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READ AND FOLLOW ALL IMPORTANT SAFETY INSTRUCTIONS.

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

READ AND FOLLOW ALL INSTRUCTIONS.

1. **WARNING:** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
2. **DANGER: RISK OF ACCIDENTAL DROWNING.** Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use a spa or hot tub unless they are supervised at all times.
3. **DANGER: RISK OF INJURY.**
For cord connected units:
 - a. Replace damaged cord immediately.
 - b. Do not bury cord.
 - c. Connect to grounded, grounding-type receptacle only.
4. **DANGER:** Risk of injury. Do not remove the suction fittings. The suction fitting in this spa is sized to match the specific water flow created by the pump. Should the need arise to replace the suction fitting or the pump, be sure that the flow rates are compatible. Never operate spa if the suction fitting is broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the original suction fitting.
5. **DANGER:** To reduce the risk of drowning from hair or body entrapment, install a suction fitting(s) with a marked flow rate in gallons per minute that equals or exceeds the flow rate marked on the equipment assembly, if replacement of suction fitting(s) becomes necessary.
6. For cord and plug connected units: **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION REQUIRED.** All spa equipment systems must be protected by a ground fault circuit interrupter (G.F.C.I.) in accordance to the National Electrical Code. A cord mounted G.F.C.I. is supplied with the spa support pack equipment.
7. For permanently installed units: **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION IS REQUIRED.** All spa equipment systems must be protected by a ground fault circuit interrupter (G.F.C.I.) in accordance to the National Electrical Code. A G.F.C.I. type circuit breaker must be installed in the panel box by a qualified electrician when making wire connection to the spa support pack equipment.

8. For permanently installed units only: A green-colored terminal (or wire connector marked "G," "GR," "Ground," or "Grounding") is provided within the control box. To reduce the risk of electric shock, connect this terminal or connector to the grounding terminal of your electric service or supply panel with a continuous green insulated copper wire equivalent in size to the circuit conductors supplying this equipment, but no smaller than No. 12 AWG (3.3 mm²). In addition, a second wire connector is provided for bonding to local ground points. To reduce the risk of electric shock, this connector should be bonded with a No. 8 AWG (8.4 mm²) copper wire to any metal ladders, water pipes, or other metal within 5 feet (1.52 m) of the tub.
9. Install to provide drainage for compartments of electrical components.
10. For floor recessed spas: Install to permit access for servicing from above or below the floor. Spa equipment must be installed below water level.
11. When planning your spa installation site, prepare for the unlikely event of rapid spa drainage.
12. A pressure wire connector is provided in the control box inside the unit to permit connection of a minimum No. 8 AWG (8.4 mm²) solid copper bonding conductor between this point and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 5 feet (1.5 m) of the unit, as needed to comply with local requirements.
13. **DANGER: RISK OF ELECTRIC SHOCK:** Install spa at least 5 feet (1.52 m) from all metal surfaces. (A spa may be installed within 5 feet of metal surfaces if, in accordance with the National Electrical Code, ANSI/NFPA, each metal surface is permanently connected by a No. 8 AWG (8.4 mm²) copper conductor attached to the wire connector on the terminal box provided for this purpose. **ALL SPA SUPPORT EQUIPMENT MUST BE GROUND FAULT CIRCUIT INTERRUPTER (G.F.C.I.) PROTECTED AT THE POWER SOURCE.**
14. **WARNING:** Risk of suffocation. For spas with gas heaters only. This spa is equipped with a gas heater and is intended for outdoor use only unless proper ventilation can be provided for an indoor installation.
15. **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. Keep electrical appliances and extension cords away from the spa. Water is a conductor of electricity.
16. Enter and leave spa slowly and with caution. Surfaces around spa will be wet and slippery.
17. **WARNING – TO REDUCE THE RISK OF INJURY:**
 - A) The water in a spa or hot tub 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 extended use (exceeding 10-15 minutes) and for young children.
 - 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 or hot tub

temperatures to 38°C (100°F).

C) Before entering a spa or hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature regulating devices may vary as much as 3°C (5°F).

D) THE USE OF ALCOHOL, DRUGS, OR MEDICATION BEFORE OR DURING SPA OR HOT TUB USE MAY LEAD TO UNCONSCIOUSNESS WITH THE POSSIBILITY OF DROWNING.

E) Persons suffering from obesity or with a medical history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa or hot tub.

F) Persons using medication should consult a physician before using a spa or hot tub since some medication may induce drowsiness while other medication may affect heart rate, blood pressure, and circulation.

18. Never use the spa alone.

19. **WARNING:** "The use of alcohol, drugs or medication can greatly increase the risk of fatal 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 the spa
3. Unawareness of impending hazard
4. Fetal damage in pregnant women
5. Physical inability to exit the spa
6. Unconsciousness resulting in the danger of drowning.

21. For controls other than underwater lighting circuits:

A ground fault circuit interrupter (G.F.C.I.) must be provided if this device is used to control an underwater lighting fixture. The conductors on the load side on the ground fault circuit interrupter shall not occupy conduit, boxes, or enclosures containing other conductors unless the additional conductors are also protected by a ground fault circuit interrupter.

20. For all permanently connected units not provided with an integral disconnecting means: The electrical supply for this product must include a suitably rated switch or circuit breaker to open all undergrounded supply conductors to comply with Section 422-20 of the National Electrical Code, ANSI/NFPA. The disconnecting means must be readily accessible to the tub occupant but installed at least 5 feet (1.5 m) from tub water.

22. **WARNING:** Do not place spa in direct sunlight while unit is empty or when sealed in shipping materials. Excessive heat buildup may cause damage to spa and void warranty.

23. For spas with audio/video components:

A) CAUTION – Risk of Electric Shock. Do not leave compartment door open;

B) CAUTION – Risk of Electric Shock. Replace components only with identical components; and

C) Do not operate the audio/video controls while inside the spa.

D) **WARNING – Prevent Electrocution.** Do not connect any auxiliary components (for example cable, additional speakers, headphones, additional audio/video components, etc.) to the system.

E) 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.

F) 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.

G) When the power supply connections or power supply cord(s) are damaged; if water is entering the audio/video compartment or any electrical 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.

H) This unit should be subjected to periodic routine maintenance (for example, once every 3 months) to make sure that the unit is operating properly.

24. For your protection, a safety sign has been mounted on the outside of the spa cabinet. An additional sign has been included within this spa informational packet that should be placed where visible to spa occupants. Additional copies can be obtained from your spa retailer or directly from HTH Spas.

25. **SAVE THESE INSTRUCTIONS!**

LOCATION

The location of your spa is very important in order for you to achieve maximum enjoyment from your spa. Generally, spas belong outdoors. Locating a spa indoors increases your risk of indoor flooding. Please consider the following:

OUTDOOR INSTALLATIONS

1. Local electrical and plumbing codes.
2. Consider local codes pertaining to fencing, enclosures, walls, electrical and plumbing. You will need to ensure that your spa is an adequate distance from power lines, both above ground and underground. Your spa will also need to be childproofed (covered and of adequate height).
3. View from house for aesthetics and supervisory needs.
4. Distance from house for wintertime soaking.
5. Nighttime lighting.
6. Locate the spa with an awareness to sunlight exposure, views, access, lot lines, lighting, wind direction, shielding, septic tanks, plants, trees. (Chemicals in the spa water splashed from within your spa may damage plant life.)
7. Consider the location of the nearest bathroom.
8. If your spa is to be located on a second story, be positive support is adequate. Call your builder.
9. Area for placement of support equipment where adequate space will be needed for periodic removing and cleansing of the cartridge filter, setting the time clock and general servicing.
10. Provide adequate drainage away from the equipment and adequate elevation to allow draining by syphon.
11. Location of electrical supply. 240 volt systems require hard wire installed from the electrical source to the spa support pack terminal; 120 volt systems have a 15 foot cord and require a 20 amp grounded "dedicated" circuit. Removal of the plug or use of an extension cord will void all warranties. **ALL EQUIPMENT MUST BE GROUND FAULT CIRCUIT PROTECTED AT THE POWER SOURCE.**
12. Venting for gas heated systems.
13. Locations at least 5 feet (1.52 m) from all metal surfaces. (A spa may be installed within 5 feet of metals surfaces, if, in accordance with Article 680 of the National Electrical Code, ANSI/NFPA 70-1984, each metal surface is permanently connected by a No. 8AWG (8.4 mm²) copper conductor attached to the wire connector on the terminal box provided for this purpose.)
14. Place the spa on a firm, level surface that will not shift.

INDOOR INSTALLATIONS

1. Local electrical and plumbing codes.
2. Ventilation fans and/or dehumidifiers should be provided to handle the high humidity developed by your spa. Walls, ceiling and wood trim should be

resistant to high humidity.

3. Chemicals will vaporize from the water and may cause an odor and possibly corrosion to certain home hardware. Never store chemicals inside the spa cabinet.
4. During the normal use of the spa, water will escape the spa vessel. Never place the spa on or over any material which may be damaged by this water or the chemicals within the water. Keep damageable materials far enough away from the spa to avoid water damage, even if the spa should lose all its water.
5. Consider and prepare for the unlikely event of rapid spa drainage. If placement of the spa is permanent, you may wish to provide floor drains to accommodate draining, etc. Always leave room all around the spa for easy access in case repairs are necessary.
6. Consider and prepare for the unlikely event of spa removal.
7. Read 7-14 in the Outdoor Installations information.
8. Do not set spa on finished floor without a waterproof barrier protection underneath.

PARTS OF THE SPA

Hydro-jets: These are the wall fittings around the inside perimeter of the spa. They mix water with air to produce localized therapy, in a straight stream, circular motion or in random patterns for upper and lower back massage in the lounge and contoured seating areas.

Skimmer: This will appear at water level as a square inlet or vertical rectangle inlet. The skimmer traps surface debris. The water level in the spa should be kept at the center of the skimmer for best results. An additional skim filter may be installed on selected models for further water sanitation.

Suction: This is a circular fitting mounted on the vertical wall of the footwell and serves the same function as the skimmer. It works in conjunction with the skimmer to return water to the support equipment.

Air Controls: These are round fittings mounted on the lip of spa that control the amount of outside air mixed with the incoming water of the hydro-jet. Your spa has multiple air controls on the spa lip that control air pressure mix with a segment of jets.

Tri-Zone Therapy Diverter: Located on spa lip with tear-drop shape grip area. Turn to adjust pump power to selected jets which enhances water action through those jets by decreasing water action through others. Only selected spa designs have this feature.

Spa Light: Underwater low voltage light with three changeable colored lenses for night time spa enjoyment.

PARTS OF EQUIPMENT SYSTEM

The spa support pack contains up to five major components: either single or dual speed, that circulates the water through the hydro-jets and back through the suction; and a cartridge filter that physically removes debris from the water.

Your unit will be equipped with an electric heater. All components are operated by switching at spa side. Water is routed through the pump, filter (located on the pressure side of the pump for optimum filtration), heater and jets.

Pump: Your new spa has been equipped with a pump for hydrotherapy jet action and water filtration. The spa support pack features a dual-speed pump and, on some models an additional single speed pump. The filtration time required to maintain warm, clean water may vary from spa to spa. Generally, no less than six hours a day is recommended. The single-speed pump, if present, is activated by the JET2 control. The JET1 button can activate the pump at full speed at any time for hydrotherapy, even though turning off the pump at the JET1 button does not override the filtration cycle (low speed). For example, if the time clock has been programmed to circulate the system at a time when bathers are exiting the spa, the pump will continue to operate at low speed even though the jet button is pushed. The time clock will shut the pump off when programmed to do so. Your time clock also acts as a freeze protection unit. In severe weather, increase operation time to insure freezing of plumbing is avoided (i.e., never more than 30 minutes with circulation turned off).

Filter: Your HTH spa is equipped with a top-load pressure side filter. This assures optimum water filtering and ease of cleaning at spa side. Selected models, including the Futura Spas, also include a skim filter. Review the maintenance section of this manual for filter cartridge cleaning and replacement.

Heater: Your spa is equipped with thermostat control at spa side. Once you find the temperature you enjoy most, leave the thermostat at that setting, and the spa will automatically maintain the correct temperature, ready for your enjoyment any time of the day. Avoid constant resetting of the thermostat; it is more economical to *maintain* temperature, than to let the temperature fall and then wait during heat-up time before soaking.

Pump Key

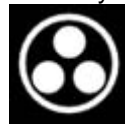
The Pump key is used to turn the pump on or off at selected speeds. If the pump is a single speed pump, the Pump key is used to turn it on and off. If the pump is a two speed pump, the first press will turn on the pump high speed, the second press will change the pump to low speed, the third press will turn the pump off or return to a heat or filtration mode (see note). A built-in timer will shut the pump off 20 minutes after it has been started

unless the user does so manually. When the pump is on, the Pump On Indicator will appear above the Pump Key. NOTE: You may not be able to turn the pump off if it has started an internal heat or filtration cycle. This is easily identified by observing the status of the "Heater On Indicator" or the "Filter Mode Indicator".



Auxiliary Key

The Auxiliary Key is used to turn the Auxiliary component on or off. The first press of the Auxiliary will turn it on. A second press will turn it off. The Auxiliary component will automatically turn itself off after 20 minutes. When the Auxiliary component is on, the Auxiliary On Light will appear above the Auxiliary Key.



Light Key

The Light key is used to turn light on or off. The first press of the Light key will turn the light on. A second press will turn the light off. The light will automatically turn itself off after 2 hours.



Filter Cycles

You may choose to filter your spa either 2 or 6 hours, twice daily, to maintain clean, sanitary water. It is recommended to filter 6 hours, twice daily, for heavy spa usage. 2 hours, twice daily, for normal or light spa usage. Monitor the conditions of your spa water to determine which cycle is right for you.

Changing Filter Cycle

Programming Filter Cycles: You may choose to filter the spa 1, 2 or 3 times per day as required to keep the water clean and sanitary. Press and hold the Pump Key. The current setting will be displayed. Press and hold the Temperature Set Key to increase or decrease the frequency of the filtration cycles per day. The filter cycle is now set. The cycles will repeat every 8, 12 or 24 hours within a 24-hour period starting from the time programmed. It is recommended to schedule the filtration cycle so they do not interfere with sleeping hours.

Programming Filter Cycle Duration: You may choose to filter your spa 60, 120, 180 or 480 minutes per cycle as required to keep the water clean and sanitary. Press and hold the Light Key. The current duration of the filter

cycle will be displayed. Press and hold the Temperature Set key to increase or decrease the duration of the filter cycle. The duration is now set. To start a filter cycle immediately, press and hold the Light Key.

Note: If a key is not pressed within 5 seconds during programming, the system will revert back to the monitoring mode. If the pump and/or light were turned on during the programming process, turn them off. The system will revert back to display the water temperature within 5 seconds.

Power Loss: Any interruption of power will cause the unit to reset and revert back to the default programming of 95°F set point temperature and 2, 2-hour filtration cycles.

***If the spa is being used during the Filter Cycle, the cycle will be suspended for a period of 40-minutes or until the spa is no longer in use.**

Note

The 2 or 6 hour filtration cycle will be repeated every 12 hours from the time that the system is powered up. It is recommended that the system is powered up at a time when the programmed cycles do not interfere with sleeping hours.

Default System Operations

When power is applied, or there is a temporary loss of power, the system will initiate its default programming. The filtration will continue per the jumper settings. The maintained temperature will default to 95°F. The freeze protection feature will stay in effect.

Temperature Set Key

The Temperature Set Key is used to set the desired water temperature. Press and hold this key to increase the desired temperature setting (press, release, then press and hold to decrease). The temperature can be adjusted in 1°F increments from 41°F to 104°F (or 5°C to 40°C.). The desired temperature setting will remain in the display for 5 seconds as confirmation of the new value, after 5 seconds the display will return to display the present water temperature.



Heater Operation

When the water temperature drops 1°F lower than the desired temperature, the heater will be turned on until the water temperature reaches the desired temperature plus 1°F. The Heater On Indicator will appear on the function panel when it is on. The Heater On Light Indicator will blink on the function panel whenever there

is a call for heat and the heater has not yet been powered.

Freeze Protection

If the water temperature falls below 40°F, the system will start a special process to circulate the water in the pipes. Pump and heater will be turned on for one minute. The message **FrE** will be displayed throughout the special cycle. During this cycle all other functions of the unit (except the alarms) are disabled.

High Temperature Protection

If the water temperature exceeds 115°F at the High Temperature probe, the system will display the message **HL** and will turn the heater off. If the water temperature exceeds 122°F at the High Temperature probe, the high limit circuit will turn off all outputs. In either case, after the water temperature has cooled down, pressing any key on the spaside panel control will restart the system. If the spa water temperature does not seem to be elevated, the **HL** reading may have been caused by poor water flow or electrical line interference (e.g. thunderstorms, voltage surges, etc.). Simply reset and monitor the system.

NOTE: After the unit cools down below 115°F, the Freeze Protection Circuit can automatically engage if needed.

ALL SYSTEMS REQUIRE THE INSTALLATION OF GROUND FAULT CIRCUIT INTERRUPTER PROTECTION (G.F.C.I.) BY A QUALIFIED ELECTRICIAN IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND LOCAL REGULATIONS.

Monthly testing of the GFCI is required. Refer to instructions under "Spa Maintenance."

240 Volt Systems

For all 240 volt support packs, the model number and components are listed on a label affixed to the support pack electrical box.

Model ECO-2: This support system is located beneath the end cabinet and provide easy access for servicing and maintenance. These support systems may feature an additional 24-hour circulation pump and skim filter. Note location of circulation pump behind spa cabinet prior to install.

1. All spa support systems are multiple supply circuits.
2. All 240 volt systems require the electrical supply to be protected by a Ground Fault Circuit Interrupter circuit breaker 50/60 amp G.F.C.I. 120/240 volt circuit breaker.
3. The electrical connection must be done by a

qualified electrician and conform with the National Electric Code as well as all local codes existing. The qualified electrician is to wire the 240 volt legs and neutral into the appropriately marked terminal found within the spa equipment control panel using #6-3 copper wire with ground. The ground wire must be inserted into the ground (bonding lug) found within the spa equipment control assembly.

4. The G.F.C.I. protection must be tested monthly. Refer to the maintenance section in this manual for instructions.

DISCONNECT ALL ELECTRICAL SUPPLY AND CONTACT A QUALIFIED TECHNICIAN FOR ALL SERVICING.

GENERAL START-UP

1. **Be sure that the power is turned off at the main circuit breaker.**
2. **Turn temperature knob to “off” setting (if equipped).**
3. **CAUTION: Electric heater element must be fully submerged in water before being energized.**
4. Fill spa to the recommended level, assuring all suction outlets are covered with water. (Third opening from top of Skimmer)
5. Make sure valves on the suction and return sides of the spa pump are open to allow water to flow to and from the spa and spa support system.
6. Carefully open the hose bib spigot on support pack to allow air to bleed from the system. Close the hose bib when a solid stream of water flows out. (On units without hose bibs, this bleeding may be done by loosening the suction unions at the slide valves and retightening them.)
7. Turn power “on” at main circuit breaker.
8. Press jet/pump button to “on” position to activate cycle.
9. Turn both air regulator knobs to “off” position.
10. When the system has fully primed, all the jets should be freely rotating and free of excess air; except the jet attached to ozone, if this option is included on the system. Allow the system to operate for five minutes in this position.
11. Turn the thermostat to the desired temperature to begin heating the spa water. The indicator light on the side of the heater terminal box will be “on” during heating cycle.
12. The economical, gradual heating of the water takes place over a number of hours, depending upon the size of the spa, size of the heater and the recommended use of a HTH spa cover. When the desired temperature is reached (not over 104°), leave the thermostat at this setting, the temperature will automatically be maintained. Re-check water temperature with an accurate thermometer before entering the spa.
13. Set the filtration program to desired setting. Review instruction particular to each spaside control.
 - A. Increase the filtration time periods during colder weather temperatures to guard against freezing.
 - B. Twenty-four hour circulation is suggested with the use of ozone sanitation systems to effectively treat the water. This can be programmed through the filtration program. Review the operation instructions for specific controls.
14. Chemically treat the spa water. Read the section on Water Chemistry Maintenance and follow instructions on container of any product used.
15. Cover the spa with thermal cover to maintain temperature.

SPA MAINTENANCE

TESTING THE G.F.C.I.

Ground Fault Circuit Interrupter (G.F.C.I.) protection for the spa should be tested at least once per month by the homeowner. With the spa in operation, push the "test" button on the G.F.C.I. breaker at the panel box or on the power cord. The spa should shut down immediately. Now reset the G.F.C.I. The spa should return to normal operation. If the G.F.C.I. fails to operate in this manner, there exists a possibility of electrical shock.

Discontinue spa operation by disconnecting the power source and notify a qualified electrician for identification and correction of the problem.

THE SPA SURFACE

To preserve the sheen of your spa's surface, clean and sanitize the acrylic surface with rubbing alcohol. Avoid using abrasive cleansers. If you are not certain as to the suitability of a particular cleanser, consult your dealer. Do not use soap, as it can cause sudsing.

THE CABINET

Wood Cedar Cabinet: With time and exposure to the elements, the wood on your spa will tend to lose its new appearance. Protecting or reviving the wood surfaces is a fairly simple process.

Light sanding with fine-grit sandpaper will help smooth any roughness, and regular applications of a penetrating, wood preservative will enhance and protect the richness of the wood.

Perma-Wood Cabinet: Your spa may be constructed from a wood alternative material designed to be durable, tough, and virtually maintenance-free. It may require cleaning periodically with a non-abrasive cleaner.

THE COVER

Use the insulating spa cover anytime the spa is not in use will significantly reduce your operating costs, heat-up time and maintenance requirements. To prolong the life of the cover, handle it with care and clean it regularly using mild soap and water. Periodic treatments with a vinyl conditioner will help protect against deterioration caused by UV rays from the sun. Never allow anyone to stand or sit on the cover, and avoid dragging it across rough surfaces.

THE FILTER

Cleaning/Replacing Top-Load Filter Cartridge:

Spa water filtration begins as soon as the flow is steady through the pump. HTH primarily uses a top load pressurized filter to assure optimum cleaning capacity. As the filter cartridge removes dirt from the water, the accumulated debris will cause a resistance to flow. When this is noticed, along with cloudy water, clean or replace the filter element as noted below.

1. Shut off power at the main or sub panel.
2. Open the small, black bleeder valve on top of the filter cover slightly to release pressure. (Be sure to re-close the valve snugly before reactivating the spa.)
3. Depress safety tab next to the lid and remove the black lock ring. Lift the dome lid and remove the filter

element. Clean any debris from the filter housing. Soak the filter element in a filter cleansing solution available from your spa dealer. Rinse the filter element down with a garden hose or pressure hose, and replace in the filter housing. (It is recommended to have an extra filter cartridge on hand so that a clean element will always be available while the soiled element is being cleaned. This will minimize downtime of the spa during the cleaning procedure.) When replacing the element into the housing, be sure that the o-ring is in place and clear to assure a snug fit of the filter dome lid to prevent leakage. Hand tighten the lock ring until the safety tab clicks into place. Re-check bleeder valve to be sure it is closed.

PERIODIC SPA WATER DRAINING

After a certain time, you may find that the addition of chemicals will not clarify or eliminate odors in the spa. This is an indication that the water needs to be drained and replaced. Generally, depending upon bather load and water chemistry maintenance, this may need done every 3 months. With the use of ozone as the sanitizing agent, it is found that the water needs changed less frequently.

1. Turn thermostat to "off".

2. Turn off all power.

3. Hook-up garden hose to spigot on the support pack and open spigot. Gravity will feed the draining process.

4. Clean cartridge filter noted above.

5. Apply coat of wax to spa finish.

6. Follow instruction under start-up.

PLUMBING CARE

All spas are plumbed with plastic jets, pipes and fittings which are glued together. These plastic parts and their many glue joints are subjected to harsh treatment. Every spa is tested with water to assure there are no leaks when it leaves the factory; however, sometimes spas develop a leak caused by shipping vibration. Over the years, your spa is subjected to many hot-cold cycles and the high pressure generated by the powerful jet pump, which together stresses the pipes and joints. HTH spas are designed to be owner serviceable with easy-access panels on all 4 sides of the portable spa which allow quick and thorough inspection and repair of the plumbing system. Should a leak occur, follow these instruction to make the repair.

1. Remove side panel to locate leak. Mark the leak with a marking pen.
2. Turn off all power. Drain spa below leak, allow plastic parts to dry.
3. Contact qualified service technician to repair plumbing.

WATER CHEMISTRY MAINTENANCE

pH Control: Chemically balanced water depends primarily on:

1. The amount of acid or base in the water (pH),
2. Those chemicals that help maintain or stabilize pH (total alkalinity) and,
3. Those chemicals that cause scaling (calcium hardness).

Described as a measure of relative acidity or alkalinity of water, pH is measured on a number scale from 0 to 14. The mid-point, 7, is said to be precisely neutral, above which alkalinity becomes progressively greater and below which acidity becomes progressively greater. Properly balanced spa water should have a pH between 7.2-7.8, a total alkalinity of 75-150 ppm and an optimum range of 100-400 ppm of calcium hardness. Within these limits, your sanitizing chemicals and filtering functions will be most effective. Test kits are available to measure the pH and should be replaced on an annual basis to assure accuracy.

Disinfection: The high temperature and increased velocity of the water, as well as the heavy bather loads, all contribute to the organic contamination of spa water. It is very important to maintain an effective residual of sanitizing agent, to shock treat at periodic intervals and, if needed, to control algae growth.

Bromine is the best-suited sanitizer for spa water. Although chlorine is popular as a swimming pool sanitizer, the high temperatures and aeration of a spa greatly accelerate chlorine loss. Free chlorine reacts with organic materials to form combined chlorine, which is a poor disinfectant that causes offensive odors and often causes eye burn. Bromine is similar to chlorine, although in the free and combined form it is an effective sanitizing agent and causes no offensive odor or eye burn. It is easier to maintain a bromine residual than chlorine and it is effective over a wider pH range than chlorine.

The test for bromine should read 1 ppm in a residential spa. Depending upon bather load, amount of usage, type of water, ultraviolet exposure, etc., the amount of chemicals needed will vary. On a weekly basis, a "shock" treatment should be used to destroy organic contamination not readily destroyed by normal additions of the sanitizing agent. This is accomplished by using a powerful, long-lasting oxidizing agent capable of destroying the organic contaminants so the sanitizer can be effective in killing bacteria. Contact your chemical supplier for the best "shocking" agent in conjunction with the line of chemicals being used. For spas installed outside and directly in sunlight, algae growth may be a problem. If this occurs, contact your dealer or chemical manufacturer for advice on the best agent available to handle this problem. **Above all, remember:**

1. Before using chemicals, read the labels and follow directions carefully.
2. Always add the chemicals directly to the spa water, either in a suitable feeder, distributed over the surface of the water, or poured into the water,

preferably with the pump "on."

3. Never add chemicals to the spa while people are using it.
4. Maintaining temperature between 95°-104°F is essential as a health factor for bathers and is helpful in controlling water problems.
5. The bottom line to proper water maintenance is to **adhere to a regular schedule** of testing chemical levels and maintaining them. HTH also makes available the option of the use of ozone as the sanitizing agent. This utilizes ultraviolet light and offers a "hands-free" routine to spa water care. The pH must be maintained and shocking may be needed after heavy bather loads. With the use of ozone, the periodic draining may be needed less frequently, and the bromine odor no longer an issue. It is suggested that 24-hour circulation is required to effectively sanitize the water, and a chlorine shock used periodically.

Contact your spa dealer for more information.

Ozone: This a popular form of disinfection that utilizes ultraviolet radiation to create ozone which sanitizes and minimizes the need for chemicals. There is no test kit available to test ozone presence in spa water, although a 24-hour circulation period is recommended for clean, clear water. A proper pH must be maintained and a routine bromine or chlorine shock is suggested.

WINTERIZING

If your spa is to be used during the winter months in cold climate where the danger of freezing exists, certain precautions should be taken to avoid damage. An increased circulation cycle, and use of a rigid foam cover are suggested. Contact your dealer for advice. Many spa owners find that outdoor wintertime soaking is quite enjoyable, and HTH certainly suggests the use of a spa year-round, although certain situations do require closing the unit for the winter months (i.e., vacation homes). If the spa will not be used for a period of time, perform the following winterizing procedures:

1. **Turn thermostat knob to off position.**
2. Drain spa of all water.
3. Remove any remaining water with sponge. In order to drain all of the water from the air channel, turn "bubbler" on for approximately ten minutes to spray out the water. Clean spa as per previous instruction. Repeat as necessary.
4. Shut off all electrical power to unit.
5. Filter should be drained, removed and cleaned.
6. Pump, motor and all connecting lines should be drained fully to protect from freezing. Blow air through all connection lines to remove water. You may wish to use a non-toxic RV type antifreeze to guarantee freeze prevention. Be sure to read the manufacturer's instructions and remove all antifreeze before the next spa use.
7. Cover the spa with a waterproof rigid cover to protect it from snow, ice and wind.

TROUBLESHOOTING

A good general rule is to visually inspect your spa and equipment area frequently. If anything looks broken, worn, or incorrect, contact your electrician or spa dealer. A simple repair may prevent an injury or more serious problems requiring expensive repairs. If your spa is not operating, check the following:

1. All equipment does not operate

- Check if spa is plugged in.
- Check power source G.F.C.I. breaker.
- Check to assure spa has dedicated circuit.
- Check the “test” and “reset” buttons on G.F.C.I.
- Check time clock.
- Check internal fuses.

2. Pump does not work

- Check all items above.
- Check filter; clean or replace cartridge.
- Check for blockages (restrictions) at suction, skimmer and pump basket.
- Push “jet” button to check if high speed is functioning on a dual-speed pump.

3. Inadequate jet action

- Make sure jets are turned on.
- Make sure air controls are open.
- Check for restrictions (blockages) in jets and/or main skimmer and pump basket.
- Check water level.
- Push “jet” button to check if high speed is functioning on a dual-speed pump.
- Check to be sure the optional Turbo diverter jet is in proper position.

4. No heat

- Check all steps under part “1.”
- Check temperature dial –make sure it’s not in “low” position.
- Check for clogged filter element and other restrictions..
- Check water level.
- Check if pump is running.
- Check high-limit (labeled on terminal box).

6. No light

- Check “light” button.
- Check G.F.C.I. “test” and “reset” buttons.

7. Water is cloudy

- Increase circulation cycle.
- Test water chemistry.
- Clean/replace filter cartridge.

If above checks do not solve the problem, call a qualified service technician.



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Please read and understand all
warnings!

SAVE THIS MANUAL!