BP100G2 Tech Sheet

Customer: Balboa Water Group

Part Number: 59267-03 5.5kW 800 Incoloy

59344-02 5.5kW Titanium 59268-03 4.0kW 800 Incoloy

59270-02 Remote Heater System -- Heater is sold separately

Custom Box Overlay
Box Overlay Part Number N/A

UL System Model For 5.5kW: BP1-BP100G2-BU
UL System Model For 4.0kW: BP1-BP100G2-BS
UL System Model For Remote: BP1-BP100G2-B
Software Version ID: M100_230 V52.0

Software Version: 52.0

File Name: BP100 52.0 BP100G2.hex

Configuration Signature: F402B0EF

Eng. Project Number: 5678

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)

TP900 Version 3.1 and later (Version 3.13 or later required for bba™)

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 Any version

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

TP500 Any version

TP400T US Version 2.7 and later (TP400T CE may be used) (Version 2.12 or later required for bba™ series On/Off control via menu)

TP400W US Version 2.7 and later (TP400W CE may be used) (Version 2.12 or later required for bba™ series On/Off control via menu)

TP200T Any version
TP200W Any version



System Revision History

| Part # | EPN | Date | Originator | Changes Made |
|--|------|----------|------------|--|
| 59267 59268 | 5205 | 05-01-19 | BWG | Generic BP100G2 system, supporting most of the Setups the BP100 board can do with a pump expander board. |
| 59267-01 59268-01 | 5270 | 09-04-19 | BWG | Update software for full TP500 compatibility. |
| 59270 | 5270 | 09-04-19 | BWG | Added PN for version with remote heater support. Remote heater is sold separately. |
| 59344 | 5308 | 11-21-19 | BWG | Added 5.5kW Titanium heater system PN. |
| 59267-02 59268-02 59270-01 50344-01 | 5353 | 09-24-20 | BWG | Update to new system board shape. |
| 59267-02 59268-02 59270-01 50344-01 | 5634 | 10-07-21 | BWG | Correction to Setup Table on Wiring Diagrams. |
| 59267-03 59268-03 59270-02 50344-02 | 5678 | 04-18-22 | BWG | Redesigned expander board, with Voltrex connector J7 instead of soldered wire connnection W12. |
| | | | | |

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

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:

240VAC, 50/60Hz*, 48A, Class A GFCI-protected service (Circuit Breaker = 60A max.), 4 wires [hot, hot, neutral, ground]

120/240VAC, 50/60Hz**, 16/40A, Class A GFCI-protected service (Circuit Breaker = 20/50A max.) -- Setups 3 & 4 Only 3 or 4 wires [hot, hot (optional), neutral, ground].

**NOTE:

The above 120V spec is only when using a wall-mount GFCI / breaker. If using a GFCI cord, the breaker is 15A and so the service is limited to 12A.

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.

*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.



Basic Functions Setup 1 - 4

System Ouputs:

| Pump 1 | 240VAC* | | 12A max heater pump r 20 GPM thro | 15-minute timer (30-minute timer for P1 Low in non-circ Setups 2 & 4 only) in Setups 2 & 4. ough heater |
|--------------|---------|-------------------------------|---|---|
| | | 1-Speed in | Setups 1 & 3 | |
| Pump 2 | 240VAC | 1-Speed Unused in S | 12A max Setups 3 & 4 | 15-minute timer |
| Circ Pump | 240VAC* | | 2A max heater pump r 20 GPM thro | Programmable Filtration Cycles + Polling in Setups 1 & 3. ough heater |
| 0zone | 240VAC* | | .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) | 120VAC | Hot | 3A max | Always on |
| Heater | _ | 40VAC (approx 40VAC (1.0kW | < 1.4kW @ 12 @ 120VAC) | POVAC) |

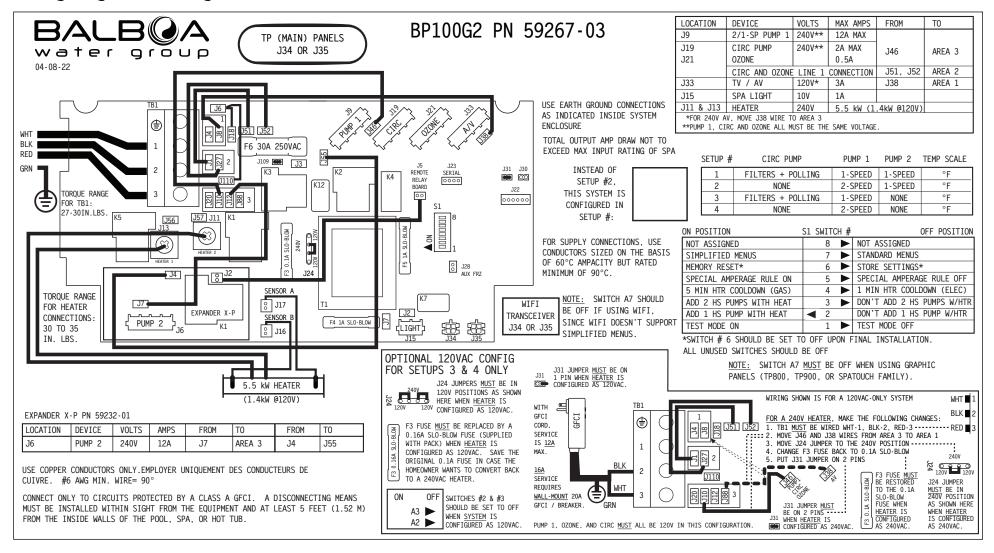
With 120VAC power input (for Setups 3 & 4 only), Pump 1, Circ pump and Ozone must all be 120V. See wiring diagram for rewiring instructions.



^{*}Pump 1, Circ Pump and Ozone must be the same voltage.

Hardware Setup

Wiring Diagram for Integral Heater Version

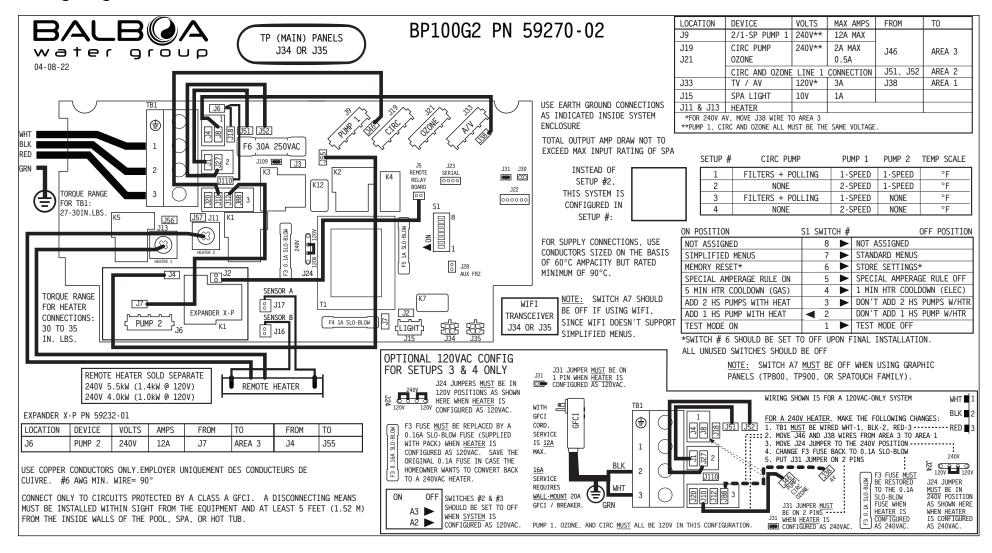


Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending.



Hardware Setup

Wiring Diagram for Remote Heater Version



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.



Setup Reference Table

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

System (and any replacement board) is shipped
in Setup 2



Changing Software Setups with spaTouch™ Icon-Driven Panels

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

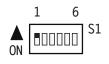
DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY!

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.

10 51

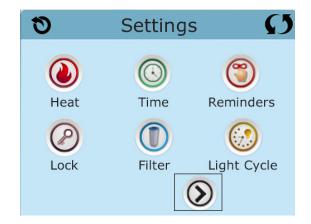
ON >

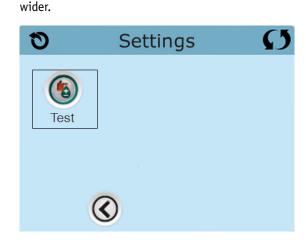


To Change Software Setups:

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



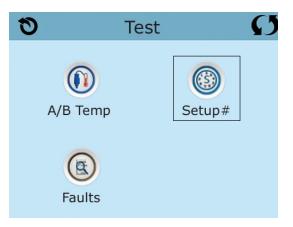




The example screens shown here are from the

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.

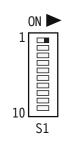
DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY!

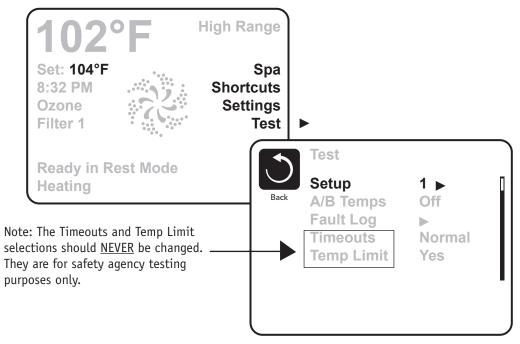
While the system is running, move DIP Switch 1 (on S1 on the Main circuit board) to ON. The system will enter Test Mode.

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

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.



As soon as Switch #1 is placed

System is in Test Mode

in the ON position, the temperature will show

"T" after it instead of F or C, indicating the

Changing Software Setups with TP600 / TP500 / TP400 Continued

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

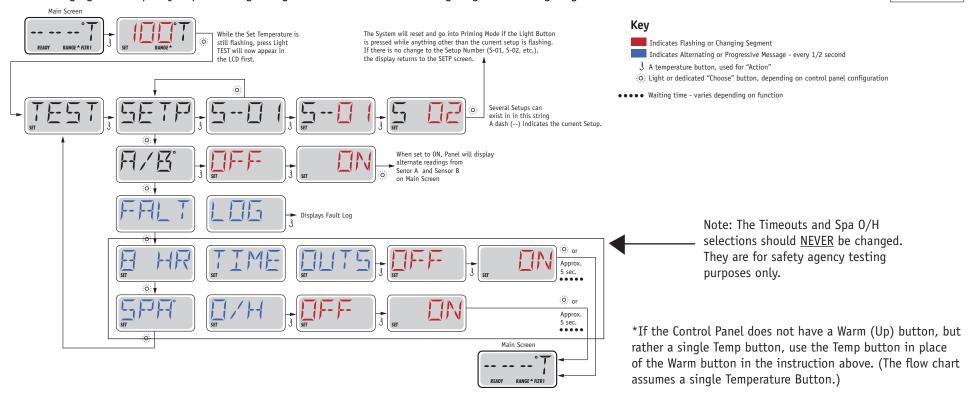
NOTE: Wherever the below says Warm or Temp followed by Light, on the TP500 press Menu instead of Warm or Temp followed by Light. And whenever the chart below says Light, on the TP500 press Menu insead of Light.

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 Pump 2

None (uses main board 30A fuse)



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).

A2 and A3 work in combination to determine the number of high-speed devices and blowers that can run before the heater 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 TP400/TP500/TP600. <u>Do not</u> 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.



ON

S1

Jumper Definitions

| J109 | GFCI Test/Trip Enable/Disable Note: This feature must be enabled in software as well. | J109 ⊱ |
|------|---|--------|
| J30 | Do Not Use | |
| J31 | Jumper on 1 pin when heater voltage is 120V Jumper on 2 pins when heater voltage is 240V | J31 🚱 |

Jumper on center two pins (240V) when heater voltage is 240V. J24

Two Jumpers installed; one on left 2 pins and one on right 2 pins (120V) when heater voltage is 120V.

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

PCBA:

Main PCBA: 59495 Expander PCBA: 59232-01

HEATER(s):

Heater: 58421R16 5.5kW 800Inc -- for integral heater only

58422R16 5.5kW Titanium -- for integral heater only

58426R16 4.0kW 800Inc -- for integral heater only

Temp Sensor Kit: 30344KIT 12-inch sensor -- for integral heater only

30382KIT 24-inch sensor -- for integral heater only

FUSES:

| Part Number | Amperage* | Location |
|-------------|-----------|---------------------------|
| 30136 | 30A | F6 |
| 26983 | 1A | F4, F5 |
| 24514 | 0.1A | F3 when using 240V heater |
| 26982 | 0.16A | F3 when using 120V heater |

^{*} 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 | |
| Cleaup as Preference setting | Yes | |
| 0zone | With Heater Pump* | |
| Ozone Suppression | OFF | |
| | | |
| Pump Purge | 60 Seconds | |
| Blower Purge | 30 Seconds | |
| Mister Purge | 5 Seconds | |
| Purge Type | Serial - Pumps at lowest | : speed |



^{*} The heater Pump can be either a Circ Pump or Pump 1 Low.

Temperature Features

Feature Default

Temperature Display

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 | <i>15</i> | 16 | 17 | 18 | 19 | 20 | 21 | 22 | |
|----|----|-----------|----|----|----|----|----|-----------|----|-----------|-----------|-----------|-----------|----|----|-----|-----|-----|----|--|
| °F | 39 | 41 | 43 | 45 | 46 | 48 | 50 | <i>52</i> | 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 | 37 | 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° |
| Hi-Range Default Temp* | 100° |
| Lo-Range Min. Set Temp | 50°F |
| Lo-Range Max. Set Temp | 99°F |
| Lo-Range Default Temp* | 70°F |
| Freeze Threshold | 44°F |

Freeze Type Rotating - Pumps at Lowest Speed

Temp Lock Type Temp + Settings



^{*}May be changed by end-user (if enabled)

Time Features

| Feature | Default |
|-------------------------|-----------------|
| Time Format* | 12 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)

Reminder Features

| Feature | Default |
|------------------|------------|
| Reminders Shown* | Yes |
| Check pH | <i>OFF</i> |
| Check Sanitizer | <i>OFF</i> |
| 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)

No Limitation

Special Features

Special Amperage Rule B

Feature Default
Special Amperage Rule A No Limitation

Drain Mode Disabled
Demo Mode Disabled
GFCI Trip Enabled
Automatic GFCI Test Disabled

Ozone Slaved to Heater Pump Yes

Dual Voltage Heater Always Input Voltage

Safety Suction Disabled

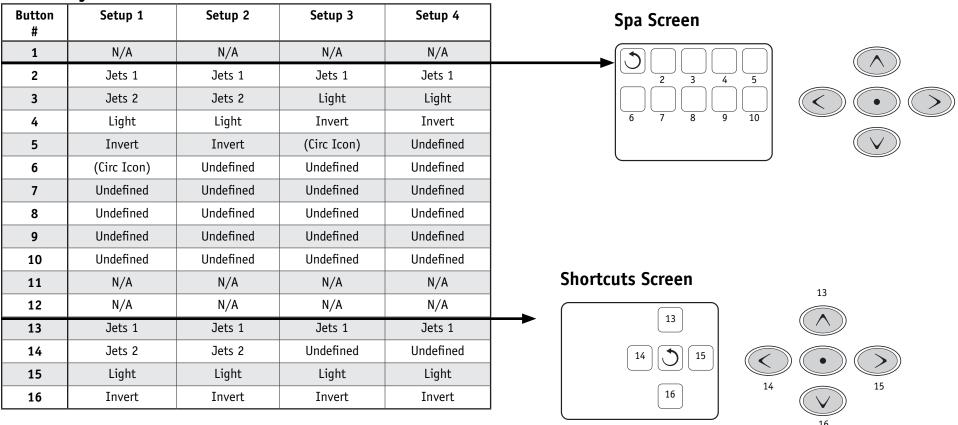
Menu Style Standard Menus when DIP switch A7 is OFF.

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

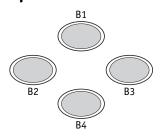
Button Layout Table

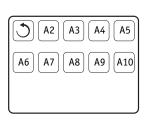
| Feature # | ire Setup 1 Setup 2 Setu | | Setup 3 | Setup 4 | |
|--------------|--------------------------|-----------|-------------|-----------|--|
| A1 | N/A | N/A | N/A | N/A | |
| A2 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | |
| А3 | Jets 2 | Jets 2 | Light 1 | Light 1 | |
| A4 | Light 1 | Light 1 | 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 | Jets 2 | Jets 2 | Undefined | Undefined | |
| В3 | Undefined | Undefined | Undefined | Undefined | |
| B4 | Light 1 | Light 1 | Light 1 | Light 1 | |

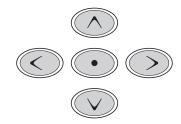


TP800 Panel Configuration

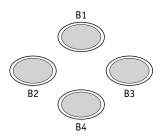
Spa Screen

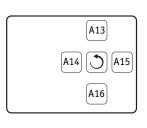


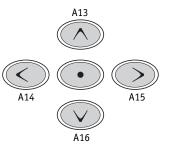




Shortcuts Screen







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 | Setups 3 & 4 | | | |
|-------------|--------------|--------------|--|--|--|
| 1 | Jets 1 | Jets 1 | | | |
| 2 | Jets 2 | Undefined | | | |
| 3 | Invert | Invert | | | |
| 4 | Up | Up | | | |
| 5 | Light 1 | Light 1 | | | |
| 6 | Down | Down | | | |
| LED 1 | Jets 1 | Jets 1 | | | |
| LED 2 | Jets 2 | Undefined | | | |
| LED 3 | Light 1 | Light 1 | | | |
| LED 4 | Heat On | Heat On | | | |



TP600

55676-XX

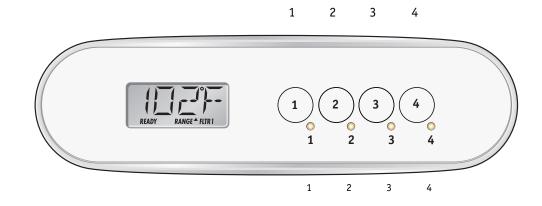
No Overlay



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 | Jets 2 | Undefined |
| LED 1 | Heater ON | Heater ON |
| LED 2 | Jets 1 ON | Jets 1 ON |
| LED 3 | Light ON | Light ON |
| LED 4 | Jets 2 | Undefined |



Button Layout Table for TP400W/TP200W

| 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 |

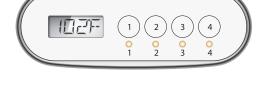
TP400W/TP200W is supported in Setups 3 & 4 only.

TP400T US

50380-XX Includes overlay PN 12511

TP200T

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



TP200W

TP400W US

57290-XX with no overlay

50384-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.

