

BP500 Tech Sheet

Balboa Water Group

Part Number: **56278** 4kW 800 Incoloy Heater Element
 56279 4kW 825 Incoloy Heater Element
 56280 4kW Titanium Heater Element

UL System Model: BP15-BP500-BJ-M
Software ID: M100_200 V6
Software Version: 6.0
Hex File: BP1500_6.0_BP15TP4A.hex
Configuration Signature: 0608A20D

Eng. Project: 3833

Base PCBs / PCBA's:

Power Board: 22117_B / 56285
Logic Board: 22121_E / 56127-02

Control Panels:

TP 600 55673-05
Software Version 2.3 and later
TP400T 50260
Software Version 2.4 and later
TP400W 50259
Software Version 2.4 and later

Auxiliary Panels

AX10A2 55919



User Interface and Programming Guide:

http://service.balboa-instruments.com/zz40940_download.zip



Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. All material copyright of Balboa Water Group.

System Revision History

Part #	EPN	Date	Originator	Changes Made
56278	3833	05-01-12	Balboa	Initial Generic Configuration
56279				Based on 56125-02
56280				



Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. All material copyright of Balboa Water Group.

Setup 1 – As Manufactured

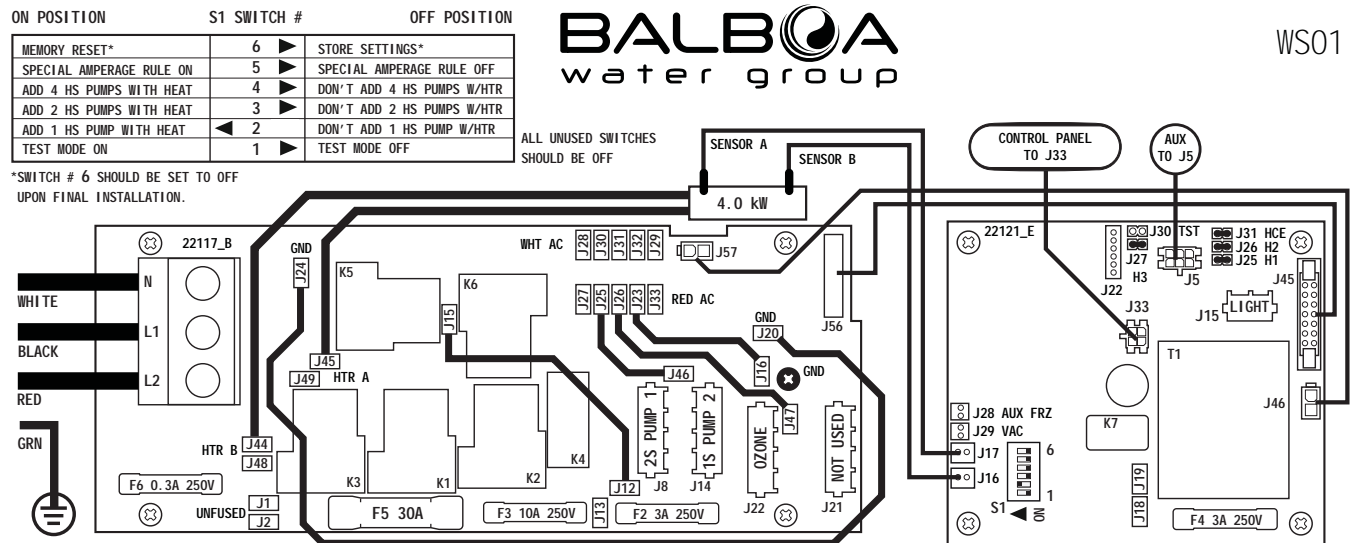
Power Requirements:

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

System Outputs:

Pump 1	240VAC	2-Speed	12A max	30-minute timer for Low Speed, 15 Minutes for High Speed
				This is the heater pump and must be the same voltage as the Ozone
				Must deliver a minimum of 20 GPM through heater
Pump 2	240VAC	1-Speed	12A max	15-minute timer
Ozone	240VAC		.5A max	Uses the same relay as Pump 1 Low
				Must be the same voltage as heater pump
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	4kW @ 240VAC			
Misc.	J23 & J32	120VAC	4A max	Hot output (Stereo). Fused equipment or in-line fuse required.

Wiring Diagram and Settings



Setup 2

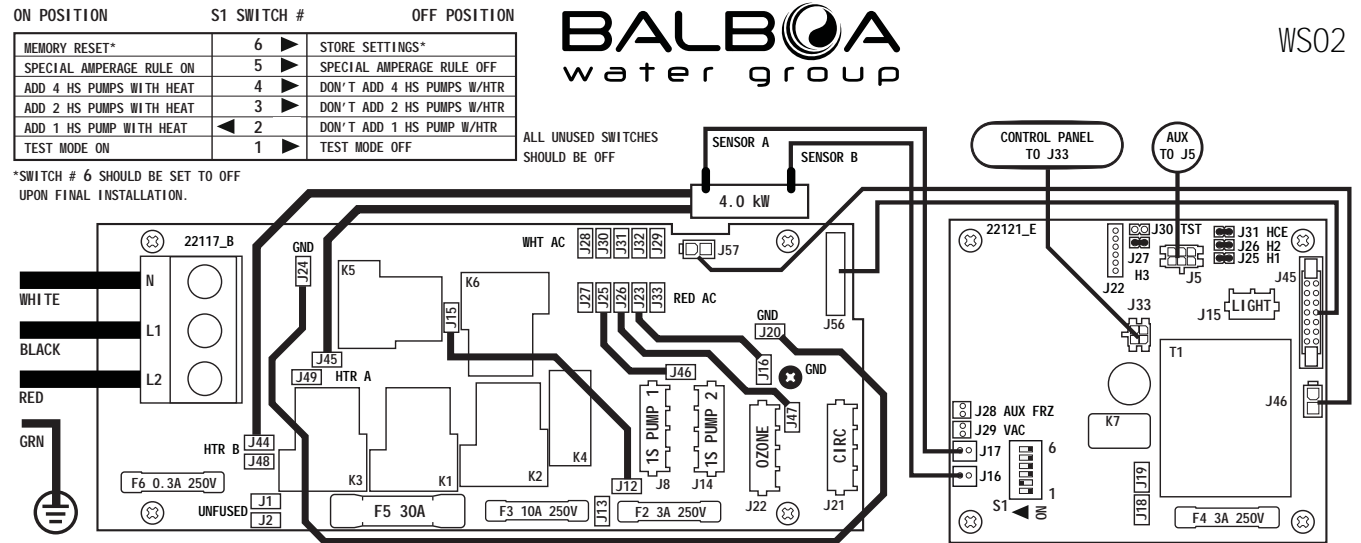
Power Requirements:

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

System Outputs:

Pump 1	240VAC	1-Speed	12A max	15-minute timer
Pump 2	240VAC	1-Speed	12A max	15-minute timer
Circ Pump	240VAC	1-Speed	5A max	Programmable Filtration Cycles + Polling
This is the heater pump and must be the same voltage as the Ozone Must deliver a minimum of 20 GPM through heater				
Ozone	240VAC		.5A max	Uses the same relay as the Circ Pump
Must be the same voltage as heater pump				
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	4kW @ 240VAC			
Misc.	J23 & J32	120VAC	4A max	Hot output (Stereo). Fused equipment or in-line fuse required.

Wiring Diagram and Settings



Software Configuration Changes based on Default Feature

Feature	Orig. Setup 1	Changes to
J8	2-Speed Pump 1	<i>1-Speed Pump 1</i>
J21	Not Used (non-circ)	<i>Circ Pump Enabled</i>



Blue indicates changes from the original Setup 1 default

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Setup 3

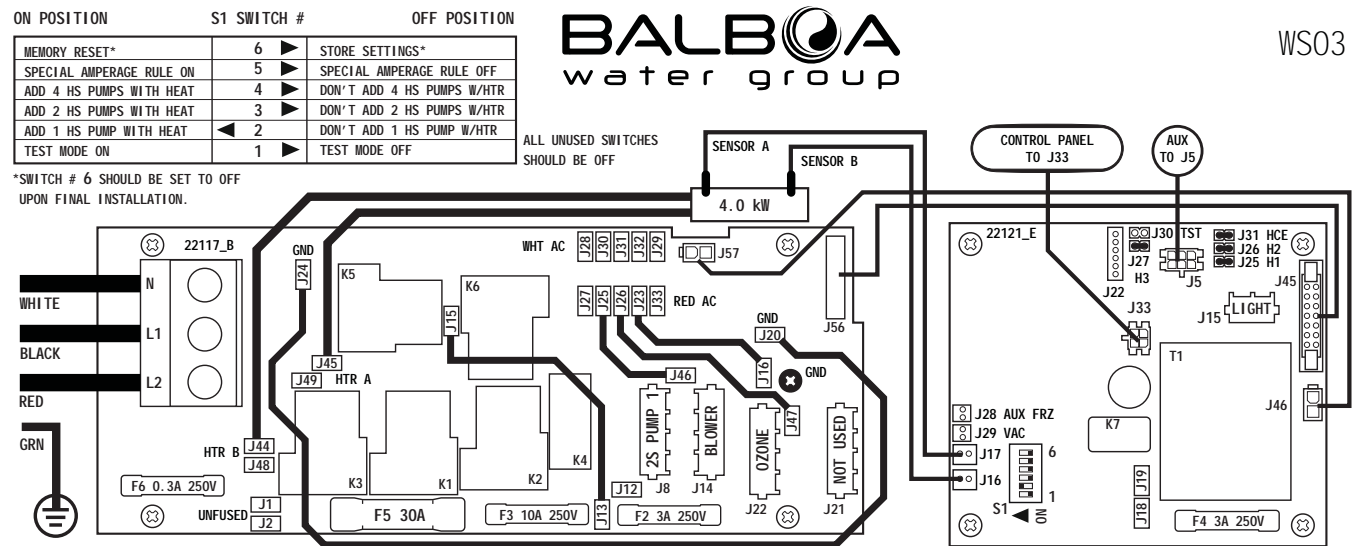
Power Requirements:

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

System Outputs:

Pump 1	240VAC	2-Speed	12A max	30-minute timer for Low Speed, 15 Minutes for High Speed
				This is the heater pump and must be the same voltage as the Ozone
				Must deliver a minimum of 20 GPM through heater
Blower	240VAC	1-Speed	8A max	15-minute timer
Ozone	240VAC		.5A max	Uses the same relay as Pump 1 Low
				Must be the same voltage as heater pump
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	4kW @ 240VAC			
Misc.	J23 & J32	120VAC	4A max	Hot output (Stereo). Fused equipment or in-line fuse required.

Wiring Diagram and Settings



Software Configuration Changes based on Default Feature

Feature	Orig. Setup 1	Changes to
J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2	Pump 2	<i>Blower</i>

Blue indicates changes from the original Setup 1 default



Setup 4

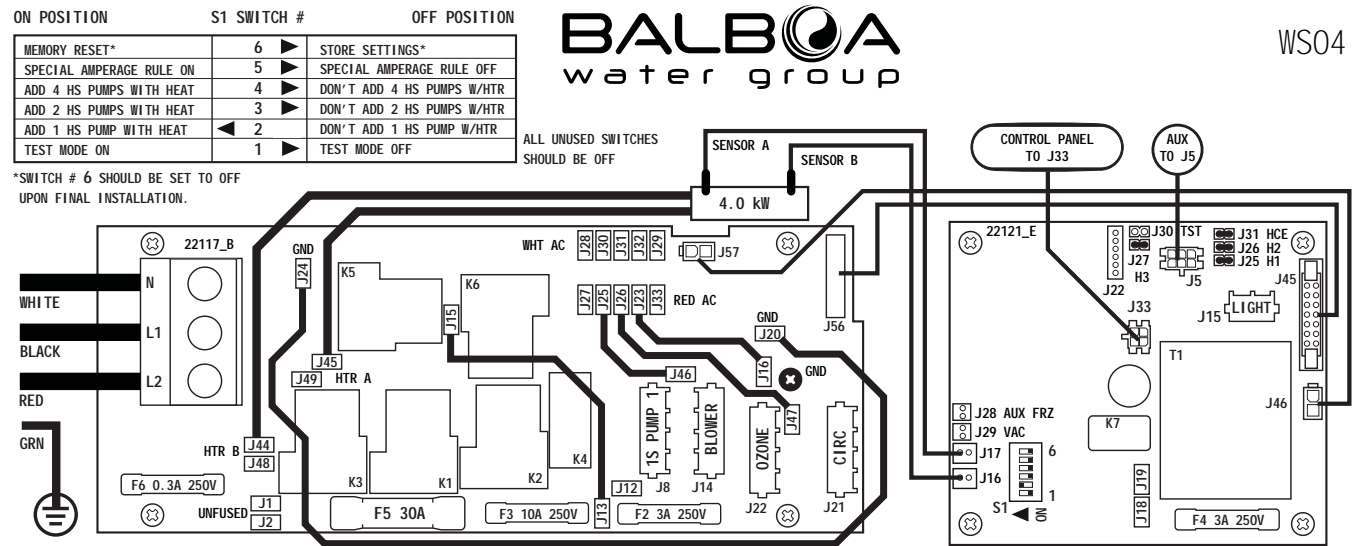
Power Requirements:

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

System Outputs:

Pump 1	240VAC	1-Speed	12A max	15-minute timer
Blower	240VAC	1-Speed	8A max	15-minute timer
Circ Pump	240VAC	1-Speed	5A max	Programmable Filtration Cycles + Polling
This is the heater pump and must be the same voltage as the Ozone Must deliver a minimum of 20 GPM through heater				
Ozone	240VAC		.5A max	Uses the same relay as the Circ Pump
Must be the same voltage as heater pump				
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	4kW @ 240VAC			
Misc.	J23 & J32	120VAC	4A max	Hot output (Stereo). Fused equipment or in-line fuse required.

Wiring Diagram and Settings



Software Configuration Changes based on Default

Feature	Orig. Setup 1	Changes to
J8	2-Speed Pump 1	<i>1-Speed Pump 1</i>
J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2	Pump 2	<i>Blower</i>
J21	Not Used (non-circ)	<i>Circ Pump Enabled</i>

Blue indicates changes from the original Setup 1 default



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Setup 5

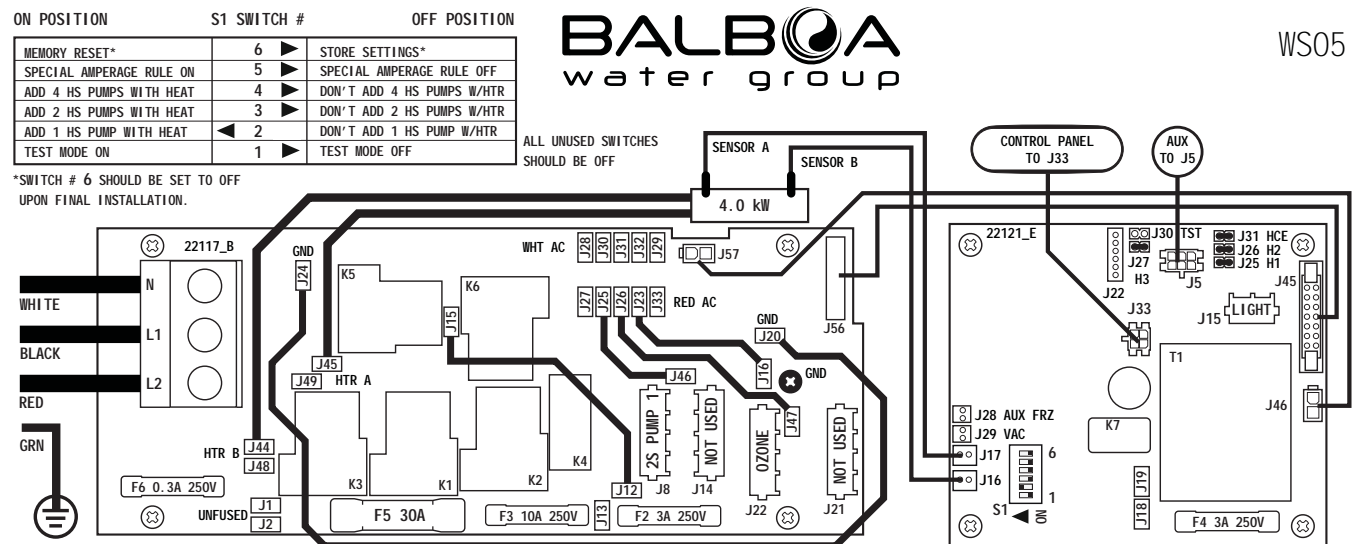
Power Requirements:

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

System Outputs:

Pump 1	240VAC	2-Speed	12A max	30-minute timer for Low Speed, 15 Minutes for High Speed
This is the heater pump and must be the same voltage as the Ozone Must deliver a minimum of 20 GPM through heater				
Ozone	240VAC		.5A max	Uses the same relay as Pump 1 Low Must be the same voltage as heater pump
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	4kW @ 240VAC			
Misc.	J23 & J32	120VAC	4A max	Hot output (Stereo). Fused equipment or in-line fuse required.

Wiring Diagram and Settings



Software Configuration Changes based on Default Feature

	Orig. Setup 1	Changes to
J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2	Pump 2	<i>Not Used</i>

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Setup 6

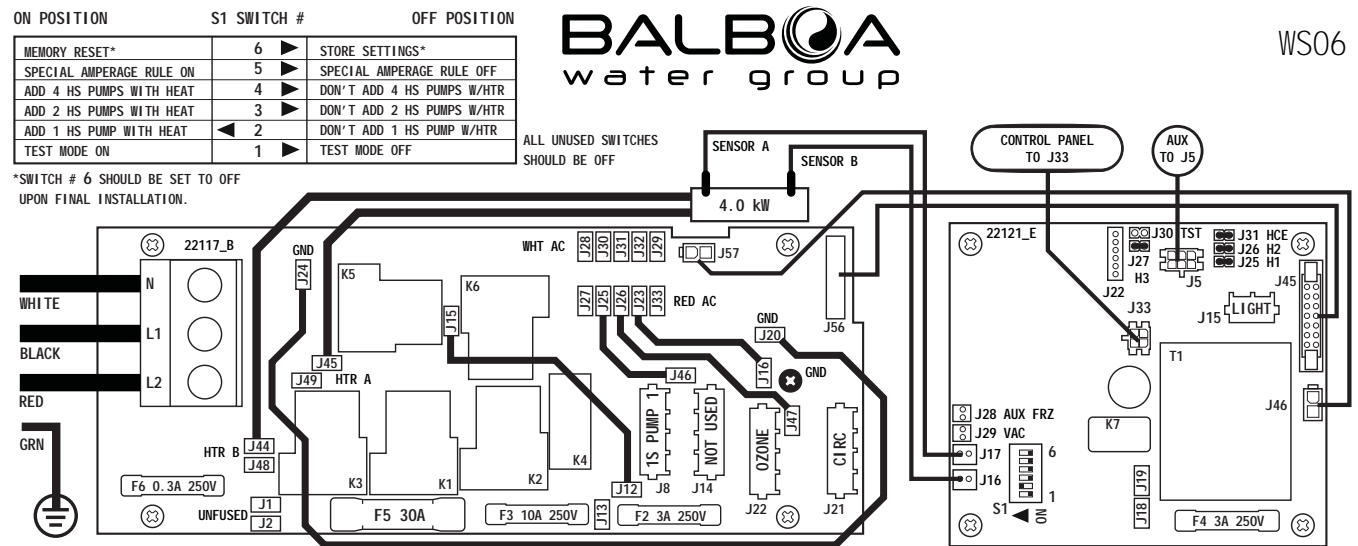
Power Requirements:

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

System Outputs:

Pump 1	240VAC	1-Speed	12A max	15-minute timer
Circ Pump	240VAC	1-Speed	5A max	Programmable Filtration Cycles + Polling
This is the heater pump and must be the same voltage as the Ozone Must deliver a minimum of 20 GPM through heater				
Ozone	240VAC		.5A max	Uses the same relay as the Circ Pump Must be the same voltage as heater pump
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	4kW @ 240VAC			
Misc.	J23 & J32	120VAC	4A max	Hot output (Stereo). Fused equipment or in-line fuse required.

Wiring Diagram and Settings



Software Configuration Changes based on Default

Feature	Orig. Setup 1	Changes to
J8	2-Speed Pump 1	1-Speed Pump 1
J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2	Pump 2	Not Used
J21	Not Used (non-circ)	Circ Pump Enabled



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Setup 7

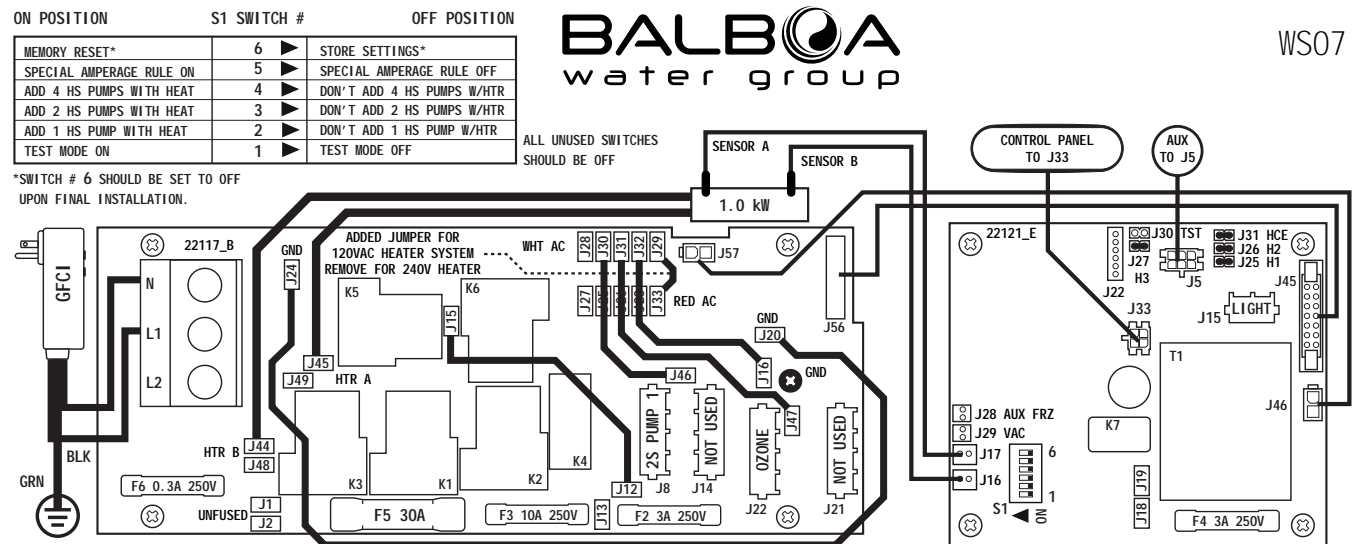
Power Requirements:

120/240VAC, 60Hz, 16/40A, Class A GFCI-protected service (Circuit Breaker = 20/50A max.),
3 or 4 wires [hot, hot (optional), neutral, ground]. **Do not use this setup with a 3 kW heater.**

System Outputs:

Pump 1	120VAC	2-Speed	12A max	30-minute timer for Low Speed, 15 Minutes for High Speed
	This is the heater pump and must be the same voltage as the Ozone			
	Must deliver a minimum of 20 GPM through heater			
Ozone	120VAC		.5A max	Uses the same relay as Pump 1 Low
	Must be the same voltage as heater pump			
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	1kW @ 120VAC or 4kW @ 240VAC			
Misc.	J23 & J32	<i>Not Applicable with 120V Heater.</i>		

Wiring Diagram and Settings



Software Configuration Changes based on Default Feature

	Orig. Setup 1	Changes to
J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2	Pump 2	<i>Not Used</i>

120v to 240v heater conversion instructions:

- 1, Conversion must be performed by a qualified, licensed electrician.
- 2, Disconnect from power and remove power cord.
- 3, Completely remove jumper wire between J29 and J33 and discard.
- 4, Install 240V power conductors; Line 1, Line 2 and Neutral to main terminal block (TB1)



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Setup 8

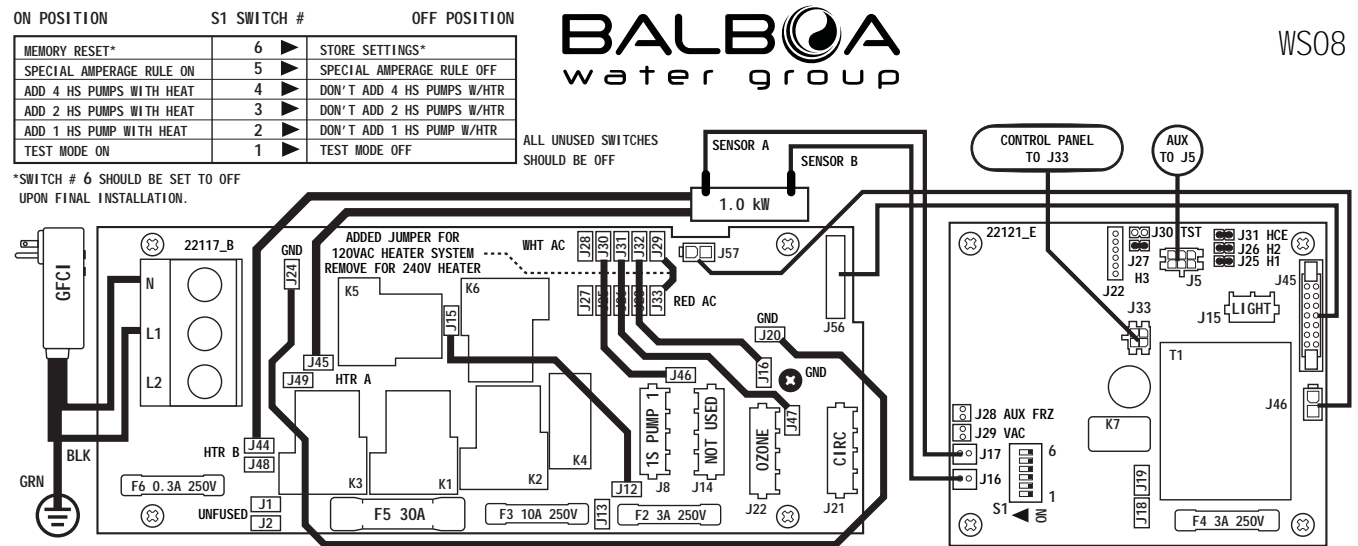
Power Requirements:

120/240VAC, 60Hz, 16/40A, Class A GFCI-protected service (Circuit Breaker = 20/50A max.), 3 or 4 wires [hot, hot (optional), neutral, ground]. **Do not use this setup with a 3 kW heater.**

System Outputs:

Pump 1	120VAC	1-Speed	12A max	15-minute timer
Circ Pump	120VAC	1-Speed	1.5A max	Programmable Filtration Cycles + Polling
This is the heater pump and must be the same voltage as the Ozone				
Must deliver a minimum of 20 GPM through heater				
Ozone	120VAC		.5A max	Uses the same relay as the Circ Pump
Must be the same voltage as heater pump				
Spa Light	12VAC	On/Off	1A max	4-Hour timer.
Heater	1kW @ 120VAC or 4kW @ 240VAC			
Misc.	J23 & J32	<i>Not Applicable with 120V Heater.</i>		

Wiring Diagram and Settings



Software Configuration Changes based on Default

Feature	Orig. Setup 1	Changes to
J8	2-Speed Pump 1	<i>1-Speed Pump 1</i>
J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2	Pump 2	<i>Not Used</i>
J21	Not Used (non-circ)	<i>Circ Pump Enabled</i>

120v to 240v heater conversion instructions:

See previous page.



Blue indicates changes from the original Setup 1 default

Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 B2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. All material copyright of Balboa Water Group.

Setup Changes with DIP Switch 1 ON

Read and understand these instructions before beginning this process.

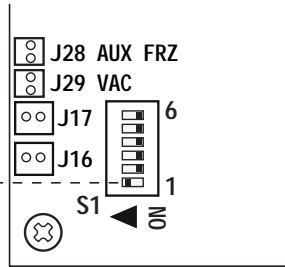
Know the Setup Number you want before you power up the spa and wait to power up the spa until you're ready to change the Setup Number.

The system must be in Test Mode, so move Switch 1 to the ON position. The Test Menu will then be available.

Power up the spa, and press any button once to Link the panel. (Note: Switch 1 can be moved to the ON position immediately after power-up, if preferred - Danger! High Voltage will be present!)

You will have 1 minute to complete the setup change after you manually exit Priming Mode. (Once familiar with the process, the Setup change should take less than 15 seconds.)

→ As soon as Switch #1 is placed in the ON position, The temperature will show "T" after it instead of F or C, indicating the System is in Test Mode



DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY!

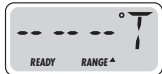
Move DIP Switch 1 (on S1 on the Logic circuit board) to ON.

The system will enter Test Mode.

Moving DIP Switch 1 to OFF will exit Test Mode.



When the panel displays RUN PMPS PURG AIR, press any Temperature button ONCE to exit Priming Mode. You should see "---T" where the T indicates the system is in Test Mode.



Continued on Next Page.



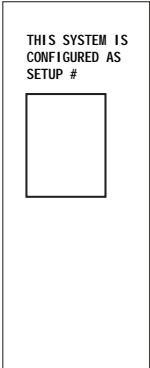
Setup Changes – Continued

Again, **You will have 1 minute** to complete the setup change after you manually exit Priming Mode.

Immediately after exiting Priming Mode, press this sequence of buttons: Warm*, Light, Warm, Warm, Warm, Warm. Continue to press Warm until the display shows the Setup Number (S-01, S-02, etc.) you want to switch to. When the correct setup number is showing, press Light once, and the system will reset, using the newly-selected Setup from that point on.

Move DIP Switch 1 to the OFF position to take the spa out of Test Mode. °F or °C will replace °T.

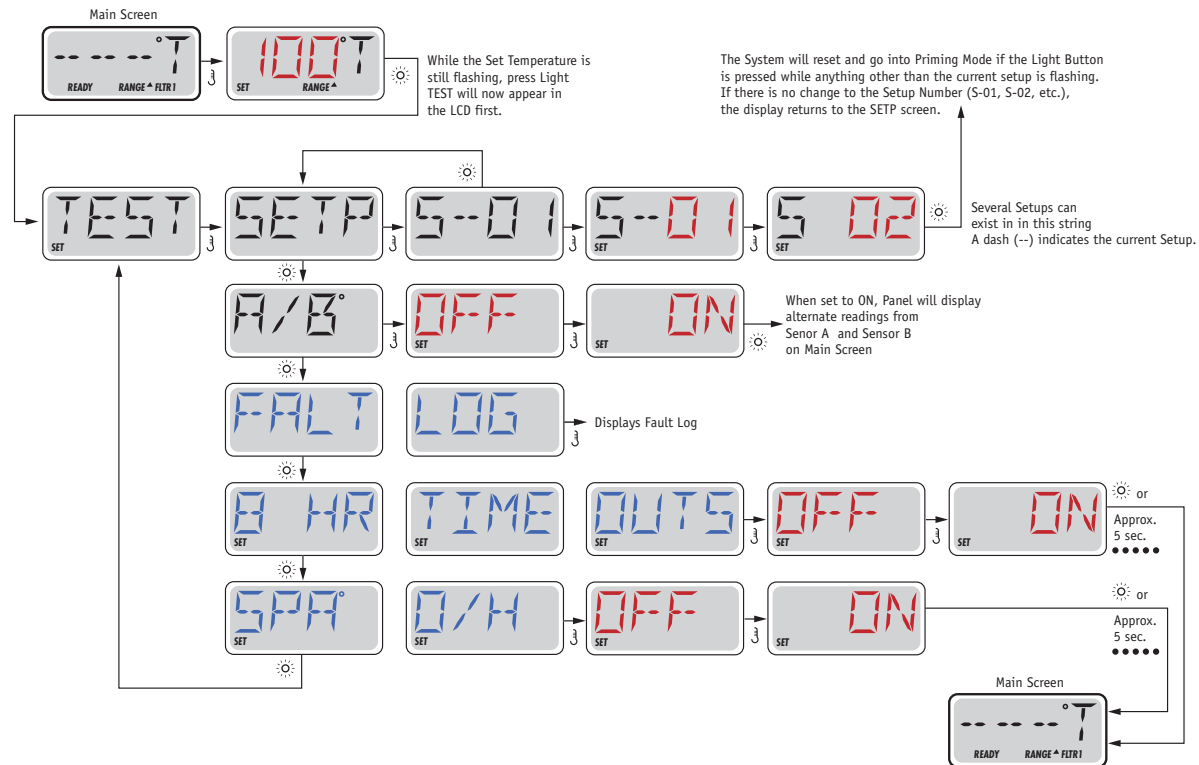
Using a permanent marker, write the Setup number on the Setup label mounted inside the system lid (right). This is very important to any service person in the future who may need to replace a circuit board or system and needs to change the Setup on a replacement part while in the field.



NOTE: Changing the Setup may require wiring changes as well - refer to the wiring diagram or wiring diagram addendum.

Key

- Indicates Flashing or Changing Segment
- Indicates Alternating or Progressive Message - every 1/2 second
- ⌄ A temperature button, used for "Action"
- ☼ Light or dedicated "Choose" button, depending on control panel configuration
- Waiting time - varies depending on function



*If the Control Panel does not have a Warm (Up) button, but rather a single Temp button, use the Temp button in place of the Warm button in the instruction above. (The flow chart assumes a single Temperature Button.)



Configuration Options

General Features

Feature	Default
Pump 1 in Filter Cycle (Circ Only)	No
Pump 1 Low Timer	30 Minutes
General Pump Timer	15 Minutes
Blower Timer	15 Minutes
Mister Timer (N/A)	15 Minutes
Light Timer	240 Minutes
Circ	Like P1 Low
Cleanup Cycle	<i>30 Minutes</i>
Cleaup as Preference setting	Yes
Ozone	With Heater Pump*
Ozone Suppression	OFF
Pump Purge	60 Seconds
Blower Purge	30 Seconds
Mister Purge (N/A)	5 Seconds

* The Heater Pump can be either a Circ Pump or Pump 1 Low.



Blue Indicates New Custom Configuration Default (Setup 1)

Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. All material copyright of Balboa Water Group.

Configuration Options

Temperature Features

Feature Default

Temperature Display °F

All temperatures must be specified in °F. The system converts °F to °C dynamically. If Celsius is required for default settings, choose a desired °C value that (after rounding) corresponds to a Fahrenheit value.

°C	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
°F	39	41	43	45	46	48	50	52	54	55	57	59	61	63	64	66	68	70	72
°C	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
°F	73	75	77	79	81	82	84	86	88	90	91	93	95	97	99	100	102	104	

Hi-Range Min. Set Temp	80°F
Hi-Range Max. Set Temp	104°F
Hi-Range Default Temp*	100°F
Lo-Range Min. Set Temp	50°F
Lo-Range Max. Set Temp	80°F
Lo-Range Default Temp*	70°F
Freeze Threshold	44°F
Temp Lock Type	Temp + Settings

Time Features

Feature Default

Time Format*	12 Hour
Filter 1 Start Hour*	8:00 PM (20:00)
Filter 1 Duration*	2 Hours
Filter Cycle 2 Default*	OFF
Filter 2 Start Hour*	8:00 AM (08:00)
Filter 2 Duration*	15 Minutes
Light Cycle	Disabled
Light Cycle Default*	OFF
Light Cycle Start Hour*	9:00 PM (21:00)
Light Cycle Duration*	15 Minutes

**May be changed by end-user (if Enabled)*



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Configuration Options

Reminder Features

Feature	Default
Reminders Shown*	<i>Yes</i>
Check pH	<i>OFF</i>
Check Sanitizer	<i>OFF</i>
Clean Filter	30 Days
Test GFCI	<i>65 Days</i>
Drain Water	<i>100 Days</i>
Change Cartridge	OFF
Clean Cover	<i>OFF</i>
Treat Wood	<i>OFF</i>
Change Filter	365 Days

Special Features

Feature	Default
Special Amperage Rule 1	No Limitation
Special Amperage Rule 2	No Limitation
Drain Mode	Disabled
Demo Mode	Disabled
Automatic GFCI Test	Disabled
Ozone Slaved to Heater Pump	<i>Yes</i>

**Editable by end-user*

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Configuration Options

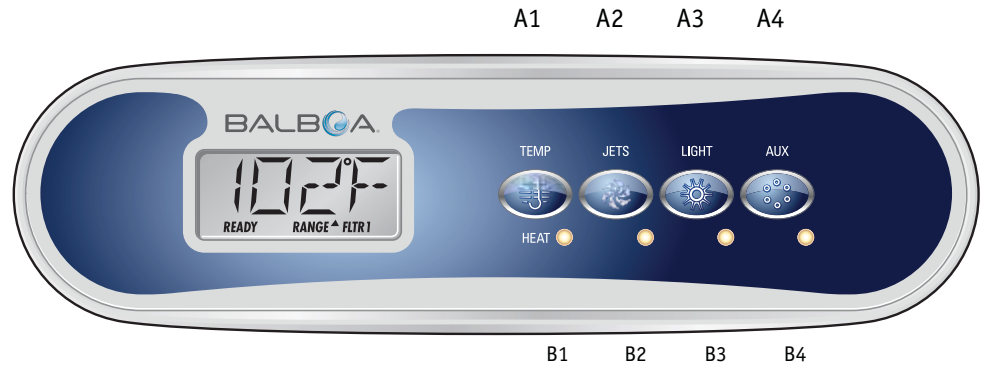
TP400 Control Panel Features

Feature	TP400T	TP400W
Button 1	<i>Temperature</i>	Up
Button 2	<i>Jets 1</i>	Down
Button 3	<i>Light 1</i>	Light 1
Button 4	<i>Jets 2</i>	Jets 1
LED B1	<i>Heat ON</i>	Heat ON
LED B2	<i>Jets 1</i>	Unused
LED B3	<i>Light 1</i>	Light 1
LED B4	<i>Jets 2</i>	Jets 1

TP400T

50260 ►

Includes Overlay PN 12511

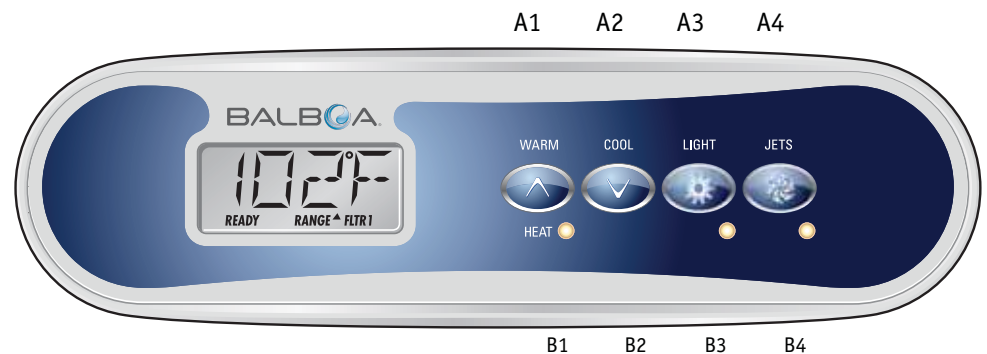


TP400W

50259 ►

Includes Overlay PN 12510

TP400W requires the use of an AX10A2 in Setups 1 – 4.



Download the User Interface and Programming Guide here:

http://service.balboa-instruments.com/zz40940_download.zip

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Template 40941_J 04-02-10

Configuration Options

TP600 Control Panel Features

Feature	Default
Button 1	<i>Jets 1</i>
Button 2	<i>Jets 2</i>
Button 3	<i>Flip</i>
Button 4	<i>Up</i>
Button 5	<i>Light 1</i>
Button 6	<i>Down</i>
LED 1	<i>Jets 1</i>
LED 2	<i>Jets 2</i>
LED 3	<i>Light 1</i>
LED 4	<i>Heat ON</i>

TP600

55673-05 ►
Includes overlay PN12511



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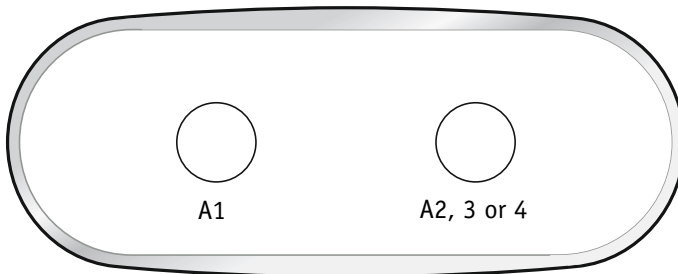
Auxilliary Panel Features

Feature	Default
Aux Button A1	Jets 1
Aux Button A2	Jets 2
Aux Button A3	<i>Unused</i>
Aux Button A4	Light

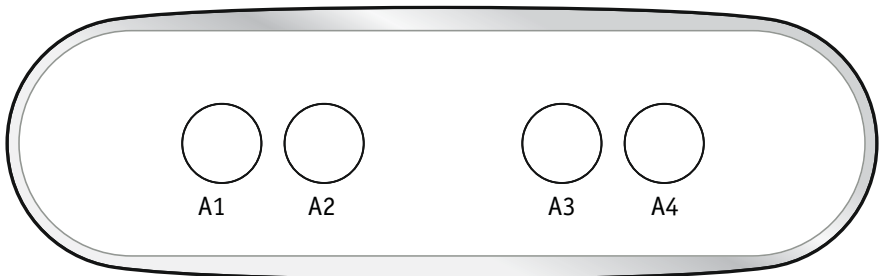
AX10 A1	No O/L	52803
AX10 A2	AUX O/L	55919
AX10 A3	No O/L	52805
AX10 A4	No O/L	52806



AX20 A1A2	No O/L	52800
AX20 A1A3	No O/L	52801
AX20 A1A4	No O/L	52802



AX40	No O/L	52799
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Blue Indicates New Custom Configuration Default (Setup 1)

Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. All material copyright of Balboa Water Group.