

# Installation Instructions for Licensed Electricians, Plumbers, and Spa Technicians

All components are intended to be installed and tested by a licensed electrician who is experienced in spas and hot tubs. A properly installed Spa Rated GFCI and grounding must be installed with any system. Installation must be permitted and inspected prior to use.

Any sales or technical advice provided on the Spaguts.com website or by Spaguts.com staff shall not be construed to authorize or suggest anything but professional installation.

## SpaGuts brand BP2000G1 Spa Controller

### Parts Content:

- (1) SpaGuts brand BP2000G1TP8 Spa Controller w/ M7 5.5KW Flo-Thru Heater, P/N 56777
- (1) Topside Panel varies and may be included based on your order\*
- (2) Heater Split Nuts, 2 inch, P/N 40-350-5421 (installed on each end of heater)
- (2) Heater Tailpieces, 2 inch, P/N 25-350-1052 (installed on each end of heater)
- (2) Heater O-Ring Gaskets, 2 inch, P/N 25-350-4030 (installed on each end of heater)
- (1) System Wiring Diagram, Labeled BP2000G1 – PN 56777 (attached to inside controller cover)
- (1) Operation Guide with Diagnostic Messages (Only Available Online if NO Topside is provided)
- (1) Installation Instructions, P/N 73-200-2100 (Included, and Available Online)
- (1) Light Package (includes one 8ft light harness, one 12V 12W Clear Light Bulb, and one white light reflector)
- (1) Pump Cord, 4ft, 4-wire, 14 AWG, w/ 4-prong amp plug, P/N 15-150-3060
- (2) Cords, 4ft, 3-wire, 14 AWG, w/ 4-prong amp plug, P/N 15-150-0024

### Plumbing up the system:

This system will work if the pump draws or discharges water through the heater. **Minimum water flow required is 25 GPM. Minimum plumbing size required is 1.5 inch.** This system is equipped with M7 Technology (no pressure switch). There are dual sensors installed on the heater to measure the water temperature flowing through the heater. No need to mount any sensors or flow switches. The heater has standard 2.0 inch plumbing fittings. If the spa plumbing is 1.5 inch, use reducers to connect to the heater 2.0 inch heater tailpieces. If re-plumbing is necessary, use PVC Glue with primer to connect the plumbing. When installing an In-Line Filter System, either install it before the heat pump and controller or after the heat pump and controller. Never install the filter system in between the heat pump and controller. Make sure to create a water flow bypass plumbing around the filter for sufficient water flow. For systems installed near or above the water level, and more than 5 feet from the tub, install the In-Line Filter System after the heat pump and controller with a water flow bypass plumbing. A water flow bypass plumbing allows half the water to go through the filter and half the water to go around the filter. This way water flow is not restricted. We recommend NSF rated flexible PVC for simpler connections. Go to this URL for more info: <https://www.spaguts.com/ez-install-plumbing-kit-42>.

### Wiring Instructions:

**\*220V Power Supply, 60Hz**

**\*Recommended 60A Power Supply. Use Copper Conductors Only. See wiring diagram for more information.**

Please note that this Installation requires 4 dedicated wire connections to the power terminal block (TB1) on the Circuit Board. These include **Line 1**, **Line 2**, **Neutral** and **Ground**. Connect Line 2 wire to Terminal 2 (Normally Red). Connect Line 1 wire to Terminal 3 (Normally Black). Connect Neutral wire to Terminal 4 (Normally White). If a dedicated Neutral wire is not connected, the heater will never come on and/or the system will not operate properly. Lastly, connect Ground to the Grounding Bar located on the side of the controller box. Since this system is not equipped with a GFCI, it is REQUIRED by the National Electric Code to install an external Spa Rated GFCI for safety and protection. Any mis-wiring or improper installation will void the warranty and could cause personal injury, death, fire or property damage.

Do Not follow the color of the original power wires, Black, Red, White and Green. **DON'T ASSUME THESE WIRES ARE WIRED**

ACCORDING TO LOCAL CODES. Some original wirings can have the wires mixed up. Get a voltage meter and verify each wire to make sure which colored wire is Line 1, Neutral, and Ground. Failure to do so will cause major electrical damage to the controller and/or other equipment, and void the warranty.

**DO NOT POWER UP THE SPA UNLESS THE SYSTEM IS COMPLETELY INSTALLED AND THE SPA IS COMPLETELY FILLED UP WITH WATER.** Doing so can cause a dry fire, which can damage the heater and controller, and will void the warranty.

**Primary Pump Circuit:** The primary pump circuit should have already been configured for the correct voltage output based on your order for “Factory Configuration”. If you find out that the pump motor is rated at a different voltage, make sure to configure pump 1 circuit to the correct voltage for the pump motor by following the wiring diagram that is provided.

**Pump Motor wiring:** The primary pump cord will have 4 wires for two speed operation. This system utilize the RED wire for High-Speed and the BLACK wire for Low-speed in Two-Speed Pump Circuits. The White wire is for Line/Common connection, and the Green wire is for ground. Keep this in mind when connecting a Two-Speed pump that has not been purchased with this system. If using a single speed pump as the primary pump, cap off the RED wire. Connect the primary pump cord in Pump 1 location (J9) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. If a complete Spa Pack with pump was ordered and is “Factory Assembled”, the pump cord should have already been connected.

**Aux Circuit:** This circuit may be used for a Pump 2 or a Blower based on your order for “Factory Configuration”. If you find out that the pump or blower motor is rated at a different voltage, make sure to configure the Aux circuit to the correct voltage for the pump or blower motor by following the wiring diagram that is provided.

\*2-Speed Pump 2 in Configuration Setups 1, 2, 4, 7, 8, 10, 15, 16

\*1-Speed Pump 2 in Configuration Setups 6, 13, 14

\*1-Speed Blower in Configuration Setups 3, 5, 9, 11, 12, 17, 18

**Aux Circuit Component Wiring:** For Single Speed operation based on the Configuration Setup that is selected, use the amp cord with 3 wires. The Black wire is for High Speed. The White wire is for Line/Common connection, and the Green wire is for ground. For Dual Speed operation based on the Configuration Setup that is selected, use the amp cord with 4 wires (Sold Separately). The Red wire is for Low Speed. NOTE that additional amp cords, 3 or 4 wires, and the B2X-WIRE KIT 30893 may be purchased separately according to the Configuration Setup that requires them (See Wiring Diagram for Configuration Setup). Connect the component cord or Splitter in the Aux location (J14) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. If a complete Spa Pack with blower was ordered and is “Factory Assembled”, the component cord(s) should have already been connected based on the Configuration Setup.

**Expander Board Circuit:** This circuit may be used for a Pump 2, Pump 3, and/or a Blower based on your order for “Factory Configuration”. If you find out that the pump(s) or blower motor is rated at a different voltage, make sure to configure the Expander Board circuit to the correct voltage for the pump(s) or blower motor by following the wiring diagram that is provided.

\*2-Speed Pump 3 in Configuration Setups 1, 7

\*1-Speed Pump 3 Only in Configuration Setups 2, 6, 8, 13, 14

\*1-Speed Pump 3 and 1-Speed Blower (with Splitter and In-Line Fuse) in Configuration Setups 15, 16

\*1-Speed Pump 2 and 1-Speed Pump 3 in Configuration Setups 5, 11, 12

\*2-Speed Pump 2 in Configuration Setups 3, 9

\*1-Speed Pump 2 in Configuration Setups 17, 18

**Expander Board Component Wiring:** For Single Speed operation based on the Configuration Setup that is selected, use the amp cord with 3 wires. The Black wire is for High Speed. The White wire is for Line/Common connection, and the Green wire is for ground. For Dual Speed operation based on the Configuration Setup that is selected, use the amp cord with 4 wires. The Red wire is for Low Speed. NOTE that additional amp cords, 3 or 4 wires, and the B2X-WIRE KIT 30893 may be purchased separately according to the Configuration Setup that requires them (See Wiring Diagram for Configuration Setup). Connect the component cord or Splitter in the Expander Board location (J1) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. If a complete Spa Pack with blower was ordered and is “Factory Assembled”, the component cord(s) should have already been connected based on the Configuration Setup.

**Ozone Circuit:** The ozone circuit should have already been configured for the correct voltage output based on your order for “Factory Configuration”. If you find out that the ozone unit is rated at a different voltage, make sure to configure the ozone circuit to the correct voltage for the ozone unit by following the wiring diagram that is provided.

**Ozone wiring:** The ozone cord will have 3 wires. The Black wire is for Line 1. The White wire is for Common connection, and the Green wire is for ground. Connect the ozone cord in the Ozone location (J32) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. Only connect the ozone cord if it is being used.

**Circulation Pump Circuit:** This system may be setup to operate a small single speed circulation pump as the heat pump based on your order for “Factory Configuration”, and it will be the same voltage as the Ozone Circuit. If a small circulation pump is connected to the system and being used as the heat pump, make sure the small circulation pump is rated the same voltage as the Ozone Circuit. Also setup the dip switches on the circuit board so that the system works properly with the small circulation pump. **Minimum water flow is 25 GPM with minimum 1.5 inch plumbing. This system will NOT work with a Low-Flo Circulation Pump.**

**Circulation Pump wiring:** The circulation pump cord will have 3 wires (cord is not included, sold separately). The Black wire is for Line 1. The White wire is for Common connection, and the Green wire is for ground. Connect the circulation pump cord in the Circulation Pump location (J21) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. Only connect the circulation pump cord if it is being used. **(See notes above regard the circulation pump circuit and using a circulation pump with this system)**

**Dip Switch Settings:** The dip switches on the circuit board (as known as Switch Bank S1, red in color with white switches) should have already been configured for the correct setting based on your order for “Factory Configuration”. If a different setup is made in the field and/or a circulation pump is added, the dip switches need to be reconfigured. If so, please follow the dip switch settings based on the new setup by using the wiring diagram as a reference.

**Topside Panel Installation\*:** See hole cut out template on SpaGuts.com for the Topside Panel that may have come with your controller kit order. A topside cover plate (not included) can be used if the existing hole cut out is larger than the new topside panel. Clean the surface area before installation of the new topside panel. Position the topside panel in the direction for operational purpose as desired. Then carefully insert the topside cable through the hole cut out. Remove the protective label from the sticky gasket on the back of the topside panel. Then apply the topside panel above the hole cut out or cover plate. Silicone can be used under the lip of the topside panel for additional water leak protection prior to installation of the topside panel. Connect the topside cable plug into J34 or J35 connector on the circuit board. The clip on the topside cable plug should snap in place to ensure a secure connection. The J5 connector is for an auxiliary topside panel, which can be purchased separately. If a longer topside cable is needed, DO NOT splice the cable or disconnect the cable from the back of the topside panel to install a longer cable. Doing so will affect the proper functionality of the topside panel and completely void the topside warranty. Available at [www.spaguts.com](http://www.spaguts.com) is P/N 25662-1 for the 25ft extension cable, P/N 25662-2 for the 50ft extension cable, and P/N 25662-3 for the 100ft extension cable. Maximum cable length is 110ft in order for the topside panel to work properly.

**Light wiring:** The light harness is 8ft long with 2 wires. One end of the light harness has a 2-prong amp plug, and the other end has a light socket that fits a 12V 12W light bulb or a ColorGlo Led Light (<https://www.spaguts.com/colorglo-led-lights-208>). Connect the 2-prong amp plug in location (J15) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. Insert the light bulb into the light socket. Then insert the light socket with light bulb into the existing light housing on the spa. The white light reflector can also be used if it fits in the existing light housing. If a light housing is not installed, it can be purchased by going to this link: <https://www.spaguts.com/thru-shell-light-lense-kit-211>. Only connect the light harness if it is being used.

**Audio Video wiring (A/V):** The A/V circuit is normally setup for 110V (unless it was specified over the phone at the time of order for 220V output). This circuit is a constant voltage output normally used for a stereo, radio, CD or TV systems. The A/V cord will have 3 wires (cord is not included, sold separately). The Black wire is for Line 1. The White wire is for Common connection, and the Green wire is for ground. Connect the A/V cord in the A/V location (J33) on the circuit board. The plug will only fit one way. Make sure the clip on the plug latches to ensure tight connection. Only connect the A/V cord if it is being used.

**DO NOT POWER UP THE SPA UNLESS THE SYSTEM IS COMPLETELY INSTALLED AND THE SPA IS COMPLETELY FILLED UP WITH WATER. Doing so can cause a dry fire, which can damage the heater and controller, and will void the warranty.**

After installation is complete, completely fill the spa with water to the required level. Refer to the original Spa Owners Manual for the required water level. We recommend using the “Pure Fill Spa Pre-Filter” for fresh clean water. DO NOT OVERFILL. Overflowing the spa will cause water to infiltrate the system and other electrical parts. Damages caused by water infiltration will not be covered under warranty. Once the spa is completely filled to the required level, then power up the spa and purge the water lines to help remove air from the lines. The “Pr” message will appear on the topside panel which indicates water purging is required or is in progress. If the pump is not running, press on the Jets key to activate the pump(s) on high speed. You may also bleed air out of the plumbing by loosening the plumbing fittings a bit, and then run the pump high speed on/off until all the air is out. Once there is constant strong water pressure from the jets, you can now proceed with normal operations. Make sure all plumbing fittings are tightened and to fix any leak.

**System Maintenance:** It is recommended to monitor the spa equipment every month. Check out for water leaks, internally and externally, and for abnormal operations. Get it repaired right away if there is a problem. Don't allow the problem to get worst. It is recommended to inspect for any loose connections and for any damaged cables every 3-6 months (especially on the power terminal block, component cord, and sensors). Loose connections will cause improper operation and overheat the wires. Damaged cables are mostly caused by rodents.

**Spa Maintenance:** Refer to the original Spa Owners Manual for proper water maintenance. Use ONLY Spa rated chemicals. We recommend using ozone, Mineral Cartridges and Spa Rated chemicals to treat the water. Ozone and Mineral Cartridges reduces maintenance and decreases the use of chemicals up to 90%. We also recommend to test the spa water every single day, and treat the spa water as needed.