

# SPABUILDERS

SYSTEMS GROUP

# LX-15 SYSTEM

Full Flow Heater  
Two Pump  
(Optional)

# OWNERS OPERATION GUIDE

A Field Manual For The Care And Maintenance Of Your New Spa



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Cautions

Surface And Pad Requirements

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Part No. 3-85-1165A (Rev. 01-00)

# INTRODUCTION

The spa that you have purchased is one of the very best available, and incorporates features designed to assure long, enjoyable and healthful use if properly operated and maintained.

The following instructions are intended to acquaint you with important facts, measures and procedures, which will guide you in the use and necessary care of your spa. Your attention is particularly directed to the important safety instructions in this manual. We strongly urge you to become thoroughly familiar with prescribed safety practices and carry them out as specified within this manual.

Your spa and control equipment incorporates the finest components available, and is designed in a manner to provide maximum enjoyment, ease of operation and years of trouble free operation.

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## **Warning**

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacture's instruction, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a class B computing device in accordance with the specifications in subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures: reorient the receiving antenna, relocate the receiver with respect to the spa, plug the receiver into a different outlet so that the receiver and spa are on different branch circuits, if necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the federal communications commission helpful: "How to identify and resolve radio-television interference problems", this booklet is available from the U.S. Government Printing Office, Washington, DC 202402, stock No. 004-000-00345-4.

# IMPORTANT SAFETY INSTRUCTIONS

## IMPORTANT SAFETY INSTRUCTIONS

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

2. **WARNING**: PEOPLE WITH INFECTIOUS DISEASES SHOULD NOT USE A SPA OR A HOT TUB.

3. **WARNING**: TO AVOID INJURY EXERCISE CARE WHEN ENTERING OR EXITING THE SPA OR HOT TUB.

4. **WARNING**: DO NOT USE A SPA OR A HOT TUB IMMEDIATELY FOLLOWING STRENUOUS EXERCISE.

5. **WARNING**: PROLONGED IMMERSION IN A SPA OR HOT TUB MAY BE INJURIOUS TO YOUR HEALTH.

6. **CAUTION: MAINTAIN WATER CHEMISTRY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.**

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

8. A wire connector is provided on this unit to connect a minimum no. 8 AWG (no. 6 AWG- Canada) solid copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipes or conduit within 5 feet (1.5m) of the unit.

9. **WARNING-** For indoor use only. This unit is not intended for outdoor use.

10. **WARNING- 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 closely supervised at all times.
11. **DANGER-** To reduce the risk of drowning from hair and body entrapment, install a suction fitting(s) with a marked flow rate that equals or exceeds the flow rate marked on the equipment assembly.
12. **DANGER-** To reduce the risk of injury, do not remove the suction fittings. Never operate a spa or hot tub if the suction fittings are broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the equipment assembly.
13. **DANGER- Risk of Electric Shock.** Do not permit any appliance, such as a light, telephone, radio, or television within 5 feet (1.5m) of the spa or hot tub.
14. **WARNING- Risk of Electric Shock.** Install at least 5 feet (1.5m) from inside wall of spa or hot tub using nonmetallic plumbing.
15. **WARNING-** 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°F (40°C) are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when use exceeds 10 minutes.
  - B. 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 water temperature to 100°F (38°C.)
  - C. Before entering a spa or a hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature-regulating devices varies.
  - D. The use of alcohol, drugs, or medications before or during spa or hot tub use may lead to unconsciousness with the possibility of drowning.
  - E. Obese persons and persons with a 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 a hot tub since some medication may induce drowsiness while other medications may affect heart rate, blood pressure and circulation.
16. The electrical supply for this product must include a suitable rated switch or circuit breaker to open all underground supply conductors to comply with section 422-20 of the National Electrical Code, ANSO/NFPA 70-1987. The disconnection means must be readily accessible to the tub occupant but installed at least 5 feet (1.5m) from the tub water.
17. **WARNING-** Install blower no less than 1 ft. (305mm) above the maximum water level to prevent water from contacting electrical equipment.
18. **SAVE THESE INSTRUCTIONS**
19. A green colored terminal or a terminal marked G, GR, GROUND, GROUNDING, or the  symbol is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment.
20. At least two lugs marked “BONDED LUGS” are provided on the external surface or on the inside of the supply terminal box or compartment. To reduce the risk of electric shock, connect the local common bonding grid in the area of the hot tub or spa to these terminals with an insulated or bare copper conductor not smaller than no. 8 AWG (no. 6 AWG- Canada.)
21. All field-installed metal components such as rails, ladders, drains, or other similar hardware located within 3m of the spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than no. 8 AWG (no. 6 AWG- Canada.)

# WARNINGS

## WARNINGS

- The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in spas and hot tubs.
- Persons suffering from heart disease, diabetes, high or low blood pressure, or any other serious illness and pregnant women should consult with their physician before using a spa or hot tub.
- Excessive water temperature can be dangerous.
- Never operate any electrical appliance from inside the spa or hot tub, or when wet.
- Do not enter the spa while under the influence of alcohol and/or drugs. Persons on medication should consult with their physician before entering the spa.
- Observe a reasonable time limit in the spa. Long exposures at higher temperatures can result in dizziness and/or hyperthermia.
- Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98°F (36.7°C.) The symptoms of hyperthermia include dizziness, fainting, drowsiness or lethargy. The affects 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.
  6. Unconsciousness resulting in a danger of drowning.
- Always enter and exit a spa slowly. It is recommended not to use the spa alone.
- The consumer product safety commission has stated that the water temperature in a spa or hot tub should not exceed 104°F (40°C.) Immersion in water in excess of 104°F (40°C) can be hazardous to your health.

**SURFACE AND PAD REQUIREMENTS**

1. Your new spa **must be placed on a uniformly firm and level surface**. The pad foundation recommended is a concrete pad at least 4 inches thick. As an alternative, a pea-gravel foundation pad could be used, but it must be on a firm, level base and it must be contained in a secure wood or concrete restraining border so that the loose gravel can not shift once the spa is in place. If a concrete pad is poured, this is the logical time to “plumb-in” your electrical conduit. Be sure the concrete has cured for at least one week before setting the spa in place. A typical spa, filled with water, could weigh as much as two and a half tons and if the concrete is not fully cured, it could easily crack. **An uneven or cracked concrete pad or the use of shims of any kind may cause the spa to buckle, distort and/or crack. If this being the case, the warranty on your spa will be void.**
2. If your spa is located near water sprinklers, adjust the cap on them so water will not hit the wood siding of the spa.
3. Balconies and decks must be constructed to current state and local codes to safely support the maximum load of your water filled spa and the number of people using the spa. Check with your construction contractor for these specifications. Balconies and decks must support at least 75 pounds per square foot.
4. Gates must be self-closing and self-locking. Check your local codes regarding fences and gates.
5. It is the responsibility of the owner to provide clear access on all sides of the spa once it is set in place for ease in repair, otherwise, additional costs to service and repair the spa will be incurred.

**INSTALLATION CONSIDERATIONS**

It is highly recommended that the owner/user of this spa carefully read all instructions in this manual prior to having your spa installed at your chosen location, whether indoors or outdoors. **Improper installation may result in equipment damage and will void the warranty.**

# ELECTRICAL REQUIREMENTS

## ELECTRICAL REQUIREMENTS

- 220 Volt
- 50 Amp Service
- 60 Hz
- 1 Phase
- 2 wire- L1, L2 & Ground – Dedicated 220V unit only
- (3 Wire- L1, L2, Neutral & Ground- utilizes 110Vac components)
- No. 6 AWG supply wire is required
- No. 8 AWG (no. 6 AWG- Canada) conductor is required for bonding
- USE COPPER CONDUCTORS ONLY**

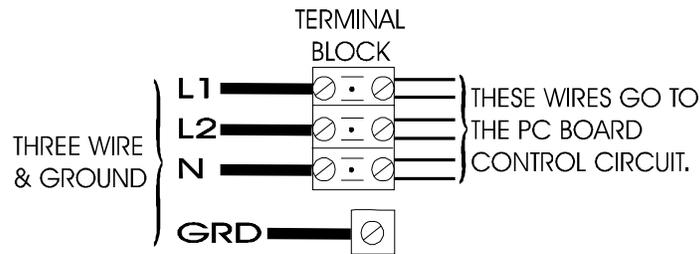
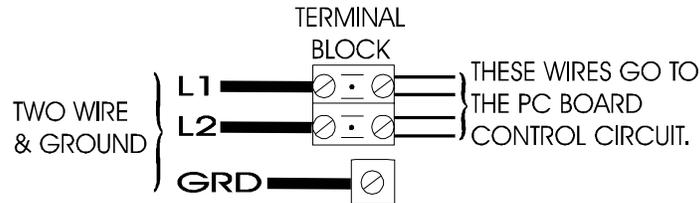
**It is the responsibility for the installer and the owner to install a readily accessible disconnecting means during the installation.**

### MOUNTING

Per UL 1563, paragraph 6.4.3, the LX-15 Indoor Spa Pack and the additional pump (Jets 2, optional) shall be mounted so that the lowest portion of any live part is a minimum of 4 in. above the mounting surface.

**CAUTION: THE EQUIPMENT AND CONTROLS SHALL BE LOCATED NOT LESS THAN 1.5M (5 ft) HORIZONTALLY FROM SPA OR HOT TUB.**

### ELECTRICAL CONNECTIONS



NOTE: Always check local and state codes for wiring requirements that may exceed N.E.C.

## TOPSIDE CONTROL PANEL COMPONENT IDENTIFICATION



### WARMER AND COOLER BUTTONS

The spa's thermostat is to provide you with optimum control of the spa water temperature. This temperature set point can be adjusted from 65°F (18.3°C) to 104°F (40°C.) In conjunction with setting the temperature, these two buttons are used in changing the filter cycles (see "Changing the Filter Cycles" section.)

### JETS 1 BUTTON

The control panel button designated **JETS 1** activates pump 1 when pressed. The pump sequences- low speed, high speed, off. Pump 1, when the **JETS 1** button is manually pressed, has an automatic twenty-minute time out.

NOTE: If the system is in a filter cycle, the indicator light for **JETS 1** will be on. If you manually press the **JETS 1** button, this specific filter cycle will be disabled.

### JETS 2 BUTTON (optional)

The control panel button designated **JETS 2** activates pump 2 when pressed. The pump sequences- low speed, high speed, off. Pump 2, when the **JETS 2** button is manually pressed, has an automatic twenty-minute time out.

NOTE: When pumps 1 & 2 are in high speed, the heater will turn off. This will allow the system to operate within a 50-amp service.

### AIR BUTTON

The control panel button designated **AIR** activates the air blower when pressed. The blower sequences- on, off. The air blower, when the **AIR** button is manually pressed, has an automatic twenty-minute time out.

Note: The air blower will turn on for 30 seconds at the beginning of each filter cycle.

### LIGHT BUTTON

The control panel button designated **LIGHT** activates the spa light when pressed. The light, when the **LIGHT** button is manually pressed, has an automatic one-hour time out.

## **START UP PREPARATIONS**

Before performing the operations in this section, make sure you have read and understood all of the previous instructions set forth in this manual. Make sure the spa has been installed correctly, including electrical wiring connections as specified in the previous section.

### **Things to check before turning on the power to the spa:**

1. Spa's water is at the correct level.
2. Pump is primed (call spa dealer for priming instructions.)
3. Ensure all valves are opened.
4. Turn circuit breaker on.
5. After booting up, the low speed pump will start running if the water temperature is below 100°F (37.8°C). If a **FL1** appears on the display turn the system off and repeat step 2. If the water temperature is below 55°F (12.8°C) **ICE** will alternately display with the water temperature, this is normal operation (see Troubleshooting section.)

Note: Let run 30 seconds. If no water flow can be detected, turn off power to the spa and re-prime the pump. Repeat step 3-6.

## **INITIAL START UP**

The LX-15 spa control has automatic functions that operate upon start up and normal operation to protect the system. Upon power up, the read out will display a three-digit software release. This number will then change to **888** while the system is booting up.

At the end of the boot up period, the water temperature will be displayed. If the temperature is below 100°F (37.8°C), the low speed pump and the heater will turn on until the temperature rises to the preset 100°F (37.8°C.) If the water temperature is below 55°F (12.8°C) a **ICE** will alternately display with the water temperature. This is normal operation (see the Troubleshooting section.) Approximately two minutes after the system has been initially powered up, the first filtration cycle will begin to operate. Any time after the boot up, you will be able to change the filter cycle and reset your temperature set point.

# CHANGING THE FILTER CYCLES

## FILTRATION

Proper filtration is an important key to maintaining the clarity of your spa's water. The filter system is designed for unsurpassed effectiveness at removing debris and suspensions from the water anytime the water is circulating.

The LX-15 comes with **six pre-programmed filtration cycles (F1-F6) and two lockout (L1 & L2) modes**. Of the six filter cycles, three cycles are in the standard mode and three cycles are in the economy mode.

To change the filter cycle or to enable or disable a lockout mode, press and hold the **WARMER** and the **COOLER** buttons for 3 seconds, the display will show **F1** through **L2**. This numeral will signify that you are in the programming mode. Use the **WARMER** and **COOLER** buttons to scroll between the filtering modes. This numeric value coincides with a specific cycle that is to be used for filtration.

## FILTER CYCLES

### STANDARD MODE

Heating is automatically controlled by the loss of water temperature. If the spa water drops **2°F (1.1°C)** below the set temperature, the low speed pump and the heater will automatically turn on. They will both remain on until the water temperature reaches the temperature set point.

Note: The internal timer still operates the filter cycle in this mode to ensure proper filtration.

- F1** 2 hours of filtration twice a day
- F2** 2 hours of filtration three times a day
- F3** 2 hours of filtration four times a day

### ECONOMY

In this mode, the timer determines when the filtering and heating take place.

Note: With the exception of **COL** and **ICE** conditions (see the Troubleshooting section.)

- F4** 2 hours of filtration twice a day
- F5** 2 hours of filtration three times a day
- F6** 2 hours of filtration four times a day

**L1** LOCKOUT -special feature used when cleaning or changing the filter cartridge or any type of non-electrical servicing that requires the pump operation to be suspended while the work is completed. **The temperature display flashes in this function.**  
 NOTE: If the control is heating when the system is put into the lockout mode, the heater will immediately turn off and the pump will cycle water for thirty seconds, then turn off. This will assist in cooling the heat element.

**L2** PANEL LOCKOUT – special feature to prevent unauthorized use of your spa. The LX-15 incorporates a unique panel locking system that disables the control buttons on the panel. **The temperature display flashes in this function.**

NOTE: In this mode the system will operate as in the filter cycle **F1**.

## TROUBLESHOOTING

The LX-15 system is a self-diagnostic control system. The system will automatically display an alphanumeric code if a problem is detected.

**Sn1 Nonfunctional high temperature sensor**

Open high temperature sensor. Heater is deactivated. This must be repaired by the dealer or a qualified service technician.

**Sn2 Nonfunctional temperature sensor**

Open temperature sensor. Heater is deactivated. This must be repaired by the dealer or a qualified service technician.

**FL1 Water flow problem**

Pressure switch is not closed when the pump is activated. Heater is deactivated. Proper flow of water is inhibited or pressure switch has malfunctioned. Check for proper water level, ensure pump is primed and/or check for clogged filter. Pressure switch may need to be adjusted. Contact dealer or qualified service technician.

**FL2 Pressure switch problem**

Pressure switch is closed, while pump is deactivated. Pressure switch may need to be adjusted. Contact dealer or qualified service technician.

**COL Cool condition**

If the water temperature drops 20°F (11°C) below the set temperature, the low speed pump and the heater will activate to bring the temperature within 15°F (8°C) of the set temperature. No corrective action is required.

**ICE Freeze condition**

A potential freeze condition has been detected (55°F / 12.8°C.) No action is required. The low speed pump will be activated along with the heater. The spa will automatically heat, until the spa is out of danger (65°F / 18.3°C.)

**OH High temperature condition**

Spa water temperature is above acceptable limits, do not enter spa water. Water temperature has reached 110°F (43.3°C.) The air blower and low speed pump are activated to assist in lowering water temperature.

**--- Watchdog**

Water temperature has reached 118°F (47.8°C.) The entire system is disabled. Contact dealer or qualified service technician.

**PC Board Fuse Replacement:**

F1 = 1.25 Amp; F2 = 4.0 Amp

## **NOTES**

### **OZONATOR (optional)**

Ozone is injected into the spa's water during the filtration cycle and when heating in the standard mode. The ozone is injected into the water to supplement chemical sanitizers, kill bacteria, oxidize organics and control minerals. If in a filter cycle, anytime the pump is manually turned on, the ozonator will turn off. The ozonator will remain off until the start of the next filter cycle.

**NOTES**

## SPA MAINTENANCE - GUIDELINES FOR SPA MAINTENANCE

The maintenance and care of your spa is simple and easy to carry out, and if performed regularly as scheduled, problems will be minimal. It is important that the following procedures be read through and carried out on a regular basis for the best, long term, overall performance of your spa.

The filtering cycle of your spa should be operated at least two hours or more a day (whether or not the heater is heating) to remove impurities and to prevent disposition of contaminants in your spa. The filtering system works automatically. Keep the spa covered when not in use to reduce the loss of heat and to keep debris from settling in the water.

Maintaining the spa's proper water chemical balance is essential to the comfort and safety of the user. Water mineral content varies constantly and is directly affected by evaporation and the use of cleaning and maintenance chemicals, which will increase mineral content, when added. If the mineral content deviates from prescribed pH level (7.2-7.8,) deposits on spa walls, filter, electric heating element or gas heater manifold and piping may adversely affect the condition and operation of your spa equipment.

Since the water capacity of your spa is far less than that of a swimming pool, the chemical reaction caused by the presence of one or more persons in the spa is more rapid and pronounced. In other words, it is much more difficult to maintain the proper pH balance in a spa than in a swimming pool. For these

reasons, it is important to check frequently, the total alkalinity of the water, the pH level, and the sanitize level, then add prescribed chemicals as necessary to maintain the proper chemical balances. Failure to maintain a proper balance of chemicals in your spa will result in an early, premature failure of your spa parts including, but not limited to, the spa cover, piping and certain electrical components in the spa electrical control box and topside panel, thus **voiding your warranty**.

## ESSENTIAL CHEMICALS AND THEIR USE

The following information on chemical use for spa maintenance is provided strictly as a guide for the spa owner and may or may not be appropriate to maintain your spa correctly and may, under certain conditions, be harmful to your spa and/or persons using the spa. Always check with your pool and spa dealer to determine which chemicals and/or procedures they recommend to maintain your spa correctly. SPA BUILDERS SYSTEMS GROUP does hereby claim no responsibility or liability for the use of and quantities of the chemicals listed.

CONCENTRATED CHLORINATING GRANULES-the minimum chlorine level in the spa should be at least 2 PPM (Parts Per Million). Chlorine level should be tested frequently and the chemical added to maintain a safe level of 2 PPM. This type of chemical can be added in quantities of 0.5 ounce per 500 gallons of spa water. Check the chlorine level at least seven hours or more after adding to determine the full effect of the added chemical. Liquid chlorine is not recommended.

**ORGANIC POLYMERS** are used in various forms. These chemicals clear up cloudy or dirty water appearance and prevent calcium deposits on the inside spa finish, plumbing and heating equipment. Use as recommended by the manufacturer.

**METAL GON** or its equivalent is a chemical that will prevent iron in the spa water from staining the spa finish. This chemical is added to the spa water when the spa is filled for the first time or when refilled. Use as directed.

**SILICONE EMULSION** quickly and effectively disperses foam and is completely compatible with the other chemicals listed. Use as required.

**POLISHES AND SEALERS** are usually silicone compounds that provide effective protection and a glossy finish to the inside surfaces of the spa. It should be applied after the surfaces have been cleaned with mild, non-abrasive cleaner. Rinse well with clean water then apply polish using a soft cloth following the directions (should be done every time the spa water is changed.)

**SPA WATER** should be changed periodically depending upon frequency of usage and other conditions that may affect water usability. Typically 60 to 90 days is a satisfactory interval under normal conditions. With heavy usage, the interval between water changing should be less.

**SPA FILTER CARTRIDGE** should be cleaned every 2-4 weeks depending on the frequency of use. Rinse the filter cartridge with a pressure hose and re-install filter cartridge in filter housing. When changing spa water it is good

practice to soak the filter cartridge in filter cleaner. The filter cleaner is specially made to remove accumulation of oils and other contaminants which will ensure good, sanitary water and extended filter cartridge life.

**ADDING CHEMICALS** to your spa water: Add to the center of the spa with the pump and the air blower (bubbles) operating simultaneously. Make sure the water is heated. Never add chemicals to cold water, as this will affect chemical action, also never add chemicals directly into the skimmer.

**IT IS DESIRABLE** to protect the wood skirt around your spa from water stain. This can be done by applying a clear wood finish to function as a sealant. If necessary, to clean and prepare the surface before sealing, use a wire brush and work with the grain to remove as much staining as possible.

Store all chemicals in a cool, dry place and in such a way as to prevent children and pets from contacting.

**Spa Builders Systems Group**  
**LX-Series Electronic Control Systems**  
**2 Year Warranty**

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To all original purchasers of its product, Spa Builders Support Group, Inc., d.b.a. Spa Builders Systems Group (SBSG), 1219 South Bon View Avenue, Ontario, California warrants its **LX-Series Electronic Spa Controls** free from defects in materials and workmanship for the period of **two years** from the date of purchase.

Products that fail or become defective during the warranty period shall be repaired or replaced at our option without charge, within 30 days of receipt of the defective product, bearing unforeseen delays.

To obtain warranty replacement or repair, defective products should be returned transportation paid, to the place of purchase, or to the nearest authorized SBSG service center. To return product directly to SBSG, contact the SBSG customer service department at (866) 639-7274 for a return goods authorization number (RGA) and return product transportation paid.

SBSG shall not be responsible for cartage, removal and/or reinstallation labor or any other associated cost incurred in obtaining warranty replacement.

Some states do not allow a limitation on how long an implied warranty lasts, or the exclusion or limitation of accidental or consequential damages, so the above limitation or exclusion may not apply to you.

The warranty gives you specific legal rights and you may also have other rights that vary from state to state.

**WARRANTY**