



Hot Tub System with Electric Heat Installation & Operation Guide

Getting Started - General Installation Considerations:

This document and the other included manuals and diagram provide a general picture of how the system is set up. Your site considerations may dictate some adjustment or changes. The placements of the components are somewhat flexible, however there are a few important rules to follow. Read the following points carefully before starting your installation and apply them in conjunction with the manuals that have been provided by the manufacturers of the components of the system.

1. Your system is quite simple. The water in the tub is circulated in a closed loop by means of a pump through a heater and a filter and returned to the tub. A two-speed pump circulates for heating and filtration at low speed and has a higher speed for adding pressure to the jets. The tub control system unit manages the temperature, sanitizer cycles, and pump. The user interface is through the topside control touchpad that can be installed next to the tub.
2. **Important:** National Electric Code requires that electronic spa equipment be at least 5 feet away from the tub and/or behind a physical barrier that prevents a bather from reaching it. **This is an important safety requirement!** Be certain that your pump and electric heater (the tub control system unit) are 5 feet away from the tub or behind a physical barrier! For example: If your tub and heater are over 5 feet apart then your installation meets code. If your tub and heater are less than 5 feet apart, you must separate them with a barrier that prevents anyone in the tub from touching the heater.
3. **VERY IMPORTANT!** Electrical devices used with hot tubs need to be wired into a GFCI protected circuit. The tub control system unit **must be wired to a GFCI circuit breaker** – have your electrician provide and install this type of breaker. This is a required safety item.
4. Qualified professionals familiar with local code must do electrical connections. They should review the manufacturer's installation instructions included with the heater equipment.
5. We provide flexible spa pipe and rigid Schedule 40 PVC pipe for connecting the system to your tub. If you place the equipment more than ten feet away you may need additional spa pipe and/or rigid pipe to complete the installation. The flexible spa pipe is best for curves and places where flexibility is helpful. Everywhere you have straight runs, rigid PVC is more ideal.
6. Most tub control systems come with a flooded suction pump. These pumps must be installed below the waterline of the tub. Optionally, self-priming pumps are available for installations requiring the pump to be above the waterline of the tub. These pumps come with an integrated leaf trap which has the second function of helping a pump to self-prime between automatic cycles. The distance above the waterline the pump may be placed varies based on factors such as horizontal distance from tub, size of plumbing, number of elbows in the plumbing, etc. The maximum self-priming pumps can typically be above the waterline of about 5'. Any installations

outside of these parameters may require the use of a check valve (not included), and/or a different pump. Improper installation may cause the system to malfunction.

7. The tub control system is UL listed as weatherproof. Place equipment where it is not exposed to flooding, pooling of water, or snow accumulation.
8. If your tub is partially or completely sunken into a deck, you may be able to keep most or all of the equipment and the tub-side plumbing out of sight below the deck.
9. If the tub is more exposed, you can hide most or all of the equipment by clustering the jets and suctions so that you don't have to run pipe connections around the front of the tub. See plumbing diagram for ideas.
10. Place all the equipment where it can be easily accessed for adjustments and service. The filter, ball valves and heater should be conveniently located. By placing unions or drain fittings at low points in the system, you can drain it completely if necessary (winter vacation, extended shutdown, service, etc.)
11. Please carefully read all the included manufacturer's instructions for the tub control system heater, sanitizer (ozonator, ionizer, etc.), and filter.
12. Remember that there is a lot of flexibility in the placement of the equipment and the routing of the pipes. The included plumbing diagram is useful for getting the big picture. We have made every effort to include the parts you will need. Your site may require some modifications or additional fittings. With the exception of the jet and suction fittings, the rest are standard sized Schedule 40 PVC plumbing fittings widely available at hardware and plumbing supply stores if you find you need additional parts for your installation. You can contact us for additional parts if necessary.
13. Test fit all plumbing connections dry before gluing any of them. The flex pipe can be cut with a utility knife or hacksaw. Clean off any rough edges or fuzz with sandpaper. Complete the installation as a "dry fit" without glue before gluing any of the connections. Once you are satisfied with the whole system, begin gluing. Make sure the pipe and fittings are clean – wipe off any dirt or debris. Use the primer first on both surfaces, then glue on both surfaces. The glue is permanent. Provide good ventilation while gluing – the fumes are harmful. Avoid getting glue on your skin by wearing gloves. Hold each connection firmly for at least 10 seconds after gluing, otherwise they will partially separate.
14. Reference the other included manuals and diagrams for the following installation steps.

Installation steps:

- **Assemble Tub First** Place any staves with pre-cut holes for jets and suctions in the locations that work best for your installation. See separate instructions for tub assembly. You have some flexibility in choosing locations for the jets and suctions. See the diagrams for ideas and suggestions.

- **Installing Suction and Jet fittings** Holes for these have been pre-cut. Follow this procedure: Gasket goes inside the tub, ribbed side against the wood. Put a small amount of silicone on the ribbed face of the gasket (the face that goes against the wood of the tub) of each fitting. Also put a small amount of silicone on the threads before installing the nut.
 - a. **Suctions** Once the tub is assembled, install the suction fittings. The suction fittings have a 4” circular perforated cover. Suction fittings are installed in the lower holes. The perforated side goes on the inside of the tub. Be sure these suction covers are in place on each – they ensure that the suction cannot be blocked – **This is an important safety feature of your tub.** Tighten the nut on the outside of the suction fitting 1/2 turn past hand tight. See diagram for example placement.
 - b. **Jets** Next install the 4 jets that return heated water to the tub. Use a little silicone between the gasket and the wood surface, and on the threads. Tighten the elbow nut on the outside of the fitting 1/2 turn past hand tight.
- **Position tub control system control unit and pump** Now position the tub control system equipment, including pump in their locations. Refer to the plumbing diagram. Remember that National Electric Code requires that electronic spa equipment be at least 5 feet away from the tub and/or behind a physical barrier that prevents a bather in the tub from reaching and touching it. **This is an important safety requirement! Be certain that the tub control system system is 5 feet away from the tub or behind a physical barrier!** Once again – do not overlook this. Consult local code and a qualified electrician for any specific requirements in your area.
- **Filter** Next position the filter. We recommend placing the filter on the pressure (jets) side of the pump and heater as shown in the plumbing diagram. Take care to align the IN and OUT properly for the water flow direction. Be sure that the filter is in a convenient location because you will need to clean or change it regularly. Notes: 1. The filter should be installed as near to vertical as possible. 2. The filter comes with both a base mounting pedestal as well as an optional mounting nut for mounting in a hole in a surface such as a deck in a drop-in manner.
- **Sanitizer** (Ozonator, Ionizer, etc.) The last major item before the water goes back to the tub should be the sanitizer. The included sanitizer system has a fitting that is installed after the heater and filter in the line returning to the tub. See the plumbing diagram and system component manual(s) for clarity, proper setup and adjustment procedures.
- **Suction Connections** Refer to the plumbing diagram. The suction fittings are joined then connected to the suction side of the pump. Using the included 90° elbows and 4-way T fitting, and the spa flex pipe/rigid PVC, make connections that join the three suction fittings into one suction line that heads to the pump. Utilize the fittings in the way that works best for your situation. Install one of the provided ball valves in the suction line in a convenient location after the suction fittings and before any other components such as the heater or pump. This is so that the water can be shut off

for filter cleaning and other service. The ball valve includes a union fitting that allows for a hassle-free disconnect if needed. Use additional unions as needed.

- **Jet Connections** The sequence from the jet (or pressure) side of the heater is as follows: heater to filter to sanitizer to ball-valve to jets. The four jets are joined together into one line using supplied T fittings and elbows as needed. See diagram for typical layout.
- **Final Connection** Now complete the return line connection by using the spa flex pipe/rigid PVC to make the final connection to the jets. Before the jets, install the second ball valve in a convenient location. Place ball valves so that by closing the two ball valves, you can stop the flow of water to the filter, pump and heater so they can be worked on without draining the tub!
- **Plumbing drainage** To make draining the plumbing easy for winterizing, place a union, union/ball-valve or other appropriate style valve at the lowest spot(s) in the plumbing. By doing this the system can be easily drained if necessary for winter storage
- **Tub Drainage** The tub drain pipe is easily adapted to accept a garden hose. By doing this you can temporarily attach a hose when it is time to drain the tub. You can also attach flex or rigid PVC with a coupler to extend the drain line to a more desired location in a more permanent manner.
- **Topside Control** The topside keypad control panel plugs into the tub control system controller unit (refer to tub control system user manual). This panel should be placed close to the tub so you can adjust the temperature or turn on jets while using the tub. Use the included touchpad shelf mount to attach it to the tub or make your own cut out in a nearby location such as a deck or wall.
- **Electrical connections to the heater unit** Contact a qualified professional electrician for these connections. The tub control system heater **must be wired to a GFCI circuit breaker** – have your electrician provide and install this type of breaker. This is a required safety item. Do not try to make these connections on your own. Refer to the tub control system installation instructions for proper wiring.

Operation:

- Before turning on your system, be sure you have water in the lines at the suction side of your pump, otherwise you risk burning up the seals in your pump. This is also necessary to have a primed pump which means there is water in the pump for it to circulate. If you have a self priming pump you can see if there's water through the clear leaf basket lid. Gravity should have forced the water from your tub, through the lines to the pump. Be sure that all ball valves are in the full open position (handle parallel to the pipe). You may need to open the air relief screw on the top of the filter to let air escape.
- Once your installation is complete and you have water in the tub (at least half full), you can turn on your system. You will use the main GFCI breaker(s) to power your system on or off. Turn on your breakers and wait a few seconds for your system to finish its checks and turn on the pump.

- After your pump begins to run, ensure you have flow to the tub through the jets. If you don't, press the button to turn the pump up from low speed to high speed. Wait a minute or two. If you still have no flow, shut off the pump quickly so you don't burn up the seals and reassess your priming situation. Remember you need water in the pipe between the tub and the suction side of the pump in order to achieve priming.
 - If you have a self priming pump (one with a leaf trap built into it), you can remove the cover, fill it up with water, replace the cover and then turn it back on to high speed and wait a couple of minutes. Repeat until prime is gained.
 - If you have a flooded suction pump (one without the leaf trap built into it) then you just need to release the air lock so the water will flow from the tub through the suction and up to the suction side of the pump. The filter has an air relief on top or you can loosen a union joint in the plumbing. Typically air goes to the high points so look for places to release it that are in high points in the plumbing. Remember a flooded suction pump must be installed at an elevation that is below the water line (top level of the water) in the tub.
- Once you have flow, check your glue joints and threaded connections. If you have any leaks, turn off your system and correct them at this time.
- Refer to the tub control system user manual to learn how to set the temperature, time of day, filtration (sanitation) schedule and other heater functions.
- Set the temperature to about 100 degrees on the tub control system.
- To operate the jets, press the pump/jet button icon on your touchpad. This will set the pump on high speed. Press it again to return to low speed (while the system is calling for heat), or to turn the pump off (while no call for heat). Subsequent presses cycle through these 2 or 3 pump settings in a loop in this manner.
- Ensure your sanitizer is calibrated and set up correctly.
 - Ozonators require the injector valve to be calibrated to draw in the proper amount of air / ozone gas. This should be a one-time adjustment, but should be checked at least annually. Ozone gas is generated during the filtration cycle, but during other times the injector manifold will continue to draw air into the water stream. See included manual for full details.
 - Ionizers require the system to be operated from its dedicated control panel in accordance with the included manual.
- Adjust the eyeballs in the jet fittings as needed to get the jet action you prefer.
- To remove the filter, turn off the system, and then close the two ball valves. Remove the top of the filter housing. Clean the filter cartridge at least monthly, often biweekly is required. Spray the filter clean using a high-pressure garden hose focusing the stream into the pleats from top to bottom. Then flip and wash back the other direction, all around the cartridge until clear water

runs away. If the filter is greasy or oily and water is not cleaning it up, soak the filter in a bucket of water and dish soap solution and then rinse.

- Replacement filters are widely available online and at hot tub / pool supply stores. Use a FC-2390 or equivalent 50 square foot replacement filter cartridge. The filter should be replaced annually, or when it shows signs of wear or reduced flow even after cleaning.

Regular Tub Maintenance:

- Important! Set filtration cycles for at least 4 hours per day. This can be twice a day for 2 hours each time (preferred) or once a day for 4 hours per day. If you have high usage, consider increasing this to 6 or 8 hours per day. Adjust as necessary based on usage and water quality.
- Clean the filter once or twice per month. Adjust as necessary based on usage and water quality.
- Once a week, maintain the pH to proper level (7.2 – 7.6 range). Follow the instructions on the test strips, the PH Up, and/or PH Down bottles.
- Once a week, directly after balancing your PH, and at a time when it will be several hours before anyone plans to enjoy the tub, administer the proper amount of shock treatment/fast dissolving granulated chlorine (e.g. Leisure Time Spa 56®).
 - IMPORTANT NOTE: You can only test for your chlorine level with the test strips 5 minutes after applying. After that it will dissolve out. DO NOT try to keep your chlorine levels up all of the time. This will damage the cedar in your tub. Once a week is enough for the chlorine to do its job and is not too much for the cedar of your tub to handle. Short durations of twice per week if your water quality is poor is ok, but don't do this more than a few consecutive weeks.
- Change the water and clean the tub every 4 to 8 weeks or as necessary. drain, brush the interior of the tub down wherever you can access with a medium brush, rinse, then refill
 - Note: During the tannin release period of a new tub, you will likely want to change your water weekly. Do so at least biweekly until your water no longer turns tea-colored from the natural cedar tannins. These tannins themselves are harmless, in fact they are healthy for you as they contain natural antioxidants. However the bacteria that stems from humans in the water seems to thrive a bit more while the tannins are present. It is for these reasons it is recommended that the water be changed more frequently.
- Replace your filters once per year. NOTE: Replace means put in new cartridges. This is different from removing, cleaning, and then replacing.

IMPORTANT: The preceding steps are necessary to maintain clean water. Warm water can grow bacteria quickly causing skin irritation and other health issues. Remember bacteria comes from humans, not the wood or other materials. Good usage habits, such as showering before each use will reduce your risk of bacteria growth and will decrease the amount of sanitizing efforts and materials your tub will require. Remember, it is much easier to maintain clean water than it is to regain it after it is lost.

- Oil the exterior of the tub and wax the rim as frequently as necessary to keep a glossy hydrated look to the wood. Usually this is frequently done at first and then plateaus to once or twice a year. This will vary depending on your climate.

Filter Cleaning:

You should clean your filter every 2 weeks. Here's how:

1. Close the valves to isolate the filter. Remove the cartridge from the canister according to the manufacturer's instructions.
2. Spray the filter with a garden hose equipped with a straight flow nozzle. Work from top down and wash the pleats – especially between the pleats where the most dirt builds up. Smaller filters may fit in your dishwasher.
3. Rinse until all the dirt and debris is washed off.
4. Filters that are exposed to heavy bather loads may clog with oils that can be soaked out with a cup of dishwasher detergent in 5 gallons of warm water.
5. Rinse again to remove oil and detergent. If the filter is coated with algae or minerals, soak it in a solution of 1 part muriatic acid to 20 parts water until the solution stops bubbling. Rinse thoroughly and reassemble.
6. Replace the filter once per year.
7. Tip: Order a second filter and swap the filters each time you clean them. . Rinse them clean both directly after removing **and just before replacing**. Allowing the filter to dry out completely between, improves cleaning and therefore, performance.

Troubleshooting:

For system component related errors, refer to the troubleshooting guides provided by the manufacturers of each of those components.

For tub related issues, refer to the tub assembly & installation manual.

- **Weak water flow.** Clean filter. Check that all valves are fully open. Check that there is nothing blocking suction fittings.

Parts & Supplies:

Photos are to help you identify your parts.

Notes:

1. Your tub kit may not include all of these items – depending on the options chosen for your tub.
2. Color and style of some items may vary.



PVC Primer & Cement



Suction with elbow nut



Jet fitting (comes assembled)



1-1/2" Union



Tub Light - Optional



1 1/2" Union Ball Valve



1 1/2" Tee



Reducer Bushings



Filter Housing



Filter Base



Filter Cartridge



Water Sanitation Start-up Kit



1 1/2" Street Elbow (left)
1 1/2" Regular Elbow (right)



Topside Controller
Mounting Shelf Kit



Floating Thermometer