

# NorthWind Hot Tubs™



———— 2016 ————  
**OWNER'S MANUAL**

VERSION 01152016

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# NorthWind Hot Tubs™

## CONGRATULATIONS!

YOU'RE ALMOST READY TO ENJOY YOUR NEW SPA!

! PLEASE READ YOUR ENTIRE OWNER'S MANUAL BEFORE SPA OPERATION !

### Basic Information

#### Water Care

**IMPORTANT:** Caring for your water by ensuring proper chemical usage is the single most important thing you can do to keep your hot tub in good condition.

**WARNING:** Improper chemical usage and maintenance will quickly lead to severe issues with your spa and can effect the spas equipment, jets, pumps and all other components in contact with the spa water. **All hot tubs and swim spas are susceptible to damage from unbalanced spa water.**

Always maintain your spa's water chemistry within the following parameters:

pH	7.2 - 7.8
Chlorine	1.0 - 3.0 ppm
Bromine	2.0 - 5.0 ppm
Total Alkalinity	100 - 120 ppm
Calcium Hardness	150 - 250 ppm

#### Electrical

All self contained spas use 120VAC or 240VAC electrical spa packs.

**120VAC:** Requires an isolated 20 Amp circuit breaker, an isolated circuit with no other appliances or lights on the circuit at any time. Extension cords are not to be used in conjunction with the operations of the spa. Low voltage damage could result and this is not covered by warranty. **IMPORTANT: Hot Tubs with 110V means that the jets and heater will not work at the same time.**

*NOTE: All components must be 120V. No 240V components allowable.*

**240VAC:** Depending on the model of spa, it will require either a 40 Amp or 50 Amp dedicated circuit breaker, GFCI, with the proper wire size based on the length of the run.

The electrical circuit must be installed by a certified electrician and approved by a local building or electrical inspector.

#### Surface

Your new portable spa must be placed on a firm, flat and level surface, so the spa weight is supported uniformly. We recommend no less than a 3" (93 mm) thick concrete slab. Wood decking or balconies must be constructed to support 150 pounds per square foot (730 kg/m<sup>2</sup>). Refer to local and current building codes in your area. Consult an engineer for live loads in your area. Should your new spa need to go through a gate, the opening should be a minimum of 48 inches and up to 8.5' overhead clearance depending on the size of the unit.

*NOTE: Damage caused by alternate decking methods may avoid the spa warranty. Contact your dealer if you have any questions regarding spa location or placement.*

#### Transport

Your new spa has left the factory cleaned and polished and ready to begin operation after passing our many quality and operational tests. However, depending on your location in the world, your spa may have spend days or even weeks in transit before arriving at your home. Please ensure that before filling or operating your hot tub that you check all electrical and plumbing connections are securely connected in the equipment area as they might have loosened during shipping. If any dirt has accumulated, you will want to remove with a clean cloth or sponge using warm water.



## PREP FOR FILLING



**1** Clean out any dirt that has accumulated during shipping / transport



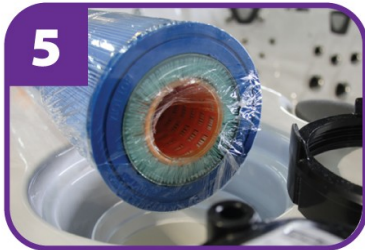
**2** Ensure all plumbing and electrical connections are securely connected and tightened as they can come loose during transit.



**3** Ensure that any gate/knife valves are fully open.



**4** Remove the filter lock ring and lid.



**5** Remove filter and take it out of the plastic transport bag. Leave filter canister open when filling.

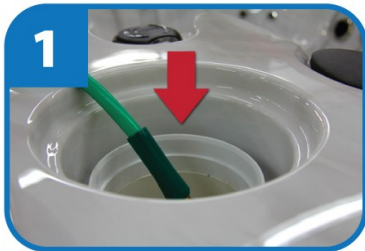


**6** Loosen (do not remove) the air bleeder valve located in the skimmer cavity.

## FILLING YOUR SPA

**!** DO NOT USE HOT WATER TO FILL YOUR SPA

**!** DO NOT USE WATER FROM A WATER SOFTENER



**1** Place fill hose into open filter canister and fill hot tub until water is 2/3 of the way up the skimmer opening.



**2** When filled all massage jets (excluding neck jets) should be under water.



**3** Remove fill hose from filter canister.

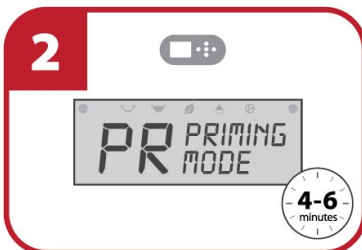


**4** Put filter back into filter canister. Then put back on the filter canister lid and tighten locking ring.

## POWERING UP YOUR SPA



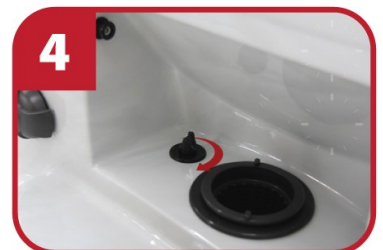
**1** Turn power on at the main breaker.



**2** PR - Priming Mode: Your spa will now run a diagnostic test. Do not press any buttons while test is running (4 - 6 minutes).

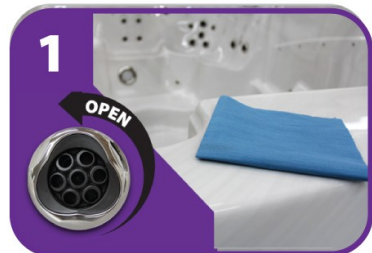


**3** Once test is complete, you will see the temperature display on your hot tub control panel.



**4** Tighten the air bleeder valve located in the skimmer cavity. Set your hot tub temperature. Get ready to enjoy!

### PREP FOR FILLING



1 Clean out any dirt that has accumulated during shipping / transport



2 Ensure all plumbing and electrical connections are securely connected and tightened as they can come loose during transit.



3 Ensure that any gate/knife valves are fully open.



4 Flip weir door outwards. Locate the filter and remove plastic packaging and reinstall.



5 Loosen (do not remove) the air bleeder valve by turning counterclockwise.

### FILLING YOUR SPA

! DO NOT USE HOT WATER TO FILL YOUR SPA

! DO NOT USE WATER FROM A WATER SOFTENER



1 Place fill hose into the skimmer opening and fill the hot tub until water is 2/3 of the way up the skimmer opening.



2 When filled all massage jets (excluding neck jets) should be under water.

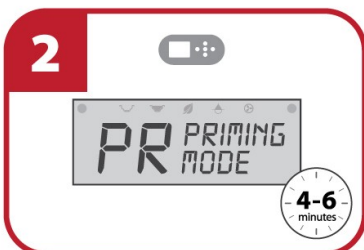


3 Remove fill hose from filter canister.

### POWERING UP YOUR SPA



1 Turn power on at the main breaker.



2 PR - Priming Mode: Your spa will now run a diagnostic test. Do not press any buttons while test is running (4 - 6 minutes).



3 Once test is complete, you will see the temperature display on your hot tub control panel.



4 Tighten the air bleeder valve. Set your hot tub temperature. Get ready to enjoy!



## IMPORTANT SAFETY INSTRUCTIONS

### READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY

**DANGER:** Risk of Injury. The suction fittings in this hot tub are sized to match the specific water flow created by the pump. Should the need arise to replace the suction fittings or the pump, be sure that the flow rates are compatible. Never operate the hot tub if the suction fittings are broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the original suction fitting.

**DANGER:** Risk of Accidental Drowning. Do not allow children to be in or around the spa without adult supervision. Keep the spa cover on and locked when not in use. See instructions enclosed with the cover for locking procedures.

**DANGER:** Risk of Electrical Shock. The electrical supply for this product must include a suitably 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. The disconnect must be readily accessible and visible to the hot tub occupant but installed at least 5 feet (1.5 m) from the hot tub water.

### READ, FOLLOW AND SAVE THESE INSTRUCTIONS

- a) A green colored terminal or a terminal marked G, Gr, Ground, Grounding or the symbol \* is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors that supply this equipment.
- b) At least two lugs marked "Bonding Lugs" are provided on the external surface or on the inside of the supply terminal box compartment. To reduce the risk of electric shock, connect the local common bonding grid in the area of the hot tub to these terminals with an insulated or bare copper conductor not smaller than No. 6 AWG.
- c) All field-installed metal components such as rails, ladders, drains or other similar hardware within 5 feet (1.5 m) of the hot tub shall be bonded to the equipment grounding buss with copper conductors not smaller than No. 6 AWG.

**WARNING:** To Reduce the Risk of Injury: The water in a hot tub should never exceed 104 °F (40 °C). Water temperatures between 100 °F (38 °C) and 104 °F (40 °C) are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when hot tub use exceeds 10 minutes. 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 hot tub water temperatures to 100 °F (38 °C). If pregnant, please consult your physician before using a hot tub. Before entering the 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 +/- 5 °F (2 °C). Persons suffering from obesity or a medical history of heart disease, low or high blood pressure, circulatory system problems or diabetes should consult a physician before using a hot tub.

**CAUTION:** Risk of Hyperthermia: Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the

normal body temperature of 98.6 °F (37 °C). The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body. Prolonged immersion in hot water may induce hyperthermia. A description of the causes, symptoms, and effects of hyperthermia are as follows:

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

**WARNING:** Children should not use hot tubs without adult supervision.

**WARNING:** Do not use hot tubs unless all suction guards are installed to prevent body and hair entrapment.

**WARNING:** People with infectious diseases should not use a hot tub.

**WARNING:** To avoid injury, exercise care when entering or exiting the hot tub.

**WARNING:** Do not use drugs or alcohol before or during the use of a hot tub to avoid unconsciousness and possible drowning. The use of alcohol or drugs can greatly increase the risk of fatal hyperthermia in hot tubs.

**WARNING:** Pregnant or possibly pregnant women should consult a physician before using a hot tub.

**WARNING:** Water temperature in excess of 38 °C (100 °F) may be injurious to your health. Before entering the hot tub, measure the water temperature with an accurate thermometer.

**WARNING:** Do not use a hot tub immediately following strenuous exercise.

**WARNING:** Prolonged immersion in a hot tub may be injurious to your health.

**WARNING:** Do not permit electric appliances (such as lights, telephone, radio, television, etc.) within 5 feet (1.5m) of this hot tub unless such appliances are built-in by the manufacturer.

**WARNING:** People using medication and/or having an adverse medical history should consult a physician before using a spa or hot tub.

**CAUTION:** Observe a reasonable time limit when using the hot tub. Long exposures at higher temperatures can cause high body temperature. Symptoms may include dizziness, nausea, fainting, drowsiness, and reduced awareness. These effects could possibly result in drowning.

**CAUTION:** Enter and exit the hot tub slowly. Wet surfaces can be very slippery.

**CAUTION:** Proper chemical maintenance of hot tub water is necessary to maintain safe water and prevent possible damage to hot tub components. Maintain water chemistry in accordance with manufacturer's instructions.

**CAUTION:** Use the straps and clip tie downs to secure the cover when not in use. This will help to discourage unsupervised children from entering the hot tub and keep the hot tub cover secure in high-wind conditions. There is no representation that the cover, clip tie-downs, or actual locks will prevent access to the hot tub.

**CAUTION:** For exercise, the water should not exceed 90 °F (32 °C).

**CAUTION:** When using this electrical equipment, basic safety precautions should always be followed.

**PREPARATION AND SET-UP FOR YOUR NEW SPA  
LOCATION FOR YOUR NEW SPA:**

- You want to keep in mind how you intend to use the spa and plan the location accordingly.
- How close is the spa from the exit or entrance to your house? (consider the cold weather)
- Is the path to your spa clean of debris, sand, grass? (so as not to track into the spa)
- Is there protection from wind, inclement weather?
- Can neighbors or passersby see the spa?

**NOTE: Allow for service access:** Many spa owners enjoy placing their spa in a decorative enclosure or a deck. Keep in mind that you need to have access to the equipment for maintenance and the spa should be able to be moved or lifted without destroying the special enclosure or its surroundings. You should discuss this with your dealer when designing the location. Extension cords are not to be used in conjunction with the operations of the spa. Low voltage damage could result and this is not covered by warranty. **NOTE:** All components must be 120V; No 240V components allowable.

**240VAC:** Depending on the model of spa, it will require either a 40 Amp or 50 Amp dedicated circuit breaker, GFCI, with the proper wire size based on the length of the run. The electrical circuit must be installed by a certified electrician and approved by a local building or electrical inspector.

**ELECTRICAL REQUIREMENTS**

All self contained spas use 120VAC or 240VAC electrical spa packs.. These instructions describe the only acceptable electrical wiring procedures. Spas wired in any other way will void your warranty and may result in serious injury. All installations should be completed by a certified electrician. Failure to comply with state and local codes may result in fire or personal injury and will be the sole responsibility of the spa owner.

**120VAC:** This requires an isolated 20 Amp circuit breaker. This needs to be an isolated circuit with no other appliances or lights on this circuit at any time. Extension cords are not to be used in conjunction with the operations of the spa. Low voltage damage could result and this is not covered by warranty. **NOTE:** All components must be 120V; No 240V components allowable.

**240VAC:** Depending on the model of spa, it will require either a 40 Amp or 50 Amp dedicated circuit breaker, GFCI, with the proper wire size based on the length of the run. The electrical circuit must be installed by a certified electrician and approved by a local building or electrical inspector.

**SURFACE AND PAD REQUIREMENTS**

Your new portable spa must be placed on a firm, flat and level surface, so the spa weight is supported uniformly. We recommend no less than a 3" (93 mm) thick concrete slab. Wood decking or balconies must be constructed to support 150 pounds per square foot (730 kg/m<sup>2</sup>). Refer to local and current building codes in your area. Consult an engineer for live loads in your area. Should your new spa need to go through a gate, the opening should be a minimum of 48 inches and up to 8.5' overhead clearance depending on the size of the unit.

**NOTE:** Damage caused by alternate decking methods may void the spa warranty. Contact your local dealer if you have any questions regarding spa location or placement.

**DRAINING AND WINTERIZING**

**DRAINING YOUR SPA**

After a period of 3-4 months, detergent residues from bathing suits and soap film will build up in your spa water. Once this happens, your spa water will appear cloudy and should probably be replaced.

- Turn power OFF at the breaker.
- Locate the drain valve (usually in the equipment area).
- Remove the safety cap and attach garden hose.
- Drain water to a convenient area. (Spa water may harm grass or plants if sanitizer levels are high.)
- When water begins to flow out of the hose, open the air relief valve located on filter lid (Hydro-Cyclonic Filtration) or Air Bleeder Valve (Skim Filtration)
- Your spa will drain except for a small portion left in the foot well. This can be removed with a sponge and pail.
- Once empty, clean as required.
- To finish, remove garden hose and attach safety cap.

**IMPORTANT (Cascade Series Only):** There will be an additional drain valve. This is connected directly to the tank reservoir and you will see the water level go down on the sight tube in the equipment area.

**WINTERIZING YOUR SPA**

In many areas of the world the temperature may drop below 32°F (0°C). We recommend the spa is always filled with water and running at normal spa temperatures. By doing this you will minimize the risk of freezing within your spa. If it is necessary to leave your spa unattended for long periods of time during cold weather conditions, you should drain your spa to avoid accidental freezing caused by power outages. Your local dealer can perform the following winterizing procedures, if you are not completely comfortable with them.

- Ensure that you have fully drained the spa (Refer to the DRAINING YOUR SPA section)
- After draining, your spa may still have water remaining in the equipment and plumbing fittings. Disconnect the hand-tightened union fittings going to and from the jet pumps. Be careful not to lose the o-rings between the unions and pump housing.
- Leave drain valve in the open position and safety cap off .
- To completely drain the plumbing lines, a wet/dry shop vacuum can be used to draw out any remaining water. Place the vacuum hose over the jet fittings in the

spa as well as the plumbing lines in the equipment area. You should also disconnect the plug on the crystal clear inspection tube (if installed)

- Remove the filter cartridge and store in a warm, dry area.
- Clean the spa shell and place spa cover on spa. Be sure to lock the cover in place in case of high winds or rain.

**WARNING:** The instructions above should be followed accordingly when winterizing your spa however they are guidelines and potential freeze damage may still occur. All freeze damage is the sole responsibility of the spa owner and will not be covered by the warranty should it occur.

**EMERGENCY SITUATIONS:** To eliminate freezing in the event of equipment failure, use a 100-watt light bulb or small heater via extension cord and place it in the equipment area, keeping it away from plumbing lines. This will help for a short period of time until proper service can be rendered.

### FILTER MAINTENANCE

The spa filter is one of the most important maintenance items of a hot tub. The filter is there to remove debris from the water and needs to be cleaned on a regular basis. Failure to do so may result in poor performance, poor water clarity and could prevent the spa from heating. Filtration starts as soon as flow is steady through the filter. As the filter cartridge removes the debris from the spa water, the accumulated debris causes flow resistance.

### CLEANING AND REPLACING FILTER CARTRIDGE

Your spa filter has been designed for quick and easy maintenance. The filter cartridge should be rinsed by hose once a week and cleaned with a cartridge cleaner once a month. A second filter cartridge is recommended and will speed up this process. This can be purchased from your local dealer.

### TOP LOAD FILTERS

- Turn power OFF at the breaker.
- Loosen air relief valve, then remove retainer ring.
- Pull filter lid straight up to remove.
- Do not twist or pull the filter lid up on an angle. This could cause damage to the filter canister, especially in freezing conditions.
- Remove filter cartridge and clean with a garden hose and a high-pressure nozzle. Periodically you may need to soak your filter in a "cartridge filter cleaner" to remove excess minerals and/or oils.
- Rinse filter thoroughly before installing. Clean o-ring on filter lid and apply a light film of silicone lubricant to the o-ring. Do not use a petroleum-based lubricant as it could damage the o-ring. Consult your dealer to purchase suitable lubricant.
- Place clean Cartridge in filter canister.
- Replace filter lid and re-tighten retaining ring (finger tight only)



**NOTE:** Make sure the o-ring is on the air relief valve, and is finger tight prior to starting the pump. This o-ring should periodically be lubricated with a silicone lubricant.

- There is a 3/8" clear line coming from the filter area and this goes to the bottom corner of the spa. This drains all the water from around the filter canister.
- This is a good time to check the skimmer basket. Bring skimmer door (weir) forward and unscrew basket. Clean out debris and reinstall.

### FRONT ACCESS SKIMMER/FILTER

- Turn power OFF at the breaker.
- Pull open skimmer weir door.
- Reach in and remove skimmer basket.
- Pull straight up and out to remove basket. Clean out debris.
- Remove diverter plate.
- Remove filter cartridges.
- Clean with a garden hose and high-pressure nozzle. Periodically you may need to soak your filter in a cartridge filter cleaner to remove excess minerals and/or oils.
- Rinse filter thoroughly before installing.
- Reverse this procedure to re-install the filter cartridges.
- Put pump on low speed this will help pull the cartridge into place.



Look for these specialized cleaning attachments at your local dealership.



### WATER QUALITY MAINTENANCE

Maintaining the quality of the water within the specified limits will serve to enhance your enjoyment and prolong the life of the hot tub's equipment. It is a fairly simple task, but it requires regular attention because the water chemistry involved is a balance of several factors. There is no simple formula, and there is no avoiding it. An indifferent approach to water maintenance will result in poor and potentially harmful conditions for soaking and even damage to your hot tub investment. The most important thing to keep in mind is that *preventing* poor water chemistry is much easier than *correcting* poor water chemistry. For specific guidance on maintaining water quality, consult your Authorized Dealer who can recommend appropriate chemical products for sanitizing and maintaining your hot tub.



## MAINTAIN HEALTHY SPA WATER

**Important!** When maintaining your hot tub's water chemistry, ensure that your cover is removed during any aggressive treatments to allow for dissipation into the air. Take care to remove the cover slowly and let chemicals deplete if you are uncertain if your water is properly balanced.

***Always maintain your hot tub's water chemistry within the following parameters:***

**pH:** pH is a measure of relative acidity or alkalinity of water and is measured on a scale of 0 to 14. The midpoint of 7 is said to be neutral, above which is alkaline and below which is acidic. In hot tub water, it is very important to maintain a slightly alkaline condition of 7.2 to 7.8. Problems become proportionately severe the further outside of this range the water gets. A low pH will be corrosive to metals in the hot tub equipment. A high pH will cause minerals to deposit on the interior surface (scaling). In addition, the ability of the sanitation agents to keep the hot tub clean is severely affected as the pH moves beyond the ideal range. That is why almost all hot tub water test kits contain a measure for pH as well as sanitizer.

**Sanitizer (Chlorine or Bromine):** To destroy bacteria and organic compounds in the hot tub water by breaking them down into non-harmful levels which get filtered out. A sanitizer must be used regularly, either chlorine or bromine. Sanitizing your spa water is the most important spa maintenance you can do for yourself.

**Total Alkalinity:** This refers to the ability of the hot tub water to resist changes in pH. Controlling alkalinity can help keep your pH in the appropriate range thereby lessening the need for pH balancing. If the TA is too low the pH level will fluctuate rapidly from high to low. If the TA is too high the pH will tend to be too high and will be very difficult to bring back down.

**Calcium Hardness:** This is a measurement of dissolved calcium in the water. Calcium will help control the corrosive nature of the spa's water.

**WARNING:** Never store chemicals inside the equipment area of your spa.

**IMPORTANT:** Do not use Hydrogen Peroxide based sanitizers in your spa. When using Chlorine or Bromine tablets you must use a floating dispenser. These chemicals can have an extremely corrosive effect on certain materials in the spa. Damage caused by use of these chemicals, or improper use of any chemicals, is not covered under the spa's warranty.

**OTHER ADDITIVES:** Many other additives are available for your spa. Some are necessary to compensate for out-of-balance water, some aid in cosmetic water treatment and others simply alter the feel or smell of the water. Your Authorized Dealer can advise you on the use of these additives.

**WATER CLARITY TROUBLESHOOTING**

PROBLEM	PROBABLE CAUSE	POTENTIAL SOLUTIONS
<b>Water Odor</b>	<ul style="list-style-type: none"> <li>• Improper sanitization</li> <li>• Excessive organics in water</li> <li>• pH is too low</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Add sanitizer</li> <li>&gt; Shock spa with sanitizer</li> <li>&gt; Adjust pH</li> </ul>
<b>Chlorine Odor</b>	<ul style="list-style-type: none"> <li>• Chloramines are too high</li> <li>• pH is too low</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Shock spa with sanitizer</li> <li>&gt; Adjust pH</li> </ul>
<b>Musty Odor</b>	<ul style="list-style-type: none"> <li>• Bacteria or Algae growth</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Shock spa with sanitizer</li> <li>&gt; Drain and refill spa water</li> </ul>
<b>Scale</b>	<ul style="list-style-type: none"> <li>• Total alkalinity is too high</li> <li>• pH is too high</li> <li>• High calcium content in water</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adjust total alkalinity</li> <li>&gt; Adjust pH</li> <li>&gt; Use stain and scale product</li> </ul>
<b>Stains</b>	<ul style="list-style-type: none"> <li>• Total alkalinity is too low</li> <li>• pH is too low</li> <li>• High metal content in water</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adjust alkalinity</li> <li>&gt; Adjust pH</li> <li>&gt; Use stain and scale product</li> </ul>
<b>Cloudy Water</b>	<ul style="list-style-type: none"> <li>• Poor filtration</li> <li>• pH is too high</li> <li>• Hardness is too high</li> <li>• Total alkalinity is too high</li> <li>• Suspended particles</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Clean filter cartridge</li> <li>&gt; Adjust pH</li> <li>&gt; Adjust hardness</li> <li>&gt; Adjust total alkalinity</li> <li>&gt; Drain and refill spa water</li> </ul>
<b>Algae Growth</b>	<ul style="list-style-type: none"> <li>• pH is too high</li> <li>• Sanitizer is too low</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adjust pH</li> <li>&gt; Shock spa with sanitizer</li> <li>&gt; Adjust sanitizer level</li> </ul>
<b>Eye Irritation</b>	<ul style="list-style-type: none"> <li>• pH is too low</li> <li>• Sanitizer is too low</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adjust pH</li> <li>&gt; Shock spa with sanitizer</li> <li>&gt; Adjust sanitizer level</li> </ul>
<b>Skin Rash/Irritation</b>	<ul style="list-style-type: none"> <li>• Free chlorine level too high</li> <li>• Unsanitary water</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adjust chlorine level</li> <li>&gt; Shock spa with sanitizer</li> <li>&gt; Adjust sanitizer level</li> </ul>

### PRODUCT & CARE GUIDE

Your Authorized Dealer carries a wide variety of care and maintenance products. For more information please contact your Dealer.

#### REQUIRED FILTER MAINTENANCE

Your new hot tub is equipped with a filter cartridge. To ensure maximum water quality at all times, you should replace the filter cartridge every six months, or earlier as necessary. The filter cartridge is designed to be thrown away! Attempts to re-use the filter cartridge may result in the re-release of unwanted particles back into the hot tub.

#### PLEATCO DUAL CORE FILTERS

Your hot tub/spa comes with a premium filter. Most come with equipped with a Pleatco DualCore Filter, which does a better job of cleaning your spa water than any other filter cartridge. The DualCore filter has two layers of filtration media, the outer layer and the inner layer. Both are engineered to remove different particles from your water.



The outer core is similar to a traditional filter which traps larger debris, while the inner core filters the water for particles down to 3 microns in size. The inner core is easily removed and both filter media can be cleaned.

Keeping your spa water clean and refreshing is extremely important for your enjoyment of your hot tub. Our hot tubs come with only the best filters available in order to ensure your satisfaction.

#### REQUIRED WATER REPLACEMENT

You should replace the hot tub's water every 3-6 months. The frequency will depend on a number of variables including frequency of use, number of bathers and attention paid to the water quality maintenance. You will know it is time for a change when you can no longer get the normal feel or sparkle to the water, even though the key water balance measurements are all within the recommended ranges.

#### HEADREST / PILLOW CARE

The pillows can be removed for easy cleaning and maintenance. All pillows have plugs within the pillow itself. To remove the pillow, grab the bottom edge firmly and pull outward. This will allow the pillows to pop-out from the receptacle in the spa shell. To reinstall the pillow you will align the pillow plug with the receptacle. Press/hit the front side of the pillow firmly, which will insert the plug back into the receptacle.

- **Proper water chemistry must be maintained. Your hot tub pillows are easily and quickly damaged when exposed to unbalanced spa water.** If you suspect that your chemicals may be unbalanced, remove your pillows immediately until the water has been restored to suggested conditions.
- Do not sit on the pillows

- Do not pull on the pillows
- Pillows should be cleaned using a soft cloth and mild soap, then wiped with a conditioner. We recommend that pillows be washed each time you drain you spa.

#### HOT TUB INTERIOR

Your hot tub has a fiberglass reinforced acrylic shell. Generally dirt and stains will not adhere to the surface. To properly clean the surface, we recommend wiping it with a soft damp cloth (or sponge) using household soap or liquid detergent and rinsing thoroughly with fresh water. Stubborn dirt or stains may be removed by using Spic & Span adequately dissolved in water. Contact your dealer and inquire about maintenance packages.

**DO NOT** use any cleaning products containing abrasives or solvents, since these could damage the surface. Harsh chemicals should never be used on acrylic surfaces. Damage to the shell due to the use of harsh chemicals is not covered under the warranty.

**DO NOT** leave your hot tub drained and in direct sunlight for extended periods of time. Extreme heat could cause damage to the acrylic surface and may induce an effect known as "crazing".

#### STAINLESS STEEL CONTROLS AND COMPONENTS ABOVE THE WATER LINE

To preserve the stainless steel finish of the controls and components above the water line, we recommend they be wiped with a dry soft cloth after each use of your hot tub. In addition, off-gas your tub by removing the cover for approximately 30 minutes multiple times per week (if not in use) and after every shock treatment.

#### CABINET CARE

Never spray cabinets with a high-pressure garden hose or pressure washer for any reason. This action may induce an electrical short in the hot tub's electrical equipment.

#### CEDAR CABINET

Our cedar cabinets are made from top quality Western Cedar and manufactured and stained at our factory. With proper care and maintenance, your cedar cabinet should maintain its beauty for many years. Manufacturer recommends touch-up or re-staining of the cabinet every three to four years depending on your environment. Contact your Dealer for re-staining procedures.

#### VINYL CABINET

Vinyl cabinets are made of a rigid polymer that combines the durability of plastic with the beauty of real wood. This cabinet is manufactured so that it won't crack, peel, blister or delaminate even after prolonged exposure to the elements. We recommend wiping the cabinet with a soft damp cloth (or sponge) using household soap or liquid detergent and rinsing with fresh water thoroughly. **DO NOT** use abrasive cleansers or material as this may damage the surface.



**COVER CARE**

A well cared for spa cover is a thing of beauty in its own right. Be sure to clean and condition your cover at least once a month – more often if needed. Your cover needs to be cleaned and conditioned because vinyl can be dry and become brittle, spoiling your spa's appearance. Dry, brittle vinyl can also tear at the seams and stress points. Quality materials, internal sewn reinforcing and careful workmanship can only go so far against the ravages of Mother Nature. See the specific Warranty card enclosed with your cover for further details.

- When you shock your spa you need to remove the cover for a minimum of 30 minutes to ensure that the chemical gas off can escape from the spa.
- You are required to keep the spa covered at all time when not in use to protect the shell from harmful UV rays.
- A covered spa will use less electricity when maintaining the desired water temperature
- See the manual that comes with the cover for proper mounting of the cover locks
- The cover should remain locked at all times to prevent unauthorized entry into the spa and potential drowning.
- Do not Sit, Stand or Lie on your cover. Nor should you place any heavy object on top of the cover as this may damage the structure.

**VERY IMPORTANT:** We recommend a vinyl conditioner for your spa cover. Your local dealer carries a wide variety of care and maintenance products. Choose a pleasant day each month to remove your cover from the spa and lay it on a flat surface accessible by garden hose. Douse the cover with a healthy amount of water from the hose or a bucket to rinse away loose dirt or debris. Using a soft bristle brush and a mild solution of dishwashing liquid (about one teaspoon of detergent to two gallons of water), and with a gentle circular motion, scrub the cover clean. Be careful not to let any areas of the cover dry before they're thoroughly rinsed. Now apply the vinyl conditioner as directed on the container. Massage the conditioner into the cover in a gentle but firm manner. Before replacing the cover on your spa, wipe and rinse any dirt from the bottom of the cover. When you are ready, put the cover on the spa.

**NOTE:** To remove tree sap, use lighter fluid (not charcoal lighter but the fluid used in cigarette lighters). Use sparingly, then immediately apply conditioner to that area.

**GLOSSARY OF TERMS**

**AIR CONTROL VALVE:** Mounted generally on the lip of the spa, it induces warm air from the equipment enclosure into the jet stream through venturi action.

**WATER DIVERTER VALVE:** The large diverter is used to divert water to various seats in the spa.

**ON/OFF DIVERTER VALVE:** The smaller diverter is used to control water flow and to turn on/off the neck jets and/or waterfalls.

**FILTER AIR RELIEF VALVE:** Located on top of dome filter lid. Used to release air from the filter.

**SKIMMER BLEEDER VALVE:** Located in the skimmer area, needs to be loosened while filling the spa. This will help eliminate air from being trapped in the spa equipment.

**OZONATOR:** Available as an option. The ozonator produces natural ozone through the Corona Discharge process. Continuous use of an ozonator can dramatically reduce sanitizer consumption.

**CONTROL BOX (Pack):** Basically the "heart" of the spa. Power is distributed to any/all functions of the spa: pumps, ozonator, LED lighting, heater element, etc.

**CONTROL PANEL:** Mounted on the top lip of the spa and controls the functions of the spa.

**DRAIN VALVE:** Used in draining of the spa. Normally located in the equipment area.

**EQUIPMENT ENCLOSURE:** An enclosure that houses the control box, pump(s) and other electrical components.

**FILTER:** The filter cleans the spa by passing water through a filter cartridge where debris and impurities are removed. Top load filter means the filter cartridge is accessible through the top of the spa. Front access skimmer means cartridge is accessed through door of skimmer.

**FLOOR DRAIN:** The floor drain is covered by a grate-type cover and is utilized when draining the spa. It also acts as the return for the ozonator. You will see bubbles emitted from this drain, which is the result of water mixing with the ozone output.

**GATE VALVES:** Red with a grey handle is located at the inlet and outlet of the pumping system. Used while servicing the spa equipment, the valves open or close the water flow to the equipment. To remain open for normal use, turn fully counterclockwise.

**KNIFE VALVES:** A white "T"-handled valve, same functions as Gate valve (see above), except to open them you pull up on handle.

**HEATER:** The electronically controlled heater raises the temperature of the spa to the desired setting.

**LEDs:** LEDs and their special lenses can be used to achieve the desired mood lighting in the spa and spa jets.

**SKIMMER:** This is the rectangular outlet at the water level. The skimmer removes surface debris to the filter. The water level in the spa should be kept ½ to ¾ up on the skimmer for optimum operation.

**SUCTION FITTING:** During operation of the equipment, the suction works in conjunction with the skimmer to draw water from the bottom of the spa through the filter, keeping the spa sparkling clean.

**NECK JET:** Direction-controllable jet for soothing neck massage.

**ADJUSTABLE CLUSTER JET:** Our adjustable, high-intensity hydrotherapy jet.

**DIRECTIONAL JET:** Provides a straight flow for a therapeutic massage

**ROTATIONAL JET:** Provides a Uni-directional circular therapeutic massage.

**MESSAGE JET:** Delivers massage in staccato bursts over a narrow, focused area.

**VOLCANO/WHIRLPOOL JET:** high-output jet designed for foot and leg massage.

**LAMINAR FLOW WATER FEATURE:** A thin stream of water that arcs from the spa lip.

### BASIC INSTALLATION AND CONFIGURATION GUIDELINES

#### **Warning! Qualified Technician Required for Service and Installation**

Use minimum 6AWG copper conductors only. Torque field connections between 21 and 23 in lbs. Readily accessible disconnecting means to be provided at time of installation. Permanently connected power supply. Connect only to a circuit protected by a Class A Ground Fault Circuit Interrupter (GFCI) or Residual Current Device (RCD) mounted at least 5' (1.52M) from the inside walls of the spa/hot tub and in line of sight from the equipment compartment.

#### **CSA ENCLOSURE: TYPE 2**

Refer to Wiring Diagram inside the cover of the control enclosure. Refer to Installation and Safety Instructions provided by the spa manufacturer.

**Warning:** People with infectious diseases should not use a spa or hot tub.

**Warning:** To avoid injury, exercise care when entering or exiting the spa or hot tub.

**Warning:** Do not use a spa or hot tub immediately following strenuous exercise.

**Warning:** Prolonged immersion in a spa or hot tub may be injurious to your health.

**Warning:** Maintain water chemistry in accordance with the Manufacturers instructions.

**Warning:** The equipment and controls shall be located no less than 1.5 meters horizontally from the spa or hot tub.

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

- Disconnect the electric power before servicing. Keep access door closed.

#### **CSA COMPLIANCE**

##### **Caution:**

- Test the ground fault circuit interrupter before each use of the spa.
- Read the instruction manual.
- Adequate drainage must be provided if the equipment is to be installed in a pit.
- For use only within an enclosure rated CSA Enclosure 3.
- Connect only to a circuit protected by a Class A ground fault circuit interrupter or residual current device.
- To ensure continued protection against shock hazard, use only identical replacement parts when servicing.
- Install a suitably rated suction guard to match the maximum flow rate marked.

##### **Warning:**

- Water temperature in excess of 38°C may be injurious to your health.
- Disconnect the electrical power before servicing.

#### **WARNING! GFCI OR RCD PROTECTION.**

The Owner should test and reset the GFCI or RCD on a regular basis to verify its function.

#### **WARNING! SHOCK HAZARD! NO USER SERVICEABLE PARTS.**

**TROUBLESHOOTING GUIDE**

**SPA SYSTEM**

SYMPTOM	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Spa does not work</b>	<ul style="list-style-type: none"> <li>• Power is turned off</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Reset GFCI</li> </ul>
<b>No display on the control panel</b>	<ul style="list-style-type: none"> <li>• Power is turned off</li> <li>• Defective topside control</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Reset GFCI</li> <li>&gt; Contact your Dealer</li> </ul>
<b>Letters on the control panel</b>	<ul style="list-style-type: none"> <li>• An error has been found</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Refer to the Reference Card for your control panel to verify the error. Contact your Dealer for service</li> </ul>

**PUMP PROBLEMS**

SYMPTOM	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Noisy/Loud motor</b>	<ul style="list-style-type: none"> <li>• Air trapped in the pump</li> <li>• Low water level</li> <li>• Worn pump seal</li> <li>• Defective pump</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Open bleed valve in the skimmer</li> <li>&gt; Add water to the spa</li> <li>&gt; Contact your Dealer</li> <li>&gt; Contact your Dealer</li> </ul>
<b>Pumps power down on their own</b>	<ul style="list-style-type: none"> <li>• Set temperature has been reached</li> <li>• Filtration cycle has ended</li> <li>• Automatic time out</li> <li>• Overheat safety protection</li> </ul>	<ul style="list-style-type: none"> <li>&gt; No problem</li> <li>&gt; No problem</li> <li>&gt; Pumps are set to run for a predetermined time while the spa is in use (15-20 Mins)</li> <li>&gt; The pumps have a thermal overload which will prevent them from running for extended periods of time. Wait until pumps have cooled down (1+ hrs). If problem persists, contact your Dealer.</li> </ul>
<b>Pump running constantly, will not turn off</b>	<ul style="list-style-type: none"> <li>• Filter cycle set to 24 hours</li> <li>• Problem with the circuit board</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Turn off 24 hour filtration</li> <li>&gt; Turn power off at GFCI and contact your Dealer</li> </ul>
<b>Pump will not turn on</b>	<ul style="list-style-type: none"> <li>• GFCI tripped</li> <li>• Motor has overheated</li> <li>• Not plugged in</li> <li>• Damaged plug</li> <li>• Seized motor</li> <li>• Blown fuse</li> <li>• Motor vent is blocked</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Reset the GFCI</li> <li>&gt; Let cool for 1+ hour</li> <li>&gt; Plug in to the board</li> <li>&gt; Contact your Dealer</li> <li>&gt; Contact your Dealer</li> <li>&gt; Check fuse or contact your Dealer</li> <li>&gt; Clear debris from the vent</li> </ul>



HEAT PROBLEMS	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Water will not heat</b>	<ul style="list-style-type: none"> <li>• Error message on control panel</li> <li>• Spa is in a different Heat Mode</li> <li>• Water level is too low</li> <li>• Poor water flow</li> <li>• Closed valves</li> <li>• Pump 1 is not running</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Refer to the Reference Card for your control panel to verify the error</li> <li>&gt; Set spa to "Standard Mode"</li> <li>&gt; Add water to the spa</li> <li>&gt; Clean filter &amp; check valves</li> <li>&gt; Open all valves</li> <li>&gt; Contact your dealer</li> </ul>
<b>Water is too hot</b>	<ul style="list-style-type: none"> <li>• Incorrect reading</li> <li>• Filter cycle duration is too long</li> <li>• Pump speeds reversed</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Verify temperature with thermometer</li> <li>&gt; Reduce duration of the filter cycle</li> <li>&gt; Contact your dealer</li> </ul>
<b>Water will not maintain heat</b>	<ul style="list-style-type: none"> <li>• Cover is off for extended periods of time in cold weather / cold wind.</li> <li>• Hot tub is wired for 110V and jets are on.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Put cover back onto hot tub and allow for heat to regenerate. Call your dealer if temperature does not increase.</li> <li>&gt; Hot tubs wired for 110V only have enough power to heat or operate pumps. Turn off jets to power heater.</li> </ul>

LIGHTING ISSUES	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Standard light will not come on</b>	<ul style="list-style-type: none"> <li>• Bulb has burnt out</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Replace the light bulb</li> </ul>
<b>LED lighting not in sync</b>	<ul style="list-style-type: none"> <li>• Burnt out bulb/connection</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Contact your dealer</li> </ul>
<b>LED lighting won't come on</b>	<ul style="list-style-type: none"> <li>• Incorrect settings</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Contact your dealer</li> </ul>

PUMPS WILL NOT PRIME	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Pump on but no water flow</b>	<ul style="list-style-type: none"> <li>• Air trapped in pump</li> <li>• No water in the pump</li> <li>• Closed valves</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Loosen bleed valve in skimmer</li> <li>&gt; Check the fill level in the spa</li> <li>&gt; Open all valves</li> </ul>

HYDROTHERAPY JETS	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Little to no water flowing from jets</b>	<ul style="list-style-type: none"> <li>• Jets turned off</li> <li>• Pump not primed</li> <li>• Valves are closed</li> <li>• Diverter set to a different seat</li> <li>• Dirty filter</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Open jet by turning the face counter clockwise</li> <li>&gt; Reset breaker to allow for the spa to prime the pump. Open bleed valve in the skimmer area</li> <li>&gt; Open valves</li> <li>&gt; Switch diverter</li> <li>&gt; Remove and clean filter cartridge</li> </ul>

PLUMBING SYSTEM	PROBABLE CAUSE	RECOMMENDED ACTION
<b>Water around base of spa</b>	<ul style="list-style-type: none"> <li>• Loose connections</li> <li>• Leak from internal fitting</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Hand tighten all quick disconnects and fittings.</li> <li>&gt; Check gaskets and o-rings</li> <li>&gt; Contact your dealer</li> </ul>



## NORTHWIND HOT TUB CONTROLS

### INITIAL START-UP

Your spa will enter Priming Mode (PR) when it is energized. During Priming Mode, press “Jets” button repeatedly and be sure the pump is free of air. Priming Mode lasts less than 5 minutes. Press “Warm” or “Cool” to exit. After Priming Mode, the spa will run in Standard Mode (see Mode section).

### TEMP CONTROL (80°F - 104°F / 26°C - 40°C)

The last measured water temperature is constantly displayed. The water temperature displayed is current only when the pump has been running for at least 1 minute. To display the set temperature, press “Temp” once. To change the set temperature, press the temperature button again before the display stops flashing and hold. The set temperature will begin to rise, release the button at the desired set temperature. To decrease the set temperature, press and hold the “temp” button again and the set temperature will decline, release at the desired set temperature.. After three seconds, the display will stop flashing and begin to display the current spa temperature. The spa will then begin heating (or cooling) in order to reach the set temperature that you have selected.

### PUMP

Press “Pump” to turn the pump on or off, and to shift between low and high speeds (if equipped). If left running, the pump will turn off after a preset length of time. Low speed may run automatically at times as part of your spas filtration cycles, during which it cannot be deactivated from the panel, however you will still be able to control the high speed setting. The ozone generator (if installed) will activate anytime low speed is running.

### AUX (PUMP 2)

If an additional pump or blower is installed. Press “Aux” to turn the device on. If your additional device is a dual speed pump, pressing “Aux”

again will activate the pumps high speed. Pressing “Aux” again will turn off the device/pump.

### LIGHT

Press “Light” to operate the spa light. Turns off after 4 hours. If your hot tub is equipped with a multicolor lighting package, then pressing the “Light” button consecutively will toggle the lights through different colors modes.

### MODE

Mode is changed by pressing “Warm or Cool” then once the display is flashing “Light”.

Press the “Light” button until you reach “Mode”. Press the “Warm or Cool” to toggle the “Mode” to “Ready” or “Rest”. Once you have the desired mode on screen press the “Light” button set.

### HEAT MODE – READY VS. REST

In order for the spa to heat, a pump needs to circulate water through the heater. The pump that performs this function is known as the “heater pump.” The heater pump can be either a 2-speed pump (Pump 1) or a circulation pump. If the heater pump is a 2-Speed Pump 1, READY Mode will circulate water every 1/2 hour, using Pump 1 Low, in order to maintain a constant water temperature, heat as needed, and refresh the temperature display. This is known as “polling.” REST Mode will only allow heating during programmed filter cycles. Since polling does not occur, the temperature display may not show a current temperature until the heater pump has been running for a minute or two. While Pump 1 High can be turned on and off, Pump 1 Low will run until set temperature is reached, or 1 hour has passed.

### READY-IN-REST MODE

READY/REST appears in the display if the spa is in Rest Mode and the Jets 1 Button is pressed. It is assumed that the spa is being used and will heat to set temperature. While Pump 1 High can be turned on and off, Pump 1 Low will run until set temperature is reached, or 1 hour has passed. After 1 hour, the System without polling.

### CIRCULATION MODE

If the spa is configured for 24HR circulation, the heater pump generally runs continuously. Since the heater pump is always running, the spa will maintain set temperature and heat as needed in Ready Mode, In Rest Mode, the spa will only heat to set temperature during programmed filter times, even though the water is being filtered constantly when in Circulation Mode.

### TEMPERATURE RANGE

Temperature Range is changed by pressing "Warm or Cool" then once the display is flashing "Light".

Press the "Light" button until you reach "TEMP". Press the "Warm or Cool" to toggle the "TEMP" to "High" (Arrow Up) or "Low"(Arrow Down). Once you have the desired Temperature Range on screen press the "Light" button set.

### DUAL TEMPERATURE RANGES (HIGH VS. LOW)

This system incorporates two temperature range settings with independent set temperatures. The specific range can be selected on the Settings screen and is visible on the Main Screen in the upper right corner of the display.

These ranges can be used for various reasons, with a common use being a "ready to use" setting vs. a "vacation" setting. Each range maintains its own set temperature as programmed by the user. This way, when a range is chosen, the spa will heat to the set temperature associated with that range.

*High Range can be set between 80°F and 104°F.*

*Low Range can be set between 50°F and 99°F.*

*More specific Temp Ranges may be determined by the Manufacturer.*

*Freeze Protection is active in either range.*

### ADJUSTING FILTRATION

#### MAIN FILTRATION

Filter cycles are set using a start time and a duration. Start time is indicated by an "A" or "P" in the bottom right corner of the display. Duration has no "A" or "P" indication. Each setting can be adjusted in 15-minute increments. The panel calculates the end time and displays it automatically.

Filtration Cycles are changed by pressing "Warm or Cool" then once the display is flashing "Light".

Press the "Light" button until you reach "FLTR" 1 or 2 as indicated in the lower right side. Press the "Warm or Cool" to toggle the "FLTR" to "BEGN". Press "Warm or Cool" to move to Step 1 or press "Light" to move to Step 2.

**Step 1. BEGN**—Press the "Warm or Cool" to set the starting hour. Once the hour is set Press the "Light" button to move to the starting minute, minutes are set in 15 minutes increments. Press "Light" to move to Step 2.

**Step 2. RUN—HRS**—Press the "Warm or Cool" to set duration in hour (s). Once the hour(s) is set Press the "Light" button to move to the duration in minutes, minutes are set in 15 minutes increments. Press "Light" to move to Step 3.

**Step 3. F 1—ENDS—Time**. This screen will verify the end time of the filtration cycle. F 2 will display for Filtration cycle 2.

#### FILTER CYCLE 2 - OPTIONAL FILTRATION

Filter Cycle 2 is OFF by default.

It is possible to overlap Filter Cycle 1 and Filter Cycle 2, which will shorten overall filtration by the overlap amount.



TOPSIDE CONTROLS | DIAGNOSTIC MESSAGES

SYMPTOM	PROBABLE CAUSE	RECOMMENDED ACTION
	No message on display. Power has been cut off to the spa.	The control panel will be disabled until power returns. Spa settings will be preserved until next power up.
--	Temperature unknown.	After the pump has been running for 2 minutes, the current water temperature will be displayed.
HH	"Overheat" - The spa has shut down.* One of the sensors has detected 118°F/47.8°C at the heater.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pushing any button. If the spa does not reset, shut off the power to the spa and call your dealer for service organization
OH	"Overheat" - The spa has shut down.* One of the sensors has detected that the spa water is 110°F/43.5°C.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107°F/41.7°C, the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer or service organization
SA	Spa is shut down.* The sensor that is plugged into the Sensor "A" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat condition)
Sb	Spa is shut down.* The sensor that is plugged into the Sensor "B" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat condition)
Sn	Sensors are out of balance. If alternating with spa temperature, it may just be a temporary condition. If flashing by itself, spa is shut down.	If the problem persists, contact your dealer or service organization.
HL	A significant difference between temperature sensors has been detected. This could indicate a flow problem.	If the water level is normal, make sure all pumps have been primed. If problem persists contact your dealer or service organization.
LF	Persistent low flow problems. (Displays on the fifth occurrence of message within 24 hours.) Heater is shut down, but other spa functions continue to run normally.	Follow action required for (HFL) message. Heating capability of the spa will now reset automatically. You may press any button to reset.
dr	Possible inadequate water, poor flow, or air bubbles in detected in the heater. Spa is shut down for 15 minutes.	If the water level is normal, make sure all pumps have been primed. If problem persists contact your dealer or service organization.
dY	Inadequate water detected in heater. (Displays on third occurrence of message.) Spa is shut down.*	Follow action required for (dr) message. Spa will not automatically reset. Press any button to reset manually.
IC	"Ice" - Potential freeze condition detected. *Even when spa is shut down, some equipment will turn on if freeze protection is needed.	No action required. All equipment will automatically activate regardless of spa status. The equipment stays on 4 minutes after the sensors detect that the spa temperature has risen to 45°F/7.2°C or higher. An optional freeze sensor may be added to protect against extraordinary freeze conditions. Auxiliary freeze sensor protection is advisable for colder climates. See your dealer for details.