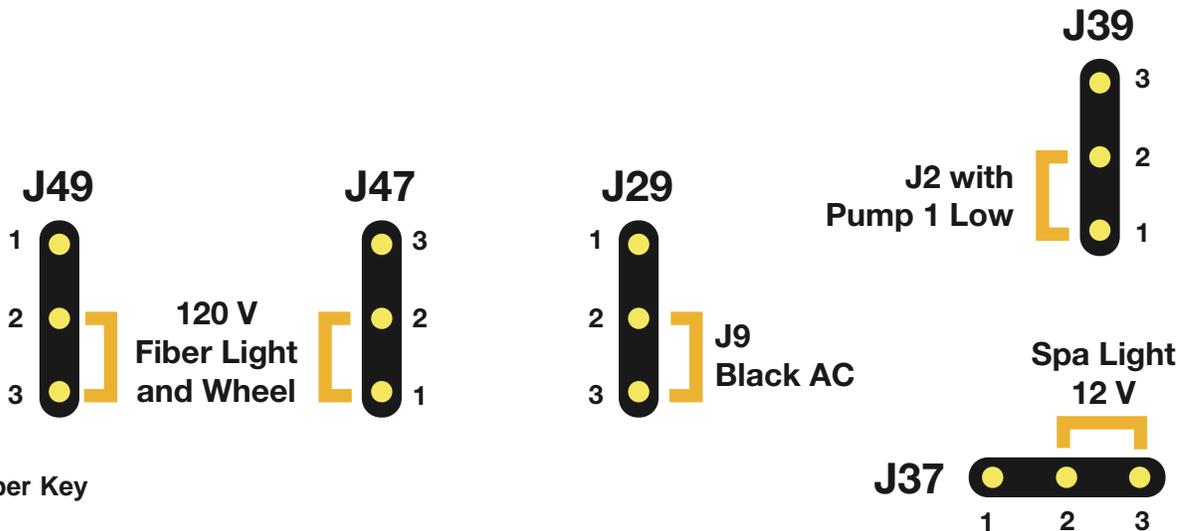A5, Degrees F
A6, Short Timeouts

A7, Cleanup Cycle OFF
A8, 1Hr O_3 Disable OFF
A9/A10, No Circ Pump
A11, Ozone w/P1 low
A12, Memory ON

Switchbank B

B1, Pump 2 2-Speed
B2/B3, Single Speed Blower (On/Off)
B4, F/O Light ON
B5, Pump 4 OFF
B6, Scrunching OFF

B7, Spa Light On/Off
B8, Spa Light Button
B9, Pump 3 2-speed
B10, Pump 3 Enabled
B11, Mister Enabled
B12, Mist Aux Pnl OFF

J49 — 120 V Fiber Light and Wheel — **J47**

J29 — J9 Black AC

J39 — J2 with Pump 1 Low

Spa Light 12 V — **J37**

Jumper Key

J29 . . . . Jumper on Pin 1 and 2 will power J9-pin 1 (Mist) at 12 Volts AC.
Jumper on Pin 2 and 3 will power J9-pin 1 (Mist) at 120 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 1 (Spa Light) at 120 Volts AC.
Jumper on Pin 2 and 3 will power one leg of J10-pin 1 (Spa Light) at 12 Volts AC.
Note: W9 controls voltage on the return line of J10-pin 2 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 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.

J49 . . . . Jumper on Pin 2 and 3 will power J8 pin 1 (Fiber Optic Wheel) at 120 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.

DIP Switch Definitions

DIP Switch Key

A 1 . . . . .Test Mode (normally Off)
A2 and A 3 . . . . .See **Figure 1** to control amp draw requirements
A 4 . . . . .In "ON" position, displays time in 24 hours (military time)
. . . . .In "OFF" position, displays 12 hour time
A 5 . . . . .In "ON" position, displays temperature in Celsius
. . . . .In "OFF" position, displays temperature in Fahrenheit
A 6 . . . . .In "ON" position, Equipment timeout 30 min (4 hrs for Pump 1-Low)
. . . . .In "OFF" position, Equipment timeout 15 min (2 hrs for Pump 1-Low)
A 7 . . . . .In "ON" position, Cleanup Cycle – 30 min after spa use/timeout, P1-Low & Ozone run for 1 hour.
. . . . .In "OFF" position, NO Cleanup Cycle
A 8 . . . . .In "ON" position, Ozone suppressed for 1 hour after pump or blower button press.
. . . . In "OFF" position, NO Ozone suppression
A9 and A 10 . . . .See **Figure 2** for Circ Pump Behavior settings
A 11 . . . . .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
A 12 . . . . .Persistent Memory Reset (used when the spa is powering up)

B 1 . . . . In "ON" position, single-speed Pump 2
. . . . In "OFF" position, two-speed Pump 2
B2 and B 3 . . . . .See **Figure 3**
B 4 . . . . See **Figure 4** for Fiber Optic and Color wheel control
B 5 . . . . .Pump 4 enable when On. Jets 4 replaces Blower on Aux panel.
B 6 . . . . In "ON" position, Alternate Panel layout
(ML900 scrunching enabled ML550 / 700 Jets 3 replaces Blower)
. . . . In "OFF" position, Normal Panel layout
B 7 . . . . In "ON" position, Spa Light operation is On/Off
. . . . In "OFF" position, Spa Light operation is Dimmable
B 8 . . . . See **Figure 4** for Spa Light Enable
B 9 . . . . In "ON" position, single-speed Pump 3
. . . . In "OFF" position, two-speed Pump 3
B 10 . . . . In "ON" position, Pump 3 enabled (Jets 3
replaces Light button on Aux panel)
. . . . In "OFF" position, Pump 3 disabled
B 11 . . . . In "ON" position, Mister enabled – B5 must be OFF
. . . . In "OFF" position, Mister disabled
B 12 . . . . In "ON" position, Mister or Option replaces Blower
button on Aux panels – B5 or B11 is ON
. . . . In "OFF" position, no button replacement on aux panels

A9	A10	Circ Pump Behavior
OFF	OFF	No Circ Pump
ON	OFF	24 Hr
OFF	ON	24 Hr w/3° Shut-Off
ON	ON	Acts like P1 low (Filter Cycles, Polls)

Figure 2

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

Figure 1

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

Figure 3

	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

Figure 4

Ozone Connections

First, configure the EL Circuit Board to deliver the desired voltage to the on-board connector (J4). Connect the W13 wire to either White AC (120V) or Red AC (240V) to set the voltage.
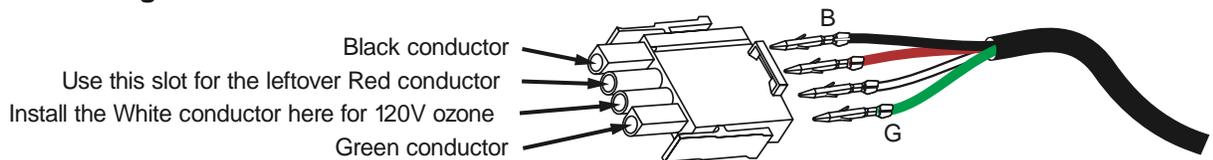
The pin next to the bottom (ground) pin of J4 is fed by W13 and sets the voltage in the connector.

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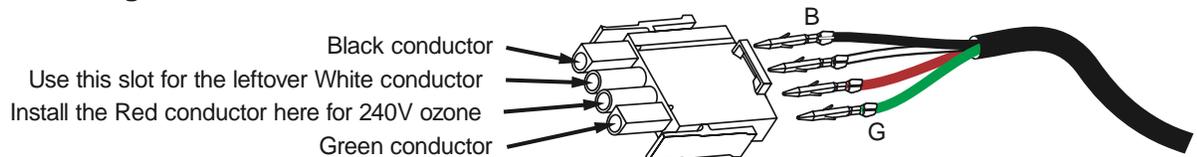
If a 240V ozone generator is required, be sure the red wire in the ozone cord is positioned in the connector next to the green ground wire as described below.

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.
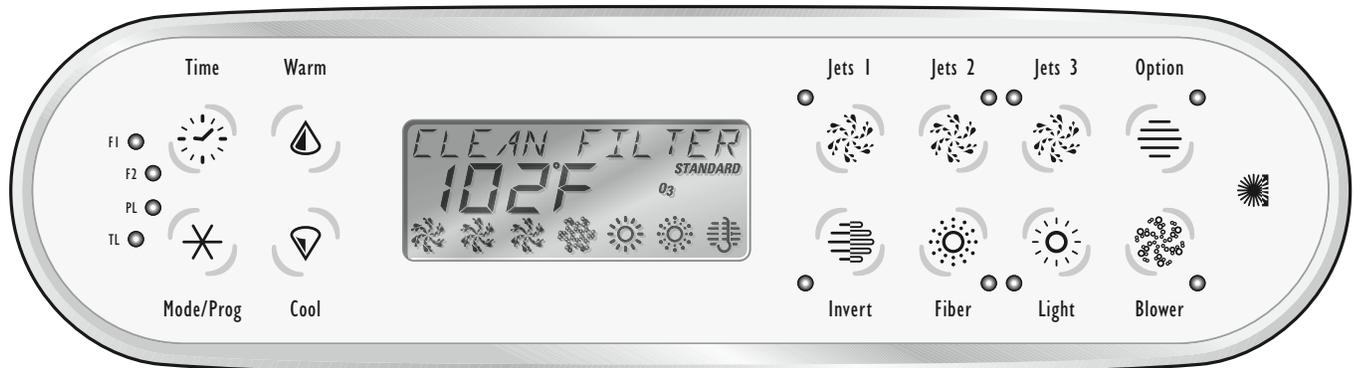
Ozone connector configuration for 120V 60Hz

Black conductor
Use this slot for the leftover Red conductor
Install the White conductor here for 120V ozone
Green conductor

B
G

Ozone connector configuration for 240V 60Hz

Black conductor
Use this slot for the leftover White conductor
Install the Red conductor here for 240V ozone
Green conductor

B
G

Panel Configuration

Time Warm   Jets 1 Jets 2 Jets 3 Option

F1
F2   CLEAN FILTER
PL   102°F   STANDARD
TL   O₃

Mode/Prog Cool   Invert Fiber Light Blower

ML 900
PN 52654

Time Warm   Light Blower

F1
F2   102°F   STANDARD
PL   O₃
TL   SET TEMP PANEL LOCK

Prog/Mode Cool   Jets 1 Jets 2
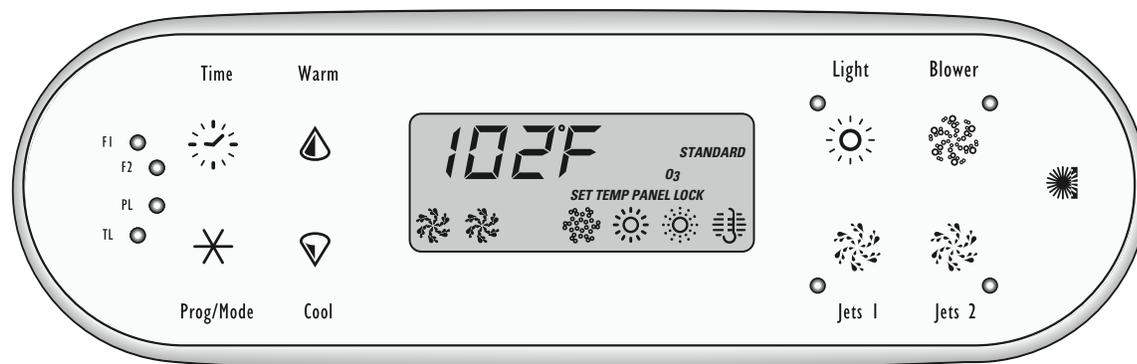
ML 700
PN 53649

Auxiliary panels are available in the following configurations:

Infrared Remote (Dolphin) which has a separate connector on the board.

4-Button
2-Button
1-Button

Configuration of the 4-Button and 2-Button Aux Panels can be done for custom applications.

1-button Aux panels are available in 4 different versions.

There are four Aux Panel connectors on the board.

Panel "Scrunching" on the ML 900 (requires custom panel overlays)

With DIP switch B6, unused buttons on an ML 900 can be "scrunched" in a custom configuration or the unused positions can be left blank.

Scrunching moves the buttons in a counter-clockwise direction from the bottom row to the top row, on the right side of the display. The result is that all missing buttons or gaps appear on the bottom row, just to the right of the display.

Note: Some button positions MUST be used in order to perform certain functions. For instance, the Jets 2 button and the Blower button are used in certain button press combinations, and need to be available to a user, even if they are labeled with a different name.

See reference cards for details.