

GL8000 Mach 3 Hot Sheet

Balboa Instruments System PN 53859-01

System Model # GL8-GL8000M3-RCA-3.0K

Software Version # 26

EPN # 2009

Base PCBA - PN 53860-01

PCB GL8000 – PN 22960 Rev B

Base Panels

ML900 – PN 52654



Basic System Features and Functions

Power Requirements

- 230VAC, 1~, 16A or 32A, 50Hz, or 230VAC (Line to Neutral), 3~, 16A, 50Hz

System Outputs (As Configured)

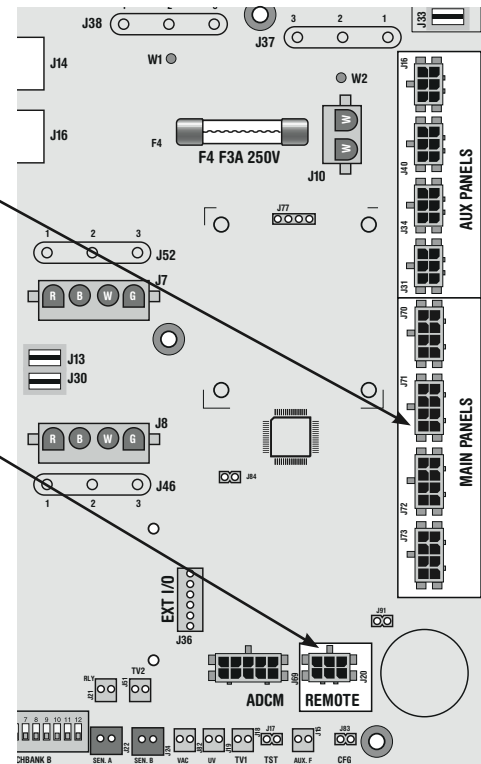
- 230V Pump 1, 2-Speed
- 230V Pump 2, 2-Speed
- 230V Pump 3, 2-Speed
- 230V Blower
- 230V Ozone
- 230V Fiber-optic Light
- 10V Spa Light
- 230V Audio\Visual (Stereo)
- 230V 3.0kW Heater

Additional Outputs (Disabled by Default)

- 230V Circ Pump
- 230V Mister

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 J10
- FiberEFX Lighting
Connects to Spa Light terminal J10
- Stereo System
Connects to A.V. terminal J5



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).

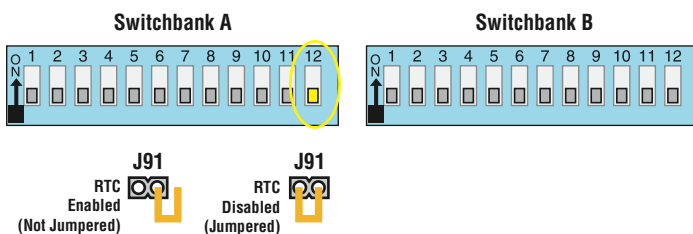
To reset Persistent Memory:

- Power down.
- Set A12 ON.
- Power up.
- Wait until “Pr” or “PRIMING MODE” is displayed on your panel*.
- 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.



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.

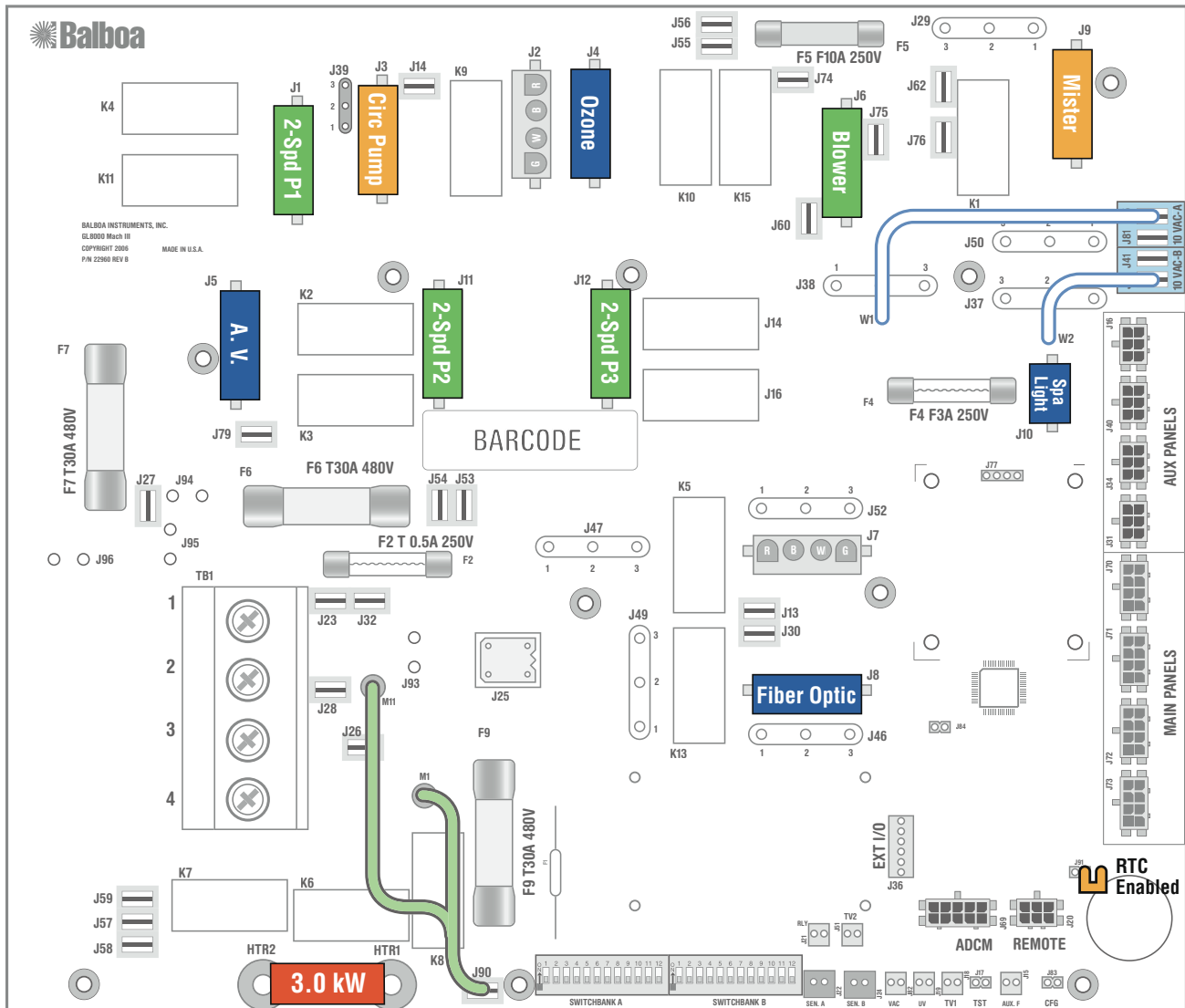
Power Up Display Sequence

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 of these numbers is the software version, which should match the version shown on the front page of this Hot Sheet. 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:
- “3-6” (indicating the system is configured for a heater between 3 and 6 kW) or “1-3” (indicating the system is configured for a heater effectively* between 1 and 3 kW). “3-6” should appear for all EL models running at 240V. “1-3” should appear for all EL models running at 120V, as well as all GL models. (*A heater which is rated at 4 kW at 240V will function as a 1 kW heater at 120V.)
- 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 panel on your system for information about how the spa operates from this point on.





Wiring Configuration



Wiring Color Key

-  Neutral (Common) AC Connections
-  Special AC Connections
-  Line AC Connections
-  10 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

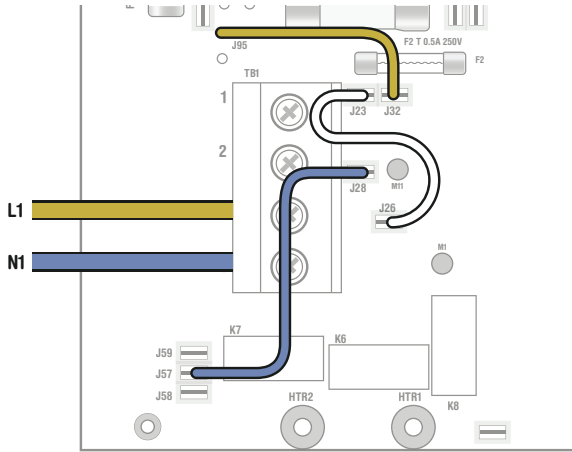
HiPot Testing Note:

Disconnect slip terminal with green wires from J90 prior to performing HiPot test. Failure to disconnect will cause a false failure of the test.

Reconnect terminal to J90 after successful completion of HiPot test.

PCB Revision	History
B	Production Release

Electrical Service Configuration Options



Single Service (1 x 16 Amp or 1 x 32 Amp)

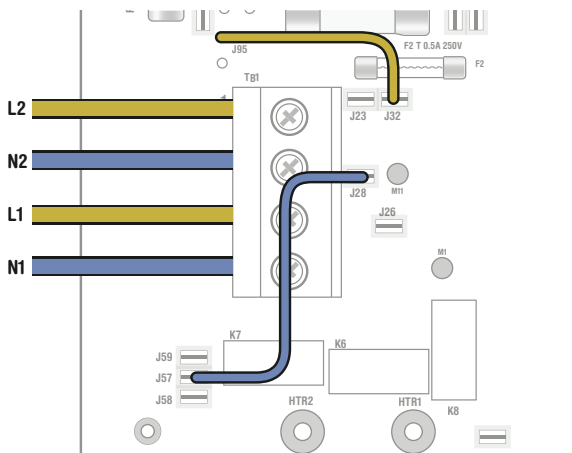
This option is configured and shipped as the default.

For 1 x 32 Amp Service:

DIP Switch A2 and A3 can be ON

For 1 x 16 Amp Service:

DIP Switch A2 and A3 must be OFF

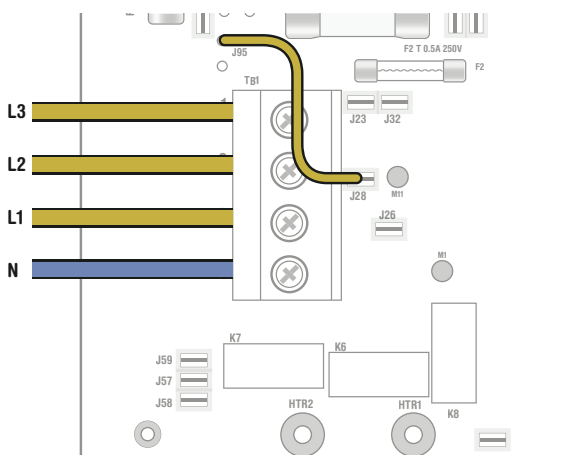


Dual Service Option (2 x 16 Amp)

Completely remove the white wire from J26 and J32.

Note: J32 and J23 are electrically identical. The white wire may be attached to either terminal before removal.

DIP Switch A2 and A3 must be ON



3-Phase Service Option

IMPORTANT - Service **MUST** include a neutral wire, with a line to neutral voltage of 230VAC.

Completely remove the white wire from J26 and J32.

Note: J32 and J23 are electrically identical. The white wire may be attached to either of these terminals before removal.

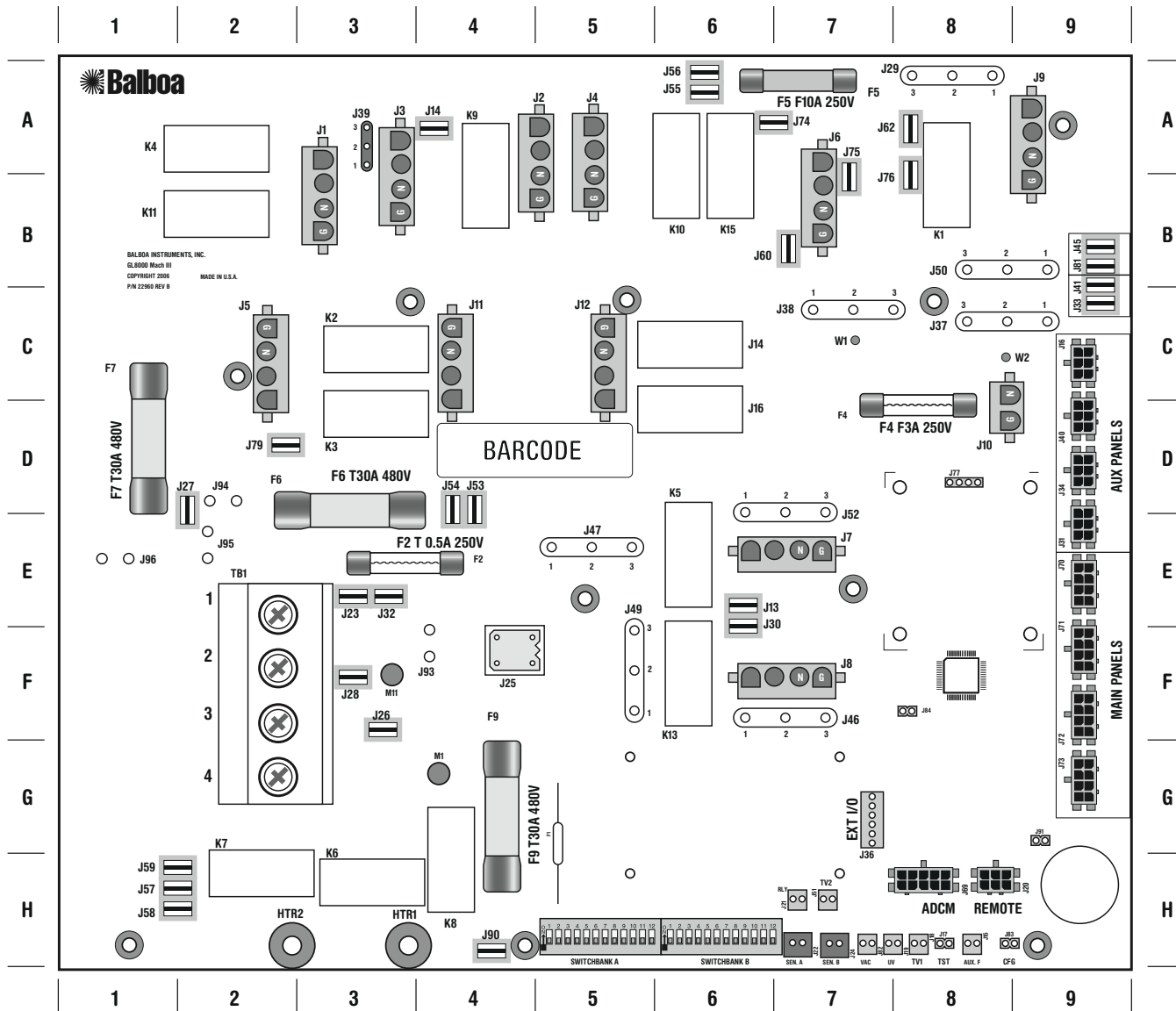
Completely remove the blue wire from J28 and J57.

Note: J57, J58 and J59 are electrically identical. The blue wire may be attached to any of these terminals before removal.

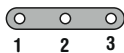
Move the brown wire from J23 or J32 to J28.

DIP Switch A2 and A3 must be ON

Configuration Options



Soldered-In Jumper Configuration



Locations 1 & 2 determine 10VAC, Locations 2 & 3 determine 230VAC.

Soldered-In Jumper Application

- | | |
|-----------|---|
| J29 + J50 | Determine Voltage for J9 (Mist) |
| J37 + J38 | Determine Voltage for J10 (Spa Light)
Light Voltage is determined with W1 & W2 |
| J47 + J52 | Determine Voltage for J7 (Misc.) |
| J49 + J46 | Determine Voltage for J8 (Fiber Optic) |

Quadrants

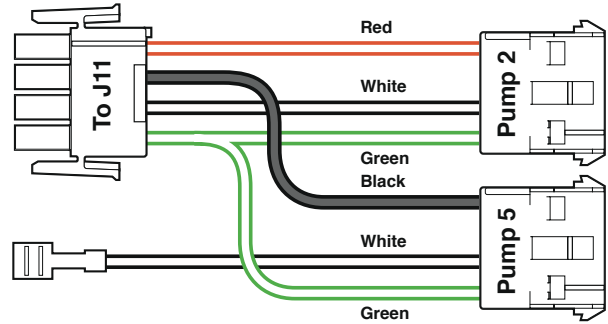
- | |
|----------|
| 8-A, 8-B |
| Unused |
| 5-E, 7-E |
| 5-F, 7-F |

Expander Options

Output Features

J1	2-Speed Pump 1	3-A
J2	Output tied to Pump 1 Low – OR output tied to Circ Pump (Set with J39)	4-A
J3	Circ Pump	3-A
J4	Ozone	5-A
J5	A.V.	2-C
J6	Blower	7-B
J10	Spa Light (10V or 230V)	8-C
J7	Misc (Separate Relay 10V or 230V)	7-E
J8	Fiber Optic (10V or 230V)	7-F
J9	Mister (10V or 230V)	9-A
J11	2-Speed Pump 2	4-C
J12	2-Speed Pump 3	5-C

Quadrant



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 at J59.

PS-34

PN 25093

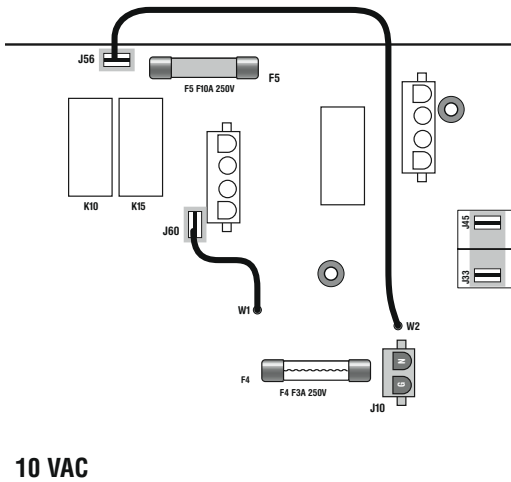
Used to split the output from the Pump 3 Connector (J12) into a single-speed Pump 3 and single-speed Pump 4. White wire quick connect goes to Main PCB at J58.

ELS-VALVE

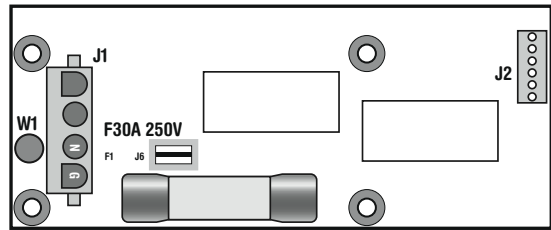
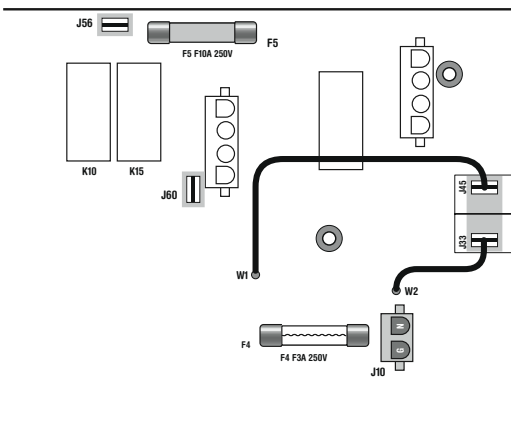
PN 22934

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

230 VAC Spa Light Configuration



10 VAC Spa Light Configuration

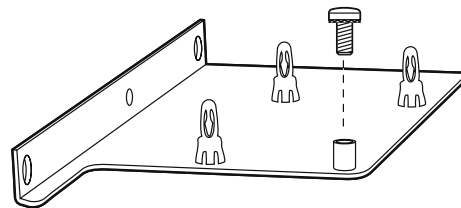


X-P632 CE

PN 55026

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-G).

- J6 on X-P632 CE connects directly to Line AC Use J27, J32, or J26 on the main GL8000 PCBA, depending on AC Service Configuration.

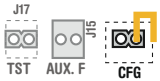


X-Mount M

PN 53914

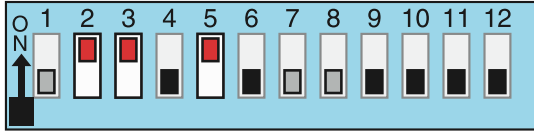
Used for mounting any Expander Board in a metal enclosure. Bracket attaches to heater mounting straps.

DIP Switches and Jumpers



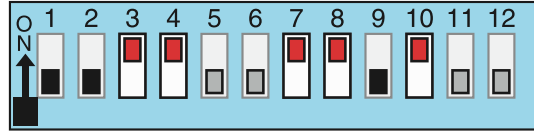
When the Logic Jumper is not installed on J83 (CFG),
DIP Switch Settings are enabled.
DIP Switches will then operate as shown below.

Switchbank A



- A1, Test Mode OFF
- A2/A3, Four H.S. Pumps w/Heater
- A4, 12 Hour Time
- A5, Degrees C
- A6, Short Timeouts
- A7, Cleanup Cycle OFF
- A8, 1Hr O₃ Suppress OFF
- A9/A10, No Circ Pump
- A11, O₃ w/ P1 Low and P1 is 2-Spd
- A12, Memory Retained

Switchbank B



- B1, Pump 2 2-Speed
- B2, N/A
- B3, Blower Enabled
- B4, ON See Table 3
- B5, Option Disabled
- B6, Scrunching OFF
- B7, Spa Light On/Off
- B8, ON See Table 3
- B9, Pump 3 2-speed
- B10, Pump 3 Enabled
- B11, Mister Disabled
- B12, Aux Panel Normal

DIP Switch Key

- A1 Test Mode (normally Off)
- A2 and A3 Control amp draw requirements (See Table 1)
- 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 and 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 (See Table 2)
- A11 In "ON" position (**non-circ mode operation**) Pump 1 is two-speed, Ozone is ON in Filter and 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)

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

Table 1

A9	A10	Circ Pump Behavior
OFF	OFF	No Circ Pump or Circ Pump not plumbed w/heater
ON	OFF	24 Hours
OFF	ON	24 Hr w/3°F Shut-Off
ON	ON	Acts like Pump 1-Low (Filter Cycles, Polls)

Table 2

DIP Switch Definitions

DIP Switch Key

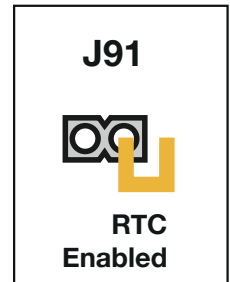
- B1 In "ON" position, single-speed Pump 2
 In "OFF" position, two-speed Pump 2
- B2 N/A
- B3 In "ON" position, Blower enabled
 In "OFF" position, Blower disabled
- B4 See **Table 3** for Fiber Optic and Color wheel control
- B5 In "ON" position, Option enabled - B11 must be OFF
 In "OFF" position, Option disabled
- 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
- B8 See **Table 3** for Spa Light Enable
- 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 – B5 must be OFF
 In "OFF" position, Mister disabled
- B12 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

	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

Table 3

Jumper Key

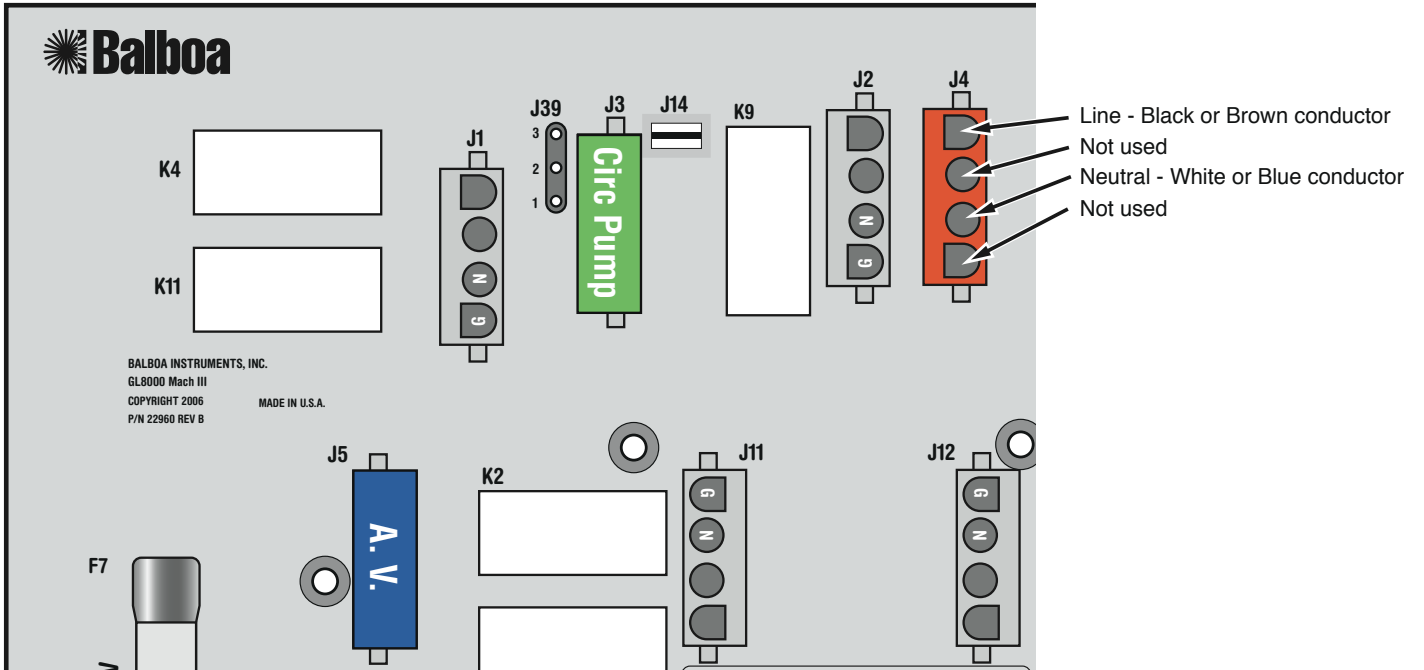
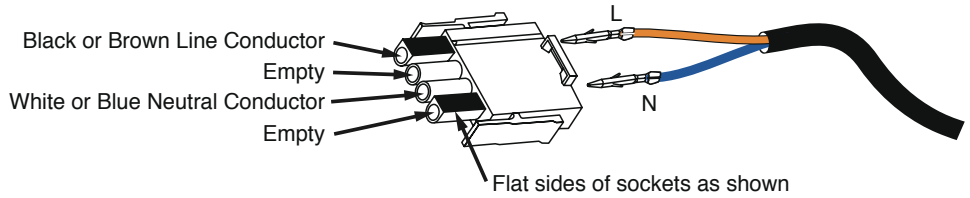
- J91 Jumper on 1 Pin only enables Real Time Clock function, for use with time capable panels.
 Jumper on Pin 1 and 2 will disable RTC function, for use with non-time capable panels.



Ozone Connections

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 230VAC 50Hz:



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)