

# KARAG

bathroom experience...



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## SPA Systems



# Spa Installation and Directions of use

## Brief Introduction of All SPA Models

**Materials** Spa models are made of acrylic plate with fiber glass reinforced.

**Functions:** Water massage、Heating、Circulation、Ozone sterilization、Music、LED lights、fountain etc.

### Functions (Standard Configuration)

Model	Spec. (cm)	Big Nozzle (Each)	Small Nozzle (Each)	Pillow (Each)	massage pump	Bluetooth player	speaker	Small LED light	Thermostat 3KW (Each)	Filter (Each)	Underwater Lamp	Ozone (Each)	Computer System (Set)
M-3527	210*158*73	7	13	4	1pc (2speed 2HP)	1	2	12	1	1	1	1	1
M-3374	175*110*72	4	11	2	1pc (2speed 2HP)	0	0	0	1	1	1	1	1
M-3522	190*190*76	7	18	3	1pc (2speed 2HP)	1	2	12	1	1	1	1	1
M-3524	220*210*83	13	20	3	1pc (2speed 3HP)	0	0	20	1	1	1	1	1

*\*Configuration above is only for reference, for exact information, please subject to actual entity.*

## SECURITY INSTRUCTIONS

CAUTION: READ THESE INSTRUCTIONS CAREFULLY AND APPLY THEM IMPERATIVELY.

### PREVENTION OF RISKS FOR CHILDREN

- Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules
- No part of the appliance is to be located above the bath during use.
- Parts containing live parts, except parts supplied with safety extra-low voltage not exceeding 12V, must be inaccessible to a person in the bath.
- Earthed appliances must be permanently connected to fixed wiring.
- Parts incorporating electrical components, except remote control devices, must be located or fixed so that they cannot fall into the bath.
- The installation is in the correct zone and that equipotential bonding is carried out.
- As regards the information for the installation, operation, maintenance and disposal of the device, refer to the following parts of the manual.
- To avoid any accident with children, do not let them use the spa alone, without supervision.
- To minimize the risks, it is advised to lower the water temperature for young children.
- Always feel test the temperature of the water with your hand, to check out the temperature and

comfort of it before authorizing allowing the child to enter into the spa.

11. Do not forget that wet surfaces are slippery; remind children to pay attention when they get in or out of the spa.
12. Do not let the children stand on the cover of the spa.
13. Never ever dive/jump into the spa.
14. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
15. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
16. The appliance should be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.
17. The floor has to be capable of supporting the expected load.
18. An adequate drainage system has to be provided to deal with overflow water.
19. For the water disposal, please refer to the drain instruction part.( Drainage pipe diameter is 18 mm)

## **PREVENTION OF RISKS FOR ADULTS**

1. To limit the risks of accident, do not remove nor lose the suction connections. Never use the spa if the suction connections are missing or broken.
2. Do not forget that wet surfaces are slippery; pay attention to the risks of slipping and falling while getting in or out of the spa. For reasons of hygiene, people having any infectious illness should not use the spa.
3. Keep large clothing and jewels away from the rotary jets and other moving parts.
4. The use of drugs, alcohol or medicines before or during the use of the spa may cause loss of consciousness, and thus risks of drowning. People under treatment must consult a doctor before using the spa; certain drugs cause drowsiness, some other drugs may cause heart problems, blood pressure and blood circulation.
5. It is advised that expectant mothers consult a doctor before using the spa.

## **PREVENTION OF ELECTRIC RISKS AND OF STARTUP**

1. Test the differential circuit breaker before use. It must always be connected to a circuit protected by a switch in the event of defect with the earthing.
2. Any damaged cable must be replaced immediately.
3. The installation of electric devices or equipment near your SPA, must be installed so as to respect the electric standards in force.
4. Install the spa so that draining is away from the electric box and any electrical parts.
5. Before carrying out maintenance of the electric parts, disconnect the spa.

Connection to the mains must be made by a professional, according to the standards into force (section of the cable/power of the circuit breakers and adequate protection).

Before filling with water make sure to close turn off the drainage valve and that all the nozzles and all the connections are tightened (during transport they can get loose).

Always disconnect the spa before carrying out any maintenance.

When filling with water for the first time, open all inspection doors and make sure that there is no leak.

Never close all the nozzles and valves of the fountains and put the pumps in operation as this risk seriously damaging the spa.

**NOTE: Your spa is equipped with two or three massage pumps enabling you to use half the jets. Do not switch the spa on if it is empty, as this could damage the controller, the heater, the circulation pump, etc...**

## Installation on the ground

A: Height of Concrete Paving stone >100mm

B: Length of the Paving stone: G + F + C

C: Length of your SPA

D: Width of the Paving stone: 2xG + E

E: Width of your SPA: Space between the SPA and the Paving stone

G: Technical area: >600mm

## Description and Installation:

### INSTALLATION INSIDE/IN BASEMENT

If you install your spa inside, you must check how solid the floor is on which it will sit and follow some precise instructions. The water may spill around the spa, so the floor must offer good grip when it is wet. Additionally, make sure there is sufficient drainage to avoid an accumulation of water around the spa. If you are building a space for your spa, make room for a ground siphon. The level of humidity naturally increases while the spa is in use. Steam from the water may therefore get into the wood and lead to the development of fungus or other such things. Check any possible traces of humidity on the parts of the room with wood or paper etc. To minimise these effects, it is recommended to air the room in which it is installed (extractor fan or extraction system).

### INSTALLATION OUTSIDE/ON TERRACE

The foundations must be solid. Find out the load capacity of the intended surface and call a qualified tradesman or a construction engineer. To know the weight of the spa while empty and full, refer to the specifications table. The weight by m<sup>2</sup> must not exceed the nominal capacity of the structure to avoid causing serious damage to the structure. If you install the spa outside, we recommend that you place it on a concrete slab of a thickness of at least 10cm. Do not forget to install the ground siphons around the spa to be able to drain water in case of heavy rain.

**WARNING:** You must fix the tarpaulin to your spa and for strong wind, you will have to ballast it.

### PREPARATION FOR CONNECTION TO THE MAINS

Make sure that the 30mA circuit breaker is permanently connected (electric board of YOUR installation) to a circuit protected by a switch in case of an earth fault. Only use copper cables. The electrical connection of the spa is very important as when it is running at full power, it consumes a high level of amps. The first step is to calculate the maximum current supported by the 230 volts line.

***The electrical connection must be done by a professional and in accordance with current standards (cable section/ power of the circuit-breakers and adequate protection)***

## Description of use:

1. Install the filter: open the handle lock of the filter lid, remove the cover and put the filter in place, then replace the cover and the handle lock.
2. To replace the filter: open the filter cap handle lock, remove the cover and then take out the filter. Remove the dirt from the bottom of the filter, then replace the clean filter. Next replace the cover and the

handle lock.

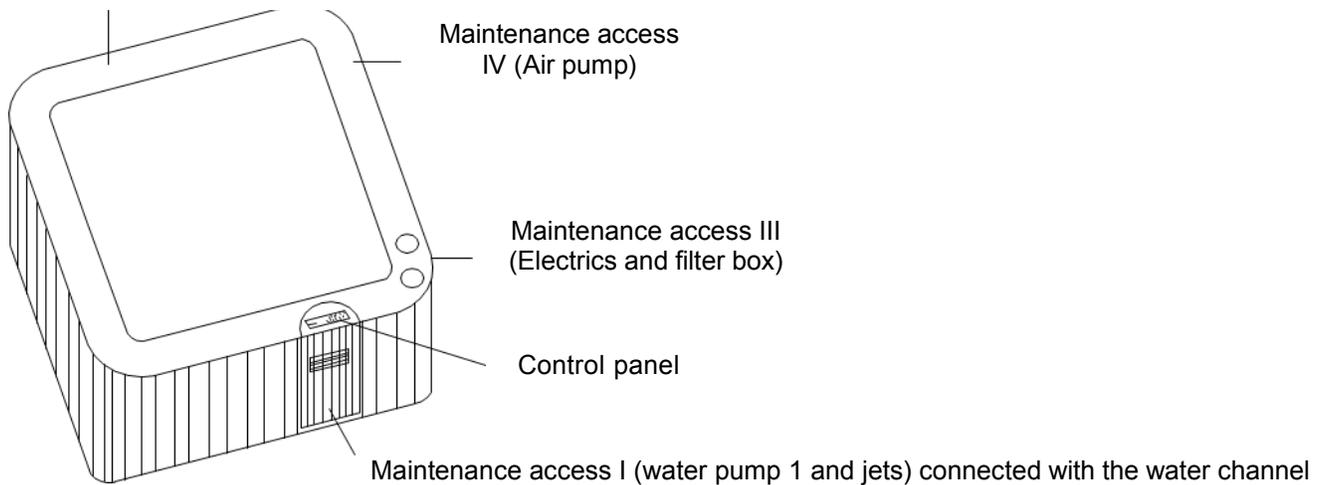
3. Clean the Filter: the base filter can be directly rinsed with pressurised water, or shake it after it has been dried.

4. When you use the filter for the first time, open the escape valve on the upper lid of the filter to ease the pressure after having poured enough water into the spa;

Use of ozone generators:

5. Disinfection takes on average between 15 and 20 minutes.

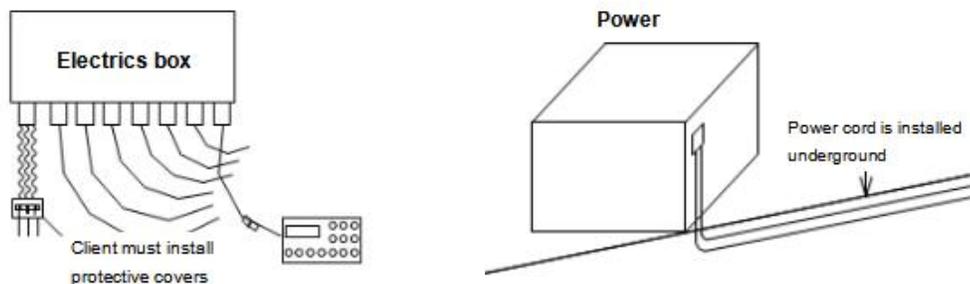
Maintenance access II  
from the water pump 1 and the jets



6. Connect the power lead (see the picture) with output III and make sure the installation and leakage protection is at 1.5m above the ground.

7. Repair access I, II and III are used for the repair (represent by the picture).

8. The drainage device is installed in the hole, for repair, and needs to be in contact with the water channels and controlled by a tap.



## GENERAL REMARKS

- Do not leave the spa in the sun without water and without its tarpaulin as it may damage the shell. Always cover the spa with its tarpaulin when it is not in use, whether empty or full. Do not expose the spa to rain or snow. If possible, build a shelter for the spa.
- Do not try to open the electronic command box. It does not contain any parts which require maintenance.
- Regularly empty the spa and refill it with clean water.
- It is necessary to empty the ducts once a week (see emptying the ducts).
- Clean the filter cartridge at least once a month and the filter once a week.
- Before getting into the spa, it is advised to have a wash or a shower without soap and to wear a swimming costume which has been rinsed in clean water to stop the water in the spa being contaminated by detergent or soap.
- Repaint the spa's outer wood every 1 or 2 years.

*Good maintenance of the water quality will enable you to keep your SPA for a long time... for this, you simply need to balance the water in your SPA and avoid a build up of lime scale which may damage your system.*

## **WATER MAINTENANCE**

It is very important that the water in the spa is always clean and clear. We advise you to change the water every 60 to 90 days depending on use. To do this, disconnect the Spa from the power supply and drain the water (see Drainage, p.14). Make sure the plug is replaced properly and refill the spa with fresh water. If you are not sure, here is a simple little calculation to know when to change the water: Litres of water in your spa ÷ (number of days of use x the number of users) = the number of days you can keep the water in your Spa.

### **The terms used in a few words:**

**pH:** The pH level must be between 7.2 and 7.6 with a pH of 7.4 being the ideal.

Abbreviation of power of hydrogen is the index to express the activity or concentration of the hydrogen ion in a solution. The pH is acid at 0, neutral at 7 and alkaline at 14. It has a very great influence on the disinfection and must be checked once a week.

Type of disinfectant used:

- Chlorinated products:  $6.9 < \text{pH} < 7.7$

- Bromine:  $7.5 < \text{pH} < 8.2$

**Total Alkalinity:** The level of Total Alkalinity is between 8° (80ppm) and 10° (100ppm).

The Total Alkalinity, expressed in French degrees (°f), is based on the concentration of carbonate and bicarbonate ions. It sets the buffer power of the water. That is to say, the capacity of influence of an acidic or basic product on the pH of the water. The higher the Total Alkalinity and the more difficult it is to vary the pH of the water.

**TH:** The ideal rate of water hardness is between 7 and 15 °TH

Water hardness, its TH (Total Hardness), expressed in French degrees (°f), depends on the concentration of calcium and magnesium ions. If the water is too soft, it will damage the heater, and if it is too hard, it will damage the pipes and the ducts will become blocked with an accumulation of lime scale.

## **First use**

### **Material requirements:**

- Get a water maintenance and measuring kit.
- Bromine and chlorine tablets
- Float diffuser for bromine or chlorine
- Oxidising shock
- Total Alkaline +
- Total Alkaline –
- pH + & pH –
- Lime scale + (not recommended if pH stabiliser)
- pH stable (not recommended if lime scale +)
- Chemical test rods

### **NEVER MIX BROMINE AND CHLORINE IN THE WATER: DANGER!**

The water will be perfect when the following values are met:

- pH: 7.4
- Bromine: 5 mg/L or Chlorine: 1.5 mg/L

## **Description on Using Parts**

### **1. Thermostat**

1) Normal starting up time is 4-8 hours

2) SPA Thermostat cannot be heated by man in the air, or there will be danger. If there is something wrong in operation, professional servant is indeed needed to prevent the risk of electricity.

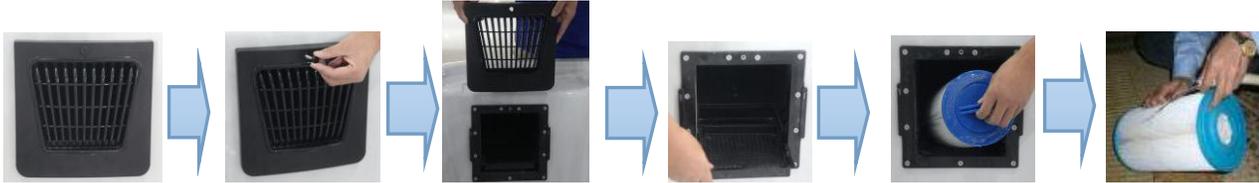
## 2. Air pump

Normal starting up time is 15-30 minutes

Please notice that water level should not be 7cm over the tub water level to prevent air pump being burnt out by water leakage.

## 3. Paper element filters daily maintenance

### Type one:



1) Remove the outer cover of the skimmer;

2) Pull out the skimmer screw;

3) Take out the paper core;

4) Wash the paper core with water, reset it after cleaning and dry out;

### Type two:



1) Remove the cover on the filter, and screw the core paper filter out.

2) Repeatedly Clean the core paper filter with water.

3) Put the core paper filter back to use after dry out.

4) Change the core paper filter half a year once, depends on the high quality of water, lifetime of paper filter can be properly extended.

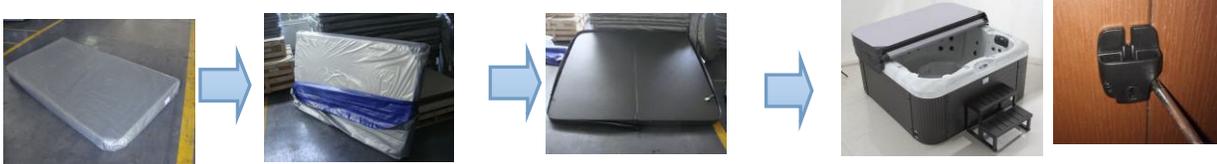
5) Change a new paper filter, take out a new one and tear out the package of the paper core and put it inside the filtration bucket.

6) Match the paper core correctly inside and screw it down in sequence, then put the cover of filtration bucket on top.

## 4. Ozone sterilization instruction

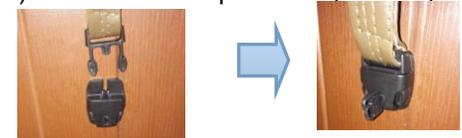
The lasting time of ozone sterilization is different in different systems; there will be strong smell if operating it too long.

## 5. Use and installation of cover:



1). Remove the lid pack and put on spa

2). Nailed the buckle on the skirt



3). Fasten the other side of the buckle.



4). lock/unlock the buckle by turning the key.

## Precaution to avoid damage when the appliance is left empty for an extended period:

When not in use for a long time, drain the water in the bathtub, cut off the power, sealed and keep the surroundings dry and ventilated, put on the cover.

## Before using after a long left empty:

- 1) Check the electrical leakage protection switch performance.
- 2) Check the power cord, switches, connectors, etc. if chewed by rats, pests damaged.
- 3) Check the water supply and drainage for cracks, fold and inconvenient to use; check drainage channel whether it's smooth.

## Precaution to avoid damage due to water freezing

In cold regions or seasons, to keep SPA energized and in the standby state, keep the water level in the normal water level, the spa has the antifreeze function can prevent freezing motor, air pump all accessories. Or drain out all the water and make spa seal storage.

## 6. MANUAL OF THE WATERPROOF BLUETOOTH/AMPLIFIER SYSTEM

### Configuration:

- 1、 Waterproof speakers: 2pcs (30-50W)
- 2、 Bluetooth amplifier: 1pc

### Equipment parameters

1. Power input: 2100-240V ~ 50-60Hz 1.0A
2. Power output:sound channel 2.0 (2\*15W/4Ω )
3. Bluetooth version :V4.2
4. Frequency response: 20Hz-20kHz
5. Water proof: IPX5



The wiring diagram

### 6. Connected to the load and power supply



Connect the load and power supply according to above wiring diagram

### 7. The normal work

When power is supplied, search and connect the Bluetooth equipment named “P20” with a Smartphone or ipad. Then users can play music with Smartphone or ipad. (note: password “2288”)

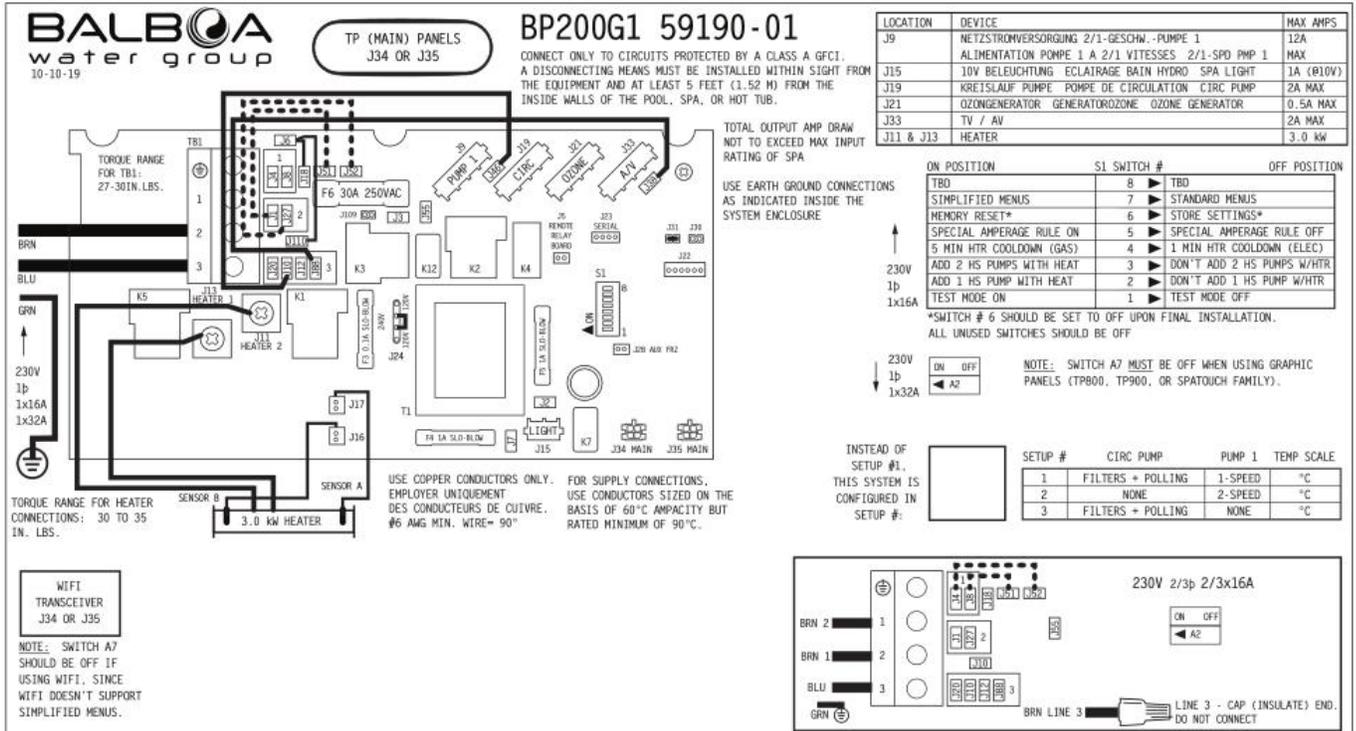


## Description of installation:

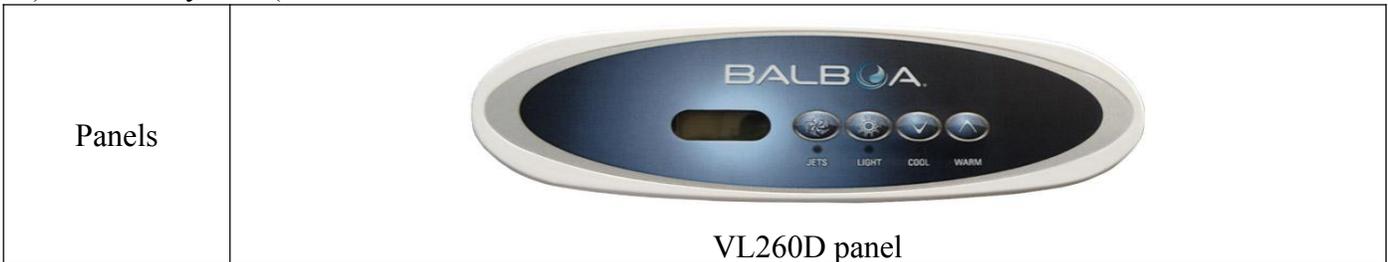
Please check that the circuit breaker and drainage agree with the positions of the electrical box and drainage for different SPA models.

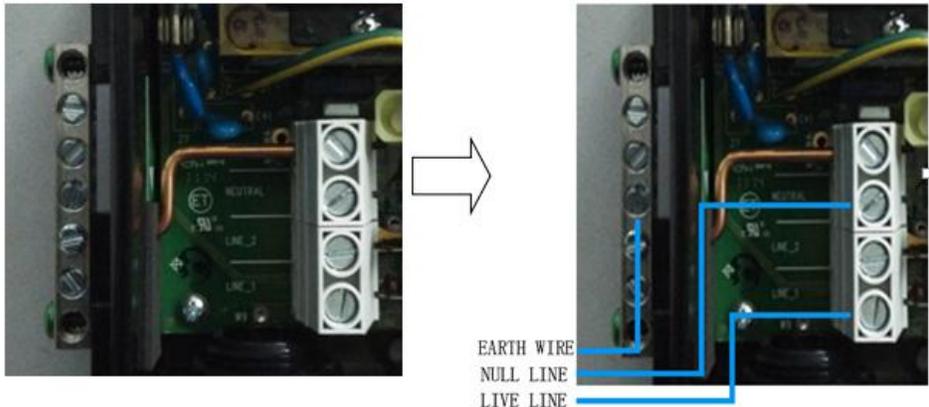
1. Please reserve an independent - controlled electric leakage switch before installing the SPA and reserve power cord no less than 3\*6mm<sup>2</sup>. For big swimming SPA, at least two group of power cord 3\*6mm<sup>2</sup> is needed. If customer requires 380V power supply, please reserve the 380V leakage switch and power cord at least 5\*4mm<sup>2</sup> and two group of power cord at least 5\*6mm<sup>2</sup> for big swimming SPA.

### 1) Control system BP200

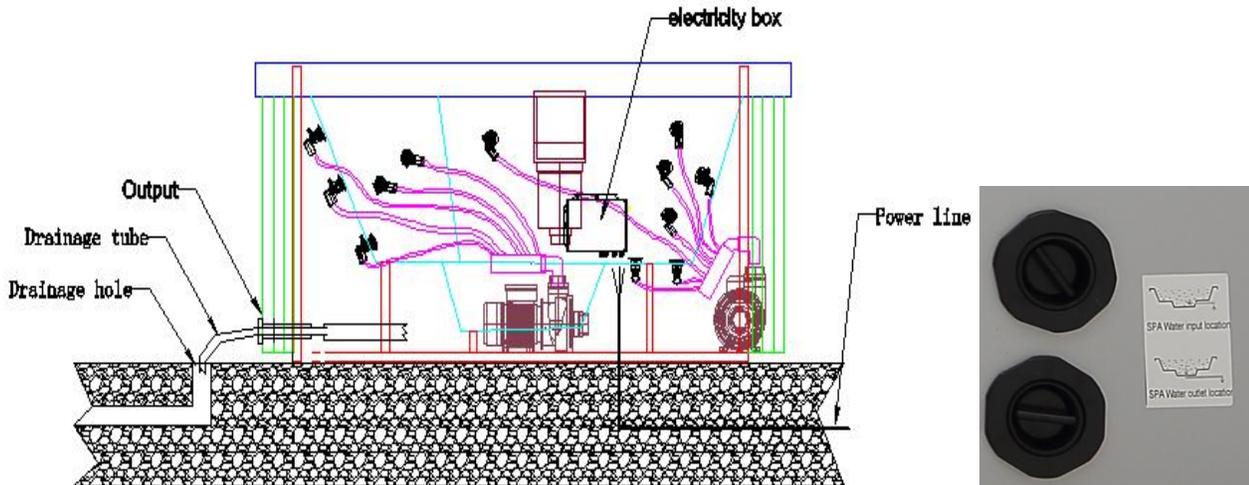


### 2) control system (GS100)

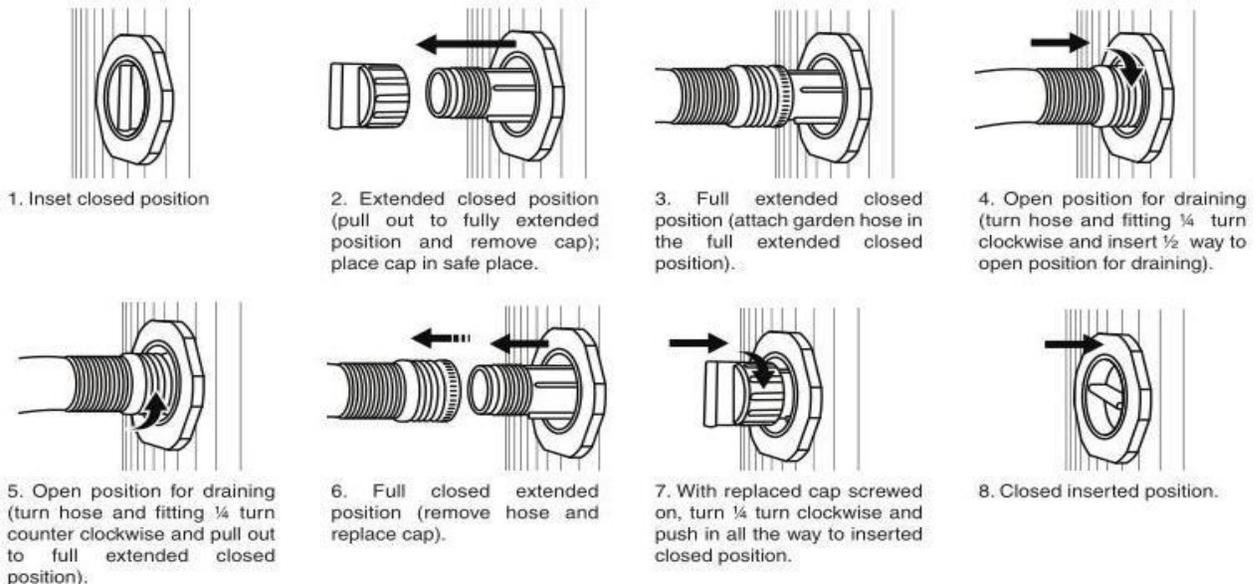


<p>Electric box GS100</p>	<p><b>Power Requirements</b></p> <ul style="list-style-type: none"> <li>• 230VAC, 1~, 16A, 50Hz</li> <li>• 3 wires (line, neutral, ground)</li> </ul> <p><b>System Outputs</b></p> <p><b>Setup 1 (As Manufactured)</b></p> <ul style="list-style-type: none"> <li>• 230V Pump 1, 2-Speed</li> <li>• 230V Ozone</li> <li>• 10V Spa Light</li> <li>• 230V 3.0kW Heater PN 58202</li> </ul> 
<p>Diagram of 220V-230V (L/N/E)</p>	 <p>EARTH WIRE NULL LINE LIVE LINE</p>

2. Connect the drainage hole with the 1.5" tube prepared when you drain the water from these.



## DRAIN INSTRUCTIONS



## Care and Maintenance

1. Please clean the massage bathtub with neutral detergent and soft fabric. Do not clean it with acetone, solution, ammonia water and organic solvent, otherwise, it may possibly damage the surface of the bathtub. Mildly wipe off the adhesive stains on the bathtub with soft fabric and gasoline.
2. If there's scratches on the bathtub, please grind with 2000# grinding paper with water, and then polish with toothpaste and soft fabric.
3. Please wipe off the water scale on the bathtub with light acid detergent such as citric acid and vinegar.
4. Remove the water-return unit and nozzle for cleaning and removing dirt.
5. Do not frequently wipe the gold and chrome plated parts (do not contact it with organic solvent).
6. Please keep blunt and knife away from the surface, and butt or the things over 60 degree should be away from that too.
7. One time to check button of electricity leakage every month.
8. Make frequent checks on the electrical wires, buttons, connectors always to see if they are bitten by rats or worms.
9. Make frequent checks on the feed pipe and drain pipe always to see if there is some parts broken or bended make sure it is smooth.
10. When storing the products, do not put converted and overlapped, make sure they are far away from formic acid and methanal as well as any other organic solvent.
11. If they are needed to be carried, do take those actions lightly, in case of high pressure, mechanical impact strength and succession.
12. If the bathtub are not to be used for a long time, dry inside the bathtub and make the circumstance dry and ventilated as well as no corrosive gas.

## Instructions on Maintenance

1. Replace the massage water pump: cut off power supply, open the bathtub side plate, drain empty the SPA's water, remove the wires and open the water pump, loosen the fixed bolts and take out the water pump, after replacing the pump, install power wire, fix the bolts, put into small amount of water into the bathtub, check if there's leakage at the pump, and then install the side plate of the bathtub.
2. Replace the filter water pump: cut off power supply, open the bathtub side plate, turn off the valves on both ends of water pump, remove the wires and open the water pump, loosen the fixed bolts and take out the water pump, after replacing the pump, install power wire, fix the bolts, put into small amount of water into the bathtub, turn on the valve, check if there's leakage at the pump, and then install the side plate of SPA.
3. Replace the thermostat: cut off power supply, open the bathtub side plate, turn off the valves on both ends of thermostat, remove the wires, loosen the fixed bolts and take out the thermostat, after replacement, install

power wire, fix the bolts, put into small amount of water into the bathtub, turn on the valve, check if there's leakage at the pump, and then install the side plate of the bathtub.

4. Replace the filter core: cut off power supply, open the bathtub side plate, turn off the valves, loosen the bolts on top of the filter, take out the filter, remove dirt on bottom of the filter.
5. Anti-frozen of filter: In some area, water may be frozen in winter, under this case, please stop using filter, to remove it and clean the core, store it in safe place or move the filter core to interior. Or keep the SPA at standby state.

## Troubleshooting

Faults	Reason	Solution
No reaction for panel Key	11. Panel was locked 12. Panel is broken	Unlock the panel Change panel
No power supply	1. There's problem for the power circuit; 2. Protective switch is cut off.	Check the circuit; Check and remove short circuit, Connect the protective switch
Nozzle doesn't spray water	1. There's problem for power supply of water pump; 2. Water pump is not started. 3. Massage water pump is damaged 4. There is air in pipe	Check and connect the power wire Check the massage water pump Replace the massage water pump Purify pipe by taking the loose joint part
Bottom lamp doesn't light on	1. Bulb is broken; 2. Fuse is damaged.	Replace the bulb Replace the fuse
Poor filtering effect	1. Filter water pump is not started; 2. Filter is not cleaned; 3. Filter water pump is damaged.	Start the filter water pump Clean the filter Replace the filter water pump
Constant temperature effect is unavailable	1. Thermostat is damaged; 2. Power supply is unavailable. 3. Filter is jammed.	Repair or replace the thermostat Check the power supply Clean or replace the filter paper core
Bathtub is scratched		Grind with 2000# grinding paper with water, and then polish with toothpaste and soft fabric

**NOTICE:** The usage manual is only for reference, and all data subject to the actual product, any update without notice.

## FAQ

### How do you fill the spa?

Take your hosepipe. Put the plug in the tub and turn on the tap. The time it takes to fill the spa depends on the water pressure and the size of the spa. On average, it takes between 1 and 4 hours.

### How many times per year should the spa's water be changed?

It is very difficult to answer this question. It depends on 3 factors:

- How many people use the spa regularly?
- How many times a week is your spa used?
- Are you regularly monitoring the water treatment of your spa?

On average, the water should be changed every 3 months for a spa used every day by 2 people if the water is being treated correctly. If you do not use your spa so regularly, you can change the water a bit less often.

### How do I treat the water in my spa?

It is imperative to keep the water pure in your spa. Before getting into your spa, wash with soap and water

to eliminate bacteria and all traces of cream and deodorant (these products may reduce the efficiency of the disinfecting products and the efficiency of the filters).

Never put bubble bath in your spa.

- The ozonator destroys the bacteria. It is a safe method, without smell, which must nevertheless be complimented by a chemical treatment (bromine or active oxygen).

- A disinfectant product is necessary (bromine or active oxygen). The dosage of these products requires all your attention to avoid not treating your water sufficiently or, on the contrary, attacking your spa and creating an unpleasant smell if you overdose the products.

As there are different products on the market, with different concentrations, always ask advice from the person who sold you your spa.

They will be a spa professional and will have knowledge and experience of treatment products for spas. They will know which products work and which products do not.

Always check that the chemical products you are using are compatible with your spa's acrylic coating.

- The filter cartridges clear the water of residual impurities. The greater the surface of the filters, the more efficient the filtration.

- Anti lime scale products stop deposits of lime scale on the ducts, the walls and the bottom of the spa.

- Anti algae products prevent algae forming. They enable slightly infected water to be recovered.

### **Is the spa dangerous for children?**

A permanent adult presence is required while children use the spa. We remind you that it is possible for a child to drown in 10cm of water. When you get out of the spa, do not forget, each time, to replace its top cover. This must be fitted with lockable fittings.

### **What are the benefits of the spa?**

Other than the pleasure from bathing in it, the spa is known for its relaxing, appeasing, toning and stress relief properties. It leads to deep and refreshing sleep. It is a convivial space, which can be used alone, as a couple, with the family or between friends.

### **When can the spa be used?**

Throughout the year as it is heated to your desired temperature (between 30°C and 34°C in summer and between 35°C and 37°C in winter). To protect it, the spa is covered with an isothermal cover.

### **How long does it take for a spa session?**

On average, between 10 and 20 minutes. This will enable you to relax and spend the optimal time to revive yourself.

### **What temperature should the water be set at?**

In winter, between 25°C et 32° C and in summer between 30°C and 34° C.

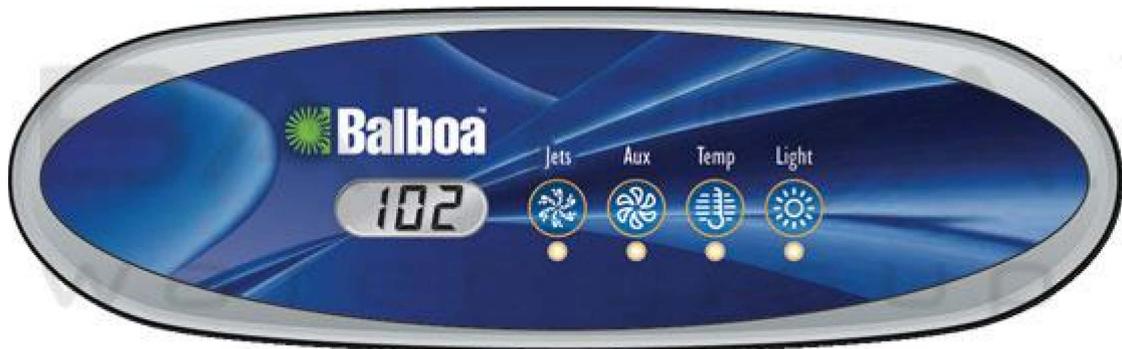
Between 25°C and 37°C you can stay in the water for as long as you want.

Between 30°C and 35°C you will be at the upper temperature zone of the internal body temperature, so do not stay for more than 15 minutes in the spa. You will be able to get out feeling very tired.

# USA Balboa Control System Usage Instructions

\*Three control systems are referable, please read through the corresponding system carefully before operation.

## 1.GS100 Balboa Control System



**GS100 Control System with VL260 Panel**  
*Non-Circ Operation*

### (1) 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 “Temp” or “Set” to skip Priming Mode) and then the spa will begin to heat the spa and maintain the water temperature in the Standard mode.

### (2) Temp/Set(80°F - 104°F / 26°C - 40°C)

The start-up temperature is set at 100F°/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 “Temp” or “Set” pad once.

To change the set temperature, press the pad a second time before the LCD stops flashing. Each press of the “Temp” or “Set” pad will continue to either raise or lower the set temperature. If the opposite direction is desired, release the pad and let the display revert to the current water temperature. Press the pad to display the set temperature, and again to make the temperature change in the desired direction.

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

*\*Note: If there is not a blower on the system, an alternate panel with separate "Up" and "Down" buttons in place of a "Set" or "Temp" button may be used. Simply press "Up" or "Down" where a "Temp" or "Set" button press is indicated. (Ignore the "direction reversal paragraph")*

### (3) JETS

(1) operation with circ pump: Press “JETS” once to turn circ pump on, and press the button again to turn massage pump/surfing pump on. Circ pump at work cannot be turn on but massage pump/surfing pump can. The heater and ozone work together with the circ pump. Surfing pump/massage pump at work will turn off after 15 minutes. Circ pump will work without stop, during which it cannot be deactivated from the panel, but surfing pump/massage pump may be operated by button.

(2) operation without circ pump(equipped with two-speed pump): ) Press “JETS” to turn pump on or off, also can

switch the pump from high-speed to low-speed. Pump in low-speed will work together with heater and ozone. High-speed will turn off after 15 minutes. Low-speed may run automatically at times, during which it cannot be deactivated from the panel, but high-speed may be operated.

#### **(4) Blower (optional)**

This button is used to turn the blower on and off. If left on, the blower automatically turns off after 15 minutes.

#### **(5) Jets 2 (optional)**

If your system has a pump 2 installed instead of a blower, it behaves exactly like a blower would.

#### **(6) Light**

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

#### **(7) Mode**

Mode is changed by pressing the "Temp" or "Set" button, then pressing the "Light" button.

**1) 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. "SL" will be displayed momentarily when you switch into Standard Mode.

**2) Economy Mode** heats the spa to the set temperature only during filter cycles. "EC" will display solid when temperature is not current, and will alternate with temperature when temperature is current.

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

#### **(8) Preset Filter Cycles**

The first filter cycle begins 6 minutes after the spa is energized. The second filter cycle begins 12 hours later.

Filter duration is programmable for 2, 4, 6, 8 hours or for continuous filtration (indicated by "FL" The default filter time is 2 hours. To program, press "Temp" or "Set," then "Jets." Press "Temp" or "Set" to adjust. Press "Jets" to exit programming. The blower purges for 30 seconds at the beginning of each filter cycle. The low speed of the pump runs during filtration and the ozone generator (if installed) will be enabled.

#### **(9) Freeze Protection**

If the temperature sensors detect a drop to below 44°F/6.7°C within the heater, the pump and blower will automatically activate 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 condition, 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.

## 1. Diagnostic Messages

Message	Meaning
	No message on display.
--	Temperature unknown.
HH	"Overheat" The spa is shut down. One of the sensors has detected 118°F/48°C at the heater.
DH	"Overheat" The spa has shut down. One of the sensors has detected that the spa water is 110°F/43°C.
IE	"Ice" Potential freeze condition detected.
SA	Spa is shut down. The sensor that is plugged into the Sensor "A" jack is not working.
Sb	Spa is shut down. The sensor that is plugged into the Sensor "B" jack is not working.
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.
HL	A significant difference between temperature sensors has been detected. This could indicate a flow problem.
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.
dr	Possible inadequate water, poor flow, or air bubbles in detected in the heater. Spa is shut down for 15 minutes.
dy	Inadequate water detected in heater. (Displays on third occurrence of "dr" message.) Spa is shut down.

## 2. Action Required

The control panel will be disabled until power returns. Spa settings will be preserved until next power up.

After the pump has been running for 2 minutes, the temperature will be displayed.

DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, it re-set by pushing any button. If spa does not reset, shut off the power to the spa and call your dealer or service organization.

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.

No action required. The pump and blower will automatically activate regardless of spa status

If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)

If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)

If the problem persists, contact your dealer or service organization.

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.

Follow action required for “*HL*” message. Heating capability of the spa will not reset automatically; you may press any button to reset.

Check water level in spa. Refill if necessary. If 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 organization.

Follow action required for “*dr*” message. Spa will not automatically reset. Press any button to reset.