### **BP200G1 Tech Sheet**

## KARAG

Customer:	Balboa Wa	ater Group									
Part Number:	59368 3 59192-01 2	3.0kW 825 Incoloy 1 2.0kW 800 Incoloy									
Custom Box Overlay											
Box Overlay Part Number											
CE System Model For 2.0K	W: BP2-BP20	OG1-RCA-2.0KW									
CE System Model For 3.0K	W: BP2-BP20	BP2-BP200G1-RCA-3.0KW									
CE System Model For Rem	ote: BP2-BP20	BP2-BP200G1-RCA									
Software Version ID:	M100_235	M100_235 V52.0									
Software Version:	52.0	52.0									
File Name:	BP200_52	2.0_BP200G1.hex									
Configuration Signature:	EB1605F2										
Eng. Project Number:	5270										
Control Panels (See later	pages for more i	information):									
spaTouch™2	Any version (v	y version (version 2.0 or later required for bba™2 fully integrated functionality)									
Icon spaTouch™	Any version (v	ersion (version 3.36 or later required for bba™2 fully integrated functionality)									
Menued spaTouch™	Menued spaTouch™ Any version (version 2.8 or later required for bba™2 integrated functionality)										
TP800	00 Version 3.1 and later (Version 3.13 or later required for bba™; version 4.11 or later required for bba™2 integrated functiona										
TP600		2.7 and later (Version 2.12 or later required for bba™/bba™2 0n/Off control via menu)									
TP500	Any version										
TP400T CE		Version 2.7 and later (TP400T US should <u>not</u> be used) (Version 2.12 or later required for bba <sup>™</sup> /bba <sup>™</sup> 2 On/Off control via menu)									
TP400W CE	2400W CE Version 2.7 and later (TP400W US should <u>not</u> be used) (Version 2.12 or later required for bba <sup>™</sup> /bba <sup>™</sup> 2 0n/Off control via me										



## **System Revision History**



EPN	Date	Originator	Changes Made
5205	04-15-19	BWG	Generic BP200G1 system, supporting all the Setups the BP200 board can do without an expander board.
5205	06-05-19	BWG	Added PN for version with remote heater support. Remote heater is sold separately.
5270	09-03-19	BWG	Update software for full TP500 compatibility.
"	10-10-19	BWG	Add line 3 info to 2/3x16A conversion instructions box.
"	10-17-19	BWG	Added new 825 Incoloy system PN.
	5205 5205 5270 "	5205         04-15-19           5205         06-05-19           5270         09-03-19           "         10-10-19	5205         04-15-19         BWG           5205         06-05-19         BWG           5270         09-03-19         BWG           "         10-10-19         BWG

 $bba^{\scriptscriptstyle \rm M}$  &  $bba^{\scriptscriptstyle \rm M}2$  (Balboa Bluetooth Amp) connection is documented seperately.

 $bba^{m}$  is integrated into graphic display panels (TP800, TP900 and spaTouch<sup>m</sup>). With TP600/TP500/TP400, use the "BT" entry on the menu to toggle  $bba^{m}$  power On/Off.  $bba^{m}2$  is integrated into graphic display panels (TP800, TP900 and spaTouch<sup>m</sup>). With TP600/TP500/TP400, use the "BT" entry on the menu to toggle  $bba^{m}2$  power On/Off.



### **Basic Functions Setup 1 - 3**

#### **Power Requirements:**

Single Service [3 wires (line, neutral, ground)]
230VAC, 50/60Hz\*, 1b, 16A, (Circuit Breaker rating = 20A max.)

**Single Service** [3 wires (line, neutral, ground)] 230VAC, 50/60Hz\*, 1þ, 32A, (Circuit Breaker rating = 40A max.)

**2-out-of-3-Service** [4 wires (line 1, line 2, <u>no</u> line 3, neutral, ground)] 230VAC line-to-neutral\*\*, 50/60Hz\*, 2/3b, 16A, (Circuit Breaker rating = 20A max each phase line.)

NOTE: 2-out-of-Service is simply 3-Service (single common) with one of the three lines unused. The third line could be used for a slave heater if desired, or left for a use not related to the spa at all.

\*BP systems automatically detect 50Hz vs 60Hz. However, power frequency (50Hz vs 60Hz) is just one of many differences between North American (UL) and CE power, and it is because of these other differences that different BP systems must be used for UL vs CE territories. Also, there are a few countries that use CE power but 60 Hz (such as South Korea) which need CE systems, and a few countries that use UL power but 50 Hz which need UL systems.

\*\* 3-phase service measured line-to-line will read about 400V, but BP systems do not use it line-to-line.

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

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. © Copyright 2009 Balboa Water Group.

#### HiPot Testing Note:

Disconnect slip terminal with green wires from J6 prior to performing HiPot test. Failure to disconnect may cause a false failure of the test. Reconnect terminal to J6 after successful completion of HiPot test.



### **Basic Functions Setup 1 - 3**

## KARAG

#### System Ouputs:

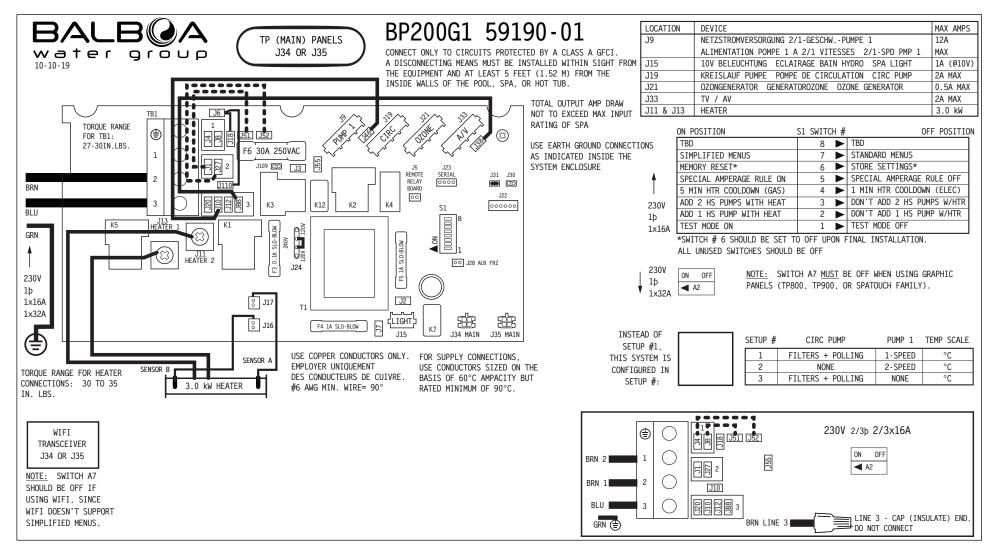
Pump 1	230VAC		12A max heater pump er 20 GPM thr	•
		1 Speed in Unused in	•	
Circ Pump	230VAC		2A max heater pump er 20 GPM thr	Programmable Filtration Cycles + Polling in Setups 1 & 3. ough heater
Ozone	230VAC		.5A max	Slaved to Circ Pump in Circ Setups and to Pump 1 Low in Non-Circ Setups
Spa Light	10VAC	0n/0ff	1A max	240-minute timer.
A/V (Stereo)	) 230VAC	Hot	2A max	Always on
Heater	3.0kW @ 2	40VAC max		



## KARAG

### Hardware Setup

#### Wiring Diagram for Integral Heater Version

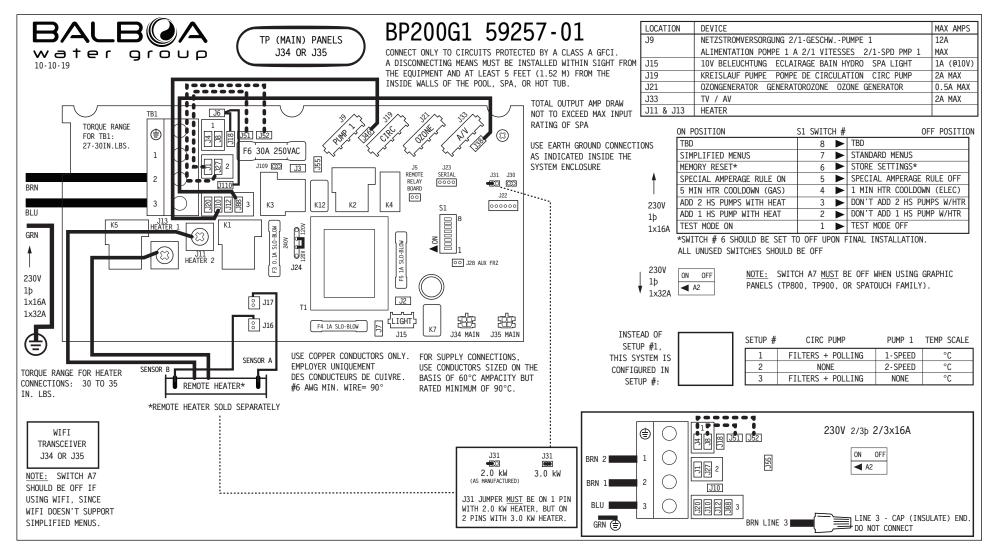




### Hardware Setup

## KARAG

#### Wiring Diagram for Remote Heater Version



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BALB A

### Setup Reference Table



Setup #	Circ Pump	Pump 1	Temp Scale
1	Programmable Filtration + Polling	1-Speed	°C
2	None	2-Speed	°C
3	Programmable Filtration + Polling	None	°C

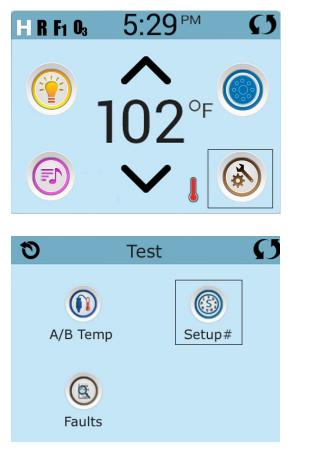
System (and any replacement board) is shipped in Setup 1



### **Changing Software Setups with spaTouch™ Icon-Driven Panels**

# Test Menu Access (S1, Switch 1 ON) Service Technician ONLY. DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY! 1 While the system is running, move DIP Switch 1 (on S1 on the Main circuit board) to ON. 1 The system will enter Test Mode. 10 Moving DIP Switch 1 to OFF will exit Test Mode. 10 To Change Software Setups: 10

While in Test Mode, press the indicated icons to move from screen to screen.

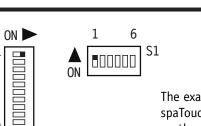




Once on the Setup Selection screen, press the Up or Down icon to select the desired Setup Number, then press the Check Mark icon to confirm and to have the spa restart.

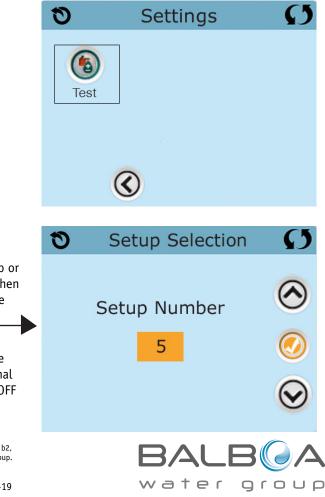
S1

After the system restarts, you may see a message that "The settings have been reset"; this is normal after changing Setups with DIP Switch 6 in the OFF position. Press "Clear" to dismiss this message.

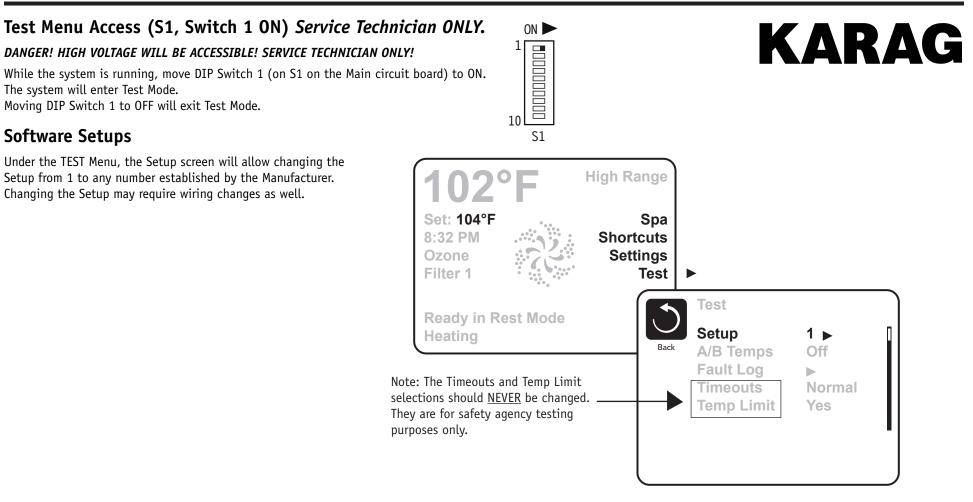


## KARAG

The example screens shown here are from the spaTouch 1 Icon-Driven Panel, but the screens on the spaTouch 2 Panel are similar. The main difference is that the spaTouch 2 display is wider.



### **Changing Software Setups with TP800 / TP900 / spaTouch™ Menued Panel**





## Changing Software Setups with TP600/TP500/TP400 KARAG

#### Test Menu Access (S1, Switch 1 ON) Service Technician ONLY.

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

While the system is running, move DIP Switch 1 (on S1 on the Main circuit board) to ON. The system will enter Test Mode. Moving DIP Switch 1 to OFF will exit Test Mode.

#### **Software Setups**

Under the TEST Menu, the Setup screen will allow changing the Setup from 1 to any number established by the Manufacturer. Changing the Setup may require wiring changes as well.

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.)



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.

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. © Copyright 2009 Balboa Water Group.



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

## Continued Changing Software Setups with TP600/TP500/TP400 KARAG

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

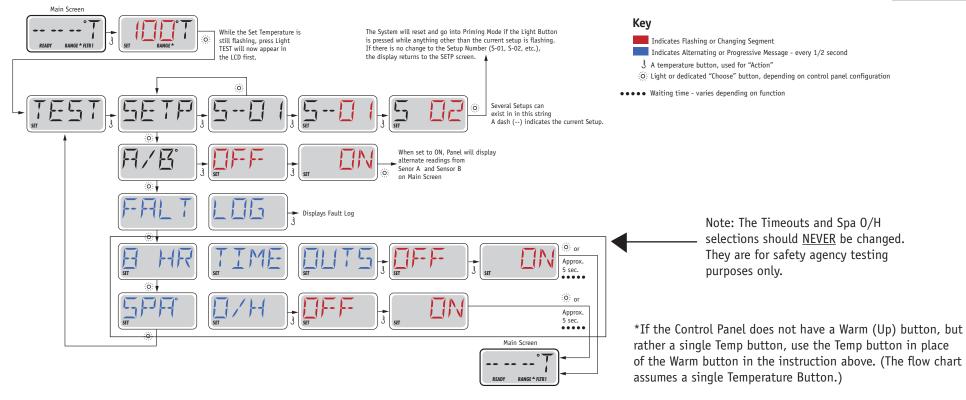
NOTE: WHerever the below says Warm or Temp folowed by Light, on the TP500 press Menu instead of Warm or Temp followed by light. And whenever the chart below says Light, on the TP500 press Menu insead of Light.

Immediately after exiting Priming Mode, press this sequence of buttons: Warm\*, Light, Warm, Warm, Warm. Continue to press Warm until the diplay 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.



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.



THIS SYSTEM IS

CONFIGURED AS SETUP #

## **Equipment Expansion**

## KARAG

#### Expansion Features

**Control Connection** 

Relay 1 (J5)

**Default** None Fuse

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. © Copyright 2009 Balboa Water Group.



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### **DIP Switch Functions**

Test Mode (normally Off).

#### **Fixed-fuction DIP Switches**

A1

A2

Α3

Α5

- In "ON" position, enables Special Amperage Rule B. See Special Features section under Configuration Options for functionality with your system.
- A6 Persistent memory reset (Used when the spa is powering up to restore factory settings as determined by software configuration).

A2 and A3 work in combination to determine the number of high-speed devices and blowers that can run before the heat is disabled. i.e. A2 and A3 in the ON position will allow the heater to operate with up to 3 high-speed pumps (or two HS Pumps and Blower) running at the same time. Heat is disabled when the fourth high-speed pump or blower is turned on.

**Note:** A2/A3 all off = No heat with any high-speed pump or blower.

#### **Assignable DIP Switches**

In "ON" position, enables a 5-minute cooldown for some gas heaters (Cooling Time B). Α4 In "OFF" position, enables a 1-minute cooldown for electric heaters (Cooling Time A).

In "ON" position, add one high-speed pump (or blower) with Heater.

In "OFF" position, enables Special Amperage Rule A.

In "ON" position, add two high-speed pumps (or 1 HS Pump and Blower) with Heater.

Α7 In "ON" position, Simplified Menus on TP400/TP500/TP600. Do not use graphic panels (TP800, TP900, or spaTouch™ family) with Simplified Menus. In "OFF" position, Regular Menus on TP400/TP500/TP600. This setting is compatible with all panels.

Undesignated switches are not assigned a function.

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. © Copyright 2009 Balboa Water Group.





## KARAG

### **Jumper Definitions**

## KARAG

J109	Non Applicable on CE models			J109 🔂
J30	Do Not Use			
 J31	Jumper on 1 pin with 2.0kW or smaller heater Jumper on 2 pins with a 3.0kW or higher heater	J31	for 2kW models	
	· · · ·	which is shown to the right of the jumper.	J31	for 3kW models

J44 Jumper must be on center two pins (240V) for CE Systems.



#### Warning!

Setting DIP switches or jumpers 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.



### **Replacement Parts**

## KARAG

#### PCBA: Main PCBA: 59191-01 3.0kW Models 59193-01 2.0kW Models Expander PCBA: N/A HEATER(s): 58419 3.0kW 800 Inc -- for integral heater only Heater: 58450 3.0kW 825 Inc -- for integral heater only 58427 2.0kW 800 Inc -- for integral heater only 30344KIT 12-inch sensor -- for integral heater only Temp Sensor Kit: 30382KIT 24-inch sensor -- for integral heater only **CABLES:** N/A **FUSES:** Part Number Amperage Location 30136 30A F6 26983 1A F4, F5 0.1A SI 0 24514 F3



## KARAG

#### **General Features**

Foaturo

D۵	fэ	m	H.

reature	Derault	
Pump 1 in Filter Cycle (Circ Only)	No	
Pump 1 Low Timer	30 Minutes	Applies in non-circ Setups (configurations) only
General Pump Timer	15 Minutes	
Blower Timer	15 Minutes	
Mister Timer	15 Minutes	
Light Timer	240 Minutes	
Circ (when enabled)	Programmable + Polling	
Cleanup Cycle	30 Minutes	
Cleanup as Preference setting	Yes	
Ozone	With Heater Pump*	
Ozone Suppression	OFF	
Pump Purge	60 Seconds	
Blower Purge	30 Seconds	
Mister Purge	5 Seconds	

Serial - Pumps at lowest speed

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

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.



Purge Type

## KARAG

#### **Temperature Features**

Feat	ure				D
_		-			

Default

Temperature Display

°C

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	1 <b>9</b>	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-R	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-R	ange l	Max. S	Set Te	mp				99°F											
Lo-R	ange l	Defaul	lt Tem	ıp*				70°F											
Free	ze Thre	esholo	ł					44°F	in Se	tups 1	& 2;	48°F	in Set	tup 3					
Free	ze Typ	e						Rotat	ting -	Pump	s at L	owest	Spee	d					
Tem	D Lock	Туре						Temp	+ Set	tings									

\*May be changed by end-user (if enabled)

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. © Copyright 2009 Balboa Water Group.



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## KARAG

#### **Time Features**

Feature	Default
Time Format*	24 Hour
Filter 1 Start Hour*	20:00 (8:00 PM)
Filter 1 Duration*	2 Hours
Filter Cycle 2 Default*	OFF
Filter 2 Start Hour*	08:00 (8:00 AM)
Filter 2 Duration*	15 Minutes
Light Cycle	Disabled
Light Cycle Default*	OFF
Light Cycle Start Hour*	21:00 (9:00 PM)
Light Cycle Duration*	15 Minutes
Cooling Time A	1 Minute
Cooling Time B	5 Minutes

\*May be changed by end-user (if enabled)



## KARAG

#### **Reminder Features**

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

\*May be changed by end-user (if enabled)



## **KARAG**

#### **Special Features**

Feature	Default
Special Amperage Rule A	No Limitation
Special Amperage Rule B	No Limitation
Drain Mode	Disabled
Demo Mode	Disabled
GFCI Trip	Not Applicable for CE Models
Automatic GFCI Test	Disabled
Ozone Slaved to Heater Pump	Yes
Dual Voltage Heater	Always Input Voltage
Safety Suction	Disabled
Menu Style	Standard Menus when DIP switch A7 is OFF. Simplified Menus when DIP switch A7 is ON



## **TP900 Panel Configuration**

## KARAG

#### **Button Layout Table**

Button #	Setup 1	Setup 2	Setup 3	Spa Screen
1	N/A	N/A	N/A	
2	Jets 1	Jets 1	Light	
3	Light	Light	Invert	
4	Invert	Invert	(Circ Icon)	
5	(Circ Icon)	Undefined	Undefined	
6	Undefined	Undefined	Undefined	
7	Undefined	Undefined	Undefined	
8	Undefined	Undefined	Undefined	
9	Undefined	Undefined	Undefined	
10	Undefined	Undefined	Undefined	
11	N/A	N/A	N/A	Shortcuts Screen
12	N/A	N/A	N/A	
13	Jets 1	Jets 1	Undefined	
14	Undefined	Undefined	Undefined	
15	Light	Light	Undefined	
16	Invert	Invert	Undefined	

A Circ Icon will appear when a Circ Pump is configured

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.



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## **TP800 Panel Configuration**

## KARAG

#### **Button Layout Table**

Feature #	Setup 1	Setup 2
 A1	N/A	N/A
A2	Jets 1	Jets 1
A3	Light 1	Light 1
A4	Invert	Invert
A5	(Circ Icon)	Undefined
A6	Undefined	Undefined
A7	Undefined	Undefined
A8	Undefined	Undefined
A9	Undefined	Undefined
A10	Undefined	Undefined
A11	N/A	N/A
A12	N/A	N/A
A13	Undefined	Undefined
A14	Undefined	Undefined
A15	Undefined	Undefined
A16	Undefined	Undefined
B1	Jets 1	Jets 1
B2	Undefined	Undefined
B3	Undefined	Undefined
B4	Light 1	Light 1

TP800 is not officially supported in Setup 3.

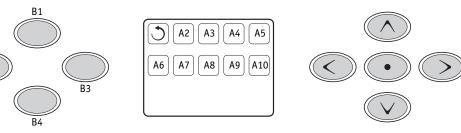


### **TP800 Panel Configuration**

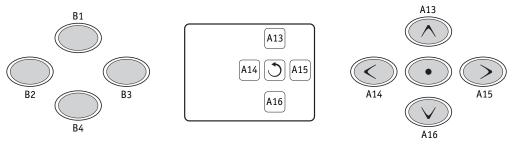
## KARAG

Spa Screen

B2



#### **Shortcuts Screen**



**Note:** Buttons 11 and 12 are not used in this configuration.

Button 1 is fixed.



## **TP600 Panel Configuration**

## KARAG

#### **Button Layout Table**

Button #	Setup 1 & 2
1	Jets 1
2	Undefined
3	Invert
4	Up
5	Light 1
6	Down
LED 1	Jets 1
LED 2	Undefined
LED 3	Light 1
LED 4	Heat On

TP600 is not officially supported in Setup 3.



TP600 55676-XX No Overlay



## **TP400 Panel Configuration**



#### **Button Layout Table for TP400T**

Button #	Setup 1 & 2	Setup 3
1	Temperature	Up
2	Jets 1	Down
3	Light 1	Light 1
4	Undefined	Undefined
LED 1	Heater ON	Heater ON
LED 2	Jets 1 ON	Undefined
LED 3	Light ON	Light ON
LED 4	Undefined	Undefined

#### **Button Layout Table for TP400W**

Button #	All Setups
1	Up
2	Down
3	Light 1
4	Jets 1
LED 1	Heater ON
LED 2	Undefined
LED 3	Light ON
LED 4	Jets 1 ON



50259-XX Includes overlay PN 12510.



**TP400T CE** 

50260-XX Includes overlay PN 12511.

