



Owner's Manual

Care, Maintenance and
Installation Guide



– WARNING –

THIS IS A PROFESSIONAL GRADE PRODUCT. A KNOWLEDGE OF CONSTRUCTION TECHNIQUES, PLUMBING AND ELECTRICAL INSTALLATION ACCORDING TO CODES ARE REQUIRED FOR PROPER INSTALLATION AND USER SATISFACTION. WE RECOMMEND THAT A LICENSED CONTRACTOR PERFORM THE INSTALLATION. OUR WARRANTY DOES NOT COVER IMPROPER INSTALLATION-RELATED PROBLEMS.

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**BE SURE TO READ THIS
INSTRUCTION MANUAL
BEFORE INSTALLING AND
USING YOUR SPA.**

SAVE THIS MANUAL FOR FUTURE REFERENCE.

READ AND FOLLOW ALL IMPORTANT SAFETY INSTRUCTIONS.

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

READ AND FOLLOW ALL INSTRUCTIONS.

1. It is the responsibility of the owner to ensure that all users of the spa are adequately informed of all precautions.
2. Use the spa only as described in this manual.
3. The spa is intended for home use only. Do not use the spa in a commercial, rental, or institutional setting.
4. **WARNING:** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
5. **DANGER: RISK OF ACCIDENTAL DROWNING.** Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use a spa or hot tub unless they are supervised at all times.
6. **DANGER: TO REDUCE THE RISK OF DROWNING:**
 - A) Never use the spa alone.
 - B) Children should not use the spa unless they are supervised by an adult.
 - C) Keep pets away from the spa at all times.
 - D) Always replace and lock the spa cover when the spa is not in use.
7. **DANGER: RISK OF INJURY.** Do not remove the suction fittings. The suction fitting in this spa is sized to match the specific water flow created by the pump. Should the need arise to replace the suction fitting or the pump, be sure that the flow rates are compatible. Never operate spa if the suction fitting is broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the original suction fitting.
8. **DANGER:** Keep hair and body parts away from the suction guard. Do not allow long hair to float freely in the water; long hair should be restrained with a bathing cap. To reduce the risk of drowning from hair or body entrapment, install a suction fitting(s) with a marked flow rate in gallons per minute that equals or exceeds the flow rate marked on the equipment assembly, if replacement of suction fitting(s) becomes necessary.
9. For cord and plug connected units: **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION IS REQUIRED.** All spa equipment systems must be protected by a ground fault circuit interrupter (G.F.C.I.) in accordance to the National Electrical Code. A cord mounted G.F.C.I. is supplied with the spa support pack equipment.
10. For permanently installed units: **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION IS REQUIRED.** All spa equipment systems must be protected by a ground fault circuit interrupter (G.F.C.I.) in accordance to the National Electrical Code. A ground fault circuit interrupter type circuit breaker (not supplied) must be installed in the panel box by a qualified electrician when making wire connection to the spa support pack equipment.
11. For permanently installed units only: A green-colored terminal (or wire connector marked "G," "GR," "Ground," or "Grounding") is provided within the control box. To reduce the risk of electric shock, connect this terminal or connector to the grounding terminal of your electric service or supply panel with a continuous green insulated copper wire equivalent in size to the circuit conductors supplying this equipment, but no smaller than No. 12 AWG (3.3 mm²). In addition, a second wire connector is provided for bonding to local ground points. To reduce the risk of electric shock, this connector should be bonded with a No. 8 AWG (8.4 mm²) copper wire to any metal ladders, water pipes, or other metal within 5 feet (1.52 m) of the tub.
12. Install to provide drainage for compartments of electrical components.
13. For floor recessed spas: Install to permit access for servicing from above or below the floor. Spa equipment must be installed below water level.
14. When planning your spa installation site, prepare for the unlikely event of rapid spa drainage.
15. A pressure wire connector is provided in the control box inside the unit to permit connection of a minimum No. 8 AWG (8.4 mm²) solid copper bonding conductor between this point and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 5 feet (1.5 m) of the unit, as needed to comply with local requirements.
16. **DANGER: RISK OF ELECTRICAL SHOCK:** Install spa at least 5 feet (1.52 m) from all metal surfaces. (A spa

may be installed within 5 feet of metal surfaces if, in accordance with the National Electrical Code, ANSI/NFPA, each metal surface is permanently connected by a No. 8 AWG (8.4 mm²) copper conductor attached to the wire connector on the terminal box provided for this purpose. – **ALL SPA SUPPORT EQUIPMENT MUST BE GROUND FAULT CIRCUIT INTERRUPTER (G.F.C.I.) PROTECTED AT THE HOME POWER SOURCE.**

17. **WARNING:** The Ground Fault Circuit Interrupter (G.F.C.I.), must be tested before each use. To test the G.F.C.I., press the “test” button while the spa is running. The spa should shut off. Press the “reset” button. The spa should resume normal operation. If the spa continues to run after the “test” button is pressed, then the G.F.C.I. is damaged. Do not use the spa until the G.F.C.I. has been repaired or replaced by a qualified electrician.

18. **WARNING: RISK OF SUFFOCATION.** For spas with gas heaters only. This spa is equipped with a gas heater and is intended for outdoor use only, unless proper ventilation can be provided for an indoor installation.

19. **DANGER: RISK OF ELECTRIC SHOCK.** Do not permit any electric appliance, such as a light, telephone, radio or television, within 5 feet (1.5 m) of a spa or hot tub. Keep electrical appliances and extension cords away from the spa. Water is a conductor of electricity.

20. Enter and leave spa slowly and with caution. Surfaces around spa will be wet and slippery.

21. **WARNING: TO REDUCE THE RISK OF INJURY:**

- A) The water in a spa or hot tub should never exceed 40°C (104°F). Water temperatures between 38°C (100°F) and 40°C (104°F) are considered safe for a healthy adult. Lower water temperatures are recommended for extended use (exceeding 10-15 minutes) and for young children.
- B) Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possible pregnant women should limit spa or hot tub temperatures to 38°C (100°F).
- C) Before entering a spa or hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature regulating devices may vary as much as 3°C (5°F).
- D) **THE USE OF ALCOHOL, DRUGS, OR MEDICATION BEFORE OR DURING SPA OR HOT TUB USE MAY LEAD TO UNCONSCIOUSNESS WITH THE POSSIBILITY OF DROWNING.**
- E) Persons suffering from obesity or with a medical history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa or hot tub.

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

22. Never use the spa alone.

23. Do not bring any object into the spa that could damage the spa shell.

24. Never insert any object into any opening.

25. Do not use breakable containers in or near the spa.

26. Do not sit on the spa cover or place objects on it; it is not designed to support weight.

27. Remove any water or debris that may collect on the spa cover.

28. Keep children under the age of 12 and pets away from the spa when it is not in use.

29. Keep all chemicals away from children and pets.

30. The pH and chemical balance of the water must be maintained as explained in this manual. Failure to do so may cause injury to users or damage to the spa, and will void the warranty.

31. Individuals with infections and open sores or wounds should not use the spa. Bacteria thrive in warm and hot water. Always keep your spa disinfected and maintain the proper chemical balance.

32. Shower before and after using the spa. This will remove any deodorant, perspiration, or body oils that could contaminate the water. Showering after will remove any residual chemicals and any bacteria that may have been in the spa.

33. **WARNING:** “The use of alcohol, drugs or medication can greatly increase the risk of fatal hyperthermia.”

DANGER – TO REDUCE THE RISK OF DROWNING:

Prolonged immersion in the spa may cause hyperthermia. The causes, symptoms and effects of hyperthermia may be described as follows: Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6°F. The symptoms of hyperthermia include an increase in the internal temperature of the body, dizziness, lethargy, drowsiness, and fainting. The effects of hyperthermia include:

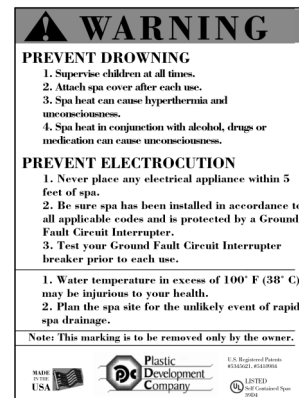
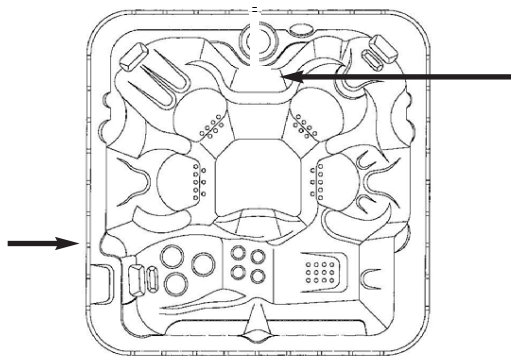
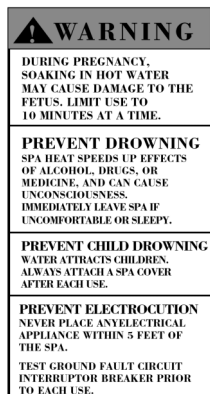
- 1. Failure to perceive heat
- 2. Failure to recognize the need to exit the spa
- 3. Unawareness of impending hazard
- 4. Fetal damage in pregnant women
- 5. Physical inability to exit the spa
- 6. Unconsciousness resulting in the danger of drowning.

34. Do not use the spa immediately after strenuous exercise.
35. If you feel pain or dizziness at any time while using the spa, discontinue use and contact a physician.
36. **WARNING:** The spa jets produce a stream of water with relatively high pressure. Prolonged exposure of a localized area of the body may cause bruises to the skin.
37. **WARNING: TO REDUCE THE RISK OF INJURY:**
It is especially important for persons over the age of 35 or persons with pre-existing health problems, such as obesity, heart disease, high or low blood pressure, circulatory problems, or diabetes to consult their physician before using the spa.
38. For controls other than underwater lighting circuits: A Ground Fault Circuit Interrupter (G.F.C.I.) must be provided if this device is used to control an underwater lighting fixture. The conductors on the load side on the Ground Fault Circuit Interrupter shall not occupy conduit, boxes, or enclosures containing other conductors unless the additional conductors are also protected by a Ground Fault Circuit Interrupter.
39. For all permanently connected units not provided with an integral disconnecting means: The electrical supply for this product must include a suitably rated switch or circuit breaker to open all underground supply conductors to comply with Section 422-20 of the National Electrical Code, ANSI/NFPA. The disconnecting means must be readily accessible to the tub occupant but installed at least 5 feet (1.5 m) from tub water.
40. **WARNING:** Do not place spa in direct sunlight while unit is empty or when sealed in shipping materials. Excessive heat build-up may cause damage to spa and void warranty.
41. For spas with audio/video components:
- CAUTION – Risk of Electric Shock.** Do not leave compartment door open.
 - CAUTION – Risk of Electric Shock.** Replace components only with identical components; and
 - Do not operate the audio/video controls while inside the spa.
 - WARNING – Prevent Electrocutation.** Do not connect any auxiliary components (for example cable, additional speakers, headphones, additional audio/video components, etc.) to the system.
 - These units are not provided with an outdoor antennae; when provided, it should be installed in accordance with Article 810 of the National Electrical Code, ANSI/NFPA 70.
 - Do not service this product yourself as opening or removing covers may expose you to dangerous voltage or other risk of injury. Refer all servicing to qualified service personnel.
 - When the power supply connection or power supply cord(s) are damaged; if water is entering the audio/video compartment or any electrical equipment compartment area; if the protective shields or barriers are showing signs of deterioration; or if there are signs of other potential damage to the unit, turn off the unit and refer servicing to qualified service personnel.
 - This unit should be subjected to periodic routine maintenance (for example, once every 3 months) to make sure that the unit is operating properly.
42. For your protection, a safety sign has been mounted on the outside of the spa cabinet. An additional sign has been included within this spa informational packet that should be placed where visible to spa occupants. Additional copies can be obtained from your spa retailer.

SPA WARNING LABELS

1. The included warning sign must be posted where all users of the spa can see and read it. Additionally, we have placed a label on the outside of your spa.

2. **WARNING DECAL PLACEMENT:** Locate the decals shown here and familiarize yourself with the information found on the inside and the cabinet of your spa.



WARNING: Read all instructions before using the spa.
PDC Spas assumes no responsibility for personal injury or property damage sustained by or through the use of this product.

SAVE THESE INSTRUCTIONS!

LOCATION

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

OUTDOOR INSTALLATIONS

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

INDOOR INSTALLATIONS

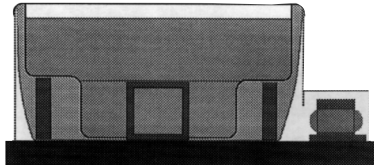
1. Local electrical and plumbing codes.
2. Ventilation fans and/or dehumidifiers should be provided to handle the high humidity developed by your spa. Walls, ceiling and wood trim should be resistant to high humidity.
3. Chemicals will vaporize from the water and may cause an odor and possibly corrosion to certain home hardware. Never store chemicals inside the spa cabinet.
4. During the normal use of the spa, water will escape the spa vessel. Never place the spa on or over any material which may be damaged by this water or the chemicals within the water. Keep damageable materials far enough away from the spa to avoid water damage, even if the spa should lose all its water.
5. Consider and prepare for the unlikely event of rapid spa drainage. If placement of the spa is permanent, you may wish to provide floor drains to accommodate draining, etc. Always leave room all around the spa for easy access in case repairs are necessary.
6. Consider and prepare for the unlikely event of spa removal.
7. Read 7-14 in the Outdoor Installations information.
8. Do not set spa on finished floor without a waterproof barrier protection underneath.
9. The spa should be located near a power source capable of supplying 240 volts AC power. It must be wired directly into a grounded circuit with a Ground Fault Circuit Interrupter (G.F.C.I.) capable of carrying 50 amps. No other appliances should be on the same circuit.
10. The spa should be close to a source of water.
11. Be sure that the location you choose is stable. It must be able to support the weight of the spa when it is filled with water, plus the weight of the occupants. The spa weighs approximately 4000 pounds when it is filled with water.
12. Do not use the spa above a finished living area, due to the risk of water damage.
13. The spa is not designed for in-floor installation. However, it is compatible with a deck system that is built flush with the top of the spa, provided you leave access for service.
14. Be sure to note any other considerations, such as aesthetics or privacy concerns, that may affect the safety or enjoyment of using the spa.

GENERAL SPA INSTALLATIONS

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“ONE-PIECE” PORTABLE SPA INSTALLATIONS

One-piece portable spa unit with external equipment pack.



The PDC “one-piece” portable spa is fully assembled with the skirting (cabinet) attached to the spa shell. This unit may be equipped with a Slimline Series support pack that is installed behind the cabinet walls. If so, take note of the location of the equipment components prior to permanent installation for possible future need of access by removing side skirt panels. The one-piece unit must be installed on a flat, firm, level surface. If the unit is equipped with an external pump pack, those components should be connected as noted here.

CUSTOM, IN-GROUND SPA INSTALLATION

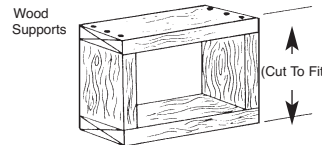
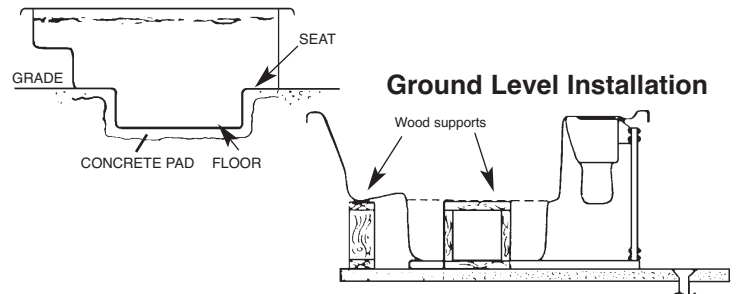
* This type of installation is not recommended by the factory.

Custom spa installations may have numerous variations. For those sitting on ground level, the spa must be set level on a concrete pad, a stable sand base or

well-supported by the wooden supports shown below. In **NO** way should the lip of the spa be used for support.

Partial in-ground and below-ground installations should have the footwell of the spa resting on concrete or firm sand for support and leveling purposes. Again, the seating area must be fully supported and the lip **NOT** used for support.

Partial In-Ground Installation



The spa must be filled with water and checked for leaks before being backfilled with sand or before decks are installed.

Review all location considerations in this manual to assure proper placement of the spa for years of enjoyment.

CONNECTING EQUIPMENT SYSTEM

Attach the equipment pack components as marked. Connect the unions together from the equipment pack and spa as they are marked (example: suction, return, blower).

Your electrician can now complete all hook-ups as described in this manual and on the equipment pack. All connections must be in compliance with all national and local electrical codes. Finally, fasten the pump cabinet to the skirt with the screws provided.

Your PDC spa has had two factory tests for water leaks. Leaks can develop, however, in handling and shipping. Check with accuracy for leaks that may have developed during this time.

EQUIPMENT SYSTEMS CONSIDERATIONS

Location

It is recommended that the support equipment pack for custom in-ground spas be placed within 10 to 15 feet

from the spa. Upgraded and oversized equipment should be substituted if the equipment must be placed farther than 15 feet away.

The spa support equipment must be placed at or below water level. In NO way should the pack be above water level. All PDC equipment must be placed in a sheltered environment that will protect the equipment from rain, sleet, snow, and direct sunlight.

It is recommended that the blower line be raised above the water level of the spa, creating a plumber's loop, for all in-ground installations. This will eliminate water drainage from the spa if blower check valve should fail.

ALL ELECTRICAL CONNECTIONS MUST BE G.F.C.I. PROTECTED AND PERFORMED BY A QUALIFIED ELECTRICIAN IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE AND ANY APPLICABLE LOCAL ELECTRIC CODES.

Pack Sizing

PDC offers a wide variety of UL listed spa support packs enabling proper sizing of the spa with the power of the equipment. PDC recommends that the support pack not be over 15 feet from the spa to assure adequate water action. If the pack must be installed at a distance further than 15 feet, the pump should be upgraded or a second pump added. In addition, the number of jets in the spa deserves consideration in choosing the proper spa pack: more jets require more power and the pump should be upgraded or a second pump added for proper water action.

Plumbing

1. Two valves for each pump are provided to shut off flow to and from the spa system. Valves should be placed in front of the pump, one on the suction side and one on the outlet side of the pump.
2. Inlet and outlet pipes should be connected with 1½" or 2" schedule 40 PVC. Blower lines should be 1½" schedule 40 PVC.

3. All pipe connections should be made with products formulated specifically for plastics, i.e., PVC solvent cement, Teflon tape, etc. DO NOT OVER-TIGHTEN PIPE CONNECTIONS.
4. Check all areas for leaks prior to backfilling or decking around the unit. PDC conducts factory water tests for leaks several times prior to shipping, but leaks may develop during transit and handling.

GENERATION NEXT SERIES SPAS

The GENERATION NEXT SERIES spas are designed to be easily installed on any flat, firm, level surface. A wire chase molded into the bottom floor panel allows electrical service to be brought in under the spa from any direction. Removable panels on the side allow easy access for servicing the support pack components and the plumbing. Keep this in mind when locating the spa for possible future need of access when servicing. The bottom floor panel may also be removed if necessary for servicing the spa.

PARTS OF THE SPA

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

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

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

Air Controls:

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

Air'assage:

This appears as

a number of tiny holes in the seating area where the bubbler (blower) pushes air through for extra therapy action.

Ultra Massage Selector: Located on spa lip. Turn to adjust pump power to selected jets which enhances water action through those jets by decreasing water action through others. Only selected spa designs have this feature.

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

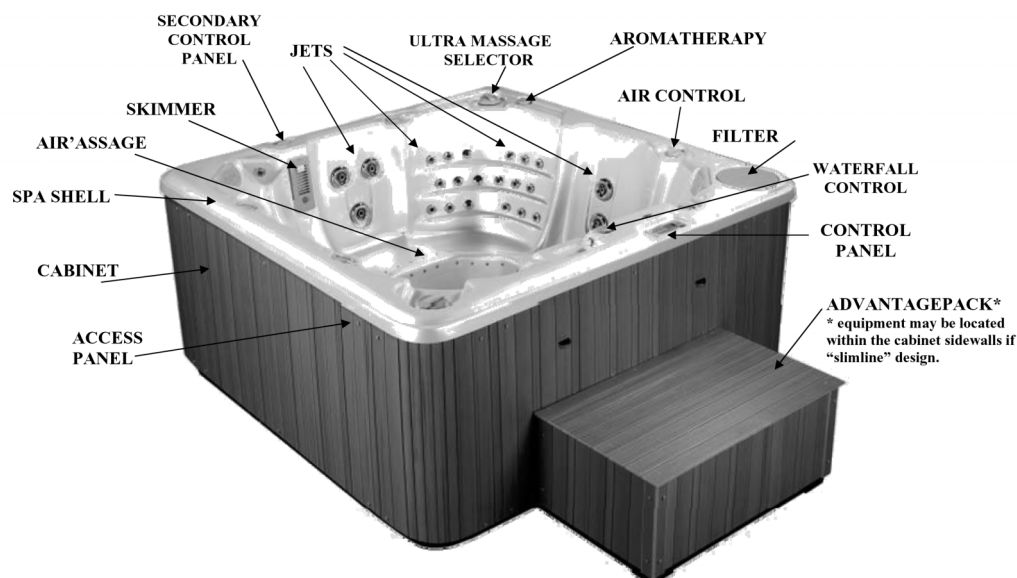
Safety Glow Light: As an option, your spa may have low voltage lighting installed around the base perimeter of the cabinet. This not only looks good, but also provides lighting for safer entering and exiting of the spa.

Motion Glow

Lighting: Low voltage spa light, with 8 shades of color wash controlled manually at spa side.

Illusion

Lighting: As an option, LED pinpoint lights with up to 25 points of light, accent the lip of your spa with 7 color options.



PARTS OF EQUIPMENT SYSTEM

The spa support pack contains up to five major components: either single or dual speed pumps, that circulate the water through the hydro-jets and back through the suction; a cartridge filter that physically removes debris from the water; and a blower (“bubbler”) that pushes air through the air channel of the spa for increased therapy. Your unit will also be equipped with either a gas or electric heater. All components are operated by switching at spa side. Water is routed through the pump, filter (located on the pressure side of the pump for optimum filtration), heater and jets. The bubbler acts as a separate component and is used for general massage in the Contempra and Ultra spas, and Timeless Platinum.

Pump: Your new spa has been equipped with a pump for hydrotherapy jet action and water filtration. The spa support pack features a dual-speed pump and, on some models one or two additional single speed pumps. For “E” (economy electronic), and “GE” (deluxe electronic) controls, the high speed of a dual-speed pump is activated by the PUMP1 control at spa side. The lower speed (filtration speed) is controlled by the programmable electronic control on “E” or “GE” support pack models. The filtration time required to maintain warm, clean water may vary from spa to spa. Generally, no less than six hours a day is recommended. The PUMP1 button can activate the pump at full speed at any time for hydrotherapy, even though turning off the pump at the PUMP1 button does not override the filtration cycle (low speed). For example, if the spa has been programmed to circulate the system at a time when bathers are exiting the spa, the

pump will continue to operate at low speed even though the jet button is pushed. The control unit will shut the pump off when programmed to do so. The single-speed pump(s), if present, are activated by the PUMP2 or PUMP3 control.

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

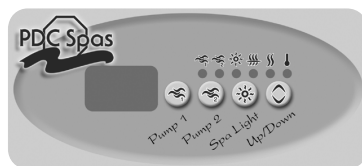
Air’assage (Blower): This equipment acts independent from all other support pack components. It pushes outside air through the air channel for generalized massage. It is activated by depressing the bubbler control at spa side. The blower is located behind the cabinet wall. Make note of location prior to installing.

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

Ozone: All spas with ozone option for sanitation should circulate 16-24 hours daily. Use the electronic control to program this operation.

SPA SIDE CONTROLS

Economy Electronic Control* (“E”)



Pump 1: Press Pump 1

key to turn Pump 1 on. Press a second time to change the pump speed. A third time turns pump off.

A built-in timer automatically turns pump off after 20 minutes, unless it has been manually deactivated. The “Pump 1” indicator lights up when Pump 1 is on.



Pump 2: Press Pump 2 key to turn Pump 2 on. Pressing a second time turns pump off.

A built-in timer automatically turns pump off after 20 minutes, unless manually deactivated. The “Pump 2” indicator lights up when Pump 2 is on.



Light: Turning the light(s) on - (depending on your spa configuration) *Spa Light Only* – Press Light key to turn light on. Press a second time to turn light off.



Spa Light – The “Light” indicator lights up when the light is on. Spa Light is also used as a program function.

* Control not to be used on remote pack location installs due to 25-foot limit of connecting ribbon.

Temperature: Setting water temperature:

Use Up/Down arrow key to regulate water temperature. Press and hold key to increase (or decrease) current temperature setting. The temperature setting will be displayed for 5 seconds to confirm your new selection.





The “Set Point” indicator displays the desired temperature, NOT the current temperature! Water temperature can be adjusted by 1° increments from 59° to 104°F (15-40°C).

Automatic water heater start: When water temperature is 1°F (0.5°C) lower than the Set Point, the heater will automatically turn on until water temperature reaches Set Point plus 1°F (0.5°C). The “Heater” indicator lights up when the heater is on.



Programming the filter cycle duration: The system automatically performs two filter cycles per day, at 12 hour intervals. During a filter cycle, pumps are activated for a programmed number of hours.

To set the filter cycle duration:



Press and hold **Light** key for 5 seconds. The display will show a value that represents the filter cycle duration in hours.



Use **Up/Down** arrow key to change setting. 0 = no, 12 = continuous filtration.



When desired setting is displayed, press **Light** key again. The filter cycle will start. The “Filter” indicator lights up when a filter cycle is on.



NOTE: After a power failure, the filter cycle duration will return to its default value (6 hours). In this case, the first filter cycle will start 12 hours after power is restored.

NOTE: Prevent excessive water temperature caused by too long filter cycles, the system will cancel a filter cycle after 3 hours if water temperature raises above 104°F.

Troubleshooting:



A. Pumps have started up for 1 minute on several occasions and “Filter” indicator is flashing.

Not a bug but a feature! Our **Smart Winter Mode** protects your spa from the cold by turning pumps on for 1 minute several times a day to prevent freezing in pipes.

B. The display is flashing.

A power failure must have occurred. Press any key to stop the flashing and reprogram the filter cycle.



C. 3 flashing dots are displayed.

A problem has been detected.

Do not enter the water! Check and open water valves. Clean filter if necessary. Check water level. Add water if needed.

Shut power off and power your spa up again to reset the system.

Call your dealer or service supplier if problem persists.

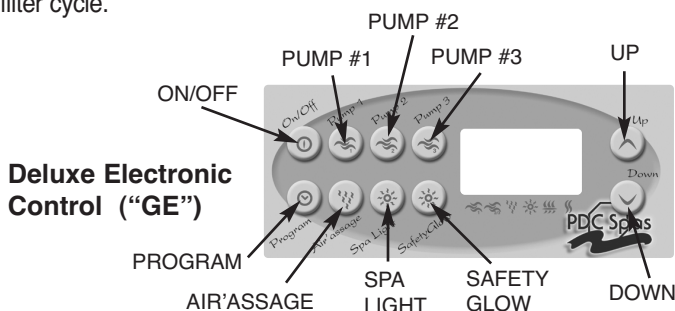


D. Water temperature is flashing.

Water temperature in the spa has reached 112°F (44°C).

Do not enter the water! Remove the spa cover and allow the water to cool down. The system will reset itself when water reaches 109°F (43°C).

Call your dealer or service supplier if problem persists.



System On/Off: This key is used to turn On/Off the entire system. When power is applied to the unit, it is “On” by default. The unit will regulate the spa temperature to the desired set point and the display will show the current temperature.

When the system is “Off”, all outputs are turned off for 30 minutes and the display shows “OFF” for at least 10 seconds. The filter cycle, the smart winter mode and the heater can’t start during this time. All keys are disabled except the On/Off key to restart the system before the 30 minutes ends. This feature is used to clean/change the filter.

Note that also the filter cycle is cancelled when the system is turned off.

Pump #1: This key is used to turn the Pump #1 in the sequence Low, High, then Off. A built-in 20 minute timer will shut the pump off unless the user does so manually. The arrow above the Pump 1 logo on the display will be on when the pump is running, or it will blink if the pump is in Low speed.

When there is a Heat demand, a Cool down period, or a Filter cycle (last phase), the controller will run pump #1 in Low speed. Then, if the user presses the *Pump #1* key, pump #1 will go directly into High speed. This has been added to give the user feedback.

Pump #2: This key is used to turn the Pump #2 in the sequence On, then Off. A built-in 20-minute timer will shut the pump off unless the user does so manually.

The arrow above the Pump 2 logo on the display will be on when the pump is running.

Pump # 3: This key is used to turn the Pump # 3 in the sequence On then Off. A built-in 20-minute timer will shut the pump off unless the user does so manually.

The arrow above the Pump 2, 3 logo on the display will be on when the pump is running.

Air'assage: This key is used to turn the Blower High, Low, then Off. A built-in 20-minute timer will shut the Blower off unless the user does so manually.

The arrow above the Blower logo on the display will be on when the Blower is running. It will blink if the Blower is on Low speed.

PROGRAM

Filter cycle definition

A Filter cycle consists of starting pump #2, pump #3 and the blower for 1 minute to purge their plumbing and then start pump one low speed for the duration of the cycle.

The Filter cycle icon is displayed when there is an active Filter cycle.

Filter cycle duration and frequency adjustment

The Filter cycle *Duration* is user programmable. By pressing the Program key, the display shows the current duration value "Fdx", where xx is from 0 to 12. Using the *Up* and *Down* keys, this value can be adjusted as desired.

The Filter cycle *Frequency* (per day) adjustment is user programmable by pressing another time on the Program key, the display will show the current frequency value ("FFxx", where xx is the frequency). Using the *Up* and *Down* keys, this value can be adjusted from 1 to 4.

If a duration of 0 is selected, the Filter cycle never comes on and the Frequency selection is not offered, as it makes no sense. On the other hand, if any of the following combinations is selected, the Filter cycle is constantly on: "Fd06" with "FF04", "Fd08" with "FF03", or "Fd12" with "FF02". In these cases however, the initial 1-minute purge will still occur at every start of a cycle.

The default frequency per day is two times a day and the default number of hours per cycle is two hours.

During the duration adjustment of the frequency per day adjustment, if the user doesn't use any key for 5 seconds, the system "stores" the new duration and the new frequency, but these will take effect only at the next Filter cycle. However, if the user exits the duration of frequency adjustments by pressing the Program key again, a new Filter cycle is immediately started, and a new 12-hour cycle is started.

Safety Glow: This key is used to turn the Safety Glow light On, then Off. A built-in 4-hour timer will shut the Safety light off unless the user does so manually.

Spa Light: This key operates the Motion Glow light and Illusion light option. The Motion Glow light has eight different programs activated by repeated pressing of the key. Illusion lighting features a series of pinlights around the spa lip and other various locations.

Up and Down: These keys are used to set the temperature of the water and program some system functions. As soon as the user presses one of these keys, the display will show the current set point and will keep showing it for 5 seconds after releasing the key. Pressing the keys will either increase or decrease the current set point. The Set Point logo on the display tells the user if the display shows the current set point or the actual temperature of the water.

The water temperature can be adjusted in 1 degree increments from 59 to 104° F (or from 15 to 40° C). After a power down, the default set point is 95° F .

When the water temperature is 1° F (0.5° C) lower than the set point, the heater will come on until the water temperature reaches the set point plus 1° F (0.5° C). The Heater logo on the display will blink when the system calls for heat and will come on when the heater is actually turned on.

ADDITIONAL FEATURES

Panel Lock

It is possible to lock out all the keys. This feature is helpful when young children could have access to the keypad. To lock / unlock the keypad, simply press the Pump #1 key for at least 5 seconds.

There are 2 keypad lock modes: the *full* lock and *partial* lock. The full lock, as the name implies, locks ALL keypad functions. The partial lock locks only the programming and temperature functions; the Pump, the Blower, and Light keys remain useable.

To lock, press on the Pump 1 key for 5 seconds. At that point, "LocP" will be displayed. If the key is released at this time, keypad will be in partial lock. However, if lock key is kept pressed for *another* 5 seconds, "LocF" will appear and the keypad will be fully locked.

When the keypad is locked, all automatic functions of the system run as usual. However, when a locked key is pressed, a “LocP” or “LocF” message is displayed for 1 second.

To unlock a locked system, press Pump #1 key until “Uloc” appears in the display screen, at least 5 seconds. This keypad has 4 keys that have exactly the same functionality as the Pump 1, Pump 2/3 and the Air’assage and Light keys on the main keypad.

Overtemp error

If the water temperature reaches 112° F on the regulation probe, the display will start blinking and will stop all the pumps and accessories; filter cycle and user demand will be cancelled.

The only things that will still work during overtemp error will be the smart winter mode and all the keys that do not start the accessories.

The system will return in the normal mode when the temperature returns to 109° F.

High-Limit

The high-limit circuit will shut the heater off if the temperature of the water at the high-limit sensor reaches 119° F. Should this occur, the display will show “...” and a LED will light up on the PCB, but all of the accessories will still function.

The heater will remain off until a complete shut down of the circuit occurs.

Overtemp during Filter cycle

In order to prevent excessive water temperatures due to long Filter cycles during warm weather, the system has a special safeguard.

If the water temperature exceeds the set point by more than 2 degrees F for more than three hours, the system will cancel the Filter cycle and the Filter cycle icon will blink for the remainder of the filter cycle.

Ozone output

During the Filter cycle, the ozone output is turned on.

Smart Winter Mode

This system prevents the water from freezing in the pump plumbing. An onboard sensor continuously checks the ambient air temperature in the pack. If at any time the temperature goes below 68° F, the system activates the winter mode for the next 24 hours even if the temperature returns above 68° F. In this mode, if a pump hasn’t been turned on since a determinate time (see table below) depending on the temperature, the system will start all pumps for 1 or 2 minutes to circulate warmer water in the plumbing depending if pump #3 is configured. When the pumps are running because of this protective feature, the filter cycle icon on the display will blink.

When the smart winter mode is starting, the pumps don’t start all at the same time. The sequence follows :

- 2 first seconds : Pump #1 Low and circulation pump is starting.
- After 2 seconds : Pump #1 turns to high speed.
- After 4 seconds : Pump #2 turns to low speed.
- After 6 seconds : Pump #2 turns to high speed.
- After 1 minute : All others pumps are stopping and pump #3 is starting.

Note: If a key is pressed during a 1-minute cycle, the cycle will be cancelled.

Power-up detection

After a power-up, the display will blink until somebody presses a key. This feature is to let the user know that a power failure has occurred.

Temperature sensor failure

If the value returned by the temperature sensor does not seem to be in the normal range (between 32° F and 122° F), the display will show the wrong temperature and the Heater will not be allowed to turn on and the heating demand will be cleared. This error will also clear the filtration cycle, but the Smart Winter Mode will remain operational. The pumps will be allowed to work manually, if the error is detected in the low limit (34° F).

If the error is not present anymore, it can be cleared by pressing a key.

Inverted display

It is possible to invert the display so that the display is readable from either inside or outside the spa. To do this, just press on the Program key for 5 seconds to toggle between the inverted mode or not.

At power-up, the display defaults to the non-inverted mode. Also, note that in the inverted mode, some icons (ie. F and C) are not displayed.

Temperature Display in Fahrenheit or Celsius

The temperature can be displayed in Fahrenheit or Celsius. To toggle between those choices, press the light key for five seconds.

Secondary Electronic Control

(Standard on Ultra Spas and Platinum Spas, optional on Contempra Spas)



This keypad is usually installed in large spas. It gives users the possibility of operating the spa from another location within the spa. User cannot toggle temperature units from this keyboard.

SUPPORT SYSTEMS SPECIFICATIONS

PDC offers a wide choice of support equipment models. The model number and component sizes are found on a label inside the panel box lid. Refer to the label when referring to this manual and arranging for service.

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

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

Prior to each use, testing of the GFCI is required. Refer to instructions under "Spa Maintenance."

1. All spa support systems are multiple supply circuits.
2. All 240 volt systems require the electrical supply to be protected by a Ground Fault Circuit Interrupter circuit breaker. Models E36, GE36X2, are single pump systems requiring a 40 amp G.F.C.I. 120/240 volt circuit breaker. All other 240 volt systems require a 50 amp G.F.C.I. 120/240 volt circuit breaker.
3. The electrical connection must be done by a qualified electrician and conform with the National Electric Code as well as all local codes existing. The qualified electrician is to wire the 240 volt legs and neutral into the appropriately marked terminal found within the spa equipment control panel using #6-3 copper wire with ground. The ground wire must be inserted into the ground (bonding lug) found within the spa equipment control assembly.
4. The G.F.C.I. protection must be tested prior to each use. Refer to the maintenance section in this manual for instructions.

120 Volt System

HRC unit: This unit is a plug-in system. It requires a 15 amp dedicated circuit with ground. This unit comes equipped with a 10 ft. power cord which includes a G.F.C.I. plug. This plug must be plugged directly into a 15 amp 120 volt receptacle. **DO NOT USE AN EXTENSION CORD.** Use of an extension cord between this plug and the receptacle may damage the control and will void the warranty. This system uses both friction and recovered motor heat to heat the spa water. Spa water is therefore being heated only when the pump is running. The HRC system is not available with ozone or lighting features. Conduct monthly GFCI testing per instructions under "Spa Maintenance."

240 Volt Systems

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

Models E36, E57XP, E63XP, GE36X2, GE57XP, GE63XP, GE78XP, GE85XP: These support systems are located beneath the end cabinet and provide easy access for servicing and maintenance. Some models may have the blower

located behind the cabinet; take note of location.

Circulation Pump Models: These support systems may feature an additional 24-hour circulation pump and skim filter. The model number ends in "C" for these systems. Refer to the maintenance section of this manual for cleaning procedure of filter. Note location of circulation pump behind spa cabinet prior to install.

"Slimline" Construction Models: All 240 volt systems are offered and noted with "SL" after model number. These systems are installed **behind** the spa skirt **outside** of the RTB. The location of system components; control box, pumps, heater, blower, may vary with each spa design. Make note of location prior to installation to ensure future access. The heater manifold and element designs differ with these systems and should be noted during service. These spas **do not** have the end cabinet.

International 50 Hz System

1. All spa support systems are multiple supply circuits.
2. All spa support systems require the electrical supply to be protected by a Ground Fault circuit Interrupter. See the specification chart below for the proper sizing of the circuit interrupter for each spa support system.
3. The electrical connections must be done by a qualified electrician in accordance to the Electrical Codes for your local area.
4. The Ground Fault Circuit Interrupter must be tested according to manufacturer's guidelines to insure proper operation and protections to the occupants of the spa. It is encouraged to test prior to each spa use.

SUPPORT SYSTEMS for INTERNATIONAL INSTALLATIONS

MODEL NUMBER	VOLTS/HERTZ	PUMPS	HEATER	BLOWER	SPA SIDE CONTROL	TOTAL AMPS	
GER 200CE	220/50	2 HP - 2 Speed	3 KW		Deluxe Electronic GE	1 Phase	3 Phase
GER 200CCE	220/50	2 HP - 2 Speed 1/15 HP Circulation	3 KW		Deluxe Electronic GE	32	16
GER 450XPCE	220/50	1 1/2 HP - 2 Speed 3 HP - 1 Speed	3 KW		Deluxe Electronic GE	32	16
GER 450XPCE	220/50	1 1/2 HP - 2 Speed 3 HP - 1 Speed 1/15 HP Circulation	3 KW		Deluxe Electronic GE	32	16
GE200CE	220/50	2 HP - 2 Speed 4 1/2HP - 1 Speed	3 KW	1HP 220V	Deluxe Electronic GE	32	16
GE200CCE	220/50	2 HP - 2 Speed 1/15 HP Circulation	3 KW	1HP 220V	Deluxe Electronic GE	32	16
GE 450XPCE	220/50	1 1/2HP - 2Speed 3 HP - 1 Speed	3 KW	1HP 220V	Deluxe Electronic GE	32	16
GE 500XPCE	220/50	2 HP - 2 Speed 3 HP - 1 Speed	3 KW	1HP 220V	Deluxe Electronic GE	32	16
GE 500XPCE	220/50	1 1/2 HP - 2Speed 3 HP - 1 Speed 1/15 HP Circulation	3 KW	1HP 220V	Deluxe Electronic GE	32	16
GE 500XPCE	220/50	1 1/2 HP - 2 Speed 3 HP - 1 Speed 3 HP - 1 Speed	3 KW	1HP 220V	Deluxe Electronic GE	32	16
GE 750XPCE	220/50	1 1/2 HP - 2Speed 3 HP - 1 Speed 3 HP - 1 Speed 1/15 HP Circulation	3 KW	1HP 220V	Deluxe Electronic GE	32	16

GENERAL START-UP

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

Start-Up for “HRC” Units

1. **Be sure unit is off and unplugged.**
2. Fill unit with clear water.
3. Plug into power source (Dedicated three-pronged grounded outlet). Push “test” button and then “reset” button to assure that the G.F.C.I. is working properly.
4. Depress the “reset” button on the spa side control to close the high limit relay.
5. The spa side thermostat control is to be set at desired level, activating the pump and heat recovery warming mode.
6. Cover the spa with the thermal cover to speed up the warming process.
7. Refer to “Control” section of this manual for further details on this spa side operation.

SPA MAINTENANCE

TESTING THE G.F.C.I.

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

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

THE SPA SURFACE

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

THE CABINET

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

Light sanding with fine-grit sandpaper will help smooth

any roughness, and regular applications of a penetrating, wood preservative will enhance and protect the richness of the wood.

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

THE COVER

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

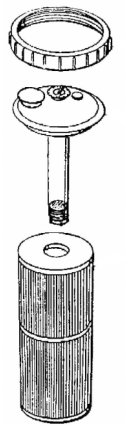
THE FILTER

Cleaning/Replacing Top-Load Filter Cartridge:

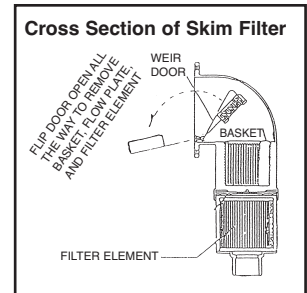
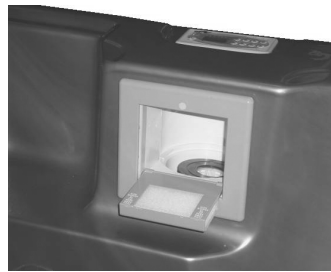
Spa water filtration begins as soon as the flow is steady through the pump. PDC primarily uses a top load pressurized filter to assure optimum cleaning capacity. As the filter cartridge removes dirt from the water, the accumulated debris will cause a resistance to flow. When this is noticed, along with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



1. Shut off power at the main or sub panel.
2. Open the small, black bleeder valve on top of the filter cover slightly to release pressure. (Be sure to re-close the valve snugly before reactivating the spa.)
3. Depress safety tab next to the lid and remove the black lock ring. Lift the dome lid and remove the filter element. Clean any debris from the filter housing. Soak the filter element in a filter cleansing solution available from your spa dealer. Rinse the filter element down with a garden hose or pressure hose, and replace in the filter housing. (It is recommended to have an extra filter cartridge on hand so that a clean element will always be available while the soiled element is being cleaned. This will minimize downtime of the spa during the cleaning procedure.) When replacing the element into the housing, be sure that the o-ring is in place and clear to assure a snug fit of the filter dome lid to prevent leakage. Hand tighten the lock ring until the safety tab clicks into place. Re-check bleeder valve to be sure it is closed.



Cleaning/Replacing Skim Filter Cartridge:



To clean or replace the cartridge in the skim filter, first shut off electrical power at the main or sub-panel. Refer to the diagram at right when disassembling the filter. The basket is cleaned by dumping out all large debris and then rinsing it in clean water. If an oil, film, or scum is present, wash the basket in a soap solution and clean with a bristle brush. Rinse thoroughly to remove all soap before replacing the basket in the skim filter.

Inspect the cartridge filter. If the cartridge filter appears discolored and covered with film or scum, it should be cleaned. Rinse the exterior of the cartridge with a garden hose, then soak the cartridge in a mild solution of a chlorine bleach and warm water, or a special filter cartridge cleaning solution available at your local pool and spa supply store. To keep a filter in the spa while soaking the dirty one, obtain a replacement filter at a local pool and spa supply store.

PERIODIC SPA WATER DRAINING

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

1. Reduce set temperature to 59°.
2. Turn off all power.
3. Hook-up garden hose to spigot on the support pack and open spigot. Gravity will feed the draining process.
4. Clean cartridge filter noted above.
5. Apply coat of wax to spa finish.
6. Follow instruction under start-up.

PLUMBING CARE

All spas are plumbed with plastic jets, pipes and fittings which are glued together. These plastic parts and their many glue joints are subjected to harsh treatment. Every spa is tested with water to assure there are no leaks when it leaves the factory; however, sometimes spas develop a leak caused by shipping vibration. Over the years, your spa is subjected to many hot-cold cycles and the high pressure generated by the powerful jet pump, which together stresses the pipes and joints. PDC spas are designed to be owner serviceable with easy-access

panels on all 4 sides of the portable spa which allow quick and thorough inspection and repair of the plumbing system. Should a leak occur, follow these instruction to make the repair.

1. Remove side panel to locate leak. Mark the leak with a marking pen.

2. Turn off all power. Drain spa below leak, allow plastic parts to dry.
3. Contact qualified service technician to repair plumbing.

WATER CHEMISTRY MAINTENANCE

pH Control: Chemically balanced water depends primarily on:

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

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

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

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

The test for bromine should read 1 ppm in a residential spa. Depending upon bather load, amount of usage, type of water, ultraviolet exposure, etc., the amount of chemicals needed will vary. On a weekly basis, a "shock" treatment should be used to destroy organic contamination not readily destroyed by normal additions of the sanitizing agent. This is accomplished by using a powerful, long-lasting oxidizing agent capable of

destroying the organic contaminants so the sanitizer can be effective in killing bacteria. Contact your chemical supplier for the best "shocking" agent in conjunction with the line of chemicals being used. For spas installed outside and directly in sunlight, algae growth may be a problem. If this occurs, contact your dealer or chemical manufacturer for advice on the best agent available to handle this problem. **Above all, remember:**

1. Before using chemicals, read the labels and follow directions carefully.
2. Always add the chemicals directly to the spa water, either in a suitable feeder, distributed over the surface of the water, or poured into the water, preferably with the pump and bubbler "on."
3. Never add chemicals to the spa while people are using it.
4. Maintaining temperature between 95°-104°F is essential as a health factor for bathers and is helpful in controlling water problems.
5. The bottom line to proper water maintenance is to **adhere to a regular schedule** of testing chemical levels and maintaining them.

PDC offers an automatic brominator as a cylinder inside the top-load filter. This offers easy chemical insertion and adjustment. PDC also makes available the option of the use of ozone as the sanitizing agent. This utilizes ultraviolet light and offers a "hands-free" routine to spa water care. The pH must be maintained and shocking may be needed after heavy bather loads. With the use of ozone, the periodic draining may be needed less frequently, and the bromine odor no longer an issue. It is suggested that 24-hour circulation is required to effectively sanitize the water, and a chlorine shock used periodically. Contact your spa dealer for more information.

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

WINTERIZING

If your spa is to be used during the winter months in cold climate where the danger of freezing exists, certain precautions should be taken to avoid damage. An increased circulation cycle, and use of a rigid foam cover are suggested. Contact your dealer for advice.

Many spa owners find that outdoor wintertime soaking is quite enjoyable, and PDC certainly suggests the use of a spa year-round, although certain situations do require closing the unit for the winter months (i.e., vacation homes). If the spa will not be used for a period of time, perform the following winterizing procedures:

1. Turn thermostat knob to off position.
2. Drain spa of all water.
3. Remove any remaining water with sponge. In order to drain all of the water from the air channel, turn

“bubbler” on for approximately ten minutes to spray out the water. Clean spa as per previous instruction. Repeat as necessary.

4. Shut off all electrical power to unit.
5. Filter should be drained, removed and cleaned.
6. Pump, motor and all connecting lines should be drained fully to protect from freezing. Blow air through all connection lines to remove water. You may wish to use a non-toxic RV type antifreeze to guarantee freeze prevention. Be sure to read the manufacturer’s instructions and remove all anti-freeze before the next spa use.
7. Cover the spa with a waterproof rigid cover to protect it from snow, ice and wind.

TROUBLESHOOTING

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

1. All equipment does not operate

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

2. Pump does not work

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

3. Inadequate jet action

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

4. No heat

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

5. No bubbler

- Check all steps under part “1.”
- Blowers generally need no maintenance. Replacement is normally the solution.

6. No light

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

7. Water is cloudy

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

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

SAFETY SIGN

Place enclosed safety sign where legible by spa occupants. These warnings are posted for the safety and well-being of all users of the spa.

To obtain additional or replacement copies of this safety sign, contact your local retailer or PDC Spas, P.O. Box 4007, Williamsport, PA 17701.

Please read and understand all warnings!

SAVE THIS MANUAL!



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