### **BP200G3 Tech Sheet**

**Customer:** Balboa Water Group

**Part Number:** 59271-02 3.0kW 800 Incoloy

59370-02 3.0kW 825 Incoloy 59335-02 3.0kW Titanium 59273-02 2.0kW 800 Incoloy 59516-01 2.0kW 825 Incoloy

Custom Box Overlay

Box Overlay Part Number N/A

CE System Model For 2.0KW: BP2-BP200G3-RCA-2.0KW
CE System Model For 3.0KW: BP2-BP200G3-RCA-3.0KW

Software Version ID: M100\_235 V52.0

Software Version: 52.0

File Name: BP200 52.0 BP200G3.hex

Configuration Signature: 37BAC3E9

Eng. Project Number: 5738

Control Panels (See later pages for more information):

spaTouch™3 Any version

spaTouch™2 Any version (version 2.0 or later required for bba™2 fully integrated functionality)

Icon spaTouch™ Any version (version 3.36 or later required for bba™2 fully integrated functionality)

Menued spaTouch™ Any version (version 2.8 or later required for bba™2 integrated functionality)

TP800 Version 3.1 and later (Version 3.13 or later required for bba™; version 4.11 or later required for bba™2 integrated functionality)

TP700/TP740 Any version

TP600 Version 2.7 and later (Version 2.12 or later required for bba™/bba™2 On/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 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 On/Off control via menu)

TP200T Any version
TP200W Any version





### **System Revision History**

Part #	EPN	Date	Originator	Changes Made
59271 59273	5205	08-27-19	BWG	Generic BP200G3 system, supporting most of the Setups the BP200 board can do with a blower expander board.
"	"	10-10-19	BWG	Add line 3 info to 2/3x16A conversion instructions box.
59370	"	10-17-19	BWG	Added new 825 Incoloy system PN.
59335	"	06-16-20	BWG	Added new Titanium system PN.
59271-01 59273-01 59335-01 59370-01	5353	11-17-20	BWG	Update to new system board shape.
59516	5565	04-20-21	BWG	Add new 2.0kW 825 Incoloy system PN.
59271-02 59273-02 59335-02 59370-02 59516-01	5678 5738	04-21-22 10-11-23	BWG BWG	Redesigned expander board, with Voltrex connector J7 instead of soldered wire connection W12.  Remove GFCI wording from wiring diagram.

bba™2 / bba™3 (Balboa Bluetooth Amp) connection is documented separately.

Template 56377 10-05-12

bba™2 / bba™3 is integrated into graphic display panels (TP700, TP800, TP900 and spaTouch™). With TP600/TP500/TP400/TP200, use the "BT" entry on the menu to toggle bba™2 / bba™3 power On/Off.



### **Basic Functions Setup 1 - 4**

#### **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\*, 1b, 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\*, 2/3þ, 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.

#### 2-out-of-3-Service wiring options with Blower:

The Blower can either be wired to the Heater service or to the Pump 1 service.

If the Blower is wired to the Heater service, DIP Switch A8 ON (with other DIP swtiches OFF) makes the Blower shut OFF the heater, but lets Pump 1 run along with the Heater.

If the Blower is wired to the Pump 1 service, then the heater can always run (with DIP switches A2 and A3 both ON). However, in most cases DIP Swtich A5 also has to be ON, which only allows either Pump 1 High or the Blower (not both) to run at a given time. To determine whether DIP switch A5 can be turned OFF, add up the amperages of PUmp 1 High, the Blower, the Circ Pump (if any), the Ozone, and A/V (if any). If the sum of all this equipment is below 16A, DIP switch A5 can be trurned OFF.

When DIP swtich A5 is ON, the Blower is automatically turned OFF when Pump 1 goes to high speed. (If Pump 1 then goes to low speed or turns OFF, the Blower may turn back ON automatically.)

#### 2-out-of-3-Service wiring options without Blower:

When not using Blower, ie in Setups 3 & 4, the heater can run at any time with either of the above DIP swtich settings.



**HiPot Testing Note:** 

Disconnect slip terminal with green

successful completion of HiPot test.

wires from J6 prior to performing HiPot test. Failure to disconnect may

cause a false failure of the test.

Reconnect terminal to J6 after

### **Basic Functions Setup 1 - 4**

System U	uputs:			1	n Group 3:
Pump 1	230VAC	2-Speed	12A max	15-minute timer for High Speed 30-Minute timer for Low Speed	
			eater pump i 20 GPM thro	n Setups 2 & 4. ugh heater	
		1 Speed in S	etups 1 & 3		
Blower	230VAC	1-Speed Unused in Se	4A max etups 3 & 4	15-minute timer	X
Circ Pump	230VAC		2A max eater pump i 20 GPM thro	Programmable Filtration Cycles + Polling n Setups 1 & 3. ugh heater	
0zone	230VAC		.5A max	Slaved to Circ Pump in Circ Setups and to Pum	p 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 @ 240	OVAC max			

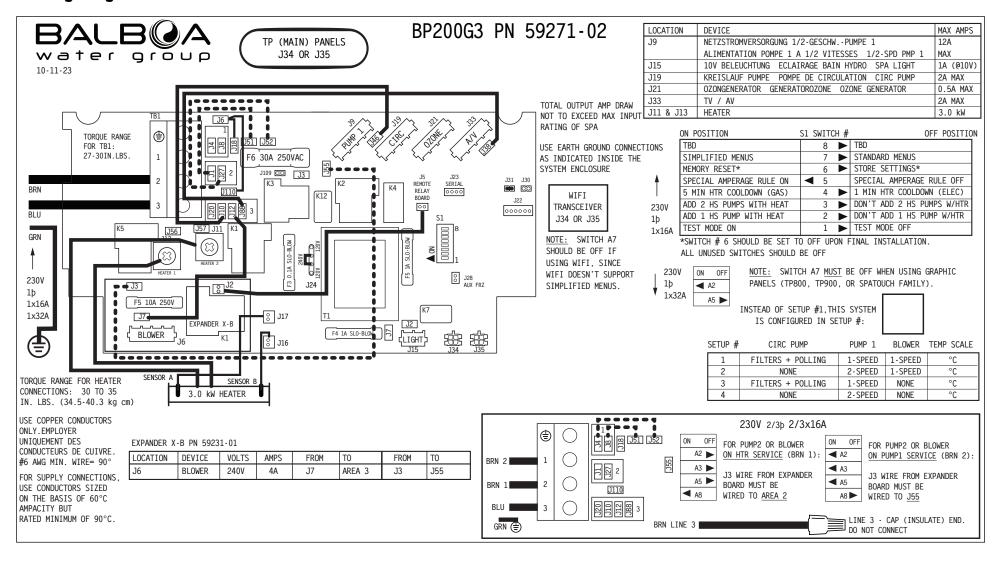


In Croup 2.

Systam Dunuts

### **Hardware Setup**

#### **Wiring Diagram**



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.



### **Setup Reference Table**

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

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



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

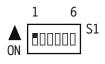
#### Test Menu Access (S1, Switch 1 ON) Service Technician ONLY.

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

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.

# ON D



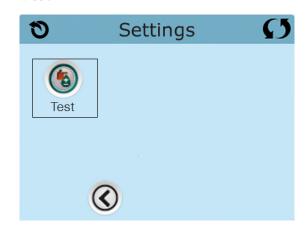
wider.

#### **To Change Software Setups:**

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



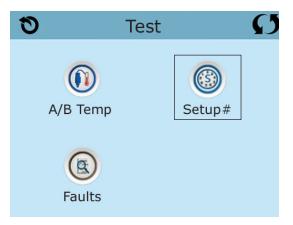




The example screens shown here are from the

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



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.

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.



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.



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

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

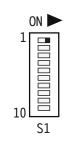
#### DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY!

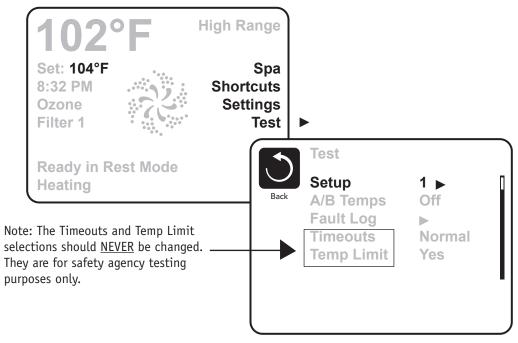
While the system is running, move DIP Switch 1 (on S1 on the Main circuit board) to ON. The system will enter Test Mode.

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.







### **Changing Software Setups with TP600/TP500/TP400/TP200**

#### 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.

## 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

#### **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.



### Changing Software Setups with TP600/TP500/TP400/TP200 Continued

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

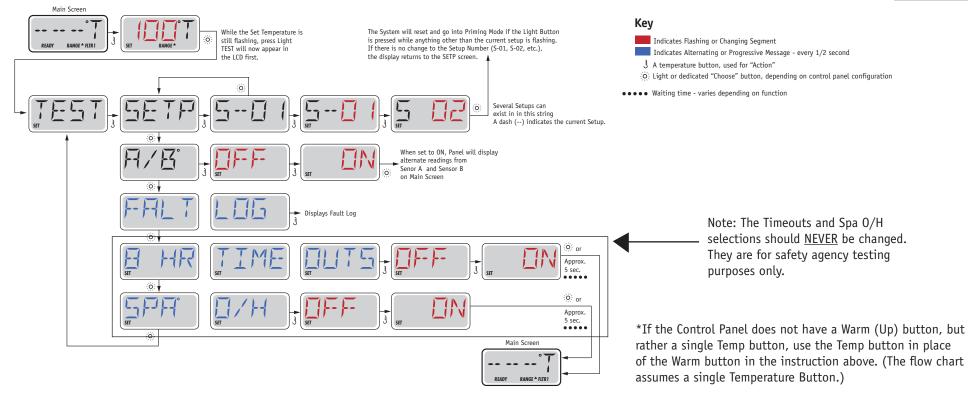
NOTE: Wherever the below says Warm or Temp followed by Light, on the TP500 press Menu instead of Warm or Temp followed by Light. And whenever the chart below says Light, on the TP500 press Menu instead of Light.

Immediately after exiting Priming Mode, press this sequence of buttons: Warm\*, Light, Warm, 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. © Copyright 2009 Balboa Water Group.



THIS SYSTEM IS

CONFIGURED AS SETUP #

### **Equipment Expansion**

**Expansion Features Control Connection** 

**Default** 

Fuse

Relay 1 (J5)

1-Speed Blower

10A



### **DIP Switch Functions**

#### Fixed-fuction DIP Switches

A1 Test Mode (normally Off).

A2 In "ON" position, add one high-speed pump (or blower) with Heater.

A3 In "ON" position, add two high-speed pumps (or 1 HS Pump and Blower) with Heater.

A5 In "ON" position, enables Special Amperage Rule B. See Special Features section under Configuration Options for functionality with your system.

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

A6 Persistent memory reset (Used when the spa is powering up to restore factory settings as determined by software configuration).

8 □□□□ 1 ■ 0N S1

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**

A4 In "ON" position, enables a 5-minute cooldown for some gas heaters (Cooling Time B).

In "OFF" position, enables a 1-minute cooldown for electric heaters (Cooling Time A).

A7 In "ON" position, Simplified Menus on TP200/TP400/TP500/TP600. <u>Do not</u> use graphic panels (TP700/TP800/TP900/spaTouch™ family) with Simplified Menus.

In "OFF" position, Regular Menus on TP200/TP400/TP500/TP600. This setting is compatible with all panels.

A8 In "ON" position, 3-Phase Special Amperage Rule is enabled.

In "OFF" position, 3-Phase Special Amperage Rule is disabled.

Undesignated switches are not assigned a function.



### **Jumper Definitions**

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	Jumper setting varies by system model	J31 for 2kW models
	which is shown to the right of the jumps		J31 for 3kW models

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.

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.



### **Replacement Parts**

PCBA:

Main PCBA: 59505 3.0kW Models 59506 2.0kW Models

Expander PCBA: 59231-01

**HEATER(s):** 

Heater: 58419R16 3.0kW 800 Inc

58450R16 3.0kW 825 Inc 58420R16 3.0kW Titanium 58427R16 2.0kW 800 Inc 58454R16 2.0kW 825 Inc

Temp Sensor Kit: 30344KIT 12-inch sensor

30382KIT 24-inch sensor

CABLES: N/A

#### **FUSES:**

Template 56377 10-05-12

Part Number	Amperage*	Location
30136	30A	F6
26983	1A	F4, F5 on main board
24514	0.1A	F3
30122	10A	F5 on X-B expander

<sup>\*</sup> The amperages shown above are only intended for identifying fuses on our boards. They are not complete descriptions of those fuses. Please use the part numbers at the left to order fuses directly from Balboa.



#### **General Features**

Feature	Default	
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	
Duran Duran	CO C	
Pump Purge	60 Seconds	
Blower Purge	30 Seconds	
Mister Purge	5 Seconds	



Serial - Pumps at lowest speed

Purge Type

<sup>\*</sup> The heater Pump can be either a Circ Pump or Pump 1 Low.

#### **Temperature Features**

Feature 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	19	20	21	22
°F	39	41	43	45	46	48	50	52	54	55	<i>57</i>	59	61	63	64	66	68	70	72
°C	23	24	25	26	27	28	29	30	31	<i>32</i>	33	34	<i>35</i>	36	<i>37</i>	38	39	40	
°F	73	<i>75</i>	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	99°F
Lo-Range Default Temp*	70°F

Freeze Threshold 44°F in Setups 1 & 2

Freeze Type Rotating - Pumps at Lowest Speed

Temp Lock Type Temp + Settings



<sup>\*</sup>May be changed by end-user (if enabled)

#### **Time Features**

Feature	Default
Time Format*	24 Hour
Filter 4 Chart Harry	20.00 (0.00 PM)
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



<sup>\*</sup>May be changed by end-user (if enabled)

#### **Reminder Features**

Feature	Default
Reminders Shown*	Yes
Check pH	0FF
Check Sanitizer	0FF
Clean Filter	30 Days
Test GFCI	OFF
Drain Water	100 Days
Change Cartridge	OFF
Clean Cover	0FF
Treat Wood	0FF
Change Filter	365 Days



<sup>\*</sup>May be changed by end-user (if enabled)

#### **Special Features**

Feature Default
Special Amperage Rule A No Limitation

Special Amperage Rule B 1 Pump at High Speed maximum, Blower turns OFF when 1 Pump is at High Speed

3-Phase Special Amperage Rule Blower in Group 3 is the only device which turns the Heater OFF

Pumps not in Group 3 (ie, Pump 1) do not turn the Heater OFF

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

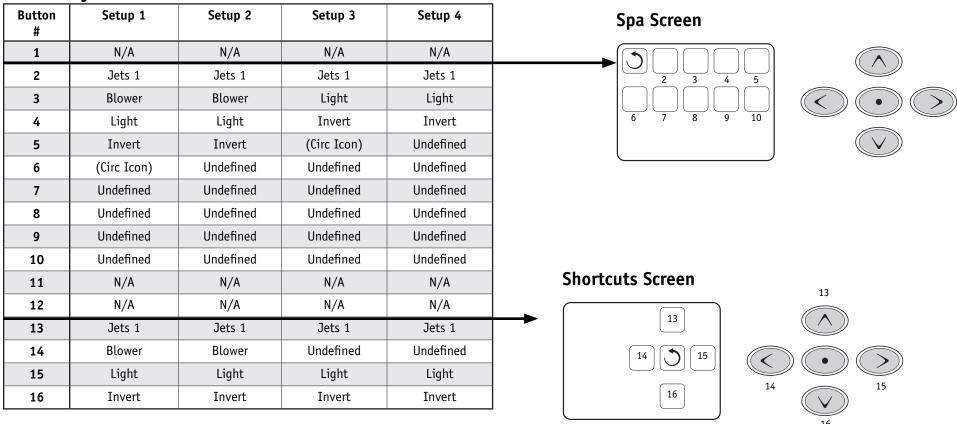
Menu Style Standard Menus when DIP switch A7 is OFF.

Simplified Menus when DIP switch A7 is ON.



### **TP900 Panel Configuration**

#### **Button Layout Table**



A Circ Icon will appear when a Circ Pump is configured



### **TP800 Panel Configuration**

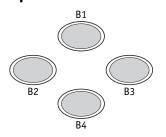
#### **Button Layout Table**

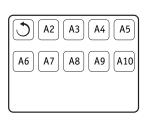
Feature #	Setup 1	Setup 2	Setup 3	Setup 4
A1	N/A	N/A	N/A	N/A
A2	Jets 1	Jets 1	Jets 1	Jets 1
А3	Blower	Blower	Light 1	Light 1
A4	Light	Light	Invert	Invert
A5	Invert	Invert	(Circ Icon)	Undefined
A6	(Circ Icon)	Undefined	Undefined	Undefined
A7	Undefined	Undefined	Undefined	Undefined
A8	Undefined	Undefined	Undefined	Undefined
A9	Undefined	Undefined	Undefined	Undefined
A10	Undefined	Undefined	Undefined	Undefined
A11	N/A	N/A	N/A	N/A
A12	N/A	N/A	N/A	N/A
A13	Undefined	Undefined	Undefined	Undefined
A14	Undefined	Undefined	Undefined	Undefined
A15	Undefined	Undefined	Undefined	Undefined
A16	Undefined	Undefined	Undefined	Undefined
B1	Jets 1	Jets 1	Jets 1	Jets 1
B2	Blower	Blower	Undefined	Undefined
В3	Undefined	Undefined	Undefined	Undefined
B4	Light 1	Light 1	Light 1	Light 1

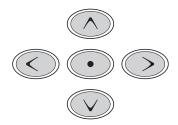


### **TP800 Panel Configuration**

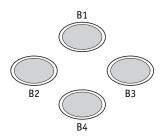
#### **Spa Screen**

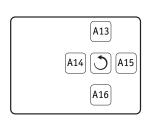


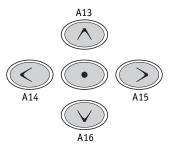




#### **Shortcuts Screen**







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

Button 1 is fixed.



### **TP600 Panel Configuration**

#### **Button Layout Table**

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



#### **TP600**

55676-XX

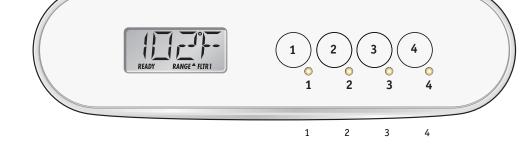
No Overlay



### **TP400/TP200 Panel Configuration**

#### **Button Layout Table for TP400T/TP200T**

Button #	Setups 1 & 2	Setups 3 & 4
1	Temperature	Temperature
2	Jets 1	Jets 1
3	Light 1	Light 1
4	Blower	Undefined
LED 1	Heater ON	Heater ON
LED 2	Jets 1 ON	Jets 1 ON
LED 3	Light ON	Light ON
LED 4	Blower	Undefined



1

#### TP400T CE

50260-XX includes overlay PN 12511

#### **Button Layout Table for TP400W/TP200W**

= a		
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	

TP400W/TP200W is supported in Setups 3 & 4 only



#### **TP200T**

57281-XX with no overlay 57282-XX includes overlay PN 17325

#### **TP200W**

TP400W CE

57290-XX with no overlay

50259-XX includes overlay PN 12510 57283-XX includes overlay PN 17374

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.

