

BP21MS3B Tech Sheet

Customer: Balboa Water Group

Part Number: 56633 800 Incoloy 3kW
56634 825 Incoloy 3kW
56635 Titanium 3kW

Custom Box Overlay
Box Overlay Part Number N/A

CE System Model: BP21-BP21MS3B-RCA3.0K
Software Version ID: M100_225 V20.0
Software Version: 20.0
File Name: BP2100_20.0_BP21MS3B.hex
Configuration Signature: 7CE48642

Eng. Project Number: 4280

Base PCBA: 56636

Control Panels:

TP800 version 3.1 or later (Version 3.13 or later required for bba™)

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



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 2012 Balboa Water Group.

System Revision History

Part #	EPN	Date	Originator	Changes Made
ZT000093	4280	05-06-14	BWG	New generic MicroSilk® system, with 3 Pumps, plus optional Blower and optional Circ.
56633 56634 56635	4280	06-14-14	BWG	Approved by JP Parent for production.

bba™ (Balboa Bluetooth Amp) connection is documented seperately.

bba™ is only integrated into graphic display panels (TP800, TP900 and spaTouch™). With TP600 the Aux button operation of bba™ must be used.

Basic Functions Setup 1-8

Power Requirements:

Single Service [3 wires (line, neutral, ground)]

230VAC, 50/60Hz*, 1p, 32A, (Circuit Breaker rating = 40A max.)

Dual Service N/A

3-Service [5 wires (line 1, line 2, line 3, neutral, ground)]

400VAC, 50/60Hz*, 3p, 16A, (Circuit Breaker rating = 20A max each phase line.)

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

*BP systems automatically detect 50Hz vs 60Hz.

In 3x16A Service:

Pump 2 and Blower (if any) are on one service.

Pump 3, MicroSilk®, and the heater are on another service.

Everything else is on the remaining service.

Basic Functions Setup 1-8

System Outputs:

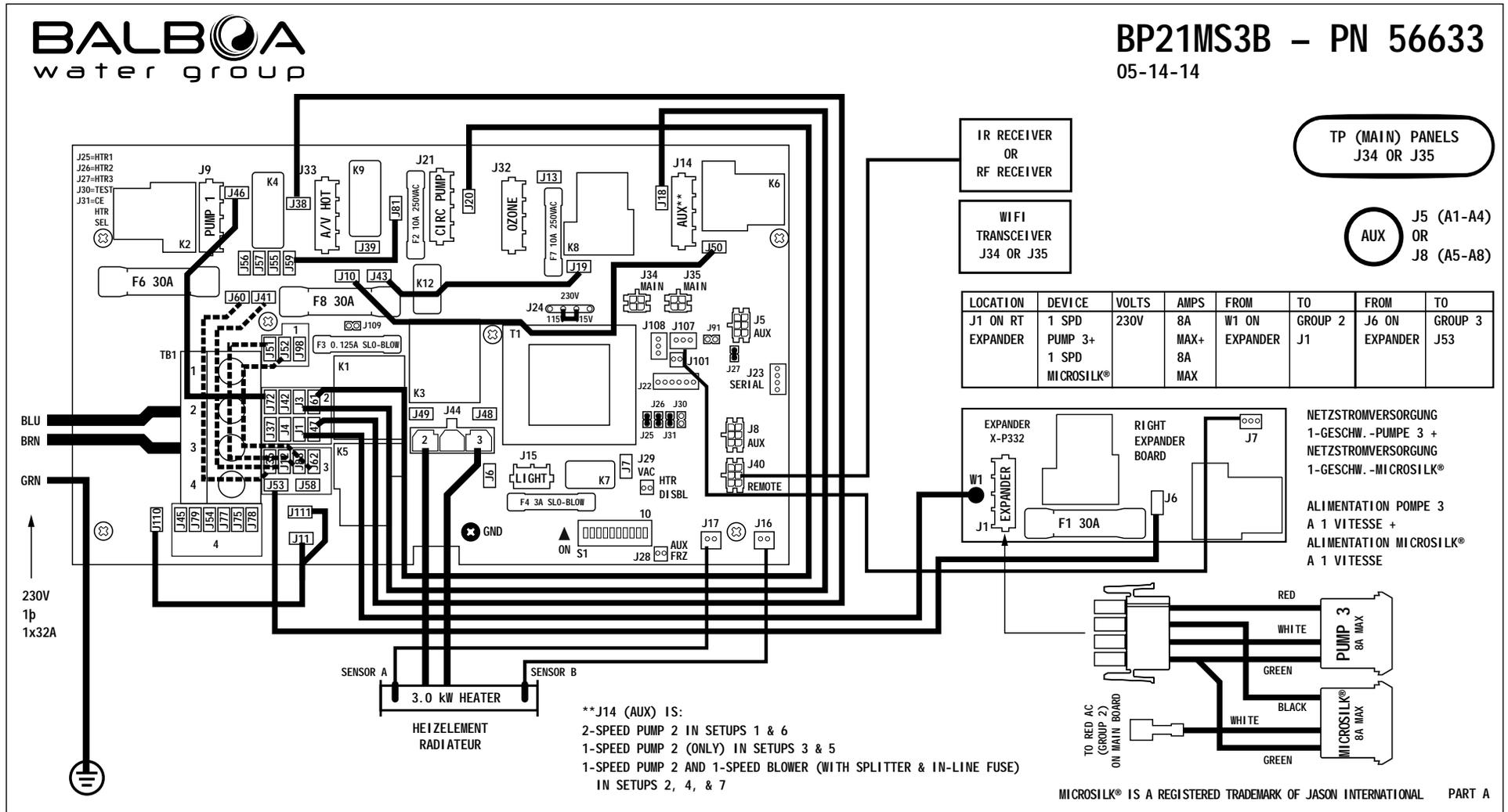
Pump 1	230VAC	2-Speed 1-Speed in Setups 4 & 5	11A max*	15-minute timer for High Speed, 15-Minute timer for Low Speed
		This is the heater pump in Setups 6-8 Must deliver 20 GPM through heater		
Pump 2	230VAC	2-Speed 1-Speed in Setups 2-5, 7-8	11A max*	15-minute timer
Pump 3	230VAC	1-Speed	8A max*	15-minute timer
MicroSilk®	230VAC	1-Speed	8A max*	30-minute timer
Blower	230VAC	1 Speed	5A max*	15-minute timer Unused in Setups 1, 3, 5, 6 & 8
Circ Pump	230VAC	1-Speed	2A max*	Programmable Filtration Cycles + Polling This is the heater pump in Setups 1-5 Must deliver 20 GPM through heater
Ozone	230VAC		.5A max*	Slaved to Circ Pump in Setups 1-5 Independent in Setups 6-8
Spa Light	10VAC	On/Off	1A max	240-minute timer.
A/V (Stereo)	230VAC	Hot	2A max*	Always on
Heater	3.0kW @ 240VAC max			

* These are individual maximums but depending on the electrical services they may need to be reduced. See restrictions on next page.

MicroSilk® is a registered trademark of Jason International

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.

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BALBOA
water group

Setup Reference Table

Setup #	Circ Pump	Pump 1	Pump 2	Pump 3	MicroSilk®	Blower	Temp Scale
1	Programmable Filtration + Polling	2-Speed	2-Speed	1-Speed	1-Speed	None	°C
2	Programmable Filtration + Polling	2-Speed	1-Speed	1-Speed	1-Speed	1-Speed	°C
3	Programmable Filtration + Polling	2-Speed	1-Speed	1-Speed	1-Speed	None	°C
4	Programmable Filtration + Polling	1-Speed	1-Speed	1-Speed	1-Speed	1-Speed	°C
5	Programmable Filtration + Polling	1-Speed	1-Speed	1-Speed	1-Speed	None	°C
6	None	2-Speed	2-Speed	1-Speed	1-Speed	None	°C
7	None	2-Speed	1-Speed	1-Speed	1-Speed	1-Speed	°C
8	None	2-Speed	1-Speed	1-Speed	1-Speed	None	°C

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

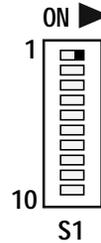
Color Key	Output
	XP332 and Splitter
	J14 (Aux) and splitter and in-line Blower fuse
	J14 (Aux) on Main Board

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

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

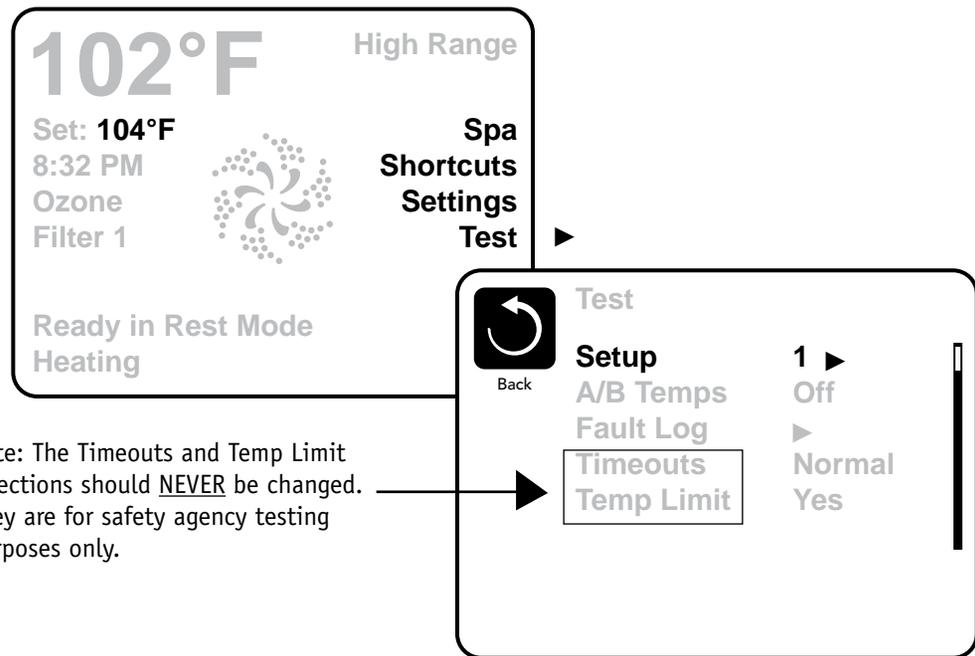
DANGER! HIGH VOLTAGE WILL BE ACCESSIBLE! SERVICE TECHNICIAN ONLY!

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.

Equipment Expansion

Expansion Features

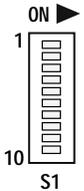
Control Connection

	Default	Fuse
Relay 1 (J101)	Undefined	None
Relay 7/8 (J107)	See Below 1-Speed Pump 3 And 1-Speed MicroSilk® (With Splitter)	30A
Relay 9/10 (J108)	Undefined	None

DIP Switch Functions

Fixed-function 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.
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, 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). |
|----|---|

Undesignated switches are not assigned a function.

Jumper Definitions

J109	Non Applicable on CE models	J109 
J91	Real Time Clock Enable/Disable Note: This Jumper should NOT be shorted when the Control Panel can display time of day.	J91 
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 
J29	Heater Disable Switch Connection. If J29 is shorted by any means, the heater will not run until J29 is no longer shorted. 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.	J29 
J25, J26, J27	Heater Type Settings. Note: Factory Configured do not change.	J25  J26  J27 
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.	J24     230V 115V 15V

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.

BP2100 Configuration Options

General Features

Feature	Default
Pump 1 in Filter Cycle (Circ Only)	No
Pump 1 Low Timer	<i>15 Minutes</i>
General Pump Timer	15 Minutes
Blower Timer	15 Minutes
MicroSilk® Timer	30 Minutes
Mister Timer	15 Minutes
Light Timer	240 Minutes
Circ (when enabled)	Programmable + Polling <i>See Circ Pump Note</i>
Cleanup Cycle	<i>30 Minutes</i>
Cleaup as Preference setting	<i>Yes</i>
Ozone	With Heater Pump*
Ozone Suppression	OFF
Pump Purge	60 Seconds
Blower/MicroSilk® 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.

Blue Indicates New Custom Configuration Default (Setup 1)

Manufactured under one or more of these patents. U.S. Patents: 5332944, 5361215, 5550753, 5559720, 5,883,459, 6253227, 6282370, 6590188, 6976052, 6965815, 7030343, 7,417,834 b2, Canadian Patent: 2342614, Australian patent: 2373248 other patents both foreign and domestic applied for and pending. © Copyright 2012 Balboa Water Group.

BP2100 Configuration Options

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	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
Freeze Threshold	44°F
Freeze Type	Rotating - Pumps at Lowest Speed
Temp Lock Type	Temp + Settings

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

Blue Indicates New Custom Configuration Default (Setup 1)

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BP2100 Configuration Options

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)*

Blue Indicates New Custom Configuration Default (Setup 1)

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BP2100 Configuration Options

Reminder Features

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

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

Blue Indicates New Custom Configuration Default (Setup 1)

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BP2100 Configuration Options

Special Features

Feature	Default
Special Amperage Rule A	No Limitation
Special Amperage Rule B	Blower and MicroSilk® turn off with 3 high speed pumps
Drain Mode	Disabled
Demo Mode	Disabled
GFCI Trip	Not Applicable for CE Models
Ozone Slaved to Heater Pump	<i>Yes in circ setups</i> <i>No in non-circ setups</i>
Dual Voltage Heater	Always Input Voltage
Safety Suction	Disabled

TP800 Panel Configuration

Button Layout Table

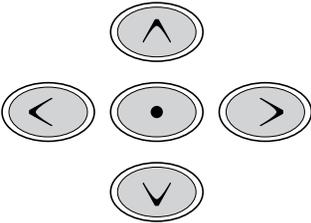
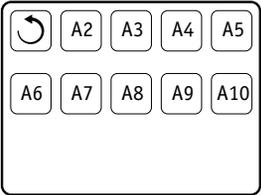
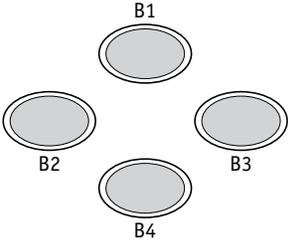
Feature #	Blower & Circ Setups 2 & 4	NO Blower & Circ Setups 1, 3, & 5	Blower & No Circ Setup 7	NO Blower & No Circ Setups 6 & 8
A1	N/A	N/A	N/A	N/A
A2	Jets 1	Jets 1	Jets 1	Jets 1
A3	Jets 2	Jets 2	Jets 2	Jets 2
A4	Jets 3	Jets 3	Jets 3	Jets 3
A5	MicroSilk®	MicroSilk®	MicroSilk®	MicroSilk®
A6	Blower	Light 1	Blower	Light 1
A7	Light 1	Invert	Light 1	Invert
A8	Invert	(Circ Icon)	Invert	Undefined
A9	(Circ Icon)	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	Jets 1	Jets 1	Jets 1	Jets 1
A14	Jets 2	Jets 2	Jets 2	Jets 2
A15	Jet 3	Jet 3	Jet 3	Jet 3
A16	Blower	Light 1	Blower	Light 1
B1	Jets 1	Jets 1	Jets 1	Jets 1
B2	Jets 2	Jets 2	Jets 2	Jets 2
B3	MicroSilk®	MicroSilk®	MicroSilk®	MicroSilk®
B4	Light 1	Light 1	Light 1	Light 1

Overlay Part Number 12719.

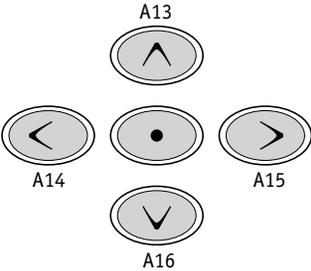
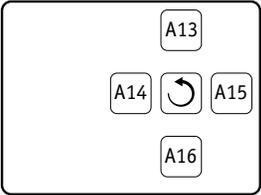
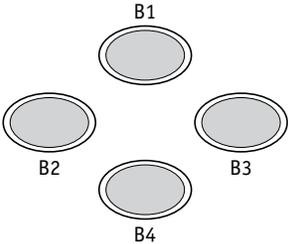


TP800 Panel Configuration

Spa Screen



Shortcuts Screen



Note: Buttons 11 and 12 are not used in this configuration.
Button 1 is fixed.

A Circ Icon will appear when a Circ Pump is configured.

TP900 Panel Configuration

Button Layout Table

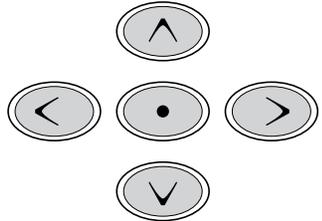
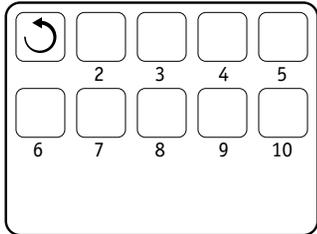
Feature #	Blower & Circ Setups 2 & 4	NO Blower & Circ Setups 1, 3, & 5	Blower & No Circ Setup 7	NO Blower & No Circ Setups 6 & 8
A1	N/A	N/A	N/A	N/A
A2	Jets 1	Jets 1	Jets 1	Jets 1
A3	Jets 2	Jets 2	Jets 2	Jets 2
A4	Jets 3	Jets 3	Jets 3	Jets 3
A5	MicroSilk®	MicroSilk®	MicroSilk®	MicroSilk®
A6	Blower	Light 1	Blower	Light 1
A7	Light 1	Invert	Light 1	Invert
A8	Invert	(Circ Icon)	Invert	Undefined
A9	(Circ Icon)	Undefined	Undefined	Undefined
A10	Undefined	Undefined	Undefined	Undefined
11	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A
13	Jets 1	Jets 1	Jets 1	Jets 1
14	Jets 2	Jets 2	Jets 2	Jets 2
15	Jets 3	Jets 3	Jets 3	Jets 3
16	Blower	Light 1	Blower	Light 1

A Circ Icon will appear when a Circ Pump is configured.

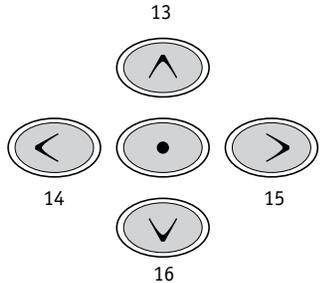
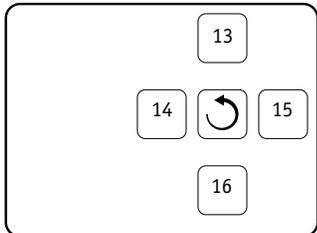
TP900 Panel Configuration

Button #
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Spa Screen



Shortcuts Screen



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BP2100 Configuration Options

Auxilliary Panel Features on Bank 1*

Feature	Default
Aux Button A1	Jets 1
Aux Button A2	Jets 2
Aux Button A3	Blower
Aux Button A4	Light

Auxilliary Panel Features on Bank 2*

Feature	Default
Aux Button A5	Jets 1
Aux Button A6	Jets 2
Aux Button A7	Jets 3
Aux Button A8	<i>MicroSilk®</i>

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

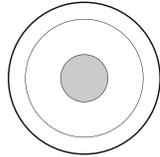
*Bank 1 consists of J5 on the Main Circuit Board.
Bank 2 consists of J8 on the Main Circuit Board.
Aux Connection Splitter PN25257 may be required.

BP2100 Configuration Options

Auxilliary Panel Features

AX10 Panels on Bank 1*

A1, AX10A1	No O/L	52803	
A2, AX10A2	No O/L	52804	
A3, AX10A3	No O/L	55805	▶
A4, AX10A4	No O/L	52806	



Call Customer Service for additional information about Auxiliary Panels.

Auxiliary Panel Part Number _____

Overlay Part Number _____

AX10 Panels on Bank 2*

A5, AX10A1	No O/L	52803
A6, AX10A2	No O/L	52804
A7, AX10A3	No O/L	52805
A8, AX10A4	No O/L	52806

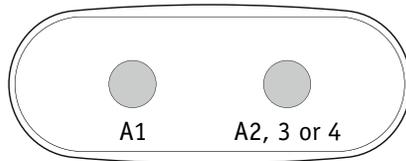
*Bank 1 consists of J5 on the Main Circuit Board.

Bank 2 consists of J8 on the Main Circuit Board.

Aux Connection Splitter PN25257 may be required.

AX20

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

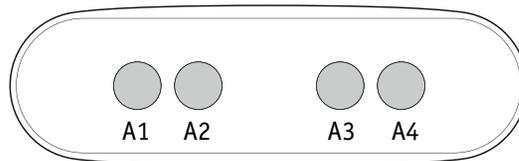


AX20 Auxiliary Panel plugged into Bank 1 will operate A1 + A2, A3 or A4.

AX20 Auxiliary Panel plugged into Bank 2 will operate A5 + A6, A7 or A8.

AX40

AX40	No O/L	52799
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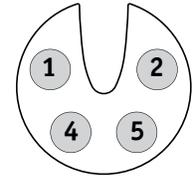
AX40 Auxiliary Panel plugged into Bank 1 will operate A1 + A2, A3 and A4.

AX40 Auxiliary Panel plugged into Bank 2 will operate A5 + A6, A7 and A8.

BP2100 Configuration Options

Remote Panel Features

Feature	Default
Remote Button A1	Jets 1
Remote Button A2	Jets 2
Remote Button A3	<i>Undefined</i>
Remote Button A4	<i>Jets 3</i>
Remote Button A5	Light
Remote Button A6	Undefined
Remote Button A7	Undefined
Remote Button A8	Undefined



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

Remote Panel Part Number _____
Overlay Part Number _____