

ZSPAS



Owners Manual Leisure Spa



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Introduction

Your choice of a spa indicates that you are devoted to excellence. The manufacturer appreciates your patronage and take pride in the tradition of quality spas that our company represents.

In order to get the most out of your spa, we strongly suggest that you take time to read through this manual before you hook up and operate your spa. This will acquaint you with the operating features, hook up procedures, maintenance, safety procedures, ensuring an enjoyable experience right from the start. Manufacturer has tried to anticipate all of your needs and desires; however, if you need any addition information, feel free to call your authorized dealer.

WARNING!! This manual was written to ensure the proper use and installation of these spas. Any modifications to the procedures outlined in this manual may result in your warranty being void. Please take the time to read this manual to avoid any unnecessary problems with your brand new spa and equipment.

THIS MANUAL AND ITS CONTENTS ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALTHOUGH MANUFACTURER HAS PREPARED THIS MANUAL AS ACCURATE AND PRECISE AS POSSIBLE, WE WILL NOT BE LIABLE FOR LOSS, INJURY OR DAMAGES CAUSED BY IMPROPER INSTALLATION OR USE OR SPA (IMPROPER OR OTHERWISE).



This Manual Covers The Following Spas

Z20, Z30, Z40, Z50

Date Purchased: _____

Date Installed: _____

Dealer Name: _____

Dealer Address: _____

Dealer Telephone: _____

Spa Model and Serial Number: _____

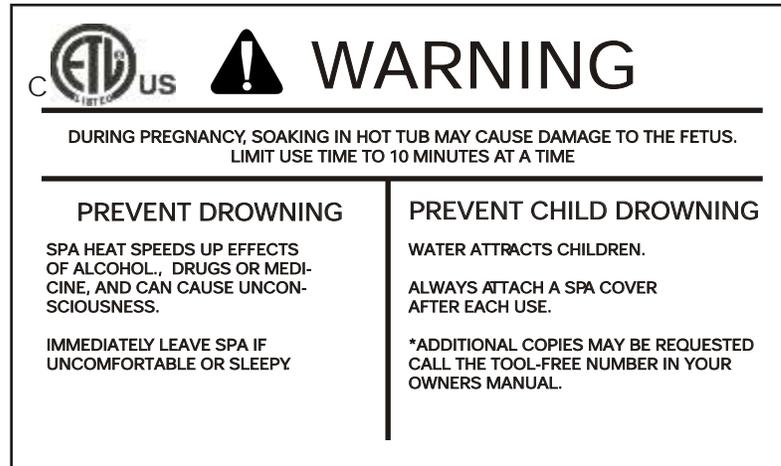
Part #7618 Manual Revised July 04

MANUFACTURE RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

IMPORTANT SAFETY INSTRUCTIONS

When installing your spa and using this equipment, basic safety precautions should always be followed, to include the following:

- **READ AND FOLLOW ALL INSTRUCTIONS!** The following instructions are required by UL 1583 standard to be printed as a condition of their listing this product. They contain important safety information we strongly urge you to read and apply.
- **DANGER - TO REDUCE THE RISK OF INJURY:** Do not permit children to use spa unless they are closely supervised at all times.



WARNING SIGN MUST BE POSTED

The WARNING sign (RED) above is packed with your new Hydrosipa Spa. This sign must be posted in a prominent place in close proximity to the spa installation site immediately upon completion of spa installation.

- **WARNING SIGN** - It is extremely important that this sign be permanently placed in clear view of any persons using the spa. Occasional spa users may not be aware of some of the dangers hot water poses to pregnant women, small children, and people under the influence of alcohol. If you did not receive a warning sign or your sign has become damaged, please contact your spa dealer or manufacturer.
- **DANGER** - A wire connector is provided on this unit to connect a minimum No. 8 AWG (8.4mm²) solid copper conductor between unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit, if that item is located within 5 feet (1.5m) of the unit.
- **DANGER - RISK OF ACCIDENTAL DROWNING:** Extreme Caution must be exercised at all times, to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use spa unless they are supervised at all times. Cover spa and use safety locks to prevent accidents.
- **DANGER - TO REDUCE THE RISK OF INJURY:** The suction fittings in the spa are sized to match the specific water flow created by the pump/pumps. Should the need arise to replace the suction fittings or the pump/pumps, be sure that the flow rates are compatible.
- **DANGER - RISK OF ELECTRICAL SHOCK:** Install at least 5 feet (1.5m) from all metal surfaces. As an alternative, a spa may be installed within 5 feet (1.5m) of metal surfaces if each metal surface is permanently connected by a minimum No. 8 AWG (8.4mm²) solid copper conductor to the wire connector on the terminal box that is provided for this purpose. Do not permit any electrical appliance, such as a light, telephone, radio or television within 5 feet (1.5m) of the spa, unless factory installed.
- Position spa to provide proper drainage of the compartment for electrical components.
- For floor recessed spas, install to permit access for servicing from above or below floor.
- **NEVER USE AN EXTENSION CORD!**
- Consideration should be taken for water splash out. Water can ruin wood floors and some finishes.
- **DO NOT** use a wall switch, ground fault circuit interrupter, circuit breaker, fuse, or plugging and unplugging the spa as a means of turning on or off your spa for normal everyday use.
- **DO NOT** block access door.
- Set the spa on a firm level (flat) surface. **DO NOT** set spa on blocks as structural damage may occur to spa.
- **WARNING** - To reduce the risk of injury. The water in a spa should never exceed 40° C (104° F). Water temperatures between 38° C (100° F) and 40° C (104° F) are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when spa use exceeds 10 minutes.

IMPORTANT SAFETY INSTRUCTIONS

- Since excessive water temperatures have a high potential for causing fetal damage during early pregnancy, pregnant or possible pregnant women should limit water temperatures to 38° C (100° F). Before entering a spa, the user should test the water temperature with an accurate thermometer. The tolerances of water temperature-regulating devices vary. The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning. Persons suffering from obesity, medical history or heart disease, low/high blood pressure, circulatory system problems, or diabetes, should consult a physician before using a spa. Persons using medication should consult a physician before using a spa because some medications induce drowsiness while others may affect heart rate, blood pressure and circulation.

HYPERTHERMIA

Prolonged immersion in hot water may induce hyperthermia. A description of the causes, symptoms, and effects of hyperthermia are as follows:

Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6° F (37° C). The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include.

- Unawareness of impending hazard;
- Failure to perceive heat;
- Failure to recognize the need to exit spa;
- Physical inability to exit spa;
- Fetal damage in pregnant women; and
- Unconsciousness and danger of drowning.

CHOOSING A LOCATION

IMPORTANT: Because of the combined weight of the spa, water and users, it is extremely important that the base upon which the spa rests be smooth, flat, level and capable of uniformly supporting this weight, without shifting or settling, for the entire time the spa is in place. If the spa is placed on a surface which does not meet these requirements, damage to the skirt and/or the spa shell may result. Damage caused by improper support is not covered under warranty. It is the responsibility of the spa owner to assure the integrity of the support at all times. It is strongly recommended that a qualified licenced contractor prepare foundation for your spa.

Manufacturer recommends a poured, reinforced concrete slab with a minimum thickness of 4 inches (10cm). Wood decking is also acceptable provided it is constructed so that it meets the requirements outlined above. The spa must be installed in such a manner as to provide drainage away from the spa. Placing the spa in a depression without provisions for proper drainage could allow rain, overflow and other casual water to flood the equipment and create a wet deck. Install so as to permit access to the equipment, either from above or below, for servicing. Make certain that there are no obstructions which would prevent removal of the cabinet side panels and access to the jets components, especially on the side with the equipment bay doors.

Outdoor Location

In selecting the ideal outdoor location for your spa, we suggest that you take into consideration:

1. The proximity to changing area and shelter (especially in colder weather conditions).
2. The pathway to and from the spa (free of debris, dirt, leaves as not to be tracked into spa).
3. The closeness to trees and shrubbery (leaves and birds could create extra work).
4. A sheltered environment (less wind, weather exposure resulting in lowered operation and maintenance costs).
5. The overall enhancement of your environment. It is preferable not to place the spa under an unguttered roof overhang since run-off water will shorten the life expectancy of spa cover.

Indoor Location

Be sure your spa will fit into the space you have chosen. Proper access into the home is needed to move the spa into place. Ventilation may be needed because of the humidity from the spa. In most cases, a spa cover is sufficient. Be sure to check the load carrying capabilities of the floor you will be installing your spa, as most homes meet the requirement of 80lbs per square foot (manufacturer not responsible). Insure you have proper drainage in the event of a leak or water spill due to over load of spa with people causing water damage (manufacturer not responsible). Incase of maintenance problems, leave enough room around the spa to work. Choose proper flooring area for spa.

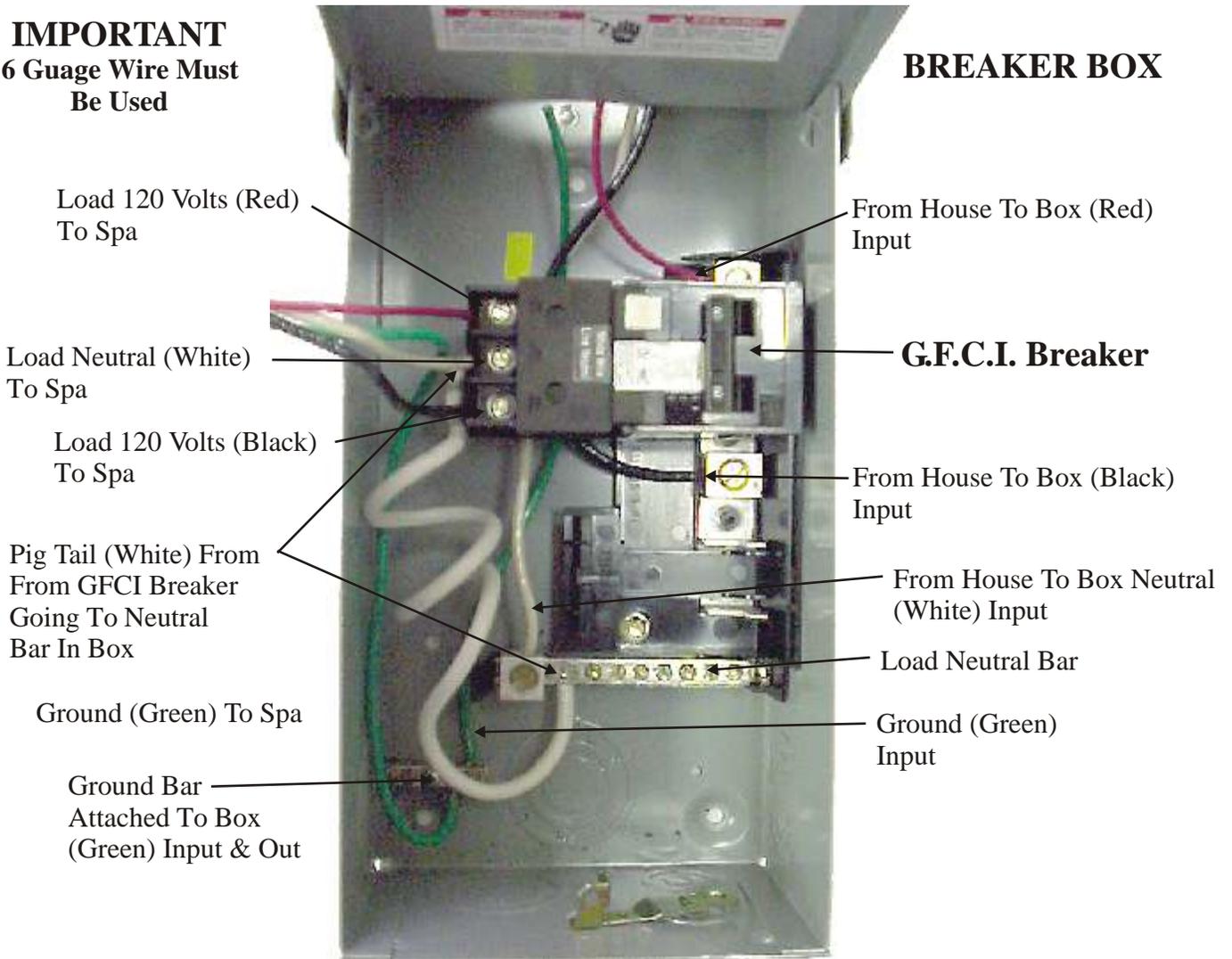
POWER REQUIREMENTS

MODEL	VOLTS	AMPS	AMP LOAD	MARKING	APPLICATION
Z20	240	50	40	3 Wire #6 + Grd 3	CTI B224055M
Z30	240	50	40	3 Wire #6 + Grd 3	CTI B224055M
Z40	240	60	48	3 Wire #6 + Grd 3	CTI B224055M
Z50	240	60	48	3 Wire #6 + Grd 3	CTI B224055M

WARNING - ALWAYS USE A CERTIFIED ELECTRICIAN WHEN HOOKING UP YOUR NEW SPA.

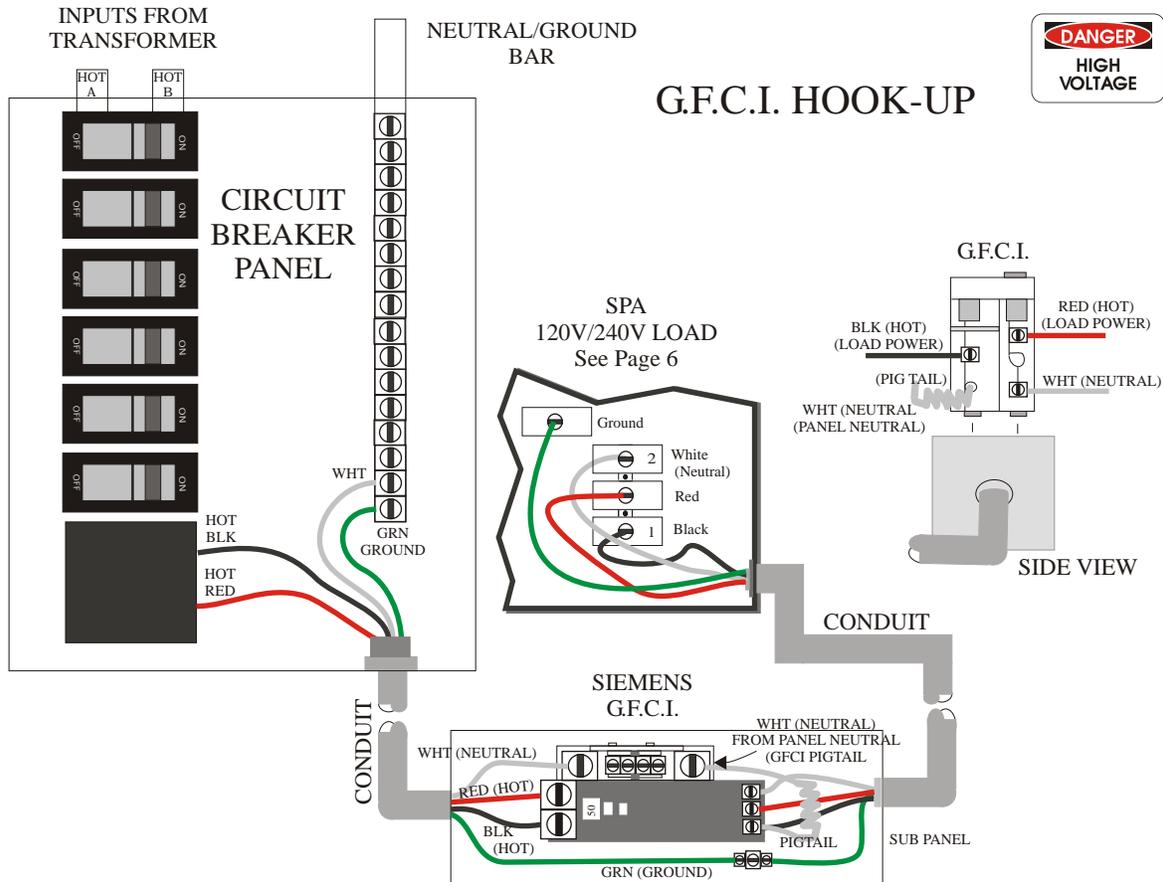
IMPORTANT
6 Guage Wire Must
Be Used

BREAKER BOX



NOTE: The White Neutral Wire from the GFCI MUST be connected to an incoming Line Neutral. The internal mechanism of the GFCI requires this Neutral connection. The GFCI WILL NOT WORK WITHOUT IT.

POWER REQUIREMENTS



An illustration showing the proper electrical connections for 240 volt service has been provided for you on a wiring diagram and conversion instruction affixed to the backside of the electrical box faceplate. Be sure to follow these and all other instructions carefully. Be sure that all connections are tight before switching on the circuit breaker.

CAUTION! Failure to abide by specifications listed may result in damage to equipment and may void the warranty. **IF THE SPA IS WIRED INCORRECTLY, YOUR WARRANTY WILL BE VOID ON ANY BURNED OUT ELECTRICAL EQUIPMENT.**

G.F.C.I (Ground Fault Circuit Interrupter)

IMPORTANT

This service must be single phase. Do not attempt to fix these types of problems yourself. High voltage can seriously injure or kill. Always use a certified electrician when hooking up your new spa.

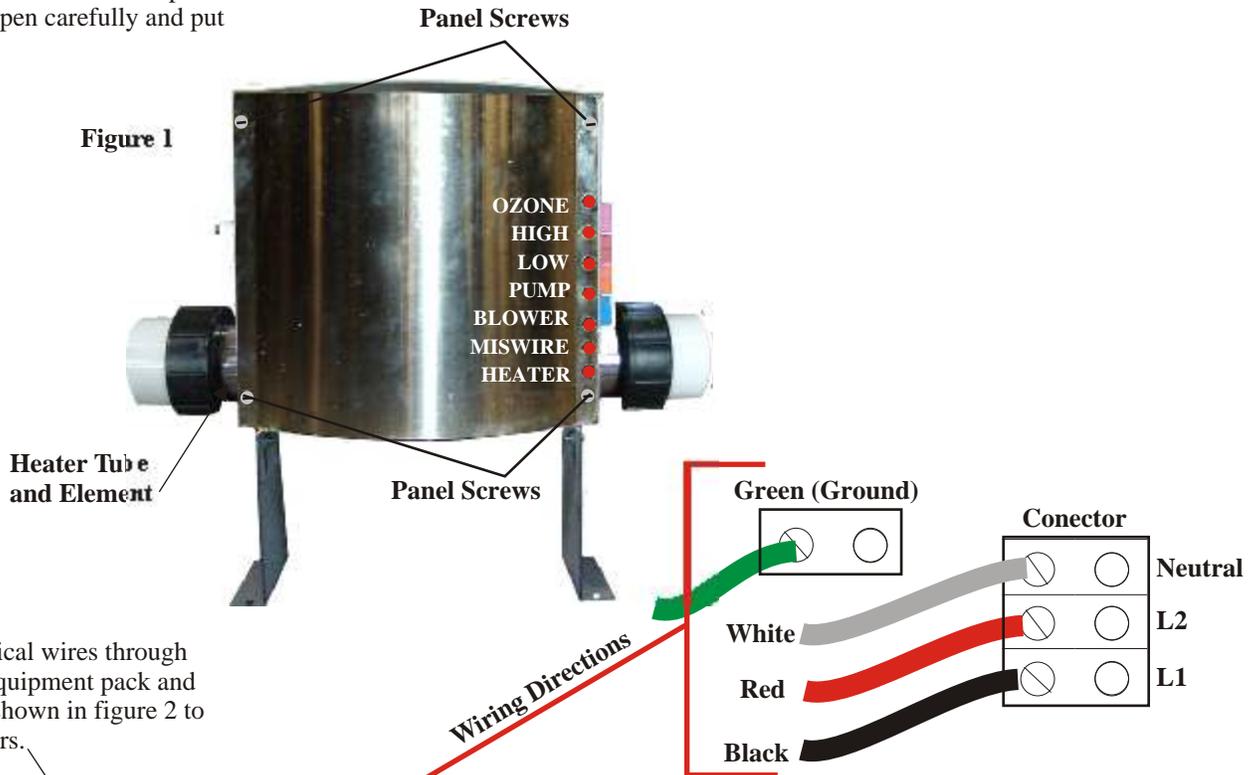
The National Electrical Code states that a service disconnect breaker box (a G.F.C.I. can be used for this purpose) must be located at least 5 feet away from the spa and should be conveniently located near the equipment bay. If it is not in plain sight, keep the disconnect padlocked when in the off position.

Remember, high voltage is still accessible in the housebreaker box even though you have turned off the spa breaker.

CONTROL SYSTEM DIAGRAM

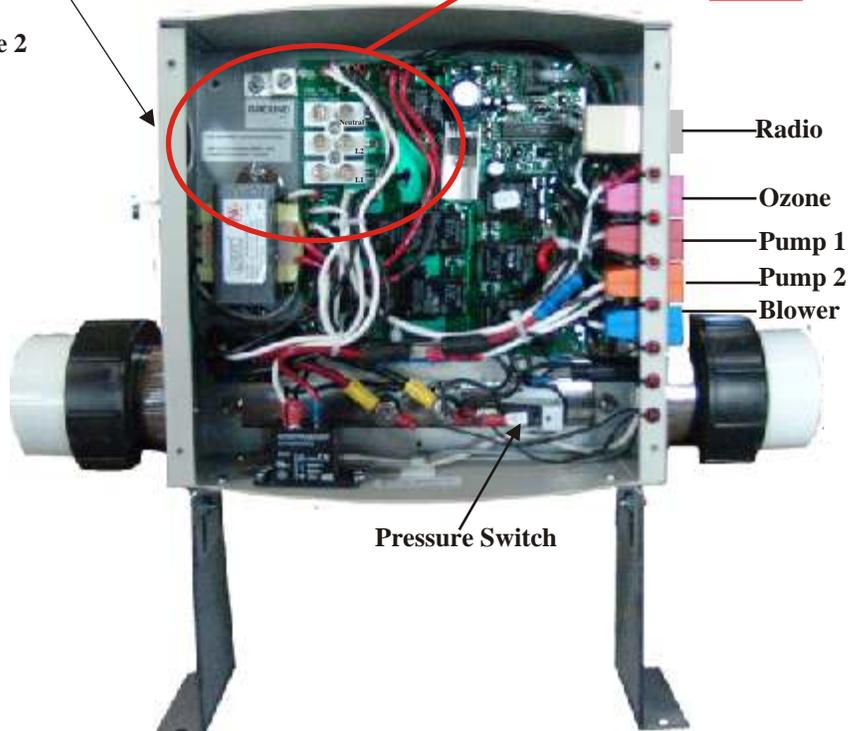
CTI B224055M Control Equipment Pack System Wiring Directions

Remove 4 screws from cover panel figure 1 and open carefully and put aside.



Route the electrical wires through conduit of the equipment pack and attach wires as shown in figure 2 to proper connectors.

Figure 2



WARNING: FILL THE SPA WITH WATER BEFORE TURNING ON THE POWER.

ELECTRICAL WIRING INSTRUCTIONS

IMPORTANT NOTICE: The electrical wiring of this spa must meet the requirements of the National Electrical Code (NEC) and any applicable state or local codes. The electrical circuit must be installed by a qualified electrician and approved by a local building/electrical inspection authority.

1. This spa must be permanently connected (hard-wired) to the power supply. No plug-in connections or extension cords are to be used in conjunction with the operation of this spa. Supplying power to the spa which is not in accordance with these instructions will void both the independent testing agency listing and the manufacturer's warranty.
2. The power supplied to this spa must be a dedicated circuit with no other appliances or lights sharing the power provided by the circuit.
3. To determine the current and voltage and wire size required, refer to section "Power Requirements" (Pages 3-5).

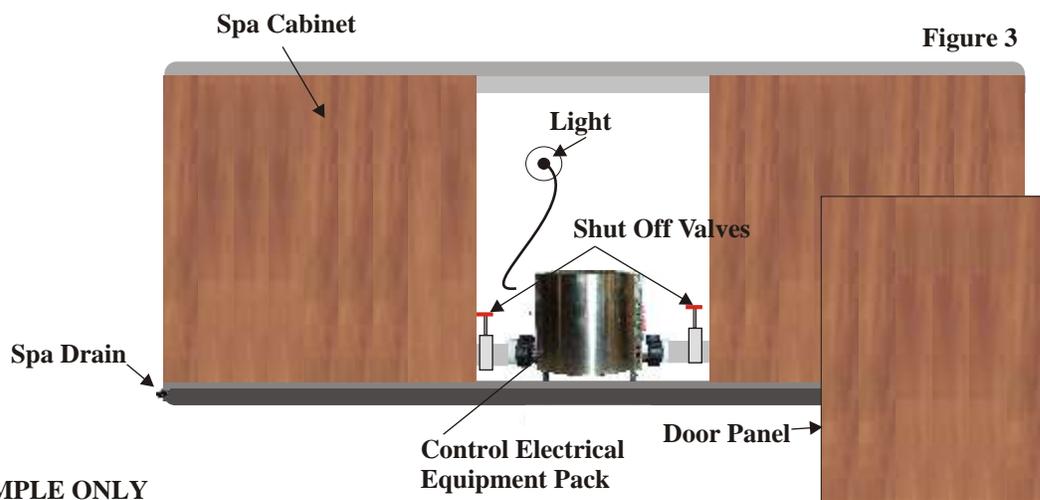
Wire size must be appropriate per NEC and/or local codes.

We recommend type THHN wire

All wiring must be copper to ensure proper connections. Do not use aluminum wire.

When using wire larger than #6 (10mm²), add a junction box near the spa and reduce to short lengths of #6 (10mm²) wire to connect to spa.

4. The electrical supply for this product must include a suitably rated circuit breaker to open all ungrounded supply conductors to comply with Section 422-20 of the National Electrical Code., ANSI/NFPA 70. The disconnecting means must be readily accessible to the spa's occupant but installed at least 5 feet (1.5m) from spa water.
5. The electrical circuit supplied for the spa must include a suitable ground fault circuit interrupter (GFCI) as required by NEC Article 680-42.
6. To gain access to the spa's power terminal block, remove the screws and cabinet panel setting it aside figure 3 (Page 7), then remove the securing screws from the panel figure 1, (Page 5) from the control equipment pack system.
7. Select the power supply inlet you want to use and remove the cabinet panel from the front of the spa to allow you to feed the cable through to the control box. Install the cable with connector through the conduit on figure , (Page).
8. Connect wires, color to color, on terminal blocks as figure (Page), TIGHTEN SECURELY! All wires must be hooked up securely or damage could result.
9. Install control box door panel with screws and reinstall the cabinet side panels.



**SAMPLE ONLY
OF SHUT OFF VALVES.
CONTROL ELECTRICAL
EQUIPMENT PACK MAY
BE LOCATED IN DIFFERENT
LOCATION INSIDE CABINET.**

START-UP INSTRUCTIONS

FILLING THE SPA

Clear all debris from inside the spa. At the factory your spa shell was cleaned and polished, but you may want to treat it with a specially formulated spa cleaner available from your dealer prior to filling it for the first time.

Make sure the spa has been installed correctly, including electrical wiring connections as specified in the wiring diagram, and the spa is level.

Do Not Over Fill. Never fill your spa with water from a water softener, or use hot water while filling. Ensure that your spa drain is shut off. Remove your filter lid. Place your garden hose into the filter housing and begin filling with clean water see figure 5 (Page 7). Continue filling spa until the water level is 3 inches above the filter housing see figure 5 (Page 7). Remember every person entering a spa displaces a given volume of water, so **adjust water level to number of people who will be entering spa.**

If your water is extremely “hard”, it is preferable to fill half-way with hard water and the rest of the way with softened water. Or, you may fill the entire spa with hard water if you use a special water additive available from you Hydrospa Spa dealer.

Always refill spa through one filter housing to purge any trapped air from pump intakes. Failure to do so may cause air to be trapped in either pump #1 or the circulation pumps intake creating an air lock, preventing either pump from circulating water. Ensure both shutoff valves are fully open see figure 3 (page 6). Make sure filter cartridge is clean before installing. See “Cleaning the Filter” for specific cleaning procedures (see page 11).

Figure 4



Water Level 3” Above Filter Housing

Filter Housing Assembly

Remove filter lid and rotate top filter housing counterclockwise and remove assembly. Remove filter cartridge upward, and inspect element for cleanliness. Fill your spa using a common garden hose placing it inside the filter assembly.. Once spa is filled with water 3” above filter housing, re-install filter cartridge and housing assembly locking it back in place replacing filter lid.

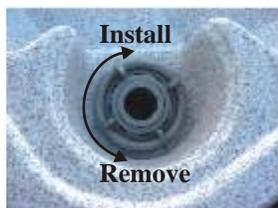


Figure 5

START-UP INSTRUCTIONS

Safety Check

Open the cabinet access door panel and check all pump unions to make sure they are hand tight. Loosening can occur during shipping and handling. Check Shut-Off Valves and insure both are open fully, otherwise your pumps will not function (Page 6)..

Turn on Power

Turn on the power to the spa and test the ground fault circuit interrupter (GFCI). If the GFCI tests okay restore power by pushing the Reset button and releasing it.

Power To Spa

Turn on power to spa, the “Pur” will appear for 30 seconds while the system is in a purge mode and then normal operation will assume.

Add Start-Up Chemicals

Add the spa water chemicals as recommended by your Hydrospa Spa dealer. Refer to (Page 7) for general guidance.

Place Cover On Spa

Keep the insulating cover in place anytime the spa is not in use it will reduce the time required for heating, thereby minimizing operating cost. The time required for initial heat-up will vary depending on the starting water temperature and the capacity of your spa. Smaller spas heat at a rate of approximately 8 to 10 degrees per hour; larger spas heat at about 4 to 6 degrees per hour. Lock cover with safety locks when not in use.

WARNING: RISK OF INJURY. Always check water temperature carefully before entering spa.

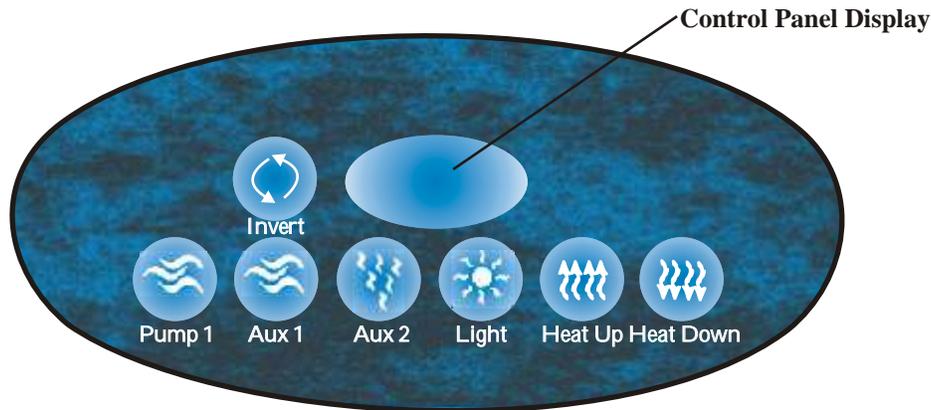


Figure 6

Control Panel

Hydrospa Spas are equipped with a main control panel, located on the side of the spa as show above Figure 6.

The main control panel controls all of the spa functions, and uses indicator lights and an integrated LCD display to aid in determining the status of the spa



Press “Pump 1” key to activate Pump 1 (High Speed), Pilot Light “High” will light up for High Speed, the system will run for 30 minutes at which time it will automatically shut off unless done so manually prior to the 30 minute period. Press “Pump 1” key again to shut off Pump 1, Press “Pump 1” key to activate Pump 1 (Low Speed), Pilot Light “Low” will light up for a Low Speed, the system will run for 30 minutes at which time it will automatically shut off unless done so manually prior to the 30 minute period. Check if all jets operated correctly.



Press “Aux 1” key to activate Pump 2 (if equipped), Pilot Light “Pump 2” will light up, the system will run for 30 minutes at which time it will automatically shut off unless done so manually prior to the 30 minute period. Check if all jets of Pump 2 operated correctly. Press “Aux 1” key again to shut off Pump 2.

START-UP INSTRUCTIONS



Press “Aux 2” key to activate Blower (if equipped), Pilot Light “Blower” will light up, the system will run for 30 minutes at which time it will automatically shut off unless done so manually prior to the 30 minute period. Check if all air jets operated correctly. Press “Aux 2” key again to shut off Blower.



Press “Light” key to activate Light on/off. Auto shut off in 1 hour.



The temperature setting will assume the previous value. Press and hold “Heat Up” or “Heat Down” keys to adjust temperature set. Minimum set point is 70 degrees F, maximum temperature set is 104 degrees F. A red LED will flash at the top side control while there is a call for heat and Pilot Light “Heater” will light up when the heater is on. If the tub is filled with water that is less than 52 degrees F, the freeze protect mode will start. This will run the Pump(s) and heater until the temperature rises above 52 degrees F. To by-pass this safety feature and operate tube normally in this condition, press the Pump1 and Light Keys simultaneously for 10 seconds until FPO appears. To disarm the by-pass, press the “light” and “Pump1” keys again. The freeze protect override will automatically time out in 6 hours if not shut off manually.

PROGRAMMING FILTRATION

To adjust or check the filter cycle setting press Heat up and Aux2 keys simultaneously and hold to adjust filter cycle from 2-12 hours of each 12 hour period. We recommend the filter cycle duration 2 hours twice per day.

ADDITIONAL FEATURES

Press the Invert key to flip readout 180 degrees. Press the “Heat Up” and Pump 1” key simultaneously and hold to activate LOC and same to de-activate.

To choose between F/C degree of water temperature press Aux 2 and “Light” keys simultaneously and hold toggle between F/C.

TROUBLESHOOTING

If the readout is flashing this indicates an overheat condition. If adjusting temperature within operating range does not work DO NOT ENTER WATER.

If “---” message appears on control shut the system off and clean your filter, check water level or any water leaks.

If “---” message appears the temperature sensors on PCB are either disconnected or the water temperature is cold and system is in freeze protect. The pumps will run intermittently until above 39 degrees F. Between 39 degrees F and 42 degrees F the pumps, blower and heater will run to heat the water. Above 52 degrees F the heater will remain on and the pump 1 will run on low speed until the temperature setting is reached. Wait for heat up or add warm water.

If Pilot Light “Miswire” light up you have miss-wired system. The .5 amp fuse must be replaced at the pak-side and wiring must be corrected.

The LED lights on the spa pack indicate power is present at the receptacles and indicate that the spa pack is working properly.

The LED light at the miswire fuse indicates the unit has been Miswired.

SPA CARE AND MAINTENANCE

Draining Your Spa

Remove screws from cabinet panel door and set aside as shown below.

- Turn power off
- Select a safe suitable drainage capable of safely assimilating 300 plus gallons of water, which may contain both unsanitary contaminants and chemical residue that could cause harm to plants or grass.
- Twist the drain fitting counter clockwise to open valve.
- The spa will drain by gravity flow.
- Close the disconnect drain fitting clockwise to close valve.
- Refill the spa through the filter shown on figure 5 (Page 7) before restoring power.

Filter Cleaning and Cartridge Replacement

The filter(s) in your spa should be cleaned at least every 5-6 weeks, depending on spa usage. This will ensure that the water is being filtered properly, and there is no restriction in the filter due to dirt and grease build-up.

Cleaning the filter can be done easily using a Filter Degreaser solution and following the directions on the bottle. Soak filter in a degreaser and power wash with a garden hose. It is recommended to have a second filter, which can be cleaned between filter changes. This will enable you to quickly exchange the dirty filter with a clean filter and immediately start your spa up again.



Filter Element

Care Of The Exterior

Spa Shell

Your spa shell is made of acrylic. Stains and dirt generally will not adhere to the surface. Using a soft rag or a nylon scrubber should easily remove most dirt. Most household chemicals are harmful to your spa's shell. See your dealer for the best product to use. The only products which have passed the manufacturer's test are Soft Towel and Windex. Sodium bicarbonate (baking soda) can also be used for minor surface cleaning. Always thoroughly rinse off any spa shell cleaning agent with fresh water.

NOTES: Iron and copper in the water can stain the spa shell if allowed to go unchecked. Ask your Hydro Spa dealer about a stain and scale inhibitor to use if your spa water has a high concentration of dissolved minerals.

The use of alcohol or any household cleaners other than those listed to clean the spa shell surface is **NOT** recommended. **DO NOT** use any cleaning products containing abrasives or solvents since they may damage the shell surface. **NEVER USE HARSH CHEMICALS!** Damage to the shell by the use of harsh chemicals is not covered under the warranty.

IMPORTANT: Some surface cleaners contain eye and skin irritants. Keep all cleaners out of the reach of children and use care when applying.

Maintenance Free Cabinet

Hydro Spa's consists of a rigid polymer that combines the durability of plastic with the beauty of redwood or gray looking cabinet. Cabinet will not crack, peel, blister or delaminate. Cleaning consists of simply spraying the cabinet with a mild soap and water solution to remove any stains and residue.

Care Of Spa Cover

To clean and condition the vinyl cover:

- Remove the cover from the spa and gently lean it up against a wall or fence.
- Using a garden hose, spray the cover to loosen and rinse away any dirt or debris.
- Using a sponge and/or a soft bristle brush, and using a very mild soap solution (one teaspoon dishwashing liquid with two gallons of water), or baking soda (sodium bicarbonate), scrub the vinyl top in a circular motion. Do not let the vinyl dry with a soap film on it before it can be rinsed clean.
- Scrub the cover's perimeter and side flaps. Rinse clean with water.
- Rinse off the underside of the cover with water only (use no soap), and wipe it clean with a dry rag.
- To condition the cover after cleaning, apply a thin film of vinyl cleaner to the surface and buff to a high luster.

SPA CARE AND MAINTENANCE

Important reminders:

- DO NOT walk or stand on top of cover (unless you own a “walk-on-cover”).
- DO remove snow buildup to avoid breakage of the foam core from the additional weight of the snow.
- DO lock cover locking straps to secure the cover when the spa is not in use.
- DO NOT drag or lift the spa cover using either the flaps, or the cover lock straps.

Vacation Care Of Spa

Following these instructions to ensure that the water quality of your spa is maintained:

For Short Periods (3 to 5 days)

Adjust the pH
Sanitize the water
Lock cover for safety

For Long Periods (5 to 14 days)

Set temperature to its lowest level
Adjust the pH
Sanitize the water
Lock cover for safety

Return Procedures

Sanitize the water following shock procedures
Return water temperature to original setting
Insure chlorine level has dropped below 5.0 ppm

NOTE: If you plan on not using your spa for periods exceeding 14 days, you may ask a family member or neighbor to assist with your spa maintenance, and if not available you will need to drain or winterize spa.

Winterizing Your Spa

During the cold weather you may not wish to use your spa outside. In this case you may move it to a heated area, or leave it until the weather warms up.

WARNING: Allowing your spa water to freeze will cause severe damage to the spa shell, equipment, and plumbing and **WILL VOID WARRANTY.**

The following steps should protect your spa from freezing:

- Disconnect the spa from the power supply.
- Remove the screws holding your spa excess panel door.
- Open the valve and the spa will drain by gravity flow.
- Remove the filter cartridge, then clean and store in a dry place.
- Attach a wet/dry shop vac (capable of blowing air as well as vacuuming) into the filter housing.
- Turn blower on and allow it to blow out any water remaining in the plumbing lines. (Should take no more than 5 minutes).
- Reinstall the filter housing.
- Use the shop vac to remove water inside spa blown through jets.
- Use a shop vac and clean towel and remove any remaining water from bottom of spa until dry.
- Leave the drain open.
- Close the spa cover and fasten with tie down safety loks.

WATER QUALITY AND MAINTENANCE

Your Water In Your Spa

The quality of your water in your spa is important to keeping it clean. Your dealer can guide you through the process of achieving and maintaining perfect water in your spa in your given local conditions. Your program will vary depending on your water's mineral content, and how often you use your spa, and the amount of people using it.

Here are our suggested step-by-step procedures:

General Information - The three fundamental areas of water maintenance.

* Water Filtration * Chemical Balance/pH Control * Water Sanitation

The water's chemical balance and pH control are also your responsibility. You will have to add chemicals to maintain proper levels of Total Alkalinity (TA), Calcium Hardness (CH) and pH. Proper water balance and pH control will minimize scale buildup and corrosion of metals, extend the life of the spa, and allow the sanitizer to work at maximum efficiency.

Methods For Testing Spa Water

Accurate water testing and analysis are an important part of effectively maintaining your spa water. You must have the ability to test for:

- Total Alkalinity (TA)
- pH
- Calcium Hardness (CH)
- Sanitizer

Two types of testing methods are recognized and recommended:

- **Reagent Test Kit** is a method which provides a high level of accuracy. They come in either liquid or tablet form.
- **Test Strips** are a convenient testing method used by many spa owners. Keep in mind that test strips are susceptible to heat and moisture.

Basic Chemical Safety

When using chemicals, always read the labels carefully and follow directions. Though chemicals protect you and your spa when used correctly, they can be hazardous in concentrated form. Observe the following guidelines:

- Allow only a responsible person to handle spa chemicals **KEEP OUT OF THE REACH OF CHILDREN.**
- Accurately measure the exact quantities specified, never more. Do not overdose your spa.
- Handle all containers with care. Store in a cool, dry well ventilated place.
- Always keep chemical containers closed when not in use. Replace caps on their proper containers.
- Don't inhale fumes, or allow chemicals to come in contact with your eyes, nose, or mouth. Wash your hands immediately after each use.
- Follow the emergency advice on the product label in case of accidental contact, or if the chemical is swallowed. Call a doctor or the local Poison Control Center. If a doctor is needed, take the product container along with you so that the substance can be identified.
- Don't let chemicals get on surrounding surfaces or landscaping. Rinse off with fresh water if spilled.
- Never smoke around chemicals. Some of the fumes can be highly flammable.
- Don't store chemicals in the spa equipment compartment.

Adding Spa Chemicals:

- Fold back the spa cover. Carefully remove and set aside the filter lid.
- Push the **JETS1** button to turn on the pump.
- Carefully measure the recommended amount of chemical and slowly pour it into the filter compartment. Use care not to splash chemicals on your hands, eyes, or on the spa shell surface or cabinet.
- Replace filter lid and run spa for 10 minutes on high speed. Re-install spa cover.

IMPORTANT: Super Chlorination/Non-Chlorine Shock Treatment - **NOTE:** After administering a super chlorination treatment or non-chlorine shock to your spa, leave the cover open for a minimum of 20 minutes to allow the oxidizer gas to vent. A high concentration of trapped oxidizer gas which may exist as a result of the shock treatment (not daily sanitation) may eventually cause discoloration or vinyl degradation to the bottom of the cover. This type of damage is considered chemical abuse and is not covered under the terms of the limited warranty of the spa cover.

WATER QUALITY AND MAINTENANCE

Balancing Total Alkalinity (TA)

- The recommended Total Alkalinity (TA) for your spa water is 125-150 ppm.
- Total Alkalinity is a measure of the total levels of carbonates, bicarbonates, hydroxides, and other alkaline substances in the water. TA is referred to as the water's "pH buffer". It's a measure of the ability of the water to resist changes in pH level.
- If the TA is too low, the pH level will fluctuate widely from high to low. Fluctuations in pH can cause corrosion or scaling of spa components. Low TA can be corrected by adding pH/Alkalinity UP (sodium hydrogen carbonate).
- If the TA is too high, the pH level will tend to be high and may be difficult to bring down. It can be lowered by adding pH/Alkalinity down (sodium bisulfate).
- Once the TA is balanced, it normally remains stable, although the addition of more water with a high or low alkalinity will raise or lower the TA reading of the water.
- When the Total Alkalinity is within the recommended range, proceed.

Balancing Calcium Hardness (CH)

- The recommended Calcium Hardness (CH) level for your spa is 150-200 ppm.
- Calcium Hardness is a measure of the total amount of dissolved calcium in the water. Calcium helps control the corrosive nature of the spa's water. That's why calcium-low water (commonly known as "soft" water) is not recommended. It is very corrosive to the equipment, and can cause staining of the spa shell. If the calcium level is too low, we recommend using Calcium Increaser to bring the calcium hardness level to within the recommended range.
- If the CH is too high (commonly known as "hard" water), formation of scale on the spa's shell surface and equipment can result. CH can be decreased by dilution - a mixture of 75% hard and 25% soft water will be a good starting point. If soft water is not available, or practical for you, a stain and scale control such as Scale Defense should be added to the spa water, according to instructions on its label.
- Once the CH is balanced, it normally remains stable, although the addition of more water with a high or low calcium content will raise or lower the CH reading of the water.
- When the Calcium Hardness is within the recommended range, proceed.

Balancing The pH

- The recommended pH level for your spa water is 7.4-7.6.
- The pH level is the measure of acidity and alkalinity. Values above 7 are alkaline; those below 7 are acidic.

Maintaining the proper pH level is extremely important:

- Optimizing the effectiveness of the sanitizer.
- Maintaining water that is comfortable for the user.
- Preventing equipment deterioration.

If the spa water's pH level is too low, the following may result:

- The sanitizer will dissipate rapidly.
- The water may become irritating to spa users.
- The spa's equipment may corrode.

If the pH level is too low, it can be increased by adding pH/Alkalinity Up (sodium hydrogen carbonate) to the spa water.

If the pH level is too high, the following may result:

- The sanitizer is less effective.
- Scale will form on the spa shell surface and the equipment.
- The water may become cloudy.
- The filter cartridge pores may become obstructed.

If the pH is too high, it can be decreased by adding pH/Alkalinity Down (Sodium bisulfate) to the spa water.

NOTE: After adding pH/Alkalinity Up (sodium hydrogen carbonate) or pH/Alkalinity Down (sodium bisulfate), wait at least two hours before testing the water for pH. Measurements taken too soon may not be accurate.

- It is important to check the pH on a regular basis. The pH will be affected by the bather load, the addition of new water, the addition of various chemicals, and the type of sanitizer used.
- When the pH is within the recommended range, proceed.

WATER QUALITY AND MAINTENANCE

Maintaining Sanitizer Level

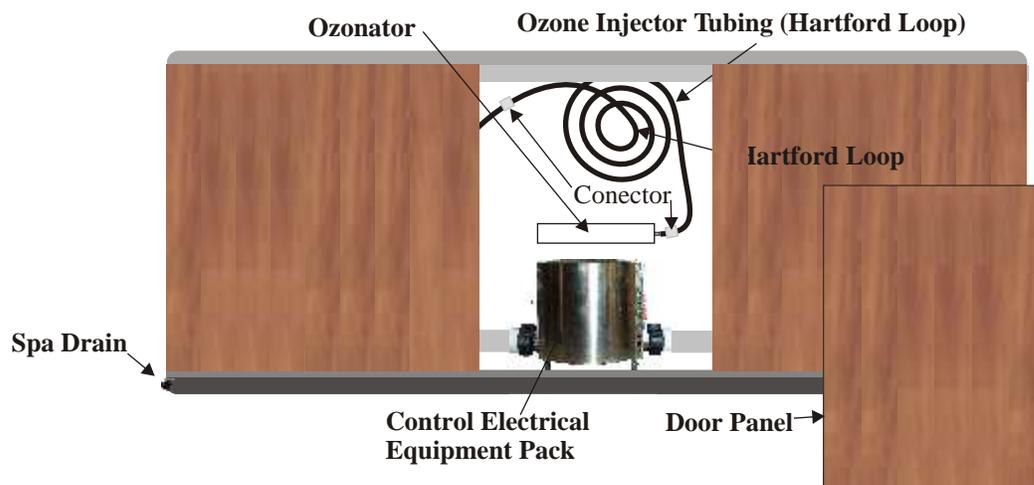
- Sanitizer is extremely important for killing algae, bacteria and viruses, and preventing unwanted organisms from growing in the spa. At the same time, you don't want too high a sanitizer level, or it can irritate your skin, lungs, and eyes.
- Always maintain the sanitizer level in your spa at the recommended level for each type of sanitizer.

Ozone

Hydro Spa's Ozonation System drastically reduces the use of chemicals in the water. This also aids in maintenance requiring less attention from harsh chemicals and less frequency with which they are used.

Replacement Of Ozone Tubing and Ozonator

Call your manufacture to provide you with maintenance service if replacement of ozonator or tubing is required. Remove door panel screws and set door panel aside. The Ozone is setting above the Control Electrical Equipment Pack shown below or in area. The ozonator plugs into the Control Electrical Equipment Pack. Tubing is mounted above the ozonator and has a Hartford Loop as shown below.



Water Terminology

Bromamines: Compounds formed when bromine combines with nitrogen from body oils, urine, perspiration, etc. Unlike chloramines, bromamines have no pungent odor, and are effective sanitizers.

Bromine: A halogen sanitizer (in the same chemical family as chlorine). Bromine is commonly used in stick, tablet, or granular form.

Calcium Hardness: The amount of dissolved calcium in the spa water. This should be approximately 150-220 ppm. High levels of calcium can cause cloudy water and scaling. Low levels can cause harm to the spa equipment.

Chloramines: Compounds formed when chlorine combines with nitrogen from body oils, urine, perspiration, etc. Chloramines can cause eye irritation as well as having a strong odor. Unlike bromamines, chloramines are weaker, slower sanitizers.

Chlorine: An efficient sanitizing chemical for spas.

Chlorine (or Bromine) Residual: The amount of chlorine or bromine remaining after chlorine or bromine demand has been satisfied. The residual is, therefore, the amount of sanitizer which is chemically available to kill bacteria, viruses and algae.

Corrosion: The gradual wearing away of metal spa parts, usually caused by chemical action. Generally, corrosion is caused by low pH or by water with levels of TA, CH, pH or sanitizer which are outside the recommended ranges.

DPD: The preferred reagent used in test kits to measure the Free Available Chlorine.

Halogen: Any one of these five elements: fluorine, chlorine, bromine, iodine, and astatine.

MPS: Monopersulfate is the non-chlorine oxidizer used with the purification system.

Nitric Acid: The formulation of nitric acid, a highly corrosive chemical, is a byproduct of the ozone generating process. Nitric acid is produced in very small quantities and is readily dissolved in the water stream with ozone.

Oxidizer: The use of an oxidizing chemical is to prevent the buildup of contaminants, maximize sanitizer efficiency, minimize combined chlorine and improve water clarity.

Ozone: Ozone is a powerful oxidizing agent which is produced in nature and artificially by man. Ozone forms no byproducts of chloramines (ozone actually oxidizes chloramines) and will not alter the water's pH.

Pathogen: A microorganism such as bacterium that cause disease.

pH: The measure of the spa water's acidity and alkalinity. The recommended pH for the spa water is 7.4 to 7.6. Below 7.0 (considered neutral), the spa water is too acidic and can damage the heating system. Above 7.8, the water is too alkaline and can result in cloudy water, and scale formation on the shell and heater.

WATER QUALITY AND MAINTENANCE

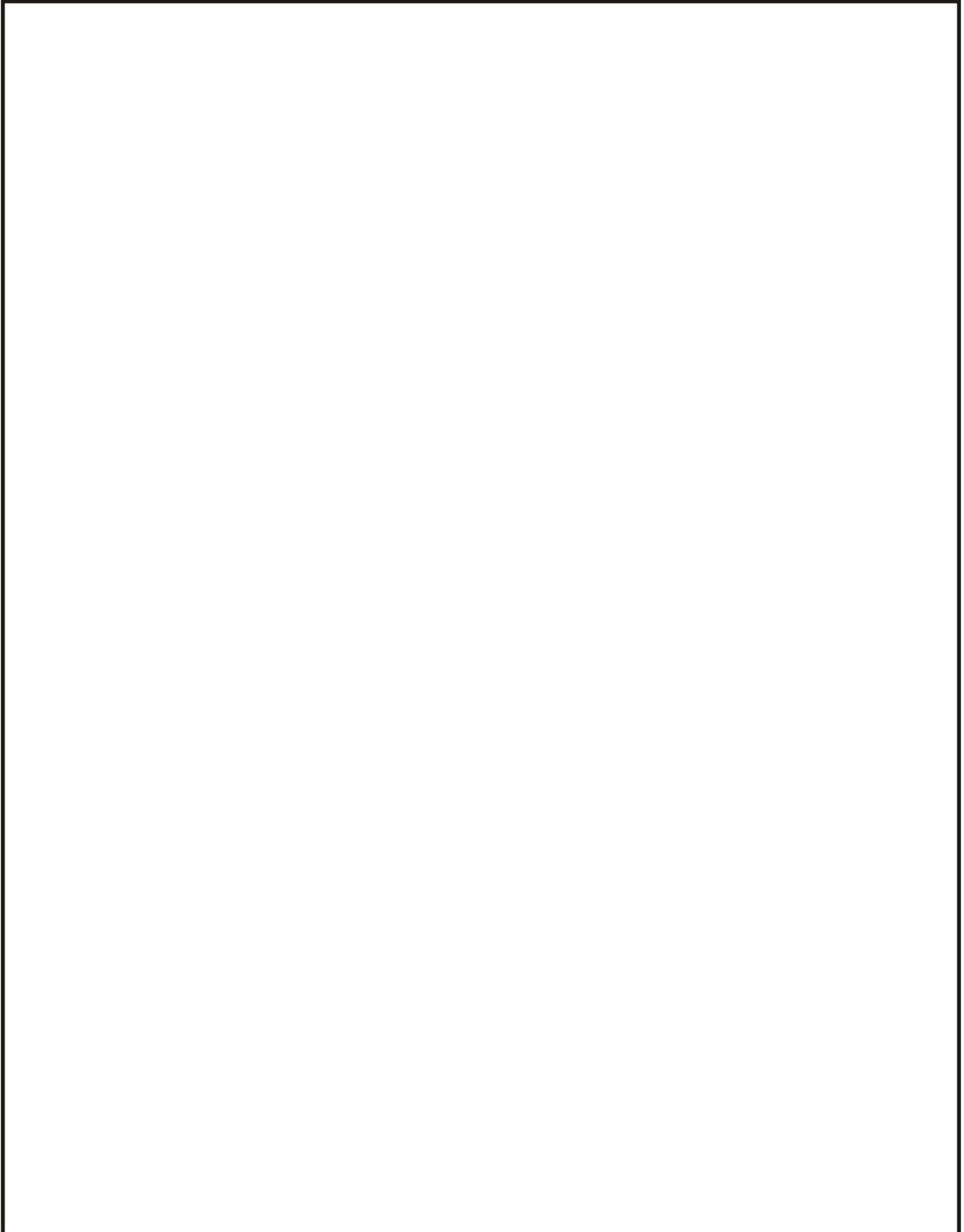
Reagent: A chemical material in liquid, power, or tablet form for use in chemical testing.

Sanitizer: Sanitizers are added and maintained at recommended residuals to protect bathers against pathogenic organisms which can cause disease and infection in spa water.

Scale: Rough calcium-bearing deposits that can coat spa surfaces, heaters, plumbing lines, and clog filters. Generally, scaling is caused by mineral content combined with high pH. Additionally, scale forms more readily at higher water temperatures.

SPA WATER MAINTENANCE & TROUBLESHOOTING		
Problem	Probable Causes	Solutions
Cloudy Water	Dirty Filter/s Excess oils / organic matter Improper sanitization Suspended particles / organic matter Overused or old water	Clean filter or replace. Shock spa with sanitizer. Add sanitizer. Adjust pH and/or alkalinity Run jet pump(s) and clean filter. Drain and refill spa.
Water Odor	Excessive organics in water Improper sanitization Low pH	Shock spa with sanitizer. Add sanitizer. Adjust pH to recommended range.
Chlorine Odor	Chloramine level too high Low pH	Shock spa with sanitizer Adjust pH to recommended range.
Musty Odor	Bacteria or algae growth	Shock spa with sanitizer - if problem is visible or persistent, drain, clean and refill spa.
Organic buildup / scum ring around spa	Build-up of oils and dirt	Wipe off scum with clean rag - if severe, drain the spa, use a spa surface and tile cleaner to remove the scum, and refill spa.
Algae Growth	High pH Low sanitizer level	Shock spa with sanitizer and adjust pH Shock spa with sanitizer and maintain sanitizer level.
Eye Irritation	Low pH Low sanitizer level	Adjust pH. Shock spa with sanitizer and maintain sanitizer level.
Skin Irritation / Rash	Unsanitary water Free chlorine level above 5 ppm	Shock spa with sanitizer and maintain sanitizer level. Allow free chlorine level to drop below 5 ppm.
Stains	Total alkalinity and/or pH too low High iron or copper in source water	Adjust total alkalinity and/or pH. Use a metal deposit inhibitor.
Scale	High calcium content in water - total alkalinity and pH too high	Adjust total alkalinity and pH - If scale requires removal, drain the spa, scrub off the scale, refill the spa and balance the water.

SPA CARE NOTES

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W A R R A N T Y

Lifetime Spa Structural Warranty

Manufacturer warrants the spa shell structure against the loss of water through the fiberglass laminate of the shell caused by defects in materials and workmanship for as long as the original purchaser owns the spa. Contact manufacturer if you have any questions concerning warranty issues.

10 - Year Hydro Spa Surface Warranty

Manufacturer warrants the interior acrylic spa surface against blisters, cracks, or delaminating resulting from a defect in the acrylic surface material for a period of 10 years from the date of purchase, based on the following formula: Retail cost divided by months covered (120), multiplied by months owned = replacement cost.

Lifetime Manifold Plumbing Warranty

Manufacturer warrants the plumbing manifolds, fittings, and parts to be free of defects in materials or workmanship for as long as the spa is owned by the original purchaser.

Electrical Equipment Warranty

Manufacturer warrants electrical equipment and components to be free of defects in materials and workmanship for a period of 2 years from the date of purchase.

Warranty Performance

In the event of a defect covered under the terms of this Limited Warranty, notify manufacturer. Use all reasonable means to protect the spa from further damage. A service representative from manufacturer will repair the spa subject to the terms and conditions contained in this Limited Warranty. The service representative may assess reasonable travel charges, during inspection or repairs. If we determine that repairs are not feasible due to functional defect, we reserve the right to provide a replacement part or spa in lieu of repair. We will replace with a part of value equal to the original purchase. In such event, reasonable costs for removal of the defective spa and delivery and installation of the replacement spa will be the responsibility of the spa owner. We reserve the right to an on-site inspection by an authorized service representative.

Limitations and Exclusions

This limited warranty applies to spas sold after January 1, 2004 by manufacturer. This limited warranty applies only to the Original Purchaser and terminates with any transfer of ownership. This limited warranty does not apply to a spa used for any commercial, rental, club purposes, or for any spa used outside of the United States. The purchaser must establish the date of purchase by dated sales invoice or delivery receipt.

This limited warranty does not cover damage resulting from abuse, misuse, or neglect including any installation, operation, maintenance, or use of spa other than in accordance with the Owner's Manual of the spa. Damage caused by operation of the spa at water temperatures outside the range of 32 degrees F. and 120 degrees F., damage caused by dirty, clogged, or calcified filter cartridges, damage to the spa surface caused by improper use of chemicals or cleaning agents, allowing undissolved spa sanitizing chemicals to lie on the surface, damage caused by improper pH balance or other improper water chemistry, damaged caused by failure to provide even and sufficient support for the spa, are considered abuses and may invalidate this Limited Warranty. Damage caused by repairs or alterations performed by anyone other than an authorized service representative is not covered. Failure caused by accidents, acts of God, nonstructural normal wear and tear, cosmetic blemishes and other causes beyond our control is excluded.

The warranty is in lieu of all other warranties, expressed or implied, including implied warranties of merchantability and fitness for a particular purpose. In no event shall Dealer be liable for incidental or consequential damages.

Disclaimers

The spa owner is required to provide adequate access to the spa for any repair or inspection. Manufacturer shall not be liable for loss of use of the Spa or other incidental or consequential costs, expenses or damages, which may include but are not limited to water damage, or the removal of a permanent deck or other custom fixture. Under no circumstances shall we, or any of our representatives be held liable for injury to any person or damage to any property, however arising. This warranty gives you specific legal rights and you may have other rights. No agent, dealer, Service Company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever.



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