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# Owner's Manual

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# IMPORTANT SAFETY INSTRUCTIONS

**Caution: Risk of electrical shock.  
Read and follow all instructions.**

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

## 1. **READ AND FOLLOW ALL INSTRUCTIONS.**

2. **Danger:** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

A. **Warning: Risk of child drowning.**  
Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use a spa unless they are supervised at all times.

3. To reduce the risk of injury:

A. The water in a spa or hot tub should never exceed 104°F (40°C). Water temperatures between 100°F (38°C) and 104° (40°C) are considered safe for a healthy adult. Lower water temperatures are recommended for extended use (exceeding 10-15 minutes) and for young children.

B. Pregnant or possibly pregnant women should not use the spa without consulting a physician. Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa or hot tub water temperatures to 100°F (38°C).

C. Before entering a spa or hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water tempera-

ture-regulating devices may vary as much as ±5°F (3°C).

D. The use of alcohol, drugs, or medication before or during spa 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.

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

4. The very young, or aged, those with illness, heart conditions or under doctor's care should not use the spa unattended. Infants should not be permitted in the spa at water temperatures over 100°F.

5. Prolonged immersion in hot water may induce 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 dizziness, fainting, drowsiness, lethargy, and an increase in the internal body temperature. The effects of hyperthermia include (1) unawareness of impending hazard, (2) failure to perceive heat, (3) failure to recognize the need to exit spa, (4) physical inability to exit spa, (5) fetal damage in pregnant women, and (6) unconsciousness resulting in danger of drowning. **Warning:** The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in spas.

6. **Danger:** To reduce the risk of injury to persons, do not remove suction fitting covers.

7. **Danger: Risk of electrical shock.** Install at least 5 feet (1.5m) from all metal surfaces. (A spa may be installed within 5 feet of metal surfaces if each metal surface is

- permanently connected by a minimum No. 8 AWG (8.4mm<sup>2</sup>) solid copper conductor attached to the wire connector on the terminal box that is provided for this purpose.)
8. **Danger: Risk of electric shock.** Do not permit any electric appliance, such as a light, telephone, radio, or television, within 5 feet (1.5m) of a spa.
  9. A licensed electrician should make the final electrical connections.
  10. A pressure wire connector is attached to the control box inside this spa to permit connection of a minimum No. 8 AWG (8.4mm<sup>2</sup>) solid copper ground bonding conductor between that point and any metal equipment, metal electrical boxes or fixtures, metal water pipes or conduits that are within 5 feet (1.5 meter) of the spa as required to comply with local code requirements.
  11. 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 70-1987. This disconnecting means must be readily accessible for operation but installed at least 5 feet (1.5 meters) from the spa as required to comply with local code requirements.
  12. Do not use electrical appliances such as television, radio, lights, cooking devices or telephones within 10 feet of the spa while the spa is being used. Lighting fixtures must not be located within 10 feet of the spa. Lighting fixtures located within 20 feet of the spa must be on a circuit protected by a ground fault circuit interrupter (GFCI).
  13. Install to provide drainage of compartment for electrical components.
- 110 V Cord and plug connected units:**
14. Connect only to a grounded, grounding type receptacle.
  15. Do not bury the cord.
  16. **Warning:** To reduce the risk of electric shock, replace damaged cord immediately.
  17. Your spa is equipped with a ground fault circuit interrupter (G.F.C.I.) on the end of the power supply cord. Before each use, with the plug connected to the power supply and the unit operating, push the "Test" button. The unit should stop operating and the "Reset" button should appear. Reset the G.F.C.I. by pushing the "Reset" button. The spa should now operate normally. If the interrupter does not perform in this manner, a ground current is flowing indicating the possibility of electric shock. Disconnect the plug from the receptacle until the fault has been identified and corrected.
18. **SAVE THESE INSTRUCTIONS.**

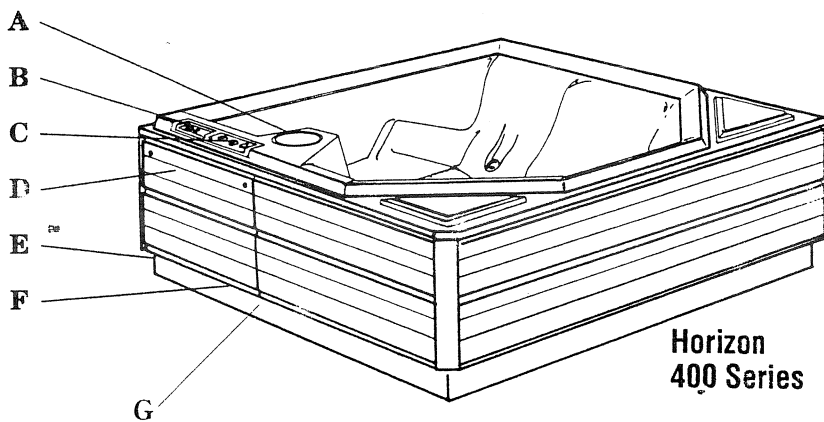
### **Do's and Don'ts**

#### **Do:**

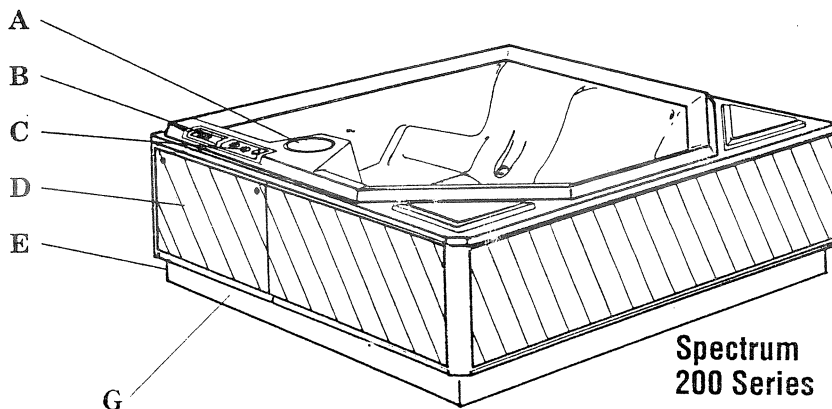
- Replace your cover immediately after use.
- Be aware of the dangers of a wet and slippery surface. Use caution when entering and exiting your spa.
- Have a licensed electrician make all final electrical connections.
- Keep your water chemistry correctly balanced. Untreated spa water will cause problems with your spa and equipment as well as being a health risk.
- Clean your filter monthly.
- Leave access to the equipment area when installing your spa.

#### **Don't:**

- Use the spa at 104°F for long periods of time.
- Use an extension cord to power your spa.
- Allow anyone to stand on the spa cover. It is not designed to support weight.
- Power the spa unless it is filled with water to the water level mark on the Weir door.
- Operate the pump for extended periods of time with the cover in place. Extended operation can cause heat build-up and interfere with spa operation.



**Horizon  
400 Series**

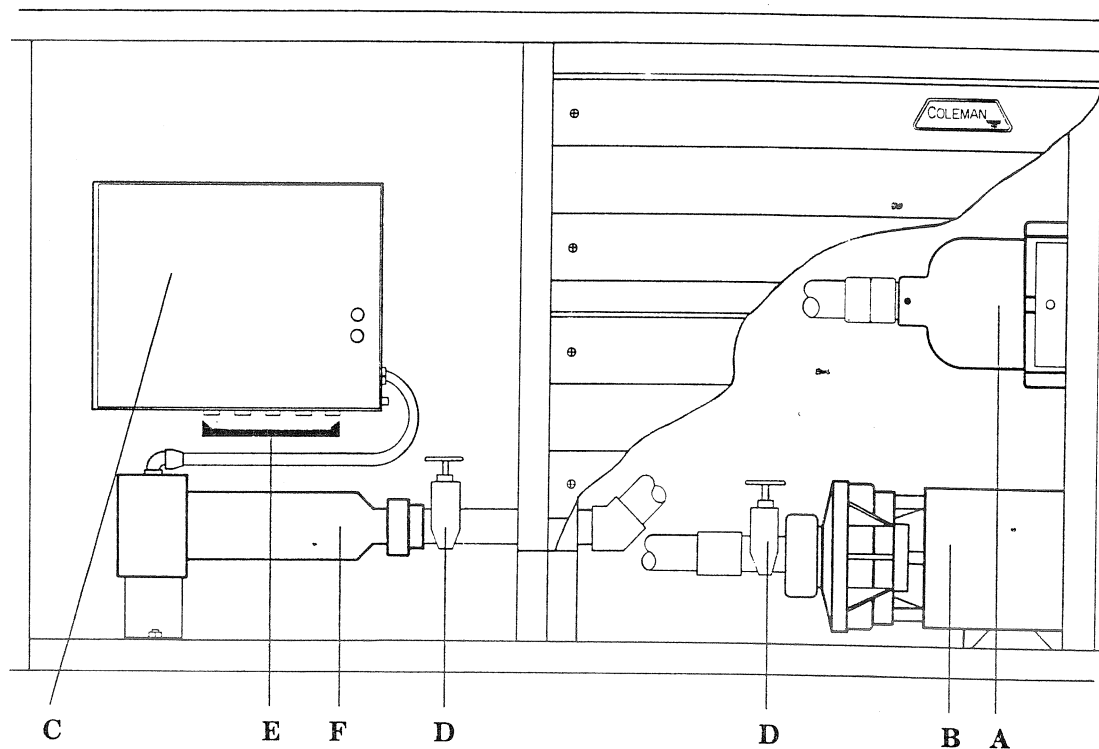


**Spectrum  
200 Series**

## Spa System Components

- A. **Filter Skimmer/Weir Door:** Removes floating debris from the water surface, provides a water return path to equipment, and houses water filter element.
- B. **Spa Side Control Panel:** Used to control temperature setting, pump for jets, bubbler action, and light(s).
- C. **Air Controls:** Increases or decreases air entering the jets. Close during heating for maximum efficiency.
- D. **Equipment Pack Service Panel (no user serviceable parts):** Spa support system consisting of 2-speed pump, heater, air bubbler, and associated electrical controls (not shown).
- E. **Drain Access (to left of equipment service panel):** Spa drain faucet.
- F. **Pedestal Lighting (Horizon 400 Series only):** Adds beauty and safety to your spa area. It will illuminate approximately three feet around the cabinet.
- G. **Manufacturer's Identification Label:** Contains identification information for warranty service.

# Spa Components



**Note: No consumer serviceable parts.**

- A. Air Bubbler:** Provides a large volume of air to the air holes in the seat of the spa for a vigorous bubble action (located behind or inside compartment). Not available on Model 80 spas.
- B. Pumps:** One on Spectrum 200 Series spas, two on Horizon 400 Series spas. Low speed for efficient water circulation during filtration and heating; high speed for maximum action of the jets. The pump functions are activated by topside controls.
- C. Warning and Installation Label:** Contains important safety information and installation instructions.
- D. Slice Valve:** Used to shut off water flow from the spa to the equipment while servicing. It should be open during normal operations.
- E. Electrical Connections:** The electrical plugs for the unit connect here. All existing connections should be intact.
- F. Heater Assembly:** Thermostatically controlled and equipped with an overheat safety shut-off.

## Spa Installation

**Danger: Risk of electrical shock. Install at least 5 feet from all metal surfaces.**

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/NFPA70-1987. The disconnecting means must be readily accessible but installed at least 5 feet (1.5 meters) from the spa water.

### Site and Positioning

Locate the spa on solid, level foundation or flooring. Keep in mind the weight of the filled spa (in excess of 4,000 lbs. on some models). If you have any doubts about the load bearing ability of your chosen site, contact an architect, your building department or a building contractor. The entire perimeter of the spa cabinet and the spa bottom must be evenly supported.

If your spa is installed outdoors, we recommend that you provide a concrete pad for the spa to rest on (8ft.x8ft.x4" level pad). Failure to provide a level surface could structurally damage your spa and will void the warranty.

Installation must provide for drainage for the electrical compartment. The spa must be installed to allow access for service and maintenance and therefore, below grade level installation is not recommended.

### Outdoor Installation

Keep the following additional factors in mind when installing your spa outdoors:

1. Local codes pertaining to fencing.
2. Local electrical and plumbing codes.
3. View from your house.
4. Wind direction.
5. Exposure to sunlight.
6. Location in regard to trees (falling leaves and shade).
7. Dressing and bathroom location.

8. Storage area for maintenance equipment and chemicals.
9. Location to facilitate adult supervision.
10. Landscaping and nighttime lighting.
11. Access to equipment cabinet panels.
12. Power cord location and foot traffic.

### Indoor Installation

Keep the following additional factors in mind when installing your spa indoors:

1. Indoor spas promote high humidity, so a means of decreasing this humidity must be provided. This can be accomplished by using either ventilation fans or oversized de-humidifiers. Consult your dealer.
2. Floor drains should be provided to drain off water splashed from the spa which may cause walking hazards and /or water damage.
3. Floor area should be flat and non-skid.
4. Walls, ceilings, woodwork should be of materials capable of withstanding high humidity (redwood, cedar).
5. Be sure floor load bearing capacities are adequate to support the concentrated spa weight.
6. Spas should be double checked for leaks before installing to avoid possible water damage.
7. Indoor sunrooms are capable of maintaining high ambient temperatures which may effect the spa water temperature. It is not recommended that you operate your filter cycles for longer than 6 hours under these conditions.

## Electrical Information

**Caution: Risk of electrical shock.  
Read and follow all instructions.**

### Important Safety Instructions

Prior to performing any service to the spa equipment, turn off all primary electrical power at the main circuit breaker or disconnect panel. All field electrical connections can be made by removing the front panel of the electrical control box. To gain access to the control box you must remove the equipment compartment access panel.

All electrical connections to this spa package must be accomplished by a qualified licensed electrician in accordance with the National Electrical Code and in accordance with local electrical codes in effect at the time of installation.

All connections should be made in accordance with the wiring diagram in the control box.

This equipment is designed to operate on 60Hz alternating current only, at a voltage of 120 or 240 volts as required.

Connections should be made using copper conductors only. The connecting wire and circuit breakers or fuses must all be sized to accommodate the Total Ampere load as specified on the equipment label.

### Installation Options

#### Horizon 400 Series

##### 240 Volt Installation (only)

###### Models:

- All Horizon 400 Series models.

###### Electrical Requirements:

- 240 Volts, 60Hz, Single Phase, 50 amp., 3 wire service.

**Units to be operated at 240 volts must have all electrical connections made by a qualified electrician in accordance with the National Electric Code and in accordance with all local electrical codes in effect at the time of installation.**

**Do not run conduit through the vent holes below the door. A hole can be drilled in**

the pedestal or base of the unit to bring the conduit to the equipment compartment.

Horizon spas installed for 240 volt operation require a 3 wire, 50 amp., 240 volt subfeed in non-metallic pipe to the spa equipment compartment (line 1, line 2, and ground). Refer to wiring diagram on page 25. A green colored terminal (or wire connector marked "G", "GR", "Grounding") is provided in the control box. To reduce the risk of electrical shock, connect this terminal or connector to the grounding terminal of your electrical service or supply panel with a continuous green insulated copper wire equivalent to the circuit conductor supplying this equipment, but no smaller than No. 12 AWG. In addition, a second pressure wire connector is provided on the surface of the control box for bonding to local ground points. To reduce the risk of electrical shock, this connector should be bonded with a No. 8 AWG copper wire to any metal ladders, water pipes, or any metal within 5 feet of the spa.

### Spectrum 200 Series

All Spectrum models are convertible to either 120 volt or 240 volt electrical service.

#### 120 Volt Installation

##### Permanently Connected

###### Models:

- All Spectrum 200 Series models with a "B" or "C" designation.

###### Electrical Requirements:

- 120 Volts, 60HZ, Single Phase, 30 amp., 3 wire service.
- Spectrum spas installed for 120 volt operation require a 3 wire, 30 amp., 120 volt subfeed in non-metallic pipe to the spa equipment compartment (line 1, neutral, and ground). Refer to wiring diagram on page 26. A green colored terminal (or wire connector marked "G", "GR", "Grounding") is provided in the control box. To reduce the risk of electrical shock, connect this terminal or connector to the grounding terminal of your electrical service or supply panel with a continuous green insulated copper wire equivalent to the circuit conductor supplying this equipment, but no smaller than No. 12 AWG. In addition, a second pressure wire connector is provided on the surface of the control box for bonding



## Start Up Procedures

local ground points. To reduce the risk of electrical shock, this connector should be bonded with a No. 8 AWG copper wire to any metal ladders, water pipes, or any metal within 5 feet of the spa.

### Cord Connected

#### Models:

- Spectrum 200 Series models with a "C" designation only.

#### Electrical Requirements:

- Factory installed cord with GFCI, 120 Volts, 60 HZ, Single Phase, 20 amp grounded receptacle.

Isolate the power cord from all foot traffic areas to prevent cord damage or tripping accidents. Route the cord through the hole in the side of the cabinet provided for this purpose.

### 240 Volt Installation

#### Models:

- All Spectrum 200 Series models with "B" or "C" designation.

#### Electrical Requirement:

- 240 Volts, 60Hz, Single Phase, 50 amp., 4 wire service.

**Units to be operated at 240 volts must have all electrical connections made by a qualified electrician in accordance with the national electric code and in accordance with all local electrical codes in effect at the time of installation.**

A hole can be drilled in the pedestal or base of the unit to bring the conduit to the equipment compartment.

Spectrum spas installed for 240 Volt operation require a 4 wire, 50 amp., 240 volt subfeed in non-metallic pipe to the spa equipment compartment (line 1, line 2, neutral and ground). Refer to wiring diagram on page 26. A green colored terminal (or a wire connector marked "G", "GR", "Ground", or "Grounding") is provided in the control box. To reduce the risk of electrical shock, connect this terminal or connector to the grounding terminal of your electrical service or supply panel with a continuous green insulated copper wire equivalent to the circuit conductor supplying this equipment, but no smaller than No. 12 AWG. In addition, a second pressure wire connector is provided on the surface of the control box for bonding to local ground points. To reduce the risk of electrical shock, this connector should

be bonded with a No. 8 AWG copper wire to any metal ladders, water pipes, or any metal within 5 feet of the tub.

## Start Up Procedures

Follow recommendations for site location and electrical connection. The water line on the weir door (see skimmer, page 4) is the level at which the water should be maintained.

**Note: Never operate the spa when the water level is below water level mark on weir door. It can damage the pump and heater and is potentially dangerous.**

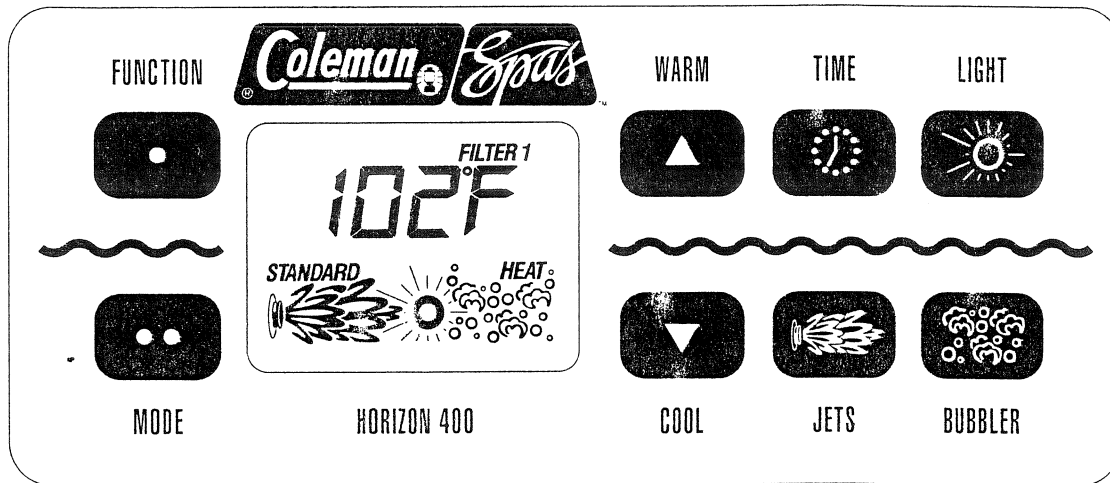
1. Fill the spa to the water line on the weir door with tap water ("softened" water is not recommended).
2. Turn power on to unit at circuit breaker or disconnect.
3. Open the air controls and press the Jets button twice. Water should come from the therapy jets. If water flow is not established, turn off jets and see Priming, page 20.

**Important: Do not operate the spa without full water flow.**

4. Add chemicals. See Chemical treatment and Water Maintenance section (page 17).

Follow Operating Instructions for your particular model and set the spa to heat to the desired temperature. Initially you may find that the spa requires 12 to 14 hours on 240 Volt installations to reach temperature or up to 18 hours on 120 installations. Keep your thermal cover on the unit to help the heating process.

# Operating Instructions



## Powerworks Horizon 400 Series Control System

The Horizon Powerworks Control offers you the ultimate in spa control. The backlit, Liquid Crystal Display (LCD) displays current temperature and operating status. Each feature is actuated through the control panel pad. Simply touch the appropriate button to activate desired function.

### User's Pads



#### Function Pad

Used for initiating time setting, filter programming and panel lock.



#### Mode Pad

Switches the spa from economy to standard mode and vice-versa. In economy mode, the spa will heat only during the filter cycles. In the standard mode, the spa will be heated automatically to the set temperature. This pad also resets the control in the rare instance of an overheat.



#### Temperature Controls

When either of these pads are touched once, the LCD will display the temperature which has been set, as well as the words "set heat". Each time either of these pads is



WARM



TIME



LIGHT



COOL



JETS



BUBBLER

pressed again, the set temperature will increase or decrease, depending on which pad is pressed. After 3 seconds, the LCD will automatically display the spa temperature.

**Note:** There is a temperature lock feature. (See the lock section, page 12.)



#### Jets

The sequence of jet action is: \*

- 1-low whirlpool
- 2-high whirlpool
- 3-high whirlpool and high therapy
- 4-high therapy only
- 5-off

The low speed whirlpool is timed to automatically turn off after four hours of operation. The high speed whirlpool and therapy jets are timed to turn off automatically after thirty minutes of operation.

**Note:** The low speed whirlpool jets will be automatically activated whenever the spa calls for filtration or heat. Whenever this automatic activation occurs, the low speed whirlpool jets cannot be turned off; however, the other jet functions may be activated.



#### Bubbler

The Horizon Series spa has a variable three speed bubbler. The sequence is:

- 1-High
- 2-Medium

## Operating Instructions

3-Low

4-Off

The bubbler is timed to turn off automatically after 30 minutes of operation.



### Lights

Touch this pad to turn on the spa light and perimeter lights. Touch again to turn off. Both lights are timed to turn off automatically after four hours of operation.



### Time

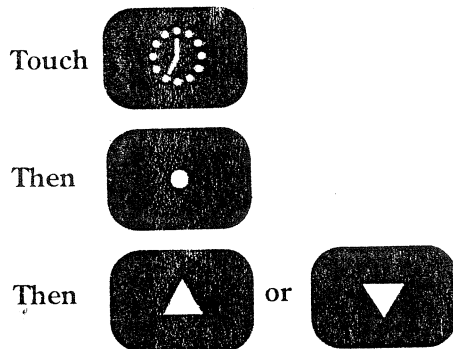
Touch to view the time of day. Touch again to view the set spa temperature. The current spa temperature display will automatically resume after five seconds.

## Time and Filtration Cycles

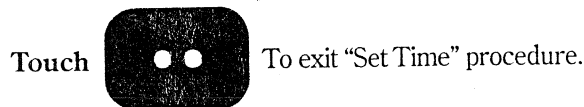
This control has been specifically designed so that by simply connecting the spa to its properly grounded source and touching the mode pad, the spa will function properly and safely at 100° F. In this mode, all user pads will be completely functional. However, to fully utilize the unique capabilities of this control, it is important to set the time of day properly.

### Setting The Time

Once the spa has been properly connected, notice the "set time" message flashing on the LCD screen.



After either pad is touched once, hours will advance or decrease in one minute increments. Press either pad again to stop the display's time setting cycle.



## Preset Filter Cycles

Now that the time has been set correctly, your spa will automatically filter itself for a 2-hour period every 12 hours. Whenever a filter cycle is active, this automatic filtering sequence is indicated by the following messages on the LCD screen:

### Filter 1

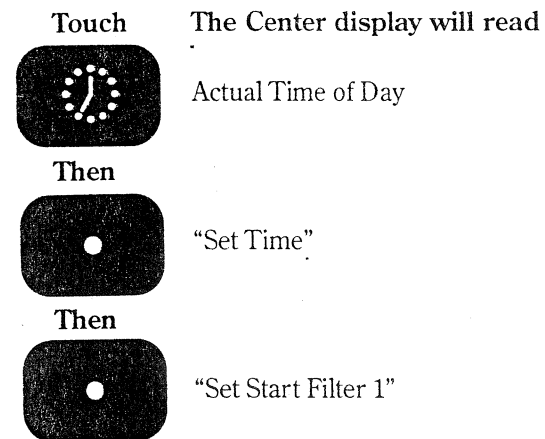
The first filter cycle is automatically activated at 2:00 a.m. and operates the low-speed pump until 4:00 a.m. The heater will operate in the economy mode.

### Filter 2

The second filter cycle is automatically activated at 2:00 p.m. and operates the low-speed pump until 4:00 p.m. Again, the heater will operate in the economy mode.

## Changing Filter Cycles

If the preset times are inconvenient, if a different duration is preferred, or if you wish to leave the heater off during filtering, the following procedure can be used to change the automatic filter cycle settings.



At this point, each time the program pad is pressed, the filter-start time, the heater-enable status, and the filter-stop time will be indicated on the LCD screen.

When the filter-start or filter-stop times are displayed on the screen:



to reset the times.

When the "Set Heat" message is displayed:



to set the center display to "on" or "off". In the "on" position, the spa will warm to the set temperature during the filter cycles. In the "off" position, the heater will not be activated during the filter cycles.

**Note:** Must be in the "on" position to use the heater in the Economy mode.

After entering the filter-set routine, you must:



to proceed through all the start and stop times for both filter cycles. Just follow the same procedure to adjust the "Filter 2" settings.

**Note:** Under freezing conditions do not override the second filtration cycle.

To exit the filter-set procedure:



and the LCD will display the current water temperature.

**Note:** To properly clean and maintain your spa, filter time of at least six hours per day (total of both cycles) is recommended.

The second filtration cycle each day is preceded by a short bubbler cycle. This is to clear the water in the air channel and ensure complete filtration.

#### Clean Up Cycle

After periods of heavy use, turn the jets on to "low whirlpool" for a four-hour Clean Up Cycle.

#### Ozone Operation

Spas equipped with the Coleman Powerworks® Ozonator will produce ozone whenever the spa is in a timed filtration cycle. Activation of the low whirlpool jets via the "jets" pad will initiate filtration, but not ozone production. Activation of

other functions during timed filtration cycles will temporarily stop ozone production.

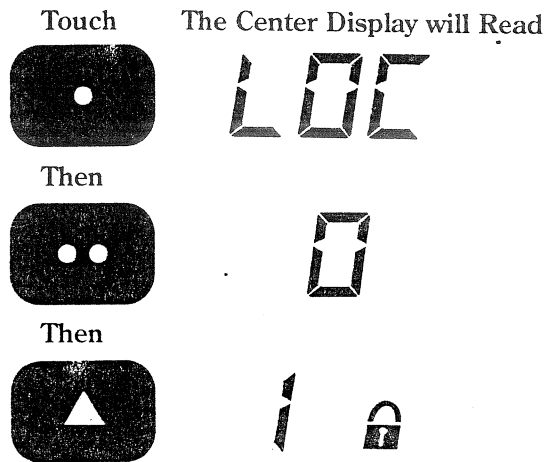
#### pH Sensor Operation

Spas equipped with the pH sensor option will provide an accurate pH reading to assist water maintenance. To view pH, touch the time pad twice. Recommended range is 7.2 to 7.6. If the pH of the spa water is outside of this range, the display will alternately flash the current temperature and pH reading. If this occurs, add chemicals as necessary to bring the pH into range.

#### Panel Lock

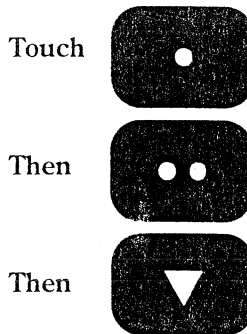
To help prevent unauthorized use of your spa, the Horizon® Digital has incorporated a unique panel locking system.

To lock the panel:



This sequence must be done within three seconds to activate the Panel Lock feature. The center display will show the spa temperature along with the lock symbol. All the panel pads are now deactivated except the program pad, which is used to initiate the unlock sequence.

To unlock the panel:



## Operating Instructions

When the panel lock is engaged, all automatic spa functions will operate normally but cannot be altered. To unlock the panel, the three pads must be pressed in the correct sequence and within two seconds. When the last pad is pressed, the lock symbol will disappear. All pads are now active.

### Temperature Lock

To prevent unauthorized temperature adjustment of your spa water. While setting your spa water temperature, after you have pressed either temperature pad, follow the instructions below to lock your set temperature.

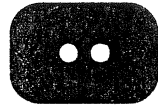
To lock the temperature:

Touch      The Center Display will Read

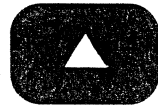


LOCK

Then



Then



The set lock pads must be pressed within three seconds to activate the lock. Within three seconds the center display will show the spa temperature along with the lock symbol. The set temperature pads will be deactivated and when pushed, the set temperature will appear with a double arrow next to it.

To unlock the temperature:

Touch



Then

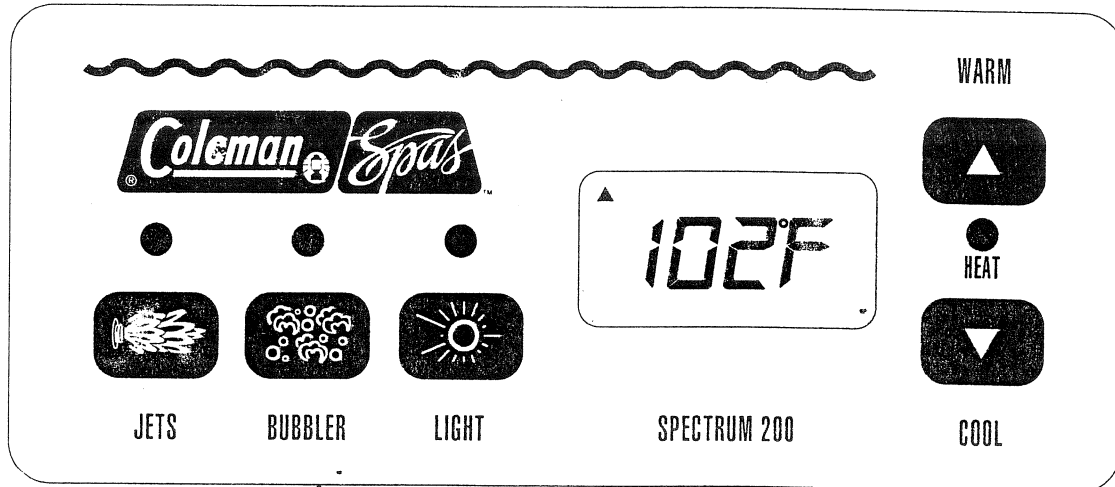


Then



To unlock the panel, the three pads must be pressed in the correct sequence and within two seconds. When the last pad is pressed, the lock symbol will disappear. All pads are now active.

# Operating Instructions



## Powerworks Spectrum 200 Series Control System

The Powerworks Spectrum Control System activates the different modes of operation of your Spectrum series spa. Each feature is actuated through the control panel pad. Simply touch the appropriate button to activate desired function.

### User's Pads



#### Temperature

The set temperature may easily be increased or decreased at any time. Both the current and set temperature will be displayed on the Liquid Crystal Display (LCD).

The set temperature is differentiated by an arrowhead next to the number on the display. When the heater is operating, the "HEAT" LED will light up.

**Note:** Spectrum series spas that are wired 120/30 amp will not heat when either the high pump or the blower is on. Spectrum series spas wired 240/50 amp will heat with either the high pump or the bubbler on. If the high speed pump and bubbler are both on, the heater will not operate.



#### Jets

Both the low-speed and high-speed pump may be activated by

touching the "JETS" pad. The first touch will activate the low speed pump. A second touch activates the high speed pump. The low speed jets are timed to go off automatically after 4 hours. The high speed jets will go off automatically after 30 minutes. Touch the pad to reactivate.

**Note:** The low-speed pump will operate automatically whenever the heater is on, a filter cycle is activated or when a freezing condition is detected. When this automatic activation occurs, the low-speed pump cannot be deactivated by the "JETS" pad; however, the high-speed pump may be started.



#### Bubbler

The bubbler aerates the spa. When activated, the "BUBBLER" LED will light up on the panel.

The bubbler is timed to stop automatically after 30 minutes. Touch the pad to reactivate.



#### Light

The spa light may be turned on or off by touching the "LIGHT" pad. The spa light will automatically turn off after 30 minutes of use.

## Operating Instructions



### Standard/Economy Mode

The spa may be switched from Standard to Economy mode and vice versa by simultaneously touching the "WARM" and "COOL" pads. In Economy mode the display will alternately flash "ECON" and the current temperature. In this mode the heater will only operate during the filtration cycles. In the Standard mode the heater will come on as necessary to maintain 100° or the set temperature at all times.

### Filtration

The Spectrum has two preset filter cycles. The first will begin immediately when power is provided to the unit. The second filter cycle will turn on twelve hours after the first filter cycle turns on. The cycles are factory preset for three hours each. Your dealer may adjust the cycles to 4, 5 or 6 hours each if needed. To reset your daily filtration cycles, you must turn off your circuit breaker and turn it back on two hours before your desired start time.

The second filtration cycle each day is preceded by a short bubbler cycle. This is to clear the water in the air channel and ensure complete filtration.

### Clean Up Cycle

After periods of heavy use, turn the jets on to "low speed" for a four-hour Clean Up Cycle.

### Ozone Production

Spas equipped with the Coleman Powerworks® Ozonator will produce ozone during timed filtration cycles only. Activating the low speed jets via the "JETS" pad will initiate filtration but not ozone production. Activation of other functions during timed filtration cycles will temporarily stop ozone production.

## Safety Features

Your Coleman spa is equipped with several safety features which are designed to protect the user and the equipment.

### Automatic Time Outs

#### Horizon Series

The low speed whirlpool and the spa lights are timed to automatically turn off after four hours of operation. The high speed whirlpool, therapy jets and bubbler are timed to turn off automatically after thirty minutes of operation.

#### Spectrum Series

The low speed jets are timed to turn off automatically after four hours of operation. The high speed jets, the bubbler, and the spa light are timed to turn off automatically after thirty minutes of operation.

### Error Messages

The following error messages are displayed on the LCD screen and describe the operating status.

**Message**

**Meaning**

**OH**

**Overheat Protection**

There are two hi-limit sensors on the system to detect overheating:

a water temperature sensor and a hi-limit sensor. The water temperature sensor constantly monitors the spa water temperature. If the spa water reaches 112° F, the spa will be disabled. When the water cools below 110° F, the spa will automatically reset. The hi-limit sensor detects overheating of the heater element. If the temperature of the heater well reaches 118° F, the spa will be disabled. This overheating condition may be caused by restricted water flow. When the water has cooled to 116° F, the spa may be reset from the panel either by touching the "COOL" temperature pad on Spectrum 200 Series spas or by touching the "MODE" pad on Horizon 400 Series spas.

**Note:** After a "OH" message, it is important that you check the water temperature before immersing yourself. If the "OH" message remains, the spa will not reset or the water doesn't cool down, contact your dealer.

**FLO**

**Flow Switch**

The flow switches enables the control to detect when any pressure switches have malfunctioned. Contact your dealer if a "FLO" message remains on the LCD.

**COOL**

**Temperature Set Back**

If the control detects that the spa water is 20° F cooler than the temperature set point, the heater will automatically activate to provide freeze protection. This is a normal spa function. No corrective action is necessary.

**ICE**

**Freeze Protection**

The spa software will automatically activate the low speed pump to circulate the water when a freeze condition is detected (temperature of the heater element is below 40° F). This is a normal spa function, no corrective action is necessary.

**Note:** Under freezing conditions do not override the second filtration cycle.

**Sn 1**

**Open Sensor Detection**

The hi-limit sensor is non-functional and the spa will be deactivated. Contact your dealer.

**Sn 3**

**Open Sensor Detection**

The water temperature sensor is non-functional and the spa will be deactivated. Contact your dealer.



# Jets, Air Controls and Bubbler

## Jets

Coleman's jets are all individually engineered to provide a unique hydromassage. The jet system is balanced so that all full size therapy jets are interchangeable and can be added in any quantity. Depending on the model, your spa will have a combination of the following jets.

### Pulse-Flow

Rotating jets deliver a pulsating massage that relax aching muscles.

### Comfort-Flow

Patented design generates a high volume/low pressure flow that is fully directional for gentle massage.

### Adjusta-Flow

Fully adjustable and directional therapy jets for hydrotherapeutic experience that is tailored to your preference.

### Whirl-Flow

High powered high flow jet to create a soothing whirlpool action.

### Therapy-Flow

Mini therapy jet that delivers hydrotherapy to your feet and legs.

## Air Controls

The intensity of the jet action can be controlled by altering the amount of air injected with water through the jets. Your spa has either 2 or 3 air controls (depending on the model) located on the lip of the spa. Each control activates air to specific jets in the spa allowing you to create various combinations and levels of jet action to suit individual taste.

**Note: Air controls should be closed during heating cycles for maximum energy efficiency.**

## Bubbler

The bubbler generates a vigorous air and water massage action throughout the spa via Coleman's unique air channel design. The temperature of the air from the bubbler is directly related to the ambient air temperature. The following chart outlines the average comfort zone considering ambient air temperature.

	AMBIENT OUTDOOR TEMPERATURE	AIR CHANNEL TEMPERATURE	PERCEIVED SENSATION
	40°	70-80	COOL
BUBBLER	60	90-100	LUKE WARM
COMFORT	70	100-110	WARM
ZONE	80	110-120	WARMER
	90	120-130	VERY WARM
	100	130-140	HOT

COMFORT ZONE—IDEAL AMBIENT AIR TEMPERATURE FOR OPERATING AIR BUBBLER.

1. Temperatures BELOW this comfort range will cause the water to cool off rapidly. This wastes electricity, as the spa water will have to be reheated.
2. Temperatures ABOVE this comfort range can cause some discomfort due to your skin sensing the differential between the water and air temperatures. Some people are more sensitive than others and will feel discomfort at lower temperatures. The bubbler can be turned to low speed (Horizon Series) or off to avoid discomfort.
3. Very warm and hot temperatures may be perceived after about 10 minutes of air bubbler operation.

**Note:** Prior to the second filtration cycle the bubbler is activated for twenty seconds to clear the air channel and ensure complete filtration.

## Maintenance

### Water Chemistry

Water chemistry is critical in a spa system. The combination of high temperature and small volume means that the chemical balance must be watched carefully. It is recommended that you purchase a chemical start up kit from your dealer.

### Sanitizing

Sanitizing your water destroys harmful organisms and keeps your spa healthy and safe. Three commonly used spa sanitizers are bromine, chlorine and ozone. Chlorine and bromine are chemicals that you will add to the water. Ozone is a gas that is produced by an ozonator and injected into the water. It is important that a residual of sanitizer remain in your water. High water temperature, aeration and use will increase the need for sanitizer. In addition to maintaining a residual, it is important to "shock" your spa water periodically and after heavy use. This addition of substantial amounts of sanitizer super-chlorinates the water and oxidizes non-filterable organic residue. Allow the sanitizer level to drop back to the residual amount before using. Also use your Clean Up Cycle, page 11 or 14, after heavy use for additional filtration.

### pH Level

pH is a balance of acidity and alkalinity in the water. Maintaining proper pH is important for the effectiveness of your sanitizer, for user comfort and to prevent corrosion of the spa equipment.

**Note:** Keep a chlorine or bromine residual of 3.0 to 5.0 ppm. Tests should be done daily with your test kit.

**Note:** Never mix two chemicals together. Never store any chemicals in the equipment compartment.

**Note:** Do not use muriatic acid to balance pH as it will damage your spa surface and equipment.

### Recommended Levels

**pH:** 7.2–7.6 (Ideal 7.4–7.6)

**Sanitizer Residual:** 3.5–5.0 ppm

**Total Dissolved Solids:** 1,000–2,000 ppm

**Free Available Sanitizer:** 3.0–5.0 ppm

**Total Alkalinity:** 80–100 ppm ideal for dichlor, trichlor, and bromine

### pH Sensor Operation

Spas equipped with the pH sensor option will provide an accurate pH reading to assist water maintenance. To view pH, touch the time pad twice. Recommended range is 7.2 to 7.6. If the pH of the spa water is outside of this range, the display will alternately flash the current temperature and pH reading. If this occurs, add chemicals as necessary to bring the pH into range.

### Water Maintenance With the Powerworks® Ozonator™

Equipping your spa with a Powerworks® Ozonator is a smart decision. The use of ozone in conjunction with the normal spa sanitizing and water balancing chemicals will give you a cleaner, healthier spa environment. Maintenance and chemical usage will be significantly reduced, and you will enjoy the cleanest water which won't irritate your skin.

### Sanitizing With Ozone

Spas vary in size and the amount that they are used will vary considerably from family to family. For this reason you will need to establish your sanitizing program based upon your own personal use. When using ozone you should start by balancing your water chemistry as you normally would. A spa should run and be ozonated no less than six hours per day. This starting point should not be considered final. If your spa is heavily used, this run time should be increased. Your spa produces ozone during filtration cycles. (See page 11 or 14.)

The amount of a residual sanitizer (chlorine or bromine) that you maintain in the water will also vary depending on use. It is recommended that you maintain a residual of 3.0–5.0 ppm. Periodically, and after periods of heavy use, it is necessary to "shock" your spa with large amounts of sanitizer. The clean up cycle, page 11 or 14, will provide extra filtration during periods of heavy use.

### Specialty Chemicals

Although ozone will greatly reduce the need for specialty chemicals, it is recommended to always have some on hand. There may come a time when you will be required to add some of these due to heavy usage of the spa or when changing the water.

## Maintenance

If you are in an area which has metals in the source water, a specialty chemical program should be followed to avoid staining.

These guidelines cover the most common procedures when operating a spa with ozone. Should you encounter a situation which you don't completely understand, contact your dealer for assistance.

## Hot Water Guide

Problem	Cause	Solution
Cloudy Water	<ul style="list-style-type: none"><li>• Inadequate filtration/dirty filter</li><li>• Excessive oils/organic matter</li><li>• Improper sanitation/bacteria</li><li>• High pH and/or high alkalinity</li><li>• Suspended particles/organic matter</li><li>• High total dissolved solids (TDS)</li></ul>	<ul style="list-style-type: none"><li>• Check to make sure the filter is running properly/Clean filter with a filter cleaner or degreaser.</li><li>• Shock the spa with a chlorine or bromine sanitizer/shock or other shock treatment product.</li><li>• Increase sanitizer level to balance water and shock if needed.</li><li>• Adjust pH; add appropriate sodium bisulfate product.</li><li>• Use clarifier</li><li>• Depending on the severity-drain the spa to half and refill; or drain the spa completely, clean and refill.</li></ul>
Water Odor	<ul style="list-style-type: none"><li>• Excessive organics/too many chloramines insufficient free available</li><li>• Improper sanitation</li><li>• Inadequate filtration</li><li>• Low pH</li></ul>	<ul style="list-style-type: none"><li>• Shock the spa with a chlorine or bromine sanitizer/shock or other shock treatment product.</li><li>• Increase sanitizer level to balance water; shock if needed.</li><li>• Check to make sure the filter is running properly/Clean filter with a filter cleaner or degreaser.</li><li>• Raise pH with sodium bicarbonate product. If metals present, add chelating agent.</li></ul>
Chlorine Odor	<ul style="list-style-type: none"><li>• Too many chloramines-insufficient free available chlorine</li><li>• Low pH</li></ul>	<ul style="list-style-type: none"><li>• Shock the spa with a chlorine sanitizer/shock or non-chlorine shock treatment.</li><li>• Adjust pH; raise pH with sodium bicarbonate product.</li></ul>
Bromine Odor/ Yellow Water	<ul style="list-style-type: none"><li>• Low pH</li></ul>	<ul style="list-style-type: none"><li>• Adjust pH; raise pH with sodium bicarbonate product.</li></ul>
Musty Odor	<ul style="list-style-type: none"><li>• Bacterial or algae growth</li></ul>	<ul style="list-style-type: none"><li>• Shock the spa with a chlorine or bromine sanitizer/shock or equivalent shock treatment product. If problem is visible drain, clean, refill and balance spa.</li><li>• Add defoamer; or drain and refill.</li></ul>
Foaming/Scum Ring Around the Tub	<ul style="list-style-type: none"><li>• Build up of body oils, lotion and chemicals resulting from soap or detergent</li></ul>	<ul style="list-style-type: none"><li>• Adjust pH</li></ul>
Algae	<ul style="list-style-type: none"><li>• pH Imbalance</li><li>• Low free chlorine or bromine concentration</li></ul>	<ul style="list-style-type: none"><li>• Shock with a chlorine or bromine sanitizer/shock or other shock treatment product.</li></ul>

Problem	Cause	Solution
Eye Irritation	<ul style="list-style-type: none"> <li>• Low pH</li> <li>• Insufficient free available chlorine</li> </ul>	<ul style="list-style-type: none"> <li>• Raise pH with sodium bicarbonate product.</li> <li>• Shock with a chlorine sanitizer/shock or other shock treatment product.</li> </ul>
Skin Irritation/ Rash	<ul style="list-style-type: none"> <li>• Unsanitary/polluted water</li> <li>• Soaking too long</li> <li>• Water temperature too high</li> </ul>	<ul style="list-style-type: none"> <li>• Keep recommended sanitizer residual at all times; superchlorinate or use a non-chlorine shock treatment.</li> <li>• Soak for smaller intervals, such as 15 minutes.</li> <li>• Reduce water temperature.</li> </ul>
Scale	<ul style="list-style-type: none"> <li>• Too much calcium dissolved in water-pH and total alkalinity too high</li> </ul>	<ul style="list-style-type: none"> <li>• Add a scale control product. Adjust total alkalinity and pH levels by adding the appropriate sodium bisulfate product; with concentrated scale deposits-drain the spa, scrub the scale off, refill the spa and balance the water.</li> </ul>
Erratic pH Test Results/Unusual pH Test Color	<ul style="list-style-type: none"> <li>• Sanitizer level too high</li> <li>• Old pH indicator dye</li> <li>• Excessive organics in water</li> </ul>	<ul style="list-style-type: none"> <li>• When the sanitizer level is below 5 ppm, test the pH.</li> <li>• Replace the pH indicator dye.</li> </ul>
Sanitizer Dissipating Too Rapidly	<ul style="list-style-type: none"> <li>• Temperature too high</li> <li>• Low pH</li> <li>• Low pH Corrosion of Metal Fixtures</li> <li>• Low calcium hardness</li> <li>• Low total alkalinity</li> </ul>	<ul style="list-style-type: none"> <li>• Increase shock dosage; add sanitizer; have bathers shower before entering spa.</li> <li>• Reduce temperature.</li> <li>• Raise pH with sodium bicarbonate product.</li> <li>• Use a chelating agent if metals are present. Keep proper pH level (7.2 to 7.6).</li> <li>• Use a chelating agent if metals are present. Maintain minimum 150-200 ppm calcium hardness.</li> <li>• Use a chelating agent if metals are present. Maintain proper alkalinity for type of sanitizer used.</li> </ul>

## Spa Cabinet Care

Your custom spa cabinet is made from quality handcrafted redwood. It has been treated with a sealer and stain prior to spa assembly to preserve its appearance and help prevent weathering. Further wood protection requirements depend on spa location (indoors or outdoors, sun, shade, etc.), and local climate conditions. Re-treat with an appropriate product recommended by your authorized dealer upon installation and 3-4 times per year.

**Cleaning the spa cabinet:** Rinse dirt and dust regularly with clear water. To remove stubborn dirt, grime, and mild discoloration, wash with a mild detergent and warm water.

## Draining Spa

Always turn the spa heater off when you drain your spa. Do not turn it back on until you have full flow coming out your jets for several minutes.

The water level in the spa must be kept at its normal level water line mark. **Note:** Evaporation and splashing will cause the water level to drop.

High concentrations of impurities caused by water evaporation, body oils, perfumes, and other contaminants may accumulate in the spa and cannot be filtered out. Consequently, it is advisable to drain your spa and refill it with fresh water every six to eight weeks or more often, depending on the amount of use.

## Maintenance

### Drain Access

Drain access is in the black pedestal base to the left of the equipment service panel. Simply remove the two screws holding the access panel on and pull the drain hose out.

Then attach a garden hose to the spa drain faucet and open the valve. Do not attempt to use the pump to drain the spa.

### Priming Spa

Be aware that after draining and refilling your spa you may need to discharge air in the system in order for the pump to operate again. Should you experience an air-lock, you can remove the filter and insert a garden hose into the center hole and flush water through the system.

If power was turned off for draining, you may need to reset your filter cycles.

### Cleaning

Your spa shell is formed by two layers of plastic material. A minimum amount of care and cleaning will keep your spa looking new for years.

Use a spa cleaner for residue and lime buildup at the water level of the spa surface. This can be applied to the acrylic surface with a soft cloth and wiped clean. Use small amounts to avoid polluting spa water. It may be necessary to lower the water level 2 to 3 inches before cleaning if heavily soiled at the waterline.

Use common household, *non-abrasive cleaners* to clean your spa shell. (For example: Lysol Basin, Tub & Tile Cleaner<sup>®</sup>; Glass Plus<sup>®</sup>; Mr. Clean; and Top Job, or a mild dishwashing detergent such as Ivory<sup>®</sup> Liquid.) Rinse well and dry with a clean cloth.

**Never use abrasive cleaners.**

Do not allow your Lucite XL acrylic surface to come into contact with products such as acetone (nail polish remover), nail polish, dry cleaning solution, lacquer thinners, gasoline, pine oil, etc.

Remove dust and dry dirt with a soft, damp cloth.

Clean grease, oil, paint and ink stains with isopropyl (rubbing) alcohol.

Avoid using razor blades or other sharp instruments that might scratch the surface. Small scratches can be removed by applying a thin coat of automotive paste wax and buffing lightly with a clean cloth.

### Filter Maintenance

The removable filter cartridge is located in the filter canister behind the skimmer. The filter should be inspected at least monthly during normal use, and more often when spa use is heavy.

**Keep the filter clean! A clogged filter decreases both performance and water quality.**

**To clean the filter, simply follow these steps:** (Note: It is not necessary to drain the spa.)

1. Turn the pump off.
2. Remove round skimmer lid on top of spa.
3. Remove strainer basket.
4. Remove filter cartridge from the filter canister by grasping the handle on top, unscrewing it counterclockwise, and lifting out.
5. Soak and hose out filter cartridge, unless replacing with new cartridge.
6. Place filter cartridge back into filter canister, and screw back in clockwise with handle until snug. Do not overtighten. When the spa is empty the Weir door will block the filter canister. You must hold it out of the way when reinstalling the cartridge. When the tub is full of water the door will float so you will have easy access for installing the filter cartridge.
7. Replace strainer basket and skimmer lid.
8. Turn the pump ON.

In addition to performing normal filter maintenance, it will be necessary to occasionally remove oils that coat the filter reducing filter flow. To remove these oils, soak the cartridge in a plastic pail containing a commercial filter cleaning solution (available from your Coleman Spas dealer or most pool supply stores). Follow the manufacturer's instructions for use.

We suggest that you replace your filter cartridge yearly to maintain optimum performance.

## Winterizing

In cold climates where freezing temperatures occur, special care is required to prevent the possibility of damage to the spa and equipment due to freezing.

If you plan on using your spa during cold months, be sure your pump and heater are in good working order. The spa shell has been insulated to provide efficient operation in cold weather areas.

**Special Note:** If you do not intend to use your spa during the winter months and there is danger of freezing, the spa must be winterized! You must do the following:

1. Turn off all electrical power to the spa.
2. Drain spa of all water. If you cannot draw off all of the water (especially from hoses) R.V. antifreeze should be added to the remaining water. If antifreeze is used, it must be an inhibitor Propylene Glycol such as Dow Frost available through Dow Chemical Distributors.
3. Be sure to drain all drain hoses.
4. The filter should be drained, and the cartridge removed and cleaned.
5. Check to see that there is no water in the heater element chamber and air bubbler elbow.
6. Clean your spa as per previous maintenance instructions.
7. Cover your spa with a waterproof, water-shedding, impenetrable cover.
8. For further information on blowing out the plumbing lines and winterizing procedures, contact your local dealer.

**Note:** If you elect not to drain your spa and the temperature is going to be below freezing for extended periods of time, especially 0° and sub zero, it is best to operate the spa heater at high temperature (90°–100°F). If the tub is not going to be used and kept in the 100°F range, you may have problems if your power goes out. It is wise during these bad weather periods to set the thermostat higher. This will keep the spa water from freezing quickly if you have a power failure.

## Light Bulbs

**Warning: Turn off electrical supply before removing cabinet panels.**

The Spa light bulb is serviceable from outside the spa. You must remove the redwood panel and insulation closest to the light. Once the panel is removed, look for the bulb holding bracket and pull bracket towards you to change the bulb.

**Perimeter light bulbs** (Horizon 400 series only) are serviced by turning the lens cap in either direction 90°. The lens and bulb receptacle will drop out of the track 2–3". Remove the lens from the bulb receptacle by pulling apart. Replace bulb and snap lens back on to the bulb receptacle. Reinsert the lens by placing it back in the track and turning 90°.

## Problem Solving Guide

Problem	Usual Cause	Solution
1. System not operating.	A. House circuit breaker tripped or if OFF position. B. Power cord not connected to outlet.	A. Reset circuit breaker on home breaker panel. B. Connect power cord to outlet.
2. Heater not functioning.	A. Heater mode not selected. B. No power to heater. C. Thermostat set lower than water temperature. D. Heater not operating.	A. Refer to temperature and heater control instructions on pages 9–15. B. Check house circuit breaker. C. Set to desired temperature. D. Contact dealer.
3. Water not clean.	A. Clogged or blocked floor suction or skimmer. B. Filter clogged (dirty). C. Poor water chemistry. D. Insufficient filtering time. E. Improper maintenance. F. High content of solids in water.	A. Clean floor suction/skimmer. B. Clean or replace. C. See “Chemical Treatment” section. D. Run filtration mode longer. Contact dealer. E. See maintenance section. F. Use clarifier or drain and refill spa.
4. Abnormal water usage.	A. Excessive evaporation and/or splashing.	A. Use spa cover.
5. Overheating.	A. High ambient temperature.	A. See page 6, Indoor Installation.
6. Low water flow from jets.	A. Operating in FILTER mode-low speed. B. Clogged or blocked suction or skimmer. C. Dirty filter.	A. Select hi-speed jets. B. Clean floor suction/skimmer. C. Clean or replace.
7. No water flow from jets.	A. Pump not primed. B. Unit not plugged in. C. House circuit breaker tripped, no power to system. D. Faulty pump or motor.	A. See priming section page 18. B. Plug unit in. C. Reset circuit breaker at home panel. D. Contact dealer.

# Problem Solving Guide

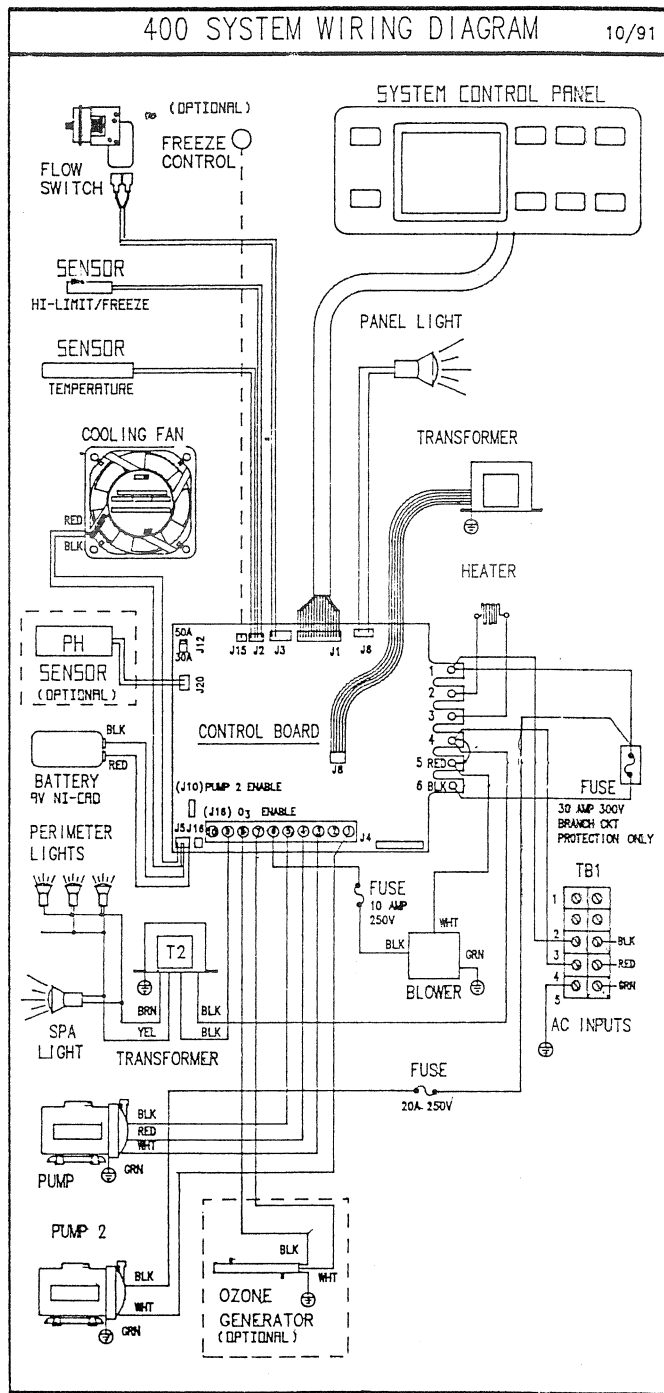
Problem	Usual Cause	Solution
8. Noisy pump and motor.	A. clogged floor suction or skimmer.	A. Clean floor suction/skimmer.
	B. Low water level.	B. Add water to normal water level (6" below lip).
	C. Damaged or worn motor bearings.	C. Contact dealer.
9. Water leakage from under spa.		A. Contact dealer.
10. No air flow from jets.	A. Air control not open.	A. Open control.
	B. Jet nozzle not seated properly.	B. Check jet nozzles.
	C. Jet nozzle missing.	C. Inspect jets.
11. Motor will not operate.	A. House circuit breaker tripped or in OFF position.	A. Reset circuit breaker.
	B. Improper or defective wiring or electrical supply.	B. Contact dealer.
	C. Thermal Overload Protection switch tripped.	C. Auto reset after motor has cooled. Contact dealer if motor continues to cycle.
12. Bubbler motor will not operate.	A. OFF mode selected.	A. Check selection.
	B. House circuit breaker tripped or in OFF position.	B. Reset circuit breaker on circuit breaker panel.
	C. Defective Thermal overload switch inside motor.	C. Contact dealer.
13. Black powder film around water line.	A. Wearing in of bubbler brushes.	A. Will disappear after use.



## Spa Soaking Guidelines

1. Persons with heart disease, diabetes, high or low blood pressure or any serious illness, and pregnant women should not enter a spa without prior consultation with their doctor.
2. People with skin, ear, genital or other body infections, open sores or wounds should not use the spa because of the possibility of spreading infection.
3. Before entering, look at the water in your spa. If there is cloudiness or foaming, or if a strong chlorine smell is present, the water needs treatment. Soaking in such water greatly increases your chances of getting a skin rash (pseudomonas). Be sure to maintain the water properly. Ask your Authorized Coleman Spas Dealer for guidance.
4. Shower with soap and water before and after using the spa. Showering before use washes away many of the common skin bacteria, and removes lotions, deodorants, creams, etc. Perspiration and lotions will reduce the effectiveness of the disinfectant and lessen the ability of the filter to work efficiently.
5. Enter the spa slowly and cautiously. Be careful of your footing, and allow your body to gradually get used to the water temperature. Leave slowly as well, because your leg muscles may be sufficiently relaxed to make you a bit unsteady, and you may become lightheaded.
6. Soaking for too long makes some people nauseous, dizzy, lightheaded or faint. **Don't soak in 104°F (40°C) water.** If you wish to soak for a longer period of time in high temperatures, leave the spa after 15 minutes, shower, cool down and then return for another brief stay. In lower temperatures (e.g. 98.6°F—normal body temperature) most people can comfortably and safely soak for longer periods at one sitting. If you have any questions about what's right for you and your family, consult with your doctor.
7. Be sure you check the water temperature before and while in the spa.
8. Never use the spa while under the influence of alcohol.
9. With any drug or medication, consult with your doctor about potential harmful effects from combined use of the drug and hot water soaking.
10. Never use the spa when you are alone, for safety's sake.
11. Never allow children to use the spa unsupervised.

# Horizon 400 System Wiring Diagram



# Spectrum 200 System Wiring Diagram

