HYDROQUIP™

THE **SMART** CHOICE™

Outdoor Series

INSTALLATION MANUAL

Covers the following CS & ES Models:

ES8800-11, ES8800-5.5, ES8800-GAS

PUMP SUPPLIED MAY VARY

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

8800 BP

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TABLE OF CONTENTS

READ AND FOLLOW ALL INSTRUCTIONS

Product approved for indoor/outdoor use

WARNING!

Risk of Personal injury:

Do not allow the use of the Hot Tub/spa by unattended children under the age of 16, or person unfamiliar with the risk of drowning , temperature exposure, or malfunctioning equipment

To reduce injury risks, the operating equipment should be checked prior to use, the temperature set appropriate for occupant, and adult supervision when hot tub/ spa is in use at all times

WARNING!

Risk of electrical shock:

Operating the hot tub/spa without proper equipment grounding or having metal objects like handrails , poles etc with 10ft. (3 miters) of the waters edge without bonding connection may lead
to an electric shock. Additionally system operation or service with the equipment door access panel removed should only be done by a professional with the system power turned off at the GFCI breaker

To reduce the risk of electrical shock, confirm the system and metal objects are grounded and the GFCI breaker has been tested in accordance with the breaker manufacturer

WARNING!

Risk of Health Hazards:

Hot tub/spa users must limit their bathing (exposure) time when bathing in temperatures exceeding 100f. (xxx c) To reduce the risk of hypothermia, do not
Bath longer than 20 minutes without a minimum 10 minute break interval being out of the water

Pregnant women and persons under the influence of drugs or alcohol should never use the hot tub/spa

Indoor gas heated units pose a risk of suffocation from carbon monoxide poisoning if venting is inadequate or becomes obstructed.
Gas heaters should be checked for proper operation prior to use. It is a good idea to install a carbon monoxide detector/alarm near the gas heater to improve detection

WARNING!

Risk of fire:

Operating equipment contains high voltage electrical power and may include a gas operated heater that should never be installed near or exposed to flammable surfaces, liquids, or combustible materials

To reduce the risk of fire, do not place or store flammable on or near spa equipment and/or gas heater. Example of flammables include chopped wood, tree and shrub foliage, propane tanks, cardboard, charcoal, lighter fluids etc.

GETTING STARTED

For the best installation possible, review all the provided instruction materials, and share with your electrician/installer for advanced planning. A complete understanding of what's needed before starting work will make things go smoothly, and at the lowest possible cost.

This manual includes complete instructions for electrical and plumbing connections, including the addition of pumps, gas heaters, lights, system startup, troubleshooting, and your warranty guidelines.

First identify the Equipment System (ES) or Control System (CS) from your product label. Refer to this code when using the GFCI breaker sizing matrix, and wiring diagrams in this manual

ES series controls include a plastic mounting base, and main system pump. The separate quick –start sheet #85-0115-4 has detailed instructions for pack assembly, and pump cord installation

CS series controls are designed for a wall mount application. Your electrician must follow all local codes and restriction pertaining to placement of an accessible electrical service.

* Copies of this manual are available online at www.hydroquip.com

Your Hydro-Quip 8000 series control has a factory pre set program. Details for changing system behavior and/or adding new components will be found in this manual.

ATTENTION!

This manual includes instructions for all options available on the ES/CS systems. Depending on how your system is equipped, some options like Plus Ozone™, Wifi, blowers, gas heaters etc may not apply to your installation.

Warning! Make no attempt to modify, disconnect, damage or adjust the safety devices contained in this equipment system. Alteration of safety devices can cause serious component damage, and/or result in unsafe operation leading to personal injury or death

Save a copy of this manual

TERMS / GLOSSARY

AC Connection	Alternating Current connection point (typically high voltage)
Additional Panel Button	Refers to HQ PT# 34-0224. Required for 3rd pump operation
Amperage Requirement	The accumulated total amperage of all items to be placed on a single breaker
AUX PCB	Smaller daughter board connected to main PCB
Auxiliary Pump	A pump that has been added to the original equipment system (ie Aux pump #2 & #3)
Blower	Appliance providing compressed air for the purpose of massage therapy
Bonding Wire	Continuous bare copper wire connecting all metallic object and electrical components to the equipment & ground rod
BWA™APP	Downloadable Balboa Water Application for wireless system control
Copper Conductors	Electrical wires made from copper alloy materials
Dedicated Circuit	An electrical supply to a remote location, having breaker protection and no additional branch or service connections
Default Programming	The standard position or programming in which the system is tested and leaves the factory
Dip Switch	Movable programming switch located within a switch-bank (on PCB)
Dip Switch Banks	Set of switches used to change operational logic and system behavior (on PCB)
Discharge	Pump exit side (piping placed on pressure side of pump)
Dual Source Wiring	Electrical power supplied by two individual wiring sources (two breakers)
Gas Heater Control Circuit	Wiring provided inside gas heaters, that can be connected to 8000 systems for operational control. Commonly called a fireman circuit
GFCI Breaker	Ground Fault Circuit Interrupter. Specialty breaker with a detection and reaction device to interrupt power when current leaking is detected to ground
GFCI breaker #1	Main 8000 system breaker, required 4 wires with incorporated “Neutral”
GFCI breaker #2	Optional breaker for independent heater operation. Required 3-wire connection, without “Neutral”
Heater Input Leads	Provided wires for connection of heaters in the dual source configuration
Heater Disable Switch	Allows for the disabling of the heater circuit during system start-up. See page #28 for more details
Jumper Pins	Circuit board electrical posts for logic changes.

TERMS / GLOSSARY

KW	Kilowatt. Heater resistance rating used for identifying energy consumption.
Line of Sight	A clear and unobstructed path, in which an object or item can be spotted from or near the spas edge.
Logic Jumper	Movable coupling located on the jumper pins for changing operational behavior
Liquid Tight Conduit	Tubing that resists water and debris penetration, made specifically for wiring
Main Control	In reference to the 8000 series control box, with factory provided components
Main Pump or Pump #1	System provided pump used for heating and filtration
NEC	National Electrical Code. Regulations for design and materials on electrical installation.
PCB	Printed Circuit Board (refers to main board)
Persistent Memory	Programming that remains unchanged, until the power is turned off and back on
Plus Ozone™/Ozonator	Appliance designed for spa water sanitation
Priming	Initial pump operation until the air is evacuated from the pump and supply lines
Pump Amperage	The highest amperage measured, when the pump is under full load condition
Pump Pot/Basket	Reservoir mounted to the pump with removable lid and strainer basket
Single Source Wiring	Electrical power supplied by a single wiring source and breaker (one breaker)
Sub Panel	An electrical service box mounted remotely from the main house power panel
Suction	Pump front inlet side (piping between spa suctions and pump pot)
System Data Label	Label placed on control box providing serial identification, and vital data
System Disconnect	An easy and safe means of 100% electrical disconnection, without obstruction or the need for tools. See NEC and UL qualifications for approved devices.
Terminal Strip	Electrical connection point for components within the PCB cabinet
Total System Amps	Highest amperage measured when all components are operating simultaneously
Wi-Fi Enabled	Having the capacity to control using a wireless connection

SYSTEM INSTALLATION REQUIREMENTS

The Hydro-Quip 8000 Series Solid-State Systems were designed for indoor or outdoor installations. This equipment may be used for both inground and above ground spas/hot tubs.

WARNING:

Pumps connected to this control in combination with the spa/hot tub/other must comply with the manufacturers guidelines for maximum water
flow rating through filters and suctions in accordance with the Virginia Graeme Baker Pool and Spa Act (VGBA) ASME/ANSI A112.19.8 performance
standard or any successor standard (Ref APSP-16 2017)

The VGBA suction outlet (suction cover) has a specific flow rating and this product SHALL NOT be installed on a pumping system that is capable
of exceeding this limit, which varies based on the number and location of installed suction outlets. if you do not have the manufactures maximum flow information for the pumps and vessel to confirm, stop and contact your equipment supplier

Equipment is not for installation on a combustible surface

The Equipment System must be installed on a firm, level surface (ie: concrete)

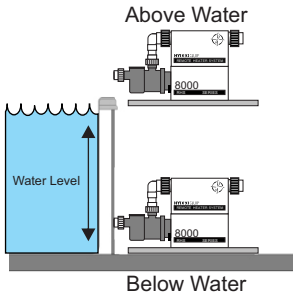
The area where the system is installed must have adequate drainage to prevent flooding of the equipment under all circumstances.

For performance reasons locate the system as close to the spa/hot tub as practical. (Consult local codes for minimum distance between equipment and spa)

Provide adequate access around and above the System for service and maintenance. 3 feet (1 mitre) of clearance around the equipment is recommended.

The pump(s) provided with the system may or may not be self-priming. Pumps that are NOT self priming must be installed BELOW water level or they will not prime.

The Spaside control has a 50' cord length. Plan routing distance between the equipment and vessel to be less than 44ft.



PLUMBING INSTALLATION INSTRUCTIONS

To assure adequate performance, the use of 2" piping is recommended.

There may be 3 or 4 separate plumbing systems in the spa. Verify the function of each pipe.

1) **Suction System Plumbing** - this plumbing will connect to the spa's skimmer, main drain and suction fittings. This plumbing connects to the front end of each pump.

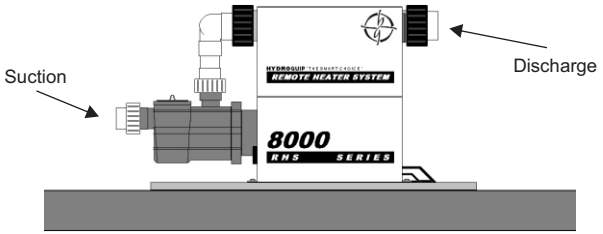
2) **Discharge System Plumbing** - this plumbing will go to the spa's hydrotherapy jet and massage fittings. This plumbing connects to the open end of the heater on your Equipment System.

3) **Air Blower Plumbing** - this plumbing will go to an air channel under the floor, or to an air distribution manifold of the spa. This plumbing connects only to an air blower.

4) **Aux Pump Plumbing** - When more pumps are added, this piping will not interconnect with the heater control system. Follow the spa/hot tub manufactures instruction for connection, and safety suction requirement

5) Understand in advance the spa manufactures plumbing design for ozone delivery and make accommodation in your plumbing plan.

PLUMBING INSTALLATION INSTRUCTIONS CO



Refer to plumbing schematic Fig.1 on page 15

INSTALLATION CONSIDERATIONS

Gas Heaters

WARNING!

Risk of suffocation.

Equipment systems provided with a natural or propane gas heater is intended for outdoor use only, unless the proper manufacturers indoor exhaust venting has been provided and connected per applicable building codes. To reduce the risk of suffocation, gas heaters should be checked for proper operation prior to use. It is a good idea to install a carbon monoxide detector/alarm near the gas heater to improve detection.

The Hydro-Quip 8000 series incorporates the most advanced controls in the industry, and are designed for years of trouble free operation. However, for year round success, review these design recommendations for extreme weather areas.

*For best results, review this manual completely before starting your project.

Hot weather conditions

Water temperatures can be elevated from high outside “ambient” temperatures. If this occurs, remove the insulating cover and add cool water until the heat has dissipated to a safe level

Hot temperatures and/or direct sunlight to the equipment system can cause temporary operational problems.

Pumps are equipped with special overload devises to self protect when encountering extreme heat conditions. All motors are equipt with an automatic reset device, and will resume operation when they become cool. Pumps can be enclosed, but require adequate ventilation

Direct sunlight on equipment can bring temperatures beyond the allowable point for circuits to function correctly. The system will shut off into a protection mode (see troubleshooting guide.) To prevent this condition, plan an equipment cover that incorporates shade, access and ventilation

Freezing weather conditions

If you wish to utilize/operate your system during seasons that may experience freezing temperatures, please incorporate pipe insulation, draining capabilities and incorporate an equipment cover that protects from snow and freezing rain. In all cases standing water, and snow should not be allowed to accumulate in or around the equipment.

If you wish to winterize your spa/hot tub, please contact your spa/hot tub manufacturer or local area pool/spa/hot tub professional for details.

In all cases make a plan for system draining in case of a power loss. Where possible, design plumbing drains and disconnects to evacuate water before it becomes frozen and does system damage.

Note the 8000 systems incorporate a freeze sensing technology, that will automatically operate the pumps when temperatures drop below 43F. Moving the water will not allow pipes and equipment to form ice.

ELECTRICAL INSTALLATION

IMPORTANT SAFETY INSTRUCTION

When using this electrical equipment, basic Safety Precautions should always be followed.

1. READ AND FOLLOW ALL INSTRUCTIONS
2. A green colored terminal or marked G,GR Ground, Grounding or symbol is located inside the terminal box compartment.

To reduce the risk of electrical shock, this terminal must be connected to the grounding means provided in the electric supply Service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment (IEC 60417, Symbol 5019

NOTICE! Before attempting installation of this equipment system, read all the information contained in this manual, and confirm the installing electrician understands and follows all national and local codes and safety instructions.

All connections must be made by a qualified and licensed electrician in accordance with the National Electrical Code (NEC article 680 Canadian Electric Code, and with any local codes in effect at the time of installation.

All connections must be made according to the electrical installation label on the outside of the system box (see page 33) Follow all instructions provided in this manual, and at labeled connections. If your electrician in unclear on how to correctly connect this equipment, call your system supplier. Note that damage caused by mistakes can be costly, and invalidate your warranty.

CAUTION, CONNECT ONLY TO A CIRCUIT PROTECTED BY AN “A” CLASS GROUND FAULT CIRCUIT INTERRUPTER (GFCI) OR EQUIVALENT.

THE GFCI and wiring must be properly sized to accommodate the system. Have your electrician follow Local and national electrical requirements and the wiring information contained In this manual.

This equipment requires a dedicated electrical supply circuit, with no other appliances or lights connected.

IMPORTANT – The NEC and most local codes require that an electrical “disconnect” be installed within “line of site” of the spa

Use copper conductors only, with grounding wire properly sized per the National Electric Code table 250-95.

Bonding lugs have been provided on the control box, allowing connection to local ground points. To reduce the risk of electrical shock, use only a properly sized copper bonding wire from this lug to all metal ladders, water pipes and other metallic objects within 5 feet of the spa/hot tubs edge. To reduce the risk of electrical shock, connect the local common bonding grid in the area of the hot tub/spa to bonding terminals with an insulated or bare copper conductor no smaller than #6.

All field metal components such as ladders, rails, drains or other similar hardware within 10ft. (3m) of the hot tub/ spa shall be bonded to the equipment grounding bus with copper conductor not smaller than #6 AWG.

This equipment assembly is not provided with integral GFCI protection for the lighting circuit. When the equipment assembly is used to power or switch a luminaire, suitable GFCI protection shall be provided. Note: the field conductors of an underwater light shall not occupy the conduit, boxes, or enclosures of conductors of other circuits, unless all other conductors are also on the load side of the GFCI.

A light assembly being connected to this spa control must be UL 1563 and/or CSAC22.2 No. 218. 1-13 listed and comply with field installed Underwater Luminaries and Submersible Junction Boxes UL standard 676.

Pumps being connected to this spa control must be UL 1563 and or CSA C22.2 No. 218. 1-13 listed as pool and spa pumps rated for outdoor use by the pump mfg.

SAVE THESE INSTRUCTION

ELECTRICAL INSTALLATION

This equipment system has been100% factory tested for quality and reliability prior to shipping. Care should be taken on all electrical connections to avoid damage to the system circuit board, and added components. Damage caused by accidents, improper wiring configurations and/or abuse voids your warranty.

Start by having your electrician select a wiring configuration that best fits your total system needs. (see the GFCI breaker sizing matrix on page 8)

Due to the availability of GFCI breaker sizes, and your electrical supply requirement, some systems require a second independent or “dual” power source, to supply the electric heater separately. Diagrams for independent heater wiring are provided in this manual.

Note; 5.5kw systems using a single source power supply will not allow electric heater operation when pumps are in high speed. See system programming to change operation if available.

System Type	Heater size	Connection type
Gas heat	none	Single source power supply
Electrical heat	5.5kw	Single source power supply
Electrical heat	11kw	Dual source power supply
Gas/Electric Combo	5.5kw/Gas	Single Source power supply
Gas/Electric Combo	11kw/Gas	Dual source power supply

All Hydro-Quip 8000 series control systems require a 4 wire electrical supply, incorporating a “Neutral” wire for operation. Electric heaters being powered independently in the “dual” circuit configuration do not require a neutral wire supply. This is clearly explained in the wiring diagrams.

For gas heaters electrical connection, consult your gas heaters supplier manual, and note in this manual contains important wiring instructions for control and operation of the gas heaters fireman circuit.

Gas and electric heater combination

When faster heat recovery is desired, or a redundant heat source is a priority, it’s possible to install both a gas and electric heater on the same 8000 series system.

Default programming allows both the gas heater control circuit (page 15) and electric heater circuit to operate simultaneously. Input from both heat sources will speed up heating times, and also provide an operating alternate if one source becomes disabled. You must follow all installation instructions for both the gas heater, and electric heater plumbing and wiring requirements to successfully connect. No PCB programming change is required.

CAUTION: Do not connect or disconnect any components while the power is on. All connections must be done with the power off as it may cause damage to the system.

Any resulting damages are not covered under manufacturer’s warranty*

CAUTION: Damage may occur to the circuit board and spaside if the spaside plug is not properly aligned to the receptacle on the circuit board or if the spaside plug is connected or disconnected while the power is on.

Any resulting damages are not covered under manufacturer’s warranty*

GFCI BREAKER SIZING MATRIX

240V Single source wiring (One breaker required)

System order code on label	System heater type	Pump 1 & System 16A Max	Aux. pump-2 12A max	Aux. pump-3 12A max	Total system Amps	GFCI Breaker	Page
ES8800-GAS	GAS Ready	X			16	20A	16
ES8800-GAS	GAS Ready	X	X		24	30A	16
ES8800-GAS	GAS Ready	X	X	X	40	50A	16
ES8800-5.5	5.5kW	X			40	50A	15
ES8800-5.5	5.5kW	X	X		48	60A	15
ES8800-11	11kW	X	X		48	60A	14

Note: When using this configuration the system is limited to heating ONLY when low speed pump is active. Heater WILL NOT operate when jets or blower is activated unless Dual Source wiring is used.

240V Dual source wiring with separate heater electrical supply (Two breakers required)

System order code on label	System heater type	Pump 1 & System 16A Max	Aux. pump-2 12A max	Aux. pump-3 12A max	Total system Amps	GFCI Breaker	Page
ES8800-11	11kW	X			16A System 46A Heater	20A #1 60A #2	13
ES8800-11	11kW	X	X		30A System 46A Heater	40A #1 60A #2	13
ES8800-11	11kW	X	X	X	40A System 46A Heater	50A #1 60A #2	13

IMPORTANT NOTE

Max Amp Per Circuits

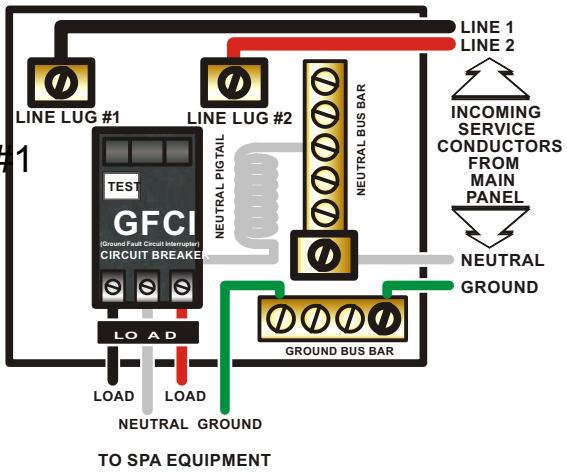
Pump 1	12A
Pump 2	12A
Pump 3	12A
Blower	4A
Ozone	0.5A
Light	1A

GFCI BREAKER WIRING DETAIL

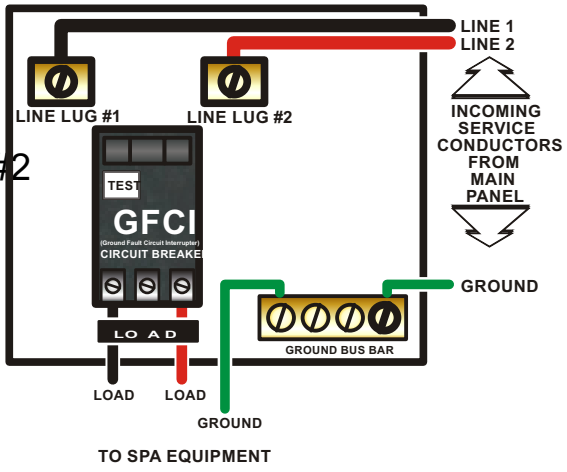
Improperly wired GFCI breakers are the leading cause of immediate GFCI tripping. It is important that your system be wired properly, reference the illustrations below for guidelines.

WARNING: Refer to the circuit breaker manufacturer's installation instructions. This illustration is meant to be a guideline, and not meant to override or substitute the instructions supplied by the breaker manufacturer

GFCI BREAKER #1
(240v 4-wire with neutral)



GFCI BREAKER #2
(240v 3-Wire)
For Independent Heater



11KW ELECTRICAL CONNECTIONS

11KW electric heat “Main” control with independent heater

DUAL SOURCE WIRE CONNECTION

For correct wire and GFCI breaker sizing, Reference the GFCI breaker sizing matrix page in this manual

Factory programming will prevent the heater and high speed pump from operating simultaneously.

FOR SYSTEM MODEL CODES (Label located on outside of box)

ES8848A ES8848B ES8848C CS8800A
ES8850A ES8850B ES8850C

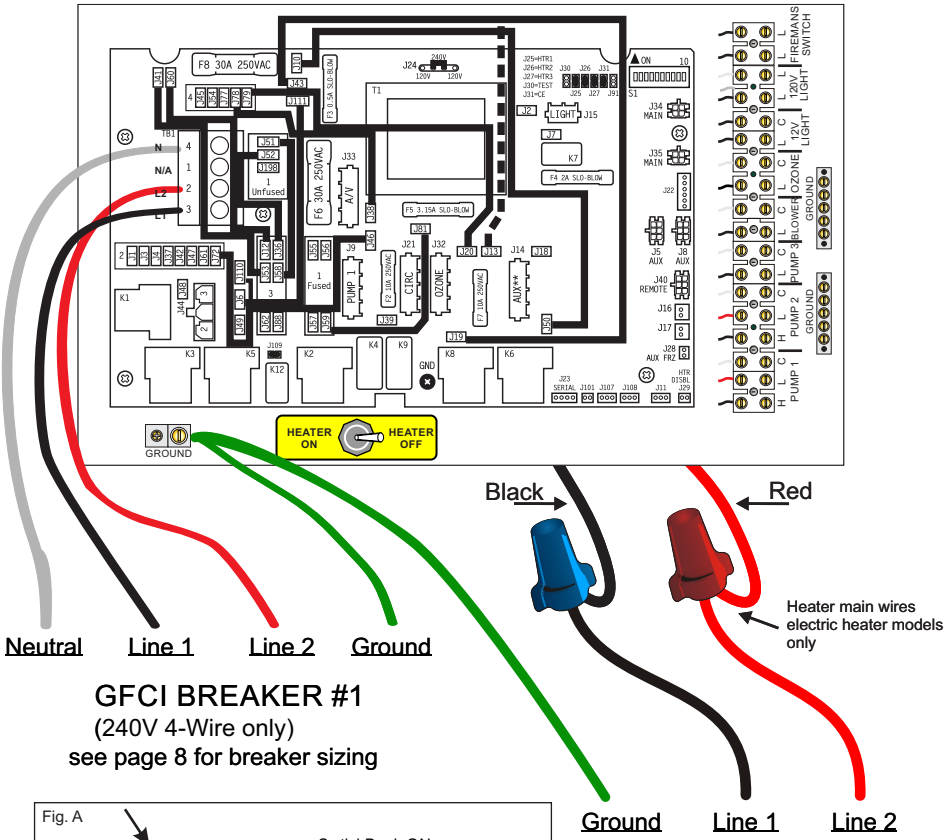
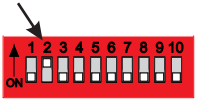


Fig. A



SwtichBank ON:
A2: Add 1 HS Pump with heat
A3: Add 2 HS pumps with heat
A4: Add 4 HS pumps with heat

Move dip switch #2 - #4 to the ON position to allow high speed pump(s) and heater to function simultaneously

11KW ELECTRICAL CONNECTIONS

11KW electric heat “Main” control system wiring diagram

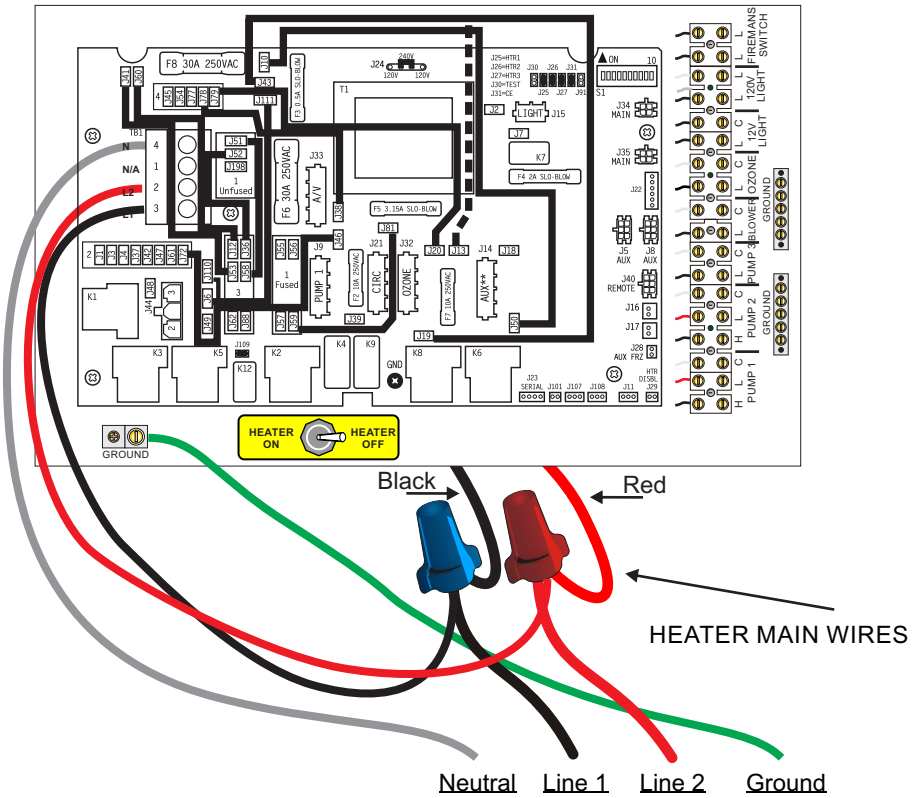
SINGLE SOURCE WIRE CONNECTION

For correct wire and GFCI breaker sizing, Reference the GFCI breaker sizing matrix page in this manual

Factory programming will prevent the heater and high speed pump from operating simultaneously.

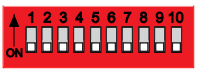
FOR SYSTEM MODEL CODES (Label located on outside of box)

ES8848A ES8848B ES8848C CS8800A
ES8850A ES8850B ES8850C



GFCI BREAKER #1
(240v 4-Wire only)
see page 8 for breaker sizing

Fig. A



Make certain all switches are down/off

5.5KW ELECTRICAL CONNECTIONS

5.5KW electric heat “Main” control system wiring diagram

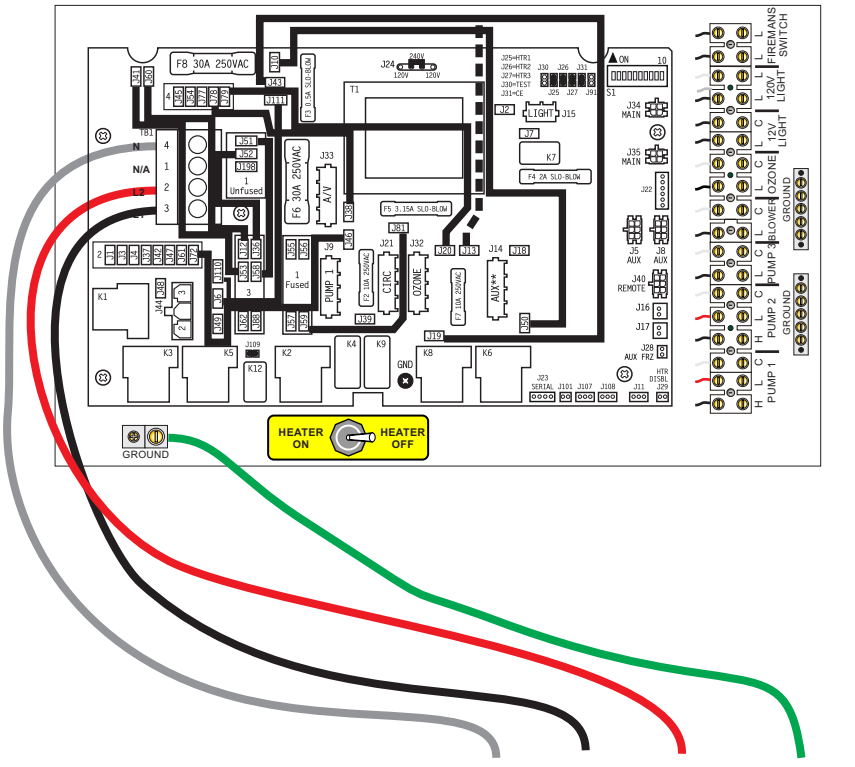
SINGLE SOURCE WIRE CONNECTION

For correct wire and GFCI breaker sizing, Reference the GFCI breaker sizing matrix page in this manual

Factory programming will prevent the heater and high speed pump from operating simultaneously

FOR SYSTEM MODEL CODES (Label located on outside of box)

ES8848D ES8848E ES8850F
ES8850D ES8850E CS8800B



Neutral Line 1 Line 2 Ground

GFCI BREAKER #1
(240v 4-Wire only)
see page 8 for breaker sizing

GAS ELECTRICAL CONNECTIONS

Remote gas heat “Main” control system wiring diagram

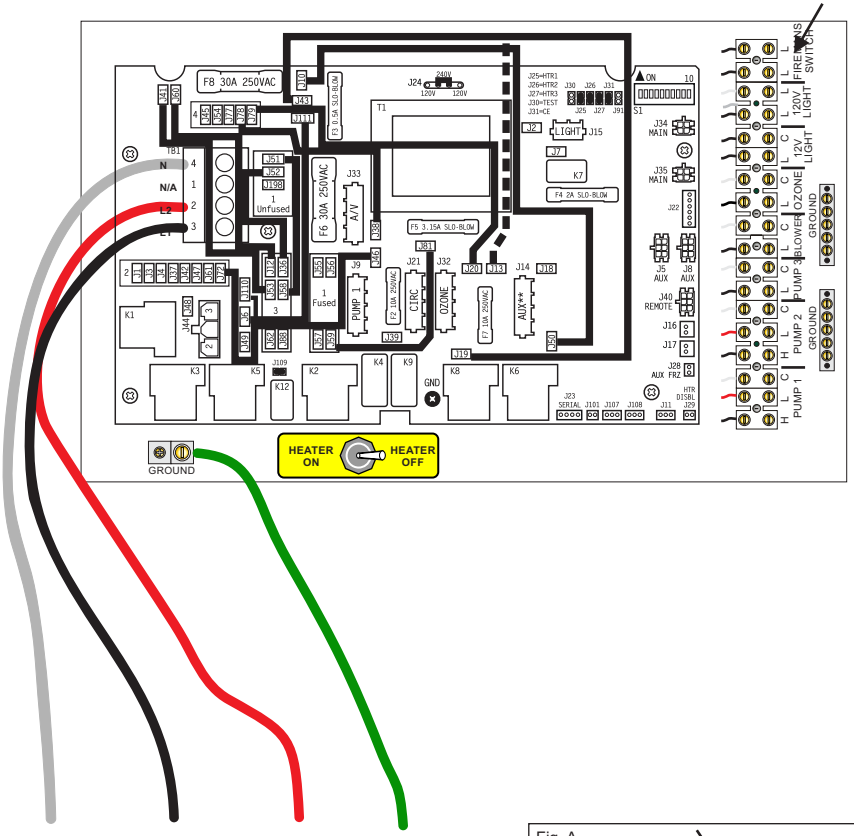
SINGLE SOURCE WIRE CONNECTION

For correct wire and GFCI breaker sizing, Reference the GFCI breaker sizing matrix page in this manual

FOR SYSTEM MODEL CODES (Label located on outside of box)

ES8848G ES8848H ES8848J CS8800C
ES8850G ES8850H ES8850J

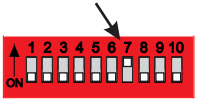
Gas heater internal control see page 15



Neutral Line 1 Line 2 Ground

GFCI BREAKER #1
(240v 4-Wire only)
see page 8 for breaker sizing

Fig. A

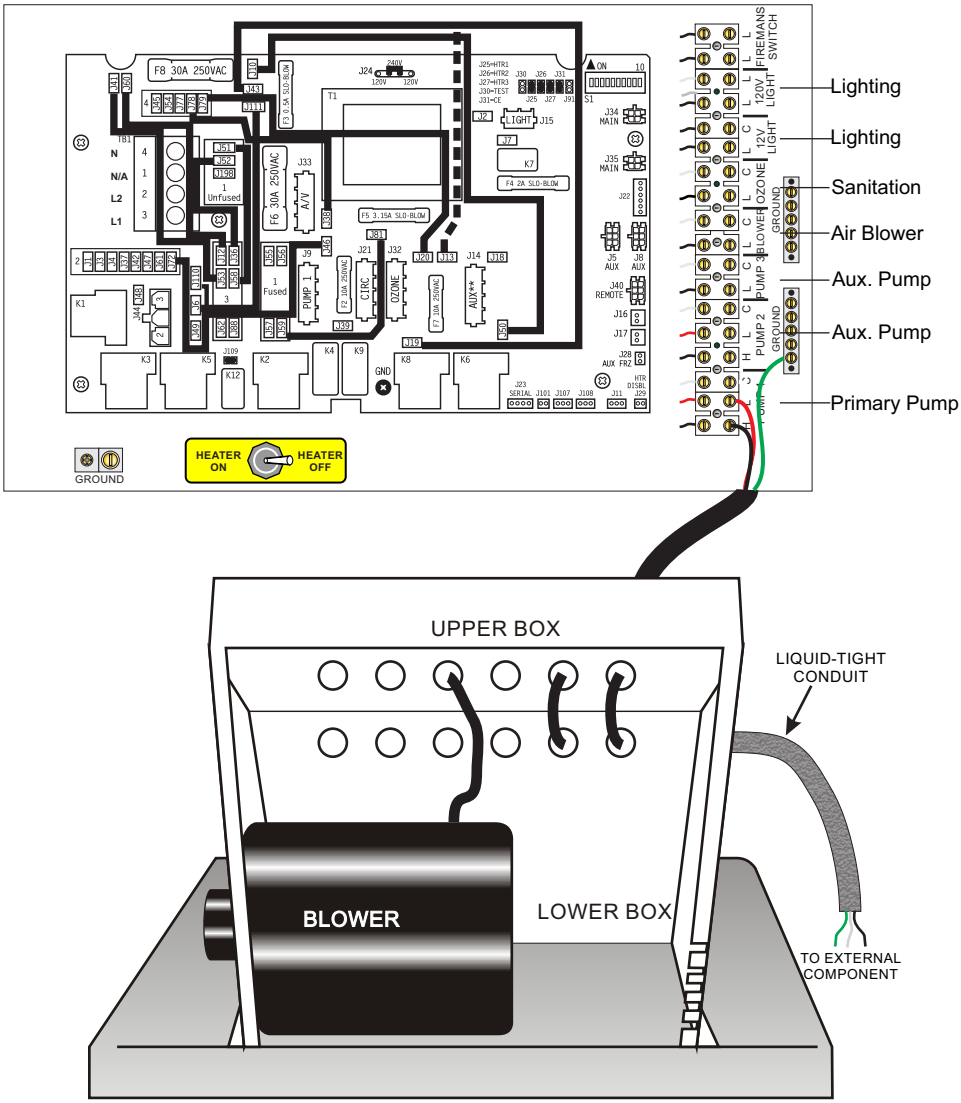


Move dip switch #7 to the ON position to allow 5 minute gas heater cool down

COMPONENT CONNECTION

The system is set up to have components hardwired to a terminal strip inside the upper enclosure. Liquid tight conduit must be used on all externally added field connections exposed to the weather. Route and connect the conduit to the knock-outs in the back of the lower box. The wires will then enter the bottom of the upper box through another set of knock-outs. Connect the component(s) accordingly to the corresponding position on the terminal strip and tighten securely. Refer to the included wiring diagram as needed. All components not included with the system are set at the factory for 120V. Verify the voltage of the additional component(s) and adjust supply voltage if necessary by referring to System Configuration on page 10.

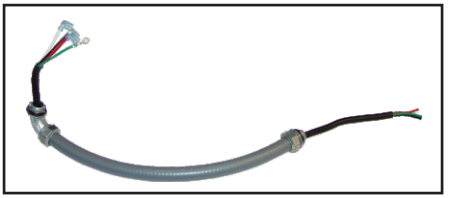
*Systems equipped with blowers and Plus Ozone™ options come pre connected to the terminal strip



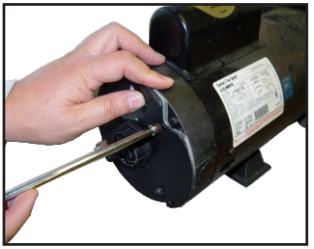
PUMP CORD INSTALLATION

The equipment system has been provided with a pump power cord and liquid-tight conduit assembly. This is to be used on the main 2-speed pump supplied with the system. Any other components or accessories attached to the equipment system should be attached in a similar manner.

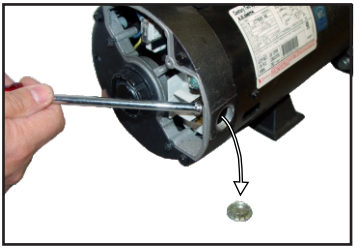
Follow the simple instructions below to quickly attach the cord assy to the pump:



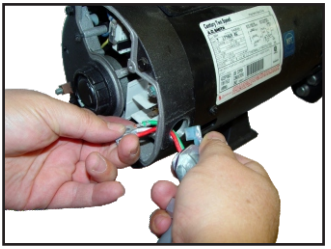
Cord Assy included for Pump 1

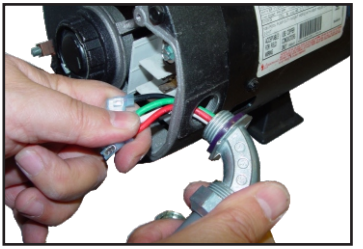


1) Remove the terminal cover off the back off the pump

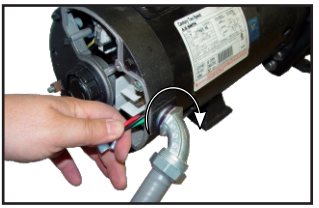


2) Remove the conduit hole cover





3) Route the power wires through the conduit hole and pull toward you to allow for the cord assy to be rotated for tightening.



WIRING NOTE:

RED = LOW
BLACK = HIGH
WHITE = COMMON
GREEN = GROUND

4) While holding the wires as shown thread the liquid-tight connector into the pump until secure then connect the power wires to the pump per the label on the pump.

5) Route the other end of the conduit through the empty knock-out and secure with lock-nut. The cord inside will route up to the terminal strip inside the upper portion of the enclosure.

GAS HEATER CONNECTION

Warning: Do not install a spa that utilizes a natural gas or propane heater without proper venting. These heaters require adequate ventilation and must be installed according to the heater manufacturers instructions and to local building codes.

Warning: Gas heaters MUST be installed in the plumbing AFTER the control system as shown below. Fig.1

Note: Many gas heaters require a separate electrical service for proper operation, the Hydro-Quip "Gas Heater Control Circuit" does NOT provide voltage to any gas heater circuits. Always refer to the manual included with your gas heater for proper installation.

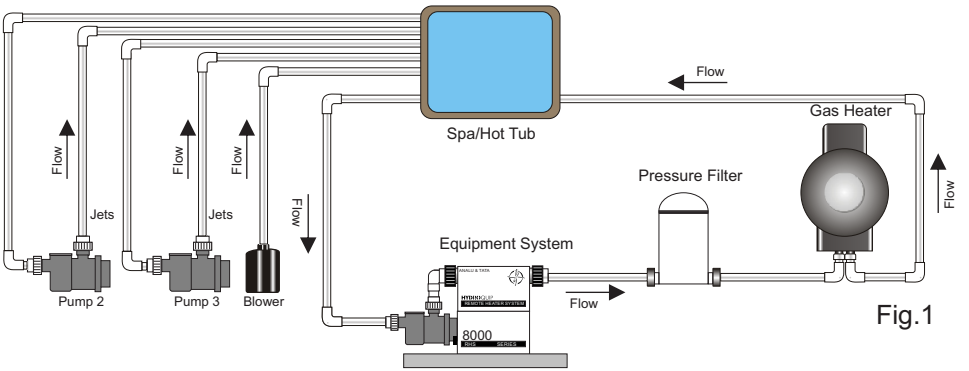


Fig.1

TYPICAL PLUMBING LAYOUT

Gas Heater Control Circuit

Your control system contains a Gas Heater Control Circuit Fig.2. This circuit is a passive or "dry contact" circuit, do not apply line voltage to this circuit. Connect this circuit to the gas heater's Fireman Switch or Fireman Circuit. Refer to the instructions provided with your gas heater to identify the circuit / switch and correct wiring connection. Additional programming may be required to the gas heater to utilize an auxiliary control system.

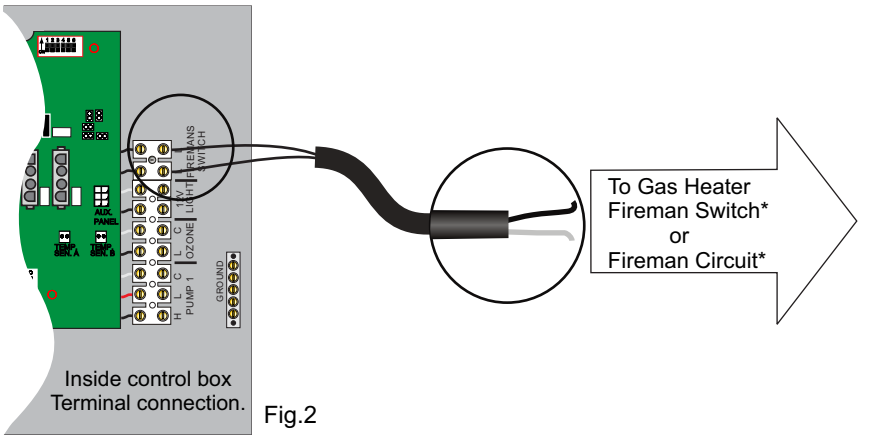
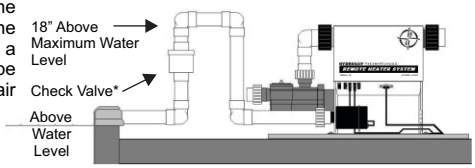


Fig.2

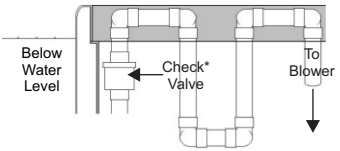
IMPORTANT: Applying line voltage to Gas Heater Control Circuit voids all warranty.

AIR BLOWER INSTALLATION (Optional)

CAUTION: The air blower must be connected ONLY to the spa's air distribution plumbing. Connecting the air blower to the air piping associated with the hydrotherapy jets will create a hazzard 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 hazzard.



- The air blower must be installed to ensure that water cannot enter the air blower motor. This can be accomplished by installing a single or double air loop that incorporates a check valve.



SYSTEM CONFIGURATION

This System was pre-configured by the manufacturer as follows:

Pump 1: 240V **Pump 3: 240V** **Ozone: 120V**
Pump 2: 240V **Blower: 240V**

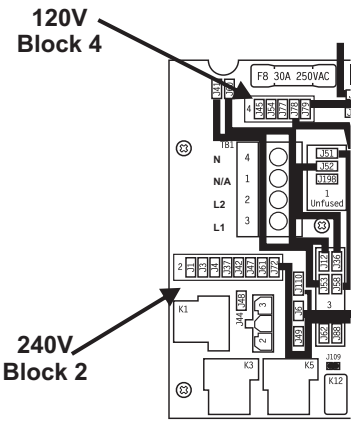
CHANGING COMPONENT VOLTAGES

Below are illustrations and instructions for converting the universal circuits of your control. Hydro-Quip utilizes color coded connectors to help identify each circuit. Simply locate the colored connector on the Neutral (white) wire from each component receptacle on the PCB.

- Component "Neutral/White" wire connected at BLOCK 2 will operate at 240V
- Component "Neutral/White" wire connected at BLOCK 4 will operate at 120V

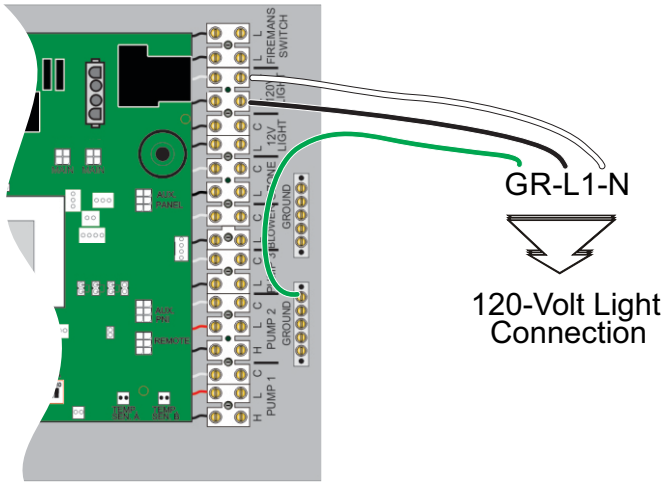
COMPONENT COLOR CODE

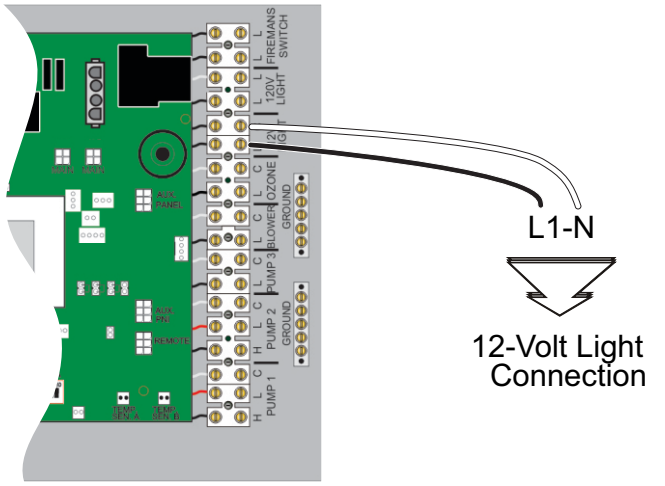
PUMP 1	RED
PUMP 2	VIOLET
BLOWER	BLUE
OZONE	YELLOW



SPA LIGHT INSTALLATION

To offer the most flexibility, Hydro-Quip configures each 8000 Series system so that it can accept a 120-Volt light and/or 12-Volt light. A terminal block has been provided for connection purposes. Connect your light using the illustration below.





SPASIDE CONTROL INSTALLATION

If required, you may have to cut out a hole in the spa shell to install spaside control.

- The mounting area must be above the maximum water level of the spa and in an area with good drainage to prevent any standing water on or around the spaside.
- The spaside should never be submerged.
- The spaside should be protected from extended periods of exposure to sunlight.
- Do not step or stand on the spaside

Step 1 - Clean area and insert spaside control. (Fig.1)

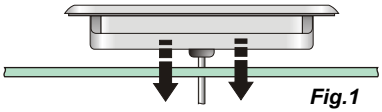


Fig.1

Step 2 - Remove the double sided adhesive from the back of the spaside. Make certain the spaside is straight and adhere to the spa shell. (Fig.2)

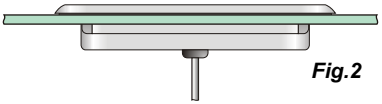


Fig.2

Step 3 - Remove protective film from display window then clean the face of the spaside.
Now carefully align and apply the label. (Fig.3)

Overlay & Spaside may vary *Fig.3*

Step 4 - Connect spaside to an empty connection marked MAIN. (Fig.4)

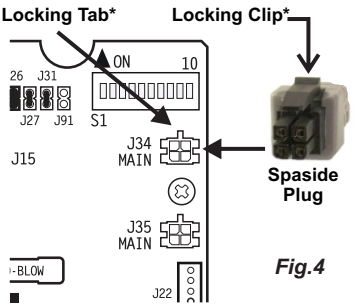
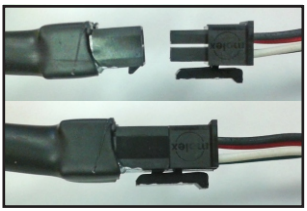


Fig.4

CONNECTING SPASIDE & EXTENSION

Must align Locking Clip on spaside plug with Locking Tab on circuit board for proper function.



When utilizing a spaside extension cord, the clip and tab must also be aligned at all connections. **Fig.5**

Fig.5

Cord plugs are labeled to insure proper plug alignment as shown in **Fig.6**

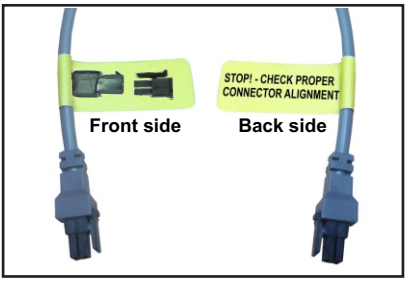


Fig.6

CAUTION: Damage may occur to the circuit board and spaside if the spaside plug is not properly aligned to the receptacle on the circuit board or if the spaside plug is connected or disconnected while the power is on.

Any resulting damages are not covered under manufacturer's warranty*

ATTENTION! The plug connectors must be placed in a protected area so moisture, dirt or chemicals are not allowed to infect this link.

WIFI MODULE INSTALLATION KIT (OPTIONAL)

You may control your 8000 ES or CS spa system remotely using your smart phone, and/or other connected mobile device by installing the optional wifi antenna kit #34-51159-K.

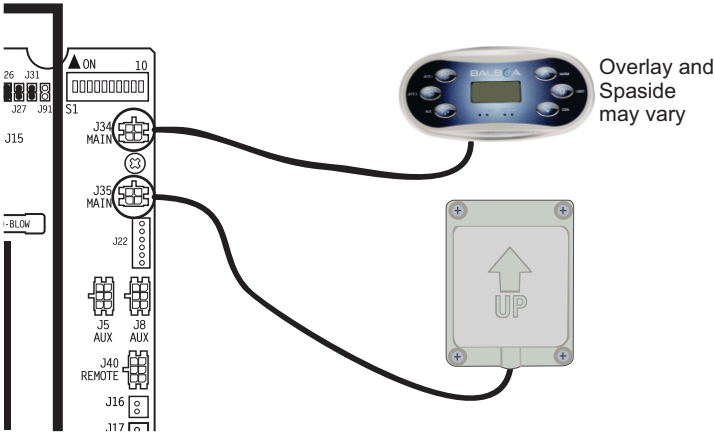
A yard friendly connection can be established directly from peer to peer, or an intranet connection can be made through a localized router for premier global control. Review the BWG information provided with the wifi antenna kit to explain the capabilities and options

Follow these steps for installing the wifi antenna kit

Step 1 - Disconnect power to the control system before performing work

Step 2 - Route the antenna cable through one of the knockouts in the 8000 cabinet. Reference component connection page in this manual for a diagram showing the knockout locations

Step 3 - Insert the wifi cable plug into any empty connection port on PCB marked “Main” if a receptacle is unavailable, use the provided “Y” cable splitter for connecting 2 devices to a single “Main” port



Step 4 - selecting a location for the antenna

Do not mount the wifi antenna inside or attached to the 8000 cabinet or other metal enclosure, as this will cause a reduction in reception capability. Follow the kit instructions and locate the antenna as high as possible, away from metal objects, and towards the home router.

The wifi antenna is indoor/outdoor weather resistant and therefore must be located under a visor that provides shade and/or protection from extreme weather conditions.

Mount the antenna with the arrow facing up, and make sure the cable is protected from objects and materials that may cause damage

Step 5 – Follow kit instructions for setup and connection of your Smart phone or other wireless device using the BWA™ APP

Step 6 - testing

Before permanently mounting antenna with the provided screws, confirm the wifi connection is satisfactory. If you're experiencing problems, it may be necessary to relocate the antenna closer to the home router (or an improved line of site with a peer to peer only connection)
*A wifi antenna cable extension is available from your Hydro Quip system provider

SYSTEM CONFIGURATION (Optional)

Set Up Reference Table

HQ Set Up	Set Up #	Pump 1	Pump 2	Pump 3	Blower	Y Splitter Req.
Default	18	2-Speed	1-Speed	None	1-Speed	No
Opt 1	3	2-Speed	2-Speed	None	1-Speed	No
Opt 2	2	2-Speed	2-Speed	1-Speed	None	No
Opt 3*	5	2-Speed	1-Speed	1-Speed	1-Speed	Yes

*See page 23 for Option 3 considerations.

Changing Software Setups

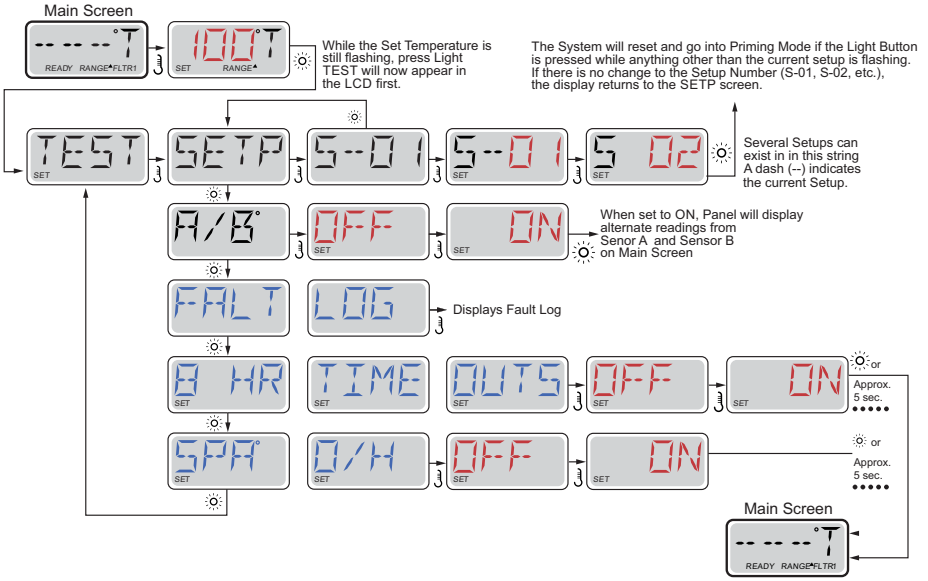
Under the TEST Menu, the Setup screen will allow changing the Setup from 1 to any number established by the Manufacturer. While the system is running, move DIP Switch 1 (on S1 on the Main circuit board) to ON.

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.

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.

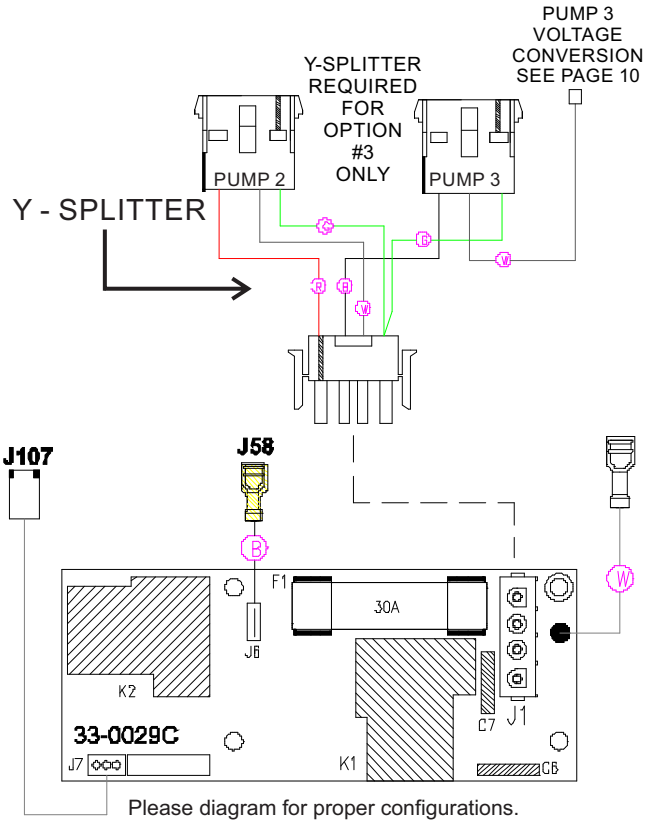
Move DIP Switch 1 to the OFF position to take the spa out of Test Mode. °F or °C will replace °T.

NOTE: Changing the Setup may require wiring changes as well - refer to the wiring diagram.



OPTION 3 SETUP CONSIDERATIONS

The Y-Splitter (included) is required when choosing Option #3 on the setup menu (see Pg. #24). You must have a topside control compatible with 3-pumps and a blower.



PLEASE SEE THE INCLUDED OPERATIONS MANUAL FOR FULL INSTRUCTION ON OPERATING THIS SYSTEM

TROUBLESHOOTING

The following describes operational problems, and the possible solution. Note that your system may not include all the components listed in this guide

Warning: Allow only a qualified electrician, service technician or your system installer to test the electrical components and wiring

NOTHING OPERATES

Set GFCI breakers and quick disconnect to “on” position. If power will not reset, contact your electrician or installer. If power restores, but there are no lights on topside, or the system fuse has blown, contact your installer

GFCI TRIPS IMMEDIATELY OR RANDOMLY

Make sure the equipment is not wet internally. Moisture inside equipment, or malfunctioning parts will cause GFCI Trip. Reset breaker when conditions are dry, and inspect for water leaks in or around equipment.

Loose wires can cause over amperage, and malfunctioning equipment can also be the cause of intermittent GFCI tripping. Contact your electrician or installer if tripping persists

*If a particular component trips the GFCI when operated. This will assist your installer with faster repairs

PUMP DOESN'T START

Confirm spaside command for pump
Confirm motor is not overheated, and wait for it to cool down.
Recheck pump cord installation was done correctly per instructions
Have electrician or installer check supply fuse and system voltage

MOTOR RUNS/NO FLOW

Confirm gate valves are 100% open & spa is full of water
Confirm pump basket and spa filter are free of debris
Confirm adjustable spa jets are in the open position
Confirm pump is not frozen with ice, or has clogged pipes
Prime pump with water on high speed (see start-up inst)
Have installer confirm pumps have correct voltage supply per instructions

PUMP HAS LOW FLOW

Check for dirty filter or basket, low spa water level, valves partially closed, or all jets in the off position. Jet system should be plumbed using spa manufactures instruction for pipe sizing.

TROUBLESHOOTING

PUMP STOPS DURING TIMED CYCLE

Motor overheat protection has tripped, allow motor to cool before reactivating
If motor continues to overheat, have an electrician check voltage and connections.

PUMP SURGES OR LOSES PRIME

Check for low water level, loose lid on pump, pipe leaks on suction plumbing, debris in filter or suction fittings

PUMP MAKES CAVITATION OR "GRAVEL" SOUNDS

Check filter and baskets for debris overload
Check gate valves for full open position
Pump not having baskets or filters removed could clog pump impeller. contact your installer.

PUMP DOESN'T STOP AFTER FILTER OR JET CYCLE

Pump will continue to run in low speed, if the water is not at the set temperature. See "standard mode" in operations manual.
If filter cycle programs are overlapped, see operations manual
When freezing weather protection is activated. See "ICE" in operations manual
Main system pump #1 will operate once an hour for a few minutes to sample the spa/hot tubs vessel temperature.

BLOWER DOESN'T START

Confirm operational command on spaside. Have installer review wire connection and test fuse.

BLOWER TRIPS GFCI

Blower internals could be wet. Make sure device was placed above water level and/or incorporates a loop per the installation instructions, so water cannot reach motor. If motor is confirmed dry and continues to trip GFCI, contact your installer.

BLOWER RUNS, NO AIR

Make sure all blower plumbing is connected, and there is no ice formed in the lines. The blower will not clear long distance pipes holding too much water. Confirm a plumbing loop was installed near the spa per the assembly instructions

Confirm correct voltage has been supplied to blower, if added to system. If problem continues call your installer

TROUBLESHOOTING

OZONE NOT WORKING

The ozone circuit will only work when the main pump #1 is in low speed operation. Confirm with ozone suppliers operations manual for appliance testing. Ozone circuit supply voltage is factory set at 115V (unless altered), test for correct supply voltage for ozonator.

NO HEAT

Main pump must be on and pumping water for heater to operate. Low water levels, dirty filters, or loss of prime will cause the pump to surge, and heater will not function

Confirm the heat light is on the spaside. And there is no error code message on spaside. Spas heat slowly, so allow the system to run several hours before testing for temperature rise.

On some system the heater is not allowed to operate when 2 or more pumps are operating. Reference setup in this manual for programming changes, when power supply allows.

Heater Disable Switch activated - Assure proper water flow and de-activate the Heater Disable Switch. (see page #XX)

NO HEAT (GAS HEATER)

Gas heaters have their own operating system, independent from the 8000 series control. You must have the gas heaters thermostat set to “max” and the fireman electronic control wired to the 8000 system for proper control.

Refer to the gas heater hookup instruction in this guide for proper fireman switch connection, and consult the heater suppliers manual for all other operation and troubleshooting

WATER NOT REACHING SET TEMPERATURE

Note that pump must be primed completely and running for heater to operate. Additionally the system will not allow programmed temps above 104F.
Confirm heat indicator is on spaside display
Spaside should be programmed for a higher temp than current water temp., and in “Standard Mode” see operations manual.
Check for heating error codes on spaside display and follow instructions
If heater is on its own GFCI breaker, check for tripped condition and reset
Consult gas heater manual for correct thermostat setting to work with 8000 series
Burned out elements are rare, but if all conditions for the heater have been checked, consult an electrician for power supply problems, and heater element operation

TROUBLESHOOTING

WATER TEMPERATURES HIGHER THAN SET TEMPERATURE

In warmer months, running the pump in prolonged timing cycles will add heat kinetically to the water. Shorten filter times in summer to prevent heat gain.

* NOTE that frequently in warmer months; expect spa/hot tub water to settle just below ambient air temps. During these months it's impossible to set a temperature on the spaside below the natural water temp. For this reason, you can experience water temps above your desired set temperature.

LIGHT NOT WORKING

Confirm operational command on spaside. Light installed should be 120v. unless installer used 12v light, and reprogrammed board wiring and logic using this manual

Make sure the bulb is in the correct position in the light assy. Contact your installer or electrician to confirm wire connection, bulb operation, and light fuse

REQUIRED MAINTENANCE

Water chemistry maintenance information will be provided by your installer. Care should be taken to properly sanitize the water and balance the ph. Poor water conditions can cause permanent damage to heaters and pumps, that may void your warranty. Consult a local pool and spa professional for water treatment.

Filters and strainer baskets should be inspected and cleaned frequently, so it does not effect water flow and operation.

Plumbing when starting systems, after refilling, inspections are a good idea to find leaks in seals, valves, connections etc.

GFCI breakers should be tested monthly by following the manufacturer's steps for test and reset.

Equipment area should be kept clean, not allowing snow, leaves or other moisture holding material to buildup

Electrical connections should be inspected and tightened by a certified electrician every few years. This includes bonding wires, conductors, breakers and terminal strip connections

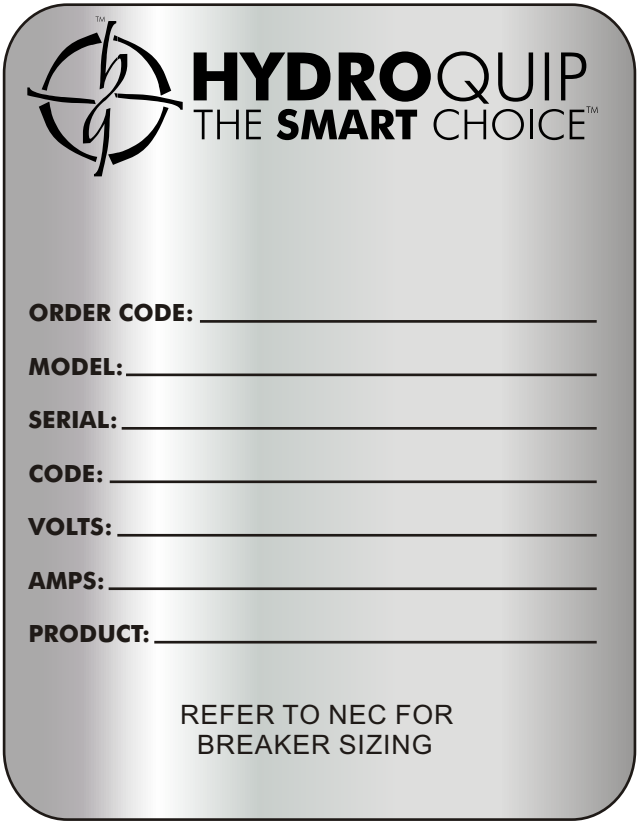
When servicing the filters or replacing the water, power OFF the system at the GFCI or disconnect. Once service is complete, follow the startup procedures in this manual.

Systems equipped with Plus Ozone™ should have the removable filter checked and cleaned annually. Additionally the ozone plumbing check valve should be tested for operation. Reference the Plus Ozone™ plumbing connection page for location and instruction.

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.



WARRANTY INFORMATION

Hydro-Quip warrants its products to the original purchaser to be free from defects in material and workmanship for a period of 2 years (24 months) from the original date of purchase, except as noted below.

Products which become defective within the warranty period will be repaired or replaced (at the option of Hydro-Quip) except for damage due to freezing, water chemistry, negligence, abuse, misuse, misapplication, unauthorized modification, improper installation, normal wear and tear or chemical attack.

This warranty extends only to normal, personal (non-commercial) usage by the original purchaser. Pump seals, o-rings, gaskets, air blower brushes are only covered for 90 days from original date of purchase.

Hydro-Quip will not be responsible for labor incurred in removing, inspecting or reinstalling of warrantable products. Hydro-Quip will not be responsible for any travel related charges or labor costs attributable to disassembly and reassembly of the spa, skirt, decking or any other materials enclosing the product, or attributable to difficulties in gaining access to the product.

Hydro-Quip will not be responsible for labor incurred for routine maintenance, adjustments or alterations to the calibration of electrical devices.

Any products which are claimed to be defective must be shipped freight prepaid to Hydro-Quip and the repaired or replaced product will be returned to the sender freight collect. When sent to Hydro-Quip, the product must be accompanied by the sales receipt or other proof of the purchase date as well as the sender's name, mailing address, daytime phone number and a detailed description of the defect as well as any other information relating to this claim.

Unless state law expressly provides otherwise, Hydro-Quip will only be responsible for repair or replacement of any of its products that are found to be defective as provided above, and will not bear the cost of any consequential damages. This warranty gives you specific legal rights but you may have other rights which vary from state to state.

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