# MS90U Tech Sheet

**Customer:** **Master Spas**

**Part Number:** 59470-03 825 Incoloy 4.0kW “3S” heater


Custom Box Overlay ☐

Box Overlay Part Number N/A

UL System Model (4.0kw): BP20-MS90U-BS

Software Version ID: M100_221 V65.0

Software Version: 65.0

File Name: BP1800_65.0_MS90U_SW9.hex

Configuration Signature: A24F4132

Eng. Project Number: 5500

Control Panels (See later pages for more information):

| | |
|---|---|
| spaTouch™3 | Any version (version 3.2 or later required for Clim8zone™ heat pump support) |
| spaTouch™2 | Any version (version 2.19 or later required for CHROMAZONƎ™ support; version 2.37 or later required for Clim8zone™ heat pump support) |
| Icon spaTouch™ | Any generic version (version 3.36 or later required for bba™2 fully integrated functionality) |
| Menued spaTouch™ | Any generic version (version 2.8 or later required for bba™2 integrated functionality) |
| MP800/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) |
| TP600 | Version 2.7 and later (Version 2.12 or later required for bba™/bba™2 On/Off control via menu) |
| TP400T US | Version 2.7 and later (TP400T CE may be used) (Version 2.12 or later required for bba™/bba™2 On/Off control via menu) |
| TP200T | Any version |





BALBOA water group

# System Revision History

| Part # | EPN | Date | Originator | Changes Made |
|---|---|---|---|---|
| ZT000545 | 5446 | 08-17-20 | Customer | Custom BP1800 system with optional expander board, patterned after MS6013XE and MS501X. |
| ZT000545 | 5446 | 09-08-20 | Customer | Updated to add Setups from MS40U, change heater to 4.0kW “3S” only, and renamed to MS90U. |
| 59470 | 5446 | 09-22-20 | Customer | Approved for production. |
| 59470-01 | 5563 | 06-23-21 | BWG | Update with Wago terminal block (later discontinued). |
| 59470-02 | 5663 | 06-09-22 | Customer | Update to support Clim8zone™ heat pump. |
| 59470-03 | 5500 | 11-21-22 | Customer | Add DIP switch A9 for choosing between 2 types of Circ behavior, with A9 defaulting to On. Also change filter cycle defaults on Circ Setups. |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |

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

bba™2 / bba™3 is integrated into graphic display panels (including TP800 and spaTouch™).
With TP600/400, use the “BT” entry on the menu to toggle bba™2 / bba™3 power On/Off.

# Basic Functions Setup 1-28

## 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 7, 8, 17, 18, 25 & 26 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.

* 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.

**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 - 28

## System Ouputs:

| | | | | |
|---|---|---|---|---|
| Pump 1 | 240VAC | 2-Speed | 12A max | 15-minute timer (120-minute timer for low speed in Non-Circ Setups only) |
| | | This is the heater pump in Setups 2, 4, 6, 8, 12, 14, 16, 18, 22, 24 & 28<br>Must deliver 20 GPM through heater<br>1-Speed in Setups 9, 10, 19, 20, 25 & 26 | | |
| Pump 2 | 240VAC | 2-Speed | 12A max | 15-minute timer |
| | | 1-Speed in Setups 3 - 6, 9, 10, 13 - 16, 19, 20<br>Unused in Setups 7, 8, 17, 18, 21 - 26 | | |
| Pump 3 | 240VAC | 1-Speed | 12A max | 15-minute timer |
| | | Used in Setups 3, 4, 9, 13, 14, 19, 27 & 28 only | | |
| Circ Pump | 240VAC* | 1-Speed | 2A max | 24-hour with 3˚F shutoff (outside of filter cycles)<br>This is the heater pump in Setups 1, 3, 5, 7, 9, 10, 11, 13, 15, 17, 19, 20, 21, 23, 25 - 27<br>Must deliver 20 GPM through heater |
| Ozone | 240VAC* | | 0.5A max | Independent in Non-Circ Setups and Slaved to Circ Pump in Circ Setups |
| Spa Light | 10VAC | On/Off | 2A** max | 60-minute timer.<br>Unused in Setups 21 - 24 |
| AV only | 120VAC**** | Hot | 4A max | Always on |
| AV + C8Z*** | 240VAC**** | Hot | 2A + 8A max | Always on |
| Heater | 4.0kW @ 240VAC max | | | |

*Circ Pump and Ozone must be the same voltage.

With 120VAC power input (for Setups 7, 8, 17, 18, 25 & 26 only), Pump 1, Circ Pump, and Ozone must be set to 120VAC by moving wires attached to J50, J51 and J32 to area 1 (Neutral).

** 2A max limit is shared by On/Off Spa Light and CHROMAZON∃™.

*** Optional splitter PN 22934 can be used to connect two things, such as an audio device and Clim8zone™(C8Z), to J33.

**** AV is configured by default to 120VAC, but must be converted to 240VAC if using Clim8zone™(C8Z) heat pump.

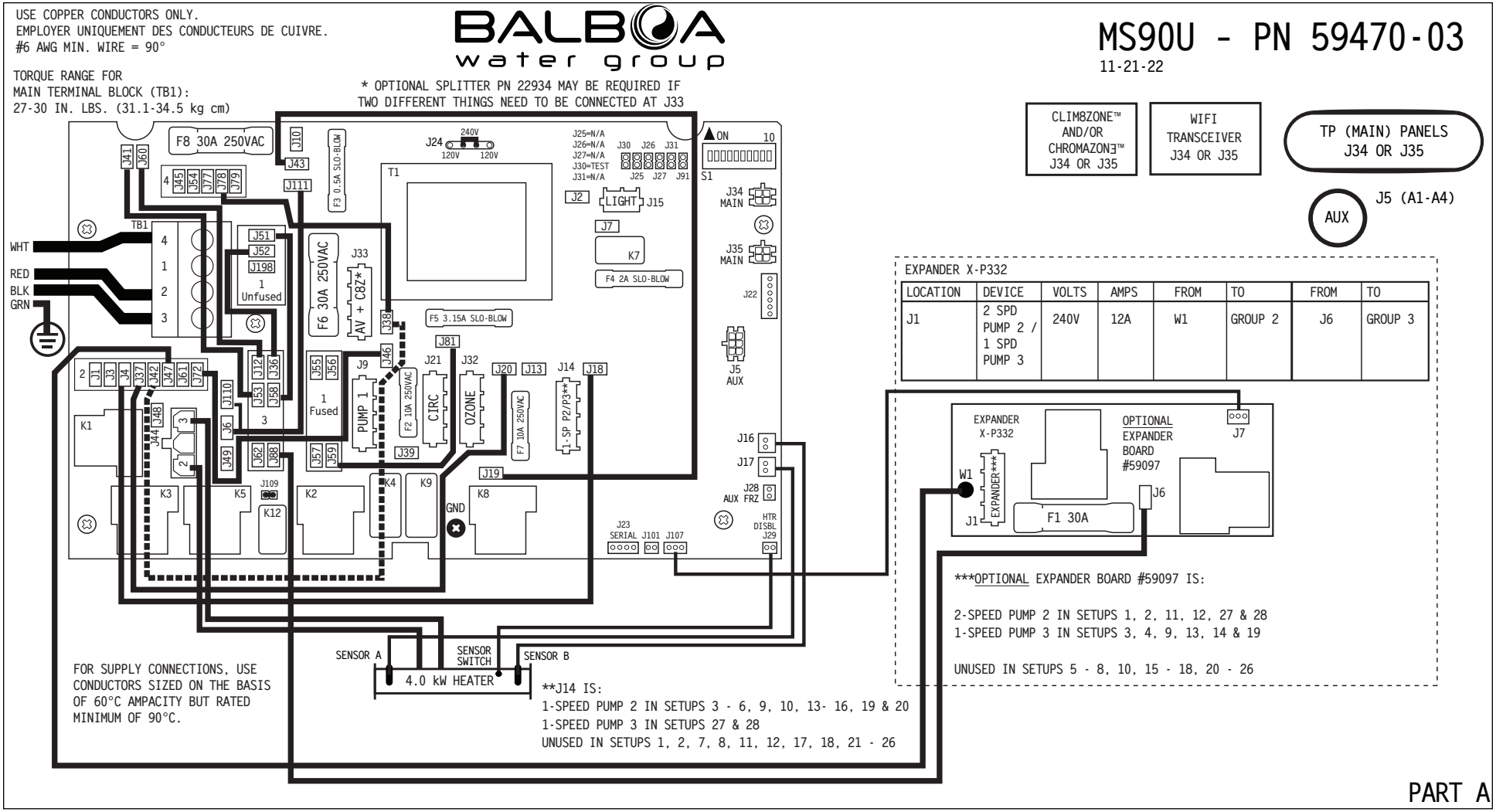




BALBOA water group

# Hardware Setup

## Wiring Diagram for “3S” heater versions

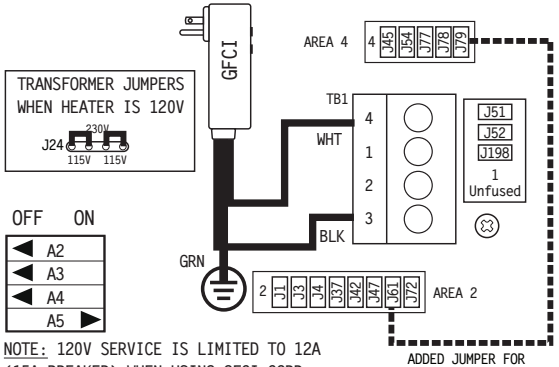


# Hardware Setup

## Settings for “3S” heater versions

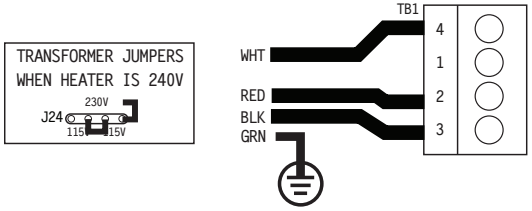
OPTIONAL 120VAC CONFIGURATION
FOR SETUPS 7, 8, 17, 18, 25 & 26 ONLY:

PUMP1 (J46), PUMP2 (J18), AV (J38), OZONE & CIRC (J20) MUST BE WIRED TO 120VAC (AREA 4 NEUTRAL) WHEN SYSTEM IS CONFIGURED WITH 120VAC POWER INPUT/GFCI CORD.




NOTE: 120V SERVICE IS LIMITED TO 12A (15A BREAKER) WHEN USING GFCI CORD. FOR 16A SERVICE (20A BREAKER), A WALL-MOUNTED GFCI MUST BE USED.

FOR 240V HEATER
REMOVE JUMPER BETWEEN AREA 2 AND AREA 4 BEFORE REMOVING GFCI CORD AND CONNECTING A 30A 240VAC GFCI-PROTECTED SERVICE. THERE SHOULD BE NO WIRES GOING TO AREA 2 WHEN HEATER IS 240V.




| LOCATION | DEVICE | VOLTS | MAX AMPS | FROM | TO |
|---|---|---|---|---|---|
| J9 | 2-SP PUMP 1 | 240V | 12A MAX | J46 | GROUP 2 |
| J14 | 1-SP PUMP 2/3 | 240V | 12A MAX | J18 | GROUP 2 |
| | J14 LINE 1 CONNECTION | | | J43<br>J10 | J19<br>J50 |
| J15 | SPA LIGHT | 10V | 2A* | | |
| J21 | CIRC PUMP | 240V | 2A MAX | J20 | GROUP 2 |
| J32 | OZONE | | 0.5A | | |
| | CIRC AND OZONE LINE 1 CONNECTION | | | J81 | J59 |
| J33 | AV ONLY | 120V** | 4A | J38 | GROUP 4 |
| J33 | AV + CLIM8ZONE™ (C8Z) | 240V** | 2A + 8A | J38 | GROUP 2 |
| J44 | HEATER | 240V | 4.0 kW | | |

* 2A LIMIT IS SHARED BY J15 SPA LIGHT AND CHROMAZONE™
** AV MUST BE REWIRED FROM 120V TO 240V WHEN USING CLIM8ZONE™ (C8Z) BY MOVING THE J38 WIRE FROM GROUP 4 TO GROUP 2.

SWITCHBANK S1 OFF / SWITCHBANK S1 ON

| | | |
|---|---|---|
| TEST MODE OFF | ◀ A1 | TEST MODE ON |
| DON’T ADD 1 HS PUMP W/HTR | ◀ A2 | ADD 1 HS PUMP WITH HEAT |
| DON’T ADD 2 HS PUMPS W/HTR | ◀ A3 | ADD 2 HS PUMPS WITH HEAT |
| DON’T ADD 4 HS PUMPS W/HTR | ◀ A4 | ADD 4 HS PUMPS WITH HEAT |
| SPECIAL AMPERAGE RULE A | ◀ A5 | SPECIAL AMPERAGE RULE B |
| STORE SETTINGS* | ◀ A6 | MEMORY RESET* |
| ONLY HEATER PUMP IN FILTER | ◀ A7 | P1 ASSISTS CIRC IN FILTER |
| REGULAR HIGH RANGE | ◀ A8 | ALTERNATE HIGH RANGE |
| CIRC: 24HR W/ 3F SHUTOFF | A9 ▶ | CIRC: PROG FILTERS + POLLING |
| NOT ASSIGNED | ◀ A10 | NOT ASSIGNED |

*SWITCH # 6 SHOULD BE SET TO OFF UPON FINAL INSTALLATION.

| SETUP # | CIRC PUMP | PUMP 1 | PUMP 2 | PUMP 3 | LIGHT | MENU TYPE | TEMP SCALE |
|---|---|---|---|---|---|---|---|
| 1+ | YES* | 2-SPEED | 2-SPEED | NONE | 1-SPEED | STANDARD | °F |
| 2+ | NONE | 2-SPEED | 2-SPEED | NONE | 1-SPEED | STANDARD | °F |
| 3+ | YES* | 2-SPEED | 1-SPEED | 1-SPEED | 1-SPEED | STANDARD | °F |
| 4+ | NONE | 2-SPEED | 1-SPEED | 1-SPEED | 1-SPEED | STANDARD | °F |
| 5 | YES* | 2-SPEED | 1-SPEED | NONE | 1-SPEED | STANDARD | °F |
| 6 | NONE | 2-SPEED | 1-SPEED | NONE | 1-SPEED | STANDARD | °F |
| 7 | YES* | 2-SPEED | NONE | NONE | 1-SPEED | STANDARD | °F |
| 8 | NONE | 2-SPEED | NONE | NONE | 1-SPEED | STANDARD | °F |
| 9+ | YES* | 1-SPEED | 1-SPEED | 1-SPEED | 1-SPEED | STANDARD | °F |
| 10 | YES* | 1-SPEED | 1-SPEED | NONE | 1-SPEED | STANDARD | °F |
| 11+ | YES* | 2-SPEED | 2-SPEED | NONE | 1-SPEED | SIMPLE | °F |
| 12+ | NONE | 2-SPEED | 2-SPEED | NONE | 1-SPEED | SIMPLE | °F |
| 13+ | YES* | 2-SPEED | 1-SPEED | 1-SPEED | 1-SPEED | SIMPLE | °F |
| 14+ | NONE | 2-SPEED | 1-SPEED | 1-SPEED | 1-SPEED | SIMPLE | °F |
| 15 | YES* | 2-SPEED | 1-SPEED | NONE | 1-SPEED | SIMPLE | °F |
| 16 | NONE | 2-SPEED | 1-SPEED | NONE | 1-SPEED | SIMPLE | °F |
| 17 | YES* | 2-SPEED | NONE | NONE | 1-SPEED | SIMPLE | °F |
| 18 | NONE | 2-SPEED | NONE | NONE | 1-SPEED | SIMPLE | °F |
| 19+ | YES* | 1-SPEED | 1-SPEED | 1-SPEED | 1-SPEED | SIMPLE | °F |
| 20 | YES* | 1-SPEED | 1-SPEED | NONE | 1-SPEED | SIMPLE | °F |
| 21 | YES* | 2-SPEED | NONE | NONE | NONE | STANDARD | °F |
| 22 | NONE | 2-SPEED | NONE | NONE | NONE | STANDARD | °F |
| 23 | YES* | 2-SPEED | NONE | NONE | NONE | SIMPLE | °F |
| 24 | NONE | 2-SPEED | NONE | NONE | NONE | SIMPLE | °F |
| 25 | YES* | 1-SPEED | NONE | NONE | 1-SPEED | STANDARD | °F |
| 26 | YES* | 1-SPEED | NONE | NONE | 1-SPEED | SIMPLE | °F |
| 27+ | YES* | 2-SPEED | 2-SPEED | 1-SPEED | 1-SPEED | STANDARD | °F |
| 28+ | NONE | 2-SPEED | 2-SPEED | 1-SPEED | 1-SPEED | STANDARD | °F |

CONNECT ONLY TO CIRCUITS PROTECTED BY A CLASS A GFCI.

A DISCONNECTING MEANS MUST BE INSTALLED WITHIN SIGHT FROM A DISCONNECTION MEANS MUST BE INSTALLED WITHIN SIGHT FROM THE EQUIPMENT AND AT LEAST 5 FEET (1.52 M) FROM THE INSIDE WALLS OF THE POOL, SPA OR HOT TUB.

TOTAL OUTPUT AMP DRAW NOT TO EXCEED MAX INPUT RATING OF SPA.

USE EARTH GROUND CONNECTIONS AS INDICATED INSIDE THE SYSTEM ENCLOSURE.

‘+’ AFTER THE SETUP NUMBER MEANS THAT SETUP NEEDS THE #59097 EXPANDER BOARD INSTALLED

* CIRC BEHAVIOR DEPENDS ON THE SETTING OF DIP SWITCH A9

INSTEAD OF SETUP #5, THIS SYSTEM IS CONFIGURED IN SETUP #: ☐

BALBOA water group 11-21-22

MS90U - PN 59470-03

PART B





BALBOA water group

# Setup Reference Table

| Setup # | Circ Pump | Pump 1 | Pump 2 | Pump 3 | Lights | Menu Type | Temp Scale |
|---|---|---|---|---|---|---|---|
| 1+ | Yes* | 2-Speed | 2-Speed | None | 1-Speed | Standard | °F |
| 2+ | None | 2-Speed | 2-Speed | None | 1-Speed | Standard | °F |
| 3+ | Yes* | 2-Speed | 1-Speed | 1-Speed | 1-Speed | Standard | °F |
| 4+ | None | 2-Speed | 1-Speed | 1-Speed | 1-Speed | Standard | °F |
| 5 | Yes* | 2-Speed | 1-Speed | None | 1-Speed | Standard | °F |
| 6 | None | 2-Speed | 1-Speed | None | 1-Speed | Standard | °F |
| 7 | Yes* | 2-Speed | None | None | 1-Speed | Standard | °F |
| 8 | None | 2-Speed | None | None | 1-Speed | Standard | °F |
| 9+ | Yes* | 1-Speed | 1-Speed | 1-Speed | 1-Speed | Standard | °F |
| 10 | Yes* | 1-Speed | 1-Speed | None | 1-Speed | Standard | °F |
| 11+ | Yes* | 2-Speed | 2-Speed | None | 1-Speed | Simple | °F |
| 12+ | None | 2-Speed | 2-Speed | None | 1-Speed | Simple | °F |
| 13+ | Yes* | 2-Speed | 1-Speed | 1-Speed | 1-Speed | Simple | °F |
| 14+ | None | 2-Speed | 1-Speed | 1-Speed | 1-Speed | Simple | °F |
| 15 | Yes* | 2-Speed | 1-Speed | None | 1-Speed | Simple | °F |
| 16 | None | 2-Speed | 1-Speed | None | 1-Speed | Simple | °F |
| 17 | Yes* | 2-Speed | None | None | 1-Speed | Simple | °F |
| 18 | None | 2-Speed | None | None | 1-Speed | Simple | °F |
| 19+ | Yes* | 1-Speed | 1-Speed | 1-Speed | 1-Speed | Simple | °F |
| 20 | Yes* | 1-Speed | 1-Speed | None | 1-Speed | Simple | °F |
| 21 | Yes* | 2-Speed | None | None | None | Standard | °F |
| 22 | None | 2-Speed | None | None | None | Standard | °F |
| 23 | Yes* | 2-Speed | None | None | None | Simple | °F |
| 24 | None | 2-Speed | None | None | None | Simple | °F |
| 25 | Yes* | 1-Speed | None | None | 1-Speed | Standard | °F |
| 26 | Yes* | 1-Speed | None | None | 1-Speed | Simple | °F |
| 27+ | Yes* | 2-Speed | 2-Speed | 1-Speed | 1-Speed | Standard | °F |
| 28+ | None | 2-Speed | 2-Speed | 1-Speed | 1-Speed | Standard | °F |

**System** (and any replacement board) **is shipped in Setup 5**

**'+'** after the Setup number means that Setup needs the #59097 expander board installed

* Circ type is either 24hr/3°F or Programmable Filters + Polling, depending on the setting of DIP switch A9.





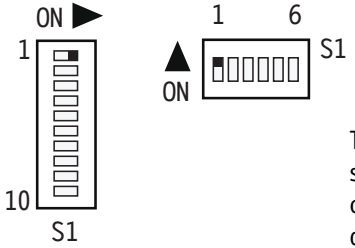
BALBOA water group

# 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!***

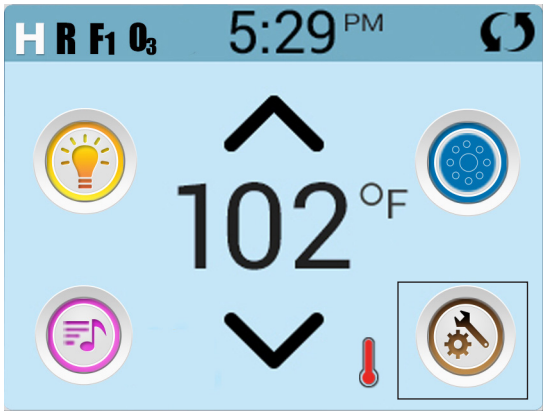
While the system is running, move DIP Switch 1 (on S1 on the Main circuit board) to ON. The system will enter Test Mode.
Moving DIP Switch 1 to OFF will exit Test Mode.

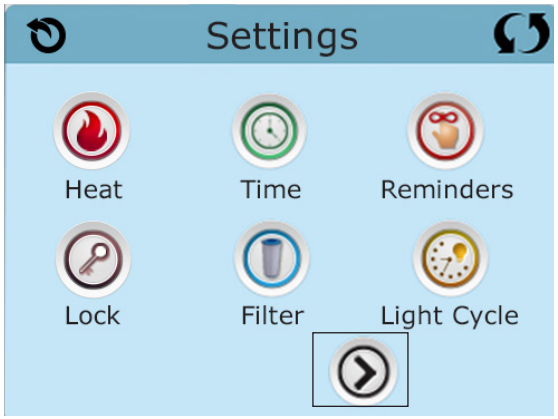


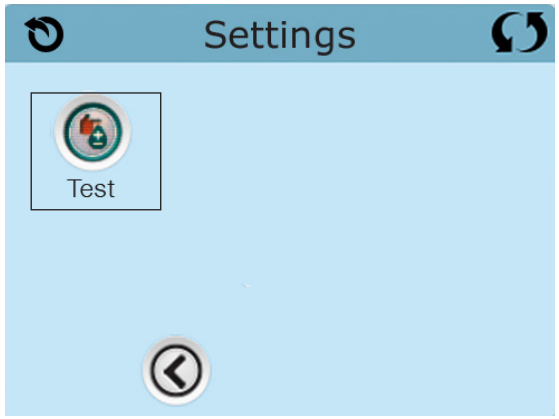

The example screens shown here are from the spaTouch 1 Icon-Driven Panel, but the screens on the spaTouch 2 Panel are similar. The main difference is that the spaTouch 2 display is wider.

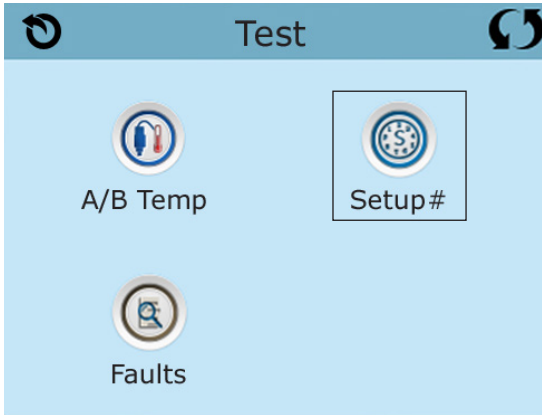
## To Change Software Setups:

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



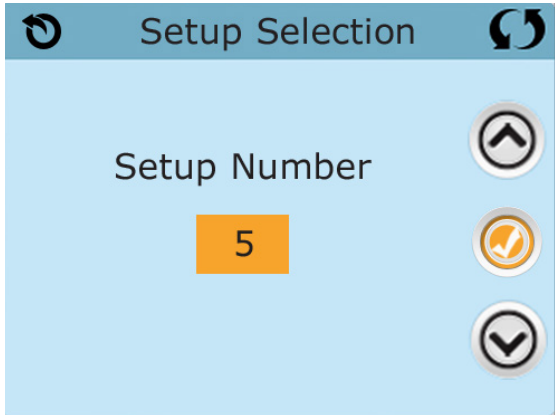




Once on the Setup Selection screen, press the Up or Down icon to select the desired Setup Number, then press the Check Mark icon to confirm and to have the spa restart.

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.

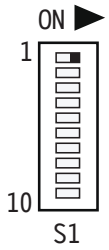


# Changing Software Setups with TP800 / TP900 / spaTouch™ Menued Panel

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

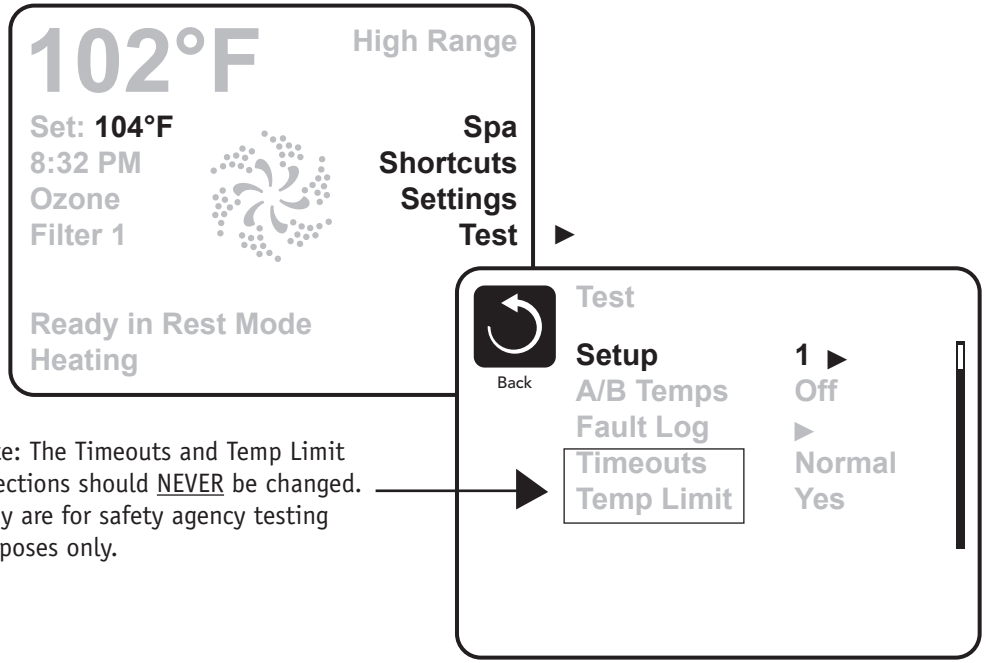
***DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY!***

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.




Note: The Timeouts and Temp Limit selections should NEVER be changed. They are for safety agency testing purposes only.

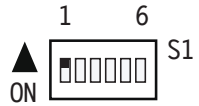
# Changing Software Setups with TP600 / TP400

## 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.

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

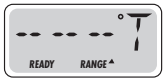



## Software Setups

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 / TP400 Continued

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

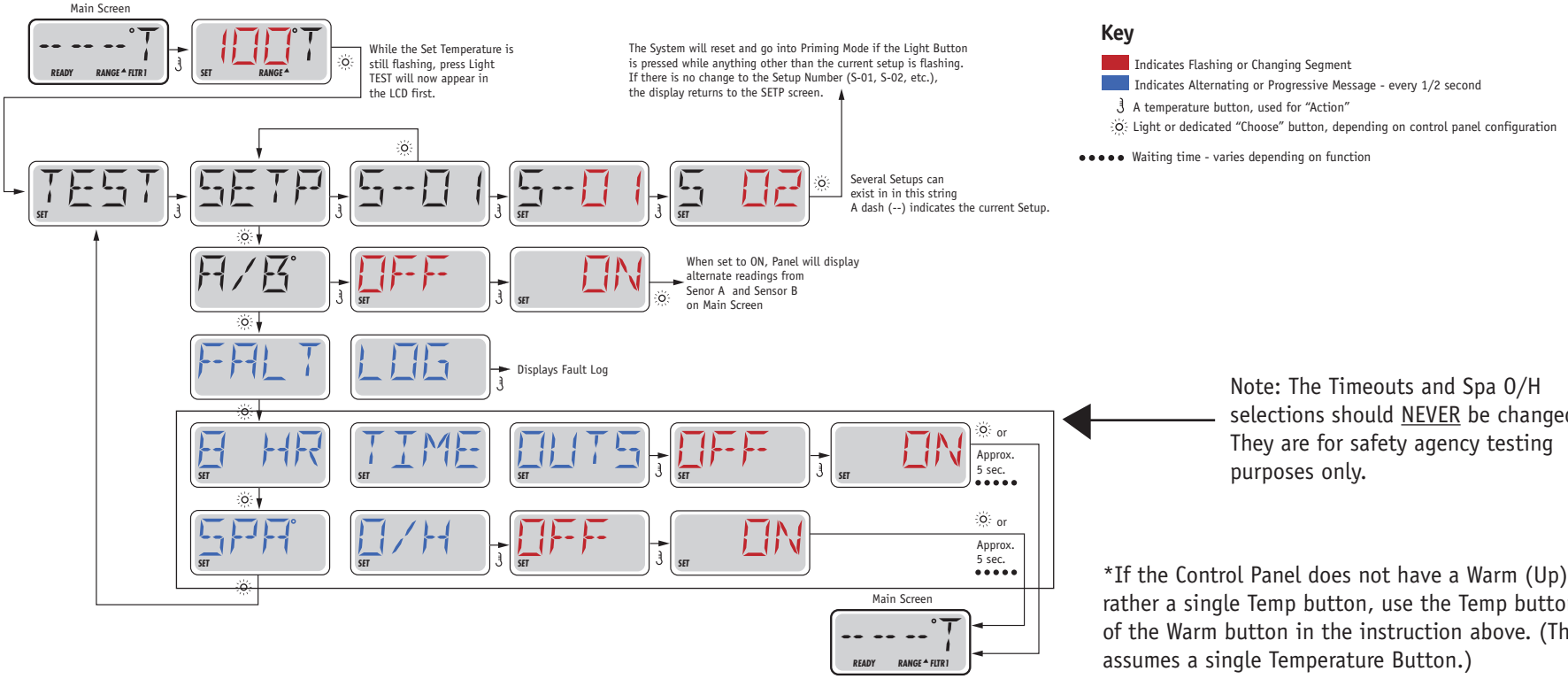
Immediately after exiting Priming Mode, press this sequence of buttons: Warm*, Light, Warm, Warm, Warm, Warm. Continue to press Warm until the diplay shows the Setup Number (S-01, S-02, etc.) you want to switch to. When the correct setup number is showing, press Light once, and the system will reset,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

THIS SYSTEM IS CONFIGURED AS SETUP #




**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

Note: The Timeouts and Spa O/H selections should NEVER be changed. They are for safety agency testing purposes only.

*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.)

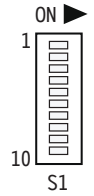
# Equipment Expansion

## Expansion Features

| Control Connection | Default | Fuse |
|---|---|---|
| Relay 1 (J101) | Undefined | None |
| Relay 7/8 (J107) | 2-Speed Pump 2 or 1-Speed Pump 3 | 30A |

# 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. |
| A4 | In “ON” position, add four high-speed pumps (or 3 HS Pumps 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.<br>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, A3, and A4** 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 and A4 in the OFF 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/A4 all off = No heat with any high-speed pump or blower.*

**Assignable DIP Switches**

| | |
|---|---|
| A7 | In “ON” position, Pump 1 (at lowest speed) assists Circ Pump in Filter Cycles (on Circs Setups only).<br>In “OFF” position, only the heater pump runs during Filter Cycles. |
| A8 | In “ON” position, High Range is replaced by Alternate High Range settings (see page 17)<br>In “OFF” position, the regular High Range settings are used |
| A9 | In “ON” position, Circ Type is Programmable Filters + Polling (aka Acts Like Pump 1 Low)<br>In “OFF” position, Circ Type is as configured under General Features (see page 16) |

*Undesignated switches are not assigned a function.*

# Jumper Definitions

**J109** GFCI Test/Trip Enable/Disable

***Note:*** *This feature must be enabled in software as well.*

J109 

**J91** Not used on BP1800 board.

**J30** Do Not Use

**J31** Not used on BP1800 board.

**J29** Heater Disable Switch Connection. If J29 is shorted by any means, the heater will not run until J29 is no longer shorted.

J29 

If J29 is shorted during power-up "J29" will appear on the panel.
The message can be dismissed with a button press, and is the only control panel notification of J29 being shorted.
No message is displayed if J29 is shorted after power-up, but the heater will not run until J29 is no longer shorted.

J29 expects a switch closure (not a voltage) as the command signal.

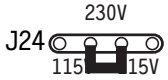
In some areas, a local power company may offer discounts based on voluntary "power shedding" devices that may be installed in conjunction with the spa.

**J25, J26, J27** Not used on BP1800 board.

***Note:*** *Factory Configured do not change.*

**J24** Jumper on center two pins (230V) when heater is running at 240V.

Two Jumpers installed; one on left 2 pins and one on right 2 pins (115V) when heater is running at 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: | 59471-03 |
| Expander PCBA: | 59097 |

**HEATER(s):**

| | |
|---|---|
| Plug + Click Heater Kit: | 58442R16 4.0kW 825 Inc “3S” heater |
| Temp Sensor Kit: | 53605 |

**CABLES:** N/A

**FUSES:**

| Part Number | Amperage* | Location |
|---|---|---|
| 30136 | 30A | F6, F8, F1 (Expander) |
| 26307 | 2A | F4 |
| 26905 | 0.5A | F3 |
| 26904 | 10A | F2, F7 |
| 26976 | 3.15A | F5 |

* 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.

# BP1800 Configuration Options

## General Features

| Feature | Default | |
|---|---|---|
| Pump 1 in Filter Cycle (Circ Only) | No | |
| Pump 1 Low Timer | *120 Minutes* | Applies in non-circ Setups (configurations) only |
| General Pump Timer | 15 Minutes | Applies to all pumps, except Pump 1 low in Non-Circ Setups |
| Blower Timer | 15 Minutes | |
| Mister Timer | 15 Minutes | |
| Light Timer | *60 Minutes* | |
| Circ (when enabled) | *24 hr with 3˚F shutoff (outside of filter cycles)* | |
| Circ Type Select switch | *DIP switch A9 (see page 13)* | |
| Cleanup Cycle | *60 Minutes* | |
| Cleanup as Preference setting | *Yes* | |
| Ozone | With Heater Pump* | |
| Ozone Suppression | *60 Minutes* | |
| 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.

# BP1800 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 | 99°F |
| Lo-Range Default Temp* | 70°F |
| Alternate Hi-Range Min. Set Temp | *50°F* |
| Alternate Hi-Range Max. Set Temp | *99°F* |
| Alternate Hi-Range Default Temp* | *85°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)*

# BP1800 Configuration Options

## Time Features

| Feature | Default |
|---|---|
| Time Format* | 12 Hour |
| Filter 1 Start Hour* | 20:00 (8:00 PM) |
| Filter 1 Duration* | *4 Hours in Circ Setups, 4 Hours 30 Minutes in Non-Circ Setups* |
| Filter Cycle 2 Default* | *ON in Circ Setups, OFF in Non-Circ Setups* |
| Filter 2 Start Hour* | 08:00 (8:00 AM) |
| Filter 2 Duration* | *4 Hours in Circ Setups, 15 Minutes in Non-Circ Setups* |
| 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)*

# BP1800 Configuration Options

## Reminder Features

| Feature | Default |
|---|---|
| Reminders Shown* | *Yes* |
| Check pH | *OFF* |
| Check Sanitizer | *OFF* |
| Clean Filter | 30 Days |
| Test GFCI | *OFF* |
| Drain Water | *180 Days* |
| Change Cartridge | OFF |
| Clean Cover | *OFF* |
| Treat Wood | *OFF* |
| Change Filter | *180 Days* |

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

# BP1800 Configuration Options

## Special Features

| Feature | Default |
|---|---|
| Special Amperage Rule A | No Limitation |
| Special Amperage Rule B | No Limitation |
| Drain Mode | Disabled |
| Demo Mode | Disabled |
| GFCI Trip | Enabled |
| Automatic GFCI Test | Disabled |
| Ozone Slaved to Heater Pump | *Yes in circ setups*<br>*No in non-circ setups* |
| Dual Voltage Heater | Always Input Voltage |
| Safety Suction | Disabled |

# TP800 Panel Configuration

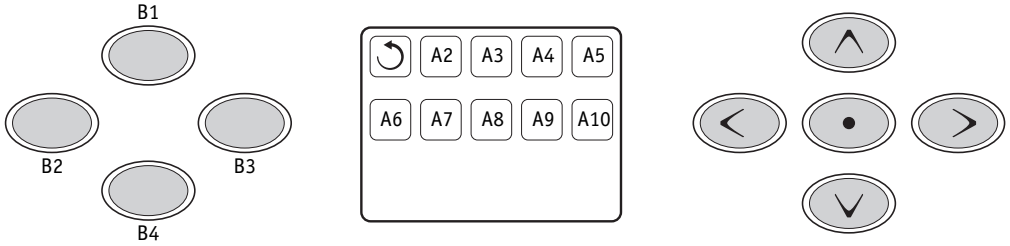
## Button Layout Table

| Feature # | Setups 4 & 28 | Setups 2 & 6 | Setups 3, 9 & 27 | Setups 1, 5 & 10 | Setups 7 & 25 | Setup 8 | Setup 21 | Setup 22 |
|---|---|---|---|---|---|---|---|---|
| **A1** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **A2** | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 |
| **A3** | Jets 2 | Jets 2 | Jets 2 | Jets 2 | Light 1 | Light 1 | Invert | Invert |
| **A4** | Jets 3 | Light 1 | Jets 3 | Light 1 | Invert | Invert | (Circ Icon) | Undefined |
| **A5** | Light 1 | Invert | Light 1 | Invert | (Circ Icon) | Undefined | Undefined | Undefined |
| **A6** | Invert | Undefined | Invert | (Circ Icon) | Undefined | Undefined | Undefined | Undefined |
| **A7** | Undefined | Undefined | (Circ Icon) | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A8** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A9** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A10** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A11** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **A12** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **A13** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A14** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A15** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **A16** | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined | Undefined |
| **B1** | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 | Jets 1 |
| **B2** | Jets 2 | Jets 2 | Jets 2 | Jets 2 | Undefined | Undefined | Undefined | Undefined |
| **B3** | Jets 3 | Undefined | Jets 3 | Undefined | Undefined | Undefined | Undefined | Undefined |
| **B4** | Light 1 | Light 1 | Light 1 | Light 1 | Light 1 | Light 1 | Undefined | Undefined |

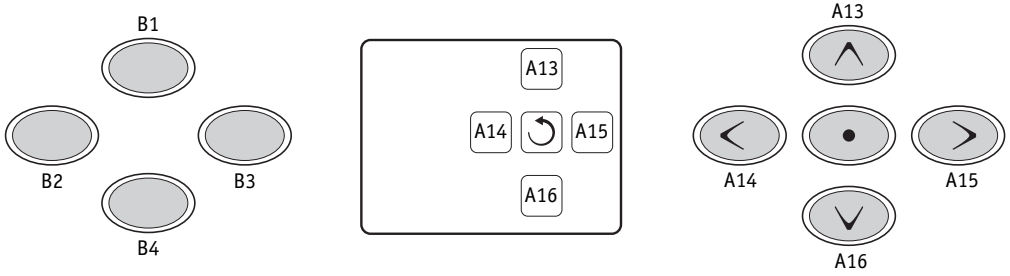
TP800 not supported in Setups 11 - 20, 23, 24 & 26.

# TP800 Panel Configuration

## Spa Screen




## Shortcuts Screen




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

*Button 1 is fixed.*

| | |
|---|---|
| **Panel Part Number** | **50204-XX** |
| Overlay Part Number | N/A |

# TP600 Panel Configuration

## Button Layout Table

| Button # | Setups 11, 12, 15, 16 & 20 | Setups 17, 18, 23, 24 & 26 | Setups 13,14 & 19 |
|---|---|---|---|
| **1** | Jets 1 | Jets 1 | Jets 1 |
| **2** | Jets 2 | Undefined | Jets 2 |
| **3** | Invert | Invert | Jets 3 |
| **4** | Up | Up | Up |
| **5** | Light 1 | Light 1 | Light 1 |
| **6** | Down | Down | Down |
| **LED 1** | Jets 1 | Jets 1 | Jets 1 |
| **LED 2** | Jets 2 | Undefined | Jets 2 |
| **LED 3** | Light 1 | Light 1 | Light 1 |
| **LED 4** | Heat On | Heat On | Heat On |

TP600 not supported in Setups 1 - 10, 21, 22, 25, 27 & 28.

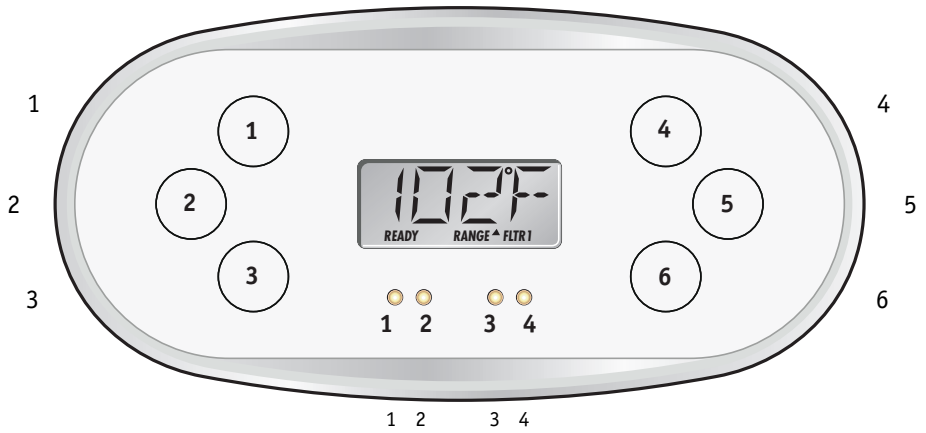
In Setups 23 & 24, which have no Light output, the only functions of button 5 are:

- Activates Circ Pump during Priming Mode.
- Acts as navigation button for menus.

### TP600

55676-XX

No Overlay



# TP400/TP200 Panel Configuration

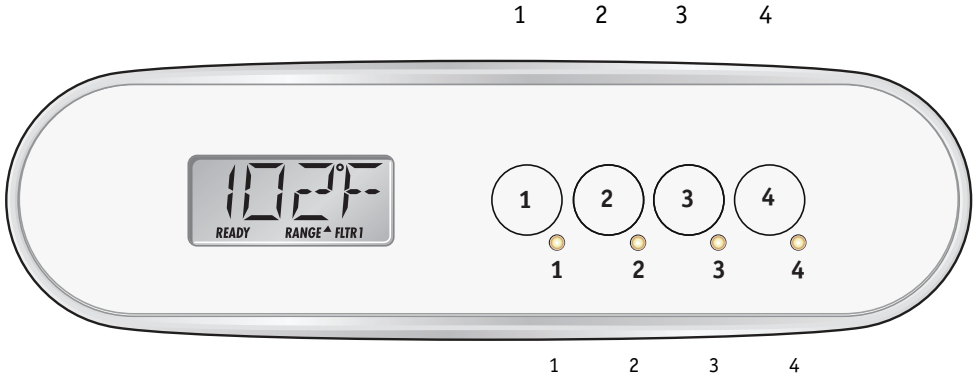
## Button Layout Table for TP400T/TP200T

| Button # | Setups 11, 12, 15, 16 & 20 | Setups 17, 18, 23, 24 & 26 |
|---|---|---|
| **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 ON | Undefined |

TP400T/TP200T not supported in Setups 1-10, 13, 14, 19, 21, 22, 25, 27 & 28.

In Setups 23 & 24, which have no Light output, the only functions of button 3 are:

- Activates Circ Pump during Priming Mode.
- Acts as navigation button for menus.




### TP400T US

50380-XX includes overlay PN 12511.


### TP200T

57281-XX with no overlay

57282-XX includes overlay PN 17325

# BP1800 Configuration Options

## Auxiliary Panel Features on Bank 1*

| Feature | Default |
|---|---|
| Aux Button A1 | Jets 1 |
| Aux Button A2 | Jets 2 |
| Aux Button A3 | Jets 3 |
| Aux Button A4 | Light |

*Bank 1 consists of J5 on the Main Circuit Board.

**Aux Connection Splitter PN 25257 may be required.**

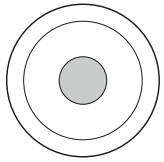
Buttons that are assigned to equipment that is not defined in a Setup will not do anything in that Setup.

# BP1800 Configuration Options

## Auxiliary Panel Features

### AX10 Panels on Bank 1*

| | | |
|---|---|---|
| A1, AX10A1 | No O/L | 52803 |
| A2, AX10A2 | No O/L | 52804 |
| A3, AX10A3 | No O/L | 52805 ▶ |
| A4, AX10A4 | No O/L | 52806 |



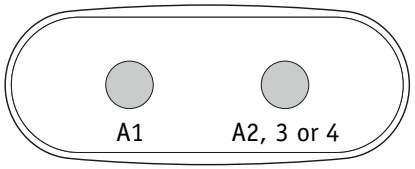
**Call Customer Service for additional information about Auxiliary Panels.**

*Bank 1 consists of J5 on the Main Circuit Board.

**Aux Connection Splitter PN 25257 may be required.**

### AX20

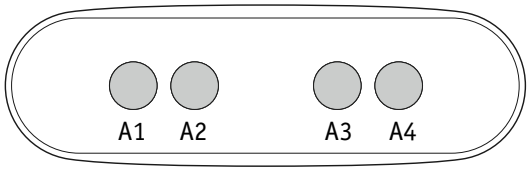
| | | |
|---|---|---|
| AX20 A1A2 | No O/L | 52800 |
| AX20 A1A3 | No O/L | 52801 |
| AX20 A1A4 | No O/L | 52802 |




**AX20 Auxiliary Panel plugged into Bank 1 will operate A1 + A2, A3 or A4.**

### AX40

| | | |
|---|---|---|
| AX40 | No O/L | 52799 |




**AX40 Auxiliary Panel plugged into Bank 1 will operate A1 + A2, A3 and A4.**