NESPA
TILED SPAS

# Production Booklet

**for**

# 972 Palisades SPA

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## Welcome To Ultimate Relaxation!

Thank you for choosing your new spa built by Nespa Tiled SPAS. Please read the entire Owner's Manual before installing and using your spa. The goal of this manual is to provide you with safety and operational information plus some tips that will help you enjoy your spa to its fullest.

At the time of print, this manual is accurate in its information. Master Spas reserves the right to change or improve its product without prior notice. To check on updates or for other information, please visit www.tiledspas.com and follow the links to the customer service section.

## Record Of Ownership

Name _____

Address _____

City _____ State _____ Zip _____

Phone # (_____)_____-_____ Date Purchased _____ /_____ /_____

Model _____ Serial #_____

Dealer Name _____

Service Tech Rep _____

## Serial Number Location

The serial number for your spa is located in the filter area, on the spa system pack, or on the listing plate on the skirting.

**NO DIVING** DANGER: DIVING MAY RESULT IN SERIOUS INJURY OR DEATH.

# IMPORTANT SAFETY INSTRUCTIONS

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

# READ AND FOLLOW ALL INSTRUCTIONS

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

2. **DANGER - RISK OF CHILD DROWNING.** Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use this spa unless they are supervised at all times.

***NOTE:** A wire connector is provided on this unit to connect of a minimum No. 6 AWG solid copper conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe, or conduit within 5 feet (1.5m) of the unit.

3. **DANGER - RISK OF ELECTRIC SHOCK.** Install spa at least five (5) feet (1.5M) from all metal surfaces. A spa may be installed within five (5) feet (1.5M) of metal surfaces if, in accordance with the National Electrical Code, each metal surface is permanently connected by a minimum No. 6 AWG (8.4mm) solid copper conductor attached to the wire c onnector on the terminal box. A grounding lug is provided for this purpose.

4. **DANGER - RISK OF INJURY.** The suction fittings in this spa are sized to match the specific water flow created by the pump. Should the need arise to replace the suction fittings or the pump, be sure that the flow rates are compatible.

***NOTE:** Never operate the spa if the suction fittings are broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the original suction fitting.

5. **DANGER -** To reduce the risk of injury to persons, do not remove the suction grate. Suction through drains and skimmers is powerful when the jets in the spa are in use. Damaged covers can be hazardous to small children and adults with long hair. Should any part of the body be drawn into these fittings, turn off the spa immediately. As a precaution, long hair should not be allowed to float in the spa.

**NO DIVING** DANGER: DIVING MAY RESULT IN SERIOUS INJURY OR DEATH.

# IMPORTANT SAFETY INSTRUCTIONS (CONT.)

**6. WARNING.** Install the spa so that water can be easily drained out of the compartment containing electrical components so as not to damage equipment. When installing the spa make sure to allow for an adequate drainage system to deal with any overflow water. Please allow for at least 2 feet of clearance around the perimeter of the spa to provide enough room to access for servicing. Contact your local dealer for their specific requirements.

## 7. WARNING - TO REDUCE THE RISK OF INJURY:

(A) Reminder - Never allow anyone to dive into a spa. Always enter feet first.

(B) Always enter and exit a spa slowly.

(C) Do not use the spa alone.

(D) Before entering the spa, always measure the water temperature with an accurate thermometer. Tolerance of water temperature regulating devices can vary as much as plus/minus 5° F (3° C).

(E) Persons suffering from obesity or with a medical history of heart disease, diabetes, high or low blood pressure or circulatory system problems should consult a physician before using the spa.

(F) Since excessive water temperatures have a high potential for causing fetal damage during early months of pregnancy, pregnant or possibly pregnant women should limit spa water temperatures to 100° F (38° C).

(G) Excessive water temperature can be dangerous. The water in the spa 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 extended use (exceeding 10 minutes) and for young children. Long exposures at higher temperatures can result in hyperthermia.

(H) The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.

(I) 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.

(J) The spa should be covered with an approved locking cover when not in use, to prevent unauthorized entry and injuries.

**NO DIVING** DANGER: DIVING MAY RESULT IN SERIOUS INJURY OR DEATH.

# IMPORTANT SAFETY INSTRUCTIONS (CONT.)

**11.** **DANGER - RISK OF ELECTRIC SHOCK.** Do not permit any electric appliance, such as a light, telephone, radio or television, within five (5) feet of the spa. Never operate any electrical appliances from inside the spa or while wet.

**12.** **WARNING - RISK OF SUFFOCATION.** If this spa is equipped with a gas heater, it is intended for outdoor use only, unless proper ventilation can be provided for an indoor installation.

**13.** **CAUTION - RISK OF ELECTRIC SHOCK.** Do not leave the CD compartment open.

**CAUTION - RISK OF ELECTRIC SHOCK.** Replace components only with identical components.

The CD player controls are not to be operated while inside the spa.

**WARNING - PREVENT ELECTROCUTION.** Do not connect any auxiliary components (for example, additional speakers, headphones, additional audio/video components etc.) to the system. These units are not provided with an outdoor antennae.

Do not service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

If the power supply/supply cord(s) are damaged, water is entering the speaker, CD compartment, or any other component in the electrical equipment compartment area, the protective shield is showing signs of deterioration, or there are signs of other potentially hazardous damage to the unit, turn off the circuit breaker from the wall and refer servicing to a qualified service personnel.

The unit should be subjected to periodic routine maintenance once every quarter to make sure that the unit is operating properly.

**14.** **DANGER - RISK OF ELECTRIC SHOCK.** Do not permit any electric appliance, such as light, telephone, radio, or television, within 5 feet (1.5m) of a spa.

**NO DIVING** DANGER: DIVING MAY RESULT IN SERIOUS INJURY OR DEATH.

# IMPORTANT SAFETY INSTRUCTIONS (CONT.)

## HYPERTHERMIA

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 • Increase in Internal Body Temperature

## THE EFFECTS OF HYPERTHERMIA INCLUDE:

Unawareness of Impending Hazard • Failure to Perceive Heat • Failure to Recognize the Need to Exit Spa • Physical Inability to Exit Spa • Fetal Damage in Pregnant Women • Unconsciousness Resulting in a Danger of Drowning

(I) Children's body temperature can increase more rapidly than adults in the same water with elevated temperatures (above 99° F). Children should spend less time in water above body temperature than adults.

8. **WARNING -** The use of alcohol, drugs, or medication can greatly increase the risk of hyperthermia.

(J) The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.

(K) 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.

9. Reminder: A safe temperature for swimming or aquatic exercise is around 80˚ F.

10. People with infections, sores or the like should not use the spa. Warm and hot water temperatures may allow the growth of infectious bacteria if not properly disinfected.


# IMPORTANT SAFETY INSTRUCTIONS (CONT.)

15. A green coloured terminal or a terminal marked G, GR, Ground, Grounding or the symbol shown in Figure 14.1 of UL1563 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.

16. At least two lugs marked "Bonding 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 spa to these terminals with an insulated or bare copper conductor not smaller than No. 6 AWG.

17. All field-installed metal components such as rails, ladders, drains, or other similar hardware within 3m of the spa shall be bonded to the equipment grounding bus with copper conductors not smaller than No. 6 AWG.

# SAVE THESE INSTRUCTIONS.

# PLAN APPROVAL DOCUMENTATION

**APPROVED**

Please initial **Yes** or **No** for each item. Production will not start until all items are reviewed and approved.

1. I have reviewed and approved the Spa dimensions, width, length and height.( Pg 1)
   Yes_____ No_____ Other _____

2. I have reviewed and approved the jet quantity and locations. ( Pg 1)
   Yes_____ No_____ Other _____

3. I have reviewed and approved the Spa Tile Type, Grout and Layout. ( Pg 2)
   Yes_____ No_____ Other _____

**I approve the above drawings X_____Date:_____**

Any changes to these plans from here forward shall be directed in writing to Nespa.

## SPA FABRICATION AUTHORIZATION

Nespa's engineering and structural manufacturing departments may find it necessary to make slight adjustments (= 1") to your spa. This may include the size of the spa (OD/ID), tile cuts, depths, jet location, bench steps etc. These adjustments must be made in the primary stages of building the spa. The adjustments are generally made to ad structural and aesthetic integrity to the vessel. IE: balance of supporting gussets (exterior) and less tile cuts/ symmetrical cuts, grout lines, etc. (interior)

**Please initial next to the following number that describes your project needs** .

_____1. YES, I understand adjustments need to be made. Nespa will use their expertise to make these adjustments as needed. I give them the authority to make changes. I will receive final accurate drawings prior to receipt of spa or spa hole construction (if changes were made to the size)

_____2. NO, No changes can be made even under 1". Dimensions are fixed. More tile cuts may be needed, Structural supports may be altered to accommodate.

_____3. Nespa will need to contact us for any changes to spa dimensions prior to continued spa fabrication.

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If printing as a PDF: Page Scaling: None

0 1/4 1/2 3/4 1"

DWG NAME 972 PALISADES | DATE 5/9/2013 | DWG TYPE Revisions | SHEET Cover Sheet

| SPECIFICATIONS | |
|---|---|
| SHELL WEIGHT | 1200 LBS. |
| WATER WEIGHT | 2432 LBS. |
| TOTAL SHELL & WATER WEIGHT | 3632.1 LBS. |
| WATER VOLUME | 39 Cu.Ft. |
| WATER GALLONS | 292 GAL. |
| SURFACE AREA | 16.0 SQ. FT. |
| ICC ES LISTED #: | PMG-1161 |
| FDA#: | 2030305 |

**SKID SUPPORT STRUCTURE* BONDED TO SPA**

*SKIDS SUPPLIED BY NESPA

**LIGHT NICHE**

L.E.D. *SPA LIGHT*

**SIDEWALL SUCTION**

6" Round Hockey Puck
*AquaStar 6HPHAxxx*
*Sumpless Suction Outlet*
Floor/Wall 224 GPM @ 6.3fps
Complies w/ ANSI Code
ASME A112.19.8-2007 & VGB 2008

**JET**

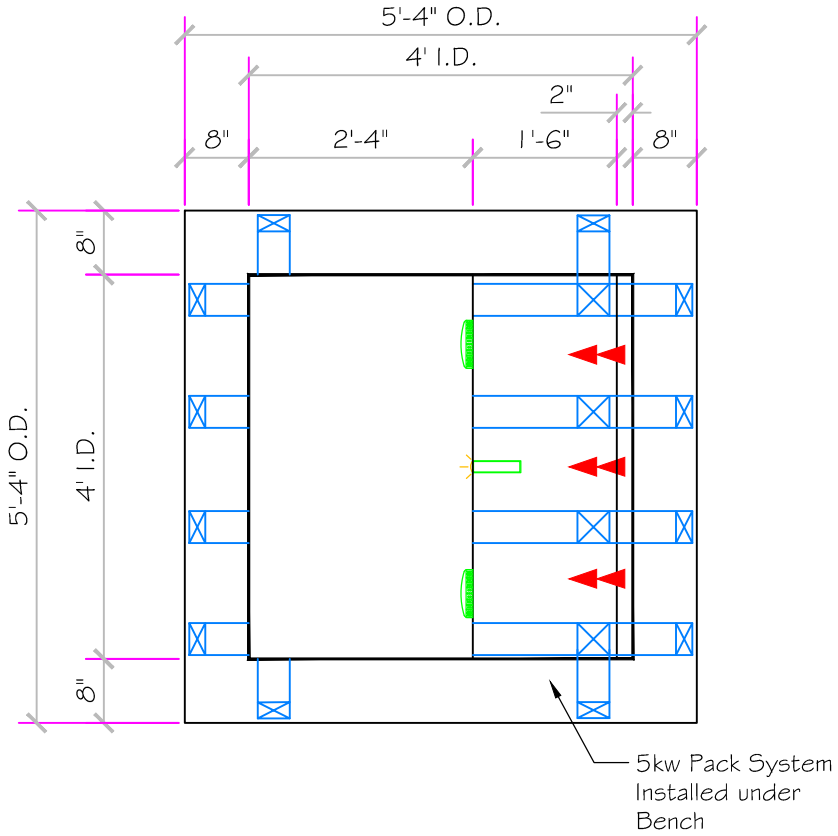
HYDRO INLETS
1-1/2" WATER - 1-1/2" AIR
*HYDROAIR #10-5100*
COMPLIES W/ ANSI CODE ASME A112.19.8-07
UL APPROVED

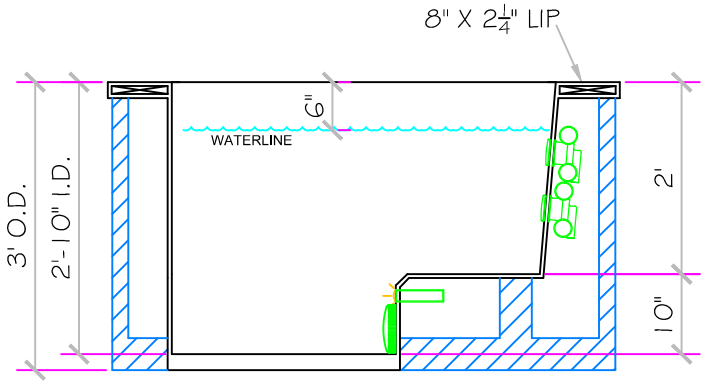
**RETURN**

INLET FITTINGS
1-1/2" WALL TYPE W/ EYEBALL
*HYDROAIR #10-3500*
COMPLIES W/ ANSI CODE ASME A112.19.8-07
UL APPROVED

**FILL**

INLET FITTINGS
1-1/2" WALL TYPE W/ EYEBALL
*HYDROAIR #10-3500*
COMPLIES W/ ANSI CODE ASME A112.19.8-07
UL APPROVED




**APPROVED**

*ALL DIMENSIONS SUBJECT TO 1/4" TOLERANCES*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| SCALE | DWG TYPE |
|---|---|
| 1/2" = 1' (0 1/4 1/2 3/4 1") | SD |
| DWG NAME: 972 PALISADES | DATE: 5/8/2013 |
| | SHEET: PAGE 1 OF 3 |

#1 - FIELD TILE: DalTile Sonterra 1" X 1" SR 70 - Cancun Blue

#2 - WATERLINE (optional): _____

#3 - BENCH & STEP EDGES (optional): _____

#4 - TILED LIP (optional): By Others

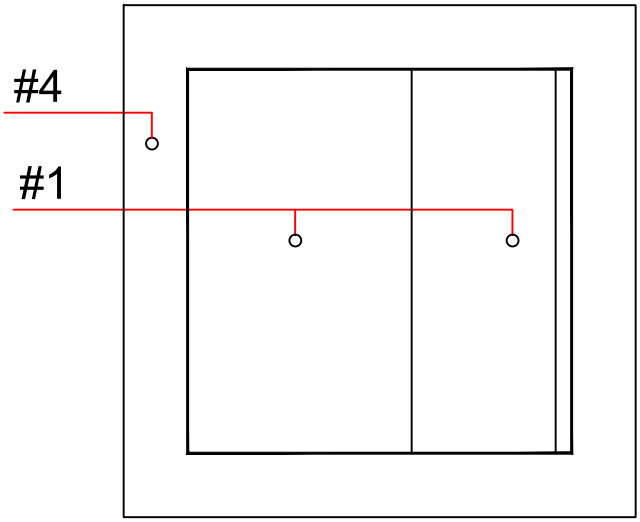
Date: _____

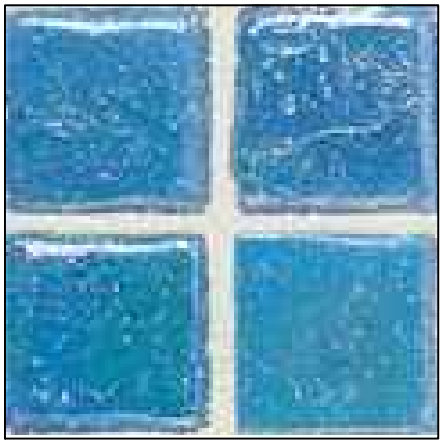
Approval: _____

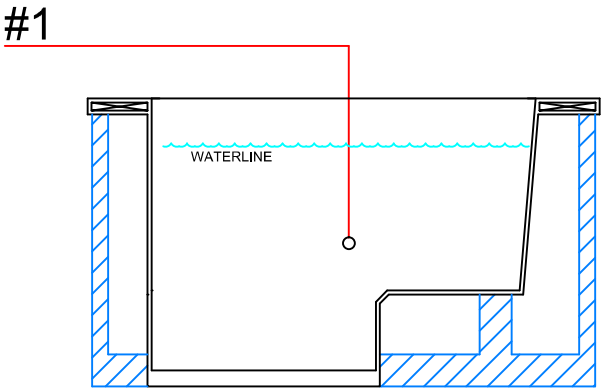
#1 - GROUT: _____

#2 - GROUT: _____

#3 - GROUT: _____



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If printing as a PDF: Page Scaling: None

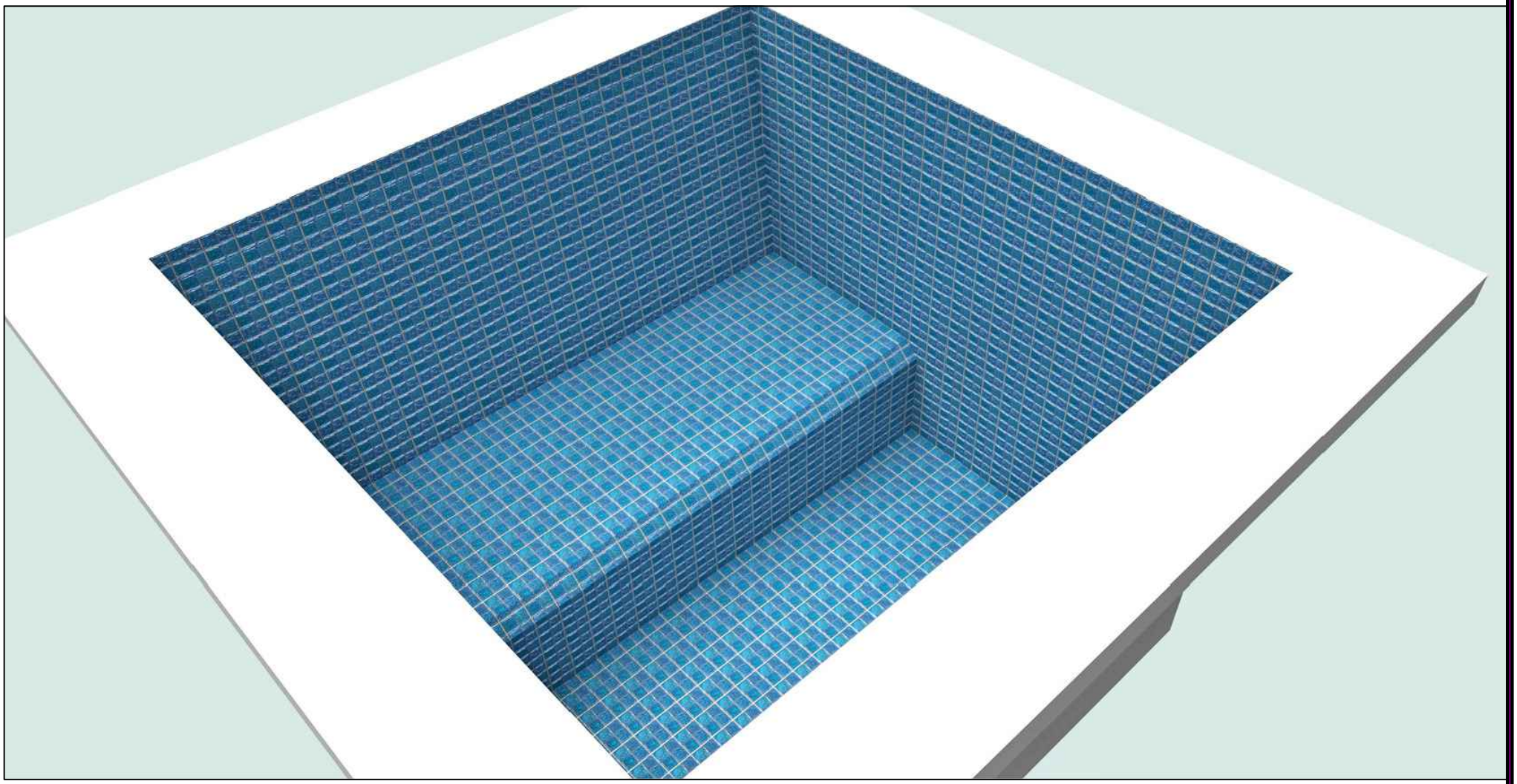
SCALE 1/2" = 1' (0 1/4 1/2 3/4 1")

DWG TYPE Tile

DWG NAME 972 PALISADES

DATE 5/8/2013

SHEET PAGE 2 OF 3



All drawing dimensions supplied by **NESPA ENTERPRISES INC.** are for reference only. All CAD files were created using AutoCAD file (*dwg.) and were provided as a service to our customers using AutoCAD. Errors sometimes occur during this process and with software incompatibility upon opening a file. **NESPA ENTERPRISES INC.** and/or any authorized distributor of our products will not be held responsible for problems arising from files which have been converted and does not warranty the documents against deficiencies or typographical errors of any kind. We recommend that all measurements are verified with actual physical product before any custom fabrication in the field occurs.

**APPROVED**

ALL DIMENSIONS SUBJECT TO 1/4" TOLERANCES



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If printing as a PDF:
Page Scaling: None

SCALE N/A

0 1/4 1/2 3/4 1"

DWG TYPE Render

DWG NAME 972 PALISADES

DATE 5/8/2013

SHEET PAGE 3 OF 3

# SITE PREPARATION / GENERAL GUIDELINES

Portable spa installation is simple when properly planned. To that end, it is important that you read the following information carefully and consult with your Nespa Tiled Spas dealer.

1) Access - The actual dimensions of your new spa will determine the amount of space that is needed in moving the spa from curbside to its final installation area. Be sure to measure side yard dimensions, gates or doors and vertical obstructions such as roof overhangs and overhead cables. Any other space limiting obstacles such as trees or shrubs must be evaluated.
2) If the spa is being installed indoors, dimension limitations such as stairs, ceilings and walls must be taken into consideration. Please have your Master Spas dealer or delivery service review site or installation plans prior to delivery.
3) Surface/Pad Requirements - When your new spa is filled with water and bathers, it may weigh as much as several tons. It is imperative that the base beneath the spa can support the actual weight. The spa must be on a uniformly firm, continuous, and level surface. The recommended foundation is a concrete pad with a minimum thickness of four (4) inches with steel reinforcement bars crossed throughout the pad.

## IMPORTANT

When installing your spa indoors, on a wood deck, or balcony, the same load requirements must be met. Total load may be as much as 90 pounds per square foot. You should speak with a qualified contractor or your local building department to confirm that your surface is adequate for supporting a spa. Be sure to locate your spa so that equipment remains above grade and is not subject to flooding.

The equipment side(s) of the spa must be accessible in the event that future service is needed. Periodical maintenance checks require entry into the equipment bay. When possible, it is wise planning for the future to leave access to all sides of the spa in the event your spas plumbing requires maintenance. Your spa warranty does not cover the cost of providing access for service.

## GENERAL CONSIDERATIONS FOR OUTDOOR INSTALLATION

Again, proper planning will increase your total enjoyment factor with your new spa. Listed below are some additional items to consider when planning your installation.

- How spa will complement landscaping and vice versa
- View from inside spa and view of spa from inside of home
- Exposure to sunlight and shading from trees
- Privacy
- Getting to spa from house and return
- Proximity to dressing rooms and bathrooms
- Storage for spa chemicals
- Local building codes (if applicable)
- Power cable

## GENERAL CONSIDERATIONS FOR INDOOR INSTALLATION

Installing your spa indoors creates an entirely different set of considerations. Here again, with proper planning, no matter what room your spa goes in, it will be your favorite room.

- Work with your Master Spas dealer and contractor to insure all local building, electrical and plumbing codes are met
- Plan for a floor drain to drain off excess water or for draining and cleaning your spa
- A ventilation fan may be necessary due to high humidity created by your spa
- Finished material in your spa room should also be capable of withstanding increased humidity

## ELECTRICAL INSTALLATION REQUIREMENTS

### HAVE YOUR ELECTRICIAN READ THE FOLLOWING INFORMATION BEFORE INSTALLATION BEGINS

Electrical connections made improperly, or the use of wire gauge sizes for incurring power which are too small, may continually blow fuses in the electrical equipment box, may damage the internal electrical controls and components, may be unsafe and in any case will void your warranty.

It is the responsibility of the spa owner to ensure that electrical connections are made by a qualified electrician in accordance with the National Electrical Code and any local and state electrical codes in force at the time of installation.

These connections must be made in accordance with the wiring diagrams found inside the control box. This equipment has been designed to operate on 60Hz. alternating current only, 240 volts are required. Make sure that power is not applied while performing any electrical installation. A copper bonding lug has been provided on the electrical equipment pack to allow connection to local ground points. The ground wire must be at least 6 AWG copper wire and must be connected securely to a grounded metal structure such as a cold water pipe. All Master Spas equipment packs are wired for 240 VAC only. The only electrical supply for your spa must include a 50 AMP switch or circuit breaker to open all non-grounded supply conductors to comply with section 422-20 of the National Electrical Code. The disconnect must be readily accessible to the spa occupants, but installed at least five feet from the spa. A Ground-Fault Circuit Interrupter (GFCI) must be used to comply with section 680-42 of the National Electrical Code. A ground fault is a current leak from any one of the supply conductors to ground. A GFCI is designed to automatically shut off power to a piece of equipment when a current fault is detected.

Power hook-up to the spa must be 240 volt 3 wire plus ground (6 AWG copper).

Route the cable into the equipment area for final hook-up to terminals inside the control panel. The spa must be hooked up to a “dedicated” 240 volt, 50 amp breaker and GFCI. The term “dedicated” means the electrical circuit for the spa is not being used for any other electrical items (patio lights, appliances, garage circuits, etc.). If the spa is connected to a non-dedicated circuit, overloading will result in “nuisance tripping” which requires resetting of the breaker switch at the house electrical panel.

Rev. 05/01/06

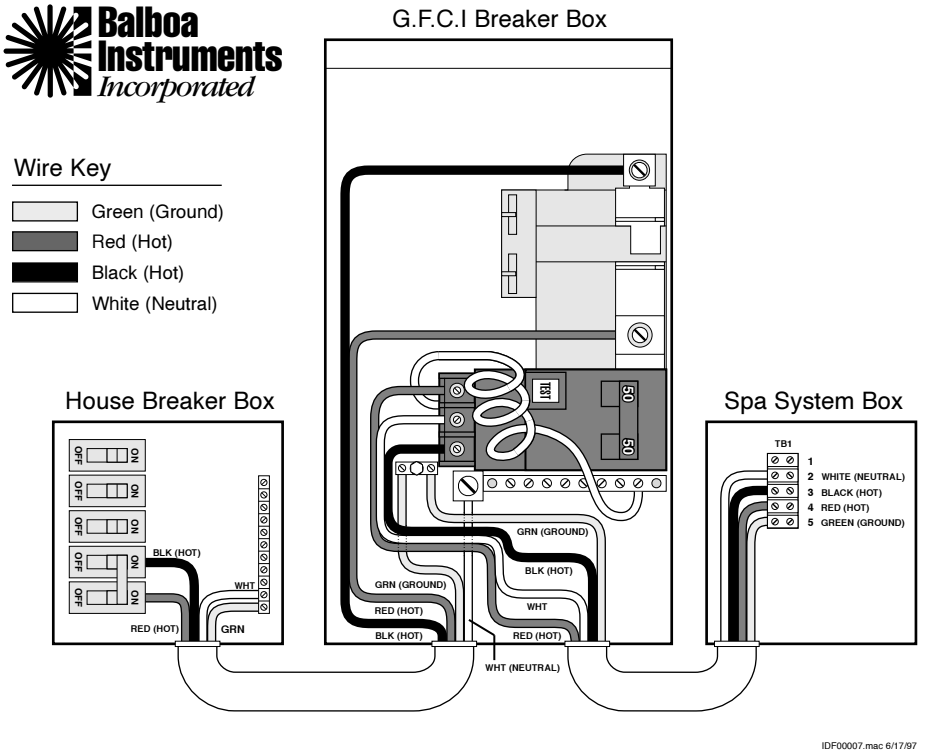
Permanently Connected Equipment Assembly with Pump(s), Heaters, Luminaine, Ozone, Spa Side Control(s), Pump shut off device, and Audio/Video Components.

**Note: Some of the above components may be optional or not available with every spa model.**

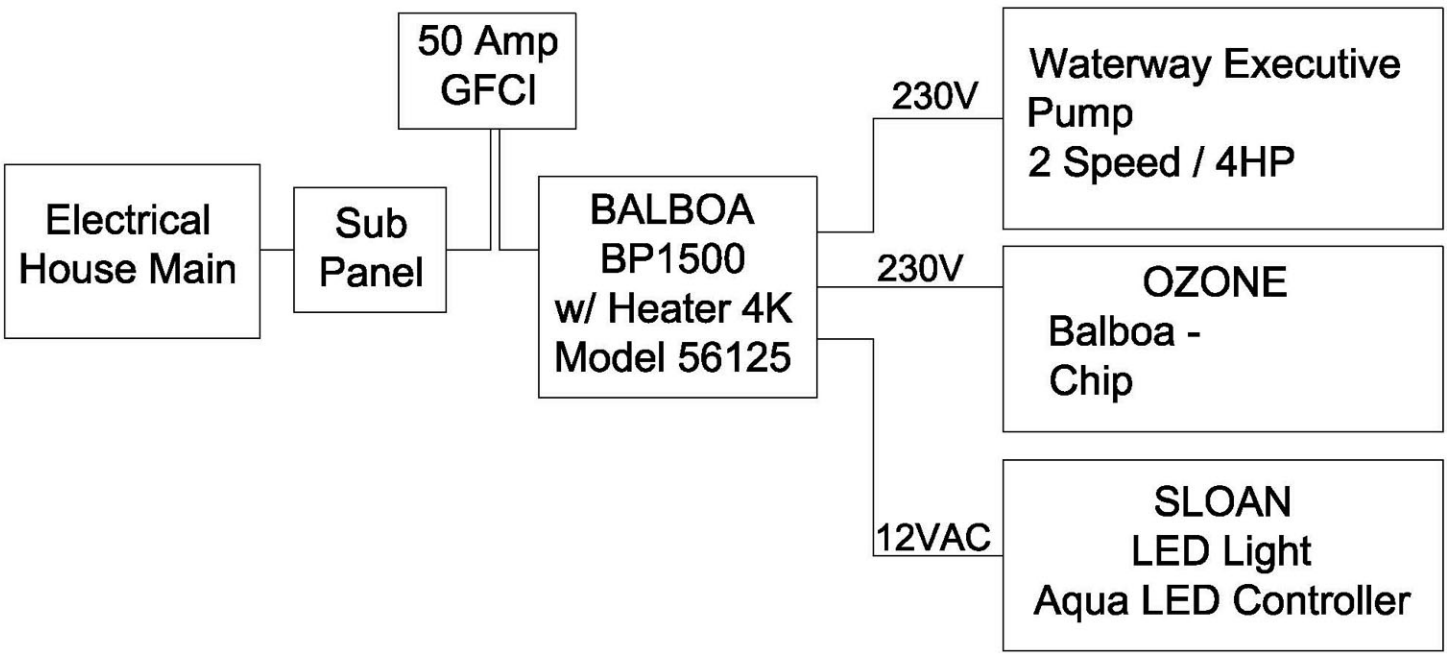
**WARNING: FAILURE TO PROVIDE A DEDICATED CIRCUIT FOR YOUR SPA ELECTRICAL INSALLATION CAN CAUSE EQUIPMENT DAMAGE AND INVALIDATE YOUR WARRANTY.**

Your spa electrical installation must be accomplished by a qualified and licensed electrician in accordance with the National Electrical Code (NEC) Article 680, Canadian Electric Code, and with any local codes effective at the time of installation.
All connections must be made according to the electrical installation label inside the control box. Follow the instructions from the label if they are different than instructions found in this manual. If your electrician is not absolutely sure how to correctly connect your system, call your dealer. Do not guess. Any mistake may be costly and invalidate your equipment warranty.
The GFCI is a mandatory electrical safety device required for all portable spas and hot tubs as specified in the National Electrical Code Article 680-42. The GFCI in your particular installation may be installed at the electrical service panel, a separate sub-panel or built into your Spa's Equipment System. Equipment systems with a built in GFCI meeting the code requirements will be marked on the top of the control panel with an identification label.
Your spa equipment requires a dedicated circuit. No other appliances or lights can be on this circuit. Refer to equipment data label for power supply requirements of your spa equipment. Use copper conductors only.
The ground must be equal to or larger than the largest power conductor.
NOTE: Due to the spa electrical installation requirement of some models, it may be required to SPLIT the incoming electrical service to accommodate the GFCI Circuit Breaker limitations. Contact your electrician if you need additional information on this topic or others related to your spa electrical installation.

# WIRING SCHEMATIC - 240 VOLT SPA HOOK-UP




* Actual wiring of GFCI will vary by manufacturer of GFCI. The GFCI shown is a Square D. Improper wiring of GFCI may result in permanent damage to spa system box. Repair / replacement of spa system box is not covered under warranty when damage results from improper wiring.


Electrical
House Main
Sub
Panel
50 Amp
GFCI
BALBOA
BP1500
w/ Heater 4K
Model 56125
230V
230V
12VAC
Waterway Executive
Pump
2 Speed / 4HP
OZONE
Balboa -
Chip
SLOAN
LED Light
Aqua LED Controller

# BP1500 Tech Sheet

## Balboa Water Group

Part Number: **56125-02** 4kW 800 Incoloy Element
**56126-02** With 4kW Titanium Element

Compatible Plumbing Kits (Coupling nuts and seals included)

| | |
|---|---|
| 55911 | 2" Tailpieces (2-Speed Pump 1) |
| 55914 | 1.5" Tailpieces (2-Speed Pump 1) |
| 55912 | 1" Tailpiece Inserts (Circ) |
| 55913 | One Direct Circ Pump Coupling and one 1" Tailpiece Insert |

| | |
|---|---|
| UL System Model: | BP15-BP1500-BJ |
| Software ID: | M100_200 V6 |
| Software Version: | 6.0 |
| Hex File: | BP1500_6.0_BP15TP4A.hex |
| Configuration Signature: | 0608A20D |
| Eng. Project: | 3767 |

Base PCBs / PCBA's:

| | |
|---|---|
| Power Board: | 22117_B / 56128 |
| Logic Board: | 22121_E / 56127-02 |

Control Panels:

| | |
|---|---|
| TP 600 | 55673-05 |
| Software Version | 2.3 and later |
| TP400T | 50260 |
| Software Version | 2.4 and later |
| TP400W | 50259 |
| Software Version | 2.4 and later |

Auxiliary Panels

| | |
|---|---|
| AX10A2 | 55919 |

User Interface and Programming Guide:
http://service.balboa-instruments.com/zz40940_download.zip

BALBOA water group

# Setup 5

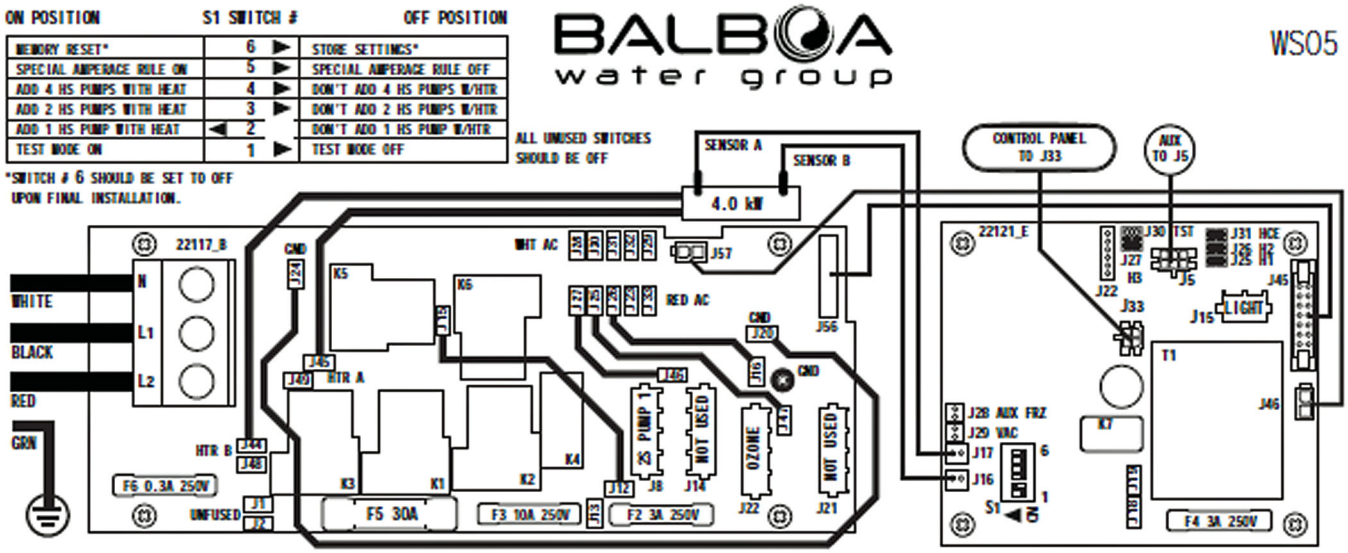
## Power Requirements:

240VAC, 60Hz, 40A, Class A GFCI-protected service (Circuit Breaker rating – 50A max.)
4 wires (Hot–Line 1, Hot–Line 2, Neutral, Ground)

## System Ouputs:

| | | | | |
|---|---|---|---|---|
| Pump 1 | 240VAC | 2-Speed | 12A max | 30-minute timer for Low Speed, 15 Minutes for High Speed<br>This is the heater pump and must be the same voltage as the Ozone<br>Must deliver a minimum of 20 GPM through heater |
| Ozone | 240VAC | | .5A max | Uses the same relay as Pump 1 Low<br>Must be the same voltage as heater pump |
| Spa Light | 12VAC | On/Off | 1A max | 4-Hour timer. |
| Heater | 4kW @ 240VAC | | | |
| Misc. | J23 & J32 | 120VAC | 4A max | Hot output (Stereo). Fused equipment or in-line fuse required. |

## Wiring Diagram and Settings




# Software Configuration Changes based on Default

| Feature | Orig. Setup 1 | Changes to |
|---|---|---|
| J14, TP600 Button 2, TP400 Button 4, LED 2, AX10A2 | Pump 2 | *Not Used* |

Refer to Page 3 to choose a suitable Plumbing Kit.

*Blue indicates changes from the original Setup 1 default*

## Initial Start-up

When your spa is first actuated, it will go into Priming mode, indicated by "Pr." The Priming mode will last for less than 5 minutes (press "Warm" or "Cool" to skip Priming Mode) and then the spa will begin to heat the spa and maintain the water temperature in the Standard mode.


This system is equipped with a 24-hour circ pump. The circ pump and ozone generator (if installed) run continuously.

## Warm/Cool (80˚F - 104˚F / 26˚C - 40˚C)

The start-up temperature is set at 100˚F/37˚C. The last measured temperature is constantly displayed on the LCD.

**Note that the last measured spa temperature displayed is current only when the pump has been running for at least 2 minutes.**

To display the set temperature, press the "Warm" or "Cool" pad once.

To change the set temperature, press the pad a second time before the LCD stops flashing.
Each press of the "Warm" or "Cool" pad will continue to either raise or lower the set temperature.

After three seconds, the LCD will stop flashing and display the current spa temperature.

## Jets 1

Touch the "Jets 1" button once to activate pump 1. Press the "Jets 1" button again to turn off the pump. If left running, the pump will automatically turn off after 15 minutes.

## Jets 2

Touch the "Jets 2" button once to activate the pump. Press the "Jets 2" button again to turn off the pump. If left running, the pump will automatically turn off after 15 minutes.

## Light

Press the “Light” button to turn the light on and off. If left on, the light automatically turns off after 4 hours.

## L.E.D. Light

Press the "Light" button to turn the light on and off. If you wish to change the “function” of the lights, turn the lights off, then on within 5 seconds. If you wish to leave the lights in the same “function” setting for the next use, turn the lights off and do not turn back on for at least 5 seconds.

## Mode

Mode is changed by pressing the “Warm” or “Cool” button, then pressing the “Mode” button.

**Standard mode** is programmed to maintain the desired temperature. Note that the last measured spa temperature displayed is current only when the pump has been running for at least 2 minutes. “St” will be displayed momentarily when you switch into Standard mode.

**Economy mode** heats the spa to the set temperature only during filter cycles. “Ec” will display solid when the temperature is not current, and will alternate with the temperature when the temperature is current.

**Sleep mode** heats the spa to within 20˚F /10˚C) of the set temperature only during filter cycles. “SL” will display solid when the temperature is not current, and will alternate with temperature when temperature is current.

## Preset Filter Cycles (if configured)

Your spa comes standard with a 24 hour circulation pump that filters and maintains heat as programmed/configured.

## Freeze Protection

If the temperature sensors detect a drop to below 44˚F /6.7˚C within the heater, the pump automatically activates to provide freeze protection. The equipment stays on until 4 minutes after the sensors detect that the spa temperature has risen to 45˚F /7.2˚C or higher. In colder climates, an optional additional freeze sensor may be added to protect against freeze conditions that may not be sensed by the standard sensors. Aux freeze sensor protection acts similarly except with the temperature thresholds determined by the switch and without a 4-minute delay in turnoff. See your dealer for details.

# LSX 557 Diagnostic Messages

| Message | Meaning | Action Required |
|---|---|---|
| | No message on display. Power has been cut off to the spa. | The control panel will be disabled until power returns. Time of day will be preserved for 30 days on your system. Spa settings are preserved on all systems. |
| -- | Temperature is unknown. | After the pump has been running for 2 minutes, the temperature will be displayed. |
| HH | "Overheat" - The spa has shut down. One of the sensors has detected 118˚F/48˚C at the heater. | DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pushing any button If spa does not reset, shut off the power to the spa and call your dealer or service organization. |
| OH | "Overheat" - The spa has shut down. One of the sensors has detected that the spa water is 110˚F/43˚C. | DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107˚F/ 42˚C, the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer or service organization. |
| IC | "Ice" - Potential freeze condition detected. | No action required. The pumps will automatically activate regardless of spa status. |
| SA | Spa is shut down. The sensor that is plugged into the Sensor "A" jack is not working. | If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.) |
| Sb | Spa is shut down. The sensor that is plugged into the Sensor "B" jack is not working. | If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.) |
| Sn | Sensors are out of balance. If alternating with spa temperature, it may just be a temporary condition. If flashing by itself, spa is shut down. | If the problem persists, contact your dealer or service organization. |
| HL | A significant difference between the temperature sensors has been detected. This could indicate a flow problem. | Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. If problem persists, contact your dealer or service organization. |
| LF | Persistent low flow problems. (Displays on the fifth occurrence of "HL" message within 24 hours.) Heater is shut down, but other spa functions continue to run normally. | Follow action required for "HL" message. Heating capacity of the spa will not reset automatically; you may press any button to reset. |

| Message | Meaning | Action Required |
|---|---|---|
| dry | Inadequate water detected in heater. (Displays on third occurrence of "dr" message.) Spa is shut down. | Follow action required for "dr" message. Spa will not automatically reset; you may press any button to reset. |
| Pr | When your spa is first actuated, it will go into Priming mode. | See the M-7 Installation Instruction Manual for complete instructions on Power-up and Pump Priming. The Priming mode will last for up to 4 minutes and then the spa will begin to heat and maintain the water temperature in the Standard mode. |
| --F<br>--C | Temperature unknown. | After the pump has been running for 2 minutes, the temperature will be displayed. |
| -- | Temperature not current in Economy or Sleep mode. | In Economy or Sleep mode, the pump may be off for hours outside a filter. If you wish to see the current spa temperature, either switch to Standard mode or turn Jets 1 on for at least two minutes. |
| Sby | Standby Mode has been activated by pressing a button combination on the user panel. | Press any button to leave Standby mode and return to normal operation. |

## PERIODIC REMINDER MESSAGES *Press the "Mode" button to reset a displayed reminder (if configured)*

| Message | Meaning | Action Required |
|---|---|---|
| rPH | Every 7 days | Test and adjust ph chemical levels per manufacturer's instructions. |
| rSA | Every 7 days | Test and adjust sanitizer chemical levels per manufacturer's instructions. |
| rCL | Every 30 days | Remove, clean, and reinstall filter per manufacturer's instructions. |
| rt9 | Every 30 days | Test and reset GFCI per manufacturer's instructions. |
| rdr | Every 90 days | Drain and refill spa per manufacturer's instructions. |
| rCO | Every 180 days | Clean and condition cover per manufacturer's instructions. |
| rtr | Every 180 days | Clean and condition wood per manufacturer's instructions. |
| rCH | Every 365 days | Install new filter. |

**Warning! Shock Hazard! No User Serviceable Parts.** Do not attempt service of this control system. Contact your dealer or service organization for assistance. Follow all owner's manual power connection instructions. Installation must be performed by a licensed electrician and all grounding connections must be properly installed.

| Message | Meaning | Action Required |
|---|---|---|
| | No message on display. Power has been cut off to the spa. | The control panel will be disabled until power returns. Time of day will be preserved for 30 days on your system. Spa settings are preserved on all systems. |
| OHH | "Overheat" - The spa has shut down. On some systems, an alarm may sound. One of the sensors has detected 118˚F (approx. 47.8˚C) at the heater. | DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pushing any button. If spa does not reset, shut off the power to the spa and call your dealer or service organization. |
| OHS | "Overheat" - The spa has shut down. One of the sensors has detected that the spa water is 110˚F (approximately 43.3˚C). | DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107˚F (approx. 41.7˚C), the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer or service organization. |
| ICE | "Ice" - Potential freeze condition detected. | No action required. The pumps will automatically activate regardless of spa status. |
| SnA | Spa is shut down. The sensor that is plugged into the Sensor "A" jack is not working. | If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.) |
| Snb | Spa is shut down. The sensor that is plugged into the Sensor "B" jack is not working. | If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.) |
| SnS | Sensors are out of balance. If this is alternating with the temperature, it may just be a temporary condition. If the display shows only this message (periodically blinking), the spa is shut down. | If the problem persists, contact your dealer or service organization. |
| HFL | A substantial difference between the temperature sensors was detected. This could indicate a flow problem. | Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. If problem persists, contact your dealer or service organization. |
| LF | Persistent low flow problems. (Displays on the fifth occurrence of the "HFL" message within 24 hours.) Heater is shut down, but other spa functions continue to run normally. | Follow action required for "HFL" message. Heating capacity of the spa will not reset automatically; you may press any button to reset. |
| dr | Inadequate water detected in heater. | Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. Press any button to reset. |

# LSX 557 Diagnostic Messages

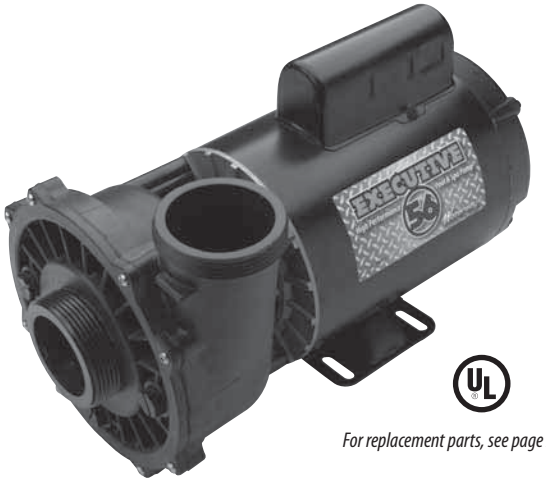
| Message | Meaning | Action Required |
|---|---|---|
| dr | Possible inadequate water, poor flow, or air bubbles are detected in the heater. Spa is shut down for 15 minutes. | Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. Press any button to reset, or this message will automatically reset within 15 minutes. If problem persists, contact your dealer or service provider. |
| dy | Inadequate water detected in heater. (Displays on third occurrence of "dr" message.) Spa is shut down. | Follow action required for "dr" message. Spa will not automatically reset; you may press any button to reset. |

**Warning! Shock Hazard! No User Serviceable Parts.** Do not attempt service of this control system. Contact your dealer or service organization for assistance. Follow all owner's manual power connection instructions. Installation must be performed by a licensed electrician and all grounding connections must be properly installed.

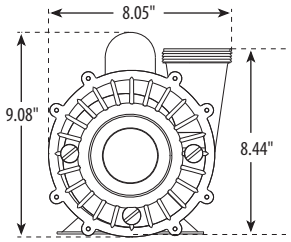
**FEATURES:**

- Executive wet end designed specifically for 56-frame motors
- Two double shielded ball bearings with moisture resistant grease for quieter operation and longer life
- Two speed motors have four sets of insulated windings for increased efficiency
- 56-frame motor for added strength, cooler operating temperature and longer motor life
- Large 2 ½" intake for improved flow performance and reduced noise
- Large 6 ½" diameter wet end for higher head pressure
- Split capacitor, (start and run) for less energy consumption
- Thermally protected to extend life expectancy of motor
- Highly versatile wet end can be rotated every 90°
- Viton seals
- Three year warranty on motor and wet end

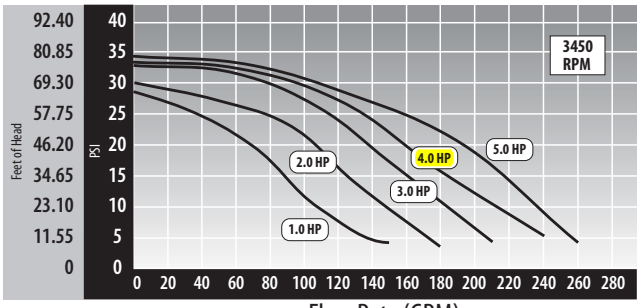
*Call for available cords and plugs.*



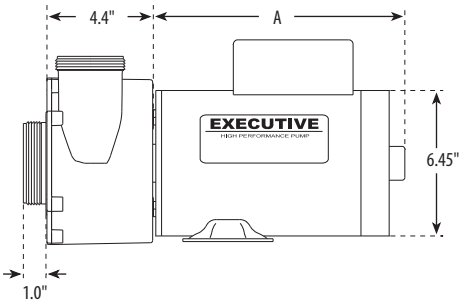

*For replacement parts, see page 279*




## PRESSURE VERSUS FLOW RATE




Flow Rate (GPM)




## 2-Speed Executive 56-Frame Pumps

| Part No. | Description | HP | Volts | Amps High Speed | Amps Low Speed | Hz | Dimension "A" | List (US $) |
|---|---|---|---|---|---|---|---|---|
| **3720821-1D** | 2" Intake - 2" Discharge | 2 | 230 | 8.0 | 3.0 | 60 | 8.875" | 605.01 |
| **3720821-13** | 2 ½" Intake - 2" Discharge | 2 | 230 | 8.0 | 3.0 | 60 | 8.875" | 605.01 |
| **3721221-1D** | 2" Intake - 2" Discharge | 3 | 230 | 10.0 | 3.4 | 60 | 9.875" | 646.45 |
| **3721221-13** | 2 ½" Intake - 2" Discharge | 3 | 230 | 10.0 | 3.4 | 60 | 9.875" | 646.45 |
| **3721621-1D** | 2" Intake - 2" Discharge | 4 | 230 | 12.0 | 4.4 | 60 | 10.375" | 704.82 |
| **3721621-13** | 2 ½" Intake - 2" Discharge | 4 | 230 | 12.0 | 4.4 | 60 | 10.375" | 704.82 |
| **3722021-1D** | 2" Intake - 2" Discharge | 5 | 230 | 16.4 | 4.8 | 60 | 10.375" | 800.35 |
| **3722021-13** | 2 ½" Intake - 2" Discharge | 5 | 230 | 16.4 | 4.8 | 60 | 10.375" | 800.35 |

## 1-Speed Executive 56-Frame Pumps

| Part No. | Description | HP | Volts | Amps | Hz | Dimension "A" | List (US $) |
|---|---|---|---|---|---|---|---|
| **3710821-1D** | 2" Intake - 2" Discharge | 2 | 230 | 8.0 | 60 | 8.875" | 605.01 |
| **3710821-13** | 2 ½" Intake - 2" Discharge | 2 | 230 | 8.0 | 60 | 8.875" | 605.01 |
| **3711221-1D** | 2" Intake - 2" Discharge | 3 | 230 | 10.0 | 60 | 9.875" | 646.45 |
| **3711221-13** | 2 ½" Intake - 2" Discharge | 3 | 230 | 10.0 | 60 | 9.875" | 646.45 |
| **3711621-1D** | 2" Intake - 2" Discharge | 4 | 230 | 12.0 | 60 | 10.375" | 670.61 |
| **3711621-13** | 2 ½" Intake - 2" Discharge | 4 | 230 | 12.0 | 60 | 10.375" | 690.21 |
| **3712021-1D** | 2" Intake - 2" Discharge | 5 | 230 | 16.4 | 60 | 10.375" | 690.21 |
| **3712021-13** | 2 ½" Intake - 2" Discharge | 5 | 230 | 16.4 | 60 | 10.375" | 699.30 |

BALBOA water group

# Installation Instructions for Balboa's CD Cartridge Ozone Generator CD Chip Ozone Generator with Universal Input Power

$O_3$zone™ by Balboa is a reliable and flexible system designed to generate ozone for your pool or spa. It has Universal Auto-range Voltage that can operate with any input voltage (110-240 VAC and 50/60 Hz).

Warning! Shock Hazard! No User Serviceable Parts. Do not attempt service of this ozonator. Contact your dealer or service organization for assistance. Follow all owners manual instructions. Installation must be performed by a licensed electrician. Installation must be in compliance with all state, national, and local building & electrical codes. No usable parts inside.

P/N 40694 Rev F April 27, 2010

Balboa Water Group, Tustin, CA

This unit is shipped with the wiring as shown. 110V or 240V can be applied to the black and white wires. To match alignment of the white wire of the ozone generator connector with the controller box connector, the white wire can be moved. Refer to Step 2 under "FOR REPLACEMENT".

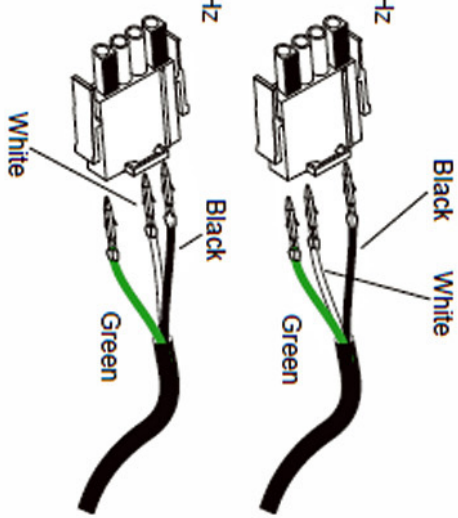



Diagram 3

## OEM Installation

The effectiveness of the ozone generator is dependent on the design delivery system per each manufacturer. It is the responsibility of the installer to follow the installation procedures set forth by the manufacturer. Failure to do so will void the warranty. Diagram 2 shows the basic layout recommended for the installation of Balboa's Ozone Generator.

1. Turn off all power.

2. Loop the hose into a "Hartford Loop" and have the upper part of the loops positioned above the water line level as shown. Failure to do so could result in water intrusion, which is not covered by the warranty. Attach the hose to the ozone injector fitting on the spa plumbing. Install the check valve so that the arrow points in the direction of air flow from the generator to the ozone injector (Diagram 2).

Note: If you do not properly install the check valve, the air flow will be blocked from going into the spa/pool and will not perform the ozonation process.

3. Power up the system and briefly run the filtration pump. Place your finger over the end of the hose near the check valve. You should feel a slight suction. If not, check for hose kinks, hose obstructions, and that the check valve is in the proper direction. When suction is obtained, attach the hose from the generator to the barbed output of the ozone generator.

4. Turn off the control system and hook the power cable to the control system marked for Ozone. (Follow the system's wiring diagram for the proper location.)

5. Turn the system power back on and run the pump. Confirm that the light in the Ozone window is ON.

**FOR REPLACEMENT** (System with AMP connector on the outside of the box)

1. Follow the above steps (1-4).

2. Uncover the controller box. Match the wires' output of the ozone AMP connector mark on the outside of the box with the AMP connector provided with the ozone generator. Refer to Diagram 3.

3. Insert the wire. You will feel it "click" into position when it is seated. A slight tug on the wire is all that's needed to be sure that the terminal is seated.

4. Mate the AMP connector and power up the spa. Make sure that you are in filtration cycle and confirm that the light on the ozone generator window is on.

Both diagrams, Diagrams 1 & 2, show that the ozone generators must be mounted with their inlets facing down. As shown (right), the chip generator outlet will be pointing to the left once installed.

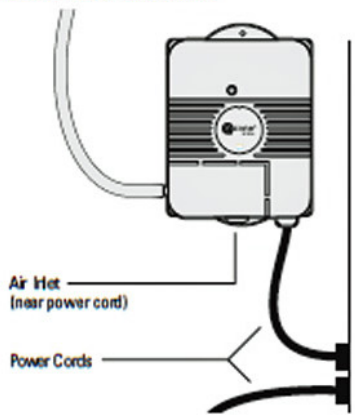



**Diagram 1**

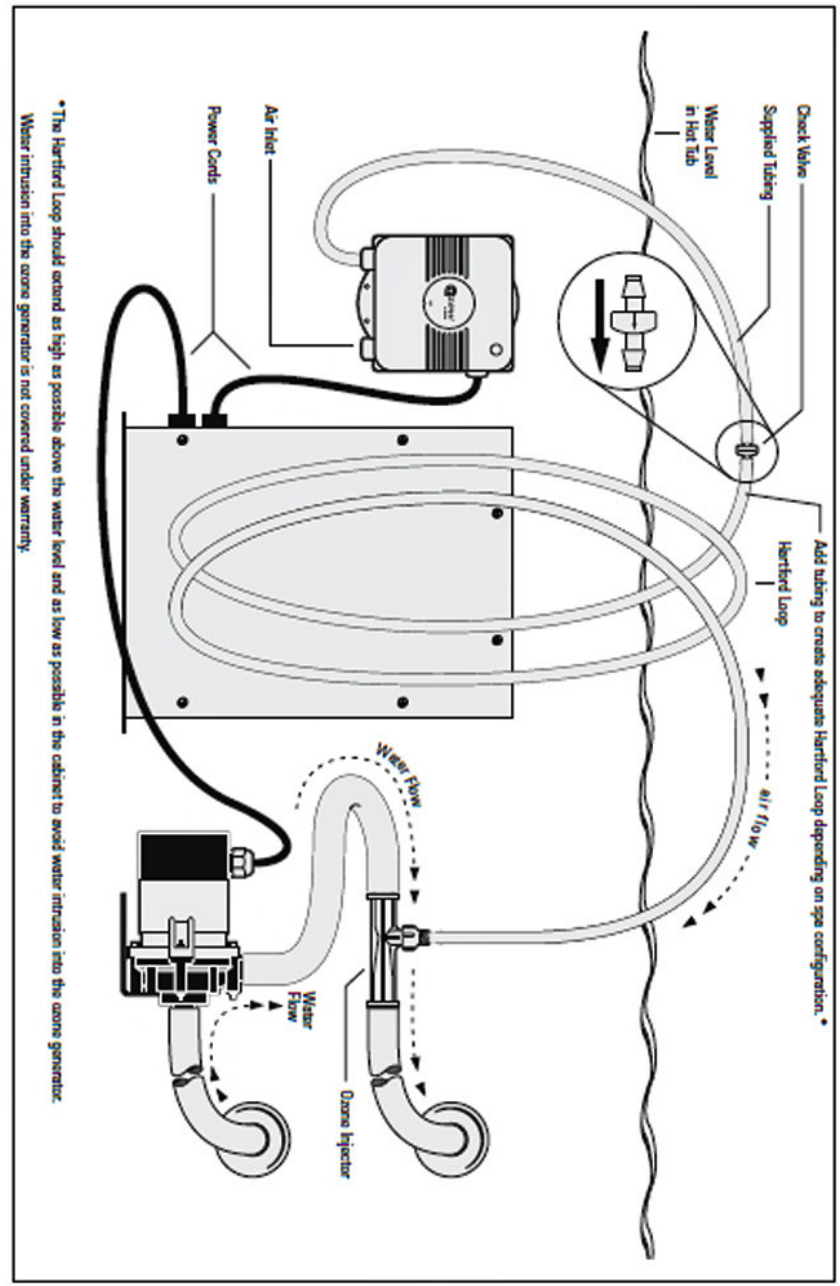



**Diagram 2**

# LiquaLED Controllers

*Controls colors, color-changing and sequencing via built-in software program*

- Patent Pending control technology
- Compatible with all LiquaLED Cluster Lights, Bullet Lights and Accent Lights
- UL Approved - File Number #E242370
- Serviceable fused input for safety
- Moisture resistant electronics
- Easy to mount anywhere in spa's equipment area Full Spectrum Color Control

LiquaLED Control 100

- Controls and synchronizes all LEDs
- Controls up to 100 points of light plus one cluster
- Controlled by spa pack
- Powered by spa's stereo power supply or external SloanLED power supply
- Replaces large fiber optic systems

LiquaLED Control 40

- Controls up to 40 points of light plus one cluster
- Controlled by spa pack
- No external power supply required
- Cost effective control device

| | **LiquaLED Controllers** | |
|---|---|---|
| **Item Description** | **Control 100** | **Control 40** |
| Part Number | 701712-DLO | 701678-DLO |
| Max Points of Lights (not including clusters) | 100 | 40 |
| Required Input Voltage - AC | 12 V AC from Spa Pack | |
| Required Input Voltage - DC | External 12 V DC Supply | No External DC Supply Required |
| Typical Max Output Current / Power | 2 Amps / 24 Watts | 1 Amp / 12 Watts |
| Controller Dimensions | 3.25" x 2.75" x .75" | 3.25" x 2.75" x .75" |
| On/Off Control | Spa pack light on/off switch on top-side control panel | |

www.SloanLED.com · info@SloanLED.com
Toll-Free 888.747.4LED · 805.676.3200 · Fax 805.676.3206

# *UltraBRITE-Mini Standard Integrated LED Cluster Lamp*

*Bring high-end features and quality to entry-level spas*

UltraBRITE-Mini
with lens

- Fully Integrated Solution – No separate controller required
- High-brightness LED cluster
- Reliable moisture-resistant electronic coatings
- On-board selectable color-controller
  - Color Wheel
  - Magenta
  - Green
  - White
  - Blue
  - Red
  - Cyan
  - Yellow
  - White Strobe
- Two physical packaging configurations:

Bi-Pin Connector Style

- Bi-Pin (-P) used for simple incandescent replacement / retrofitting into standard bulb socket

Bayonet Style Mounting

- Bayonet-Style (-SA) installs into standard lens bases (from 2” to 5” in diameter). Includes adapter cable to allow connection via either 1/4” QC terminal or 2-prong MLX plug

| Item Description | UltraBRITE-Mini LED Light |
|---|---|
| Part Numbers | 701861-9-P (bi-pin)<br>701861-9-SA (bayonet) |
| High-Brightness LEDs per Cluster | 9 - 5mm LEDs |
| Input Voltage | 12V AC |
| Typical Maximum Current | 200 mA |
| Diameter of PCB | 1.3” |
| Fits Lens Sizes (Approximate) | ~ 2.0” to 5.0” |
| Fixture depth | 1.75" |

www.SloanLED.com · info@SloanLED.com
Toll-Free 888.747.4LED · 805.676.3200 · Fax 805.676.3206

# SPA WATER MAINTENANCE - START-UP

1. Read the spa owners manual first.
2. Clean the surface with a spa general purpose cleaner or wipe down with a clean wet towel.
3. Begin filling the spa with fresh water. If possible, do not use softened water.
4. When the spa has 2 to 4 inches of water on the bottom, add the recommended amount of a sequestering chemical for that size spa. See the chemical bottle for correct amounts.
5. When the spa is full, run the pump on high speed for 30 minutes without air controls open. This will give the sequestering chemical time to mix well with the water. Allow sequestering chemical 12-24 hours to properly filter in the water before proceeding with any further steps.
6. Using test strips or a test kit, test for total alkalinity, and adjust if necessary to between 80 to 150 ppm using the pH / alkalinity increaser or decreaser 1oz. at a time. Wait 15 minutes, retest, and adjust if necessary. The pump should be running on high speed during this time without air controls open.
7. Using test strips or a test kit, test for pH, and adjust if necessary to within the 7.2 and 7.8 range using the pH / alkalinity increaser or decreaser 1/2oz. at a time. Wait 15 minutes, retest, and adjust if necessary. The pump should be running on high speed during this time, without air controls open.
8. Add the sanitizer of choice, following label directions. If chlorine is used, broadcast the recommended amount across the surface of the water, with the pump running on high speed. Wait 15 minutes, retest, and adjust if necessary to a total chlorine reading of 1 to 3 ppm. If bromine is used, add bromine tablets to the bromine feeder following label directions. With the pump running on high speed, add 2oz. of sodium bromide, and shock the spa with 2oz. of non chlorine shock. It may take several days adjusting the bromine feeder to obtain a total bromine reading of 3 to 5 ppm. A bromine reading may not be obtained on the first day.
9. If any foam develops, add a defoamer at the base of the problem area. Use only enough defoamer to get rid of the foam. This is usually one or two drops Do not pour large amounts of defoamer into water.
10. Wait two days, and begin a three day a week maintenance program.

# WATER CHEMISTRY TERMS YOU SHOULD KNOW

Before jumping into the Spa Water Maintenance, here are some terms to help you.

1. **Parts per million, or ppm:** This is a form of measurement used in most pool or spa chemical readings. Best described as any one million like items of equal size and make up, next to one unlike item , but of equal size. This would be one part per million.
2. **Average size spa:** What is it? The national spa and pool institute (NSPI) states; 350 to 400 U.S. gallons is average. As a general rule, chemical dosages are the same for any spa between 100 and 500 U.S. gallons. Spas over 500 U.S. gallons the dosage would be double. Under 100 U.S. gallons would be on a case by case basis.
3. **Total Alkalinity:** This is a measurement of the ability of the water to resist changes in pH. Put another way, it is the water's ability to maintain proper pH. Total alkalinity is measured in parts per million from 0 to 400 plus, with 80 to 150 ppm being the best range for spas. With low alkalinity, the pH will flip, or change back and forth, and be hard to control. With high alkalinity it becomes extremely difficult to change the pH.
4. **pH or potential hydrogen:** This is a measurement of the active acidity in the water, or it is the measurement of the concentration of active hydrogen ions in the water. The greater the concentration of active hydrogen ions, the lower the pH. pH is not measured in parts per million, but on a scale from 0 to 14, with 7 being the neutral. In spas when ever possible, a measurement between 7.2 and 7.8 is best. Whenever possible, it should be between 7.4 and 7.6. With low pH, the results can be corroded metals, etched and stained plaster stained fiberglass or acrylic, eye / skin irritation, rapid chlorine or bromine loss, and total alkalinity destruction. With high pH, the results can be cloudy water, eye / skin irritation, scale formation and poor chlorine or bromine efficiency.
5. **Shocking:** This is when you add either extra chlorine (superchlorinate) by raising the chlorine level above 8 ppm, or add a non-chlorine shock (potassium monoperoxysulfate or potassium monopersulfate) to burn off the chloramines or bromamines. A non-chlorine shock acts by releasing oxygen in the water, which serves the same function as chlorine. The advantage to using non-chlorine shock, is you can enter the water within 15 minutes after shocking. Using chlorine, you must wait until the total chlorine reading is below 5 ppm. One thing to remember, a non-chlorine shock will not kill bacteria or disinfect.
6. **Sequestering:** This can be defined as the ability to form a chemical complex which remains in solution, despite the presence of a precipitating agent (i.e. calcium and metals). Common names for sequestering chemicals are; minquest, stain and scale control, metal-x, spa defender, spa metal gone, (etc.).
7. **Filtration:** Filters are necessary to remove particles of dust, dirt, algae, etc. that are continuously entering the water. If the spa is not operated long enough each day for the filter to do a proper job, this puts a burden on the chemicals, causing extra expense. Filtration time will depend on the spa size, pump and filter size, and of course, bather load. A spare cartridge should be kept on hand to make it easy to frequently clean the cartridge without the need for a long shut down. This will also allow the cartridge to dry out between usages, which will increase the cartridge life span as much as twice. Replace the cartridge when the pleats begin to deteriorate. Cartridge cleaning should be done a minimum of once a month. More often with a heavy bather load.

# WATER CHEMISTRY TERMS YOU SHOULD KNOW

Before jumping into the Spa Water Maintenance, here are some terms to help you.

8. **Sanitizers:** This is what kills the germs and bacteria that enter the water from the environment and the human body.

   A. Chlorine

      1. Only one type is good for spa use: Sodium dichlor which is a granule, fast dissolving, and pH neutral
      2. Chlorine is an immediate sanitizer.

   B. Bromine (Note: Bromine use is not recommended with Eco Pur filters.)

      1. Two types of tablets.
         a. Hydrotech
         b. Lonza
      2. Bromine is a slow dissolve chemical and may take a few days to develop a reserve or reading in the water.

9. **Total dissolved solids (TDS):** Materials that have been dissolved by the water. i.e. Like what happens when you put sugar in coffee or tea.

10. **Useful life of water (in days):** Water should be drained at least once every 180 days. Useful life may vary by usage and bather load.

11. **Defoamer:** Foaming may be caused by body oils, cosmetics, lotions, surface cleaners, high pH or algeacides as well as other organic materials. Low levels of calcium or sanitizer can also cause foaming. Also, double rinse your bathing suits as they will hold residual soap after being washed.

12. **Calcium hardness:** Water that is too hard (over 250 ppm) can promote scale formation in components and on spa surface. Water that is too low (below 180 ppm) may also shorten the life of metal components on the spa.

    **NOTE:** Always leave spa cover open for 15 minutes after adding chemicals to prevent the off gas from damaging your spa cover, spa pillows and other critical parts.

# WATER CHEMISTRY TERMS YOU SHOULD KNOW

Before jumping into the Spa Water Maintenance, here are some terms to help you.

1. **Parts per million, or ppm:** This is a form of measurement used in most pool or spa chemical readings. Best described as any one million like items of equal size and make up, next to one unlike item , but of equal size. This would be one part per million.
2. **Average size spa:** What is it? The national spa and pool institute (NSPI) states; 350 to 400 U.S. gallons is average. As a general rule, chemical dosages are the same for any spa between 100 and 500 U.S. gallons. Spas over 500 U.S. gallons the dosage would be double. Under 100 U.S. gallons would be on a case by case basis.
3. **Total Alkalinity:** This is a measurement of the ability of the water to resist changes in pH. Put another way, it is the water's ability to maintain proper pH. Total alkalinity is measured in parts per million from 0 to 400 plus, with 80 to 150 ppm being the best range for spas. With low alkalinity, the pH will flip, or change back and forth, and be hard to control. With high alkalinity it becomes extremely difficult to change the pH.
4. **pH or potential hydrogen:** This is a measurement of the active acidity in the water, or it is the measurement of the concentration of active hydrogen ions in the water. The greater the concentration of active hydrogen ions, the lower the pH. pH is not measured in parts per million, but on a scale from 0 to 14, with 7 being the neutral. In spas when ever possible, a measurement between 7.2 and 7.8 is best. Whenever possible, it should be between 7.4 and 7.6. With low pH, the results can be corroded metals, etched and stained plaster stained fiberglass or acrylic, eye / skin irritation, rapid chlorine or bromine loss, and total alkalinity destruction. With high pH, the results can be cloudy water, eye / skin irritation, scale formation and poor chlorine or bromine efficiency.
5. **Shocking:** This is when you add either extra chlorine (superchlorinate) by raising the chlorine level above 8 ppm, or add a non-chlorine shock (potassium monoperoxysulfate or potassium monopersulfate) to burn off the chloramines or bromamines. A non-chlorine shock acts by releasing oxygen in the water, which serves the same function as chlorine. The advantage to using non-chlorine shock, is you can enter the water within 15 minutes after shocking. Using chlorine, you must wait until the total chlorine reading is below 5 ppm. One thing to remember, a non-chlorine shock will not kill bacteria or disinfect.
6. **Sequestering:** This can be defined as the ability to form a chemical complex which remains in solution, despite the presence of a precipitating agent (i.e. calcium and metals). Common names for sequestering chemicals are; minquest, stain and scale control, metal-x, spa defender, spa metal gone, (etc.).
7. **Filtration:** Filters are necessary to remove particles of dust, dirt, algae, etc. that are continuously entering the water. If the spa is not operated long enough each day for the filter to do a proper job, this puts a burden on the chemicals, causing extra expense. Filtration time will depend on the spa size, pump and filter size, and of course, bather load. A spare cartridge should be kept on hand to make it easy to frequently clean the cartridge without the need for a long shut down. This will also allow the cartridge to dry out between usages, which will increase the cartridge life span as much as twice. Replace the cartridge when the pleats begin to deteriorate. Cartridge cleaning should be done a minimum of once a month. More often with a heavy bather load.

# WATER CHEMISTRY TERMS YOU SHOULD KNOW

Before jumping into the Spa Water Maintenance, here are some terms to help you.

8. **Sanitizers:** This is what kills the germs and bacteria that enter the water from the environment and the human body.

   A. Chlorine

      1. Only one type is good for spa use: Sodium dichlor which is a granule, fast dissolving, and pH neutral
      2. Chlorine is an immediate sanitizer.

   B. Bromine (Note: Bromine use is not recommended with Eco Pur filters.)

      1. Two types of tablets.
         a. Hydrotech
         b. Lonza
      2. Bromine is a slow dissolve chemical and may take a few days to develop a reserve or reading in the water.

9. **Total dissolved solids (TDS):** Materials that have been dissolved by the water. i.e. Like what happens when you put sugar in coffee or tea.

10. **Useful life of water (in days):** Water should be drained at least once every 180 days. Useful life may vary by usage and bather load.

11. **Defoamer:** Foaming may be caused by body oils, cosmetics, lotions, surface cleaners, high pH or algeacides as well as other organic materials. Low levels of calcium or sanitizer can also cause foaming. Also, double rinse your bathing suits as they will hold residual soap after being washed.

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# SPA WATER MAINTENANCE TROUBLE-SHOOTING GUIDE

| Problem | Possible Causes | How To Fix It |
|---|---|---|
| Chlorine / Bromine Odor | • Excessive Chlorine or bromine level<br>• Low pH | • Shock water with non-chlorine shock treatment<br>• Adjust pH if necessary |
| Water Odor | • Low levels of sanitizer<br>• pH out of range<br>• Bacteria or algae growth | • Shock water with non-chlorine shock treatment or adjust sanitizer levels<br>• Adjust pH level if necessary<br>• Adjust sanitizer if necessary |
| Cloudy Water | • Dirty filters or inadequate filtration<br>• Water chemistry not balanced<br>• Suspended particles or organic materials<br>• Old water | • Clean filters and adjust filtration<br>• Adjust chemistry levels<br>• Add spa clarifier (see dealer)<br>• Change spa water |
| Scum Ring Around Spa | • Build up of oils, dirt and organic elements | • Wipe off with a clean towel |
| Eye / Skin Irritation | • Unsanitary water<br>• Free chlorine level above 5 ppm<br>• Poor sanitizer / pH levels | • Shock spa with non-chlorine shock<br>• Allow level to drop below 5 ppm<br>• Adjust according to spa test strip results |
| Foaming | • High levels of body oils, lotions, soap, etc. | • Add small amount of defoamer |

## RECOMMENDED LEVELS OF CHEMICAL

Chlorine 1.0 - 3.0 ppm

pH 7.2 - 7.8

Total Alkalinity 80 - 150 ppm

Calcium Hardness 180 - 250 ppm

# WHY ARE CHEMICALS IMPORTANT IN A SPA

1. **Evaporation:**

   As water evaporates, only pure water evaporates, leaving the salts, minerals, metals, and any unused chemicals behind. Adding water adds more salts, minerals, and metals. In time, the water can become saturated with these dissolved solids and can cause stains or scale to form on the walls of the spa or a scale build up inside the equipment. Colored or cloudy water, and possible corrosion of plumbing and fittings may also occur.

2. **Heat:**

   Heat causes evaporation to happen faster. Heat also causes certain minerals and metals to precipitate out of solution.

3. **Air:**

   Dust and airborne dirt particles are introduced into the spa.

4. **Environment:**

   The environment surrounding the spa is also a consideration. Watch for pollen, grass, sand, dirt, lawn fertilizer, dust storms, insects, dogs, cats, etc.

5. **Consider the human next:**

   In a heated spa, the average adult sweats 3 pints per hour. This person also brings in the spa surface dirt, soap, body oils, deodorant, hair spray, hand and body lotion, perfume and cologne, make up, lipstick, and suntan lotion. To this you can add spit, urine, bacteria and virus germs from open sores or certain body parts. To this let's add spilled drinks, cigarette ash, and various play things. Now multiply this times 4 or 6 people in an average 375 gallon spa and then try to use the water for a few months!

**Remember:**
The maintenance routines set forth in this manual may need to be adjusted depending on how much the spa is being used.

# MAINTENANCE RECOMMENDATIONS

Your spa requires periodic draining and cleaning to ensure a safe, healthy environment. It is recommended that you clean your spa at least every 180 days. Heavy bather load will require cleaning it more often.

## TO DRAIN YOUR SPA

- See page 13.

## TO CLEAN YOUR SPA SURFACE

- With a soft cloth, wipe down the spa surface with a non-abrasive spa surface cleaner that may be purchased through your local spa dealer. Do not use paper towels. Be sure to rinse residue from spa surface.
- If your spa has developed an oily or chalky residue at the waterline it may require special treatment. Consult your dealer.

## TO REFILL YOUR SPA

- Be sure to close the drain valve.
- Fill the spa with water. Be sure water level is above skimmer opening to the minimum safe water level label.
- Refer to your spas corresponding start-up section with any questions.

## TO CLEAN YOUR FILTER ELEMENTS (also reference page 73)

The filter in your spa is one of the most important components of your spa. It not only is essential for clean water, but also for extending the life of the spa equipment. Your filter elements must be cleaned regularly (once a month on average) with normal spa use. With heavy use, they will need to be cleaned more often.

- Turn spa off. Never have the spa running when removing your filters as debris can be pulled through into the equipment causing unwarranted damage.
- Remove filter element(s).
- With a garden hose, spray each element under pressure. Periodically, the elements need to be soaked in a filter cleaner compound. Check with your dealer for details on cleaning and/or filter replacement recommendations.
- Replace filter elements.
- Be sure water level is adequate.
- Turn spa on.
- Only clean the ECO PUR filter element with water, do not use chemical cleaners.

## CARE OF YOUR SPA PILLOWS

- Your spa pillows need to be rinsed periodically to remove any chemical residue. This should help to eliminate pillows becoming stiff and discolored.
- If spa is not to be used for a period of time, pillows should be removed. Pillow life will be extended.
- Always leave the cover open for 15 minutes in order to prevent off gas from damaging your spa pillows, cover and other critical parts. Signs of off gas damage include but are not limited to pillows peeling and bubbling, cover failing prematurely, plastics failing, etc.

# WINTERIZING YOUR SPA

Many people find they enjoy using their spa more in the winter than any other time. Your spa is designed to be used year round in any type of climate.

*However, if you decide you don't want to use your spa in the winter, you must drain it and follow the winterizing steps listed below:

1. Drain your spa completely using the drain valve (see "To Drain Your Spa") or use an inexpensive submersible pump that you can buy from your dealer or your local hardware store.
2. Use a shop vac to get all standing water out of your unit.
3. Remove access panels from equipment area.
4. Loosen all pump unions
5. Remove winterizing plug from the face of the pump(s).
6. Using your shop vac in a blowing mode, insert the hose into the nozzle of each jet and blow the trapped water from the lines into the interior of the spa.
7. After this is completed, use the shop vac to remove any standing water in the spa and in the equipment area.
8. Clean the spa with a soft cloth and a non-abrasive spa surface cleaner.
9. Replace access panels.
10. Cover spa to prevent water from entering the spa.

**Disclaimer: NESPA TILED SPAS does not recommend winterizing your spa. If you choose to do so, any damage that may result is not covered under the spa warranty.*

# NESPA ENTERPRISES, Inc. LIMITED WARRANTY

**This LIMITED WARRANTY covering NESPA products is extended to the ORIGINAL PURCHASER-USER BY NESPA ENTERPRISES Inc.(NESPA), 2800 Richter Ave. Unit C California 95966.**

**NESPA products are thoroughly inspected and tested prior to factory shipment. NESPA warrants to the ORIGINAL PURCHASER-USER that NESPA Spas and Swim Spas will be free of defect in workmanship, accessories and parts, provided said accessories and parts were manufactured by NESPA. NESPA, under this LIMITED WARRANTY, warrants only that its Spas and Swim Spas shall be structurally sound, shall retain their shape, and shall retain water for the warranty period. NESPA warrants the adhesion of tile to fiberglass for a period of three (3) years and structural soundness for ten (10) years. NESPA warrants epoxy grout adhesion for a period of three years. If any such defects appear and are reported within the warranty period, NESPA shall repair or replace such defective parts without charge if an inspection proves the claim.**

**The provisions of the LIMITED WARRANTY shall not apply to tile cracked, split, chipped or damaged after the product has left the factory, nor damage to tile caused by freezing nor to damage, defect, malfunction or failure to conform with the above warranty provisions where the damage, defect, malfunction or failure to conform was caused during shipment or by distributor or by unreasonable use by ORIGINAL PURCHASER-USER including improper water balance and improper sand pack or support.**

**This LIMITED WARRANTY shall not apply to any plumbing, equipment, or installation of spas and Swim Spas and shall not apply to any alterations made to or upon NESPA products except alterations made by NESPA employees or NESPA authorized representatives.**

**This LIMITED WARRANTY is expressly in lieu of all other warranties expressed or implied including the warranties of merchantability and fitness for use and all other obligations or liabilities on NESPA'S part, and NESPA neither assumes nor authorizes any other person to assume for NESPA any other liability in connection with the sale of this NESPA product. This LIMITED WARRANTY shall not apply to this NESPA product or any part thereof which has been subject to accident, negligence, alteration, abuse or misuse. NESPA makes no warranty whatsoever with respect to accessories or parts not manufactured by NESPA.**

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**The LIMITED WARRANTY provided herein and the obligations and liabilities of NESPA hereunder are exclusive and are in lieu of, and buyer and original PURCHASE-USER hereby waive all other remedies, warranties, guarantees or liabilities, expressed or implied, arising by law or otherwise (including without limitation and obligations of NESPA with respect to fitness, merchantability, and consequential damages) or whether or not occasioned by NESPA'S negligence.**

**This LIMITED WARRANTY shall not be extended, altered or varied except by a written instrument signed by NESPA and original PURCHASER-USER.**

# STANDARD NESPA
# IN-GROUND INSTALLATION
## *INSTRUCTIONS*
## ***SET-UP AND EXCAVATION***

**Prerequisites**: Before installing your Nespa spa. You may be required to acquire a permit from your local State, County, and City building dept and or Health department. (Commercial jobs need Health Dept. Approval). Your spa installation must comply with the most current codes. **( Uniform Swimming Pool, Spas & Hot Tub Code 2006 ( USPC 2006).**

**Spa drawings:** Request from Nespa a current spa specific construction detail, plan and section, spa plumbing detail.

**Delivery Access**: Clearly determine the method of getting the spa to jobsite and into the hole. This may require the use of a crane, forklift, hoist, backhoe and/or manpower etc.

1) The following instructions are general guidelines and may not apply to your specific jobsite conditions. When excavating for your spa remember to provide for plumbing and light connection clearances. In order to determine how to excavate for your spa or swim spa, measure spas outside dimension ( O.D.) and add minimum 3" to all sides. This 3" clearance is to accommodate jet and suction plumbing. This 3"clearance can change or be reduced upon request. Note: skimmer location, this area may have to be larger than 3", if commercial 22".

2) **Freeze Climates**- If the spa is place into a vault (typical of freeze climates) a standard 18" or more of clearance minimum from spa perimeter should be provided. This dead air space is for possible future access to spa plumbing in case of a freeze. Area drain is mandatory. **Ask your local installer** for his experienced opinion. Do not hesitate to call us because we want to be sure that your installation progresses as smoothly as possible. If you have questions call us. (888) 479-4677.

2) **Hole depth** is determined by spa's outside height dimension. This height may vary depending if spa has skids or no skids. The spa lip may be finished or non- finished. How is the perimeter deck elevation transitioning to the spa? Focus on the finish surrounding deck elevations, thickness of the finish material on spa upper horizontal lip, equal to lip or under the spa lip. This material can be tile, stone, concrete or brick.

3) **Preplumb** the spa before it goes into the hole. If there are needs for electrical , bonding or control conduits run them as well before dropping in hole. Connect bond wire to niche would be best.

**4) Spa should sit on level 3 ½" thick reinforced concrete pad. Sweep debris off pad prior to dropping in hole.**

5) **Install spa** into the hole on top of concrete pad. Use the Eye bolts provided for crane, forklift etc. rigging. Do not hold onto pipes. Use caution with suction and jet plumbing when lowering into hole. DO NOT STRESS FITTINGS! Fill Spa with water and check for leaks prior to backfill.

6) **Check site reference** points for proper spa positioning (i.e., squaring to house, garage, etc.).

7) **Shim to level spa**. Shim with non-compression able material. Re square to house, or ref. point.

8) **Dry pack** with cement the gaps that have been created when shimming spa level.

9) **Connect pipes to tees** if spa is preplumb. Installers properly support your new plumbing from stressing spas preplumb fittings. After electrical conduit and bond wire is connected to light niche, water test spa before back filling with sand.
   NOTE: **All Nespa products are water tested prior to leaving factory.**

## ELECTRICAL:

1) All electrical connections to spa or equipment should comply with the most recent national electrical code (NEC), state and local codes.
2) Connect electrical conduit to light niche. This work should be done or reviewed by a licensed electrician.
3) To install spa light you will need to include inside the PVC conduit to the light niche a solid #8 coated copper wire. (If you are use brass conduit, internal bond wire is not required.) This bond wire should be pulled with the light cord at the same time. This bond wire needs to be attached to the internal bonding lug of the light niche. An approved encapsulate should be applied to bond wire connection in niche.
4) An external #8 copper wire shall be connected to the external bonding lug on the rear of the light niche. This copper wire can then be used for additional bonding requirements (i.e., handrails or any other metallic object within 5' of the spa.

## PLUMBING:

1) **When plumbing a Nespa it is important to properly size the plumbing. We highly recommend that you follow the pump manufacturer's pipe sizing requirements and Uniform Swimming Pool, Spas & Hot Tub Code 2006 ( USPC 2006). This code book is available at www.IAPMO.org or (909) 472 4100.**
2) The jet air venturi should be a Hartford loop design adjacent to spa shell and air entry point can be located next to spa or remotely at equipment.
3) Fill spa with water and test the system for leaks PRIOR to backfilling with sand.

## SAND BACK FILL:

1) **With water in spa, back-fill around spa perimeter with dry plaster sand and wet wash with hydraulic attachment to hose. Let set for one hour and hydraulic dry again. Be sure water level in spa is at the highest level. Any questions please call us. ( 888) 479-4677.**
2) **If spa is free standing on elevated deck or a structure, it is important to fill spa with water and load area prior to installing coping or perimeter decking. If spa is installed in a vault situation a area drain is needed.**

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