

# VS300FL4 Tech Sheet

## Tuff Spas System PN 56767

System Model # VSP-VS300FL4-CCAJ

Software Version # 41

EPN # 4535

Base PCBA - PN 56768

PCB VS500Z - PN 22972 Rev E

### Base Panels

VL200 (Mini) – PN 55123

VL240 (MVP240) – PN 55080

VL260 (MVP260) – PN 55081

### Optional Base Panels

VL401 (LCD Lite Duplex) – PN 54665

VL403 (LED Lite Duplex) – PN 54664

VL406U – PN 55350

### Included Parts

GFCI Cord - PN 30536

# System Revision History

<b>System PN</b>	<b>EPN</b>	<b>Date</b>	<b>Requested By</b>	<b>Changes Made</b>
54626	1710	02.14.2007	Balboa	New system.
54626-01	2668	11.21.2007	Balboa	Software update to v41, model now VS300FL4.
ZT000175	4535	06-10-2015	BWG	VS300FL4 with GFCI cord.
56767	4535	06-19-2015	BWG	Approved for production.
56767	4535	06-23-2015	BWG	Change DIP switches.

# Basic System Features and Functions

## Power Requirements

- 120/240VAC, 60Hz, 16/32A, Class A GFCI-protected service (Circuit Breaker rating = 20/40A max.)
- 3 wires [hot, neutral, ground]/4 wires [hot, hot, neutral, ground]

## System Outputs

### Setup 1 (As Manufactured)

- 120V Pump 1, 2-Speed
- 120V Ozone \*
- 12V Spa Light
- 1.0kW @ 120V Heater \*\*
- VL200, VL240, or VL260 Panel (DIP switch A3 must be ON)

### Optional Panels

- VL401, VL403, or VL406U Panel (DIP switch A3 must be OFF)

\* Ozone runs with P1-low and must be same voltage as Pump 1.

\*\* Heater wattage is rated at 120V. 4.0kW @ 240V.

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## Additional Options

- 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.

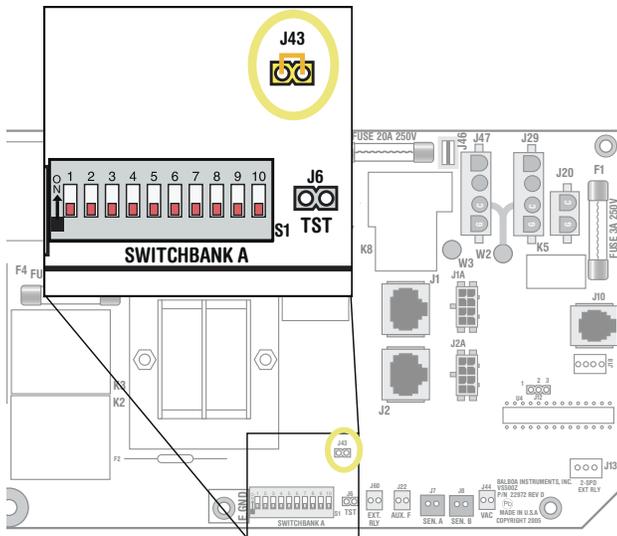
Persistent Memory is not used for Time of Day. Only models with a Serial Deluxe panel installed (VS5xxDZ and GS5xxDZ) can display the time. However, during power loss to the spa, the system will lose the correct time, and reset to 12:00 PM when power is restored.

## 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.

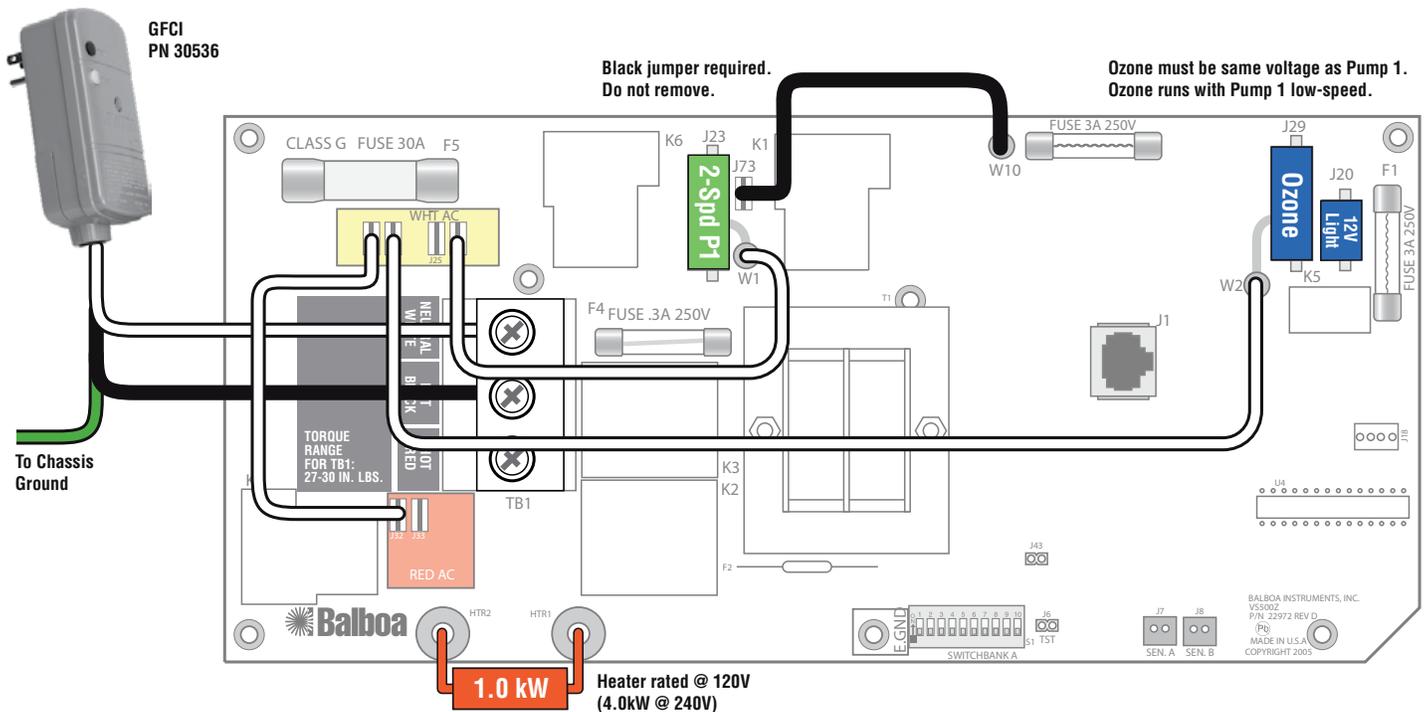


J43 on VS5xxZ and VS300 Series Main Board Shown.

# Wiring Configuration and DIP Settings

## Setup 1 (As Manufactured)

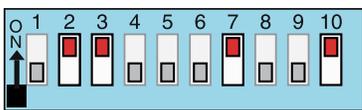
- 120V Pump 1, 2-Speed
- 12V Spa Light
- 120V Ozone
- 120V 1.0kW Heater (Approx. 4.0kW @ 240V)
- VL200, VL240, or VL260 Main Panel



**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 #**  
 100  
 59  
 41

### Switchbank A



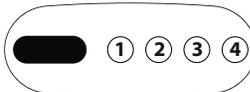
- |                              |                             |
|------------------------------|-----------------------------|
| A1, Test Mode OFF            | A6, 60 Hz                   |
| A2, P1, LT, TD, TU           | A7, Standard Mode only      |
| A3, Mini Panel               | A8, Degrees F               |
| A4, N/A (must be OFF)        | A9, P1-low timeout, Table 1 |
| A5, P1-high timeout, Table 1 | A10, Low Amp mode           |



### Panel Button Assignments

- |          |             |
|----------|-------------|
| 1=Pump 1 | 3=Temp Down |
| 2=Light  | 4=Temp Up   |

### Panel Button Positions



### Wiring Color Key

- 120 Volt Connections (Black line)
- 240 Volt Connections (Red line)
- Black AC Jumpers (Black line)
- 12 Volt Connections (Blue line)
- Relay Control Wires (Yellow line)

### 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 Switches and Jumpers Definitions

## SSID 100 59 41

## Base Model VS300F

### DIP Switch Key

- A1 Test Mode (normally OFF)
- A2 "ON" position: Button layout will be: Pump 1, Light, Temp Down, Temp Up \*  
"OFF" position: Button layout will be: Unused, Pump 1, Temp, Light
- A3 "ON" position: use Mini Panel \*   
"OFF" position: use Lite Duplex or Digital Duplex panel 
- A4 N/A (must be OFF)
- A5 Pump 1 high-speed timeout, see Table 1
- A6 "ON" position: 50Hz operation  
"OFF" position: 60Hz operation
- A7 "ON" position: Standard mode only  
"OFF" position: Std/Ecn/Sleep mode changes allowed
- A8 "ON" position: temperature is displayed in degrees Celsius  
"OFF" position: temperature is displayed in degrees Fahrenheit
- A9 Pump 1 low-speed timeout, see Table 1
- A10 "ON" position: heater is disabled while the high-speed pump is running (low amperage mode)  
"OFF" position: heater can run while the high-speed pump is running (high amperage mode)

Table 1		Pump 1 Timeouts	
A5	A9	Low-spnd	Hi-spnd
OFF	OFF	2 hours	15 min
ON	OFF	2 hours	30 min
OFF	ON	15 min	15 min
ON	ON	30 min	30 min

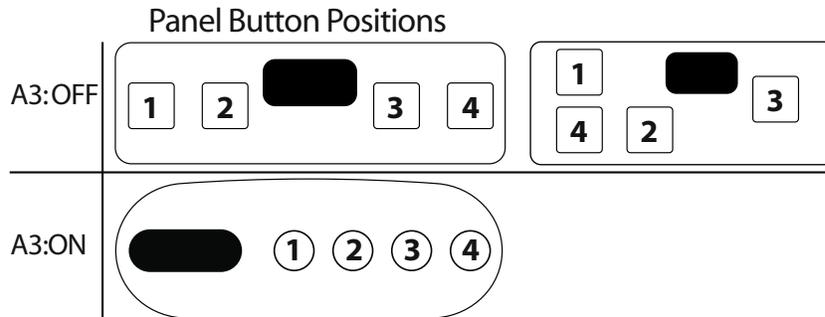
\* Panels with button layout  are not compatible when A2 or A3 is ON.  
Note: No blower or second pump available.

### Jumper Key

- 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 Assignments**

A2:OFF	1=Unused 2=Pump 1	3=Temp 4=Light
A2:ON	1=Pump 1 2=Light	3=Temp Down 4=Temp Up

# Ozone Connections

## Ozone voltage must be wired to same voltage as Pump 1.

**Ozone Connector Voltage:** The VS300/VS300F 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. **Reminder: Ozone voltage must be set to match Pump 1 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.

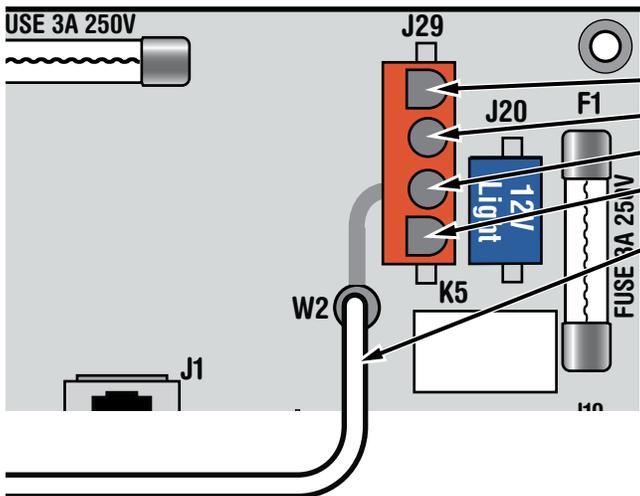
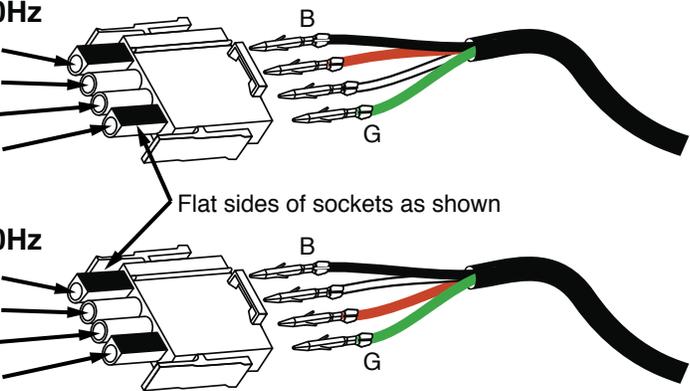
*Note: A special tool is required to remove the pins from the connector body once they are snapped in place. Check with your Balboa Account Manager for information on purchasing a pin-removal tool.*

### Balboa Ozone connector configuration for 120V 60Hz

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

### 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 (AS MANUFACTURED)

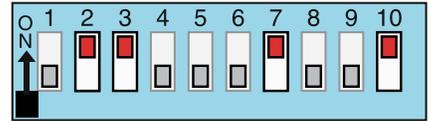


VL260 (MVP260)  
 PN 55081 with Overlay PN 11746  
 • Connects to Main Panel terminal J1



VL240 (MVP240)  
 PN 55080 with Overlay PN 11745  
 • Connects to Main Panel terminal J1

## Switchbank A

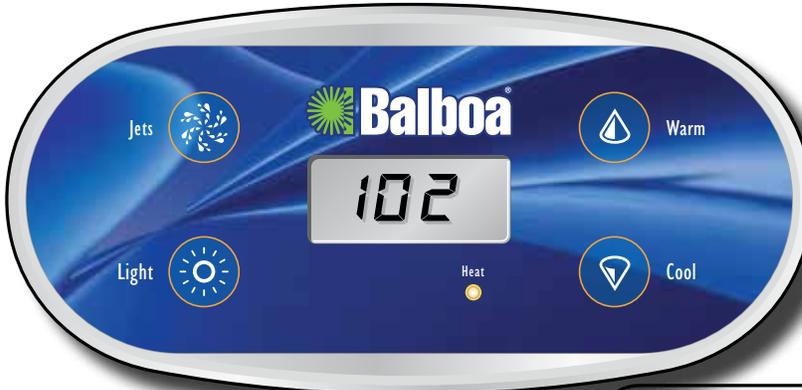


DIP switch A3 must be ON



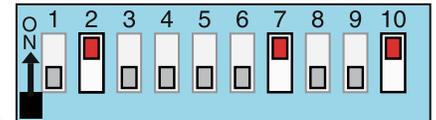
VL200 (Mini Panel)  
 PN 55123 with Overlay PN 11852  
 • Connects to Main Panel terminal J1

OPTIONAL PANELS



VL406U  
 PN 55350 with Overlay PN 11947  
 • Connects to Main Board terminal J1  
 • Cannot convert to VL406T by changing overlay

## Switchbank A



DIP switch A3 must be OFF



VL401 (Lite Digital)  
 PN 54665 with Overlay PN 11885  
 • Connects to Main Panel terminal J1



VL403 (Lite Digital)  
 PN 54664 with Overlay PN 11884  
 • Connects to Main Panel terminal J1