

MGS504DZ Hot Sheet

May Manufacturing "Island" System PN 55165-03

System Model # GS5-MGS504DZ-RCA-2.0K

Software Version # 42

EPN # 2676

Base PCBA - PN 55166-02

PCB GS500Z - PN 22015 Rev B

Base Panels

MAY800D – PN 54538

MAY803D – PN 54695

Aux Panels

VX10 (Jets 1) – PN 55301

VX10 (Jets 2) – PN 55320

Additional parts included

Spa light cable assembly – PN 25098



System Revision History

System PN	EPN	Date	Requested By	Changes Made
55165	1997	01.29.2007	Customer	New system
55165-01	2325	04.04.2007	Customer	Minor updates
55165-02	2545	09.18.2007	Customer	Update to software v41
55165-02	2545	09.26.2007	Customer	Add MAY803D and Aux Panels
55165-02	2545	10.10.2007	Balboa	Update to Service Power notes
55165-03	2676	12.20.2007	Customer	Update software to v42
55165-03	2076	12.17.2008	Customer	Update 3 phase wiring on Setup 7.
55165-03	2076	09.18.2009	BWG	Correct typos on auxiliary panel text

Basic System Features and Functions

Any time you change a DIP Switch, other than A1, you must reset Persistent Memory for your new DIP Switch Settings changes to take effect. If you do not reset Persistent Memory, your system may function improperly.

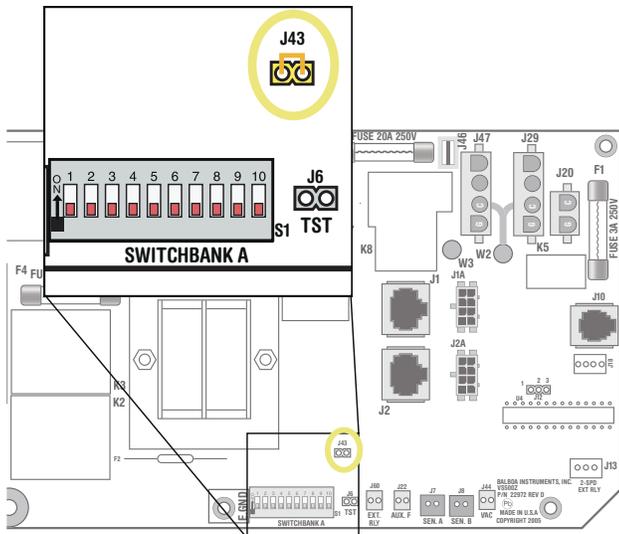
To reset Persistent Memory:

- Power down by disconnecting power source from spa.
- Put a jumper across J43, covering both pins. (See illustration below)
- Power up by connecting power source to spa.
- Wait until “P” is displayed on your panel.
- Power down again.
- Remove jumper from J43 (May also move to cover 1 pin only)
- Power up again.

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 the filter settings, the set temperature, and the heat mode.

Persistent Memory is not used for Time of Day. Only models with a Serial Deluxe panel installed (VS5xxDZ and GS5xxDZ) can display the time. However, during power loss to the spa, the system will lose the correct time, and reset to 12:00 PM when power is restored.



J43 on VS5xxZ and VS300 Series Main Board Shown.
J43 on GS5xxZ Series is located in approximately the same position.

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 67 38, that is a VS511SZ at version 38.
- Displayed next is: “24” (indicating the system is configured for a heater between 3 and 6 kW) or “12” (indicating the system is configured for a heater effectively* between 1 and 3 kW). “24” should appear for all VS models running at 240VAC. “12” should appear for all VS models running at 120VAC, as well as all GS models. (*A heater which is rated at 4 kW at 240VAC will function as a 1 kW heater at 120VAC.)
- “P” will appear to signal the start of Priming Mode.

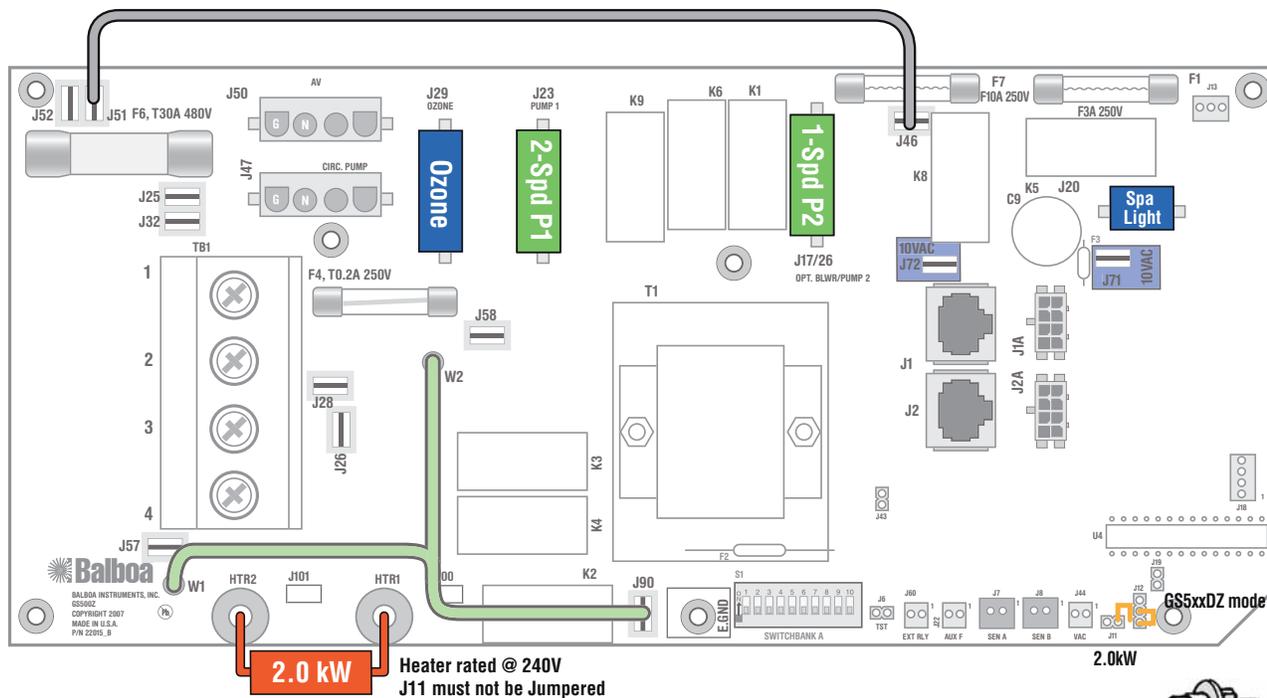
At this point, the power up sequence is complete. Refer to the Reference Card for the VS or GS System model of your spa for information about how the spa operates from this point on, including how to adjust the Time of Day if using a Serial Deluxe style panel.

Wiring Configuration and DIP Settings

Setup 1 (As Manufactured)

- 230V Pump 1, 2-Speed
- 230V Ozone
- 230V Pump 2, 1-Speed
- 2.0kW Heater
- 10V Spa Light
- MAY800D Main Panel

HiPot Testing Note:
 Disconnect slip terminal with green wires from J90 prior to performing HiPot test. Failure to disconnect may cause a false failure of the test.
 Reconnect terminal to J90 after successful completion of HiPot test.



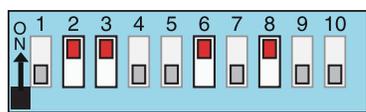
PN 25098 to be bundled loose inside system box by Balboa facility before shipping.



WARNING: Main Power to system should be turned OFF BEFORE adjusting DIP switches.
WARNING: Persistent Memory (J43) must be RESET to allow new DIP switch settings to take effect. (See Persistent Memory page)

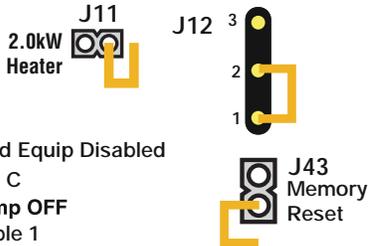
SSID #
 152
 92
 42

Switchbank A



- | | |
|-------------------------|------------------------------|
| A1, Test Mode OFF | A6, 50 Hz |
| A2, See Table 1 | A7, Off-board Equip Disabled |
| A3, J17/26 Pump Enabled | A8, Degrees C |
| A4, Aux Freeze | A9, Circ Pump OFF |
| A5, N/A | A10, See Table 1 |

GS503/504/514DZ Software



Wiring Color Key

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

Panel Button Assignments

- | | |
|-------------|----------|
| 1=Time | 5=Light |
| 2=Mode/Prog | 6=Pump 1 |
| 3=Temp Up | 7=Pump 2 |
| 4=Temp Down | 8=Unused |

Panel Button Positions

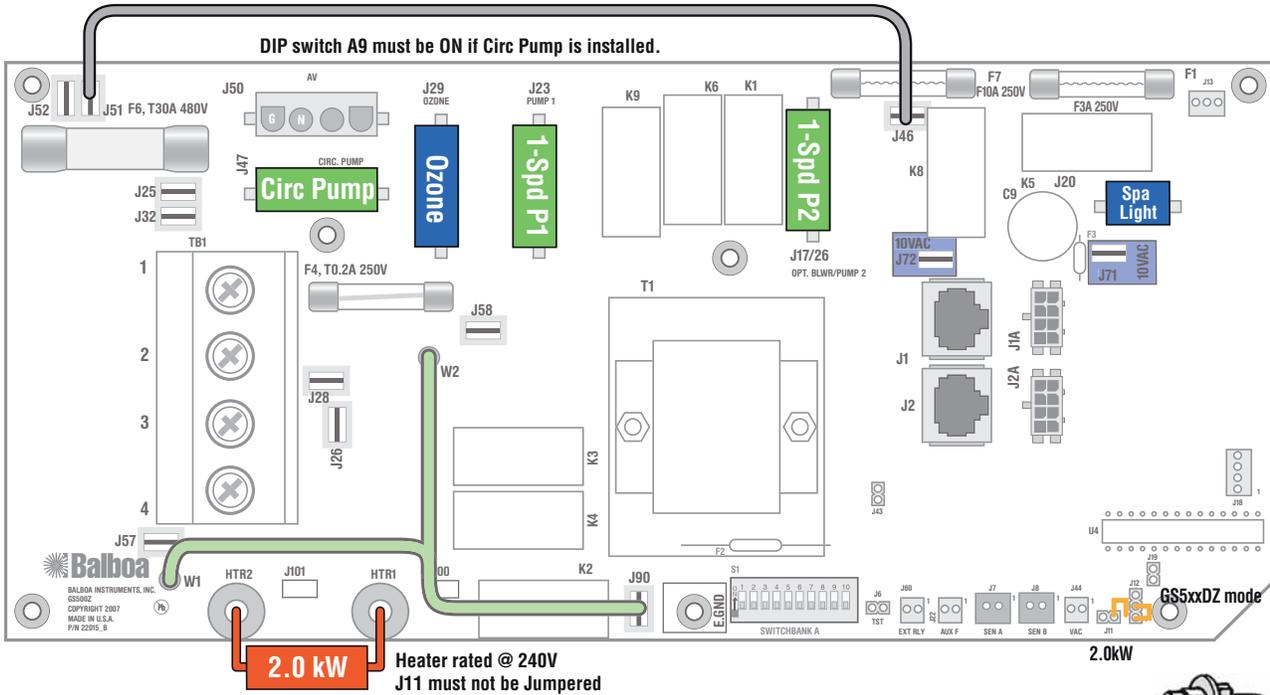


Wiring Configuration and DIP Settings

Setup 2

- 230V Pump 1, 1-Speed
- 230V Pump 2, 1-Speed
- 230V Circ Pump
- 10V Spa Light
- 230V Ozone
- 2.0kW Heater
- MAY800D Main Panel

HiPot Testing Note:
 Disconnect slip terminal with green wires from J90 prior to performing HiPot test. Failure to disconnect may cause a false failure of the test.
 Reconnect terminal to J90 after successful completion of HiPot test.



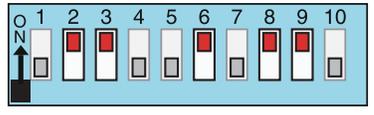
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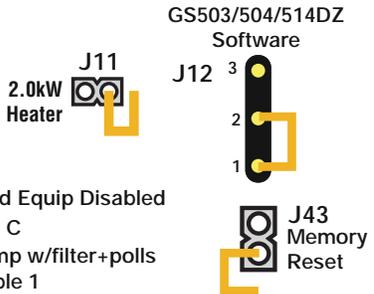
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SSID #
 152
 92
 42

Switchbank A



- A1, Test Mode OFF
- A2, See Table 1
- A3, J17/26 Pump Enabled
- A4, Aux Freeze
- A5, N/A
- A6, 50 Hz
- A7, Off-board Equip Disabled
- A8, Degrees C
- A9, Circ Pump w/filter+polls
- A10, See Table 1



Wiring Color Key

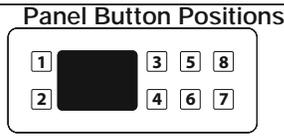
- Neutral (Common) AC Connections
- Special AC Connections
- Line AC Connections
- 10 Volt Connections
- Relay Control Wires

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

- Panel Button Assignments**
- 1=Time
 - 2=Mode/Prog
 - 3=Temp Up
 - 4=Temp Down
 - 5=Light
 - 6=Pump 1
 - 7=Pump 2
 - 8=Unused



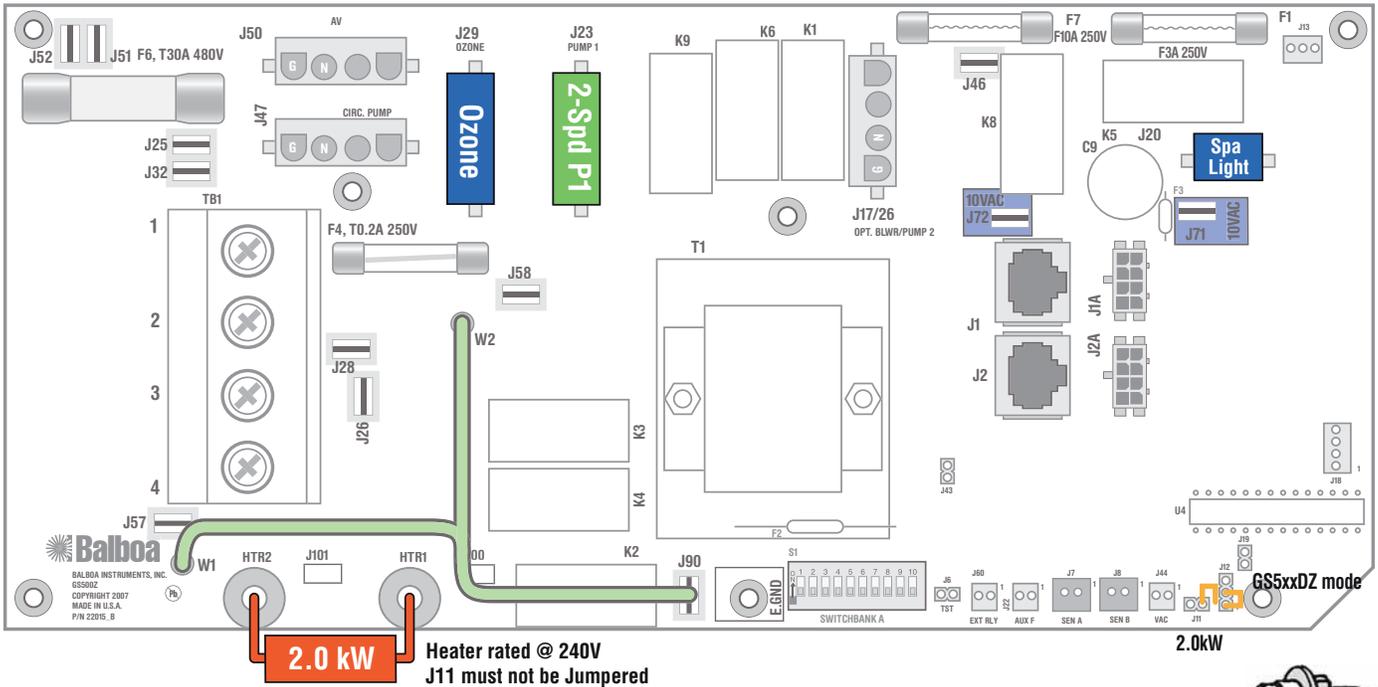
Wiring Configuration and DIP Settings

Setup 3

- 230V Pump 1, 2-Speed
- 10V Spa Light
- 230V Ozone
- 2.0kW Heater
- MAY800D Main Panel

HiPot Testing Note:

Disconnect slip terminal with green wires from J90 prior to performing HiPot test. Failure to disconnect may cause a false failure of the test. Reconnect terminal to J90 after successful completion of HiPot test.



PN 25098 to be bundled loose inside system box by Balboa facility before shipping.



WARNING: Main Power to system should be turned OFF BEFORE adjusting DIP switches.
WARNING: Persistent Memory (J43) must be RESET to allow new DIP switch settings to take effect. (See Persistent Memory page)

SSID #

152
92
42

Switchbank A

A1, Test Mode OFF A6, 50 Hz
 A2, See Table 1 A7, Off-board Equip Disabled
 A3, J17/26 Pump Disabled A8, Degrees C
 A4, Aux Freeze A9, Circ Pump OFF
 A5, N/A A10, See Table 1

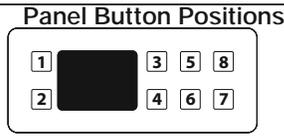
GS503/504/514DZ Software

J12 3
2
1

J43 Memory Reset

J43 2
1

- Panel Button Assignments**
- 1=Time
 - 2=Mode/Prog
 - 3=Temp Up
 - 4=Temp Down
 - 5=Light
 - 6=Pump 1
 - 7=Unused
 - 8=Unused



Wiring Color Key

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

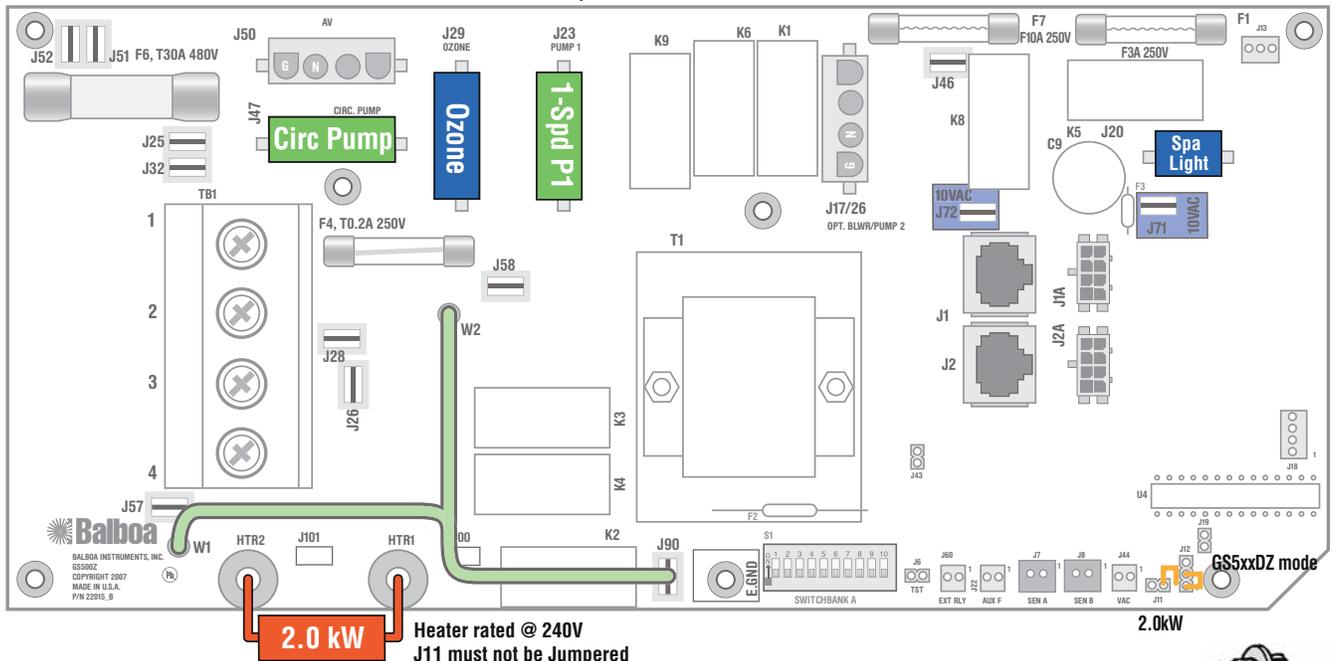
Wiring Configuration and DIP Settings

Setup 4

- 230V Pump 1, 1-Speed
- 230V Ozone
- 230V Circ Pump
- 2.0kW Heater
- 10V Spa Light
- MAY800D Main Panel

HiPot Testing Note:
 Disconnect slip terminal with green wires from J90 prior to performing HiPot test. Failure to disconnect may cause a false failure of the test.
 Reconnect terminal to J90 after successful completion of HiPot test.

DIP switch A9 must be ON if Circ Pump is installed.

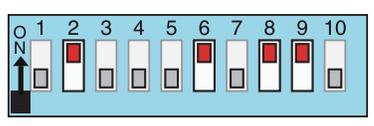


PN 25098 to be bundled loose inside system box by Balboa facility before shipping.

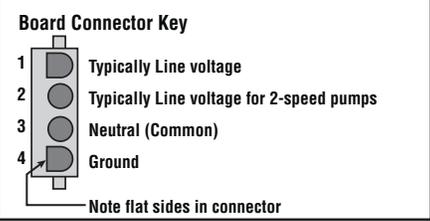
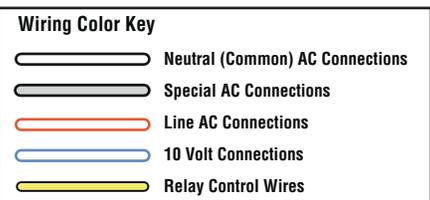
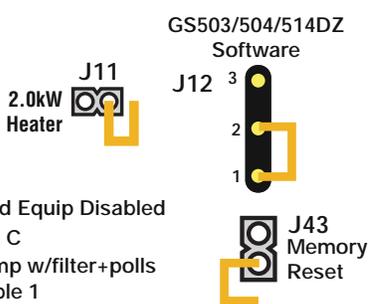
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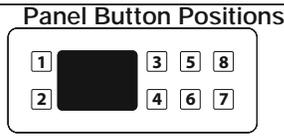
Switchbank A



- | | |
|--------------------------|------------------------------|
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| A2, See Table 1 | A7, Off-board Equip Disabled |
| A3, J17/26 Pump Disabled | A8, Degrees C |
| A4, Aux Freeze | A9, Circ Pump w/filter+polls |
| A5, N/A | A10, See Table 1 |



- Panel Button Assignments**
- | | |
|-------------|----------|
| 1=Time | 5=Light |
| 2=Mode/Prog | 6=Pump 1 |
| 3=Temp Up | 7=Unused |
| 4=Temp Down | 8=Unused |

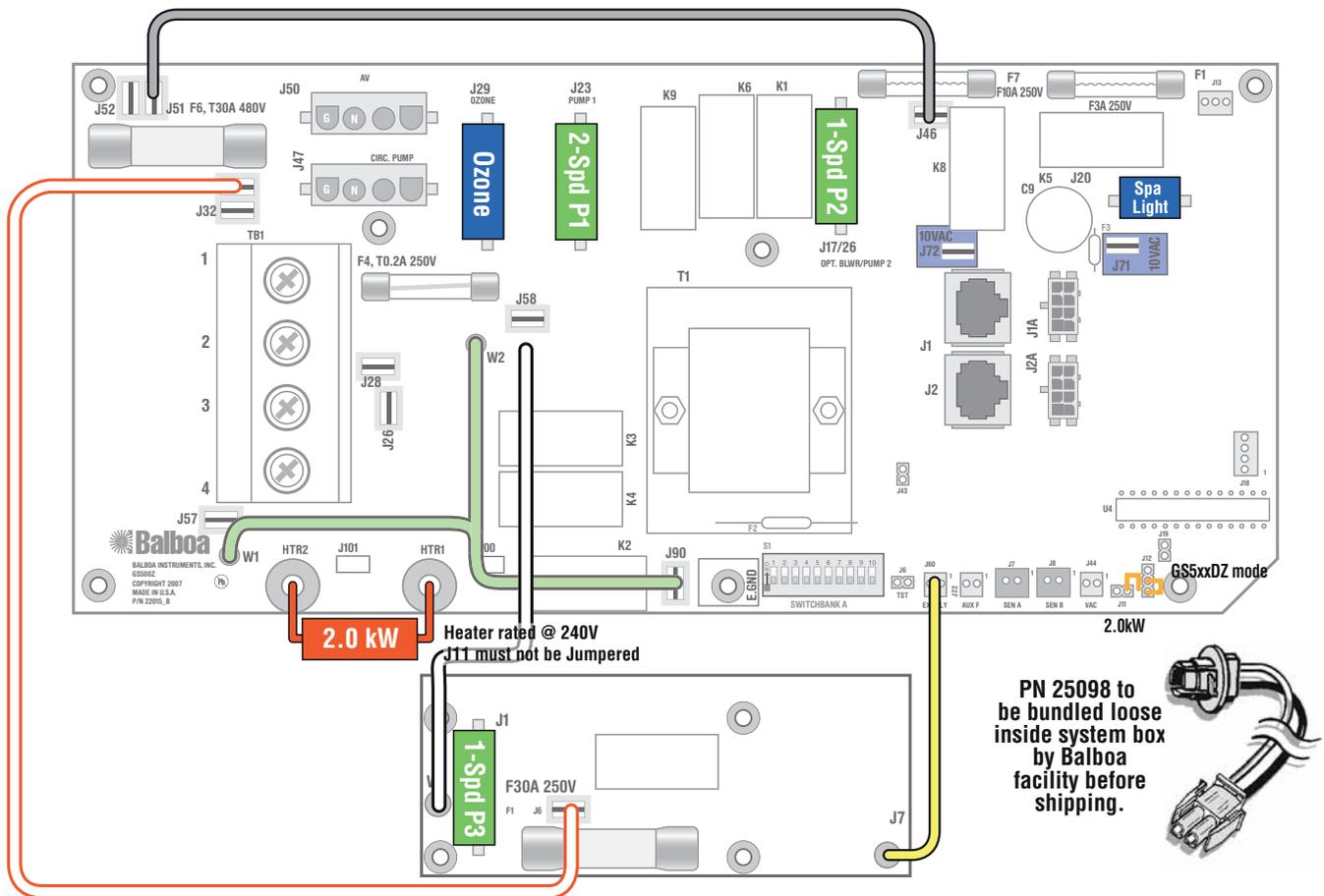


Wiring Configuration and DIP Settings

Setup 5

- 230V Pump 1, 2-Speed
- 230V Pump 2, 1-Speed
- 230V Pump 3, 1-Speed
- 10V Spa Light
- 230V Ozone
- 2.0kW Heater
- MAY800D Main Panel

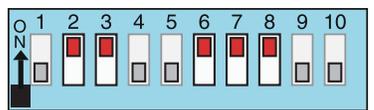
HiPot Testing Note:
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 Reconnect terminal to J90 after successful completion of HiPot test.



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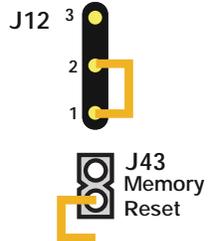
SSID #
 152
 92
 42

Switchbank A



- | | |
|-------------------------|-----------------------------|
| A1, Test Mode OFF | A6, 50 Hz |
| A2, See Table 1 | A7, Off-board Equip Enabled |
| A3, J17/26 Pump Enabled | A8, Degrees C |
| A4, Aux Freeze | A9, Circ Pump OFF |
| A5, N/A | A10, See Table 1 |

GS503/504/514DZ Software



Wiring Color Key

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

Panel Button Assignments

- 1=Time
- 2=Mode/Prog
- 3=Temp Up
- 4=Temp Down
- 5=Light
- 6=Pump 1
- 7=Pump 2
- 8=Pump 3

Panel Button Positions

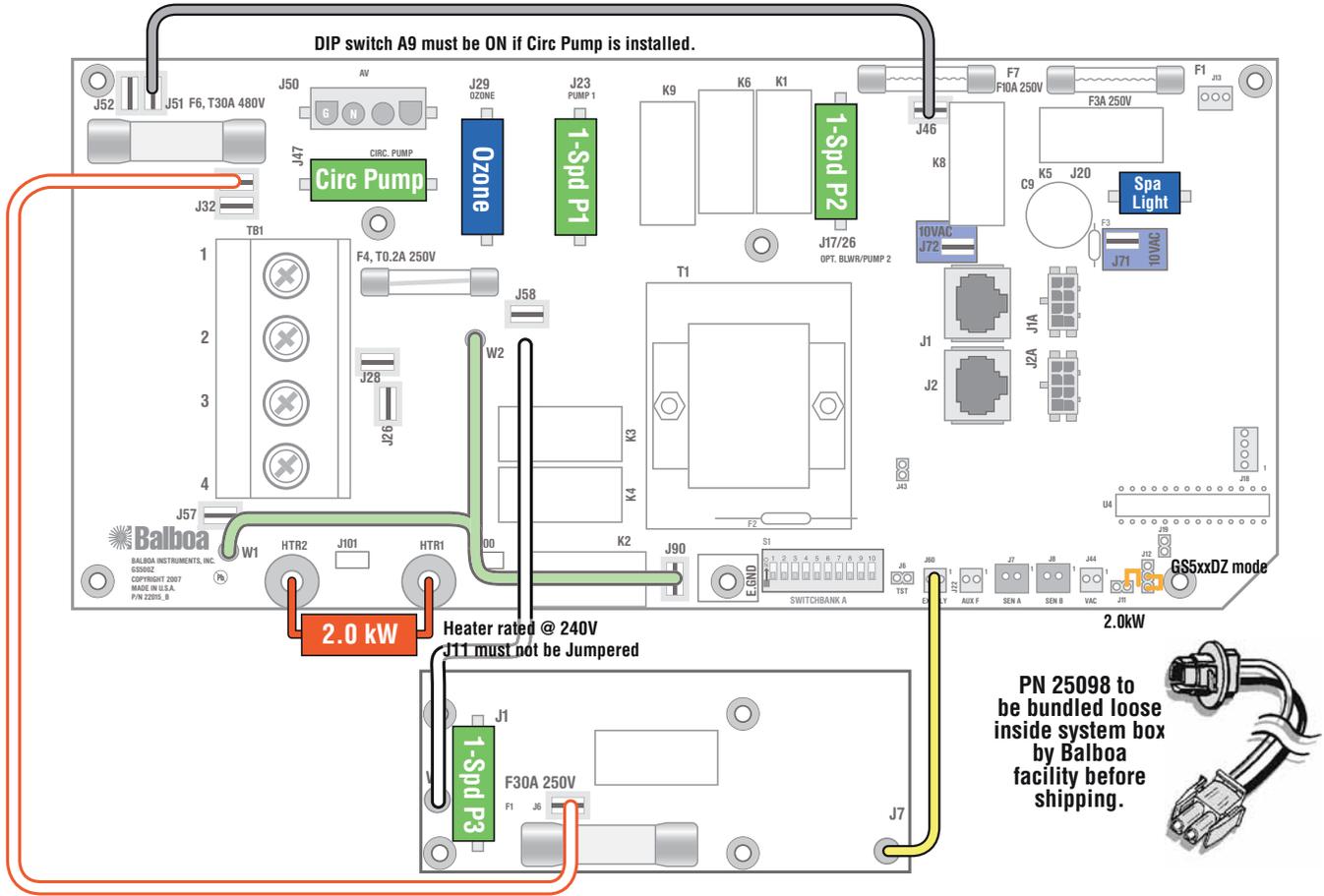


Wiring Configuration and DIP Settings

Setup 6

- 230V Pump 1, 1-Speed
- 230V Pump 2, 1-Speed
- 230V Pump 3, 1-Speed
- 230V Circ Pump
- 10V Spa Light
- 230V Ozone
- 2.0kW Heater
- MAY800D Main Panel

HiPot Testing Note:
 Disconnect slip terminal with green wires from J90 prior to performing HiPot test. Failure to disconnect may cause a false failure of the test.
 Reconnect terminal to J90 after successful completion of HiPot test.

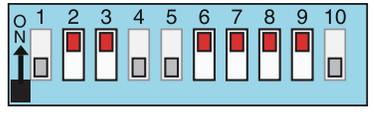


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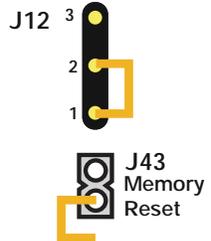
SSID #
 152
 92
 42

Switchbank A



- A1, Test Mode OFF
- A2, See Table 1
- A3, J17/26 Pump Enabled
- A4, Aux Freeze
- A5, N/A
- A6, 50 Hz
- A7, Off-board Equip Enabled
- A8, Degrees C
- A9, Circ Pump w/filter+polls
- A10, See Table 1

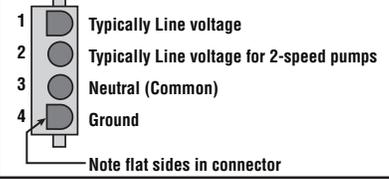
GS503/504/514DZ Software



Wiring Color Key

- Neutral (Common) AC Connections
- Special AC Connections
- Line AC Connections
- 10 Volt Connections
- Relay Control Wires

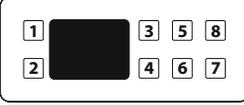
Board Connector Key



Panel Button Assignments

- 1=Time
- 2=Mode/Prog
- 3=Temp Up
- 4=Temp Down
- 5=Light
- 6=Pump 1
- 7=Pump 2
- 8=Pump 3

Panel Button Positions

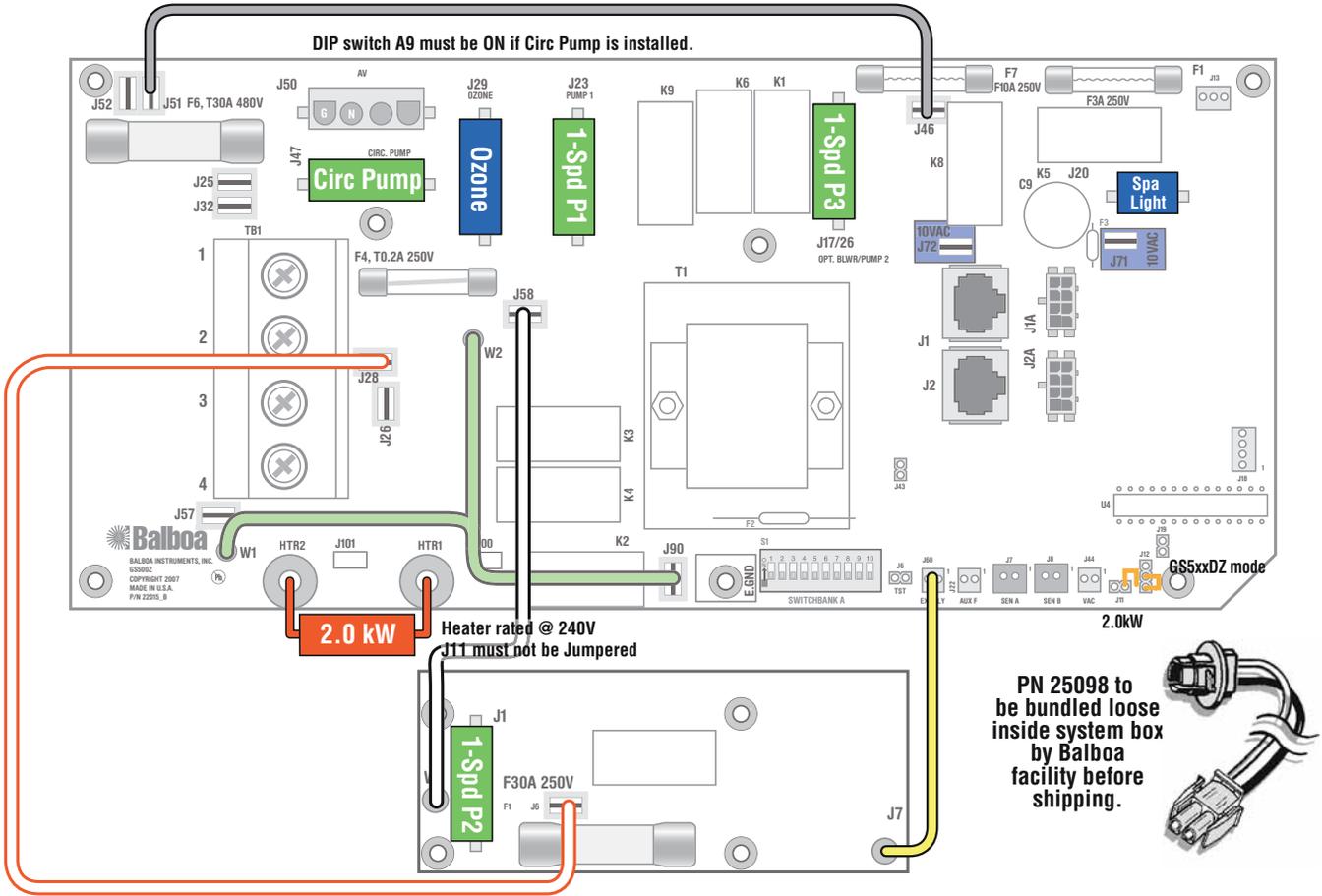


Wiring Configuration and DIP Settings

Setup 7 (3 Phase Connection)

- 230V Pump 1, 1-Speed
- 230V Pump 2, 1-Speed
- 230V Pump 3, 1-Speed
- 230V Circ Pump
- 10V Spa Light
- 230V Ozone
- 2.0kW Heater
- MAY800D Main Panel

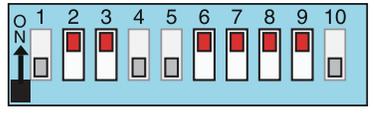
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 Reconnect terminal to J90 after successful completion of HiPot test.



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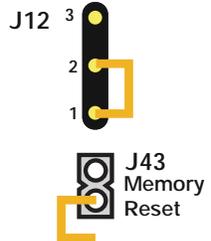
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Switchbank A



- | | |
|-------------------------|------------------------------|
| A1, Test Mode OFF | A6, 50 Hz |
| A2, See Table 1 | A7, Off-board Equip Enabled |
| A3, J17/26 Pump Enabled | A8, Degrees C |
| A4, Aux Freeze | A9, Circ Pump w/filter+polls |
| A5, N/A | A10, See Table 1 |

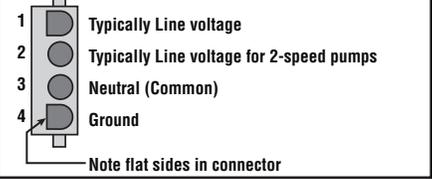
GS503/504/514DZ Software



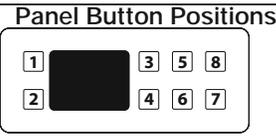
Wiring Color Key

- Neutral (Common) AC Connections
- Special AC Connections
- Line AC Connections
- 10 Volt Connections
- Relay Control Wires

Board Connector Key



- Panel Button Assignments**
- | | |
|-------------|----------|
| 1=Time | 5=Light |
| 2=Mode/Prog | 6=Pump 1 |
| 3=Temp Up | 7=Pump 3 |
| 4=Temp Down | 8=Pump 2 |



DIP Switches and Jumpers Definitions

SSID 152 92 42

Base Model GS503DZ-GS504DZ-GS514DZ

DIP Switch Key

- A1 Test Mode (normally OFF)
- A2+A10 Control amp draw requirements (See Table 1)
- A3 "ON" position: J17/26 pump enabled
"OFF" position: J17/26 pump disabled
- A4 Aux Freeze (must be OFF)
- A5 N/A
- A6 "ON" position: 50Hz operation
"OFF" position: 60Hz operation
- A7 "ON" position: off-board equipment enabled (requires expander board to be installed)
"OFF" position: off-board equipment disabled
- A8 "ON" position: temperature is displayed in degrees Celsius
"OFF" position: temperature is displayed in degrees Fahrenheit
- A9 "ON" position: Circ Pump acts like Pump 1 low-speed (filter cycles and polls), Ozone runs with Circ Pump
"OFF" position: no Circ Pump, Ozone runs with Pump 1-low during filter cycles only

Table 1 # of Hi-Speed Pumps/Blower Before Heat Disabled

A2	A10	
OFF	OFF	0
ON	OFF	1
OFF	ON	2
ON	ON	3

Jumper Key

- J11** If using 3kW or higher wattage heater, jumper can be set in either position, but may perform better on Pins 1 and 2. If using 2.5kW or lower wattage heater, jumper must be set on 1 Pin only.
- J12** **Factory set. DO NOT MOVE.**
Jumper must be on Pins 1 and 2 for GS51xZ/GS5xxSZ/GS5xxDZ software.
Jumper must be on Pins 2 and 3 for GS50xZ software.
- J43** When jumper is placed on 2 pins during power-up, system will reset persistent memory. Leave on 1 pin only to enable persistent memory feature.

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 hot sheet.

Panel Button Positions



Panel Button Assignments

- 1=Time
- 2=Mode/Prog
- 3=Temp Up
- 4=Temp Down
- 5=Light
- 6=Pump 1
- 7=J17/26 (when A3 is ON)
- 8=Exp. Board (when A7 is ON)

Aux Panel Information

Supports 2-button aux panel

VX20 6 7 When A3 is ON

VX20 6 8 When A3 is OFF

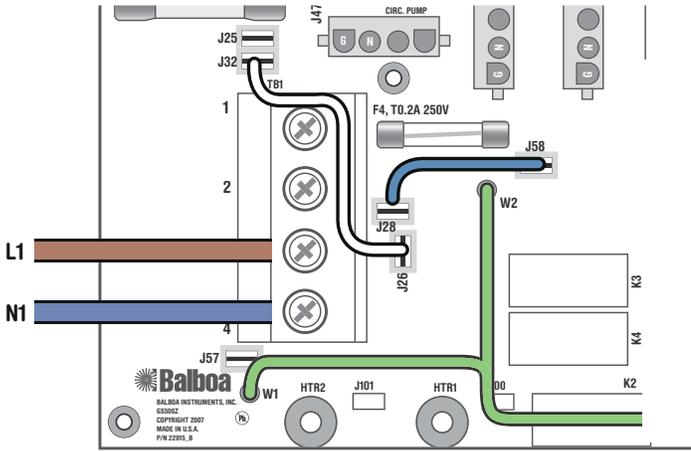
Supports 4-button aux panel

VX40D 6 7 8 5

Electrical Service Configuration Options

Systems with PCB Rev B Only

AS MANUFACTURED



Single Service, TN and TT Electrical Systems (1 x 16 Amp or 1 x 32 Amp)

3 Wires (1 Line + 1 Neutral + 1 Protective Earth)

Protective Earth wire (Green/Yellow) must be connected to system ground terminal as marked.

This option is configured and shipped as the default.

All equipment (pumps, blower, and heater) runs on service line L1.

Systems using only 1 DIP switch (A10) for heat disable:

For 1 x 16 Amp Service:

DIP Switch A10 must be ON.

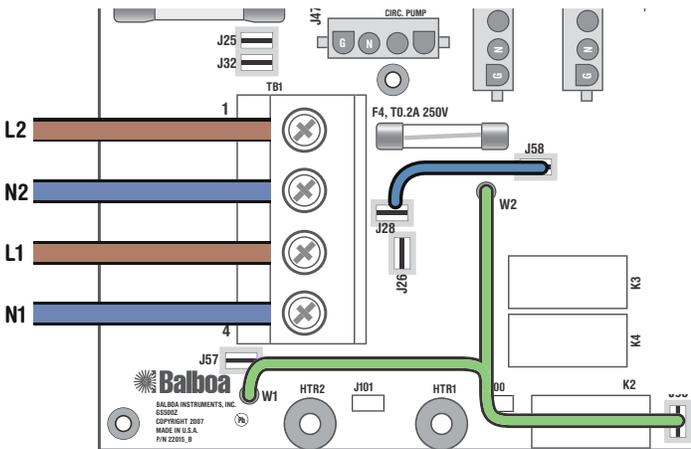
For 1 x 32 Amp Service:

Set DIP Switch A10 such that total system amperage draw never exceeds rated service input.

Systems using multiple DIP switches for heat disable:

Refer to system Hot Sheet DIP Switch Definition page and set the switches shown in Table 1 such that total system amperage draw never exceeds rated service input.

OPTIONAL



Dual Service, TN and TT Electrical Systems (2 x 16 Amp)

5 Wires (2 Lines + 2 Neutrals + 1 Protective Earth)

Protective Earth wire (Green/Yellow) must be connected to system ground terminal as marked.

The heater runs on service line L1, while all other equipment, such as pumps and blowers, run on service line L2.

Completely remove the white wire from J26 and J32.

Note: J32 and J25 are electrically identical. The white wire may be attached to either terminal before removal.

Systems using only 1 DIP switch (A10) for heat disable:

DIP Switch A10 must be OFF.

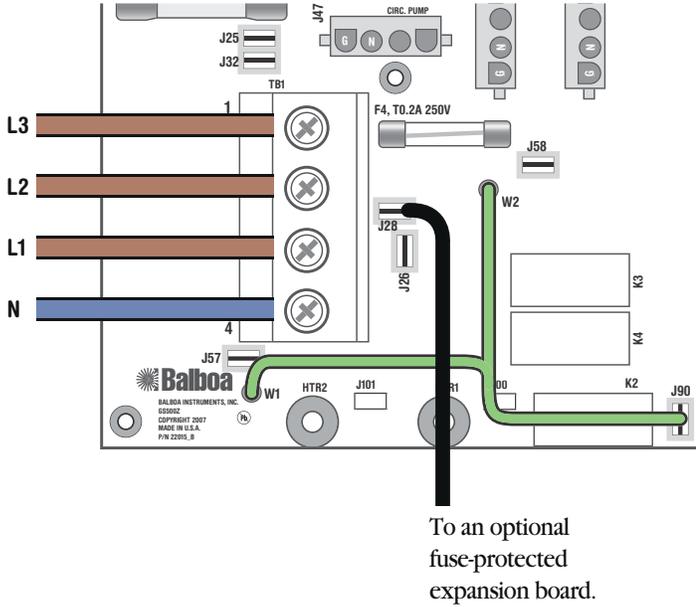
Systems using multiple DIP switches for heat disable:

Refer to system Hot Sheet DIP Switch Definition page and set both switches shown in Table 1 to ON positions.

Electrical Service Configuration Options

Systems with PCB Rev B Only

OPTIONAL



3-Phase Service, TN and TT Electrical Systems 5 Wires (3 Lines + 1 Neutral + 1 Protective Earth)

Protective Earth wire (Green/Yellow) must be connected to system ground terminal as marked.

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

The heater runs on service line L1.

All main-board equipment run on service line L3.

Additional equipment, such as expansion boards, run on service line L2.

Completely remove the white wire from J26 and J32, or J25.

Completely remove the blue wire from J28 and J58.

If an expansion board is installed, black wire must connect to J28 (Line L2) only.

Systems using only 1 DIP switch (A10) for heat disable:

DIP Switch A10 must be OFF.

Systems using multiple DIP switches for heat disable:

Refer to system Hot Sheet DIP Switch Definition page

and set both switches shown in Table 1 to ON positions.

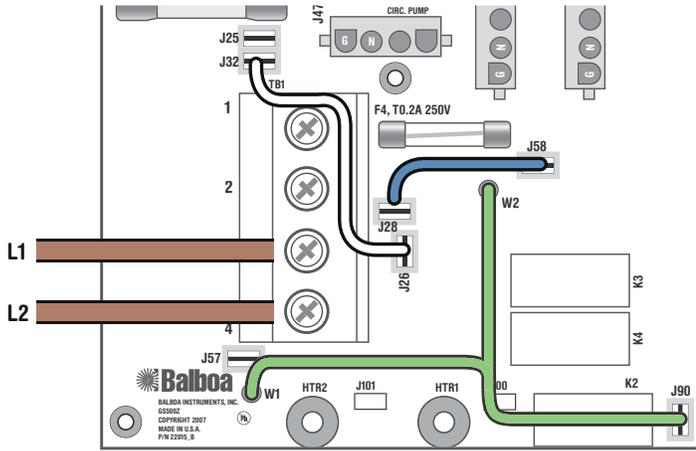
NOTE:

- Not all GS5xxZ systems can support 3-Phase.
- 3-Phase requires System PCB Rev B.
- If using an expansion board, the board must have fuse-protection.

Electrical Service Configuration Options

Systems with PCB Rev B Only

AS MANUFACTURED



Single Service, IT Electrical System (No Neutral) Line - Line voltage is 230VAC (1 x 16 Amp or 1 x 32 Amp) 3 Wires (2 Lines + 1 Protective Earth)

Protective Earth wire (Green/Yellow) must be connected to system ground terminal as marked.

All equipment (pumps, blower, and heater) runs on service line L1 with L2 acting as the return.

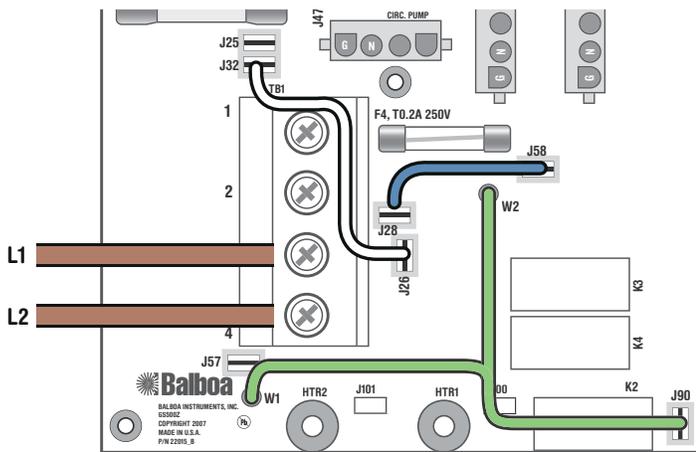
Systems using only 1 DIP switch (A10) for heat disable:

For 1 x 16 Amp Service:
DIP Switch A10 must be ON.

For 1 x 32 Amp Service:
Set DIP Switch A10 such that total system amperage draw never exceeds rated service input.

Systems using multiple DIP switches for heat disable:
Refer to system Hot Sheet DIP Switch Definition page and set the switches shown in Table 1 such that total system amperage draw never exceeds rated service input.

OPTIONAL



3-Phase Service, IT Electrical System (No Neutral) Line - Line voltage is 230VAC 4 Wires (3 Lines + 1 Protective Earth)

Protective Earth wire (Green/Yellow) must be connected to system ground terminal as marked.

All equipment (pumps, blower, and heater) runs on service line L1 with L2 acting as the return.

Systems using only 1 DIP switch (A10) for heat disable:

For 1 x 16 Amp Service:
DIP Switch A10 must be ON.

For 1 x 32 Amp Service:
Set DIP Switch A10 such that total system amperage draw never exceeds rated service input.

Systems using multiple DIP switches for heat disable:
Refer to system Hot Sheet DIP Switch Definition page and set the switches shown in Table 1 such that total system amperage draw never exceeds rated service input.

L3 
Line 3 - Cap (Insulate) end,
Do not connect.

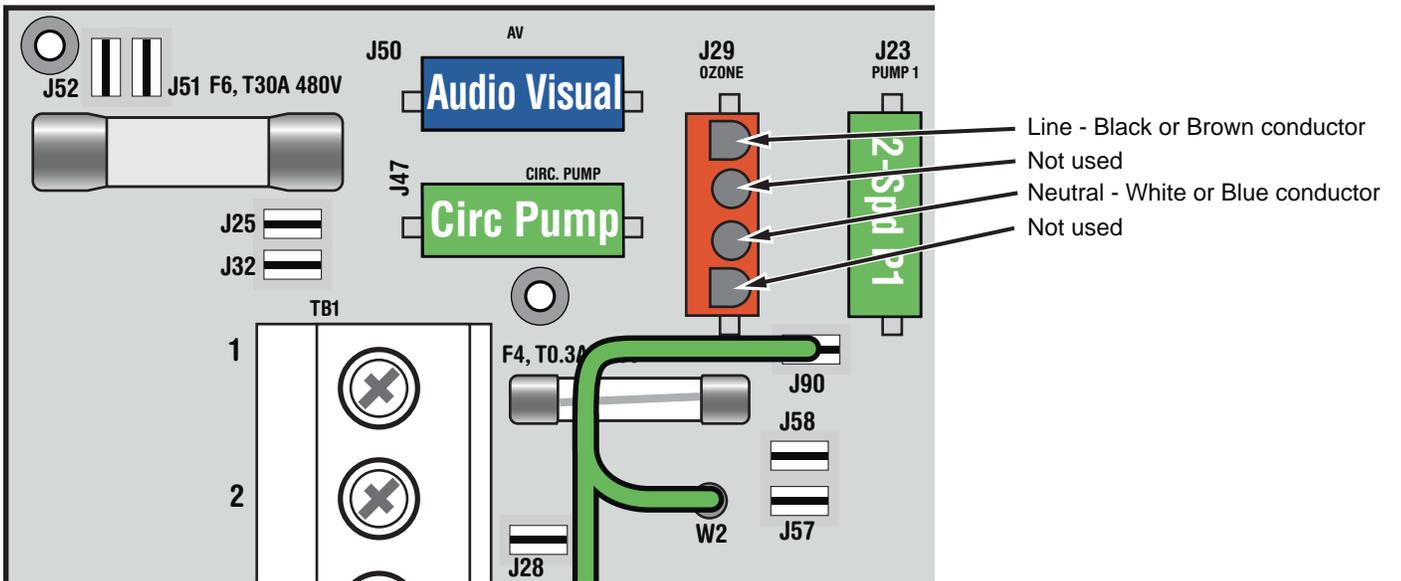
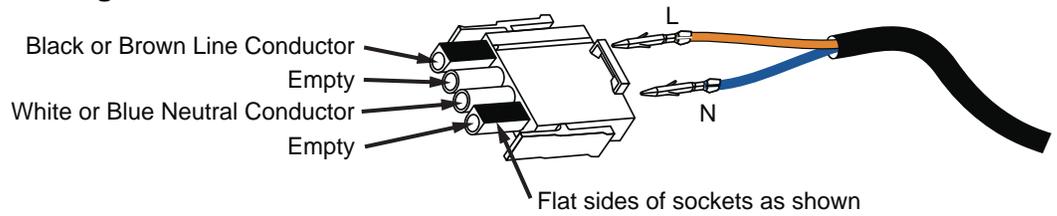
NOTE:

- Not all GS5xxZ systems can support 3-Phase.
- 3-Phase requires System PCB Rev B.
- If using an expansion board, the board must have fuse-protection.

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:



Serial Deluxe Panel Configurations



MAY800D

PN 54538 with No Overlay (Customer supplied)

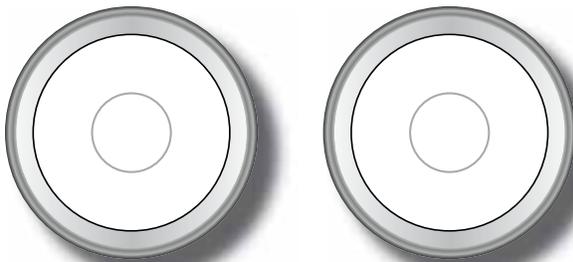
- Connects to Main Panel terminal J1
- Button assignments as shown, if equipped.



MAY803D

PN 54695 with No Overlay (Customer supplied)

- Connects to Main Panel terminal J1
- Button assignments as shown, if equipped.



AX10

Jets 1 - PN 55301 with No Overlay (Customer supplied)

Jets 2 - PN 55320 with No Overlay (Customer supplied)

- Connects to Main Panel terminal J2. Requires PN 22179 (2:1 Phone adapter)

* Panels with back-lighting (bulbs installed) should never be plugged into J2. Use J1 only. If the backlight bulbs are removed, then both J1 and J2 may be used.

SETUPS 1-6

AUX PANELS

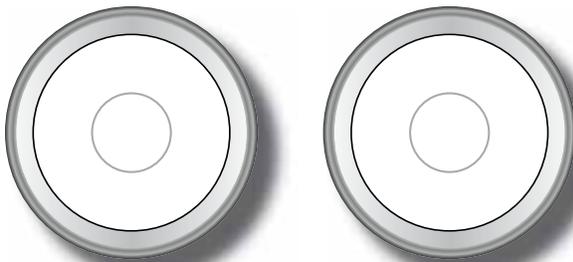
Serial Deluxe Panel Configurations



MAY800D
 PN 54538 with No Overlay (Customer supplied)
 • Connects to Main Panel terminal J1
 • Button assignments as shown, if equipped.



MAY803D
 PN 54695 with No Overlay (Customer supplied)
 • Connects to Main Panel terminal J1
 • Button assignments as shown, if equipped.



VX10
 Jets 1 - PN 55301 with No Overlay (Customer supplied)
 Jets 2 - PN 55320 with No Overlay (Customer supplied)
 • Connects to Main Panel terminal J2. Requires PN 22179 (2:1 Phone adapter)

* Panels with back-lighting (bulbs installed) should never be plugged into J2. Use J1 only.
 If the backlight bulbs are removed, then both J1 and J2 may be used.

SETUP 7

AUX PANELS