

CS5100DV Tech Sheet

Cal Spas System PN 55736-01

System Model # VSP-CS5100DV-BCAH

Software Version # 46

EPN # 3288

Base PCBA - PN 55737-01

PCB VS500DVH - PN 23928 Rev A

Base Panels

VL260 – PN 54754-03

with Overlay 12153



System Revision History

System PN	EPN	Date	Requested By	Changes Made
56736	3090	10.02.2009	Customer	Initial release of Dual Voltage Heater Model
56736-01	3288	01.21.2010	BWG	Add DIP switch to disable Pump 2

Basic System Features and Functions

Power Requirements

- 240VAC, 60Hz, 48A, Class A GFCI-protected service (Circuit Breaker rating = 60A max.)
- 240VAC, 60Hz, 40A, Class A GFCI-protected service (Circuit Breaker rating = 50A max.)
- 240VAC, 60Hz, 32A, Class A GFCI-protected service (Circuit Breaker rating = 40A max.)
- 4 wires (including ground wire) Line 1, Line 2, Neutral and Ground

See Page 7 for additional system configuration information based on electrical service provided.

System Outputs

Setup 1 (As Manufactured)

- 240V Input Power
 - 240V Pump 1, 2-Speed
 - 240V Pump 2, 1-Speed
 - 120V Ozone
 - 12V Spa Light
 - 240V 5.5kW Balboa Heater *
- Heater can automatically operate using 1.4 kW @ 120VAC as required.

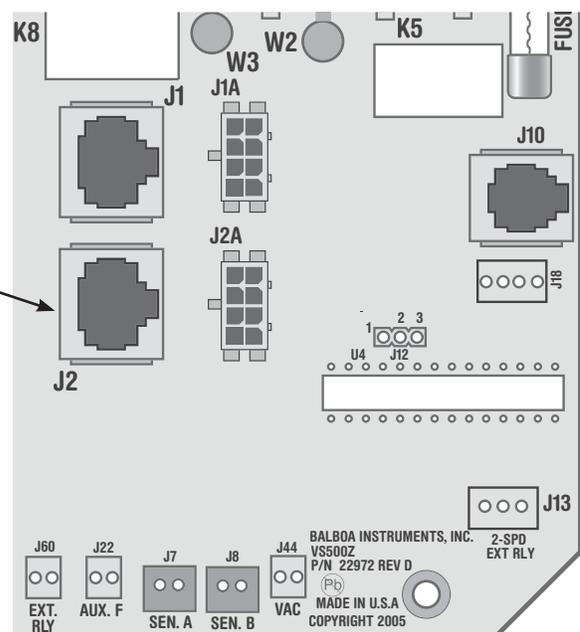
Setup 2

- 240V Input Power
 - 240V Pump 1, 2-Speed
 - 120V Ozone
 - 12V Spa Light
 - 240V 5.5kW Balboa Heater *
- Heater can automatically operate using 1.4 kW @ 120VAC as required.

* 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
- IR Receiver Module
Connects to terminal J1 or J2
- MoodEFX Lighting
Connects to Spa Light terminal J20
- FiberEFX Lighting
Connects to Spa Light terminal J20



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.

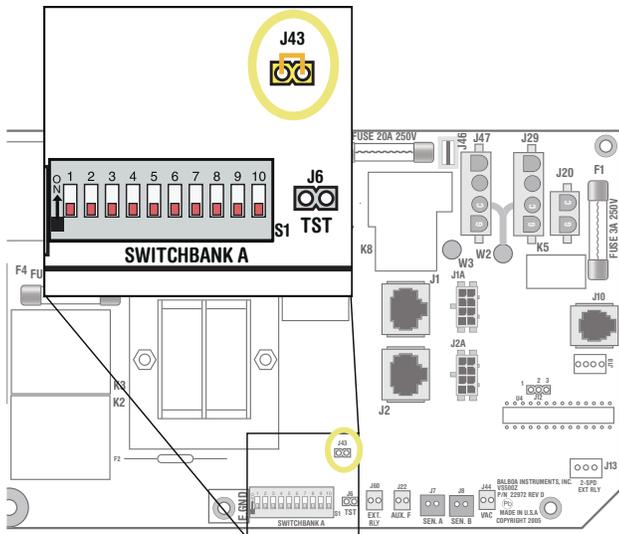
To reset Persistent Memory:

- 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.

Power Up Display Sequence

Upon power up, you should see the following on the display:

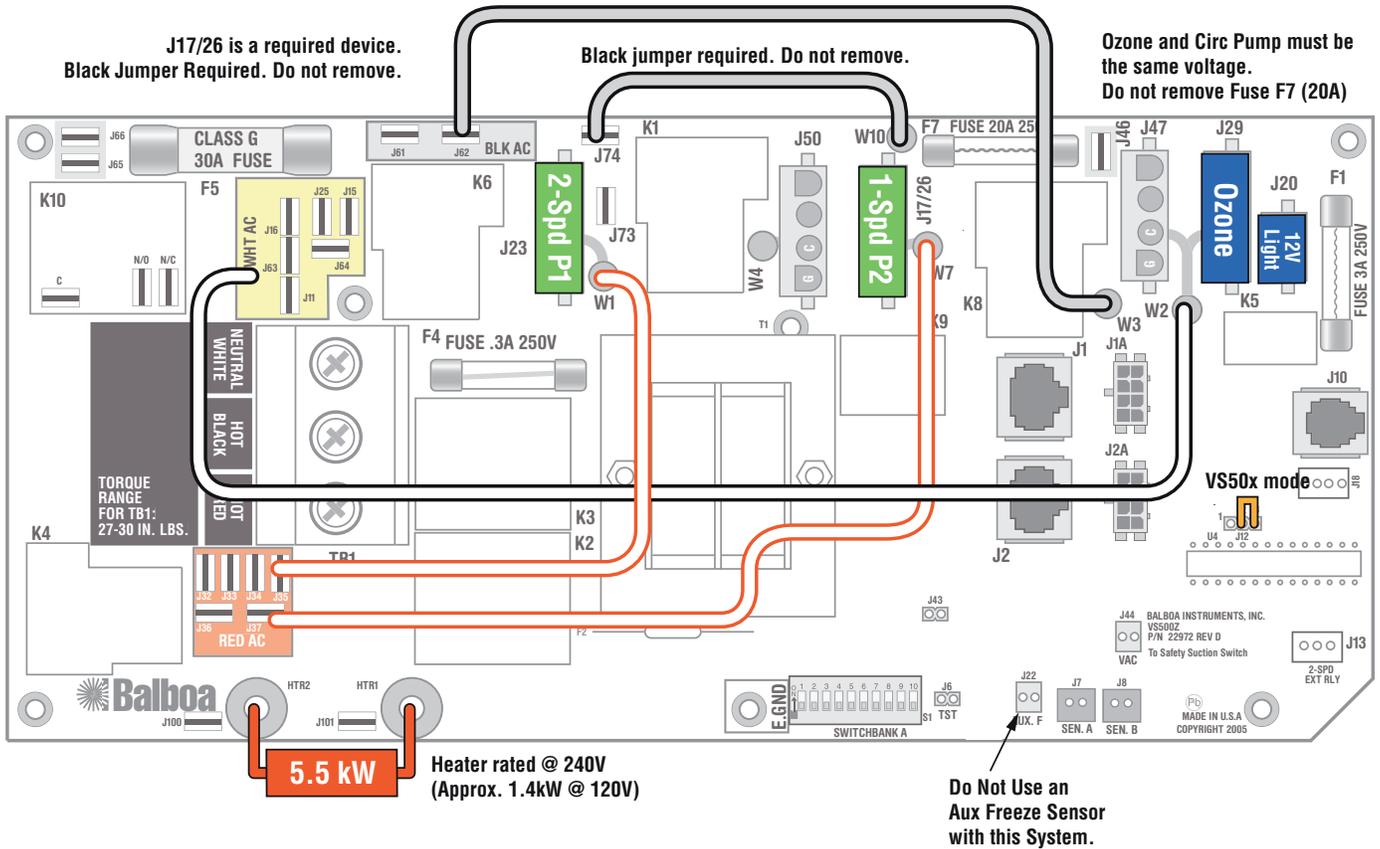
- Three numbers in a row, which are the SSID (the System Software ID). The third display of these numbers is the Software Version, which should match the version of your system. For example, if these three numbers are 100 67 38, that is a VS511SZ at version 38.
- Displayed next is: “24” (indicating the 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)

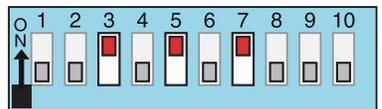
- 240V Input Power
- 240V Pump 1, 2-Speed
- 240V Pump 2, 1-Speed
- 120V Ozone
- 12V Spa Light
- 240V 5.5kW Balboa Heater
- VL260 Main Panel



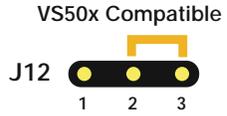
WARNING: Main Power to system should be turned OFF BEFORE adjusting DIP switches.
WARNING: Persistent Memory (J43) must be RESET to allow new DIP switch settings to take effect. (See Persistent Memory page)

SSID #
 20
 63
 46

Switchbank A



- A1, Test Mode OFF
- A2, Mode changes allowed
- A3, Mini Panel
- A4, Pump 2 Enable
- A5, Dual-Voltage Heat
- A6, Safety Suction
- A7, See Table 1
- A8, Degrees F
- A9, Circ Pump Off
- A10, See Table 1



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

DIP Switch and Jumper Definitions

SSID 20 63 45

Base Model VS501Z

DIP Switch Key

- A1 Test Mode (normally OFF)
- A2 "ON" position: Standard mode only
"OFF" position: Std/Ecn/Sleep mode changes allowed
- A3 "ON" position: use Mini Panel * 
"OFF" position: use Digital Duplex or Light Duplex panel  
- A4 "ON" position: Pump 2 Disabled
"OFF" position: Pump 2 Enabled
- A5 "ON" position: Dual-Voltage Heating enabled
"OFF" position: Single-voltage heating (240VAC only)
- A6 Safety Suction (must be OFF)
- A8 "ON" position: temperature is displayed in degrees Celsius
"OFF" position: temperature is displayed in degrees Fahrenheit
- A9 "ON" position: Circ Pump act like Pump1 low-speed (filter cycle, polls)
Pump 1 is one speed
"OFF" position, no circ pump. Pump1 is two-speed
- A7+A10 Control amp draw requirements (See Table 1)

Alert:

Blower or 1-speed Pump 2 is required, connect to J17/26.
For no Blower and no Pump 2, use VS500Z or VS515Z.

Table 1
Number of Hi-Speed Pumps that can Run Before Heater is Disabled (A5 OFF) OR Before Heater runs at 120VAC (A5 ON)

A7	A10	# of H.S.Pumps
OFF	OFF	0
ON	OFF	1
OFF	ON	2
ON	ON	3

Note: System is 60Hz only.

* Panels with button layout  are not compatible when A3 is ON.

Jumper Key

J12 **Factory set. DO NOT MOVE.**

Jumper must be on Pins 1 and 2 for VS51xZ/VS52xZ/VS5xxSZ/VS5xxDZ software.

Jumper must be on Pins 2 and 3 for VS50xZ software.

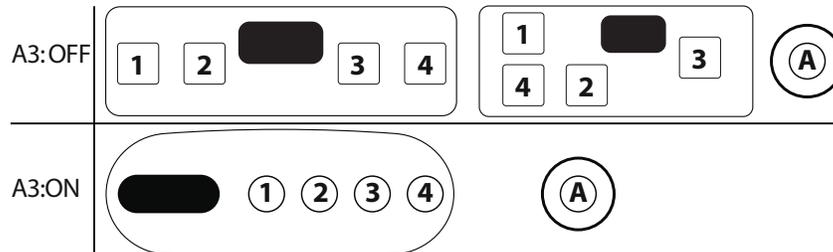
J43 When jumper is placed on 2 pins during power-up, system will reset persistent memory.

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 tech sheet.

Panel Button Positions



Panel Button Assignments

- 1=J17/26 (Unused if A4 is ON)
- 2=Pump 1
- 3=Temp
- 4=Light

Configuration Notes

2 pumps – 8.0A max each = 16A
5.5 kW heater at 240V = 23A nominal
5.5 kW heater at 120V = 11.5A nominal
No A/V

On 32A service (40A breaker):

A5 ON (heater at 120V can run with both pumps on high)
A7 OFF & A10 OFF (heater at 240V cannot run with even one pump on high if other pump is on low)

On 40A service (50A breaker) or 48A service (60A breaker):

A5 ON
A7 ON & A10 ON (heater at 240V can run with all pumps on high)

Ozone Connections

Ozone Connector Voltage: The VS500Z circuit board is factory configured to deliver a preset voltage (120V or 240V) to the on-board ozone connector (J29). See the ratings table on the wiring diagram attached to the cover of the enclosure for the configured voltage. For 240V output W2 connects to Red AC and for 120V output W2 connects to White AC.

The voltage to the ozone connector can be changed in the field if required. W2 just needs to be set for the required voltage.

WARNING: Changing the voltage of the ozone connector also effects the voltage supplied to the circ pump connector (J47). Any equipment controlled by that connector may be damaged if the wrong voltage is selected.

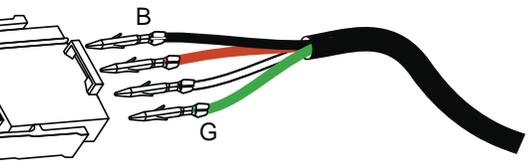
Balboa Ozone Generator: If the board is set up to operate a 120V ozone generator, the connector on the ozone generator is likely to be configured correctly, but should be compared to the illustration below.

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

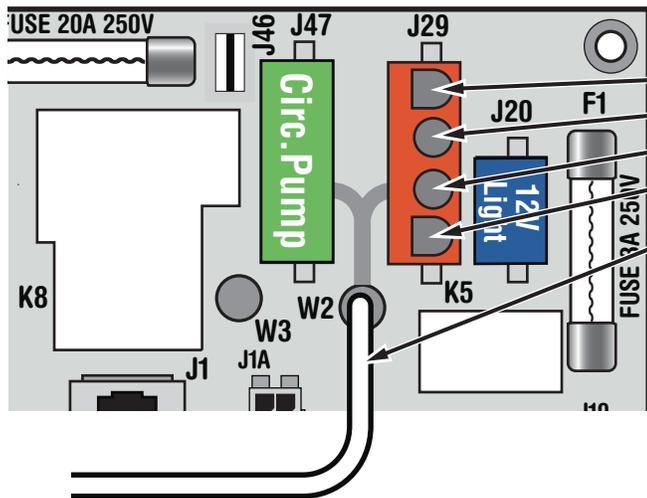
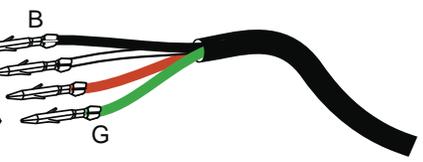
- Line - Black conductor
- Use this slot for the leftover Red conductor
- Common - Install the White conductor here for 120V ozone
- Ground (Green) conductor



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



- Line - Black conductor
- Use this slot for the leftover conductor
- Common - Red for 240V or White for 120V ozone (See W2 wire)
- Ground (Green) conductor
- W2 wire determines voltage

Duplex Panel Configurations

SETUP 1



VL260
PN 54754-03 with Overlay PN 12153
• Connects to Main Panel terminal J1

SETUP 1



VL260
PN 55354-04 with Overlay PN 12154
• Connects to Main Panel terminal J1