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# Owner's Manual

2008

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## **IMPORTANT SAFETY INSTRUCTIONS**

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

1. **READ AND FOLLOW ALL INSTRUCTIONS**
2. **WARNING**-To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
3. A wire connector is provided on this unit to connect a minimum No. 8 AWG (8.4mm<sup>2</sup>) solid copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 5 feet (1.5m) of the unit.
4. **DANGER**-Risk of Accidental Drowning. Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use this hot tub unless they are supervised at all times.
5. **DANGER**-Risk of Injury. The suction fittings in this hot tub are sized to match the specific water flow created by the pump. Should the need arise to replace the suction fittings or the pump, be sure that the flow rates are compatible. Never operate the hot tub if the suction fittings are broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the original fitting.
6. **DANGER**- Risk of Electric Shock. Install at least 5 feet (1.5 m) from all metal surfaces. As an alternative, a hot tub may be installed within 5 feet of metal surfaces if each metal surface is permanently connected by a minimum No. 8 AWG (8.4 mm<sup>2</sup>) solid copper conductor to the wire connector on the terminal box that is provided for this purpose.
7. **DANGER**-Risk of Electric Shock. Do not permit any electric appliance, such as a light, telephone, radio, or television, within 5 feet (1.5 m) of a spa or hot tub.
8. **WARNING**-To reduce the risk of injury:
  - a) 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 hot tub use exceeds 10 minutes.
  - b) Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa water temperatures to 38°C (100°F).
  - c) Before entering a spa, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature-regulating devices varies.
  - d) The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.
  - e) Obese persons and persons with a history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa.
  - f) Persons using medication should consult a physician before using a spa since some medication may induce drowsiness while other medication may affect heart rate, blood pressure, and circulation.
9. (For cord-connected / convertible units) **DANGER**-Risk of injury.
  - a) Replace damaged cord immediately.
  - b) Do not bury cord.
  - c) Connect to a grounded, grounding type receptacle only.
10. **WARNING**– People with infectious diseases should not use a spa or hot tub.
11. **WARNING**– To avoid injury exercise care when entering or exiting the spa or hot tub.

12. WARNING— Do not use a spa or hot tub immediately following strenuous exercise.
13. WARNING— Prolonged immersion in a spa or hot tub may be injurious to your health.
14. CAUTION— Maintain water chemistry in accordance with manufacturer's instruction.
15. CAUSES, SYMPTOMS AND EFFECTS OF HYPERTHERMIA - Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6° F. The symptoms of hyperthermia include an increase in the internal temperature of the body, dizziness, lethargy, drowsiness, and fainting. The effects of hyperthermia include (1) failure to perceive heat, (2) failure to recognize the need to exit spa or hot tub, (3) unawareness of impending hazard, (4) fetal damage in pregnant women, (5) physical inability to exit the spa or hot tub, (6) unconsciousness resulting in the danger of drowning. WARNING-The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia.

## ELECTRICAL SAFETY INSTRUCTIONS

1. A green colored terminal or a terminal marked G, GR, Ground, Grounding, or the international symbol is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply panel with a continuous copper equivalent in size to the circuit conductors supplying this equipment.
2. At least two lugs marked "BONDING LUGS" are provided on the external surface or on the inside of the supply terminal box or compartment. To reduce the risk of electric shock, connect the local common bonding grid in the area of the hot tub or spa to these terminals with an insulated or bare copper conductor not smaller than No. 6 AWG.
3. All field-installed metal components such as rails, ladders, drains or other similar hardware within 3m of the spa or hot tub shall be bonded to the equipment grounding bus with copper wire conductors not smaller than No. 6 AWG.
4. For units intended for use with other than single family dwellings, a clearly labeled emergency switch shall be provided as part of the installation. The switch shall be readily accessible to the occupants and shall be installed at least 5 feet (1.52 m) away, adjacent to, and within sight of, the unit.

If your hot tub is equipped with audio components, the following instructions also apply:

1. CAUTION - Risk of Electric Shock. Do not leave component access panel open.
2. CAUTION - Risk of Electric Shock. Replace components only with identical components.
3. Do not operate the audio components while inside the spa.
4. WARNING - Prevent Electrocution. Do not connect any auxiliary components (for example cable, additional speakers, headphones, additional audio/video components, etc.) to the system.
5. These units are not provided with an outdoor antennae; when provided, it should be installed in accordance with Article 810 of the National Electrical Code, ANSI/NFPA 70.
6. Do not service this product yourself as opening or removing covers may expose you to dangerous voltage or other risk of injury. Refer all servicing to qualified service personnel.
7. If the power supply connections or power supply cord(s) are damaged; if water is entering the audio equipment compartment area; if the protective shields or barriers are showing signs of deterioration; or if there are signs of other potential damage to the unit, turn off the unit and refer servicing to qualified service personnel.
8. This unit should be subjected to periodic routine maintenance (for example, once every 3 months) to make sure that the unit is operating properly.

## SAVE THESE INSTRUCTIONS

# LOCATION AND INSTALLATION

Your Great Lakes Spa has been conveniently designed for use in either an indoor or outdoor setting. While selecting an appropriate location for your spa, there are important things to consider.

## **Indoor Use Only**

- Humidity will not likely be a problem. However, just like in your bathroom, an exhaust fan would be a good idea.
- No matter how careful you are, you will splash water, especially when exiting the spa. We suggest a tile or vinyl floor.
- A self-draining floor is a great way to ease any worries about spilled water.
- Remember that you'll need extra space to store the cover when it is removed. When using our handy cover-lift device, you should allow for an extra 16" of clearance behind the spa.
- The spa must be placed on a flat and level surface that does not move or shake.
- You should consult with a builder or engineer to determine if your floor will support the spa weight. Remember, you must allow for the spa, water and people in your total weight calculations.
- Be sure your spa is secure from access to young children. Great Lakes Spas offers a locking spa cover, but we also suggest keeping the spa room locked and off limits to children.

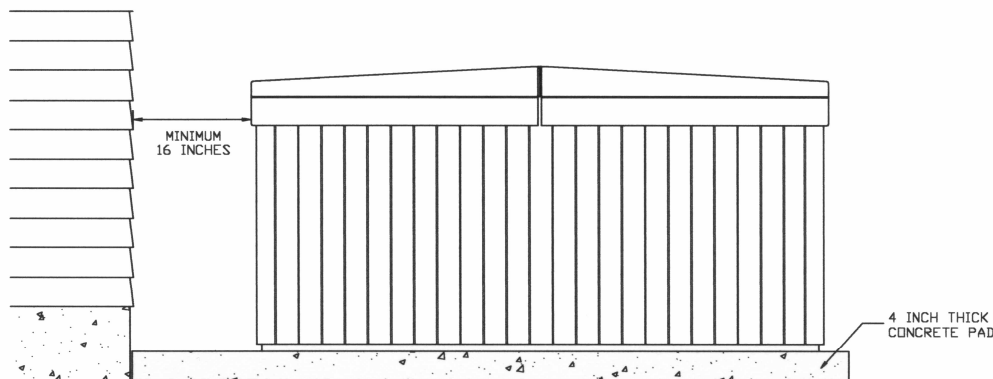
## **Outdoor Use Only**

- Place your spa on a solid, flat surface. We recommend a 4" thick reinforced concrete pad as the best surface.
- Keep in mind natural elements such as wind, view, falling leaves, etc.
- We recommend that you locate your spa in a locked fenced-in area to prevent access to the spa by children.
- It is a good idea to have a contractor review your proposed site to see that there are no support problems.

## **Indoor or Outdoor Use**

- When installing the spa, provide for adequate drainage to prevent water from entering the equipment module area.
- When installing the spa, enable access to the equipment compartment.
- Never locate light switches or other electrical components within reach from inside your spa. The equipment module must remain protected by the skirting of the spa.

Wherever you locate your spa, you will need to have access to water in order to fill it. Any water spigot or faucet will work. Also, you will need to be able to drain your spa periodically. Since your spa water will likely have chemicals in it, you won't want to drain your spa on the lawn or into a garden. Be sure you can reach a garden hose from the spa to where you plan to drain the water. Never let water get on the equipment module that is located in the door opening of your spa. Finally, we suggest that you consult an electrician prior to installation to be sure of power availability and cost.



## **RECOMMENDED SUPPORT**

# SPA SET UP

## **Unpacking**

1. Completely unwrap your spa and dispose of the packaging materials.
2. Remove any tape that holds down various components within the spa.
3. Clean any dirt or dust from the interior of your spa with a damp cloth. Remove any stubborn stains with an acrylic spa cleaner or isopropyl alcohol (concentrations under 25%). Never use an abrasive cleaner or scraper to clean the surface of your spa.
4. Position the cover on the spa and install the locking tabs to the spa cabinet (instructions included with cover).
5. Remove the spa access panel to reach the pump and control box. This panel is held in place with 4-8 square drive screws. A square drive screwdriver bit has been furnished in this packet for your convenience.

## **Electrical**

Be sure your electrician reads this section and any others relating to the electrical hookup of your spa.

A multi-terminal bonding connector, located on the side of the equipment module, is provided to permit connection of a bonding wire between this point and any accessible metal surface within 5 feet of the spa, as may be needed to comply with local requirements. The bonding wire connecting this bonding connector to the accessible metal surfaces must be a solid, No. 6 AWG copper conductor. This bonding connector may also be used to bond any field wired components.

All electrical connections to the equipment module must be accomplished by a qualified electrician in accordance with the National Electrical Code and in accordance with any local electrical codes in effect at the time of installation. All electrical connections must be made in accordance with the wiring information contained in this manual, or on the back of the field wiring access panel of the equipment module. National Electrical Code requires a Ground Fault Circuit Interrupter (GFCI) at the power source. Use copper conductors only. **WARNING:** Improper electrical connections or conductor sizing may cause the equipment module to operate improperly, create the potential for an electrical hazard, and may void the warranty. **CAUTION:** Use only approved pressure-type wire splicing lugs or connectors suitable for the size and type of wiring used.

**WARNING: Do not turn ON the power to the spa unless it is filled with water and all valves are open. Be sure water level is at the recommended point. If the power is ON, the system may start even though the controls were not activated. If the equipment module is started without sufficient water in the spa, the system could be permanently damaged. Also, operating spa without sufficient water could cause a fire.**

## **Filling Your Spa**

Once the electric power has been connected, check the following while the power is OFF:

1. Be sure all fittings to the support system are tight. Hand tighten only!
2. Be sure the drain valve is closed.
3. Your spa is equipped with 2 or 4 push/pull valves. There is one located before the suction side of the pump and one located adjacent to the discharge side of your heater. If you have a secondary pump, there will be two valves for this pump as well. Pull the push/pull valves OUT so they are open.
4. Using a garden hose, fill with water to 2-4" above the skim filter. Always fill your spa with hard (not softened) water. Do not overfill. After the spa is filled, remove the garden hose.
5. Check the equipment module area for water leaks. If there is water dripping, it is probably a loose connection at the equipment module. You should re-check the tightness of the fittings and placement of the "O"-rings. If you cannot locate the source of the water leak, contact your dealer.
6. Check that the filter is positioned in the skim/filter system. To remove, refer to the "Cleaning your filter" section.
7. Activate the power to your spa. Refer to the Topside Instruction sheet included with this manual.

# SPA OPERATION

Refer to the Control Manual operating instructions for the spa-side control unit. The operating functions of your spa controller will vary depending on the model of Great Lakes Spa you have purchased.

Your Great Lakes Spa comes equipped with a variety of jets and water/air controls. Some of the jets allow you to control the amount of water flow by rotating the face of the jet. Turning the face clockwise will reduce the water flow from the jet and turning it counterclockwise will increase the water flow.

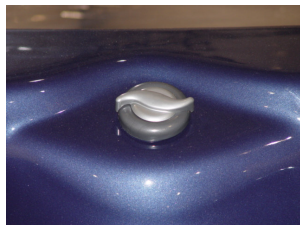
## Air Controls



Your spa comes equipped with air controls that are located on the top of your spa. If you turn the air controls open (counterclockwise) when the pump is on high speed, air will be drawn through the jets. Each control regulates the airflow to a different jet or jets. Turn the air control counterclockwise while the pump is on high speed and you will see the jets produce added agitation. Turning the control clockwise will return the jets to water-only operation.

## Diverter Valve

Certain spas are equipped with a top-side diverter valve. Turning the valve will divert water to one of two different zones within the spa. Centering the valve lever will allow water to flow to both zones.



## Flow Control Valve

Certain spas are equipped with flow control valves. By turning the handle on the valve clockwise, the flow of water will be at minimized level. By turning the handle on the valve counter clockwise, the flow of water will be at maximum level.

## Ozone Jet

In the foot well of your spa there is a jet which allows ozone to be drawn into your spa when your spa is equipped with an ozone unit. With an ozonator installed, there will be a steady stream of small air bubbles coming from the ozone jet whenever the spa pump is in operation. See your dealer for an optional ozone unit.



## **1-1/2" Mini Jets**

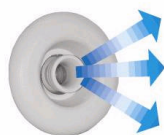
A forceful, steady stream of water/air is delivered from these jets when the pump is on high or low speed.

### **Interchangeable Jet Faces**

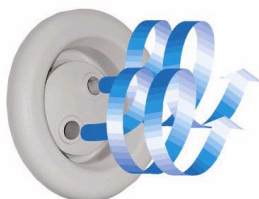
The jet faces of the various styles of 5" jets and 3" jets can be easily interchanged with others of the same size. This allows you to customize your spa massage therapy. Each style of jet varies in intensity or sensation. To remove the jet face to relocate it, simply turn the outer ring counterclockwise past the stop point. This disengages the jet, then gently pull on the outside ring of the jet. The jet insert will pull away from the spa. Follow the same procedure with another jet. To reinstall, simply push the jet insert back into the jet cavity until it stops, then rotate the jet clockwise until it snaps into place. Water flow through these jets can be controlled by turning the outside face of the jet. Turning the trim ring clockwise will reduce the water flow from the jet and turning it counterclockwise will increase the water flow.



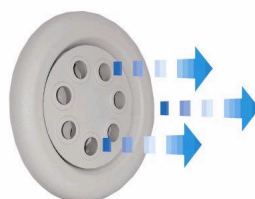
*3" Double Roto Jet*



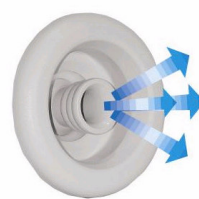
*3" Directional Jet*



*5" Double Roto Jet*



*5" Pulsating Jet*



*5" Directional Jet*



**DANGER: Risk of electric shock. Drain spa and disconnect power before attempting to open lens. Do not attempt re-lamping without the proper tool. Contact qualified service personnel or your dealer if the tool is not available.**



To service the spa light, turn off all power to the spa. Drain the hot tub. To open the lens of the fixture, follow the instructions on the GG lens insert tool found in your Owner's Manual Packet. Use the GG lens insert tool to turn the front lens of the light assembly (counter-clockwise to remove, clockwise to install). Pull the lamp straight out of the socket and gently push in the new lamp. **CAUTION:** The replacement lamp must be the same rating as the factory installed lamp. Verify the gasket is not damaged and is properly in place when replacing the lens. Contact a qualified service person if a replacement gasket is needed. Replace the lens with the tool. Tighten lens approximately 1-1/2 turns until tool aligns with flange notches.

# SPA CARE AND MAINTENANCE

## **Draining Your Spa**

Under normal usage, you should change the water in your spa every 3-4 months. To drain spas equipped with the Quick Drain™ System, first turn off electrical power to your spa. Screw on either the garden hose or 1-1/4" barbed adapter and attach your garden hose or 1-1/4" drain hose (sold separately).

Your spa has a two-fixture Quick Drain™ with a removable spigot handle. To drain, open the valve by turning the handle counter-clockwise until it stops. Close the valve by rotating the handle clockwise until it stops. The remaining water in the spa can be scooped or siphoned out and you are now ready to clean the acrylic surface. Note: It is recommended that you not drain water onto grass or vegetation since chemicals in the spa water may damage them.



## **Cleaning The Spa Surface**

Your Great Lakes Spa is manufactured with either a premium grade acrylic or a premium grade weather resistant ABS surface. Both are quality finishes that are durable and easy to clean and maintain. When the spa is empty, you can clean the surface by using a mild, nonabrasive liquid detergent or specially formulated spa cleaner. For general cleaning, any of the following items can be used: Ivory (soap & water solution), Formula 409, Windex, Spic and Span, Scrubbing Bubbles, Fantastik, Simple Green, Pine Sol or any product available at your local spa dealer. For heavy cleaning, you may try one of the following cleaning items, but make sure to remove immediately after use: Soft Scrub (may slightly abrade surface), Bug & Tar Remover or OOPS. Do not use an abrasive brush or cleaning agent, as it will scratch the finish. DO NOT USE any of the following items to clean your tub: Acetone, Goof Off or any cleaners that contain esters, ethers, ketones, aromatic or chlorinated hydrocarbons, Isopropanol (concentrations greater than 25%). If you have stubborn dirt or scum marks at the water line, use a spa cleaner and a scrub pad designed for use on spa surfaces, which are available at your spa dealership. Clean only a small portion of the surface at one time. Use a soft, clean cloth to apply the cleaner. To prevent suds, thoroughly remove all residue from the cleaning agent prior to refilling the spa.

## **Adjustable Jets**

The jet faces on the various 1-3/4", 3", 4", and 5" adjustable jets should be removed from time to time to clean off any accumulated hair, dirt deposits, etc. This will insure proper operation of the water flow control feature.

## **Thermal Spa Cover**

It is important that you properly care for your spa cover. Do not sit or stand on the cover, as it will break. Do not let snow build up on your cover. Lock-down tabs are included with your cover and should be used to prevent access to the spa by children. If your spa is located outdoors, it is important that you use the tie down tabs to prevent the wind from lifting the cover off your spa. Periodically clean your cover as described in the maintenance and cleaning instructions provided with the cover. When handling your cover, take care not to drag it over rough surfaces that will scuff or tear the fabric. Always lift by the handles or use the cover lift device which is available from your dealer.



## **Cabinet Care**

### *Natur-all™ Panels*

Natur-all products are maintenance free products and the only cleaning they require is the rinsing off of debris that has collected on the surface. To remove, simply rinse with water or lightly wash with mild soap and water. Do not use any chemicals since these may etch the surface.



## WINTERIZING

If you live in an area where the danger of freezing exists, you must take extra precautions to insure that your spa will operate properly. If you plan to operate your spa throughout the winter, be sure that the thermostat is set to keep the water warm. If you intend on closing down your spa for the winter, you should follow the winterizing procedures listed below:

1. Drain the spa as explained in the "Draining Your Spa" section.
2. Be sure that all water is removed from the spa.
3. Shut off all electrical power at the breaker box.
4. Disconnect the unions from the equipment module to allow the water in the spa lines and equipment module to drain.
5. If your spa is equipped with dual pumps, remove the pump-to-pump water circulation line connected to the front of both pump housings, and drain all water from the pump housings and the line, then reconnect the line.
6. If your spa is equipped with a single pump, remove the drain plug on the pump housing to allow water to drain out of the pump. Replace the drain plug.
7. Open all air controls to allow trapped water to drain through jets.
8. Remove the filter element from the filter housing and see that the filter housing is dry. If water is left in the filter housing it will freeze and cause the housing to crack.
9. Using a wet/dry shop vacuum, vacuum out each of the lines at the point where you disconnected the unions from the equipment module. Also, put the vacuum hose up against the face of each jet opening to vacuum out any water remaining in their supply lines.
10. Cover your spa with your spa cover and be sure it is locked in place.

WARNING: Failure to maintain the proper chemical levels or properly winterize your spa may cause extensive damage to components. Damage to components or the spa shell itself resulting from improper chemical maintenance or improper winterization will NOT be covered under warranty.

## OZONE

The optional ozonator is a unit that contains an ultra-violet light. When the unit is activated, ozone is generated which is drawn into the spa via the ozone jet. The ozone gas appears as tiny bubbles that come from the ozone jet which is located near the front of the spa. The ozone coming into your spa purifies the water without the skin irritation and chemical smell that can occur with the use of chemicals. The ozone unit operates when installed according to the instructions provided with the ozone unit and when the equipment module is in the filtering mode.

Ozone is a gas which occurs in nature. The ultraviolet (UV) radiation from the sun creates ozone photo-chemically in the outer limits of the atmosphere. Ozone is also created near ground level by lightning during electrical storms. Ozone generators simulate the short wavelength ultraviolet radiation of the sun with specially designed quartz lamp and ballast systems.

Oxygen molecules ( $O_2$ ) contained in the air passing across these lamps, are energized and split into single oxygen atoms ( $O_1$ ). These  $O_1$ 's are highly reactive and combined with additional  $O_2$  form Ozone ( $O_3$ ). This photochemical method of producing ozone is safe and efficient.

Ozone has proven to be a very effective supplement for conventional chemicals to provide cleaner, healthier water and to significantly reduce undesirable chemical by-products.

## SILENT SENTRY

The Silent Sentry is a remote monitoring system exclusively available on spas from Great Lakes. A color-changing LED mounted on the exterior of the spa cabinet provides a quick visual indicator of your control system status. It is even visible in bright daylight. The light shines green when electrical power is supplied to the system. The color changes to blue when the system starts a filtration cycle and turns red whenever the heater is on.

# WATER CARE

Your Great Lakes Spa is equipped with what we believe is the finest filtering device available. We call it the Skim/Filter system, and it is one of the few skimmers available which actually skims the water surface. When your spa is operating, watch how the Skim/Filter bobs up and down with the water level. You'll notice a distinct whirlpool being drawn into the system, and floating debris of all sizes will literally "fall" into the unit and be trapped by the filter. It is important that you keep your filter clean, and it is suggested that you check the filter at least once per month and replace it when it becomes loaded with dirt or debris.

## **Filter Basket and Cartridge Removal and Replacement Procedure**

1. Turn off electrical power to the spa.
2. Remove the floating weir and attached basket by rotating it counterclockwise to align the flat tabs on the filter housing flange with the flat areas on the floating weir and basket assembly, then lift out the assembly.
3. Lift the filter cartridge straight up and out of the filter housing, quickly moving it away from the tub to prevent collected debris from falling back into the water.
4. Separate the floating weir from the basket by rotating it counterclockwise to align the notches on the floating weir flange with the tabs on the top of the basket, then simply pull them apart.
5. Clean any accumulated debris from the basket. Avoid hitting the basket against objects to knock debris loose, as this will break the basket.
6. Re-attach the basket to the floating weir.
7. Install a new filter cartridge in the filter housing.
8. Reinstall the floating weir and attached basket assembly.
9. Turn electrical power to your spa back on.



# CONSUMER NOTICE

## **Chemicals**

Due to the warm temperatures in your spa, you must properly test and maintain your spa water for health and appearance reasons. Chemical imbalance can cause skin irritations, and dirty water is both unsightly and undesirable to soak in. With little effort you can have clean water for your constant enjoyment. This is attained through the use of spa chemicals, a superb filter system and the optional ozonator. Consult your dealer to set up a proper water treatment program that will work best with the equipment in your spa.

**CAUTION:** Always follow the water treatment chemical manufacturer's instructions when treating your water. Higher than normal concentrations of certain chemicals can degrade or cause permanent damage to your spa. When introducing chemicals into the water, never pour them directly into the filter.

Be aware that the mineral content of spa water increases from water evaporation and with the addition of algaecidal and sanitizing chemicals. If the mineral concentration of the water becomes too high, the minerals will precipitate and deposit on the spa, in the filter, and on the heater. The water must be changed when the amount of dissolved solids becomes excessive. Algaecidal and sanitizing chemicals are either alkaline or acidic. Sodium and calcium hypochlorite are alkaline. Chlorine gas and practically all other dry chlorine products are acidic. Whichever type of chlorine is used, it is very important that the pH level be checked frequently and maintained between 7.2 and 7.8.

**CAUTION:** Do NOT store spa or pool chemicals near the equipment module because their corrosive fumes may cause damage. Change the spa water frequently, typically every 3 to 4 months or when the water clarity and cleanliness can no longer be maintained by chemical treatment. It is recommended that the total alkalinity of the spa water be kept from 80 to 100 parts per million (ppm) when sodium or calcium hypochlorites are used, and 100 to 120 ppm when other dry chlorine products are used.

# TROUBLESHOOTING

- **Equipment Module Will Not Operate**

- Make sure the spa control is plugged into the circuit board of the equipment module.
- Check the main circuit breaker panel. If the GFCI or circuit breaker has tripped, reset the breaker. If the circuit breaker trips repeatedly, contact your dealer.
- Turn the circuit breaker, or switch, supplying power to the equipment module OFF then ON.
- If breaker continues to trip, check with your electrician to be sure the proper amperage breaker was installed.

- **Pump Will Run But There Is No Water Flow**

- Make sure all valves are in the open position.
- Make sure the filter is clean.
- Make sure the suction intake covers are free of debris.
- Make sure the water level of the spa is at least 2" above the skim filter.
- Check to make sure all adjustable flow-type jets are turned open.

- **Pump Runs And There Is Water Flow But No Heat**

- Press the temperature set button to increase temperature. Do NOT expect to feel hot water coming from the jets.
- Make sure all valves are open to allow full water flow through the system. Limited water flow will NOT build enough pressure to allow the heater to come on.
- Clean the filter to assure maximum water flow.
- The system is equipped with a heater delay switch that will prevent heater operation from occurring for approximately 20 seconds after the pump starts. Make sure the pump has been operating for at least 20 seconds.

- **Pulsating Or Minimal Water Flow In High Speed Mode**

- Make sure water level of the spa is at least 2" above the skim filter.
- Be sure jets are turned open (see "Operation" section).
- Make sure all valves are open.
- Make sure the filter element is clean.
- Make sure the suction intake covers are free of debris.

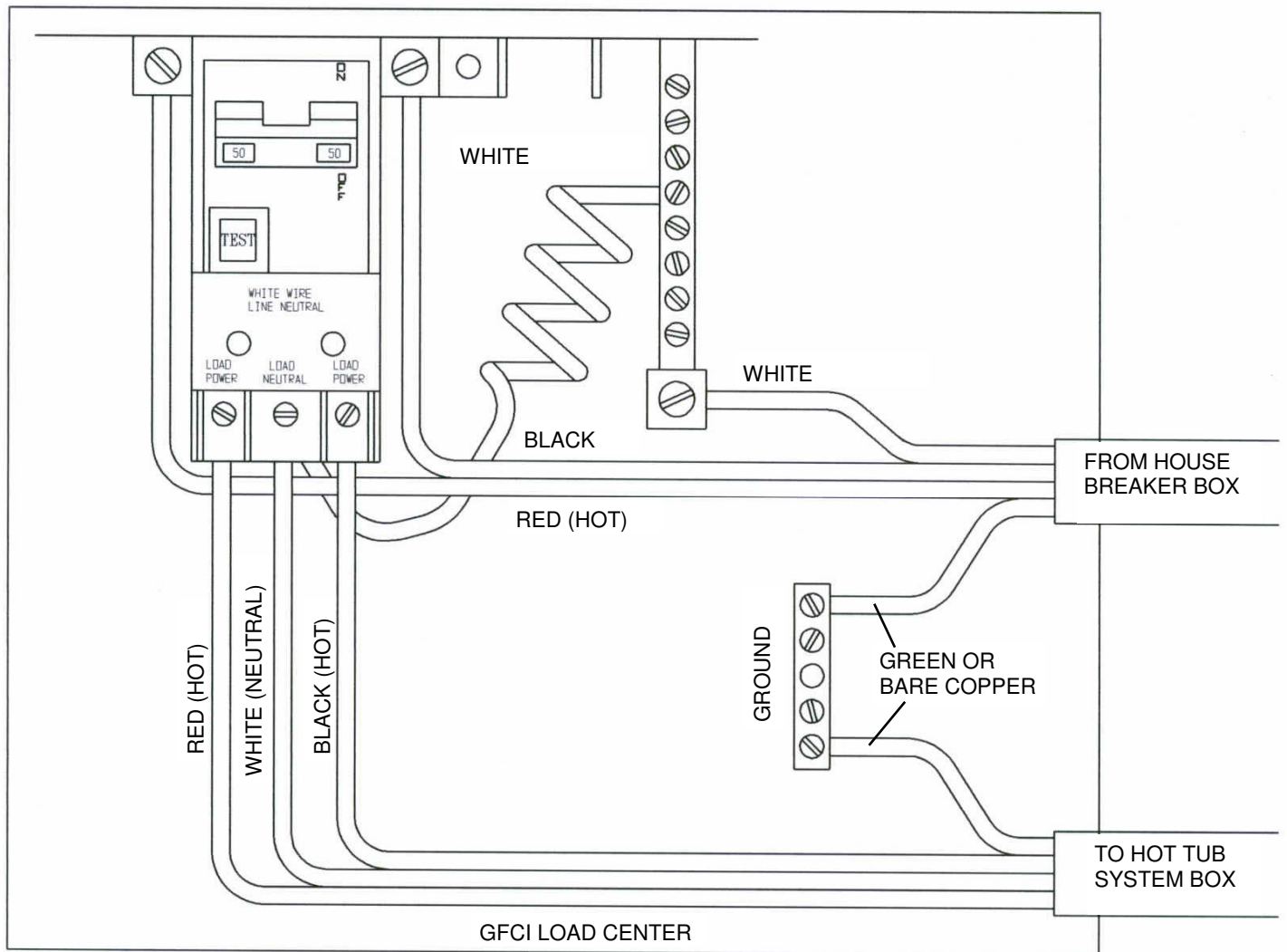
- **Ozone Bubbles Are Not Coming Out Of Ozone Jet**

- Make sure the lever of the Diverter Valve (if equipped) is not in the center position.

- **Pump Vibrates Excessively**

- Check for loose screws on equipment module face and bolts attaching equipment module to frame.
- Make sure spa is not touching or rubbing against anything such as a deck rail, house, etc.
- Air may be trapped in pump housing. Turn pump off. Slightly loosen the pump unions. With a towel covering the area (water will splash) turn the pump on for 3-5 seconds to bleed air out of pump housing. Turn pump off and tighten the unions. Repeat if necessary.
- Make sure that the spa has been installed on a properly supported surface.

# GFCI LOAD CENTER WIRING



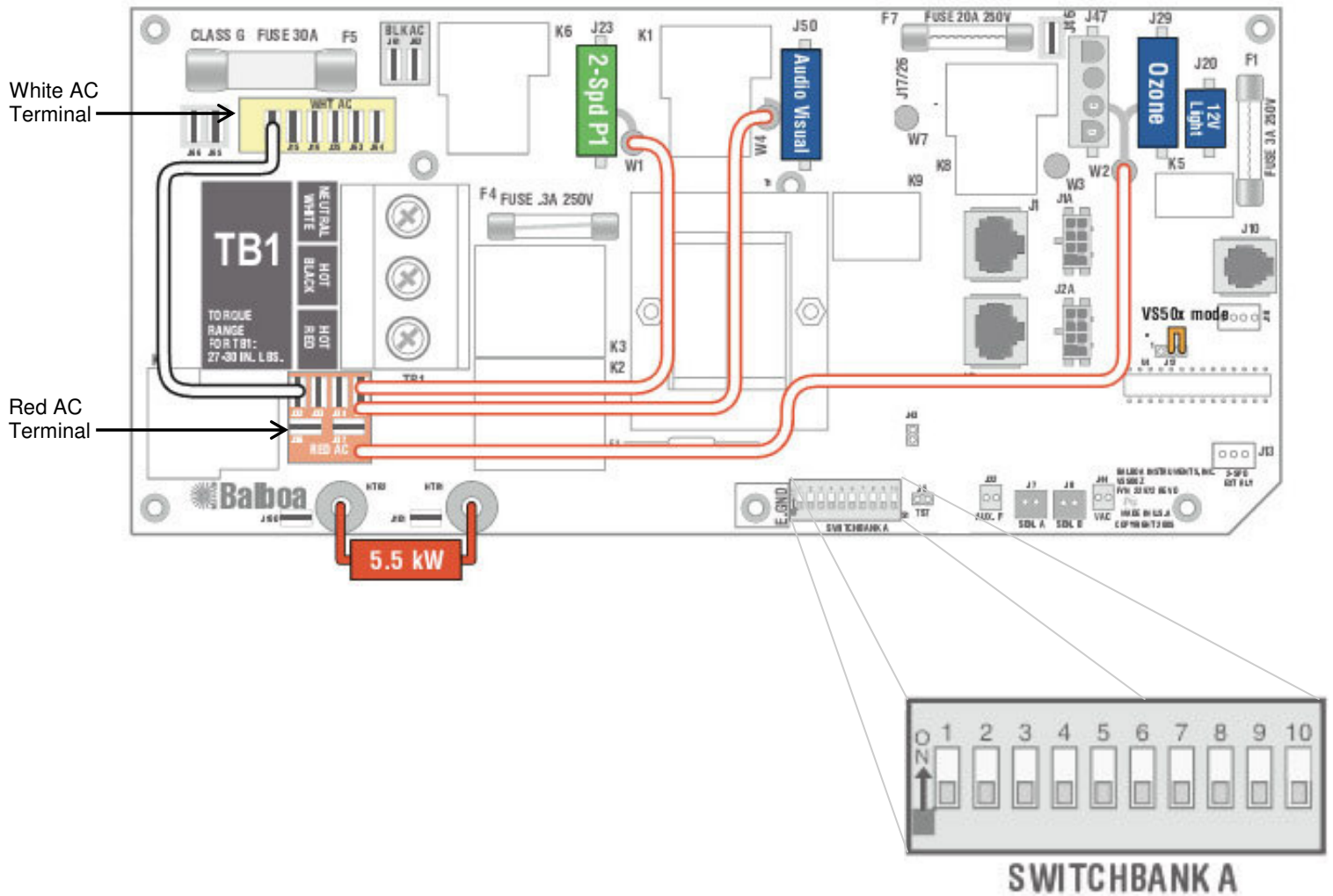
NOTE:

The white neutral wire from the back of 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.

IMPORTANT NOTE:

Installation of this GFCI-Circuit Breaker, including ampere sizing and selection of conductor size and type, must be accomplished by a qualified electrician in accordance with the National Electrical Code, or the Canadian Electrical Code, and all federal, state and local codes and regulations in effect at the time of installation.

# 120 VOLT TO 240 VOLT WIRING CONVERSION

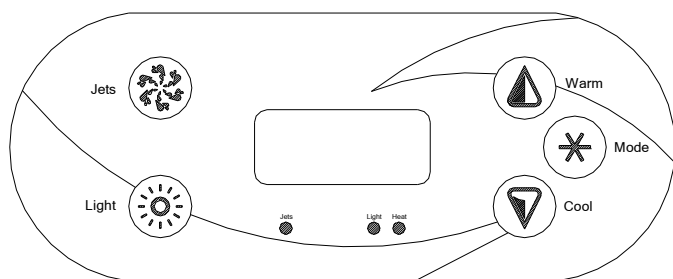


## INSTRUCTIONS FOR CONVERTING HEATER FROM 120V TO 240V

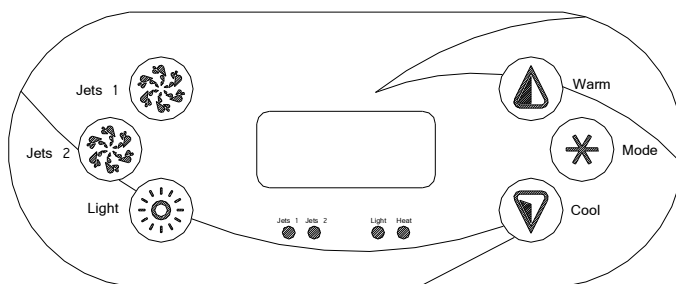
These instructions pertain only to those spas furnished with a factory installed 120 volt GFCI power cord. It is possible to convert these systems to 240 volt operation to improve the efficiency of the heater. The following instructions must be carefully followed.

1. The conversion must be made by a qualified, licensed electrician in accordance with national and local electrical codes.
2. Permanently connected units must be protected with a ground fault circuit interrupter (GFCI).
3. Unplug or disconnect power to the spa and remove the wiring or power cord from the power input terminals (TB1) on the circuit board.
4. Remove and discard the jumper wire installed on the circuit board between the WHITE AC and RED AC terminals .
5. Install the 240V power supply cables to the power input terminals (TB1) on the circuit board.
6. Set DIP switch 10 to the OFF (High Amp) position located on Switchbank A.

# CONTROL PANEL INSTRUCTIONS FOR GVS500SZ & GVS511SZ SYSTEMS



(One pump control panel shown)



(Two pump control panel shown)

**The adjustable temperature range is 80°F - 104°C / 26°C - 40°C**

## Initial Start-up

When your spa is first actuated, it will go into priming mode, indicated by "PR". The priming mode will last for less than 5 minutes (press "Warm" or "Cool" to skip priming mode) and then the spa will begin to heat and maintain the water temperature in the Standard Mode. The start-up temperature is set at 100°F / 37°C. The last measured temperature is constantly displayed on the LCD.

**NOTE that the last measured spa temperature displayed is current only when the pump has been running for at least 2 minutes.**

To display the set temperature, press the "Warm" or "Cool" button once. To change the set temperature, press the button a second time before the LCD stops flashing. Each press of the "Warm" and "Cool" button will continue to either raise or lower the set temperature.

## Jets 1

Press the "Jets 1" button once to activate the low speed of the pump and again for the high speed. Press the "Jets 1" button again to turn off the pump. If left running, the low speed of the pump will automatically turn off after 4 hours, and the high speed will automatically turn off after 15 minutes. The low speed of the pump runs when pump 2 is on. It may also activate for at least 2 minutes every 30 minutes to detect the spa temperature and then to heat to the set temperature if needed.

## Jets 2 (Two pump spas only)

If your spa has a second pump installed, press the "Jets 2" button once to turn pump 2 on or off, and to shift between low and high speeds. If left running, pump 2 will automatically turn off after 15 minutes.

## Light

Press the "Light" button to turn the light on and off. If left on, the light automatically turns off after 4 hours.

## Mode

Mode is changed by pressing the "Warm" or "Cool" button, then pressing the "Mode" button.

**Standard Mode** is programmed by default to maintain the desired temperature. "STD" will be displayed momentarily when you switch into Standard Mode.

**Economy Mode** heats the spa to the set temperature only during filter cycles. "ecn" will display solid when temperature is not current, and will alternate with temperature when temperature is current.

**Sleep Mode** heats the spa to within 20°F / 10°C of the set temperature only during filter cycles. "slp" will display solid when temperature is not current, and will alternate with temperature when temperature is current.

## Preset Filter Cycles

The first filter cycle begins 6 minutes after the spa is energized. The second filter cycle begins 12 hours later. Filter duration is programmable for 2, 4, 6, 8, hours or for continuous filtration (indicated by "F1 LC"). The default filter time is 2 hours.

To program, press "Warm" or "Cool" then "Jets 1". Press "Warm" or "Cool" to adjust. Press "Jets 1" to exit programming.

The low speed of the pump will run during the filtration and the ozone generator (if installed) will be enabled.

## Freeze Protection

If the temperature sensors detect a drop to below 44°F / 6.7°C within the heater, the pumps will automatically activate to provide freeze protection. The equipment stays on until 4 minutes after the sensors detect that the spa temperature has risen to 45°F / 7.2°C or higher. In colder climates, an optional additional freeze sensor may be added to protect against freeze conditions that may not be sensed by the standard sensors. Aux freeze sensor protection acts similarly except with the temperature thresholds determined by the switch and without a 4 minute de-

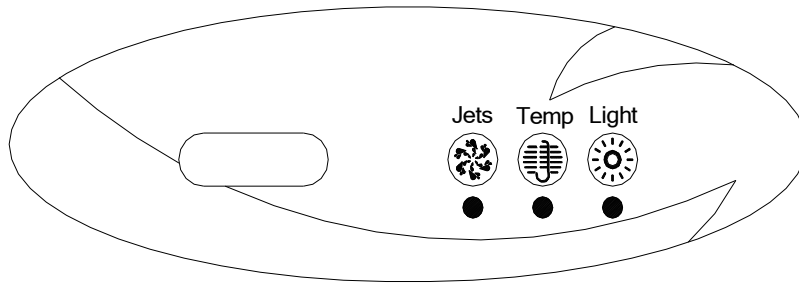
# DIAGNOSTIC MESSAGES

MESSAGE	MEANING	ACTION REQUIRED
--	No message on display. Power has been cut off to the spa.	The control panel will be disabled until power returns. Spa settings will be preserved until next power up.
OH	Temperature unknown.	After the pump has been running for 2 minutes, the temperature will be displayed.
H	"Overheat" - The spa has shut down. One of the sensors has detected 118°F / 48°C at the heater.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pressing any button. If spa does not reset, shut off the power to the spa and call your dealer.
Oh	"Overheat" - The spa has shut down. One of the sensors has detected that the spa water is 110°F / 43°C.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107°F / 42°C, the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer.
ICE	"Ice" - Potential freeze condition detected.	No action required. The pump will automatically activate regardless of spa status.
Sna	Spa is shut down. The sensor that is plugged into the sensor "A" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)
Snb	Spa is shut down. The sensor that is plugged into the sensor "B" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)
Sns	Sensors are out of balance. If alternating with spa temperature, it may just be a temporary condition. If flashing by itself, spa is shut down.	If the problem persists, contact your dealer or service organization.
Hfl	A significant difference between temperature sensors has been detected. This could indicate a flow problem.	Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. If problem persists, contact your dealer or service organization.
Lf	Persistent low flow problems. (Displays on the fifth occurrence of "HFL" message within 24 hours.) Heater is shut down, but other spa functions continue to run normally.	Follow action required for "HFL" message. Heating capability of the spa will not reset automatically; you may press any button to reset.
	Possible inadequate water, poor flow, or air bubbles detected in the heater. Spa is shut down for 15 minutes.	Check water level in spa. Refill if necessary. If water level is okay, make sure pumps have been primed. Press any button to reset, or this message will automatically reset within 15 minutes. If problem persists, contact your dealer or service organization.
	Inadequate water detected in heater. (Displays on third occurrence of "DR" message.) Spa is shut down.	Follow action required for "DR" message. Spa will not automatically reset. Press any button to reset.

## Warning! Shock Hazard! No User Serviceable Parts.

Do not attempt service of this control system. Contact your dealer or service organization for assistance. Follow all owner's manual power connection instructions. Installation must be performed by a licensed electrician and all grounding connections must be properly installed.

# CONTROL PANEL INSTRUCTIONS FOR GVS500 SYSTEM



**The adjustable temperature range is 80°F - 104°C / 26°C - 40°C**

## Initial Start-up

When your spa is first actuated, it will go into priming mode, indicated by "PR". The priming mode will last for less than 5 minutes (press "Temp" to skip priming mode) and then the spa will begin to heat and maintain the water temperature in the Standard Mode. The start-up temperature is set at 100°F / 37°C. The last measured temperature is constantly displayed on the LCD.

**NOTE that the last measured spa temperature displayed is current only when the pump has been running for at least 2 minutes.**

To display the set temperature, press the "Temp" button once.

To change the set temperature, press the button a second time before the LCD stops flashing. Each press of the "Temp" button will continue to either raise or lower the set temperature. If the opposite direction is desired, release the button and let the display revert to the current water temperature. Press the button to display the set temperature, and again to make the temperature change in the desired direction.

After three seconds, the LCD will stop flashing and display the current spa temperature.

## Jets

Press the "Jets" button once to activate the low speed of the pump and again for the high speed. Press the "Jets" button again to turn off the pump. If left running, the low speed of the pump will automatically turn off after 4 hours, and the high speed will automatically turn off after 15 minutes. It may also activate for at least 2 minutes every 30 minutes to detect the spa temperature and then to heat to the set temperature if needed. When the low speed turns on automatically, it cannot be deacti-

## Light

Press the "Light" button to turn the light on and off. If left on, the light automatically turns off after 4 hours.

## Preset Filter Cycles

The first filter cycle begins 6 minutes after the spa is energized. The second filter cycle begins 12 hours later. Filter duration is programmable for 2, 4, 6, 8, hours or for continuous filtration (indicated by "Fc"). The default filter time is 2 hours.

To program, press "Temp", then "Jets". Press "Temp" to adjust. Press "Jets" to exit programming.

The low speed of the pump will run during the filtration and the ozone generator (if installed) will be enabled.

## Freeze Protection

If the temperature sensors detect a drop to below 44°F / 6.7°C within the heater, the pump will automatically activate to provide freeze protection. The equipment stays on until 4 minutes after the sensors detect that the spa temperature has risen to 45°F / 7.2°C or higher. In colder climates, an optional additional freeze sensor may be added to protect against freeze conditions that may not be sensed by the standard sensors. Aux freeze sensor protection acts similarly except with the temperature thresholds determined by the switch and without a 4 minute delay in turnoff. See your dealer for details.



# DIAGNOSTIC MESSAGES

## MESSAGE

## MEANING

## ACTION REQUIRED

--

HH

Oh

IC

Sa

Sb

Sn

Hl

Lf

Dr

No message on display. Power has been cut off to the spa.

Temperature unknown.

"Overheat" - The spa has shut down. One of the sensors has detected 118°F / 48°C at the heater.

"Overheat" - The spa has shut down. One of the sensors has detected that the spa water is 110°F / 43°C.

"Ice" - Potential freeze condition detected.

Spa is shut down. The sensor that is plugged into the sensor "A" jack is not working.

Spa is shut down. The sensor that is plugged into the sensor "B" jack is not working.

Sensors are out of balance. If alternating with spa temperature, it may just be a temporary condition. If flashing by itself, spa is shut down.

A significant difference between temperature sensors has been detected. This could indicate a flow problem.

Persistent low flow problems. (Displays on the fifth occurrence of "HL" message within 24 hours.) Heater is shut down, but other spa functions continue to run normally.

Possible inadequate water, poor flow, or air bubbles detected in the heater. Spa is shut down for 15 minutes.

Inadequate water detected in heater. (Displays on third occurrence of "DR" message.) Spa is shut down.

The control panel will be disabled until power returns. Spa settings will be preserved until next power up.

After the pump has been running for 2 minutes, the temperature will be displayed.

DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pressing any button. If spa does not reset, shut off the power to the spa and call your dealer.

DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107°F / 42°C, the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer.

No action required. The pump will automatically activate regardless of spa status.

If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)

If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)

If the problem persists, contact your dealer or service organization.

Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. If problem persists, contact your dealer or service organization.

Follow action required for "HL" message. Heating capability of the spa will not reset automatically; you may press any button to reset.

Check water level in spa. Refill if necessary. If water level is okay, make sure pumps have been primed. Press any button to reset, or this message will automatically reset within 15 minutes. If problem persists, contact your dealer or service organization.

Follow action required for "DR" message. Spa will not automatically reset. Press any button to reset.

## Warning! Shock Hazard! No User Serviceable Parts.

Do not attempt service of this control system. Contact your dealer or service organization for assistance. Follow all owner's manual power connection instructions. Installation must be performed by a licensed electrician and all grounding connections must be properly installed.

# Thank You!

The employees of Great Lakes Spas would like to extend their sincere thanks to you for purchasing a Great Lakes Spa.

We hope that you, your family, and friends will experience many enjoyable years of fun and relaxation in your Great Lakes Spa.

Please fill in the following information, it will be very important should you ever have questions or concerns regarding your spa.

## Your Great Lakes Spa Dealer

Dealership \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_  
Phone \_\_\_\_\_ Fax \_\_\_\_\_  
E-mail \_\_\_\_\_  
Contact Person \_\_\_\_\_

## Your Spa

Model Purchased \_\_\_\_\_  
Date Purchased \_\_\_\_\_  
Serial Number \_\_\_\_\_  
Colors \_\_\_\_\_  
Spa Shell \_\_\_\_\_  
Cabinet \_\_\_\_\_  
Cover \_\_\_\_\_

## Notes:

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## **GREAT LAKES SPAS** **LIMITED WARRANTY**

Emerald Spa Corporation, manufacturer of Great Lakes Spas, ("Emerald Spa Corporation") extends this Limited Warranty solely to the original consumer purchaser of any Great Lakes Spa manufactured in the U.S.A. and installed in the U.S.A. or Canada after July 1, 2006.

### **TEN-YEAR STRUCTURAL WARRANTY**

Emerald Spa Corporation warrants (parts and labor) the spa shell against water loss due to defects in the spa shell for a period not to exceed the lesser of ten (10) years from the date of purchase or ten (10) years six (6) months from the date of manufacture.

### **FIVE-YEAR SURFACE WARRANTY**

Emerald Spa Corporation warrants (parts and labor) the spa surface against cracks or blisters caused by defective materials or workmanship for a period not to exceed the lesser of five (5) years from the date of purchase or five (5) years six (6) months from the date of manufacture. Excluded from this warranty are the cosmetic damages or conditions arising from abuse, misuse, normal wear or acts of God.

### **THREE-YEAR COMPONENT WARRANTY**

Emerald Spa Corporation., warrants the mechanical equipment, plumbing, fittings, and controls against defects in workmanship for a period not to exceed the lesser of three (3) years from the date of purchase or three (3) years six (6) months from the date of manufacture. Damage caused by improper electrical hook-up or wiring voids the warranty. Travel, trip, or mileage costs are not covered under this warranty and service travel charges will be assessed to the purchaser by the dealer. Notwithstanding anything in this paragraph to the contrary, Emerald Spa Corporation warrants stainless steel components for the earlier of one hundred eighty (180) days from the date of purchase or two (2) years from the date of manufacture.

### **EXTENT OF WARRANTY**

This warranty extends only to the original "consumer" purchaser of the spa as that term is defined in the Magnuson-Moss Warranty Act, 15 USC Section 101, as amended. This warranty terminates upon: (1) transfer of ownership of the spa; (2) rental of the spa; (3) rental of the premises where the spa is located; or (4) commercial or public use of the spa. Warranty coverage shall not extend for any reason beyond the stated periods.

### **WARRANTY PERFORMANCE**

In the event of any malfunction or defect covered by this warranty, contact the authorized dealer from whom you purchased your spa. All service work must be performed by an authorized dealer or an authorized agent of Emerald Spa Corporation. In the event there is not an authorized dealer or repair firm in your area, the spa can be returned pre-paid freight (you pay) to Emerald Spa Corporation for evaluation and, if necessary, repair of the defect. Emerald Spa Corporation will then ship the spa back to you pre-paid (Emerald Spa Corporation pays) upon completion of the repair. In the event the spa needs to be returned to Emerald Spa Corporation for repair, contact Emerald Spa Corporation in advance at: 4150 East Paris Avenue, Kentwood, Michigan, 49512, phone number: (800) 766.7727, for packaging and shipping instructions. In addition, Emerald Spa Corporation reserves the right to inspect or designate a person to inspect any part that is claimed to be defective and covered by this warranty. For any warranty service of components, Emerald Spa Corporation reserves the right to choose at its option repair of the problem or a replacement of the defective component. You are responsible to provide adequate access to the spa, equipment, and plumbing. Emerald Spa Corporation, its dealers or agents will not perform service on spas where conditions are unclean, unsafe or potentially unhealthy due to abuse, neglect, or improper maintenance. With regard to spa surface warranty repairs, cracks or blisters will be repaired so as to prevent damage to or leakage from the spa shell. No warranty is made that the color or texture of the repair will match the original surface. Emerald Spa Corporation reserves the right to substitute a part or component of equivalent value, either new or reconditioned, and any such repair or replacement shall assume as its warranty only the remaining portion of the warranty on the original product. Travel, trip, and mileage costs are not covered under this warranty and these charges will be assessed to you.

### **ACTS INVALIDATING WARRANTY**

This warranty is void if the spa has been subject to alteration, misuse or abuse, or if any repairs to the spa are attempted by anyone other than an authorized representative of Emerald Spa Corporation. Alteration shall include but is not limited to any component or plumbing change, electrical conversion, or the addition of any non-approved sanitation or water purification device or heating system, which contributes to a component or unit failure, or unsafe operation system. Use of the spa in an application for which it is not designed will void this warranty. **CORROSION OR DEGRADATION TO THE SPA SHELL, SURFACE, FITTINGS, STAINLESS ACCENTS, ELECTRONICS, PUMP AND ALL OTHER COMPONENTS THAT ARE CAUSED BY IMPROPER USE OF CHEMICALS AND/OR WATER TREATMENT ARE NOT COVERED UNDER THIS WARRANTY.** Damages caused by the following also void this warranty: operation of the spa at water temperatures outside the range of 50 degrees F. to 104 degrees F.; dirty, clogged or calcified filter cartridges; a defective Support System (must be on a solid, flat, level surface); harsh chemicals which are not recommended by the plastic manufacturer which come into contact with the spa surface; allowing undissolved spa sanitizing chemicals to come into contact with the spa surface; improper water chemistry maintenance; allowing the spa to remain uncovered in direct sunlight; freezing conditions; moving or relocating the spa; improper electrical hook-up or wiring; and acts of God or other damages caused to the spa which are outside the control of Great Lakes.

### **DISCLAIMERS**

**Any implied warranties arising out of your purchase of the spa, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, are limited in duration equal to the duration of the applicable warranty stated above. Emerald Spa Corporation 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, the removal of or reinstallation of a wall, deck or other fixture, water leakage, costs of shipping or packaging, applicable taxes, or the payment of any costs or expenses of disassembly, removal, or reinstallation of the spa or any part. Under no circumstances shall Emerald Spa Corporation or its representatives be held liable for injury to any person or damage to any property, however arising, even if caused by Emerald Spa Corporation or its representatives' negligence.** Some states do not allow limitation on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages, so these limitations or exclusions may not apply to you. These warranties give you specific legal rights, and you may also have other rights, which vary from state to state. **No distributor, salesperson, dealer, retailer, or other representative of Emerald Spa Corporation other than its President in writing has the authority to alter or change these warranties either orally or in writing.**

