

Sundance® Spas

SPA EQUIPMENT SYSTEM

Installation Instructions

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Important Notices

These instructions apply to the spa equipment systems and preplumbed spa shells designed and manufactured by Sundance Spas. If this equipment system is to be connected to a spa made by a manufacturer other than Sundance Spas, certain instructions may not apply.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: 1) Rearrange or relocate the receiving antenna. 2) Increase the separation between the equipment and the receiver. 3) Connect the equipment into an outlet on a circuit different from the circuit connected. 4) Consult the dealer or an experienced radio/TV technician for help. Changes or modifications not expressly approved by the party responsible for FCC compliance could void the user's authority to operate this equipment.

Important Safety instructions

1. Read all instructions before installing this spa equipment system.

2. Danger – A wire terminal marked “ground” is provided within the power box (Ill. 1, Item 13). To reduce the risk of electrical shock, connect this terminal to the grounding terminal of your electrical supply panel with a continuous green insulating copper wire equivalent in size to the circuit conductors supplying this equipment, but no smaller than No. 8 AWG.

3. Danger – Risk Of Electrical Shock. Install at least five feet from spa. (This equipment system may be installed within five feet of the spa if, in accordance with the National Electrical Code, ANSI/NFPA 70-1990, each metal surface is permanently connected by a No. 8 AWG copper conductor attached to the wire connector on the terminal box provided for this purpose – Ill. 1, item 4.)

4. CAUTION – This equipment system must be hardwired to the household electrical service box only. Do not use an extension cord or any other disconnectable power cord. The use of an extension cord or a disconnectable power cord is highly dangerous and will void all warranties.

5. This equipment system must be installed in such a manner as to provide drainage of casual water, such as rainwater, away from all electrical components.

6. 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 70-1990.

7. The electrical circuit supplied for the spa must include a suitable ground fault circuit interrupter (GFCI) as required by NEC Article 680-42.

8. READ AND FOLLOW THE OWNER OPERATING INSTRUCTIONS PROVIDED BEFORE USING THE SPA.

9. SAVE THESE INSTRUCTIONS.

Where To Place The Equipment System

The equipment system must be located within forty (40)-running feet of the spa. If an existing gas heater is to be used, this equipment system should be placed near the gas heater.

If the equipment system is to be installed above the spa's normal water level, it will require the available strainer pot housings to help achieve prime. Order and install two each of part numbers 6472-619, 6560-006, and 6560-004.

The equipment system base should not be set on the ground. A separate concrete pad is preferred, but any platform which serves to permanently keep the system from contact with the ground is acceptable. Do not install the equipment system in a depression where casual water may stand after a rain or lawn sprinkling.

If the equipment system is to be exposed to direct sunlight and you are in a hot climate, you will need to shade the equipment system to protect it from the excessive temperatures of the mid-day sun.

Connecting Pipes Between Spa And Equipment

Water piping between the spa and the equipment system should be 2" diameter or larger Schedule 40 PVC or heavier. The use of 90 degree elbows should be minimized. Instead use two 45 degree elbows or, better still, gradual flex hose sweeps to make turns when possible.

The pipes on the Sundance spa shell are color coded. Connect the equipment components to these pipes as follows:

Dual-speed Pump-Suction-----Red
Dual-speed Pump- Discharge-----Blue
Single-speed Pump-Suction-----Orange
Single-speed Pump-Discharge-----Yellow
Air Blower-----Green

Check with the local Building Department to ensure that your planned installation meets the code requirements.

Blower Loop—If the equipment system is installed at a level lower than the maximum water level of any spa besides a Sundance spa, measures must be taken to keep water from backing up into the air blower. When connecting the pipe from the air blower to the spa, route the pipe so that it rises at least 12 inches above the maximum water level of the spa. This raised “loop” can be located anywhere between the spa and the air blower, however, it is generally preferable to locate it as close to the spa as possible. Do not plan to rely on a check valve as sole protection against water back up as they can fail over time. (NOTE: This loop is not required on Sundance spas because they contain built-in protection against the possibility of water backing up into the air blower.

Isolation Valves—In cases where equipment is below the water level, consider installing valves in the water pipes on both the suction and discharge sides of the equipment system so that the system can be isolated for servicing without draining the spa.

Drain Valve—The simplest method for the spa owner to employ periodic draining the spa is to use a submersible pump. However, for the owner’s convenience, some installers install a valve or valves on the discharge side of the single-speed pump to provide a means of draining the spa.

IMPORTANT: Provide specific instructions to the owner regarding proper draining procedures.

Connecting The Ozone Supply Tube

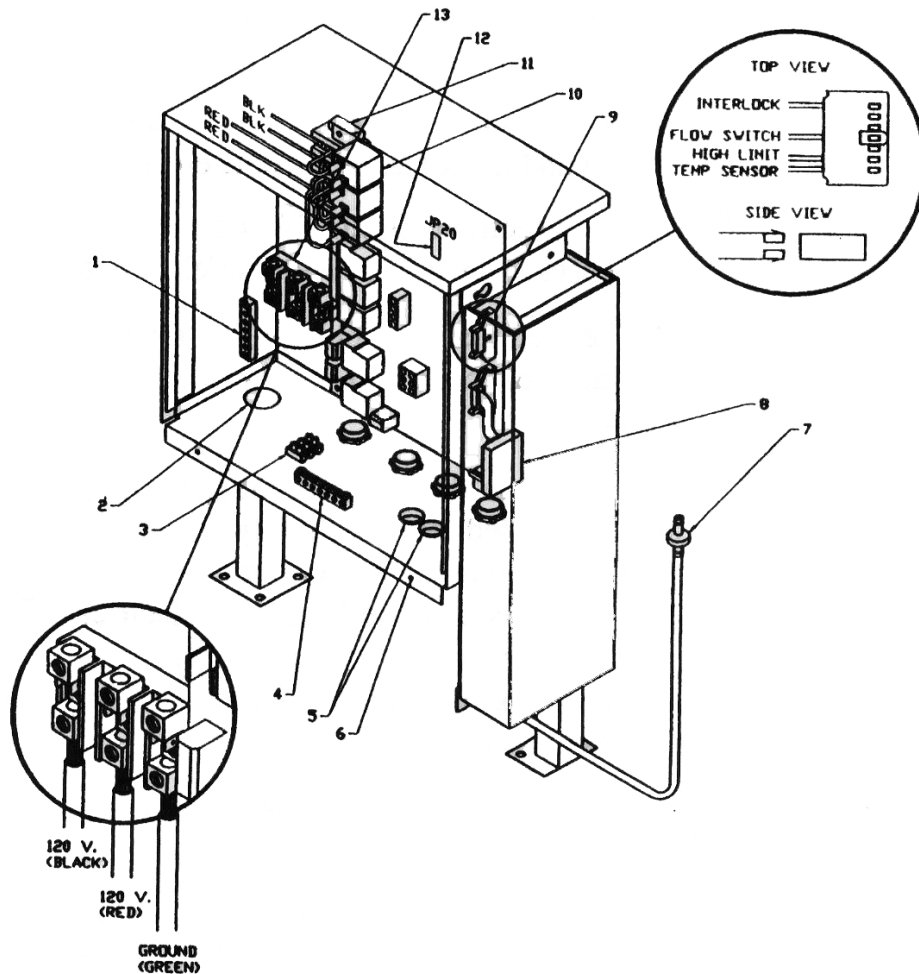
See instructions supplied with the spa shell.

Electrical Installation Instructions

1. This spa equipment system must be permanently connected (hard-wired) to the power supply. No plug-in connections or extension cords are to be used in conjunction with the operation of this equipment system. Supplying power which is not in accordance with these instructions will void the manufacturer's warranty.
2. The power supplied to this equipment system must be a dedicated circuit with not other appliances or lights sharing the power provided by the circuit.
3. All electrical work must be done to National Electrical Code (NEC) and any other applicable electrical codes.
4. The electrical circuit must be installed by a qualified electrician and checked by a local building/electrical inspection authority.
5. The electrical circuit supplied for the spa must include a suitable ground fault circuit interrupter (GFCI) as required by NEC Article 680-42.
6. Determine the current, voltage and wire size required. Refer to the table titled "Power Supply Requirements" (Ill. 2) for current and voltage required. Select wire type and size based on the power requirements and the length of electrical run per National Electrical Code requirements. (Note: When using wire larger than #6, add a junction box near the equipment system and reduce to short lengths of #8 to connect to system.)
7. All wiring must be copper to ensure reliable connections. Do not use aluminum wire.
8. To gain access to the main terminal connection for the spa equipment system, remove the front cover of the control box.
9. Using a connector feed the cable through the opening provide on the bottom of the control box (Ill. 1, item 2).
10. Connect wires, color to color, on the terminal strip (Ill. 1, item 13). **TIGHTEN SECURELY!** All wires must be hooked up. Do not neglect to run the ground line as serious damage could result.

11. To provide an additional measure of safety, connect a separate #8 solid copper bonding wire between the spa equipment system current collector (grounding buss bar inside the control box—III. 1, item 1) and a local UL-recognized ground rod fully driven into the ground.

III. 1 Sentry Control Box



- | | |
|---|---|
| <ol style="list-style-type: none"> 1. External Ground Buss 2. Power Supply Entrance 3. Light Terminal Strip 4. Internal Ground Buss 5. Control Wiring Entrance 6. Cover Screw 7. Ozone Check Valve | <ol style="list-style-type: none"> 8. Daughter Board 9. Sensor Harness 10. Heater Relays (e) 11. 4-Position Terminal Block 12. Freeze Sensor Connection (JP20) 13. Main Terminal Connection |
|---|---|

Power Supply Requirements

The power supply required by the equipment system depends on certain variables as indicated in the table below. Note that these requirements are **for the equipment system only**. Power for an external electric heater, if used, must be **separate** from, and **in addition to**, the power supplied to the equipment system. For gas heaters, add the power requirements to these figures.

III. 2 Power Supply Required For Equipment System Only

Using Integral In-Line Heater?

	<u>NO</u>	<u>YES</u>	<u>YES</u>
Circuit Breaker	30A dual pole	50A* dual pole	60A dual pole
Number of Wires	3	3	3
Current Draw (Amps)	24	40	48

If the home's electrical service does not have the full 50A, 240V power available, the spa may be connected to 30A, 240V service if a minor circuit board modification is performed by the dealer. In this configuration, the heater will yield the same rate of temperature increase as in 50A operation, but will not operate while the high speed of either pump or the air blower is operating. This could result in rapid cooling of the water while the spa is being used during periods of cold ambient temperatures.

*In 50A configurations, the heater will not operate while both pumps are operating at high speed.

Use of External Heater

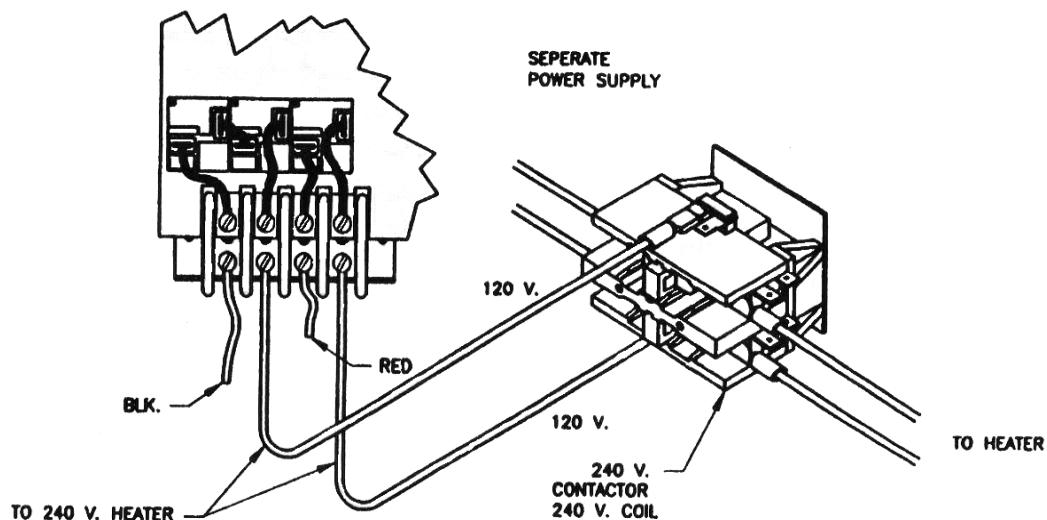
If a heater other than the in-line electric heater included in the Sundance equipment system is used, certain issues must be addressed to assure optimum operation of all components. These issues include: (1) supplying power, (2) connecting the Sentry controls, (3) water piping and (4) heater sizing. Note: If an external gas heater is to be used, Sundance Spas recommends against using a heater rated at more than 250,000 BTU.

External Electric Heater

Follow the heater manufacturer's instructions for installation of the external electric heater. Use a power source separate from that supplied to the equipment system.

III. 3

Connecting External Electric Heater to Sentry Controls



If an external electric heater is to be used, you must supply a separate 240V relay in a listed box. Connect wires (min. #16 AWG) from the heater 4 position terminal block on the Sentry circuit board to energize the relay coil (Ill. 3). Run separate power to the heater through the normally open contacts on this relay.

Gas Heater (Electronic Ignition)

Make certain that the voltage of the heater employed is 240V to match that of the equipment system and that current supplied to the equipment system is sufficient to also satisfy the power requirements for both the heater and the equipment system.

III. 4

Connecting Gas Heater with Electronic Ignition to Sentry Controls

Connect wires (min. #16 AWG) from the heater 4-position terminal block on the Sentry circuit board (Ill. 4) to the appropriate power terminals in the gas heater. Consult your heater owner's manual.

Gas Heater (Pilot Type)

Completely remove the red and black wires that connect 4-position terminal block (Ill. 1, item 11) to the main terminal (Ill. 1, item 13). Connect wires (min. #16 AWG) from the heater 4-position terminal block on the Sentry circuit board (Ill. 5). Cut into the heater's control wiring harness and connect these wires in series with the heater's controls.

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III. 5

Connecting Gas Heater with Pilot to Sentry Controls

Use of External Heater's Controls

The control systems in the external heater **should not be disconnected**. Instead, set the external heater's thermostat at maximum. Failure to do this may result in the heater turning off before the temperature set at the Sentry control panel is reached.

Piping Through External Heater

The water flow capacity of any external heater used must be at least 120 gpm. If the heater's flow capacity is not adequate, a bypass system must be installed to prevent damage to the

heater and to ensure proper jet performance. Follow the heater manufacturer's instructions for installing and adjusting the bypass system. (NOTE: A bypass system may enhance jet performance even if the heater's flow capacity rating is sufficient according to the above specifications.

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III. 6 Typical Bypass Plumbing for External Gas Heater

(Consult Heater Owner's Manual for Specific Instructions)

Installing the Sentry Control Panel

If the equipment system is being installed in a location away from the spa, the control panel cable should be installed in a conduit to provide protection for the cable and make it convenient to remove should it ever need servicing or replacement.

Cut or drill an appropriate size hole where the control panel is to be mounted and install the conduit from this point to a point under the control box of the equipment system. Using a fish tape or similar means, carefully pull the cable through the conduit. Then feed the plug through an opening on the bottom of the control box (Ill. 1, item 5) and plug the connector into the daughter board on the inside right wall of the control box (Ill. 1, item 8). Finally, peel the backing from the adhesive on the back of the control panel, align the panel in the position desired and press firmly.

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Connecting the Spa Light

Your Sundance Spa Shell comes equipped with a dry-niche, low-voltage spa light installed. The cable from this light should be run through the opening provided in the bottom of the control

box (Ill. 1, item 5) and connected to the terminal strip labeled "Spa Light" (Ill. 1, item 3).

For spa shells other than Sundance brand, other low voltage spa lights can be connected in this manner to be operated by the Sentry controls provided that the 12-volt, one amp power is sufficient for the light selected.

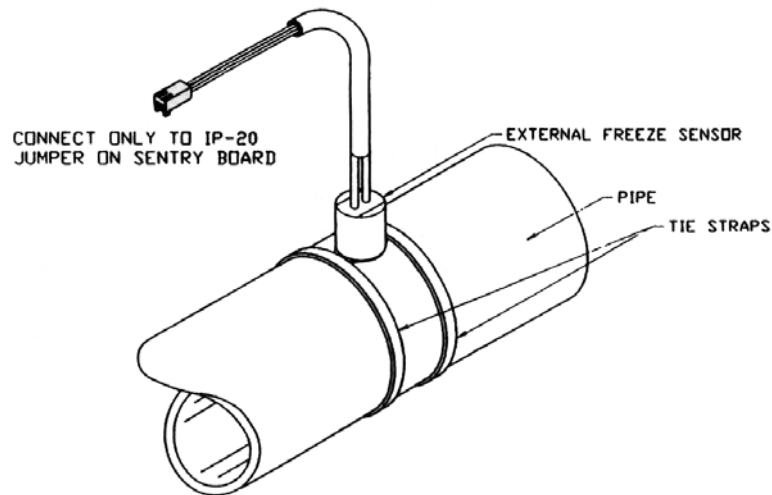
Connecting the Temperature Sensor

The temperature sensor required for operation of this equipment comes pre-installed in the Sundance spa shell. The cable from this sensor should be routed through conduit and run through the opening provided in the bottom of the control box (Ill. 1, item 5), then connected to the sensor harness (Ill. 1, item 9). **IMPORTANT:** If this equipment system is being connected to a spa shell ***other than*** a Sundance brand, you must order the 45' remote temperature sensor accessory (P/N 6600-135) and install it into the spa shell.

Remote Freeze Sensor

The Sundance spa equipment system contains a temperature sensor, which automatically turns on the system to protect against freeze damage. This sensor is located in the heater housing, which is the most vulnerable to freezing in a typical outdoor installation.

If the equipment system is to be installed in an area where temperatures may be greater than the temperatures to which any other part of the circulation system is exposed, an available remote freeze protection sensor must be installed (order P/N 6472-005). For example, if the spa is installed outdoors and the equipment system is installed in a basement or garage, the remote sensor should be placed on the piping in area which is likely to be the most susceptible to freezing. If in doubt, multiple sensors may be installed in parallel circuit.



To install the remote freeze sensor, secure the sensor to the pipe where the temperature is to be sensed using plastic tie straps. If needed, the wire may be lengthened by splicing-in additional wire making certain that the splices are tight. The wire must be protected to ensure that it cannot be accidentally disconnected or broken. Run the connector through an opening in the bottom of the control box and plug it into the JP20 connection on the Sentry circuit board (Ill. 1, item 12).

To test the remote freeze sensor, place an ice cube on it before strapping it on the pipe. Both pumps should come on within a minute or two. **IMPORTANT: Do not perform this test unless the spa is full of water and the spa installation is fully operational.**

Start Up

Follow the start up instructions in the " Owner Operating Instructions" supplied with this equipment system.

Testing the Installation

Once the installation is complete, but prior to filling in the trenches or decking around the spa, the installation should be

thoroughly tested so that any leaks or other problems can be detected.

We recommend filling the spa to an identifiable level and covering it to avoid water loss through evaporation. For one 24-hour period, the spa should be operated continuously, occasionally switching the dual-speed pump to high speed and turning on the single-speed pump and the air blower to test the pressure-side pipes. For another 24-hour period, the spa should be completely inactive to test the suction and venturi lines. If the water level has not changed and no other problems have been detected after either of these tests, you are ready to complete the installation by filling the trenches, etc.