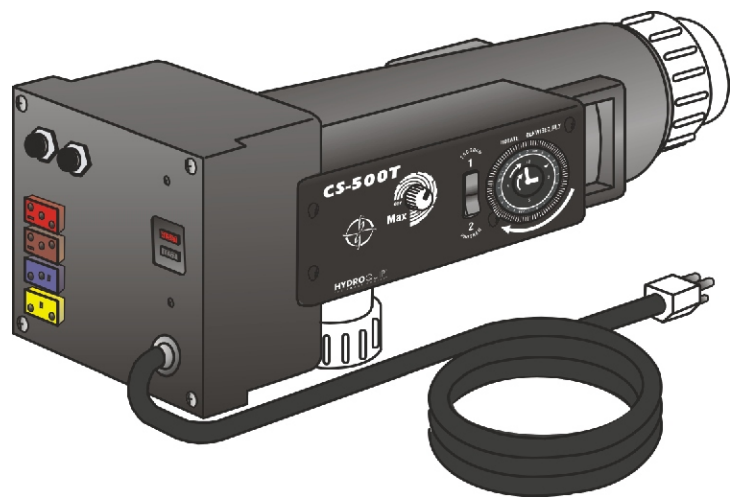


HYDROQUIP™

AIR SERIES

SYSTEM INSTALLATION MANUAL

THE **SMART CHOICE**™





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CONSIDERATIONS

Hydro-Quip equipment and control systems were designed exclusively for installation into the equipment compartment of a portable spa. The skirting of the portable spa, with suitable equipment compartment doors securely fastened, serves as a barrier to prevent a spa user from coming in direct contact with any part of the system.

General

- The Control must be installed on a firm, level surface provided by the cabinet of the spa.
- The area where the Control is mounted must have adequate drainage to prevent flooding the equipment under all circumstances.
- The equipment compartment should have adequate ventilation.
- The portable spa should be installed with a minimum of 3 feet (1m) of free, unobstructed space between the opening of the spas equipment compartment and any permanent structure. This will allow for ease of installation and access for regular maintenance.

Plumbing

- To assure adequate performance, the spa plumbing must be 1 ½ " minimum. The use of 2" is recommended. A good grade of fresh PVC-to-PVC primer and solvent should be used for all water plumbing connections.
- The pump(s) provided with *Equipment Systems* are non self-priming. Non self-priming pump(s) must be installed below the normal water level.
- To allow for safe operation of the spa, the suction fittings connected to the suction opening an *Equipment System* should be listed or approved for the purpose.

There may be three separate plumbing systems in the spa. Verify the function of each pipe.

A) Suction Side Plumbing: this plumbing will connect to the spas skimmer, main drain and suction fittings. This plumbing connects to the "open end" of the pump on your *Equipment System*.

B) Discharge Side Plumbing: this plumbing will go to the spas hydrotherapy jets and message fittings. This plumbing connects to the "open end" of the heater on your *Equipment System* (see illustration on page for details).

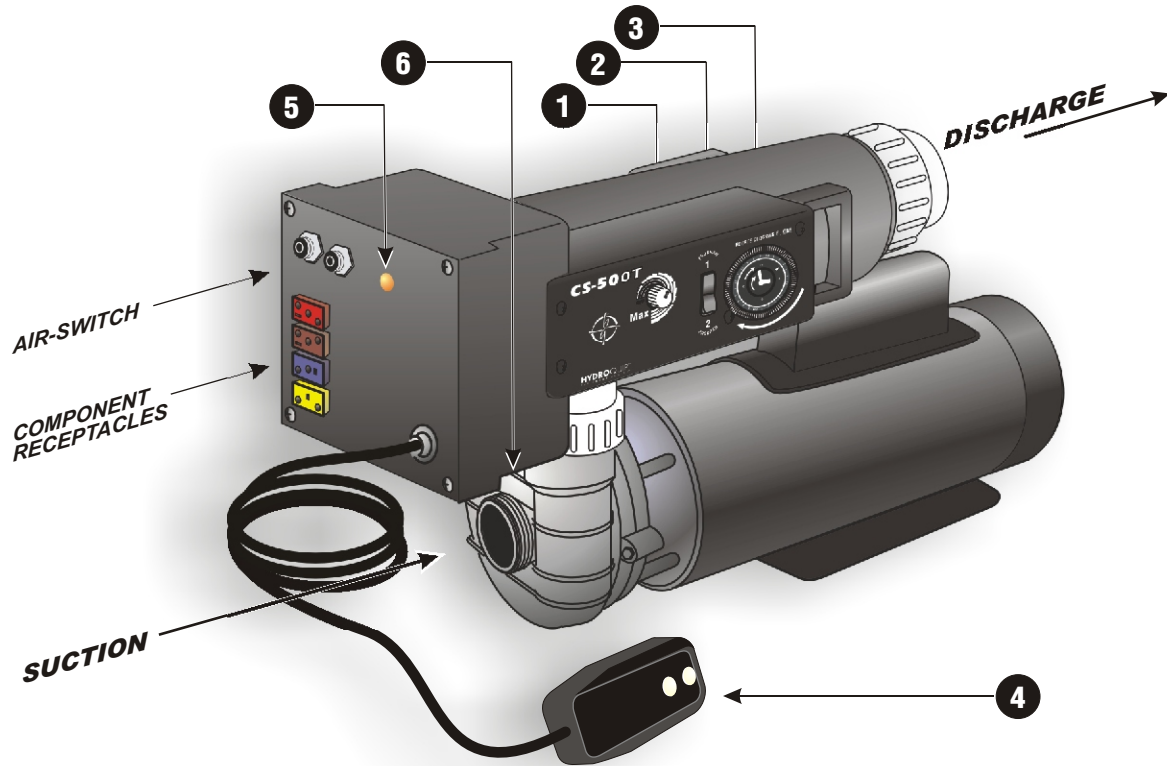
C) Air Blower Plumbing: this plumbing will go to an air channel under the floor or air distribution manifold of the spa. This plumbing connects **ONLY** to an air blower.

Component Connection

- All components such as the pump(s), air blower and light are connected using colored receptacles located on the right or left side of the control.



ILLUSTRATIONS



- 1) Thermostat
- 2) Mode Selector Switch
- 3) Time Clock
- 4) Ground Fault Circuit Interrupted (GFCI)
- 5) Overheat Protection (Press to Reset)
- 6) Heater "ON" Indicator
- 7) Pump Assembly (**included with Equipment Systems Only**)



CONFIGURATION

Congratulations on your purchase of the Air Series Control from Hydro-Quip. This series of controls has been developed to allow you complete flexibility during your installation. We highly recommend that all component cords be replaced at the time of installation.

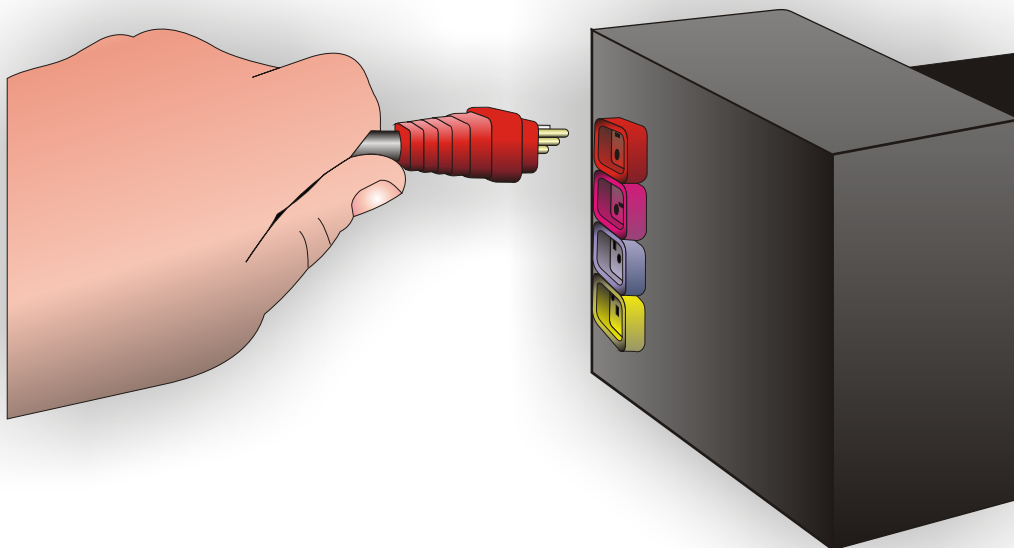
Your control has been pre-configured at the factory. Verify input and component all component voltages prior to connecting them.

- **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. Hydro-Quip cannot be held responsible for mis-wire related damage to components.



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.

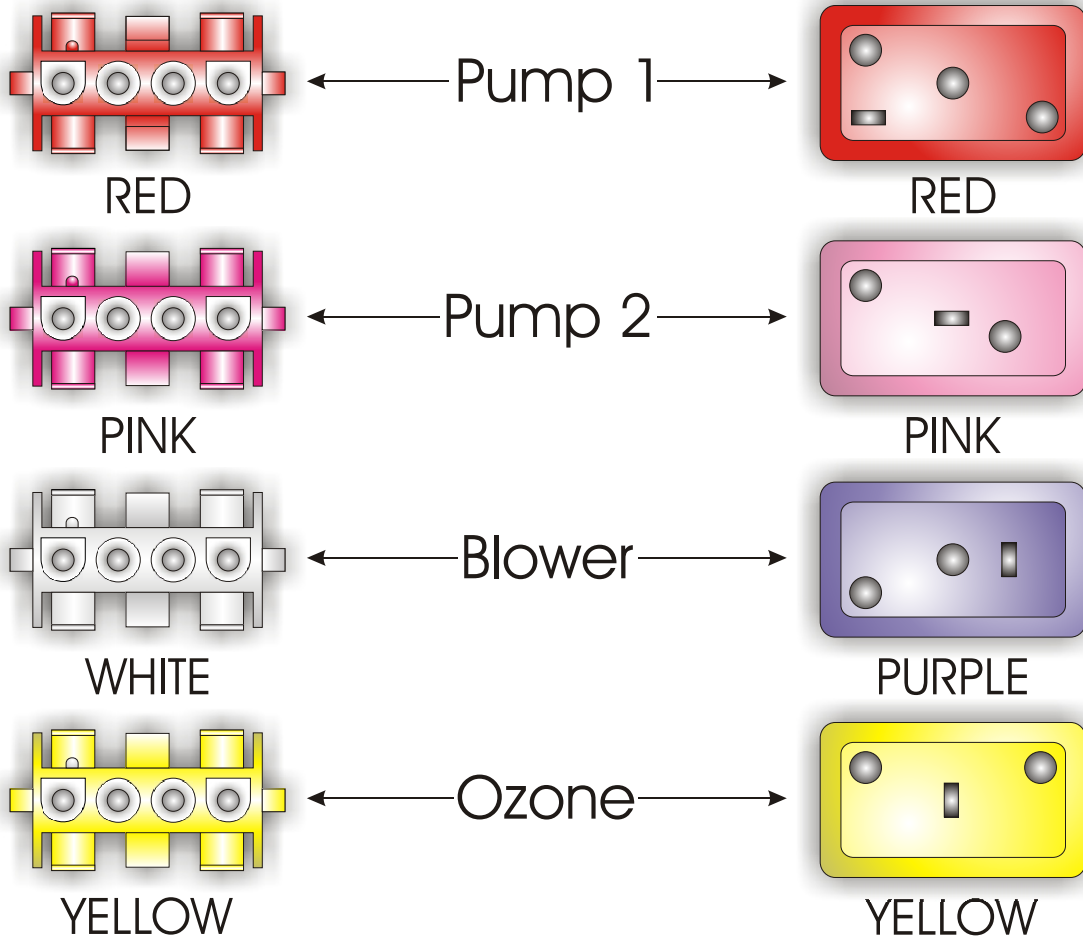




CONNECTION

Below is a color chart that illustrates the receptacle colors and component connections. Other receptacles that are not shown: Light (12V) - White 3-Pin Amp or White Molded, 120V Power - Green Amp/Molded, Circulation Pump - Red 3-Pin Amp or Blue Molded.

Receptacle Color Chart



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.

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

120 Volt - Your control will connect to a dedicated 15A or 20A receptacle via the cord-end GFCI (Ground Fault Circuit Interrupter) included (see next page for details).

240 Volt - Your control must be permanently connected by a licensed electrician or qualified technician.

ELECTRICAL INSTALLATION

If your system was configured to include a 120VAC power cord, ensure that the proper receptacle has been installed. 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 invalidate the warranty.



**15 AMP
RECEPTACLE**



**DO NOT
USE AN
EXTENSION
CORD**



**20 AMP
RECEPTACLE**

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.

■ **WARNING** - DO NOT CHANGE CONFIGURATION PLUG WHILE POWER IS ON.

The control wiring has been provided. Following NEC and local codes in effect at the time of installation, connect 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.

SPECIAL CONSIDERATIONS

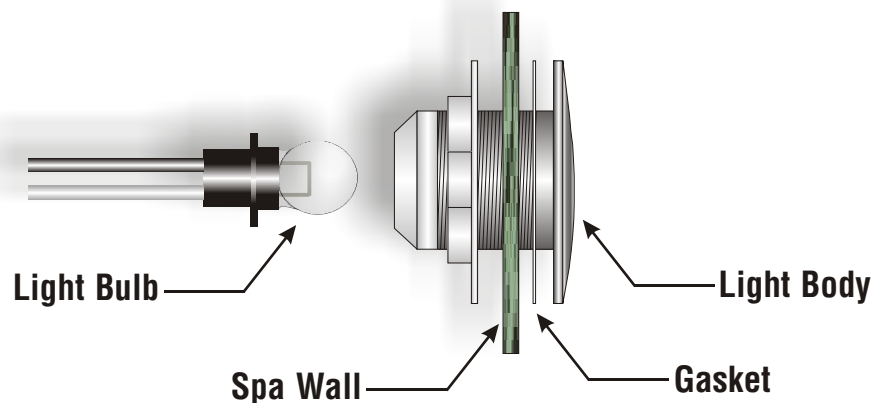
Spa Light: Using a suitable 2 ½ " diameter hole-saw, cut a hole in the spa wall.

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.



- **Air Blower:** The air blower MUST be installed to ensure that water CANNOT enter
- the air blower motor. This can be accomplished by installing a double air loop that incorporates a check valve.

CAUTION: The air blower must be connected ONLY to the spa's air distribution plumbing. Connecting the air blower to any air piping associated with the hydrotherapy jets will create a hazard by providing a path for high-pressure water to be forced into the blower motor. This will result in damage to the air blower and create an electrical shock hazard.

SPECIAL CONSIDERATIONS

System Startup Procedures:

- 1) Read and familiarize yourself with the System Operation.
- 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) Connect a garden hose to the bib or drain-valve and run it away from the equipment compartment. Open the hose bib or drain valve to bleed off any air that may have been trapped in the plumbing system during the filling operation. After a steady flow of water appears, close the hose bib and remove the garden hose. *Be sure to dry off any excess water around the electrical compartment before proceeding to the next step.*
- 9) Close all **AIR** control valves. **WARNING:** Do not confuse with **WATER** shut-off valves.
- 10) Rotate thermostat fully counterclockwise and set the Mode selector switch to PROGRAM 2.
- 11) Plug the unit into the proper outlet (120-volt system) or turn on the breaker at the electrical service panel (240-volt system).
- 12) 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.*
- 13) Activate the equipment by pressing the “Reset” button on the GFCI. (If the jet pump(s) or blower is operating, switch them off)
- 14) 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).
- 15) 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.
- 16) Switch the “JET PUMP” off.
- 17) If equipped, switch the “BLOWER” on to verify that it is working, then switch it off.
- 18) If equipped, switch the “LIGHT” on to verify that it is working, then switch it off.
- 19) 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.
- 20) Rotate the thermostat fully clockwise to the “MAX” position (the pump low speed and heater will now be operating).

After the water has attained your desired temperature set the program mode switch to PROGRAM 1. Be sure the timer operation is set.

SPECIAL CONSIDERATIONS

The equipment should be installed so that there is safe access for servicing and routine maintenance.

After filling the spa or hot tub each time it is important that the pump be operated on high speed for several minutes to insure that all the air has been removed from the plumbing before the heater is turned on. Trapped air can cause the heater to dry-fire, which is not covered under the warranty.

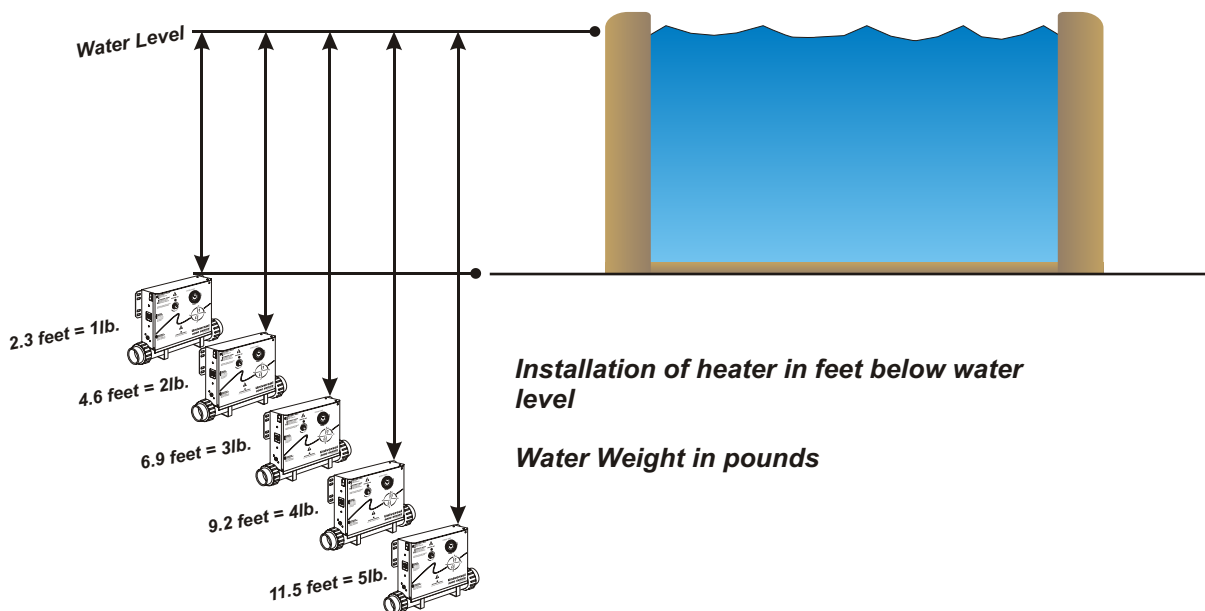
Factory Installed Pressure Switch:

The heater comes equipped with a pressure switch. The pressure switch is a safety device that will not allow the heater to activate unless there is water flowing through it. A restricted water flow (dirty filter, obstruction in the spa-plumbing) can cause the pressure switch to react abnormally .

Installation Below Spa Surface:

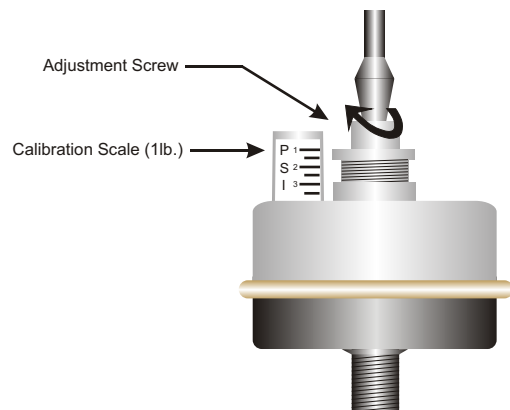
If the heater is installed more than two (2) feet below the spa water level, adjustment of the pressure switch may be necessary. The following procedures and illustrations outline the adjustment of the pressure switch.

CAUTION: Remove all power to the System prior to attempting any adjustments.



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) Turn the Thermostat *counter-clockwise* to the OFF position.
- 4) Turn power to the System ON and activate the Low-Speed Pump.
- 3) Place an Ohmmeter across the pressure switch terminals to verify an OPEN circuit.
- 4) Rotate the pressure switch adjustment screw *counter-clockwise* until the Ohmmeter indicates a CLOSED circuit.
- 5) Turn Pump OFF and verify that the pressure switch circuit is once again OPEN.
- 6) 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.



TROUBLESHOOTING

NOTHING WORKS!

System Mis-Wire light is ON - Line 1 or Line 2 connected to Neutral position.

Main Breaker is OFF - Set to ON.

Sub-Panel Breaker OFF - Set to On.

System GFCI OFF - Press RESET.

Power Switch in OFF position - Set to On.

Components not plugged in - Plug in components.

Power cord not plugged in - Plug in power cord.

Overheat Protection Switch Tripped - Press button to reset.

NO, LOW or SURGING WATER FLOW

Air-Lock in plumbing system - "Bleed" the system.

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

Dirty Spa Filter - Clean or replace filter.

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

NO LOW SPEED PUMP OPERATION

Timer Not Programmed - Set function mode to desired setting and program timer.

Overheat Protection Switch Tripped - Press button to reset.

Mode Switch set in Mode 2 - Thermostat needs to be turned up to desired temperature.

Pump Not Plugged in - Plug in the Pump.

NO JETS or BLOWER OPERATION

Air Button to Air Switch Hose Not Properly Connected - Connect hose.

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

Overheat Protection Switch Tripped - Press button to reset.

NO THERAPY JET OPERATION

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

Dirty Spa Filter - Clean or replace filter.

Jets Not Properly Adjusted - Adjust Jets per manufacturers instructions.

Diverter Valve Not Properly Adjusted - Adjust diverter valve.

Pump Thermal Overload Tripping - Check for proper voltage and/or restricted water flow.

Overheat Protection Switch Tripped - Press button to reset.

NO HEAT!

Thermostat Not Set Correctly - Adjust Thermostat setting.

Overheat Protection Switch Tripped - Press button to reset.

System In Wrong Mode - 120V Systems will not have heat if High-Speed Pump or Blower is on.

Low Water Flow - Clean or Replace filter.

Pressure Switch Not Properly Adjusted - Adjust Pressure Switch.

HIGH HEAT!

Temperature Sensor Not in Dry-wel - Place sensor in dry-well.

Thermostat Set Too High - Adjust Thermostat Setting.

High Ambient Temperature - Remove spa cover.

GFCI TRIPS OCCASIONALLY


Lightning or Electrical Storm, Power Surge, Extremely Humid Weather Conditions, or Radio Frequency Interference - Reset GFCI. **NOTE: Assure that the GFCI is properly grounded and bonded.**

GFCI TRIPS IMMEDIATELY!

Defective Component - Contact the factory for assistance.

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.



HYDROQUIPTM
THE **SMART** CHOICETM

ORDER CODE: _____

MODEL: _____

SERIAL: _____

CODE: _____

VOLTS: _____

AMPS: _____

PRODUCT: _____

**REFER TO NEC FOR
BREAKER SIZING**



NOTES

Dealer: _____ **Date of Install:** _____

Contact: _____ **Phone:** _____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Notes: _____



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