



OWNERS MANUAL

Model: _____

Serial Number: _____

Date Installed: _____

Dealer: _____

Address: _____

Telephone: _____

Note: The serial number/identification label is located within the equipment compartment and skimmer housing.

CAROLINA SPAS™			
MODEL	AVG. FILL	AVG. FILL WEIGHT	AVG. DRY WEIGHT
Caswell	150 gal. / 568 L	1638 lbs. / 743 kg.	385 lbs. / 175 kg.
Winston	150 gal. / 568 L	1500 lbs. / 680 kg.	300 lbs. / 136 kg.
Holden	240 gal. / 909 L	2504 lbs. / 1136 kg.	500 lbs. / 227 kg.
Savannah	350 gal. / 1325 L	3662 lbs. / 1661 kg.	700 lbs. / 318 kg.
Asheville	350 gal. / 1325 L	3662 lbs. / 1661 kg.	700 lbs. / 318 kg.
Charleston	375 gal. / 1420 L	3880 lbs. / 1760 kg.	750 lbs. / 340 kg.
Southport	525 gal. / 1987 L	5302 lbs. / 2405 kg.	920 lbs. / 417 kg.

Thank you for your recent Carolina Spas™ purchase.

This owner's manual has been designed to acquaint you with your Carolina Spas™ operation and general maintenance. Keep this manual available for future reference. If you have any questions regarding your Carolina Spa™ model, contact your local dealer.

Thank you!

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SAFETY INSTRUCTIONS

Read And Follow All Instructions

AVOIDING THE RISK TO CHILDREN

RISK OF CHILD DROWNING

Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use a spa unless they are supervised at all times.



- To reduce the risk of injury, do not permit children to use this spa unless they are closely supervised at all times.
- To reduce the risk of injury, lower water temperatures and control the time of hot water exposure for young children. Children are especially sensitive to hot water.

RISK OF ELECTROCUTION



- Connect only to a grounded source.
- Do not bury the power cord. A buried power cord may result in death, or serious personal injury due to electrocution if direct burial-type cable is not used, or if improper digging occurs.
- A ground terminal (pressure wire connector) is provided on 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 water pipe, metal enclosures of electrical equipment, or conduit within five feet (1.5m) of the unit as needed to comply with local requirements.
- To reduce the risk of electrocution, replace all damaged cords immediately. Failure to do so may result in death or serious personal injury due to electrocution.
- Do not connect any auxiliary components (for example, additional cable speakers, headphones or other audio components) to the audio system unless approved by the manufacturer of Carolina Spas™.
- Do not self-service audio components by opening or removing the cover as this may expose you to dangerous voltage or other risk of injury. Only qualified service personal should service your spa and it's components.
- Do not attach an external antenna to a spa audio system unless it is installed by a licensed electrician in accordance with Article 810 of the National Electric Code, ANSI/NFPA 70.

AVOIDING RISK OF ELECTRICAL SHOCK



- Do not permit any electrical appliance, such as a light, telephone, radio or television within 5 feet (1.5m) of a spa. These units DO NOT have an internal ground fault circuit interrupter. The installation of a ground fault circuit interrupter MUST be done by a qualified Electrician and must meet all local and national codes. Failure to maintain a safe distance may result in death, or serious personal injury due to electrocution, if the appliance should fall into the spa.
- Install at least 5 feet (1.5 m) from all metal surfaces. A spa may be installed within 5 feet of a metal surface if each metal surface is permanently connected by a minimum No. 8 AWG (8.4 mm²) solid copper conductor attached to the wire ground connector on the terminal box that is provided for this purpose if in accordance with National Electrical Code ANSI/NMFPA70-1993.
- Install your spa in such a way that drainage is away from the electrical compartment and from all electrical components.

AVOIDING RISK OF INJURY



- To reduce the risk of injury, DO NOT remove suction fittings located at the bottom foot well of the spa.
- The suction fittings in the spa are sized to match the specific water flow created by the pump. Never replace a suction fitting with one rated less than the flow rate marked on the original suction fitting. Never operate the spa if the suction fittings are broken or missing.
- There is a danger of slipping and falling. Remember that wet surfaces can be very slippery. Take care when entering or exiting the spa.
- People with infectious diseases should not use the spa.
- Keep any loose articles of clothing or hanging jewelry away from rotating jets or other moving components.
- The use of drugs, alcohol, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.
- Persons using medications should consult a physician before using a spa; some medication may cause a user to become drowsy, while other medication may affect heart rate, blood pressure, and circulation.
- Persons taking medications which induce drowsiness, such as tranquilizers, antihistamines or anticoagulants should not use the spa.
- Water temperature in excess of 104°F (38°C) may be injurious to your health.
- Pregnant women should consult a physician before using spa.
- 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 spa.
- Persons using or having Implanted Pacemakers or Defibrillators should consult their physician prior to using a spa, as there are risks of electrocution.

UNCLEAN WATER

- Keep the water clean and sanitized with correct chemical care.
- Maintain water chemistry in accordance with chemical manufacturer's instructions.

Important:

- Turn the Jet Pump on high speed after adding ANY spa water chemicals into the spa. It will operate for a 15 minute cycle before shutting off automatically.
- Clean the filter cartridges monthly to remove debris and mineral buildup which may affect the performance of the jets, limit the flow, or cause a heater-limit issue

SAFETY INSTRUCTIONS

AVOIDING RISK OF HYPERTHERMIA

The causes, symptoms and effects of hyperthermia may be described as follows: Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6°F. 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 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 drowning.



The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.



To Reduce The Risk of Injury:

- The water in the spa should never exceed 104°F (40°C). Water temperatures between 100°F (37.7°C) and 104°F (40°C) are considered safe for a healthy adult.
- Lower water temperatures are recommended for extended use (exceeding ten minutes) and for young children. Extended use can cause hyperthermia.
- Pregnant or possibly pregnant women should consult with their physician before entering a spa. Failure to do so may result in permanent injury to your baby.
- Do not use spa immediately following strenuous exercise.

AVOIDING RISK OF SKIN BURNS



- To reduce the risk of injury, before entering a spa the user should measure the water temperature with an accurate thermometer, since the tolerance of temperature-regulating devices may vary by as much as ±5°F.
- Test the water with your hand before entering the spa to be sure it's comfortable.

Important:

The following contains important spa information, and we strongly encourage you to read and apply them.

Do:



- Make sure you always lock the child resistant spa cover locks after using the spa for your children's safety. Every Carolina Spa™ model is equipped with a locking cover that meets the ASTM F1346-91 Standard for Safety Covers.
- Test the water temperature with your hand before allowing children to enter the spa to be sure that it's comfortable. Children are especially sensitive to hot water.
- Remind children that wet surfaces can be very slippery. Make sure that children are careful when entering or exiting the spa.
- Use and lock the vinyl cover when the spa is not in use, whether it is empty or full.
- Follow the Spa Care and Maintenance recommendations stated in this manual.
- Use only approved accessories and recommended spa chemicals and cleaners.
- Keep the spa cover locked when the spa is not in use.
- Check the equipment compartment monthly for any signs of tampering to the spa equipment.
- Follow the maintenance instructions of the spa found in this owner's manual.
- Be sure your spa is connected to the power supply correctly - use a licensed electrical contractor.
- Test the Ground Fault Circuit Interrupter(s) once a month.
- Place the spa on a level load bearing solid surface.

Don't:



- Allow children or pets to climb onto the spa cover.
- Allow children to have unsupervised access to the spa.
- **Leave the Carolina Spas™ empty and exposed to the sun. Always keep empty spas covered. Exposure to direct sunlight can cause solar distress of the shell material and will void the warranty.**
- Lift or drag the vinyl cover by using the cover lock straps; always lift or carry the cover by using the handles.
- Attempt to open the electrical control box. There are no user serviceable parts inside. Opening of the control box by the spa owner will void the warranty. If you have an operational problem, carefully go through the steps outlined in the Troubleshooting section. If you are not able to resolve the problem, contact your authorized Carolina Spas™ dealer. Many problems can easily be diagnosed over the telephone by an Authorized Service Technician.
- Block or sit on the filter compartment area.
- Allow excessive weight to be placed on the spa cover. Doing so could damage the spa cover and void any warranty.
- Use the spa with the equipment compartment door removed.
- Place electrical appliances within 5 feet (1.5m) of the spa.
- Block the equipment compartment vents. This could cause damage to the spa equipment and will void the warranty.

*** SAVE THESE INSTRUCTIONS ***

SPA SPECIFICATIONS

	Width	Length	Height	Average Fill	Dry Weight	Average Fill Weight	Seating Locations
Caswell	57"	80"	29"	150 gal.	385 lbs.	1,638 lbs.	2
Winston	59"	82"	29"	150 gal.	300 lbs.	1500 lbs.	2
Holden	67"	80"	34"	240 gal.	500 lbs.	2,504 lbs.	3-4
Savannah	80"	84"	36"	350 gal.	700 lbs.	3,662 lbs.	4-5
Asheville	80"	84"	36"	350 gal.	700 lbs.	3,662 lbs.	4-5
Charleston	84"	84"	38"	375 gal.	750 lbs.	3,880 lbs.	5-6
Southport	89"	93"	40 "	525 gal.	920 lbs.	5,302 lbs.	6



Due to the risk of property damage and injury, the manufacturer of the Carolina Spas™ strongly suggests a structural engineer or licensed contractor be consulted before the spa is placed on an elevated deck.

Note: The “Average Full” weight of the spa includes only the spa and the water inside the spa.

INSTALLATION INSTRUCTIONS

Location Preparation

Your Carolina Spa™ model is totally self-contained and portable. You can install the spa outside or inside. Preferable places are on a patio, deck or indoors. The spa should always be placed on a level, load bearing solid surface in accordance with your local building code requirements. Other items you need to consider are the following:

- Verify that the location chosen can support the weight of the spa, the water of the spa and its occupants.
- Always check the surface of the site to see if it is level before filling the spa with water.
- Allow access to the equipment compartment for routine maintenance.
- When positioning the spa, be sure to allow for drainage away from the electrical compartment.
- Leave easy access to the GFCI breaker.



Carolina Spas™ are manufactured to be a portable unit. Any permanent installation of this product is done at the risk of the owner. Permanent installation of this unit violates warranty coverage.

Outdoor Installation

Always keep in mind what type of climate you live in. In a climate with cold, snowy winters you may want to consider locating the spa close to the house for easy access. In climates where it is normally warm or hot year-round, it would be recommended to place the spa in a shaded or cool area. With deck installations it is recommended that a qualified building contractor or structural engineer review the weight the deck can support. The spa specification sheet (on page 8) can assist you with the weights and dimensions of your spa.

Indoor Installation

Special requirements are needed for indoor installation. Spas normally produce moisture. A ventilation system needs to be considered. Your spa area should contain moisture resistant wall/floor coverings and building materials to avoid damage from moisture over time. Proper drainage of the spa water also needs to be considered.



Your Carolina Spa™ model is equipped with air vents to allow for circulation of air throughout the equipment compartment. These vents are found on the face of the equipment compartment panel and under the corners of the spa at the equipment compartment end. Do not allow vents to be blocked as to prevent the circulation of air in the equipment compartment.

Your Carolina Spas™ dealer can help you with information such as local zoning regulations and building codes.



Never leave your Carolina Spa™ empty, uncovered, and exposed to sunlight for any length of time. Doing so can cause blistering to the acrylic shell. **This is not covered by your warranty.**

ELECTRICAL REQUIREMENTS AND PRECAUTIONS

Your Carolina Spa™ model has gone through numerous tests to verify that all of the spa functions operate. Beyond the tests, your Carolina Spa™ model has been designed to provide the maximum safety against electrical shock. Read and follow the electrical installation requirements and instructions completely. The next few pages will assist you in properly connecting the electrical input. Follow the electrical instructions for your specific spa model. Serious risks or injuries may occur if the spa is improperly wired.

220 Volt Permanently Connected Models:

• Caswell* • Winston* • Holden • Savannah • Charleston • Asheville • Southport

*This model is convertible to 110V. See page 12 for installation instructions.



Carolina Spas™ must be wired in accordance with all applicable local electrical codes. Use NEC 250-122(table) and local codes for more information. All electrical work should be done by an experienced, licensed Electrician. We recommend the use of appropriate electrical conduit, fittings and wire for all circuits.

220 Volt installations require a 60Hz, single phase, three-wire electrical service plus ground (Line 1, Line 2, Neutral and Ground) and must be connected using a minimum supply conductor ampacity of 60 AMPs and a minimum circuit breaker size of 60 AMPs. Note: Use copper wire only (3 wire with ground; 8 gauge under 50', 6 gauge over 50')

220 Volt model spas must be connected to a “dedicated” 220 volt 60 AMP grounded circuit. The term “dedicated” means the electrical circuit is not being used for any other electrical items (lights, appliances, etc.). If the spa is connected to a non-dedicated circuit, overloading will occur and nuisance tripping of the GFCI breaker switch at the house breaker panel will occur.

A ground lug connector is provided on the exterior surface of the spa pack (operations center) inside the equipment compartment. This is to permit the connection of a bonding wire between this point and any metal equipment, enclosures, pipe or conduit within five feet (1.5m) of the spa. This bonding wire must be at least 8AWG solid copper wire.



Due to the risk of equipment damage or fire, use only approved pressure-type wire splicing lugs or connectors suitable for the size and type of wiring used.

Electrical Installation Instructions for 220 Volt Models

1. To connect the electrical service, first remove the screws from the equipment compartment door. Carefully remove the access panel.
2. Locate the spa power pack. Loosen the screws on the front of the control box. Remove the screws and control box cover.
3. Input the electrical service from the GFCI breaker into the spa equipment compartment.

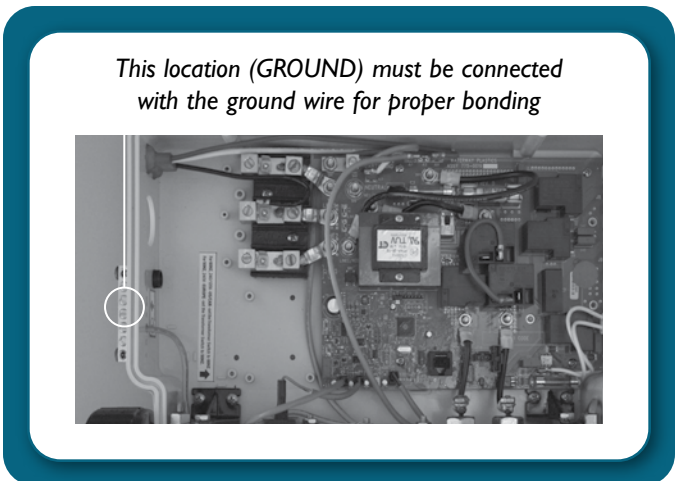
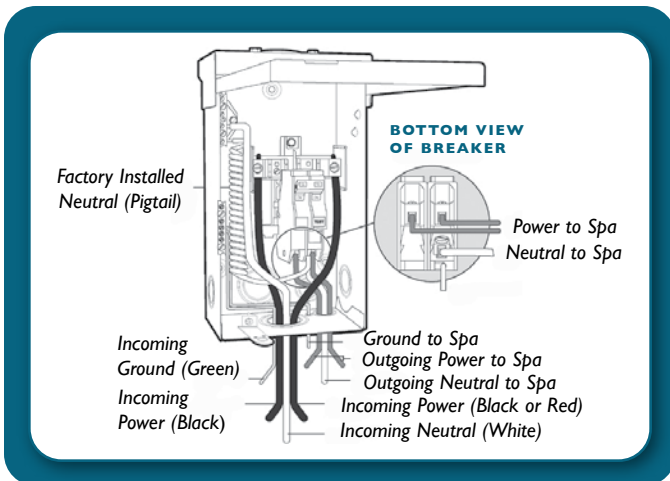


The GFCI breaker must be placed in sight of the spa, at a minimum distance of five feet (1.5m) away.

As of January 1, 1996 the National Electric Code (NEC) requires GFCI (Ground Fault Circuit Interrupter) on all spa installations.

4. Connect the supply conduit to the spa power pack.

ELECTRICAL REQUIREMENTS AND PRECAUTIONS



Electrical Spa Wiring Connection Instructions



Due to the risk of damaging the PC Board, the equipment and the GFCI tripping, never, under any circumstances, should you connect power to the neutral terminal.

1. Identify the TB1 terminal block, located inside the spa power pack on the left side.
2. Connect the 8 AWG, WHITE wire, from the GFCI 60 AMP breaker, to the NEU/WHT/BLU terminal on TB1.
3. Connect the 8 AWG, BLACK wire, from the GFCI 60 AMP breaker, to the LINE 1/BLK terminal on TB1.
4. Connect the 8 AWG, RED wire, from the GFCI 60 AMP breaker, to the LINE 2/RED terminal on TB1.
5. Connect the 8 AWG, GREEN wire, from the GFCI 60 AMP breaker, to the GROUND terminal.
6. At least two additional lugs marked "BONDING LUGS" are provided on the external surface of one of the bonded components metal enclosures. To reduce the risk of electrical 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.
7. All field-installed metal components such as rail, ladders, drains or other similar hardware within 10 ft. (3m) of the spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than No. 6 AWG.
8. Replace the control box cover and securely tighten the fastening screws. Close and secure the equipment compartment panel.



Always use copper wire only (3 wire with ground; 8 gauge under 50 ft., 6 gauge over 50 ft.) The electrical supply for this product must include a suitable rated switch or circuit breaker to open all ungrounded supply conductors to comply with Section 422.20 of the National Electrical Code ANSI/NFPA 70-1987. The disconnecting means must be readily accessible to the tub occupant but installed at least 5 feet (1.5m) from tub water



Please review the back of the spa pack cover, located in the spa equipment bay, for a complete spa equipment wiring diagram. Always use a licensed Electrician when wiring the spa.

ELECTRICAL REQUIREMENTS AND PRECAUTIONS

110 / 220 VOLT CONVERTIBLE MODELS

• Caswell* • Winston*

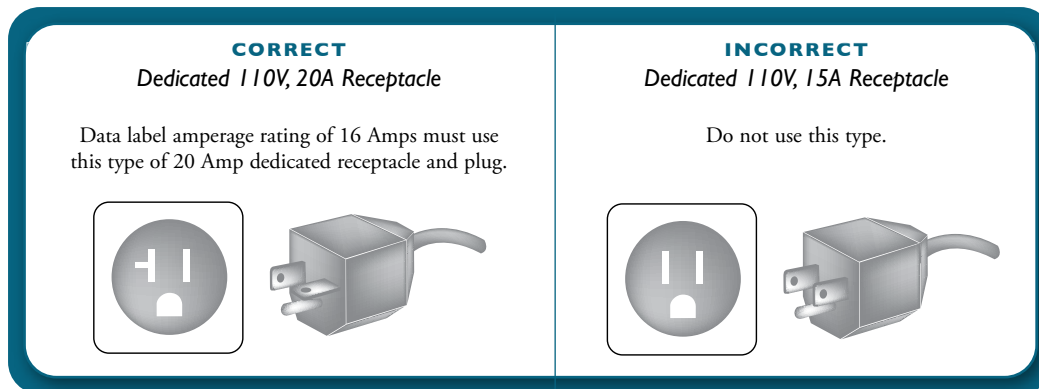
110 VOLT ELECTRICAL REQUIREMENTS:

*The above models are manufactured with the Carolina Spas™ 110V/220V convertible spa pack. The units are factory wired for 220 Volt applications with 4 kW heater operation. The models can be converted for 110 Volt applications and operate with a 1 kW heater operation.



The 110 Volt model must be connected to a “dedicated” 110 Volt 20 Amp grounded circuit. The term “dedicated” means the electrical circuit is not being used for any other electrical items (lights, appliances, etc.). If the spa is connected to a non-dedicated circuit, overloading will occur and nuisance tripping of the GFCI breaker switch at the house breaker panel or GFCI cord will occur. Never connect the spa to an extension cord due to the potential for fire from wires overheating.

The 110V models may be optionally equipped – or built standard 110V – and use a GFCI power cord (approximately 13 feet long). These models must be plugged into a grounding type, 110 Volt 20 Amp receptacle as shown below. No other electrical appliances or fixtures should be used on this circuit.



The use of any other receptacle or the connection of the plug to a 220 Volt service may cause the spa pack to operate improperly, create the potential for an electrical hazard and may void the spa warranty.

Carolina Spa™ models must be wired in accordance with all local electrical codes. All electrical work should be done by an experienced, licensed electrician familiar with spa installations.

Note: As of January 1, 1996 the National Electrical Code (NEC) requires a GFCI (Ground Fault Circuit Interrupter) on all spa installations.

ELECTRICAL REQUIREMENTS AND PRECAUTIONS

INSTALLATION INSTRUCTIONS:

The following instructions are for the conversion of the Carolina Spas™ 110V/220V control pack from a 220 Volt application to a 110 Volt application. **Please see Neo 1500 Owner's Manual or contact your Carolina Spas™ Dealer for details.**



Due to the risk of equipment damage or fire, use only approved pressure-type wire splicing lugs or connectors suitable for the size and type of wiring used.

Before servicing the spa, make sure all power to the spa is disconnected. Follow these instructions for a successful electrical installation.

1. Unscrew the screws on the front access panel.
2. Carefully pull access panel toward you (away from spa) and pull upward. Set access panel aside.
3. Locate the spa power pack. Loosen the screws on the front of the control box. Remove the control box cover and the terminal block will be exposed.
4. Route the GFCI power cord through the vent hole in the base of the equipment compartment and out from under the corner of the spa.

Note: 110 Volt installations require a 60Hz, single phase, two-wire electrical service plus ground (Line 1, Neutral and Ground) and must be connected using a minimum supply conductor ampacity of 20 Amps and a minimum GFCI circuit breaker size of 20 Amps.

5. Input the GFCI power cord to the terminal block inside the spa pack.
6. Connect the 8 AWG WHITE wire, from the power cord, to the NEU/WHT/BLU terminal on TB1.
7. Connect the 8 AWG BLACK wire, from the power cord, to the LINE 1/BLK terminal on TB1.
8. Connect the 8 AWG GREEN wire, from the power cord, to the GND/GRN location on the terminal on TB1.
9. Add jumper wire (taped to the back of the spa pack) between Neutral and Line 2.
10. Replace the control box cover and securely tighten the fastening screws. Close and secure the equipment compartment panel.

Note: Please review the back of the spa power pack cover, in the equipment bay, for a complete spa wiring diagram. See Neo 1500 Owner's Manual or contact your Carolina Spas™ Dealer for details.

OPERATING INSTRUCTIONS

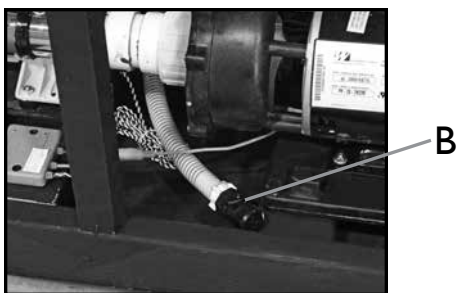
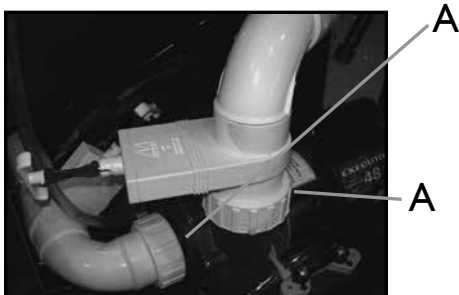
INITIAL OPERATING INSTRUCTIONS

Start-Up and Refill Procedures

Your Carolina Spa™ model has been tested at the manufacturing plant to ensure that all of the spa functions operate. During the test procedure, a small amount of water may have remained in the spa plumbing. Through the shipping process water may have spotted the spa shell. You may need to wipe down the shell with a soft cloth. Please read and follow the start-up instructions to ensure a successful start-up or refill.



- Inspect and clean spa shell of any debris
- Do not turn power on to spa unless filled with water to appropriate level (See Page 15-16). The spa pack must never be operated without water in the spa; serious damage to the heater and/or pump(s) may result.
- Do not fill spa with hot water. This may cause a false error code to the temperature sensor.
- Do not fill spa with water before checking the items below (items may become loose in transit):

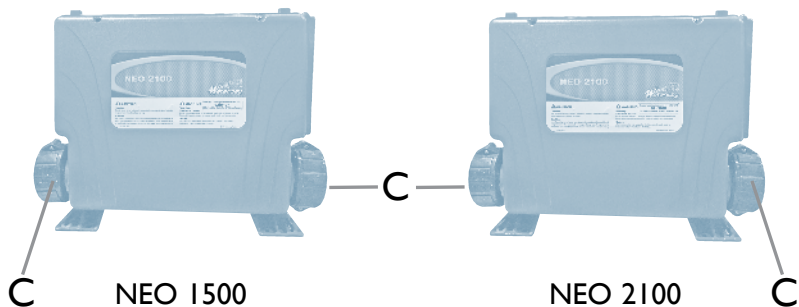


A. Hand tighten unions at the pumps

B. Tighten drain valve

Note: The Drain Valve is left open for shipping and must be closed before filling spa.

C. Tighten unions on heater



Start-up Procedures - SE Models

1. For a successful start-up, remove both filter cartridges, and fill the spa with water through the openings in the filter compartment.
 - a. Locate the filter compartment area.
 - b. Pull up and remove filter cover.
 - c. Remove each filter cartridge and screen adapter by turning counter clockwise.
 - d. After removing the filter cartridges and screen adapters, place a garden hose through one of the filter openings.
 - e. Turn water on and run clean water until free of debris it reaches a minimum level of 2" above the top of the filters.



Note: Besides filling the spa to 2" above the top of the filter, all models will need to be filled to 2" above the highest jet(s) in the spa. This is the minimum level allowed to run the spa's circulation system, and/or jet pump(s).

2. Check all plumbing (clamps, unions and drain valve) connections for leaks.
3. Re-install filter cartridges and screen adapters by turning them clockwise. Remove garden hose from the spa.
4. At this point, activate the power to the spa control by switching on the GFCI breaker. A "Priming Mode" icon will appear on the topside display screen. If no button is pressed the spa will go into Priming Mode. During Priming Mode the heater will be disabled. The system will exit Priming Mode and go to "Date/Time" Screen when return button is pressed or after four minutes of inactivity. In this mode, all devices such as jets, blowers, or lights are operable. Jets can be turned on and off to prime the pump. If the pump(s) have been primed continue to step 5. If the pump(s) have not primed after 2 minutes, and water is not flowing from the jets in the spa it may be necessary to manually prime the pump(s) by taking the following steps: First turn the power off on the GFCI breaker. Next loosen, but do not remove, the union nut on the top most areas of the pump(s). Allow for a small amount of water and the trapped air to escape from the pump(s). Once all the air has escaped tighten the union nuts back down. After the pump(s) have been vented, turn on the spa control system by turning on the GFCI breaker. The spa will now go back into priming mode.
5. After you verify the pumps are primed, turn them off by pressing the Jet(s) button(s). The Priming Mode ends after 4 minutes. The current factory default set temperature will display 100°F (38°C) (The set temperature and actual water temperature are often different). While the numbers are flashing, Press TEMP again to change the Set Temperature. Press and hold for faster adjustment. After the new Set Temperature stops flashing, in about 10 seconds, the actual water temperature is displayed again and the new set temperature is programmed. The spa will now heat to the new set temperature as needed.
6. Re-install filter cover and allow spa to heat to desired set temperature; this normally takes 24 hours. 110 Volt models may take up to 48 hours to reach desired set temperature.
7. Water must be balanced and shocked upon start-up. See your dealer or pages 21-24 of this manual for details. This procedure must be repeated each time the spa is drained and refilled.

It is recommended to press and release the ground fault circuit interrupter (GFCI) RESET button monthly to verify GFCI is working properly.



Note: When there is a heat demand, a cool down period (30 seconds after heater turns off), or when the pump is running because of a filter cycle, the controller will turn the pump on low speed.

OPERATING INSTRUCTIONS

Start-up Procedures - LE Models

1. For a successful start-up, remove both filter cartridges, and fill the spa with water through the openings in the filter compartment.
 - a. Locate the filter compartment area.
 - b. Pull up and remove filter cover.
 - c. Remove each filter cartridge and screen adapter by turning counter clockwise.
 - d. After removing the filter cartridges and screen adapters, place a garden hose through one of the filter openings.
 - e. Turn water on and run clean water until free of debris it reaches a minimum level of 2" above the top of the filters.



Note: Besides filling the spa to 2" above the top of the filter, all models will need to be filled to 2" above the highest jet(s) in the spa. This is the minimum level allowed to run the spa's circulation system, and/or jet pump(s).

2. Check all plumbing (clamps, unions and drain valve) connections for leaks.
3. Re-install filter cartridges and screen adapters by turning them clockwise. Remove garden hose from the spa.
4. At this point, activate the power to the spa control by switching on the GFCI breaker. A "Priming Mode" icon will appear on the topside display screen. If no button is pressed the spa will go into Priming Mode. During Priming Mode the heater will be disabled. In this mode, all devices such as jets, blowers, or lights are operable. Jets can be turned on and off to prime the pump. System will exit priming mode and go to MAIN display when RETURN button is pushed – or after 4 minutes of inactivity. If the pump(s) have been primed continue to step 5. If the pump(s) have not primed after 2 minutes, and water is not flowing from the jets in the spa it may be necessary to manually prime the pump(s) by taking the following steps: First turn the power off on the GFCI breaker. Next loosen, but do not remove, the union nut on the top most areas of the pump(s). Allow for a small amount of water and the trapped air to escape from the pump(s). Once all the air has escaped tighten the union nuts back down. After the pump(s) have been vented, turn on the spa control system by turning on the GFCI breaker. The spa will now go back into priming mode.
5. After the pumps are primed, turn off by pressing the Jet(s) button(s). Next manually exit the priming mode by pressing Return Arrow button. After you have manually exited the priming mode the display will show the set temperature, which defaults at 100° F/ 37°C. This will last for two minutes while the water temperature is determined. Push the Up or Down button to the desired setting.
6. Re-install filter cover and allow spa to heat to desired set temperature: this normally takes 24 hours.
7. Water must be balanced and shocked upon start-up. See your dealer or pages 21-24 of this manual for details. This procedure must be repeated each time the spa is drained and refilled.



It is recommended to press and release the ground fault circuit interrupter (GFCI) RESET button monthly to verify GFCI is working properly.

Important:

A pump should not be allowed to run without priming for more than 2 minutes. Under NO circumstances should a pump be allowed to run without priming beyond the end of the 4 minutes priming mode. Doing so may cause damage to the pump and cause the system to go into an overheat condition.

GENERAL INFORMATION

Carolina Spas™ are manufactured from the highest quality, most durable materials available today. We recommend that a spa maintenance program be followed. The care you take will ultimately determine how long your spa or its individual components will last. This section will help you maintain your investment.

Replacing The Water

Proper spa maintenance (regular draining and replacing of spa water according to these directions along with filter cleaning), proper spa water treatment (water balance and maintaining correct sanitizer levels), and proper installation (adequate ventilation) are the keys to ensuring sanitary, healthy spa water.

It is recommended that you completely drain your spa every 45 to 90 days. Normally, after a period of time the water will become sudsy and harder to maintain and should be replaced. The IPSE WRI, Water Replacement Interval Formula is as follows:

$$\text{WRI} = \frac{.33 \times \text{Spa Volume in US Gallons}}{\text{Average Bathers per Day}}$$

Note: Heavy usage may require more frequent draining.

To Drain Your Spa:

1. Disconnect the spa from the power supply by tripping the GFCI breaker located in the house breaker panel or at the GFCI disconnect breaker at the spa.
2. Take off the equipment access panel by first removing the screws and then pulling out the access panel. Locate main drain valve and attach the inlet of a garden hose to the drain valve. Route garden hose to an appropriate draining area away from the spa to avoid flooding of the surroundings around the spa.

Note: Spa water with a high sanitizer level may harm plants and grass.

3. Open the drain valve by turning the knob. The spa will drain by gravitational flow.
4. Carolina Spas™ will drain to the lower suction fittings in the foot well of the spa. It may be necessary to vacuum or sponge up a small amount of the remaining water in the spa.
5. When empty, inspect the spa shell and clean as required.
6. Close the drain valve and remove garden hose.
7. Replace or close the equipment access door and replace screws.
8. Refill the spa through the filter compartment BEFORE restoring power.

Important:

Always clean the filter cartridges each time the spa is drained for cleaning.

SPA CARE & WATER MAINTENANCE

Filter System

Carolina Spas™ are equipped with two standard filter cartridges. As with any filtering system, the filter cartridges may become clogged with particles, body oils or calcification resulting in poor water quality and reduced water flow. It is important to maintain a clean, unobstructed filtering system. A reduced water flow may cause a failure of the filter cycles to operate due to the pump shutting down. If the circulation of water stops during sub-freezing temperatures and goes unnoticed, the spa water may freeze, which is not covered under manufacturer's warranties.

Important:

The frequency and duration of use, and the number of occupants, all contribute to determining the appropriate time between filter cleanings. More use means that more frequent filter cleanings are required. Failure to maintain the cartridges in a clean, unobstructed manner will result in reduced water flow. Any damage to the spa due to freezing or caused as a result of poor maintenance will not be covered by your spa warranty.

FILTER CARTRIDGE REMOVAL AND CLEANING

1. Disconnect the spa from the power supply by tripping the GFCI breaker at the spa.
2. Remove and carefully set aside the filter compartment cover.
3. Remove any floating items from within the filter compartment.
4. Grasp the handle of the filter cartridge and turn the cartridge clockwise until it is free from the base retainer. Leave screen adapter in place.
5. Place the cartridge on a clean surface and spray with a garden hose. It will be necessary to rotate the cartridge(s) to ensure all the filter pleats have been cleaned.
6. Continue cleaning by spraying down throughout the center of the cartridge (inside out).
7. For a complete and more thorough cleaning it is recommended to soak cartridges in a filter cleaning solution. Follow directions on the filter cleaner label.
8. Before inserting cartridges, do a final inspection of the cartridges.
9. To reinstall the filter cartridges, reverse the order in which the cartridges were removed.

Important:

Do not turn power on or use the spa with the filter cartridges or screen adapters removed.

Note: Spa cartridges are a disposable item and should be replaced each year, at a minimum.

SPA CARE & WATER MAINTENANCE

CARE OF THE SPA PILLOWS

The spa pillows used on Carolina Spa™ models will provide years of comfort if treated with care. To extend their life the spa pillows should be removed and cleaned. Wash with a mild soap and water solution. ALWAYS rinse off the spa pillows thoroughly to remove any soap residue. If the spa is not going to be used for a long period of time the spa pillows should be removed until the next spa use.

To remove and replace the spa pillows:

1. Carefully lift one end of the pillow away from the spa shell.
3. Continue lifting one end until it is released from the attachment bar on the spa shell. Do the same to loosen the other end of pillow. To reinstall the spa pillow, carefully bend the pillow slightly to allow the slit on the back of the pillow to slip over the attachment bar retainer on the spa shell.
4. After the pillow slips over the attachment, press the pillow down into the recess in the spa shell.

Important:

Just pulling the pillow straight up and off of the attachment bar will eventually damage the pillow. This abuse is not covered under warranty.

CARE OF THE EXTERIOR

Spa Shell

Carolina Spas™ are manufactured with a tough acrylic surface. Some staining or water marking may occur at or above the water surface. Removal of these surface conditions can usually be accomplished with a soft cloth by merely wiping them away. Stubborn stains can be removed first by draining the spa and then using a nonabrasive product. Always thoroughly rinse off any spa shell cleaning agent with fresh water.

Never leave your Carolina Spa™ exposed to the sun without water or the cover in place.

Exposure to direct sunlight can cause solar distress of the shell material and will void the warranty.



Keep all cleaners out of the reach of children and use care when applying.

Spa Cabinet

The spa cabinet around the Carolina Spa™ models are manufactured with the finest quality material and is available in a low maintenance exterior.

The MultiWeather™ cabinet combines the durability of plastic with the look of professionally finished wood. To remove any stains or dirt simply spray the skirt with water and wipe down with a soft cloth. The MultiWeather™ cabinet is not designed to be stained or resealed.

Note: The MultiWeather™ cabinet could experience natural fading due to sunlight and weather exposure. This condition is not covered under warranty.

SPA CARE & WATER MAINTENANCE

CARE OF THE SPA COVER

Vinyl Cover

Your vinyl thermal spa cover has been designed for your particular spa. Monthly cleaning and conditioning is recommended to maintain its beauty.

To clean and condition the vinyl cover:

1. Remove the cover from the spa and gently lean it against a wall or fence.
2. With a garden hose, spray the cover to loosen and rinse away dirt or debris.
3. Using a large, non-abrasive sponge and using a very mild soap solution (one teaspoon dish washing liquid with two gallons of water) scrub the vinyl top in a circular motion. Make sure to rinse all soap off the cover before it dries.
4. Scrub the cover's perimeter and side flaps. Rinse clean with water.
5. Rinse off the underside of the cover with water only (use no soap), and wipe it clean with a dry rag.
6. To condition the cover after cleaning, apply a thin film of saddle soap (follow directions on the container) or vinyl conditioning cream.

Important reminders:

- **Do** unlock and release all cover locks before attempting to open cover.
- **Do** remove snow buildup to avoid damage of the foam core from the additional weight of the snow (not covered under warranty).
- **Do** lock cover lock straps to secure the cover when the spa is not in use.
- **Do not** drag or lift the spa cover using either the flaps, or the cover tie downs.
- **Do not** walk, stand, or sit on the cover.

Important:

Whenever the spa is not in use it is essential that the thermal cover be kept in place. When filled this ensures effective temperature maintenance and economical operation. When empty this prevents potential damage to the spas surface finish that can result from excessive heat caused by the sun. This type of damage is specifically excluded from warranty protection. It is recommended that the thermal cover tie downs always be used to discourage access to the spa by unsupervised children and minimize heat loss.

*The spa cover manufacturer handles all warranty claims. Carolina Spas™ does not handle any warranty issues on the spa cover. Every Carolina Spa™ is equipped with a locking cover that meets the ASTM F1346-91 standard for safety covers.

Important:

Do not use ethylene glycol based antifreeze. This type of antifreeze is toxic and can damage the spa surface.

WINTERIZING YOUR SPA

If you chose not to use your Carolina Spa™ model during the winter, it is recommended to properly winterize your spa. Any damage occurring due to accidental freezing of the spa is not covered under warranty.

The following steps are designed to protect your spa from freezing if followed. For ultimate protection against freeze damage to your spa, contact your local Carolina Spas™ Dealer to schedule a winterizing service plan.

1. Turn power off to the spa. Trip GFCI breaker.
2. Unscrew panel screws. Remove access panel.
3. Locate the drain valve and attach a garden hose to the drain valve.
4. Open the drain valve and allow the water to drain (Carolina Spas™ will drain to the drain fitting in the foot well of the spa).
5. Remove filter cartridges and screen adaptors. Clean and store in a dry place.
6. Using a wet/dry vacuum, soak up the water remaining on the bottom of the spa.
7. Open unions at the heater and at the pump(s). Remove pump(s) from spa. Vacuum water from return and suction sides of the plumbing on the pump(s). Vacuum any water from heater housing. Leave unions at the heater and at the pump(s) open.
8. Reverse vacuum and blow out each line of the plumbing going into the pump(s).
9. Place the vacuum hose down the filter cartridge openings and vacuum any water from filter compartment.
10. With a wet/dry shop vac, go to every jet in the spa (including suction fittings) and place vac hose over the face of every jet and vacuum out any water left in the lines. Reverse vac Hose and force air through each jet.
11. Wipe down spa shell with a soft clean cloth.
12. Place spa cover over spa and lock into place.
13. To restart the spa, connect all hoses and close all unions. Once all the hoses, jet valve assemblies, and pump unions are reattached, follow the normal fill-up procedures. It may be necessary to flush the spa depending on the amount of antifreeze used.

Note: It may be necessary to lubricate o-rings and gaskets for a positive seal. Use only Carolina Spas™ approved lubricants, contact your local dealer for more information.

Important:

If these instructions are not followed, damage due to freezing water in the plumbing lines may occur and is not covered under manufacturer's warranty.

SPA CARE & WATER MAINTENANCE

WATER QUALITY MAINTENANCE

General Information

As the owner of an Carolina Spa™ model, endless hours of entertainment, recreation, and relaxation await you. Caring for your spa will become a routine and pleasant part of your daily activities. You will be able to maintain your spa water and keep your spa equipment in excellent condition. To do so you first must balance your spa's water.

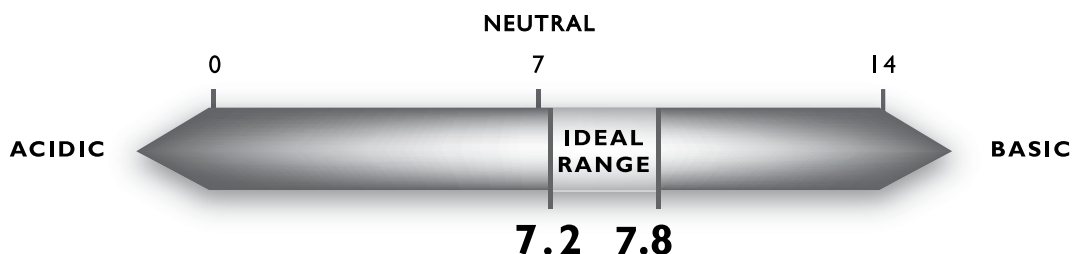
Balanced Water

Balanced water ensures spa bathers safety as well as protecting the spa heater and components from corrosion. Also, balanced water protects the spa surface from unsightly scale deposits, which reduce the efficiency of the spa equipment. You can obtain balanced water by correctly adjusting a few chemical components in the water. Specifically, you will need to adjust the pH, total alkalinity and calcium hardness

Note: Improper water chemistry can result in product failure and invalidate your warranty.

pH

pH is measured on a scale that runs from 0-14. pH indicates whether water is neutral, acidic, or basic. The drawing below shows a pH equal to 7.0 is neutral. A pH below this point is acidic and a pH above this point is basic. **Test pH weekly.**



Recommended Range - 7.2 to 7.8

If the pH is too low it can

1. Corrode metal surfaces.
2. Use excess sanitizer.
3. Irritate bathers' skin and eyes.

If the pH is too high it can

1. Deposit scale on surfaces.
2. Contribute to cloudy water.
3. Cause eye irritation.
4. Reduce sanitizer efficiency.

Adjusting pH

To raise pH add a granular pH Increaser or sodium carbonate at the rate suggested on the container. To lower pH add a granular pH Decreaser, or sodium bisulfate at the rate suggested on the container. After initial application, allow water to circulate approximately 20 minutes

on Jets 1 at high speed. Test pH and add second dose if required. (Carolina Spas™ Jets 1 operates 15 minutes)

Total Alkalinity

There are minerals in your spa water that act as buffering agents. Total alkalinity is the measurement of these alkaline materials that help prevent corrosion and staining. The correct amount of alkalinity in your spa water will keep the water's pH consistent while allowing for economical pH adjustment when necessary.

Example: At low total alkalinity levels, the water's pH easily drifts, making frequent pH adjustments necessary and the added expense of multiple chemical treatments.

On the other hand, a high total alkalinity level keeps the water pH rigidly fixed. If pH adjustment is necessary, you will need unusually large amounts of treatment chemicals to change the water's pH.

Recommended Range: 80 to 120 Parts Per Million (PPM)

Potential Problems:

1. pH difficult to maintain. If total alkalinity is too low, pH will drift.
2. Corrosive tendencies. If total alkalinity is too high:
 - pH difficult to adjust (it remains fixed.)
 - Cloudy water.
 - Potential for scaling.
 - High pH and low sanitizer efficiency.

Note: The use of Biguanide, Salt generators and other after market sanitizer/ disinfectant systems may damage components and void your spa's warranty.

Adjusting Total Alkalinity

Total Alkalinity can be raised with Alkalinity Increaser, or sodium bicarbonate at the manufacturer's recommendation for dosage.

Calcium Hardness

Calcium hardness is the amount of dissolved calcium in your spa water. Too little calcium in the water will etch plaster surfaces, too much will leave deposits on surfaces and equipment.

Recommended Range: 125-150

Potential Problems:

Calcium Hardness Too Low

- Some surfaces may be etched.
- May lead to equipment corrosion.

Calcium Hardness Too High

- May contribute to cloudy water.
- Scaling of surface, piping and equipment.

Adjusting Calcium Hardness

Raise hardness by the addition of calcium chloride. Decrease calcium hardness by draining spa and replacing with water containing lower levels of calcium hardness.

SPA CARE & WATER MAINTENANCE

Disinfectant

- Brominating Tablets, Granular Bromine and Granular Chlorine are popular disinfectants and are particularly well suited to compliment your ozone purification system spa. They are also very suitable products in water with elevated temperatures.
- Brominating Tablets and Granular Bromine are effective as a spa water sanitizer and disinfectant. Follow manufacturer's directions for proper dosage. It is recommended to maintain an active bromine residual of 2.0 to 4.0 ppm.
- Granular Chlorine (Dichlor Dihydrate, Lithium Hypochlorite), is designed to dissolve quickly and completely, provide a steady source of available chlorine to control the growth of algae, kill bacteria and destroy organic contaminants. It is recommended to maintain a chlorine residual of between 1.0 and 3.0 ppm. Non-Chlorine type shock will oxidize or destroy most of the organic contaminants that result from bather load. This quick acting oxidizing shock treatment goes to work almost immediately improving water quality and eliminating irritating wastes and odor. This product is intended to be a shock treatment only, and is not a disinfectant.

Shock Treatment with Granular Disinfectant

Adding granular chlorine or bromine disinfectant to the water in amounts much larger than normal is called "shocking" the spa and should not be confused with non-chlorine shock. An occasional shock treatment destroys algae, bacteria, and chloramines. After shocking your spa, do not allow bathers to enter the spa until disinfectant levels drop to normal.

What Causes Loss of Disinfectant?

- *Algae*: The presence of algae will consume large amounts of disinfectant. If you have an algae problem, the use of an algicide in addition to disinfectant may be necessary.
- *Bather Load*: The greater the number of people using your spa, the more disinfectant you will need to use.
- *Improper pH*: A high pH above 7.8 substantially retards disinfecting. Keep the pH between 7.2 and 7.8.
- *Sunlight*: The sun's Ultraviolet (UV) rays readily dissipate disinfectant levels.
- *Water Temperature*: High water temperature accelerates the loss of disinfectant.
- *Weather*: Rain and wind can carry a significant amount of contaminants into your spa.

Remember to Maintain:

- pH 7.2 to 7.8
- Total alkalinity 80 to 120 ppm
- If using brominating tablets, the proper level in dispenser
- Maintain granular chlorine residual level at 1.0 to 3.0 ppm
- Maintain bromine residual level at 2.0 to 4.0
- Calcium hardness 125-150
- Non-chlorine shock weekly or as needed based on spa use
- Test pH, total alkalinity and calcium hardness weekly
- Test disinfectant daily (Spa test kits are available through your Carolina Spas™ Dealer.)

Ozone Generator

Carolina Spas™ come equipped with an Ozone generator. The ozonator automatically produces ozone when pump 1 is operating on low speed, or if equipped with a continuous circulation pump, unless they are overridden by another system protection mode. The Ozone generator is a wearable item and will need to be replaced approximately every two years. This is a non-warranty item.

What is Ozone?

Ozone is nature's natural purifier. It is a chemical known as O₃ and is produced from simple oxygen molecules in our atmosphere. Ozone will breakdown and oxidize oils, greases, suntan lotions, sweat, urea, etc. from spa water more effectively than any other oxidizer commercially available. Ozone also assists chlorine, or bromine, to destroy bacteria and viruses and will do so more effectively. Ozone only leaves simple oxygen in the water as a by-product.

How is Ozone Produced?

Ozone is produced in nature from lightning during electrical storms and is also produced from ultraviolet rays from the sun to form our protective ozone layer. Your ozone converter unit is designed to duplicate this natural sanitizer.



Always follow instructions and dosages listed by chemical manufacturers. Use only spa chemicals in your spa. Do not mix chemicals or add chemicals during bather use.

SERVICE & WARRANTY INFORMATION

General Service Information

Carolina Spa™ models have been designed to provide years of trouble-free use. As with any appliance, problems may occasionally occur that require the expertise of a qualified service person. Though such simple repairs as resetting a GFCI switch or breaker, resetting a high limit thermostat or replacing a light bulb may not require a service call, they may indicate that a more serious condition exists. These conditions may require an experienced service person. Before calling for service, please refer to the Troubleshooting Guide.

Note: Always retain your original sales receipt for future reference.

Acts Invalidating Warranty

The limited warranty is void if your Carolina Spa™ model has been improperly installed, subjected to alteration, misuse, or abuse, or if any repairs on the spa are attempted by anyone other than an authorized representative of the manufacturer of Carolina Spas™. Alteration shall include any component or plumbing change, electrical conversion, or the addition of any non-approved sanitation or water purification device, or heating system that contributes to component or unit failure or unsafe operating system. Misuse and abuse shall include any operation of the spa other than in accordance with the manufacturer of Carolina Spas™ printed instructions, or use of the spa in an application for which it is not designed; specifically: use of the spa in a non-residential application; damage caused by operation* of the spa at water temperatures outside the range of 35°F and 120°F; damage caused by a dirty, clogged or calcified filter cartridge; damage to the spa components or spa surface determined to have been caused by improper water maintenance or improper use of chemicals (refer to pages 21-24 of this owners manual); damage caused by allowing undissolved spa sanitizing chemicals to lie on the spa surface (no spa surface material can withstand this kind of abuse); **and damage to the spa surface caused by leaving the spa uncovered while empty of water and in direct exposure to sunlight (this may cause solar heating distress in warm weather regions). These are considered abuses and may invalidate this warranty.**

Acts of nature, and damage caused by animals, rodents, and insects are considered abuses and are not covered under this warranty.

*Operation of the spa does not mean “use” of the spa. The manufacturer of Carolina Spas™ does not recommend using the spa if the water temperature is above or below the spa’s control panel temperature range.

DISCLAIMERS

The manufacturer of Carolina Spas™ shall not be liable for loss of use of your Carolina Spa™ model or other incidental, consequential, special, indirect, or punitive costs, expenses or damages, which may include but are not limited to the removal of a permanent deck or other custom fixture or the necessity for crane removal. Any implied warranty shall have a duration equal to the duration of the applicable limited warranty stated above. Some states do not allow limitations on how long an implied warranty lasts. Under no circumstances shall the manufacturer of Carolina Spas™ or any of its representatives be held liable for injury to any person or damage to any property, however arising.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.



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