

HYDROQUIP™

INSTALLATION INSTRUCTIONS

Universal Air Series

THE **SMART** CHOICE™

!! NOTE !!

Covers the following models:

9000 Series

6000 Series

To ensure that the system is installed properly, provide your electrician with these instructions.

ELECTRICAL INSTALLATION

A qualified and licensed electrician in accordance with the National Electric Code (NEC) Article 680, Canadian Electric Code, and with any local codes must accomplish the electrical installation.

All connections must be made according to the electrical installation label on the outside of the control box. Follow the instructions from the label if they are different than the instructions in this manual. If your electrician is not absolutely sure how to connect your system correctly, call your local dealer. Any mistake may be costly and invalidate your equipment warranty.

The GFCI (Ground Fault Circuit Interrupter) is a mandatory electrical safety device required for all portable spas and hot tubs as specified in the National Electrical Code Article 680-42. The GFCI in your particular installation may be installed at the electrical service panel, a separate sub-panel or built into your Hydro-Quip System.

Your spa equipment requires a DEDICATED CIRCUIT. No other appliances or lights can be on this circuit. Refer to equipment data label for power supply requirements of your spa equipment.

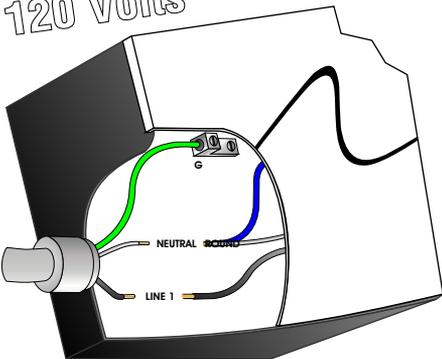
Use copper conductors ONLY. The ground must be sized following the National Electric Code, Table 250-95.

NOTE: Due to the electrical requirements of some models, it may be required to SPLIT the incoming electrical service to accommodate the GFCI Circuit Breaker limits. Contact your electrician if you need additional information on this topic.

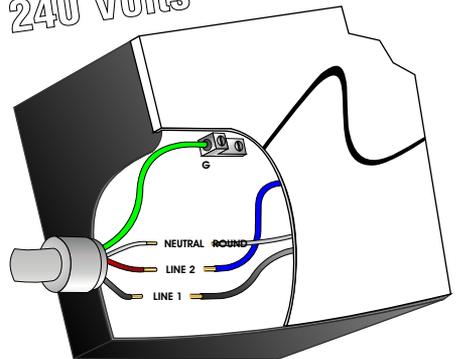
Circuit & Breaker Rating	15A	20A	30A	40A	50A	60A	70A	80A
Maximum Amps	12A	16A	24A	32A	40A	48A	56A	64A
Minimum Wire Size	14	12	10	8	6	4	4	4

Universal Systems require a Neutral wire therefore the service required is as follows: 120-volt systems require a three-wire electrical service including ground, consisting of Line 1 (Black), Neutral (White) and Ground (Green) (**system Line 2 (Blue) connected together with the Neutral (White)**). 240-volt systems require a four wire electrical service including ground, consisting of Line 1 (Black), Line 2 (Red), Neutral (White) and Ground (Green).

120 Volts



240 Volts

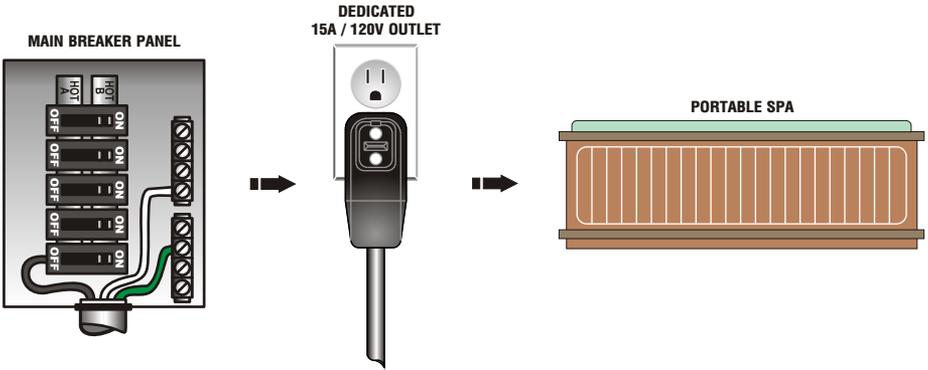


ELECTRICAL CONNECTIONS

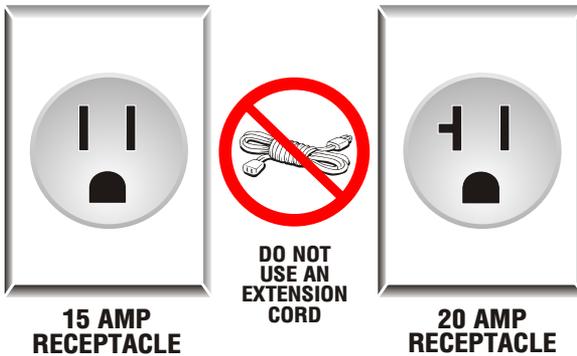
If your system was configured to include a 120VAC power cord, ensure that the proper receptacle has been installed (a dedicated circuit is required). **DO NOT** under any circumstances modify a 20 Amp plug to fit into a 15 Amp receptacle or use an extension cord. Doing so will create hazardous conditions and/or void the warranty.

OPTION 1 Units with 15A GFCI Plug Connection

15AMP CORDEND GFCI



This illustration depicts a typical 15 AMP, cord-end GFCI installation. (The spa must be installed on a dedicated circuit.)

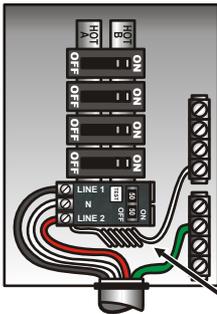


ELECTRICAL CONNECTIONS

OPTION 2 GFCI Installed in Main Service Panel

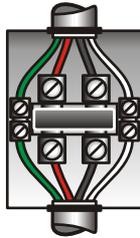
20-60AMP
HARDWIRED

MAIN BREAKER PANEL

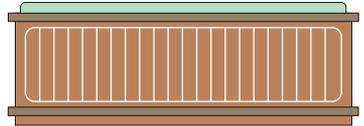


If the manufacturer of your homes main breaker panel makes a GFCI breaker, you may be able to add it to an open slot in the panel.

INLINE SPA DISCONNECT



PORTABLE SPA

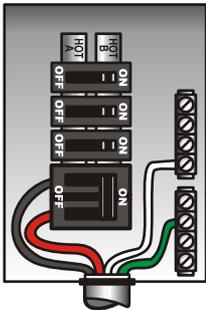


Power from GFCI breaker installed into main service panel to a service disconnect within line-of-site of the spa.

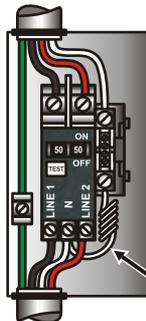
OPTION 2a Subpanel GFCI Installed

20-60AMP HARDWIRED

MAIN BREAKER PANEL



GFCI DISCONNECT



INLINE SPA DISCONNECT



TO PORTABLE SPA



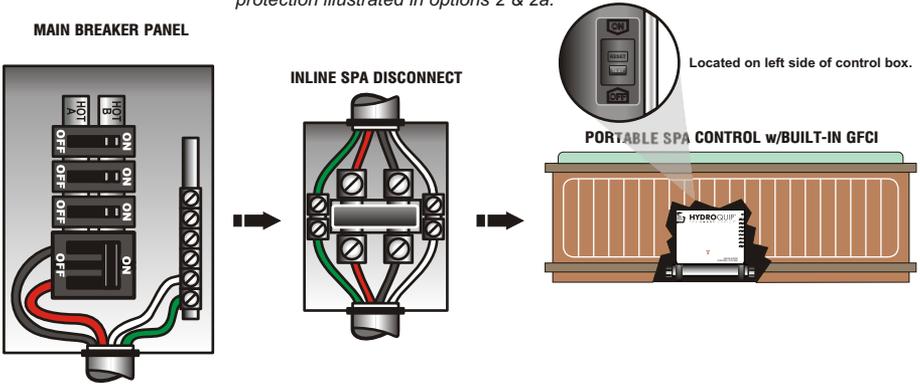
Power from main service panel to a GFCI subpanel within line-of-site of the spa. (Note: Most local codes will allow a GFCI subpanel to be a disconnect. If this is not the case in your installation, a disconnect must be provided.)

ELECTRICAL CONNECTIONS

OPTION 3 Systems with GFCI Included

BUILT-IN SYSTEM GFCI

Your system may have an integrated GFCI located on the left side of the control box as shown below. If a GFCI is present there is NO need for additional GFCI protection illustrated in options 2 & 2a.



Power from main breaker panel to service disconnect within line-of-site of the spa to portable spa control equipped with built-in GFCI.



IMPORTANT - The NEC and most local codes require that a “disconnect” be installed within “line-of-site” of the spa.

ELECTRICAL INSTALLATION DETAILS

Refer to the System Data Label for equipment voltage and maximum amperage draws.

Install proper size Ground Fault Circuit Interrupter (GFCI) or circuit breaker, then proper sized wiring and bonding wire. For Power conductor size, refer to the National Electric Code Table 310-16. For Ground conductor size, refer to the National Electric Code Table 250-122.

A bonding lug has been provided on the control box to allow connection to local ground points. To reduce the risk of electrical shock, a solid copper bonding wire should be connected from this lug to any metal ladders, water pipes or other metal object within 5 feet of the spa.

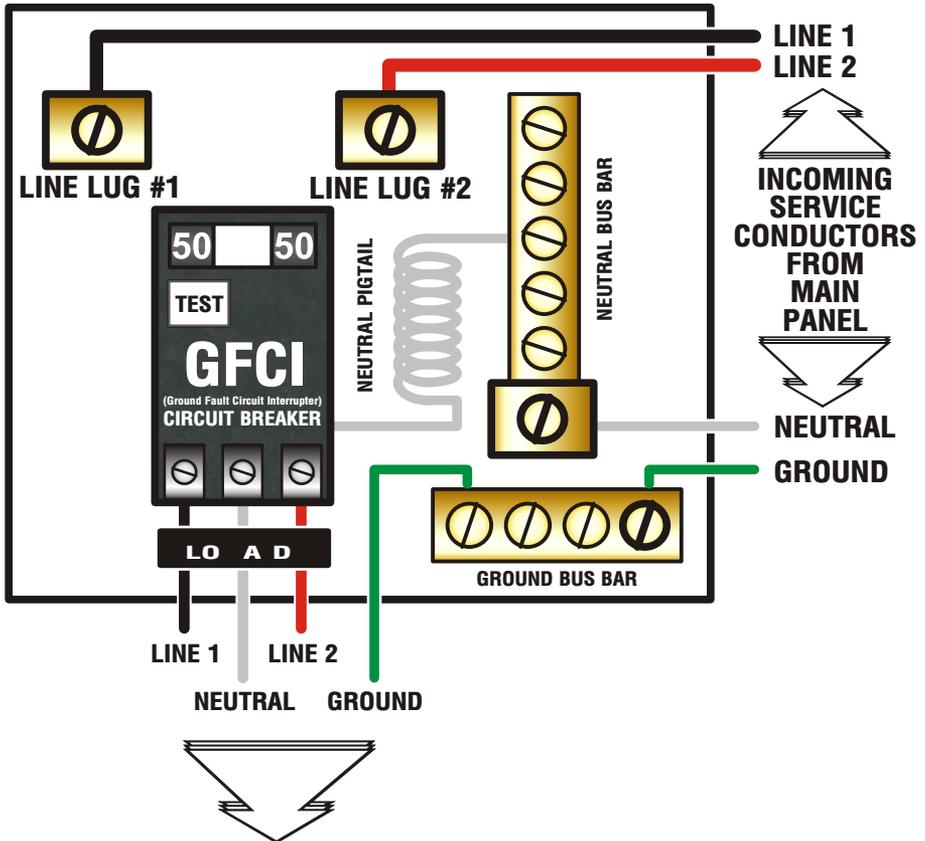
WARNING - BE SURE THAT YOUR POWER SUPPLY CIRCUIT CAN ADEQUATELY HANDLE THE AMPERAGE YOU SELECT.

The control input power wiring may have been provided. Following NEC and local codes in effect at the time of installation, connect (refer to wiring diagram located on the inside of control hinged cover) the Black wire to input Line 1, Blue wire to input Line 2 (if applicable), White wire to Neutral and the Green wire to ground.

GFCI WIRING DETAIL

When a GFCI circuit breaker is used in the installation of your spa, it is important that it has been properly installed. Often this component has been improperly installed causing the breaker to trip the instant the system is turned on. Below is an illustration of a typical GFCI breaker installation.

WARNING: Refer to Circuit Breaker Manufacturers installation instructions. This illustration is meant to be a guide for Field Technicians and is not intended to override or substitute the instructions supplied with the circuit breaker.



LOAD NEUTRAL MUST BE CONNECTED DIRECTLY TO GFCI AS SHOWN

SYSTEM CONFIGURATION

Congratulations on your purchase of the Universal Series Control System from Hydro-Quip. This series of controls has been developed to allow you complete flexibility during your installation. This Control System is configured to allow you to choose the voltage for each circuit at the time of installation. We highly recommend that all component cords be replaced at the time of installation.

The Universal conversion procedure MUST be accomplished PRIOR to connecting input service wiring. This control has been shipped from the factory with ALL circuits wired for 120 VAC.

VERIFY YOUR COMPONENT VOLTAGE REQUIREMENTS: 120 VAC will not harm a 240 VAC component if operated temporarily. 240 VAC **WILL** harm a 120 VAC component almost immediately. This is the reason we ship all circuits in the 120 VAC configuration. Hydro-Quip cannot be held responsible for mis-wire related damage to components.

Note: To utilize the Universal circuitry (120/240VAC), incoming service must be 240V/4-Wire.

Hydro-Quip has made the conversion process simple and easy. After you have determined the voltage of your components (pump(s), air blower, ozonator etc.), you are now ready to complete the conversion process. Color-Coded Neutral Wire connectors have been provided to easily distinguish the circuit to be converted. By simply moving a Neutral wire from the Neutral side of the conversion terminal block, clearly marked and located inside the control enclosure, to the Line 2 side completes the circuit conversion. Follow the illustrations and step-by-step instructions.

Circuit Color Chart

Red Connector = Pump 1

Violet Connector = Pump 2 (Optional)

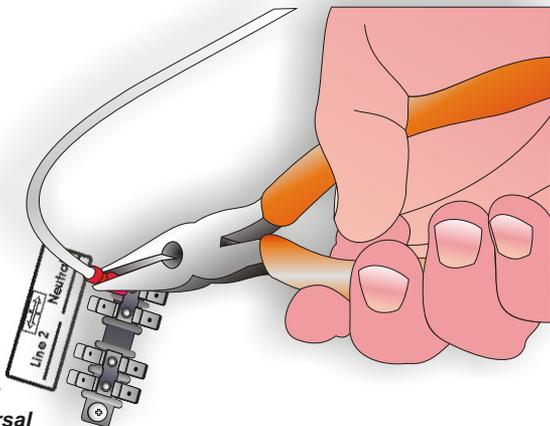
Blue Connector = Air Blower

Brown Connector = Circulation Pump (Optional)

Note: Ozonator Circuit 120V ONLY

Step 1

Remove 2(ea) screws and open front cover of enclosure. Locate the conversion terminal block and desired connector (using "Circuit Color Chart" above). Carefully remove connector from the Neutral side.

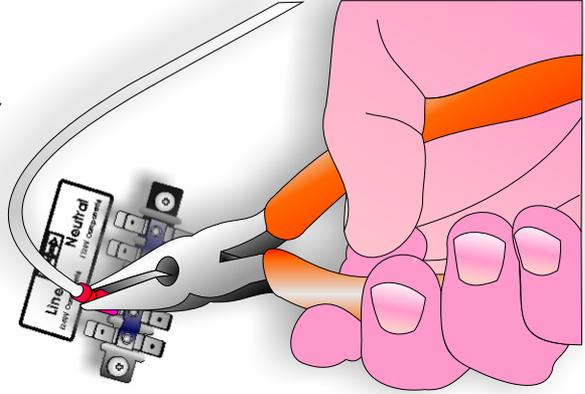


If you have a 3-wire/240V connected system, you will not have the Universal option

CONFIGURATION

Step 2

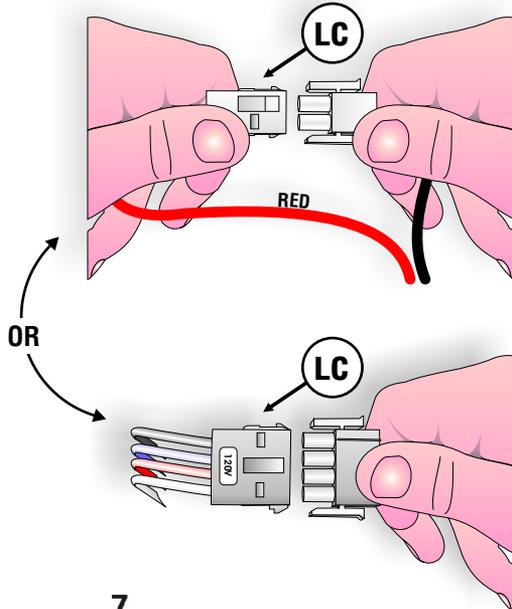
Reinstall the connector onto the "Line 2" side. The conversion is complete and the circuit is now ready for a 240VAC component.
Note: Repeat this procedure for each circuit. Refer to "Circuit Color Chart" on previous page.



HEATER CONVERSION

Step 1

Your system can be set for High Current (HC) or Low Current (LC) operation (*the connection is pre-configured at the factory for low current*). In the Low Current configuration the heater will automatically turn off when the high-speed of the pump or the air blower is activated. For unrestricted High Current operation, simply turn input power off, locate and disconnect the conversion plug and receptacle.



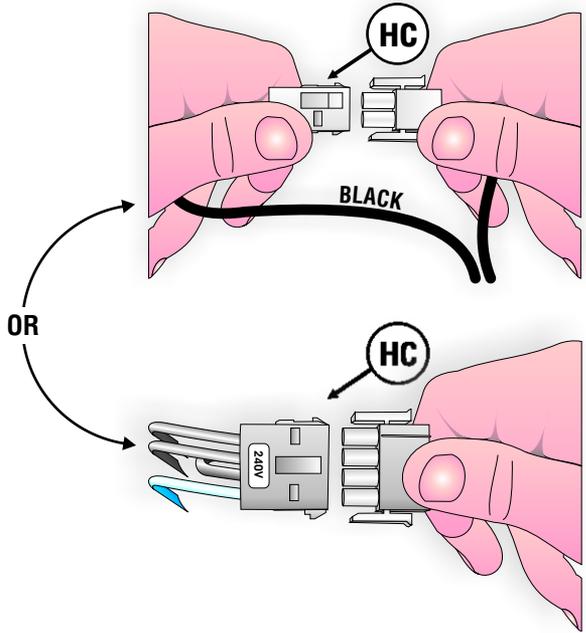
You will have either a two or four pin conversion plug.

Step 2

Now reinstall the conversion plug into the High Current (HC) conversion receptacle. The conversion is complete.

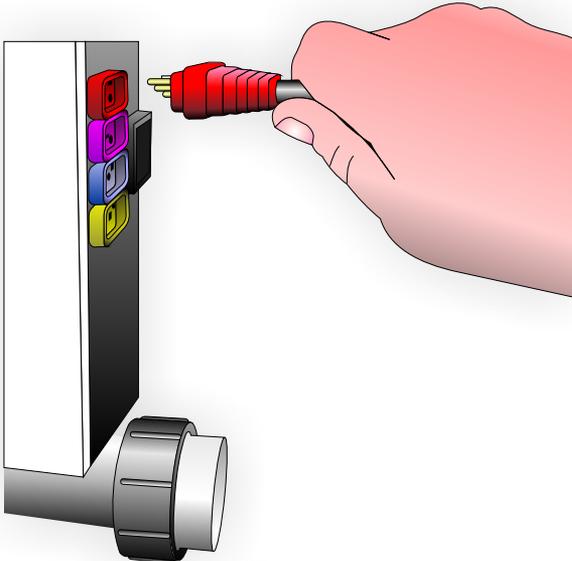
Reapply power and operate the spa normally. When the high-speed of the pump or the air blower are turned on, the heater will not shut off.

You will have either a two or four pin conversion plug.



CONNECTION

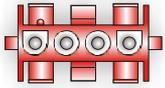
All systems include colored component receptacles for ease of identification. Match the component plug with its mating receptacle using the "Receptacle Identification Chart" on the following page.



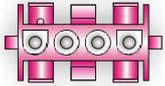
CONNECTION

Below is an illustration showing our exclusive colored receptacles, located on the right side of the control box. Use this illustration when connecting spa components.

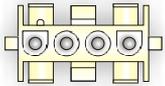
Receptacle Color Chart



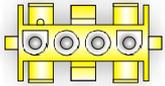
RED
Pump 1 / 2-Speed



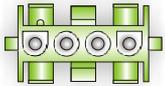
PINK
Pump 2 / 1 or 2-Speed



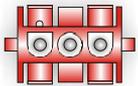
WHITE
Air Blower



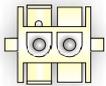
YELLOW
Ozonator



GREEN
"Hot" Accessory



RED 3-Pin
Circulation Pump



WHITE 2-Pin
12V Light

Assure that all plugs and receptacles are fully connected. A loose connection can cause damage to the system.

Note: Hydro-Quip utilizes the **BLACK** wire for High-Speed and the **RED** wire for Low-Speed in Two-Speed Pump Circuits. Keep this in mind when connecting a Two-Speed pump that has not been purchased with the system.

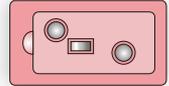
RED
Pump 1 / 2-Speed



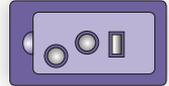
BROWN
Pump 2 / 2-Speed



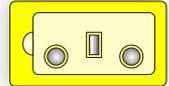
PINK
Pump 1 or 2 / 1-Speed



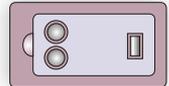
VIOLET
Air Blower



YELLOW
Ozonator



LIGHT VIOLET
Switched Accessory



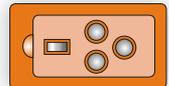
BLUE
Circulation Pump



WHITE
12V Light or
Firemans Switch



ORANGE
Fiber Optic

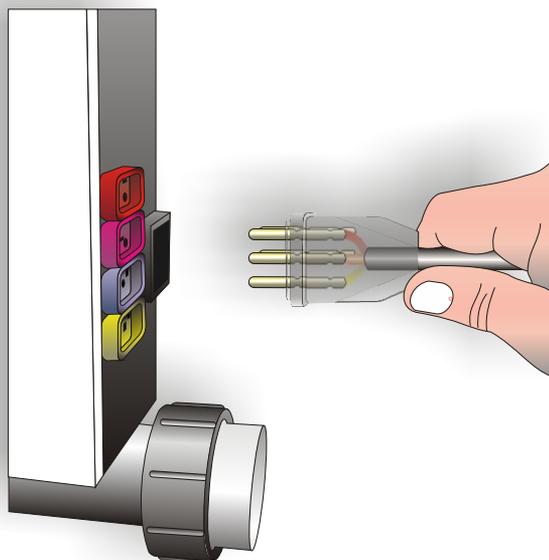


GREEN
"Hot" Accessory



CONNECTION

Spaside Control: If equipped, install the Spaside Control per the manufacturers instructions. Once installed, connect the Spaside Control plug into the receptacle provided on the side of the control box (as shown in the illustration below). If the Spaside Control includes a thermostat, installed the temperature probe into the dry-well of the spa.



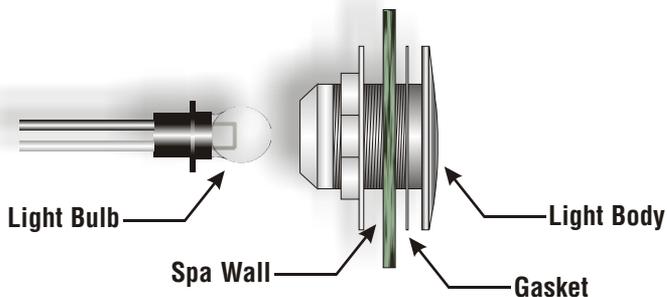
Spa Light: Using a suitable 2 ½ " diameter hole-saw, cut a hole in the spa wall.

Cut from inside the spa wall toward the outside to prevent splintering the inner surface.

Remove any insulation material from around the hole (at least ½ ") at the outside spa wall.

Install the gasket onto the light body and install the light into the hole. Take care not to over tighten the nut securing the light body. (*Silicone sealant may be used in place of the gasket. Allow adequate time for sealant to cure before filling the spa.*)

Note: It is recommended that the water level be stopped just above the level of the spa light until a thorough inspection for leaks can be completed.



SYSTEM STARTUP

System Startup Procedures:

Using the “System Operation Manual” provided with the unit, complete the following procedures:

- 1) Read and familiarize yourself with the system Operation manual.
- 2) Unplug the power cord (120-volt system only) or turn the electrical power “OFF” at the service or breaker panel (120 or 240 volt permanently connected units.)
- 3) Open all **WATER** shut-off valves.
- 4) For spas equipped with a hose bib or drain valve, make sure that it has been closed.
- 5) For spas equipped with in-line or pressure water filters, make sure that the filter nut, housing drain plug, and air relief valve are closed and tight.
- 6) Using a standard water hose, fill the spa with fresh tap water to the level recommended by the spa manufacturer.
- 7) Inspect all plumbing connections and lines for any sign of water leaks.
- 8) Close all **AIR** control valves. **WARNING:** Do not confuse with **WATER** shut-off valves.
- 9) Adjust temperature to the **lowest** setting.
- 10) Plug the unit into the proper outlet (120-volt system) or turn on the breaker at the electrical service panel (240-volt system).
- 11) On units with a Ground Fault Circuit Interrupter (GFCI), check the GFCI by pressing the “Test” button on the face of the device. The “Reset” button should pop out. **The equipment should not operate.**
- 12) Activate the equipment by pressing the “Reset” button on the GFCI. (If the jet pump(s) or blower is operating, switch them off).
- 13) Press the “JET PUMP” switch to run on high speed. Allow to run until you achieve a strong, steady water flow (free of air bubbles).
- 14) On systems with a pressure filter, bleed off the trapped air by opening the Air-Relief valve. You will notice a steady flow of water when the air has been bled completely.
- 15) Switch the “JET PUMP” off.
- 16) If equipped, switch the “AIR BLOWER” on to verify that it is working, then switch it off.
- 17) If equipped, switch the “LIGHT” on to verify that it is working, then switch it off.
- 18) If equipped, switch the “AUXILIARY PUMP” on to verify that it is working, allow to run until all air is evacuated from the plumbing system, then switch it off.
- 19) Adjust temperature to the desired set point for comfortable use of the spa. The pump low speed and heater will activate until the set point has been reached.

It is now time to turn over operation of the spa to the homeowner. See next section for basic troubleshooting tips.

TROUBLESHOOTING

*The following describes situations and possible solutions to common problems may encounter as a spa owner. **Note: your system may not include all components listed.***

NOTHING OPERATES

Main Breaker is OFF - *Set to On.*

Sub-Panel Breaker Off - *Set to On.*

System GFCI Off - *Set to On.*

Power switch in Off position - *Set to On.*

Components not plugged in - *Plug in components.*

Power cord not plugged in - *Plug in power cord.*

NO, LOW OR SURGING WATER FLOW

Air Lock in Plumbing System - *“Bleed” the system.*

Restricted Flow - *Insure that the water shut-off valves are open and that suction fittings are not blocked by debris.*

Low Water Level - *Increase water level to recommended level.*

NO LOW SPEED PUMP OPERATION

Pump 1 Not Plugged-In - *Plug in Pump 1.*

Pump 1 Fuse Blown - *Contact you local dealer.*

Pump 2 Not Plugged-In - *Plug in Pump 2.*

Pump 2 Fuse Blown - *Contact you local dealer.*

NO JETS OR BLOWER OPERATION

Blower or Pump Not Plugged-In - *Plug in the Blower or Pump.*

Pump or Blower Fuse Blown - *Contact you local dealer.*

NO THERAPY JET OPERATION

Water Shut-Off Valves are Closed - *Open Shut-Off valves.*

Jets Not Properly Adjusted - *Adjust Jets properly.*

Diverter Valve Not Properly Adjusted - *Adjust diverter valve properly.*

Thermal Overload Tripping - *Check for restricted flow of water.*

NO LIGHT OPERATION

Light Bulb Defective - *Replace bulb or contact your local dealer.*

Reflector has Fallen Off - *Replace deflector or contact your local dealer.*

Light Not Plugged-In - *Plug in the Light.*

WATER LEAKS

Spa Overfilled - *Adjust water level.*

Drain-Valve Left Open - *Close drain valve.*

Couplings or Unions Loose - *Tighten or contact your local dealer.*

Pump Seal Leaking - *Contact your local dealer.*

Plumbing / Connections Leaking - *Contact your local dealer.*

Water Leaking from Spaside Control - *Contact your local dealer.*

Water in Air Blower Plumbing - *Contact your local dealer.*

NO HEAT

Temperature Not Set Correctly - *Adjust "Set Point" Temperature.*

System Power Restriction - *Depending on available power, the spa may have interlocks in place to shut off the heater when the pumps are switched to high speed.*

HIGH HEAT

Temperature Sensor Not in Dry-Well - *Place sensor in dry-well.*

Temperature Set Too High - *Adjust "Set Point" Temperature.*

High Ambient Temperature - *Remove spa cover.*

GFCI TRIPS IMMEDIATELY

For correct GFCI breaker wiring, refer to page 5 for details.

SPECIAL CONSIDERATIONS

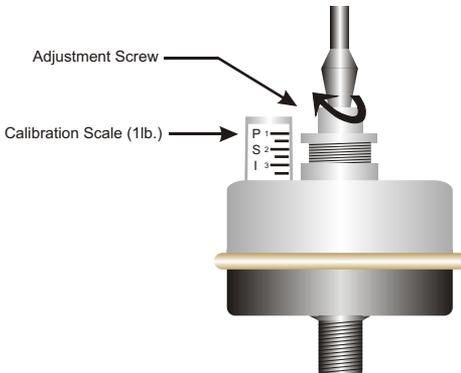
If your system is equipped with a pressure switch, the function of the pressure switch is to turn the heater off if the pump stops operating or if there is a restricted water flow (dirty filter, obstruction in the spa plumbing etc.).

The pressure switch has been preset at the factory to operate properly with your spas specific plumbing. Adjustment or other service may be required if you observe a flow related problem (3 flashing dots on spaside display). If adjustment is required, follow the next steps carefully.

IMPORTANT: After any pressure switch adjustment, it is important to test the control by turning on the pump low speed and heater. While operating, unplug the pump, the heater must turn off. If the heater stays on, plug the pump back in and readjust the pressure switch to achieve proper operation.

Adjustment

- 1) *With power to system turned OFF, remove the wires from the pressure switch terminals (secure wires safely to prevent any chance of electrical shock).*
- 2) *Use temperature adjustment key to move “set point” temperature to its lowest setting.*
- 3) *Turn power to the system ON and activate the low-speed pump.*
- 4) *Place an Ohmmeter across the pressure switch terminals to verify an OPEN circuit.*
- 5) *Rotate the pressure switch adjustment screw counter-clockwise until the Ohmmeter indicates a CLOSED circuit.*
- 6) *Turn pump OFF and verify that the pressure switch circuit is once again OPEN.*
- 7) *Turn power to the system OFF and reconnect pressure switch wires. Reapply power to the system and operate the spa or hot tub as normal.*



SYSTEM DATA LABEL

The system data label is located on the control box. This label is very important and contains information you will need to establish your electrical service. The voltage and amperage ratings are shown on the bottom of the label. Product, Model, Serial and Code numbers are also shown on the label.

Note: This information will be necessary if you should ever have to request warranty or any other type of service.



HYDROQUIP[™]
THE **SMART** CHOICE[™]

ORDER CODE: _____

MODEL: _____

SERIAL: _____

CODE: _____

VOLTS: _____

AMPS: _____

PRODUCT: _____

REFER TO NEC FOR
BREAKER SIZING

WARRANTY INFORMATION

To all original purchasers, **HYDRO**QUIP warrants its products to be free from defects in material and workmanship for a period of one year from the date of purchase.

HYDROQUIP will repair or replace the part, which in our opinion, is defective.

This warranty excludes damage as a result of: normal wear, freezing, low voltage, chemical abuse, accident, negligence, alteration, improper installation, use or care.

To obtain warranty service, return defective products within the warranty period to **HYDRO**QUIP.

Purchaser is responsible for removal or reinstallation labor, freight charges, or any other such costs incurred in obtaining warranty service.

HYDROQUIP assumes no responsibility for incidental or consequential damages. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

**THE SPA DEALER MAY PROVIDE A DIFFERENT WARRANTY,
CONTACT YOUR SPA DEALER FOR DETAILS**



HYDROQUIPTM

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Telephone: 951.273.7575 · Fax: 800.332.7190